



Thar Coal & Energy Board

Government of Sindh

No TCEB/Registrar/2-1/2014/COD-Phase.II
March 21, 2024

**DETERMINATION OF THAR COAL & ENERGY
BOARD IN THE MATTER OF TARIFF FOR
SINDH ENGRO COAL MINING COMPANY
MINE PURSUANT TO COMMERCIAL
OPERATION STAGE TARIFF FOR 7.6 MTPA
CAPACITY AT BLOCK II THAR COALFIELDS,
DISTRICT THARPARKAR, SINDH, PAKISTAN**





Thar Coal & Energy Board

Government of Sindh

No TCEB/Registrar/2-1/2014/COD-Phase.II
March 21, 2024

Determination of Reference Tariff for Sindh Engro Coal Mining Company Mine Pursuant to Commercial Operation Stage Tariff for 7.6 MTPA Capacity at Block II Thar Coalfields, District Tharparkar, Sindh, Pakistan

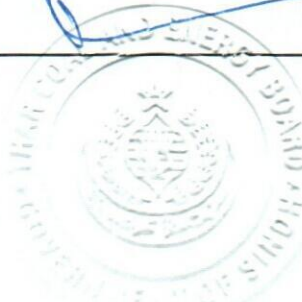
Thar Coal Tariff Determination Committee

Constituted in Pursuance of Rule 3(1) of Thar Coal Tariff Determination Rules, 2014

Dr Fahad Irfan Siddiqui
Member, Mining

Mr Ammar Habib Khan
Member, Finance/Power

Mr Riaz Hussain Soomro
Managing Director -TCEB





Thar Coal & Energy Board

Government of Sindh

No TCEB/Registrar/2-1/2014/COD-Phase.II
May 06th, 2024

In pursuance of the Rule 10(5) of the Thar Coal Tariff Determination Rules, 2014, it is certified that the Thar Coal & Energy Board, on the recommendation of the Thar Coal Tariff Determination Committee, has approved the Determination of Reference Tariff for Sindh Engro Coal Mining Company Mine Pursuant to Commercial Stage Operation Tariff for 7.6 MTPA Capacity at Block-II Thar Coalfields, District Tharparkar, Sindh, Pakistan, appended in the following pages.

Tariq Ali Shah
Managing Director/Secretary
Thar Coal & Energy Board





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TABLE OF CONTENTS

TABLE OF CONTENTS.....	4
1. Tariff Sought by Petitioner	6
2. Project Background	8
3. Public Hearing	9
4. Mining Technology	10
5. Dewatering / Hydrogeological Conditions	11
6. Operations & Maintenance	12
7. Overburden Volume.....	12
8. Coal Handling System.....	13
9. EPC Cost	13
10. Non-EPC Cost	14
11. Duties & Taxes	15
12. Interest During Construction / Financial Charges.....	16
13. Pre-COD Sales.....	16
14. Capital Structure.....	16
A. Principal Repayments	16
B. ROE / ROEDC	17
15. Working Capital	17
16. Cost of Transportation	18
Coal Tariff Determination Order	19
Reference Tariff Indexations.....	21





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List of Acronyms used in Determination Order

BCM	Bank Cubic Meter
CAR	Contractors' All Risk
COD	Commercial Operations Date
CPI	Consumer Price Index
CSA	Coal Supply Agreement
ECC	Economic Coordination Committee
EC	External Consultants
EPC	Engineering, Procurement & Construction
EPP	Energy Purchase Price
GCV	Gross Calorific Value
GoS	Government of Sindh
HSE	Health, Safety & Environment
IA	Implementation Agreement
IB	Inter-burden (waste rocks)
ICB	International Competitive Bidding
ICC	In-pit Crushing & Conveying
IDC	Interest During Construction
IRR	Internal Rate of Return
KIBOR	Karachi Inter-Bank Offer Rate
LC	Letter of Credit
LDs	Liquidated Damages
LHV	Lower Heating Value
LIBOR	London Inter-Bank Offer Rate
MJ / Kg	Mega Joules per Kilogram
MSF	Mine Service Facilities
MTPA	Million Tonnes Per Annum
MW	Megawatt
MT	Million Tonnes
MYT	Multi Year Tariff
NCV	Net Calorific Value
NEPRA	National Electric Power Regulatory Authority
NOC	No Objection Certificate
NTDC	National Transmission & Despatch Company
O&M	Operations & Maintenance
OB	Overburden (waste rocks)
OGRA	Oil & Gas Regulatory Authority
PKR	Pakistani Rupee
PPA	Power Purchase Agreement
RCOD	Required Commercial Operations Date
RMB	Chinese Renminbi
RoE	Return on Equity
RoEDC	Return on Equity During Construction
SBLC	Stand By Letter of Credit
SBP	State Bank of Pakistan
SECMC	Sindh Engro Coal Mining Company
SEPA	Sindh Environmental Protection Agency
TCEB	Thar Coal & Energy Board
TT & OD	Telegraphic Transfer & On Demand
USD	United States Dollar





