EXECUTIVE SUMMARY

As per Notification of MoEF S.O. 1533 dated 14.09.2006.

FOR

EXPANSION OF 10 MW TO 17.5 MW BIOMASS BASED POWER PLANT & ADDITION OF 120 TPD CEMENT GRINDING UNIT

AT

WADSA, DESAIGANJ, DISTRICT GADCHIROLI, MAHARASHTRA.

PROJECT PROPONENT

M/S. A. A. ENERGY LIMITED

EIA CONSULTANT

POLLUTION & ECOLOGY CONTROL SERVICES

Near Dhantoli Police Station, Dhantoli, Nagpur - 440012

NABET Accreditated EIA Consultant

No.: NABET/EIA/02/12/47 Dated 27/02/2012

JANUARY 2013

Executive Summary

General

1. In order to meet the continued power and energy demand in the state of Maharashtra, AA Energy Ltd. (AAEL) proposes to expand the existing 10 MW Biomass Power Plant (BPP) by addition of 7.5 MW Biomass based Power Plant Near Desaiganj (Wadsa), Tehsil Armori, District Gadchiroli. The expected expansion project cost will be Rs. 39.51 Crores.

2. M/s. AA Energy Ltd. (AAEL) is a company formed in the year 2005 and is in the field of power generation using biomass fuel for the past 5 years and is presently operating and maintaining a 10 MW power plant at Desaiganj (Wadsa), Tehsil Armori, District Gadchiroli.

3. The proposed expansion project of 7.5 MW biomass power plant is eco-friendly project of using renewable energy, mainly from agro residues. The proposed 7.5 MW power plant will be located at the existing plant premises adjacent to 10 MW biomass power plant. Geological location of existing plant lies between latitude 20^0 35' 35'' to 20^0 35' 49'' and longitude 79^0 57' 49'' to 79^0 58' 06''

4. The ministry of New and Renewable Energy (MNRE) has advocated to use renewable resources prudently and around 10000 MW power will be generated in next decade. Govt. of Maharashtra have decided to promote biomass based sources of energy as alternative to fossil fuels.

Project at Glance (7.5 MW)

5. Technical Details of the Plant

Boiler data:

Boiler capacity at MCR (100% load)	:	38 tons / hr
Steam pressure at Superheater Outlet	:	66 Kg/sq.cm (a)
Steam temperature at Superheater outlet	:	490 ^{0}C
Design fuels	:	Biomass like Tur stems etc

Turbo generator data:

Rated capacity of the turbine	:	7500 kW
Steam pressure at the TG inlet	:	64 kg/sq.cm (a)
Steam temperature at the TG inlet	:	485 Deg C
Type of turbine	:	Extraction cum condensing

Generator voltage	:	11 KV
Condenser type	:	Water cooled
Water		
Water sources	:	Wainganga river @3.0 km
Water requirement	:	1158.3 m³/day (0.382 MCM/year)
Power evacuation:		
Voltage	:	132 kV
Nearest Substation	:	MSEB SS at Bramhapuri, 15 km
Fuel handling	:	Series of belt and slat conveyors
Ash handling		
Bottom ash	:	Pneumatic ash handling
Fly ash	:	Dense phase ash handling system
Chimney	:	RCC; 55m tall
DM plant capacity	:	6.0 m³/hr

6. The process for generation of electricity for proposed expansion project will be same as in existing plant and the layout plan of biomass power plant is shown in the Figure 1.

Figure-1 : Layout Plan

7. The inputs to the power generation system for 7.5 MW plant are fuel biomass (69000 t/year), water 1158.3 m^3/day and startup power of 700 KW. The fuel used for startup is LSD and coal, while the power plant will run on biomass fuel. During monsoon, if biomass fuel is not available or having high moisture content, coal is used for non-stop generation. It is assumed that the power plant shall run for 330 days in a year.

8. Power generation will be 59.13 MU per annum. The process will generate ash to the extent of 15150 tones/year and the flue gas emitted from the Chimney will be round 68 tonnes/hr. The total waste water generation formj both biomass power plant from boiler blow down and cooling tower blow down will be 365 m^3/day. Evaporation losses from cooling tower and boiler blow down are estimated at 2377 m^3/day. Wastewater from filter back wash, DM plant and domestic sources will be 453 m^3/day. All wastewater generated will be suitably treated and reused in plant premises. The AAEL envisages zero wastewater discharge.

