

COST BENEFIT ANALYSIS

VARIANT- I : DEPARTMENTAL VARIANT

The investment is based on the price as applicable for December,2013 as per the P&M price list of CMPDI cost base May 2013 after giving due escalation.

Initial Capital Investment (upto target year)

Sl. No.	Particulars	Amount (upto target year)
1	Total investment (Rs.crores)	7034.73
2	Specific investment (Rs./annual t)	1758.68
3	Investment on P&M (Rs.crores)	3592.53
4	Specific investment on P&M (Rs./annual t)	898.13
5	Investment on HEMM (Rs.crores)	2751.14
6	Specific investment on HEMM(Rs./annual t)	687.78

Cost of production for different level of production, 100%, 85%.

Sl. No.	Particulars	Amount (Rs./t)
1	Cost of mining & other related activities (for ROM/unwashed coal)	444.15
2	Cost of washing	62.98

Sl. No.	Particulars	Amount (Rs./t)
1	Cost of production at 100% level (Washed coal at 70% yield)	956.54
2	Cost of production at 85% level(Washed coal at 70% yield)	1051.33

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PROFITABILITY (PROFIT/LOSS) AT 100% AND 85% LEVEL OF PRODUCTION for WASHED COAL

Sl. No.	Particulars	Amount
1	Profit at 100% level (Rs./t)	751.33
2	Profit at 85% level (Rs./t)	656.55
3	BEP	
a)	(%)	41.69
b)	(Mty)	11.67
4	FIRR (%)	
a)	At 100% production level	20.54
b)	At 85% production level	16.99
5	NPV (at 12%)	
a)	At 100% production level	2718.56
b)	At 85% production level	1417.66

PROFITABILITY (PROFIT/LOSS) AT 100% AND 85% LEVEL OF PRODUCTION for RAW COAL

Sl. No.	Particulars	Amount
1	Profit at 100% level (Rs./t)	378.68
2	Profit at 85% level (Rs./t)	321.46
3	BEP	
a)	(%)	46.13
b)	(Mty)	18.45
4	FIRR (%)	
a)	At 100% production level	17.82
b)	At 85% production level	14.22
5	NPV (at 12%)	
a)	At 100% production level	1524.64
b)	At 85% production level	514.56

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VARIANT-II: OUTSOURCING VARIANT

In this variant the activities involved in actual overburden removal like drilling, loading and transportation of OB, activities involved in coal extraction like drilling and excavation for conventional coal winning, cutting by surface miner and loading by front end loader and transportation of coal by dumper upto shiftable reclaim feeder located inside the mine will be done by outsourcing agencies. Further transport from inpit receiving arrangement to washery and transport of washed coal from washery to rapid loading system for loading onto railway wagons has been assumed to be done departmentally. Activities associated with mining like haul road construction and maintenance, pumping, land reclamation and all other auxiliary operations related to mining are also proposed to be through one or various outsourced agencies, blasting will be done through departmental means. A very small fleet of departmental auxiliary equipments have been also provided in this variant for emergency auxiliary operations.

The following scope of work for the outsourced agency/agencies have been proposed :

- i) Guaranteed coal production and OB removal as per the Mining Schedule and in accordance to the "Scope of Work" and as specified in the contract.
- ii) Drilling and blasting operations shall be carried out under the supervision of the MCL officials.
- iii) Procurement, operation & maintenance of equipments required for target coal production & OB removal.
- iv) Construction and maintenance of workshop, store, office and other infrastructure for the HEMM deployed by the outsourcing agencies.
- v) Electrical power distribution from the main sub-station for the purpose of the contracted work.
- vi) Design, construction, operation and maintenance of haul road, dozing & grading wherever necessary, activities related to pumping, water sprinkling, quarry & surface lighting, stock maintenance and other ancillary activities .
- vii) Reclamation and compliance with the environmental standards as prescribed in the EMP.
- viii) Engage manpower for maintenance and operation of HEMM deployed for mining coal and overburden at its own terms and conditions, provided that

this manpower will have no legal right to employment in MCL at the expiry of the term of agreement. Provision of salary & wages, provident fund, gratuity, health care, compensation to its manpower shall be as per the Minimum Wages Act and other statutory Rules & Regulations prevalent for coal mining industry in India.