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The Thar Coal & Energy Board, as per the respective notifications of the Government of Sindh and Government of Pakistan and in accordance with Section 5(m) of Thar Coal & Energy Board Act, 2011 is the coal-pricing agency. This determination is conducted in accordance with the authority vested with TCEB and pertains to the Petition of Sindh Engro Coal Mining Company (SECMC) for the Determination of Commercial Operation Stage Tariff for SECMC's Mine of 7.6 MTPA which will be enhanced up to a mine size of 11.2 MTPA, after achievement of Phase-II COD at Block-II Thar Coalfields, District Tharparkar, Sindh, Pakistan. The coal tariff determination relates to the specific mine lease of Block-II of Thar Coalfields. The Petition has been assessed and reviewed in accordance with the parameters and guidelines established under the Thar Coal Tariff Determination Rules, dated 27th November 2014, as notified by Government of Sindh. The coal tariff, so determined, shall form the basis of fuel cost for downstream power generation as determined by NEPRA.

1. TARIFF SOUGHT BY PETITIONER

The Petitioner has submitted a request for determination of levelized tariff of USD 46.90 per tonne for development & operations of 7.6 MTPA capacity mine. The details of the petitioned tariff and costs are provided in Tables I to IV here below:

Table I – Petitioned Project Tariff for 7.6 MTPA Capacity Mine

Project Tariff	Year 1 – 10	Year 11 – 30	Year 1 – 30
	Average	Average	Levelized
Total Production Payment Tariff Components	22.02	18.81	21.43
Total Capacity Payment Tariff Components	28.09	18.12	25.47
Total Project Tariff	50.11	36.94	46.90

All amounts in USD per tonne

Table II – Petitioned Production Payment Tariff for 7.6 MTPA Capacity Mine

Production Payment Tariff Components	Year 1 – 10	Year 11 – 30	Year 1 – 30
	Average	Average	Levelized
Fuel Cost	7.38	6.46	7.24
Variable O&M - Foreign	4.63	4.60	4.57
Variable O&M - Spares/Consumables	1.88	1.60	1.84
Duties and Taxes	0.58	0.55	0.57
Asset Replacement Cost	4.06	3.02	3.94
Royalty	3.50	2.58	3.27
Total Production Payment Tariff Components	22.02	18.81	21.43

All amounts in USD per tonne

Table III – Petitioned Capacity Payment Tariff for 7.6 MTPA Capacity Mine

Capacity Payment Tariff Components	Year 1 – 10	Year 11 – 30	Year 1 – 30
	Average	Average	Levelized
Fixed O & M - Foreign Site Services	1.80	1.81	1.80
Fixed O & M - Foreign Tech. Services	2.38	2.00	2.36
Fixed O & M - Local	3.28	2.83	3.16
Duties and Taxes	0.54	0.48	0.53
Insurance	0.90	0.90	0.90
Power Cost - By Solar (15%)	0.04	0.04	0.04
Power Cost - By Diesel (85%)	2.47	2.47	2.47
Cost of Working Capital	1.28	1.10	1.26
Principal Debt Repayment	4.73	0.00	3.19
Interest Payment	3.24	0.00	2.47
ROE	5.16	4.52	5.07
ROEDC	2.26	1.98	2.22
Total Capacity Payment Tariff Components	28.09	18.12	25.47

All amounts in USD per tonne



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Table IV – Petitioned Project Cost for 7.6 MTPA Capacity Mine