9. The other auxiliary equipment and accessories required for the biomass power plant are 1. Coal handing system during non-availability of biomass. (A covered storage

shed of 625 m^2 will be provided near biomass storage area). 2. Ash handling system used for both bottom and fly ash for generation of 15000 T/year. 3. Water treatment plant of capacity (1360 m^3/day) and wastewater treatment plant of capacity (453 m^3/day).

10. Air conditioning and ventilation system along with DM plant, filtration plant and stores etc are provided within plant premises.

11. Fire protection system will be installed for entire plant.

12. The plant land use requirements for both existing 10 MW power plant and proposed 7.5 MW power plant presented below;

Sr.No.	Plant unit	Existing (Acres)	Expansion (Acres)	After Expansion (Acres)
1	Built-up area	4.28	4.94	9.22
2	Biomass Storage Area	0.3	0.3	0.3
3	Fuel Storage Area	0.06	0.06	0.06
4	Water Storage Area	0.12	0.12	0.12
5	Area Under Building /Shed	1.76	-	1.76
6	Area Under Internal Roads, & other	4.0	-	4.0
7	Green Belt area	4.57	4.57	4.57

13. Water budgeting for the existing and proposed expansion project has been given in detail for domestic and industrial requirement. Fresh water requirement will be 2860 m^3/day having 2400 m^3/day losses and effluent generation of 453 m^3/day. Water will be drawn from reservoir of capacity 2500 m^3. Raw water source is Wainganga River for which permission has been granted by the Irrigation Department of Govt. of Maharashtra.

14. Biomass availability survey was carried out by MITCON consultancy services in Gadchiroli and Gondia districts. Within a periphery of 50 km area total biomass available is 182462 MTPA. Biomass available is from Tur stems (10%), rice husk (87%) and rest is form non-agriculture land. Biomass composition, the proximate and ultimate analysis has been presented in the report. The gross calorific value of biomass fuel ranges from 3300 (cal/g) (cotton stem) to 4600 (cal/g) from wooden power (non-agro fuel)

15. Fly ash brick machine plant (300 bricks/hour) and cement plant (120 TPD) are proposed as integral part of the proposed industry to utilized fly ash generated within the power plant to combat land pollution.

16. Air, noise water pollution control measures are taken into consideration and capital and recurring expenditure has been worked out in the project design.

Description of Environment

17. Existing environmental setting in the area encompassed within 10 km radius around the proposed plant has been incorporated in Chapter-3. The key plan consisting of project area 5.5 ha and 10 km radius area around core zone is given below;

