

Business Modeling and Financial Evaluation

Introduction

The Mormugao Port Trust –MPT has over the years been developing additional facilities at the Port with a plan to increase handling capacity and thereby the revenue to the Port. A series of berths and facilities are under development through the PPP model. The major contributor to the revenue of the Port has been the export of iron ore and recently the import of coal and coke through the Port. Additional facilities for the export of ore from West of Breakwater are in the process of being awarded to a private developer and Berth No.7 has already been contracted out to the Adani Group as an exclusive coal import terminal.

Berth 11, which is under study, is proposed to be developed through a PPP Model for the import and storage of coal, through a fully mechanized system. State-of-art technology ensures that the imported coal is handled with the least possible effects on the environment and also address the issue of scientific storage..

Data and Assumptions

Discounting Factor: A discounting factor of 10.23 % (weighted Average Cost of Capital) has been assumed to ascertain the present value where ever it has been applied in this report.

Lease Period: A lease period of 30 years has been assumed from the date of handing over of the area for development. Lease Rate for land area is calculated based on the present Scale of Rate, which stands at Rs. 31.35 M².

Land Area: Total Land area for development to be made available to the developer will be 21.64 Acres – 87574 square meters.

Debt Equity Mix: Infrastructure projects are generally designed on a mix of debt and equity components. A **debt to equity ratio of 70%:30% has been assumed for the purpose of this report and this will indicate a ratio of 7:3.**

Cost of Capital: Cost of Capital has been assumed as 16% for the equity Portion and Prime Lending rate of State Bank of India, which comes to 11.75% for the debt Portion. After adjusting the Income tax Benefit on debt Interest weighted average cost of capital worked out to 10.23 %.

Debt Repayment: It is assumed that debt will be repaid over a period of 7 Years.

Corporate Tax: Income tax rates have been assumed at the present rate of **33.99%** for calculations over the entire period.

Depreciation: Depreciation rates for all Equipments and Capital Assets are assumed at the prevailing rates indicated in the Companies Act, 1956.

Fixed assets	Depreciation Rate
Civil works	3.34 %
Equipments	10.34 %

Inflation and Price adjustment: Price escalation is calculated based on the variations anticipated in the wholesale Price Index (WPI) and assuming that the **WPI inflation rate will be 5%, and that 67% of the WPI inflation rate has to be adjusted in the rate.**

TAMP: Revenue forecast is calculated based on the rate Per Mt's expected. Rates are fixed by Tariff Authority for Major Ports (TAMP) based on a guideline published by TAMP. The rate is directly linked with the investment and capacity of the project. The Mechanized Storage system and unloading system may have high power consumption. However the calculations are done based on the TAMP rate.

Revenue Rate: Composite Revenue Rate Per Mt's of Coal works out to Rs 294/- as shown in the following Table 4 and Berth Hire Charges comes to Rs 1.12, Per GT Per Hours, which is explained in table 3.

Income Tax Exemptions: The Government of India has announced a Tax holiday of 10 years for port projects during the year 2006-07. Under section 80 (IA), infrastructure projects can opt for a tax holiday of any 10 consecutive years out of the first 15 years from the year of commencement of business. Workings are adjusted for this tax benefit.

Financial and Economic Appraisal

Revenue sources to Mormugao Port Trust can be summarized, as below:

- a) Fixed Lease Charges from the land through a 30 years lease agreement.
- b) Other Operational Revenues where the port provides Professional services like pilot age etc.
- c) A royalty/percentage of handling charges levied by the developer of the project.

Capital Structure

The Capital structure of the proposed project is as follows:

Capital Structure

Elements	Rs in Million	% to Project Cost
Investment from private investor by way of equity	1,274.45	30%
Debt Component from Infrastructure funding Financial agencies	2,973.71	70%
Total Project Cost	4,248.16	100%

Project Cost: The total Project Cost and the application of fund are tabled as follows:

Application of Project Cost

Elements	Rs in Million
Berth Cost	695.22
Storage Cost	2,047.75
Cargo Handling Cost	1,505.20
Total	4,248.16

Key Financial Ratios: All the financial parameters have been worked out to analyze the financial viability. A snap shot of the key financial ratio is as follows.