Petitioned Project Cost for 7.6 MTPA	Amount (USD Mn)
EPC Cost	130.77
Non-EPC Cost	42.75
Insurance Cost	1.49
Project Development Cost	1.57
Financing Fee, LC Charges, Sinusure Fees etc.	1.66
Interest During Construction	10.94
Duties and Taxes	1.86
Pre COD Sales	(18.33)
Total Project Cost	172.73

The amounts illustrated above are petitioned on the basis of certain assumptions which are detailed in the following sections. The key assumptions and basis of the petition are summarized hereunder:

i.	Price of Diesel	PKR 238.63 per Litre
ii.	PKR to USD Exchange Rate Parity	PKR 228.45 per USD
iii.	RMB to USD Exchange Rate Parity	RMB 7.117 per USD
iv.	US CPI	296.81
v.	Local CPI	185.68
vi.	Cost of Foreign Financing	6-month LIBOR + 3.3%
vii.	Weighted Cost of Local Financing	6-month KIBOR + 1.75%
viii.	6-month LIBOR Assumption	4.23%
ix.	1-month KIBOR Assumption	15.51%
x.	6-Month KIBOR Assumption	15.91%
xi.	Debt to Equity Ratio	75:25
xii.	Debt Repayment Period	10 Years
xiii.	Equity IRR	20.00%
xiv.	Mining Technology	Trucks (60t & 100t) & Shovel (7m ³ & 15m ³)
xv.	Construction Period	33 Months
xvi.	Overburden Removal Volume (During Construction)	47 million BCM
xvii.	Average Slope Angle of the Mine	24° (Degrees)
xviii.	Average Rate of Dewatering	78,590 m ³ /d





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Important Information Regarding Appointment of External Consultants (EC) for Assistance in COD Stage Tariff

Pursuant to Rule 3(1) of Thar Coal Tariff Determination Rules, 2014, TCEB has constituted Thar Coal Tariff Determination Committee (TCTDC). The contents of this Tariff Petition were analysed and evaluated by TCTDC in accordance with the requirements of the relevant laws of Pakistan, including without limitation, the TCEB Act, the Thar Coal Tariff Determination Rules, and any other rules and regulations made thereunder.

Rule 3(5) of Thar Coal Tariff Determination Rules, 2014, enables TCTDC to seek assistance from officers, staff, experts, and consultants for the Tariff Determination as appropriate. In view of the same, TCTDC decided to seek services of relevant experts for an independent and objective review, wherein seeking services of Coherent Engineering Management (Pvt) Ltd. (Technical Consultant), for technical review, and Ernst & Young (Financial Consultant) for financial review.

The services of the Consultants to conduct a thorough technical and financial due diligence study for the Project was required, to identify, assess, and validate, all costs and technical details associated with the expansion considering the cost-plus nature of tariff. It is essential that all costs are reasonably and prudently incurred, while the same also needs to be verified, which was done through the financial due diligence conducted by Ernst & Young.

The consultants after completing the assignment submitted the following reports which are a formal part of this determination.

- Satisfactory report related to Coal Extraction, Dewatering & Overburden removal
- Satisfactory report related to Quantity and Working hours of site equipment, site consumables, and other related costs
- Financial Due Diligence Report

The observations and adjustments raised in their reports have been duly incorporated in the Determination Order, after detailed deliberations by TCTDC.

2. PROJECT BACKGROUND

Sindh Engro Coal Mining Company (hereinafter referred to as "SECMC", or "Petitioner") submitted petition for COD Stage Tariff for expansion of mine at Block-II of Thar Coalfield from 3.8 mtpa to 7.6 mtpa ("Project") on 1st February, 2023. The petition follows a series of tariff petitions, and determinations, including Contract Stage Tariff, Financial Close Tariff, and finally COD Stage Tariff. The mine attained COD on 30th September, 2022, and intended to supply coal to power plants, viz. ThalNova Power Thar Ltd. (TNPTL) and Thar Energy Ltd. (TEL), generating 660 MW of electricity through indigenous sources.



Thar Coal & Energy Board

Government of Sindh

It is to be noted that the expansion project was initiated in 2019 – and during its construction period, the Project was marred with stressed external circumstances including prevalence of pandemic, which led to lockdowns across the board, severely hampering ordinary course of business. Despite the pandemic, SECMC was able to attain COD close to earlier identified timeline.

