

# VARAM POWER PROJECTS (P) LTD.

Chilakapalem (Village), Etcherla (Mandal)  
Srikakulam (Dist.) - 532 402, A.P.

Phones : 08942-231181, 82, 83

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December 11, 2006

The Secretariat,  
CDM Executive Board,  
UNFCCC,  
Bonn, Germany.

Dear Sir,

**Sub: Request for review for “6 MW Renewable energy generation project by Varam Power Projects in India (0697) – Submission of response to the comments raised by review team - Reg.**

Kindly refer to the communication from the Executive Board in respect of 6 MW renewable energy generation project by Varam Power Projects (P) Limited in India and we furnish for your kind review our detailed response.

#### **Comment:**

The additionality proof is not sufficient: the PP lists several barriers (technology, availability of biomass, investment) but only ‘anecdotal’ evidence is provided. Especially in the investment barrier section IRR figures are quoted but the underlying assumptions are provided nowhere (although the PP states that the information is made available). Additional information is required before this project activity can be registered.

#### **Response:**

##### Additionality Proof

The project activity is located in Srikakulam District of Andhra Pradesh which is one of the back ward districts of Andhra Pradesh lacking in industrial development. The project activity besides being first of its kind in the region is expected to create jobs to rural un- employed youth as well as enable the farmers to make additional revenue by selling their crop residues. Attracted by the promotional policies of the Government of Andhra Pradesh and the Central Government, the project proponent has ventured into the project activity and for him the project activity is the first industrial activity. The issues pertaining to additionality are dealt with in the following paragraphs. However, it was clear already at the time of the investment decision that these promotional policies of government would alone not be sufficient to make the project viable and the revenues from sale of CERs would therefore be required.

Following the request by the CDM-EB, the additionality assessment in Section B.3 of the PDD has been extended.

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## **Barrier Analysis:**

### Technological barriers

The project suffered unscheduled breakdowns in the plant and machinery due to varied characteristics of biomass fuel such as calorific value, moisture etc., Summary of log sheets maintained by the project proponent in respect of break downs in the plant and machinery is furnished to the DOE for verification.

### Biomass availability

Since the project activity was first of its kind in the region, the project proponents were confident of the availability of biomass in sufficient quantity as proved by the biomass assessment survey carried out at the time of planning of the project activity. However as the project creates commercial value for the crop residues, the project promoters were aware already at the time of the investment decision that, there would be a strong risk that the price of these crop residues might increase after the project is established. There was at the time of project planning no past history of prices for crop residues where the requirement is on regular basis. There was also no mechanism for collection and supply of biomass materials. Further, it was clear that these biomass residues are available in the cropping season and the price could therefore be different if the same is procured during non cropping season. In order to mitigate these risks, the project proponents felt the necessity of CDM revenues when a board resolution was passed in January, 2000.

### Investment barrier

At the time of taking the investment decision in early 2000, there were two major uncertainties, which came to the knowledge of the promoters. These relate to 1) tariff uncertainty and 2) uncertain price of biomass as described above. In addition, there were the technical performance risks as described above.

At the time of taking investment decision, power purchase agreement was in place executed in April, 2000 based on a tariff price of Rs.2.25 per kWh with an escalation of 5% per annum. However, during this period, electrical reforms were in place in Andhra Pradesh and Andhra Pradesh Electricity Regulatory Commission has been constituted for regulating tariff related issues. There was uncertainty with respect to continuation of MNES tariff as specified in Article 4.1 of the power purchase agreement which states that "Subject to the provisions of this agreement, APTRANSCO shall purchase the Energy delivered by the Company for sale to APTRANSCO, at the Tariff as decided by Andhra Pradesh Regulatory Commission, from and after the date of commercial operation of the project".