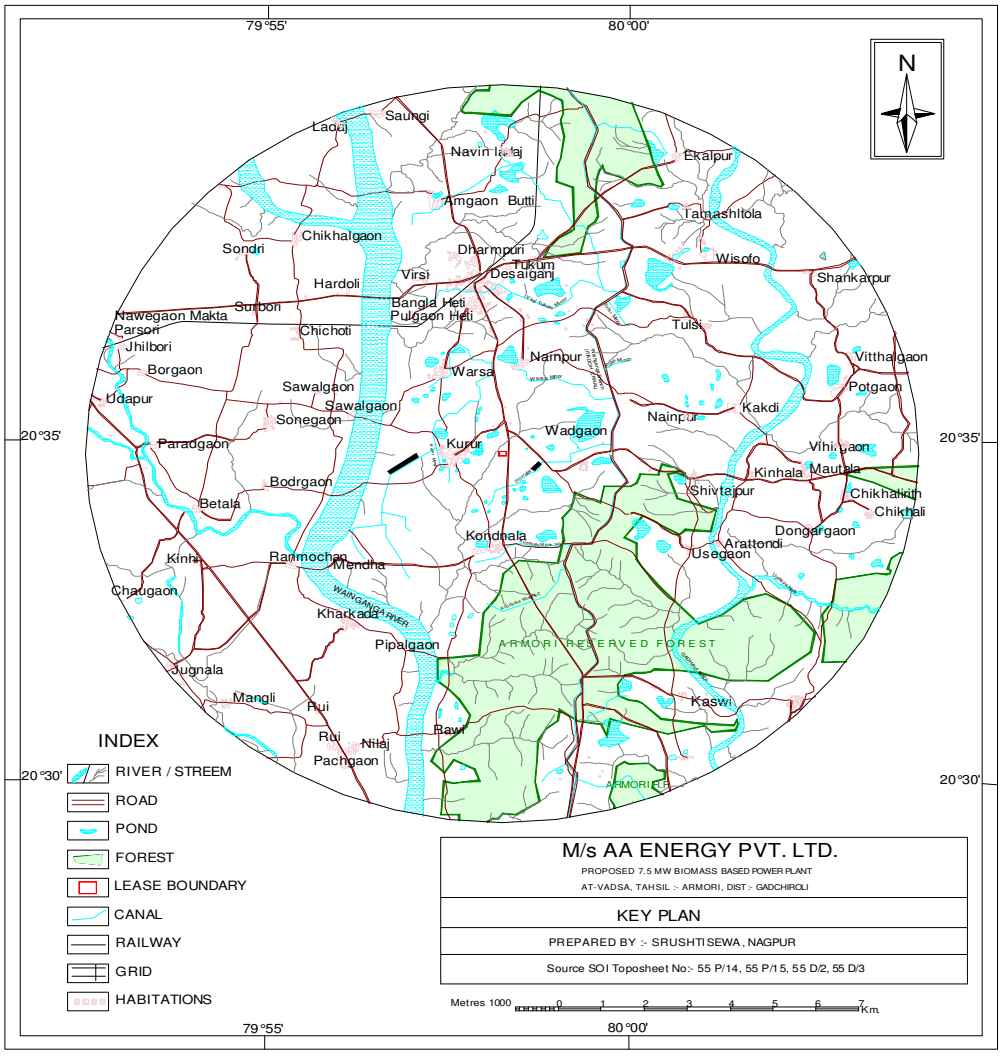

Figure-2 : Key Plan

18. Satellite image of buffer zone and existing land use pattern shows agriculture land (62.28/%), forest land (17.8%), waste land (12.2%), builtup (0.96%) and water body (6.76%).

19. Soil analysis was carried in buffer zone from five locations for physical as well as chemical properties and are presented in Table 3.3 of the main report.

20. The area belongs to Archaean-Precambrian age. The drainage comes under Wainganga catchment. Apart from river basin system, numerous small streams drain into local tanks which are used mainly for irrigation purposes. Drinking water sources are dug/bore wills. Well inventory in 43 villages is provided giving pre and post monsoon season depth and related fluctuations.

21. Ground water draft from the buffer zone is 2.33 MCM and gross ground water recharge is 40 MCM. The proposed ground water withdrawal for the biomass power plant is nil.

22. Micro meteorological data for the buffer zone is presented in depth including the annual wind rose diagram. Ambient air quality was measured at 11 stations in buffer zone and in all direction. Parameters measured were PM_{10}, $PM_{2.5}$, SO_2 and NO_X, CO O_3 and other organic constituents.

23. Ambient air quality monitoring at 11 stations selected based on predominant wind direction, sensitive areas and human settlement indicated the following ranges for specified parameters;

Parameter	Range (µg/m^3)	CPCB standard
PM_{10}	31.5 to 52.3	100
$PM_{2.3}$	9.7 to 18.2	60
SO_2	6.0 to 10.8	80
NO_X	6.5 to 13.0	80

Thus, all the air quality parameters were found within National Ambient Air Quality Standards (NAAQ). It is worth to mention that 10 MW biomass power plant was operational during the survey period.

24. Modeling studies were carried out for air dispersions through the chimney for 17.5 MW power generation. Simulation model used for predicting is industrial source

complex AERMOD view for the pollutants released into atmosphere. Predicted 24 hourly ground level incremental concentration due to 10 MW existing power plant and 7.5 MW proposed power plant and also considering cement grinding unit is for PM_{10}, $PM_{2.5}$, SO_2 and NO_X is presented in Table 4.4 to 4.6 of the main report. The tables indicate that all the concentration levels are below the CPCB standard. Graphical view for these parameters is also presented in the report.

25. Noise level survey was carried out at 12 locations within an aerial distance of 1.0 to 8.0 km and in all directions. The average values for noise levels were 43.1 dB(A) to 50.2 dB(A) in the villages during day time. Noise levels during the construction and operation of biomass power plant were predicted using Noise model "Dhwani". Coordinates of 18 sources of noise from the project were considered for modeling. Noise attenuation effects due to any barriers are not taken into consideration. Predictions have been made for worst scenario considering the plant and utilities are all in operation. The predicted noise levels at the plant boundary are less than 46 dB(A) and are superimposed on topographical map in the main report. It is concluded that high noise levels are confined within the project boundaries.