Following the pandemic, supply chain constraints also led to significant stress in managing procurement of critical machinery and material required for the expansion, leading to escalation in costs to a certain extent. Moreover, a sovereign debt crisis locally further led to a liquidity crisis of foreign currency, which further stressed ability of SECMC to make payments to its offshore contractors, and suppliers.

Due to the pandemic, and subsequent slowdown in economic activity, interest rates in both local, and international markets also declined significantly, with interest rates in US\$ terms close to near-zero. Due to the same, Interest During Construction accrued during the period was lower than anticipated, resulting in a marginal improvement in overall capital structure for the expansion project, and the mine at large. Following recovery from the pandemic, supply chain constraints resulted in inflation across the board, resulting in higher interest rates.

Emerging and frontier economies like Pakistan faced a liquidity crisis as increase in US\$ based interest rates resulted in a flight to quality, and a commodity boom resulted in constrained availability of US\$ to import essentials. In such a scenario, rationing of US\$ led to delays in payments to international contractors, and suppliers, resulting in accrued expended, particularly those denominated in foreign currency.

3. PUBLIC HEARING

The public hearing for the COD stage tariff petition for Block II open-cast lignite mine for a capacity of 7.6 MTPA was advertised in the Daily Dawn, Daily Jang and Daily Kawish on 14th December, 2023.

The hearing was conducted on 22nd December, 2023 at 10:00 am at Governor Room, Marriot Hotel Karachi, where Mr. Aamir Iqbal, the CEO of SECMC, briefed the attendees about the current status of mining project at Block II, followed by Mr. Fahim Ahmed, General Manager (Commercial), who presented the important aspects of COD Stage petition for the capacity of 7.6 MTPA.

After the SECMC team provided a detailed presentation, the floor was opened to the audience for a question-and-answer session. Participants from National Electric & Power Regulatory Authority (NEPRA) inquired via email, and during the public hearing, expressing concern about the proposed 20% IRR, deeming it higher compared to the IRR sanctioned for power plants. Additionally, NEPRA emphasized the consideration of the XIRR method over the IRR method to compute the effective IRR, accounting for monthly payments to be made to the mine owner.



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Given the anticipation of most of the equity being in local currency, NEPRA suggested that the return should be based on PKR rather than in US\$. The NEPRA representative mentioned that the transportation charges should be included in the Tariff Determination.

The NEPRA representative also highlighted that certain tariff components e.g. the local O&M, intended to be adjustable for CPI, is also being invoiced based on the current PKR-US\$ parity potentially leading to double counting of certain components. Additionally, other local costs, such as diesel price, local debt servicing, and royalty, are listed in PKR but are being invoiced in USD. NEPRA suggested to rationalize the cost of insurance to 0.7% of the EPC cost.

NEPRA also enquired that the process for post-Commercial Operation Date (COD) sales to non-dedicated power plants must be clearly differentiated. Coal sales to non-dedicated power plants should be structured on a variable charge basis, as the fixed costs are already recuperated from the dedicated power plants.

Further clarification is needed regarding the applicability of the coal mine tariff for the period spanning 1st October, 2022, to 17th February, 2023, specifically concerning Lucky Electric Power Company Limited (LEPCL). The tariff applicable during this timeframe will be determined solely based on variable charges. It is imperative to incorporate the charges gathered during the Pre-COD period, along with the markup earned on Pre-COD sales revenue, into the determination of the Commercial Operation Date (COD) tariff.

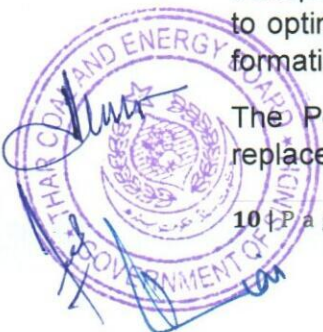
In addressing the inquiries raised by NEPRA representatives, the SECMC team asserted that the majority of the queries pertain to TCTDC, with the exception of the IRR, which aligns with the approved framework. The question regarding Pre-COD sales to non-designated power plants has been thoroughly discussed in the Petition document for proper consideration and decision.