Key Financial Ratios

Elements	Ratio
Debt – Equity Ratio	7:3 (1st year)
DSCR Coverage Ratio (Average)	1.75

Revenue Models

The revenue is designed based on a DBFOT (Design, Build, Finance, Operate and Transfer) Model under Public Private Participation (PPP) method, where the port trust will participate through its resources and a selected private investor will develop the project. The private investor can be any external body including public sector undertaking or even another port.

Compelling Infrastructural needs and the developers' interest to invest are the major factors that determine the design of the project concept. Various options for development are worked out focusing on this fact.

Selection of Methodology

Selection of an appropriate methodology for any infrastructure project plays a crucial role in conceiving the project. The methodology should be a win-win situation for the Public and Private sector.

Competitive Bids can be invited with the following parameters as Financial Bid Criteria

1. Highest % of Gross Revenue Share / highest royalty Per ton of Coal

Transfer on Completion of Period

It is envisaged that the initial working life span of the project is fixed for a period of 30 years, after which the investor will transfer the assets to MPT, free of cost. And being a green field project the investor may get a First right of Refusal in case of future operation.

Working Papers

Detailed working assumptions and financial appraisal of different revenue streams are shown as Annexure I

Annexure I

Assumptions

Table 1

Funding Pattern	
Debt	70.00%
Equity	30.00%
Interest Rate on Debt	9.00%
Expected Return on Investment	16.00%

Table 2

Weighted Average Cost of Capital			
Project Cost	Interest	Rate	WACC
Equity	16.00%	30.00%	4.80%
Debt	7.76%	70.00%	5.43%
WACC			10.23%

Table 3

Calculation of Berth Hire Charges				
	Cost in INR	Unit	Rate	Amount
Total Berth Occupancy Factor	13,25,34,857.14			
Investment on Berth	69,52,15,500			
R &M Civil	69,52,15,500	1.00%		69,52,155
Depreciation on Civil	69,52,15,500	3.34%		2,32,20,198
Insurance	69,52,15,500	1.00%		69,52,155
Total				3,71,24,508
WACC of ROCE	69,52,15,500	16.00%		11,12,34,480
Total to be allocated				14,83,58,988
Berth Hire Charges per GT per Hour	2,20,04,11,500		1.12	

Calculation of Composite Rate of Coal Handling

Table 4

Operating Cost Calculation			Coal Handling			Storage		
	Cost in INR	Unit	Rate	Amount	Cost in INR	Unit	Rate	Amount
Power		1.4	5	1,40,00,000		1.4	5	1,40,00,000
R &M Civil	69,52,15,500	1.00%		69,52,155	2,04,77,52,000		1.00%	2,04,77,520
R &M Mechanical Items	1,50,51,96,000	7.00%		10,53,63,720			7.00%	-
Insurance	1,50,51,96,000	1.00%		1,50,51,960	2,04,77,52,000		1.00%	2,04,77,520
License Fee – Land								3,32,20,119
Other expenses	1,50,51,96,000	5.00%		7,52,59,800	2,04,77,52,000		5.00%	10,23,87,600
Depreciation on Civil	69,52,15,500	3.34%		2,32,20,198	2,04,77,52,000		3.34%	6,83,94,917
Depreciation on Equipments	1,50,51,96,000	10.34%		15,56,37,266			10.34%	-
Total				39,54,85,099				25,89,57,676
WACC of ROCE	1,50,51,96,000	16.00%		24,08,31,360	2,04,77,52,000		16.00%	32,76,40,320
Total to be Adjusted				63,63,16,459				58,65,97,996
Total to be adjusted to Ore Rate (96%)				61,08,63,801				56,31,34,076
Total Material Capacity				40,00,000.00				40,00,000.00
Cost Per Mts				153.00				141.00

Table 5

Yard Capacity Calculation

Yard Capacity Calculation	
Stake Yard Required	Coal
Capacity	40,00,000
Turn Over	18
Maximum Coal which can be stacked	2,22,222
Storage Capacity	2,24,000
Optimum Capacity	4.03
	7.92
Minimum of Above	4.00