26. Selective water quality parameters for surface and ground water sources within 10 km radius of the buffer zone were considered for assessing water environment and evaluate cumulative impacts characteristics of ground water source from 8 dug/bore wells and 8 surface water sources from pond/river are presented in the report. Total forty two parameters were analyzed as per the standard methods. It was observed that at many locations alkalinity values exceed the desirable limits but was within permissible limits. This may be due to dissolution of salts and local geological formulations. Remaining physical and chemical parameters were within acceptable range of BIS 10500. Surface water quality indicated no pollution and hygienic condition surrounding these sources. Coliform count was low.

27 The terrestrial ecological observation show presence of nine common species around the core zone. Power plant is devoid of any flora except green belt development by the project proponents. Armori reserve forest is 4 km away and the modeling studies have shown that concentration of air pollutants is meager in the buffer zone. This indicates that adverse impacts on flora are not expected in the core zone.

28 The Godchiroli district is most backward district in Maharashtra state. Very few industries are located in this district and state government has announces special

packages to promote industries in the area. The community profile indicating sex composition, SC & ST population socio religious groups and literacy rate has been described. The main staple food for the area is rice. Vegetables and fruits are grown by farmers. Agriculture is the main activity in the area.

29 Infrastructural facilities and services are poor. Inter village transport facility is through kachha roads. Educational facilities area available in villages however heath facilities are very poor.

30 The core and buffer zone has no major historical places of importance from archaeological point of view, does not exist any national park/wild life sanctuary within 10 km radius from project site. Very few small scale industries are located in the district. Rice mills are existing in the study area which will supplement fuel needs of the AAEL.

Environmental Impact Assessment

31 Environmental impacts have been assessed for the construction phase of 7.5 MW power plant, cement plant ant brick manufacturing plant. Cumulative impacts during operation phase of 17.5 MW plant and the small scale cement and brick manufacturing are discussed in chapter 4 and mitigation measures suggested to minimize adverse impacts. Temporary increase in ambient SOx and NOx levels is expected due to operation of construction machinery. However, increase in these pollutants is marginal and during construction phase only. It is necessary to control fugitive emissions due to dust and rice husk by regular water sprinkling all over the exposed area. Nose mask need to be provided to workers in dust prone areas.

32 The capacity of water reservoir in the plant and carrying capacity of existing pipeline from Wainganga River is sufficient to cater the demand of 17.5 MW power plant. Irrigation Dept. Govt. of Maharashtra has already permitted to use 0.55 MCM/year water from Wainganga River.

33 Air : Suitably designed ESP with efficiency of 99.9% will be placed downstream of the stack. The stack height designed at 55 m based on CPCB guidelines. Closed circuit transformation through pneumatic conveyor is adopted for biomass and coal feeding to the boiler. Reasonably low value of NOx and SOx is expected because of quality of fuel and their properties.

34 Surface water pollution will be avoided during rainy season by avoiding earth work on a rainy day. Storm drainage and rain water harvesting has been proposed to minimize soil erosion in the plant premises. Waste water treatment plant will be

constructed and treated effluent shall be used for as make up water and gardening. The project aims at zero discharge waste water. Domestic waste water will be treated in septic tank.

35 No major impact on ground water quality is envisaged because all the wastewater generated from the proposed power plant will be treated in the effluent treatment plant and reused for ash management, dust suppression and green belt development.

36 Preparatory activities like access roads, office building, godowns etc. are available in the project area. Alternation in land use to industrial use has taken place. Hence there will not be any significant impact on the adjoining land. Further, green belt development in and around project site is expected to mitigate the impacts of construction activities.

37 Other mitigation measures suggested to minimize soil pollution are 1. Disposal of excavated material in low lying area. 2. Preservation of top soil for green belt development. 3. Selection of appropriate species.

38 There are no reported species of endangered flora and fauna within the project area. Further, wild life sanctuaries / biospheres or National Parks does not exist in buffer zone. However, species for general plantation as well as for beautification are recommended to augment present vegetation.