Mr. Nasir from the Directorate of Coal Mines, Government of Sindh, inquired about the specific date on which the royalty component is converted from US\$ to PKR. In reply, the SECMC representative stated that the US\$ to PKR conversion rate on the invoice date to IPPs is taken into consideration for royalty calculations.

4. MINING TECHNOLOGY

During Phase-II and III, SECMC plans to utilize 15m³ bucket size hydraulic excavators, and 100-tonne capacity trucks. This equipment will be dedicated to the excavation and transportation of waste material located in sub-recent and Bara formations. Additionally, 7m³ bucket size hydraulic excavators and 60-tonne capacity trucks will be deployed in Phase-II and III specifically for excavating and transporting dune sand and coal. This strategic allocation of machinery is designed to optimize the extraction and transportation processes across distinct geological formations within the scope of the Project.

The Petitioner submitted the schedule for equipment deployment and asset replacement via emails dated 5th December, 2023 and 21st December, 2023.





Thar Coal & Energy Board

Government of Sindh

Following a comprehensive analysis of the equipment deployment and asset replacement schedule, TCTDC has calculated the excavator and truck requirements for Phase-II and III, outlined as follows:

- 11 hydraulic excavators of 7m³ bucket size, and 210 dump trucks of 60-tonne capacity for mining period of Phase-II.
- 67 hydraulic excavators of 7m³ bucket size, and 1665 dump trucks of 60-tonne capacity for mining period of Phase-III.
- 25 Hydraulic excavators of 15 m³ bucket size, and 136 dump trucks of 100-tonne capacity for waste removal of sub-recent and Bara formations for Phase III.

TCTDC calculations of machinery for Phase-II and III mining period is given at Table V.

Table V –Equipment Configuration for Phase-II and III mining period

Machinery	TCTDC Calculations		
	Phase II – Mining Period	Phase III – Mining Period	Total
7 m³ Excavator	11	67	78
15 m³ Excavator	00	25	25
Truck, 60 tonne	210	1665	1875
Truck, 100 tonne	00	136	136

Furthermore, it is noteworthy that Phase-III is scheduled to commence from September, 2025 or the date of Commercial Operation (COD), whichever occurs earlier.

5. DEWATERING / HYDROGEOLOGICAL CONDITIONS

In COD Stage Petition for Phase-II, SECMC highlighted that “the ground water in Thar is one of the major risks for the Project and any change in hydrogeological condition may adversely affect the activities. However, keeping mine dry is of paramount importance and therefore, the Petitioner requests that any additional cost incurred during the operations phase of the mine due to any change in the hydrogeological conditions be allowed at the time of Multi Year Tariff (MYT)”

The Technical Consultant highlighted during the technical verification survey that 6 out of the 29 dewatering wells were found to be non-functional. Additionally, it was observed that a significant number of dewatering wells lacked operational flow meters, and pressure gauges. Considering these findings, it is recommended that the Petitioner adhere to Standard Operating Procedures in maintaining measurement gauges. Update on the functionality and operations of measurement gauges of dewatering wells needs to be provided in next petition to be submitted.



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Government of Sindh

TCTDC acknowledges the heterogeneous nature of hydrogeological conditions. Therefore, any deviations or unusual changes in dewatering requirements should be substantiated by actual measurements. The submission of a comprehensive hydrogeological model and studies, following industry best practices, is essential to provide a thorough understanding of the site's conditions, and to support the adjustments made in the dewatering process.

6. OPERATIONS & MAINTENANCE

The Petitioner had initially signed a contract with the O&M contractor for the first 16 months of the Project. In view of evolving circumstances on the foreign currency, and sovereign risk front, and to enhance efficiencies, the Petitioner decided to move away from a turnkey O&M agreement, to a contractor-miner model from the 17th month onwards.

In the updated structure, the O&M contractor would only be responsible for core mining operations, whereas the Petitioner will take over non-mining operations, such as Coal Handling System, dewatering, etc. Through such a structure, it will be possible to save precious foreign currency, reduce indexation of tariff to PKR-US\$ parity to a certain extent, and enhance local capacity accordingly. This will significantly reduce operations cost in the near term and develop further local capacity that can have a multiplier effect.