Table 6

Berth Occupancy Factor

	%	Ship Day Output	W A R	Parcel size	No of ships	DWT	GRT	Avg Time	Ship Ton GT	Berth Occ Factor
Ship Type 1 - Panamax	0.8	35000	28000	60000	53.33	75,000	45,000	41.14	18,51,428.57	9,87,42,857.14
Ship Type 2 - Handy Max	0.2	15000	3000	40000	20.00	45,000	26,400	64.00	16,89,600.00	3,37,92,000.00
WA			31000							
Optimum Capacity (II)			7.92					Factor		13,25,34,857

FEASIBILITY REPORT – DEVELOPMENT OF MECHANISED COAL HANDLING FACILITIES AT BERTH NO.11

Table 7

Cost Estimate

STAGE	DESCRIPTION OF ITEMS	Nature	QUANTITY	IN	RATE(RS)	AMOUNT (Rs)
1	BERTH					-
1	STONE PITCHING		8,400	M2	1,000	84,00,000
1	BERTH MAKING		12,940	M3	18,000	23,29,20,000
1	FENDERS		12	NOS	8,00,000	96,00,000
1	FILLING BEHIND THE CUT OF WALL		64,200	M3	150	96,30,000
1	BOLLARD		13	NOS	1,00,000	13,00,000
1	PAVMENT- PROVIDING & REDOING					1,00,00,000
1	CHANNEL BOUY					5,00,000
1	DREDGING		12,99,200	300		38,97,60,000
1	CONTIGIENCIES					3,31,05,500
	CARGO STORAGE					
5	FRABICATED DOME - RCC WORK	CIVIL	4	Nos	48,00,00,000	1,92,00,00,000
5	DISMANTILLING OF WH	CIVIL				5,00,000
5	ROAD CONNECTIVITY	CIVIL	0.50	KMS	5,00,00,000	2,50,00,000
5	WATER LINE REPLACEMENT & ADDITIONAL LINES	CIVIL				15,00,000
5	COST OF CUT OF WALL	CIVIL	180	M3	18,000	32,40,000
5	CONTIGIENCIES	CIVIL				9,75,12,000
6	COAL HANDLING EQUIPMENTS					-
6	TRACK FOR UNLOADER	MECH	600	M	2,500	15,00,000
6	CONVEYAYOR SYSTEM	MECH	2,320	M	1,86,000	43,15,20,000
6	REMOVING LINES	MECH				5,00,000
6	ELECTRICAL WORK INCLUDING SUB STATION (33 kva)	MECH				3,00,00,000
6	SHIP UNLOADERS	MECH	2	Nos	44,00,00,000	88,00,00,000
6	WAGON LOADER	MECH	1	Nos	9,00,00,000	9,00,00,000
6	CONTIGIENCIES					7,16,76,000
	TOTAL					4,24,81,63,500

Table 8

IRR Calculation and sensitivity Analysis

Cases	Equity IRR	Project IRR
Present Case	25.50%	20.43%
5 % Drop on Revenue	23.92%	19.43%
10 % Drop on Revenue	22.32%	18.40%
5 % Rise on Revenue	27.06%	21.41%
10 % Rise on Revenue	28.61%	22.37%
5% increase in Project Cost	24.98%	19.07%
10% increase in Project Cost	24.49%	18.54%
10% increase in Project Cost & 10% Sales drop (worst Sanario)	21.46%	16.06%
5% Decreases in Project Cost & 10% sales Increase	29.25%	22.17%

Table 9

Cash Flow and DSCR

Cash Flow							
Year	2015	2016	2017	2018	2019	2020	2021
Op Balance	-	424.51	839.12	1,286.61	1,767.34	2,281.69	2,830.09
Cash Profit	725.09	750.52	822.87	900.21	983.12	1,072.26	1,168.35
EMI	300.59	335.91	375.38	419.48	468.77	523.85	549.73
Excess / (Shortage)	424.51	839.12	1,286.61	1,767.34	2,281.69	2,830.09	3,448.72
DSCR	1.12	1.69	1.75	1.81	1.87	1.93	2.11