39 There are no oustees in the present land and hence rehabilitation and resettlement issues are not involved. Socioeconomic status of the present population is likely to be uplifted and positive due to increase in demand of auxiliary services like hotels, shops. banks, automobile workshops, public transport etc.

40 The villages in the 50 km radius will be benefited due to value addition to the biomass e.g. rice husk, soft wood, baggasse and crop residue. Transport and storage facilities of biomass will add to the employment generation in the under developed Gadchiroli and Gondia districts. These activities are labour incentive apart from employment at the plant itself.

41 The proposed project is expected to have several positive impacts on demography and socio-economic condition by way of increase in employment opportunities leading to reduction in migration of locals for employment; growth in service sectors; improvement in prices of indigenous produce and services benefiting local people; improvement in transport, communication, health and educational services etc.

42 Biomass handling plant is also provided with dust extraction system to control fugitive emissions. A permanent blanket of water cover has been provided over the

deposited fly ash and transportation to ash pond. HDPE lining is provided over the deposited fly ash and transportation to ash pond. HDPE lining is provided in the ash dyke to arrest leachate and ground water pollution.

43 Fly ash generated by burning biomass can be used as manure and sold/ given free of charge to the farmers. Fly ash generated by burning coal will be used in own cement plant and brick manufacturing plant.

44 The net economic benefits include increased employment in rural, natural resource based economy. An estimated six jobs are created for each megawatt (MW) of biomass power capacity that is installed. These jobs include fuel processing and delivery at plant site. A 5 MW stoker fired biomass power plant would use estimated fuel 123000 T/year. Overall costs and benefits of biomass utilization depends long term availability agriculture produce. Annual variability in resource availability, quantityfying acreage available to a particular crop**,** soil productivity impacts and competing markets for crop residues decide the cost and benefits to the farmers.

45 CSR initiatives will be prioritized on local needs, which focus on health, education, sustainable livelihood, social mobilization, infrastructure development, water harvesting, agriculture and environment conservation. However, it is proposed to initiate various developmental activities in consultation with the villagers. The 'felt needs' identified by them shall be provided with special attention on following.

- Employment to local eligible person shall be given priority.
- Vocational training for rural youths shall be arranged
- Development/Maintenance of Village Roads which lead to Project Site.
- Provision of Mobile dispensary van, organization of health camps,
- Improvement in school buildings, sanitation arrangement for school children.
- Providing Computers in local school.
- Providing Borewells for Drinking Water for Villagers.
- Formation of Self Help Groups (SHG)

46 The socio-economic benefits arising out of this project for the local populace will include creation of direct and indirect jobs and consequent rise in the income levels, associated commercial and social infrastructure development in the villages, improved quality and availability of power due to grid benefits (in terms of deemed generation and power factor improvement), better environment and higher returns for

the crops due to higher yield and price. Thus, the proposed expansion project has substantial socio-economic and environmental benefits at the local, the State, the Regional and the National levels.

47 All infrastructure facilities are available at existing site of 10 MW power plant and vacant land is available within the same premises for expansion of the power plant by 7.5 MW. Further, Desaiganj-Wadsa is the main paddy trader because of good road connectivity to Chhattisgarh and Madhya Pradesh. Thus, no alternative site was proposed for the 7.5 MW power plant.

Environmental Monitoring Programme

48 Environmental monitoring programme has been delineated in depth for air, ambient air quality, stack emission, number of sampling locations, sampling frequency and parameters to be analyzed are presented in tabular form. Approximate cost of monitoring these parameters is also mentioned. Emphasis is given on monitoring of ground water quality and effluent treatment plant. Soils and terrestrial ecology is not changed frequently and hence monitoring frequency of these aspects is once in three years.

49 Environment Management Cell will handle the environmental management system in the unit. The environmental management cell will be headed by Head of Safety (Safety, Health & Environment). HOS will be responsible to HOD (Technical Services). The HOS will be assisted by officers to look after the safety and environmental factors round the clock.

50 All parameters shall be tested through NABET accredited laboratories using standard procedures and interpretation can be done through apporved EIA consultants. Periodic reports on environmental auditing will be submitted to MPCB.

51 Online stack monitoring system will be installed in the plant premises. Ambient monitoring stations will be suitably located, preferably in the vicinity of Boiler, Steam Generator, Steam turbine, Coal stockyard, and Ash disposal area.