Effort must also be made to indigenize production of spares of various components, such that organic import substitution can take place, further reducing overall cost of operations, moving away from US\$ based indexation, and further enhancing the role of indigenous supplies.

The transition from turnkey O&M contractor to the contractor-miner model reduces overall O&M cost by US\$ 1.81 per tonne. This further enhances localization of knowledge, and activity, while reducing foreign currency outflow in the process. It is strongly recommended that the Petition transition towards further reduction in Fixed O&M charges associated with turnkey operations, by further enhancing localization of operations, and subsequently pricing the same in PKR in the future.

7. OVERBURDEN VOLUME

The Technical Consultant validated the overburden volume through a drone-based topographic survey, incorporating estimations in volume measurement. The assessment involves determining the volumetric variance between the present pit position and the preceding box-cut pit shell from Phase I for confirmation purposes.

The verified volume is established at 47 million BCM.





Thar Coal & Energy Board

Government of Sindh

8. COAL HANDLING SYSTEM

The petitioner has submitted that an Integrated Coal Handling System (CHS) has been commissioned at a total expenditure of US\$ 26.72 million, surpassing the approved allocation of US\$ 21.67 million for both Phase I and Phase-II. TCTDC acknowledges that the integrated CHS not only possesses expanded capacity but also proves to be more economically efficient in comparison to standalone systems for each phase. It is further recognized that the integrated CHS is designed to support the expansion of Phase-III up to a capacity of 11.2 MTPA. Consequently, given the scalability and improved efficiency in operations that will be brought through the Coal Handling System, the incurred cost for the Integrated CHS is deemed permissible.

9. EPC COST

The EPC Cost associated with the expansion increased marginally, particularly in the case of procurement, and other non-fuel expenses linked with supply constraints during the pandemic. However, a marginal decline in costs covered that associated with fuel resulted in overall EPC costs to increase by US\$ 2.51 million.

Overburden removal amounted to 47 Mbcm, resulting in a overburden removal cost of US\$ 2.78 per bcm. It is to be noted that in the COD Stage Petition, Duties & Taxes of US\$ 1.03 million have also been petitioned to be recovered – the same is covered in Section 10 in more detail. EPC costs petitioned are being accepted as proposed, and further verified by Ernst & Young. Duties & Taxes are only being allowed up to the amount pertaining to duties, and charges that are not exempted by any circular, or notification, and the same is restricted to US\$ 0.46 million. Total EPC Cost has been determined to be US\$ 131.23 million, against petitioned EPC Cost of US\$ 131.80 million.

Table VI – Comparison of Petitioned and Determined EPC Cost

Components	Cost Petitioned	Cost Determined
	USD million	USD million
Procurement, Supplies & Construction	78.73	78.73
OB & LG (Non-Diesel)	22.06	22.06
OB & LG (Diesel)	29.98	29.98
Duties & Taxes – EPC	1.03	0.46
Total EPC Cost	131.8	131.23





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10. NON-EPC COST

In the case of Non-EPC Cost, actual cost as petitioned was US\$ 45.17 million, which was lower than earlier approved cost of US\$ 56.7 million. The reduction in Non-EPC cost can largely be attributed to lower expenditure in multiple heads, resulting in improved economics of the project.

However, the actual costs incurred for Coal Handling System increased to US\$ 26.72 million, against approved cost of US\$ 21.67 million. The primary reason for increase was due to establishment of a more expansive Coal Handling System, which would be able to cover increased requirements in subsequent phases as well, and the same is also covered in detail in Section 7. In view of increased capacity, and more efficiency being brought by the Coal Handling System, the cost is deemed acceptable.

It is to be noted that in the current COD Stage Petition, Duties & Taxes of US\$ 0.83 million have also been petitioned to be recovered. The same is only restricted to amounts pertaining to duties and charges that do not fall under any exemption provided for the project, under any circular, or notification, etc, up to a maximum of US\$ 0.38 million. The same is covered in Section 10 in more detail.