Table 10

O & M Cost sheet Based on TAMP Norms

Year	2015	2016	2017	2018	2019
Cargo, storage and miscellaneous charges (Coal)	1,447.16	1,490.58	1,535.30	1,581.35	1,628.79
Total Revenue	1,447.16	1,490.58	1,535.30	1,581.35	1,628.79
Expenses - Direct					
Power	28.00	28.84	29.71	30.60	31.51
Repairs & Maintenance	132.79	136.78	140.88	145.11	149.46
Insurance	-	38.58	35.06	31.89	29.03
Land Fee	34.22	35.24	36.30	37.39	38.51
Admin Over Heads	177.65	186.53	195.86	205.65	215.93
EBDIT	1,074.51	1,064.61	1,097.50	1,130.72	1,164.35
Finance Cost	349.41	314.09	274.62	230.52	181.23
Cash Profit	725.09	750.52	822.87	900.21	983.12
Depreciation	390.60	351.83	317.02	285.76	257.68
PBT	334.50	398.69	505.85	614.45	725.44
Cum PBT	334.50	733.19	1,239.03	1,853.48	2,578.92
Income Tax					
PAT	334.50	398.69	505.85	614.45	725.44
Cash Surplus	424.51	414.61	447.50	480.72	514.35

FEASIBILITY REPORT – DEVELOPMENT OF MECHANISED COAL HANDLING FACILITIES AT BERTH NO.11

Year	2020	2021	2022	2023	2024
Cargo, storage and miscellaneous charges (Coal)	1,677.66	1,727.99	1,779.83	1,833.22	1,888.22
Total Revenue	1,677.66	1,727.99	1,779.83	1,833.22	1,888.22
Expenses - Direct					
Power	32.46	33.43	34.44	35.47	36.53
Repairs & Maintenance	153.94	158.56	163.32	168.22	173.27
Insurance	26.45	24.13	22.03	20.14	18.42
Land Fee	39.67	40.86	42.08	43.34	44.65
Admin Over Heads	226.73	238.06	249.97	262.47	275.59
EBDIT	1,198.41	1,232.94	1,267.99	1,303.59	1,339.76
Finance Cost	126.15	64.59	0.00	0.00	0.00
Cash Profit	1,072.26	1,168.35	1,267.99	1,303.59	1,339.76
Depreciation	232.46	209.79	189.43	171.12	154.67
PBT	839.80	958.56	1,078.57	1,132.47	1,185.10
Cum PBT	3,418.72	4,377.28	5,455.84	6,588.31	7,773.40
Income Tax					
PAT	839.80	958.56	1,078.57	1,132.47	1,185.10
Cash Surplus	548.41	618.62	1,267.99	1,303.59	1,339.76

FEASIBILITY REPORT – DEVELOPMENT OF MECHANISED COAL HANDLING FACILITIES AT BERTH NO.11

Year	2025	2026	2027	2028	2029
Cargo, storage and miscellaneous charges (Coal)	1,944.87	2,003.21	2,063.31	2,125.21	2,188.96
Total Revenue	1,944.87	2,003.21	2,063.31	2,125.21	2,188.96
Expenses - Direct					
Power	37.63	38.76	39.92	41.12	42.35
Repairs & Maintenance	178.46	183.82	189.33	195.01	200.86
Insurance	16.88	15.48	14.21	13.07	12.03
Land Fee	45.98	47.36	48.78	50.25	51.76
Admin Over Heads	289.37	303.84	319.03	334.98	351.73
EBDIT	1,376.54	1,413.96	1,452.03	1,490.78	1,530.23
Finance Cost	0.00	0.00	0.00	0.00	0.00
Cash Profit	1,376.54	1,413.95	1,452.03	1,490.78	1,530.23
Depreciation	139.87	126.56	114.60	103.83	94.14
PBT	1,236.67	1,287.39	1,337.43	1,386.95	1,436.10
Cum PBT	9,010.08	10,297.47	11,634.89	13,021.85	14,457.94
Income Tax					473.91
PAT	1,236.67	1,287.39	1,337.43	1,386.95	962.18
Cash Surplus	1,376.54	1,413.96	1,452.03	1,490.78	1,530.23