- The equipment / instruments of the monitoring station will be housed in suitable enclosure / room.
- Power supply to the station will be made from the central UPS system for all plant instrumentation / emergency shutdown systems for process plants.
- The monitoring stations will include sampling & analysis provisions for particulate Matter PM_{10} & $PM_{2.5}$ NO_x, SO_2

Disaster management plant

52 A Fire Hydrant system has been proposed to meet the norms, in addition to providing fire extinguishers at respective places wherever required.

53 AAEL has proposed to take adequate measures to mitigate all possible adverse impacts at the plant premises.

54 Possible emergencies that can arise in the power plant due to operations and storages and handling of the fuels and gases are explosion in boilers, turbo generators and transformers; heavy leakage and subsequent fire in the fuel oil handling area and storage tanks; large fires involving the biomass stockyard and coal handling areas; and accidental release of ash slurry; chlorine leakage in the water treatment plant etc.

55 The high intensity thermal radiation contours due to HFO and LDO storage tanks on fire would be confined to the plant premises. Hence, the effect of thermal radiation levels on general public outside the plant premises would be insignificant. To minimize the risk, the firewater cooling system and foam facilities will be provide as per OISD requirements.

56 All the instruments like pressure, temperature transmitters/gauges and alarms switches and safety interlocks will be tested for their intended application as per the preventive maintenance schedule. Similarly, the emergency shutdown system will be tested as per the preventive maintenance schedule.

57 Hydrocarbon, smoke and fire detectors will be suitably located and linked to fire fighting system in the vulnerable zones to reduce the response time and ensure safe dispersal of vapours before ignition can occur. Combustible materials will not be kept in storage and process areas as well as road tankers loading/unloading sites where there is maximum possibility of presence of flammable hydrocarbons.

58 The DMP will be designed to intercept full range of hazards specific 'to power plant such as fire, explosion, major spill etc. Emergency medical aids to those who might be affected by incident heat radiation flux, shock wave overpressures and toxic exposure will be inherent in the basic capabilities. The most important capability of this DMP will be the required speed of response to intercept a developing emergency in good time so that man made disasters are never allowed to happen.

59 Since the fire and explosion hazards in power plants mainly occur in the event of loss of containment, one of the key objectives of technology selection, project engineering, construction, commissioning and operation is "Total and Consistent Quality Assurance". The DMP will consist of “On-site Emergency Plan” and “Off-site Emergency Plan” and will be prepared in consonance with the guidelines laid by the MOEF.

Benefits of the project

60 Environmental Benefits

- Power generation using argo biomass is environmentally cleanness as they produce low fly ash and have low sulphur.
- Emissions of NOx is negligible as temperature in the furnace is lower than 1000^0C.
- Sulphur content in biomass is 0.08% to 0.13% maximum (0.08 for rice husk).
- Detrimental effect of SO_2 and NOx is partially mitigated by a green belt around the boundary of the plant. The plantation also helps to replenish oxygen.
- Particulate emissions from the plant are controlled by the use of high efficiency (99.8%) ESP.
- Effect of thermal pollution at ground level is minimal as the heat is dissipated to the higher levels of the atmosphere through the chimney.
- Fly ash generated by the plant is drenched with water to avoid dust hazard and is transferred in closed system to brick manufacturing units. Ash percentage is only 3% of agro residues are used as fuel. Rice husk ash (8 – 20 % of the husk) has a good fertilizer value in agricultural fields.
- Net contribution to green house effect from biomass fuel is zero in the power plant. Carbon-di-oxide absorbed by agro crops in more than the one emitted by biomass power plant.
- Use of renewable source of energy. Saving in mining, extraction and long distance transportation expanses of conversional fossil fuel.
- The project can qualify for CDM benefits under the kyoto protocall.

61 Financial Benefits

- Low gestation period as compared to conventional fossil fuel based power plants.
- Low capital investment and lesser recurring cost compared to fossil fuel based power plants.

- Minimum transmission and distribution losses and requirement of long feeder lines. Power can be fed directly to local substation in rural area.
- Reasonable returns on capital investment and less power generation cost compared to other power generation technologies.
- Payback period is reasonable, estimated payback period is 3 years 9 months.