As per Financial Due Diligence conducted by Financial Consultant, it has been identified that US\$ 16.2 million of project cost has been accrued, and the funds have not been paid to the respective counterparty. It is to be noted here that the tariff is determined on a cost-plus basis, thereby accrued expenses cannot be considered as a part of the same, since the costs have not been fully incurred yet. However, within accrued expenses, US\$ 6.73 million can be attributed to payment to the contractor for Coal Handling System – even though the task has been completed, and the Coal Handling System is operational, the funds could not be remitted mainly because of a liquidity crisis in the country.

However, subsequently the payments have been released, and the cost has been incurred. In view of the same, accrued expenses amounting to US\$ 6.73 million pertaining to Coal Handling System are allowed to be a part of Non-EPC Cost. All other accrued expenses are being disallowed at this stage. It is understood that some of the infrastructure development may be required, and critical to operations of the mine – the same can be covered in a subsequent tariff petition, whether for expansion, or in the Multi-Year Tariff, as deemed reasonable by the Petitioner.

Table VII – Comparison of Petitioned and Determined Non-EPC Cost

Components	Cost Petitioned	Cost Determined
	USD million	USD million
Capital Items (excluding CHS)	10.55	1.131
Coal Handling System (CHS)	26.72	26.72
Consultancies & Studies	0.1	0.1
Security	0.84	0.84
Project Development Cost	1.57	1.57



Thar Coal & Energy Board

Government of Sindh

Components	Cost Petitioned	Cost Determined
Legal & Professional Charges	0.47	0.47
Land & Village Relocation Costs	0	0
Other Costs	4.09	4.09
Duties & Taxes - Non-EPC	0.83	0.38
Total Non-EPC Cost	45.17	34.92

Table VIII – Summary of Petitioned and Determined Project Cost

Components	Cost Petitioned	Adjustments	Cost Determined
EPC	<i>USD million</i>	<i>USD million</i>	<i>USD million</i>
Procurement, Supplies & Construction	78.73	-	78.73
OB & LG (Non-Diesel)	22.06	-	22.06
OB & LG (Diesel)	29.98	-	29.98
Duties & Taxes - EPC	1.03	(0.57)	0.46
Non-EPC			
Capital Items (excluding CHS)	10.55	(9.419)	1.131
Coal Handling System (CHS)	26.72	-	26.72
Consultancies & Studies	0.1	-	0.1
Security	0.84	-	0.84
Project Development Cost	1.57	-	1.57
Legal & Professional Charges	0.47	-	0.47
Other Costs	4.09	-	4.09
Duties & Taxes - Non-EPC	0.83	(0.45)	0.38
Insurance	1.49	-	1.49
Financing Fee, LC Charges	1.66	-	1.66
Interest During Construction	10.94	-	10.94
Pre-COD Sales	(18.33)	(3.65)	(21.98)
Total Project Cost	172.73	(14.09)	158.64

11. DUTIES & TAXES

The Petitioner has petitioned that US\$ 1.86 million of duties & taxes be made part of the tariff, as covered in Section 9 and Section 10 above. TCTDC remains of the view that fiscal incentives provided for development of Thar Coalfields, clearly stipulate that there will be zero percent customs duties on import of machinery, in addition to other fiscal incentives. However, there are certain charges that are not exempted under Applicable Law, such as Additional Custom Duty, and Regulatory Duty on dump trucks, and its spares, infrastructure cess at import stage, stamp duty at import stage, etc. Only those amounts are not exempted under Applicable Law are being allowed in the Determination. Moreover, the same may only be considered specifically for cost recovery, and no IRR shall be applicable on the same.



Thar Coal & Energy Board

Government of Sindh

For the remaining amount, the Petitioner may take the same up with relevant tax & customs bodies, as well as any legal recourse required to resolve the issue. Duties & taxes that are already covered by Applicable Law, are not allowed to be made a part of tariff at this stage.

12. INTEREST DURING CONSTRUCTION / FINANCIAL CHARGES

The Interest During Construction (IDC) for the project is estimated to be US\$ 10.94 million, and the same adjusts for any interest income earned during the period. The same has also been verified in the Financial Due Diligence as conducted by Financial Consultant.

The IDC remains lower than target mainly because of lower interest rates during the construction period, which slowed down accrual of interest during the construction phase. Similarly, actual financial charges paid amount to US\$ 10.94 million, and the same has also been verified in the Financial Due Diligence.