- ix) Safe conduct of mining operations including ensuring safety of the workforce deployed.
- x) Deployment of adequately qualified, skilled and trained manpower and imparting periodic training as per statute.
- xi) Financing of proposed work as per the contract.
- xiii) The outsourced agency will have to arrange power distribution of their own for the HEMM to be deployed and P&M to be set up by them. MCL will provide to the outsourced agency the desired power supply at the 33 kV substation. The outsourced agency shall indicate in detail the power supply requirement with Single Line Electrical Diagram as per contract. Payment of power bills for power consumed by the outsourced agency shall be borne by them (outsourced agency).

ROLE OF MCL

Role of MCL will cover the following areas :

- i) Design, construction, operation and maintenance of Coal Load Out Arrangements.
- ii) Construction, operation and maintenance of inpit coal receiving arrangement , conveyor system for coal movement from inpit/surface to washery and washery to rapid loading system for wagon loading.
- iii) Construction, operation and maintenance of washery.
- iv) Design, construction, operation and maintenance of E&M workshop to cater to the requirement of departmental HEMM, CHP, and power supply arrangements.
- v) Design, construction, operation and maintenance of incoming power supply arrangement including Main Electrical sub-station. Power will be supplied

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on chargeable basis to meet the specified requirement of the successful bidder at specified voltage.

- vi) Supply of explosives & related accessories on chargeable basis.
- vii) Design and construction of fuel storage & supply of the same on chargeable basis.
- viii) Design, construction, operation and maintenance of water supply arrangements.
- ix) Land acquisition.
- x) Rehabilitation of project affected families.
- xi) Marketing of coal & sales realization.

MCL shall deploy the Manpower for all above activities.

Rate of extraction, drilling, loading and transport by outsourcing agencies has been assumed from prevalent rates of MCL (as on Dec 2013) in the nearby mines for finding out the economics of this variant. Rate for pumping, lighting, land reclamation, haul road construction & maintenance and some other miscellaneous activities which are beyond the scope of above rate of outsourcing have been estimated activity wise to calculate common outsourcing cost for this variant. **Scope of outsourcing and rate of these activities may be reviewed at a later date while awarding contract to the outsourcing agencies.**

Initial Capital Investment

Sl. No.	Particulars	Amount (upto target year)
1	Total investment (Rs.crores)	3596.35
2	Specific investment (Rs./annual t)	880.44
3	Investment on P&M (Rs.crores)	440.98
4	Specific investment on P&M (Rs./annual t)	110.24
5	Investment on HEMM (Rs.crores)	2.77
6	Specific investment on HEMM(Rs./annual t)	0.69

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Capital Investment beyond target year

Sl. No.	Particulars	Amount (Beyond target year)
1	Total investment (Rs.crores)	128.92
2	Investment on P&M (Rs.crores)	8.59
3	Investment on HEMM (Rs.crs.)	-

Cost of production for different level of production, 100%, 85%.

Sl. No.	Particulars	Amount (Rs./t)
1	Cost of mining & other related activities (for ROM/unwashed coal)	311.65
2	Cost of washing	62.98

Sl. No.	Particulars	Amount (Rs./t)
1	Cost of production at 100% level (Washed coal at 70% yield)	767.27
2	Cost of production at 85% level (Washed coal at 70% yield)	808.31

*cost per tonne has been calculated on the basis of washed coal yield.

Sl. No.	Particulars	Amount
1	Profit at 100% level (Rs./t)	940.61
2	Profit at 85% level (Rs./t)	899.56
3	BEP	
a)	(%)	19.83
b)	(Mty)	5.55
4	FIRR (%)	
a)	At 100% production level	26.06
b)	At 85% production level	23.53
5	NPV (at 12%)	
a)	At 100% production level	4671.55
b)	At 85% production level	3484.82

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**PROFITABILITY (PROFIT/LOSS) AT 100% AND 85% LEVEL OF PRODUCTION
for RAW COAL**

Sl. No.	Particulars	Amount
1	Profit at 100% level (Rs./t)	511.18
2	Profit at 85% level (Rs./t)	491.56
3	BEP	
a)	(%)	17.86
b)	(Mty)	7.14
4	FIRR (%)	
a)	At 100% production level	24.38
b)	At 85% production level	22.06
5	NPV (at 12%)	
a)	At 100% production level	3477.64
b)	At 85% production level	2581.73

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