This uncertainty continued in the revised power purchase agreement subsequent to the earlier one which was executed in November, 2001. Article 2.2 of the power purchase agreement states the following:

"The company shall be paid the tariff for the energy delivered at the interconnection point for sale to APTRANSCO at Rs.2.25 paise per unit with escalation at 5% per annum with 1994-95 as base year and to be revised on 1st April of every year up to the year 2003-2004. Beyond the year 2003-04, the purchase price by APTRANSCO will be decided by Andhra Pradesh Electricity Regulatory Commission. There will be further review of purchase price on

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completion of ten years from the date of commissioning of the project, when the purchase price will be re worked on the basis return on equity, O&M expenses and the variable cost.”

To summarise, the project participants faced a strong risk of changes in fuel prices as well as uncertainty with respect to tariff at the time of the investment decision.

The IRR has been prepared reflecting different scenarios considered by the project proponent in line with these risks. The project cost is estimated at Rs.244 million funded by term loan to an extent of Rs.182.7 million and share capital of Rs.61.3 million.

The first scenario represents the best-case scenario as projected by the promoters at the time of taking the investment decision in May, 2000. It is based on the optimistic assumption that the rather favourable tariff recommended by MNES (3.17 Rs/kWh in first year of generation, plus 5% yearly escalation) and accepted by the State utility upto 31<sup>st</sup> March, 2004 and would be renewed at the same terms after expiry of MNES guidelines in 2004, since the power purchase agreement is executed for a period of 10 years. In addition, this scenario includes relatively reasonable plant load factors (70% and 75% in years 1-2, and 80% thereafter). Fuel costs are assumed to start at a low basis of 900 Rs/t, but with an escalation rate of 10%. Rate of interest on term loan, working capital and depreciation are those prevailing for similar projects in the year 2000.

The IRR calculations are furnished below for the first scenario with detailed assumptions.

<b>Scenario</b>	<b>1 Best case</b>
Installed Capacity ( MW)	6
Working Days Per Annum	330
Gross Annual Generation (GWH) at 100 % PLF	47.52
Plant Load Factor	70%in the first year, 75% in the second year and 80% from third year onwards
Auxiliary Consumption	10%
Tariff Rs/KWh	MNES tariff @Rs. Rs.3.17/ kWh
Yearly Escalation on Tariff	5%
Fuel Cost Rs/Ton	900
Yearly Escalation on fuel Cost	10.00%
Depreciation per annum	9.41%
O & M Expenses on Project Cost	5.00%
Yearly Escalation on O&M Cost	5.00%
Interest on Term Loan	14.5%
Interest on Working Capital	16.5%
IRR without CDM revenue	13.79%
IRR with CDM revenues	16.21%
CER Price (US\$/tCO2)	5

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The second scenario illustrates the sensitivity of the IRR projection with respect to some key parameters. The tariff is set at the same optimistic level as in first scenario. The base price of fuel is assumed at Rs.1250 per tonne assuming that the chances of it going at this level are possible due to situation prevailing in the neighboring districts of West and East Godavari. Having considered the base price of fuel at Rs.1250 per tonne, it is expected that the escalation may not cross 5%. Plant load factor is assumed at 80%. Depreciation, interest on term loans and working capital are assumed more favorable than the assumptions considered in the first scenario as these parameters are based on applicable laws and lending norms.

The third scenario reflects the position based on the actual performance as encountered by the promoter until today. At the same time this scenario represents an unfavorable scenario which the promoter knew could occur at the time of his investment decision. It includes a substantial downward revision of the electricity tariff, as stipulated by the regulatory commission. In addition, the base price for the fuel is set at Rs 1000 /tonne, assuming that in the long run the fuel price might stabilize and the escalation also may not cross more than 5%. Plant load factor is assumed at 80%. Further, depreciation, interest on term loans and working capital represent those applicable for the project activity based on the applicable laws in India as well as the terms of lending..