FEASIBILITY REPORT – DEVELOPMENT OF MECHANISED COAL HANDLING FACILITIES AT BERTH NO.11

Year	2030	2031	2032	2033	2034
Cargo, storage and miscellaneous charges (Coal)	2,254.63	2,322.27	2,391.94	2,463.70	2,537.61
Total Revenue	2,254.63	2,322.27	2,391.94	2,463.70	2,537.61
Expenses - Direct					
Power	43.62	44.93	46.28	47.67	49.10
Repairs & Maintenance	206.89	213.09	219.49	226.07	232.85
Insurance	11.09	10.23	9.46	8.75	8.11
Land Fee	53.31	54.91	56.56	58.25	60.00
Admin Over Heads	369.32	387.78	407.17	427.53	448.91
EBDIT	1,570.41	1,611.32	1,652.99	1,695.42	1,738.64
Finance Cost	0.00	0.00	0.00	0.00	0.00
Cash Profit	1,570.41	1,611.32	1,652.99	1,695.42	1,738.64
Depreciation	85.41	77.56	70.48	64.11	58.36
PBT	1,484.99	1,533.76	1,582.50	1,631.31	1,680.28
Cum PBT	15,942.93	17,476.70	19,059.20	20,690.51	22,370.79
Income Tax	490.05	506.14	522.23	538.33	554.49
PAT	994.95	1,027.62	1,060.28	1,092.98	1,125.79
Cash Surplus	1,570.41	1,611.32	1,652.99	1,695.42	1,738.64

FEASIBILITY REPORT – DEVELOPMENT OF MECHANISED COAL HANDLING FACILITIES AT BERTH NO.11

Year	2035	2036	2037	2038	2039
Cargo, storage and miscellaneous charges (Coal)	2,613.74	2,692.15	2,772.91	2,856.10	2,941.78
Total Revenue	2,613.74	2,692.15	2,772.91	2,856.10	2,941.78
Expenses - Direct					
Power	50.57	52.09	53.65	55.26	56.92
Repairs & Maintenance	239.84	247.03	254.45	262.08	269.94
Insurance	7.53	7.00	6.51	6.07	5.66
Land Fee	61.80	63.65	65.56	67.53	69.56
Admin Over Heads	471.35	494.92	519.66	545.65	572.93
EBDIT	1,782.65	1,827.46	1,873.08	1,919.51	1,966.77
Finance Cost	0.00	0.00	0.00	0.00	0.00
Cash Profit	1,782.64	1,827.45	1,873.07	1,919.51	1,966.77
Depreciation	53.18	48.50	44.29	40.48	37.03
PBT	1,729.47	1,778.95	1,828.79	1,879.04	1,929.74
Cum PBT	24,100.25	25,879.20	27,707.99	29,587.03	31,516.77
Income Tax	570.72	587.05	603.50	620.08	636.81
PAT	1,158.74	1,191.90	1,225.29	1,258.95	1,292.92
Cash Surplus	1,782.65	1,827.46	1,873.08	1,919.51	1,966.77

FEASIBILITY REPORT – DEVELOPMENT OF MECHANISED COAL HANDLING FACILITIES AT BERTH NO.11

Year	2040	2041	2042	2043	2044
Cargo, storage and miscellaneous charges (Coal)	3,030.04	3,120.94	3,214.57	3,311.00	3,410.33
Total Revenue	3,030.04	3,120.94	3,214.57	3,311.00	3,410.33
Expenses - Direct					
Power	58.63	60.38	62.20	64.06	65.98
Repairs & Maintenance	278.04	286.38	294.97	303.82	312.94
Insurance	5.29	4.95	4.64	4.36	-
Land Fee	71.64	73.79	76.01	78.29	80.63
Admin Over Heads	601.58	631.66	663.24	696.40	731.22
EBDIT	2,014.86	2,063.77	2,113.51	2,164.08	2,219.56
Finance Cost	0.00	0.00	0.00	0.01	-
Cash Profit	2,014.85	2,063.77	2,113.51	2,164.07	2,219.56
Depreciation	33.92	31.11	28.57	26.26	-
PBT	1,980.93	2,032.65	2,084.94	2,137.81	2,219.56
Cum PBT	33,497.70	35,530.35	37,615.29	39,753.10	41,972.66
Income Tax	653.71	670.78	688.03	705.48	732.45
PAT	1,327.22	1,361.88	1,396.91	1,432.33	1,487.10
Cash Surplus	2,014.86	2,063.77	2,113.51	2,164.08	2,219.56

MIR PROJECTS & CONSULTANTS Pvt LTD.
KOCHI.
INDIA

FEASIBILITY REPORT – DEVELOPMENT OF MECHANISED COAL HANDLING FACILITIES AT BERTH NO.11