62 Additional Benefits

- Improvements in Physical Infrastructures
- Improvements in Social Infrastructures
- Improvements in CDM Intent

63 The project also fetches CDM benefits on account of the usage of biomass (cotton stalks & tur stalks). Since being a biomass based power plant the renewable energy certificates can also be considered for getting financial benefits. The project is eligible for Carbon credits as per Kyoto protocol. The revenue from CDM has been taken as Euro 8.00 per CER. The proposed 7.5 MW biomass based power project is environmentally benign and has a distinct possibility of CO2 emission reduction trade in the International market. Hence, sales revenue from carbon credit for the first year is estimated at Rs. 240 lakhs.

Environment management plan

64 Environment management plan includes in plant control of fugitive emission, noise control, solid/hazardous waste minimization, proper maintenance of wastewater treatment plant and the disposal of waste after the implementation of proposed expansion project. These action plans includes effective pollution control measures, green belt development, adequate safety measures and post project monitoring facilities for the estimation of pollutants. The management of the AAEL has taken all the necessary steps to control and mitigate the environmental pollution at the designing stage of the project.

65 Within plant premises during construction activities many precautions will be taken to preserve the environmental status including the safety of workers and minimization of occupational hazards. Facilities will be provided to workers like housing camps, sanitation and safe drinking water supply. Vehicles will be tuned and maintained in proper conditions, precautionary measures and standard operating procedures will be displayed at suitable locations.

66 Noise prone activities will be restricted to day time only. Surplus excavated material will be utilized for leveling and all surfaces will be reinstated. Tree plantation will be initiated during construction phase itself.

67 Environmental management during operation phase is a long term continual program and will be followed meticulously by AAEL. Efficiency of ESP will be monitored regularly to control SPM below 50 mg / Nm^3. Stack emissions will be monitored by external agencies on periodic basis. Dust generated form biomass/ coal handling plant will be suppressed by providing adequate water spray system. Green belt around ash pond will also be maintained to control air pollution.

68 All rotating item will be lubricated and provided with enclosures to reduce noise transmission. All machinery / equipment / compressors / turbines will be properly maintained to ensure noise / vibration standards. Ear muff / ear plugs will be provided to workers in excessive noise zone area

69 Major solid waste is bottom ash and fly ash. Brick manufacturing and cement plant will consume this solid waste in the plant premises itself. Thus transportation of solid waste will be avoided as far as possible. Reuse of fly ash is envisaged in the project design. the excess fly ash will be discharged into scientifically designed ash dyke.

70 AAEL shall provide guidance, financial aid and encouragement to farmers is the villages to properly harvest, store and transport biomass and supply to AAEL. The company shall encourage to form "Biomass bank" and construction of depots at village/Tahsil level.

71 The emissions from the stack will be monitored continuously for exit concentration of the PM_{10} and PM $_{2.5}$ $\mu g/m^3$. If the concentration of these pollutants exceeds the limits, necessary control measures will be taken. Sampling ports will be provided in the stacks as per CPCB guidelines

72 Biomass ash can be used as manure in crop fields. Proper analysis of biomass ash shall be carried out by AAEL before supply to villagers as manure. Guidance camps, awareness programs will be arranged by AAEL for utilization of biomass ash and manure.

73 The necessary design parameters and material of construction for cooling system including cooling towers are selected in such a way that they are able to utilize water from the clarifier. Provision for oil/grease separators will be made to skim oil / grease, if any, in the waste water.

- The treated effluents from all streams will be stored in a guard pond.

- The heat cycle makeup requirement for biomass power plant will be met from de-mineralized water.
- All the treated effluents will be monitored regularly for flow rate and its characteristics in order to assess the performance of the wastewater treatment plant. Appropriate measures will be taken if the treated effluent quality does not conform to the permissible limits.

74 Continuous efforts will be made to reduce the water consumption and thereby reduce wastewater generation periodic water audits will be conducted to explore the possibilities of minimizing water consumption.

75 Zero effluent discharge is aimed by reducing the consumption and recycling the wastewater for dust suppression, plantation etc. Rainwater harvesting shall be undertaken to reduce withdrawal of water from Wainganga River.

76 Welfare activities such as organizing medical checkup camps, school uniforms and construction of bus sheds shall be arranged for the village people. Scholarships to the school children, nursery plantation, health and hygiene camps shall be arranged for awareness among the village communities. CSR activities will be undertaken to improve the economic. A special budget is reserved for such activities.

77 The capital cost of EMP is estimated at 812 lakhs and recurring cost per year will be 18.85 lakhs.