The detailed assumptions underlying preparation of IRR are furnished below for the second and third scenarios:

<b>Scenario</b>	<b>2 Intermediate</b>	<b>3 As observed</b>
Installed Capacity ( MW)	6	6
Working Days Per Annum	365	365
Gross Annual Generation (GWH) at 100 % PLF	52.56	52.56
Plant Load Factor	Actuals upto the year 2004-05 and 80% from 2005-06 onwards	Actuals upto the year 2004-05 and 80% from 2005-06 onwards
Auxiliary Consumption	10%	10%
Tariff Rs/KWh	MNES tariff @Rs. Rs.3.17/ kWh	MNES tariff upto 2004-05 and Rs.2.85 per kWh from 2005-06 onwards
Yearly Escalation on Tariff	5%	Rs.0.03 per kWh
Fuel Cost Rs/Ton	1250	1000
Yearly Escalation on fuel Cost	5%	5%
Depreciation per annum	5.28%	5.28%
O & M Expenses on Project Cost	5%	5%
Yearly Escalation on O&M Cost	5%	5%
Interest on Term Loan	10.0%	10.0%
Interest on Working Capital	10.5%	10.5%
IRR without CDM revenue	12.67%	6.53%
IRR with CDM revenues	16.29%	10.96%

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CER Price (Euro/tCO2)	8	8
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While calculating the IRR incentives such as income tax holiday for a period of 10 years as well as interest subsidy availed by the company has been considered.

The results of the IRR analysis imply the following:

- Scenario #1 (best-estimate) results in a project IRR of 13.79%. This in itself would barely have been sufficient to make the project viable, given its large risks with respect to fuel costs and tariff. The CDM revenues play therefore an important role in making the project viable even in this optimistic scenario.
- Scenario #2 (intermediate) results in a lower IRR of 12.67%. In this moderately optimistic scenario, the role of CDM in making the project viable is already higher than in Scenario #1.
- Scenario #3 (as observed) results in a very low IRR of only 6.53%. At the time of the investment decision, unfavorable scenarios similar to this were considered in the context of the sensitivity analysis. The CDM revenues are therefore absolutely essential for reaching a reasonable profitability.

In conclusion, the project promoters anticipated at the time of this investment decision that the project would be just about viable without CDM in a best-case scenario, but clearly unattractive under unfavorable assumptions. Looking back, these unfavorable conditions actually did materialize and the profitability of the project activity suffered accordingly. CDM played an essential role in making the project viable for the promoter despite these large financial risks. Therefore the project activity is additional.

The financial analysis is furnished separately to the DOE for verification. .

## Comment:

In addition no information is provided showing that the CDM was considered when the implementation of the project was decided

## Response:

The decision to consider CDM in the project planning stage has been taken by the Board of Directors in one of their meetings held on 9<sup>th</sup> January, 2000. The following resolution was passed:

“ The project is biomass based one of capacity 6 MWs. The objective of the project is to generate electricity by using various surplus biomass fuels like paddy husk, jute sticks, woody biomass and other crop residues. The project caters direct and indirect jobs for many people by way of employment within the plant and also by way of biomass collection, processing and transportation. The project uses surplus biomass for power generation which otherwise would have dominated by fossil fuels such as coal, lignite and gas. Further the project will not result in harmful emissions and will not cause any negative impact on the environment. Recently the concept of sustainable development and clean development mechanism is being heard from Ministry of Environment and Forests and projects like us are eligible to develop under clean development mechanism activity so that the risks involved in venturing in these types of projects will be reduced to certain extent. The project generates

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real measurable and long term emission reductions. The board unanimously decided and resolved to examine the possibility to develop the project as a CDM activity and the Managing Director is authorized to approach, negotiate and to do such acts at his discretion in calling and appointing consultants in this line”.

Copy of minutes of board meeting is furnished separately for verification.

Copy of the revised PDD giving effect to the above clarifications is also furnished.

Please feel free to contact us for any further information.

Thanking you,

Yours faithfully,  
For **Varam Power Projects (P) Limited**,

**(A.V.Narasimham)**  
**Managing Director**