13. PRE-COD SALES

The Petitioner has petitioned US\$ 18.33 million as Pre-COD sales, against an amount of PKR 3.33 billion. Pre-COD sales were incurred from February 2019 to June 2020 – during the period PKR-US\$ exchange rate ranged between 139 to 168. The Petitioner converted the Pre-COD sales at an exchange rate of 181.96.

Since Pre-COD sales were made during the period mentioned above, it is more intuitive to use the average exchange rate during the period of sales, rather than the ending exchange rate. Utilizing the average exchange rate, Pre-COD sales are estimated to be US\$ 21.98 million, as assessed by the Financial Consultant. Such Pre-COD sales are being utilized to reduce overall project cost.

Referring to Section 8.11 of the 7.6 MTPA COD Stage Tariff Petition, it is to be noted that ThalNova Power Thar Ltd. (TNPTL) achieved its COD on 17th February, 2023, against earlier committed COD deadline of 30th September, 2022, resulting in a delay of 140 days. Due to such a delay, it is estimated that roughly 0.728 million tonnes of coal was sold to Lucky Electric Power Company Ltd. (LEPCL). In such a scenario, any discrepancy in either capacity payment, or variable payment will be adjusted in a subsequent tariff, or eventually Multi-Year Tariff, subject to provision of all relevant evidence, including invoices, contracts, etc.

14. CAPITAL STRUCTURE

A. PRINCIPAL REPAYMENTS

The Project is being funded in a 75-25 debt-equity ratio. The debt assumed by the project is in PKR, wherein the portion of debt covered by sovereign guarantee is





Thar Coal & Energy Board

Government of Sindh

priced at a spread of 1.75 percent over the benchmark interest rate, while the portion of debt not covered by sovereign guarantee is priced at a spread of 2.25 percent over the benchmark interest rate. The debt will be repaid over a period of 10 years, with a grace period of 3 years. The terms remain aligned with what was approved in the Financial Close stage. Considering how certain expenses were accrued, rather than paid out, that enabled availability of surplus funds for the entity, interest income of which has been adjusted in IDC.

The availability, and disbursement of debt, and relevant interest payments has been verified in the Financial Due Diligence. It is reiterated that going forward, any long-term debt that is raised by the Petitioner must strive for a finer pricing, given the overall reduction in risk associated with the Project, and recurring cash flows of the same. The Petitioner may also consider tapping capital markets to diversify its funding base, and reduce cost of debt accordingly.

B. ROE / ROEDC

The guaranteed IRR for the Project remains at 20 percent in-line with fiscal incentives provided for development of coal mines in Thar Coalfields. Considering how certain accrued expenses are being disallowed in Section 10, equity for the Project is also being reduced to US\$ 39.77 million, from petitioned amount of US\$ 45.10 million. The ROE and ROEDC tariff components have been adjusted accordingly. It is understood that equity injected earlier may not have been fully utilized, given accrued expenses – however, the Petitioner may roll over the same for subsequent expansion stages.

15. WORKING CAPITAL

The Petitioner in subsequent communication has raised concerns regarding delays in realization of receivables due from its customers, i.e., power plants, which inadvertently face delays in realizing receivables due to the circular debt issue that plagues the energy value chain in the country. Due to increasing quantum of receivables, the Petitioner continues to face severe liquidity constraints that hamper its ability to maintain operations, and to generate sufficient cash flow to fund subsequent expansions. The Thar Coal Pricing Framework states that working capital finance associated with receivables may not exceed more than 30 days.

However, the delay in realization of receivables can extend to as much as 150 days. Such delay in settlement of invoices issued by the Petitioner inadvertently leads to liquidity constraints, affecting operations of the mine. In view of the above, TCTDC reviewed invoice-level data to assess the duration of delay. The average duration of delay was estimated to be 120 days, over the last two years.

Considering stressed circumstances associated with the energy value chain in the country, a dispensation is being allowed for receivable financing to extend up to 120 days for an interim period only. The same may be reviewed again in a subsequent petition, and further adjusted during Multi-Year Tariff. The working



Thar Coal & Energy Board

Government of Sindh

capital finance requirements shall be reassessed at the time of every indexation, and the receivable days be adjusted accordingly depending average receivable days outstanding during the period. The same under no circumstances shall exceed 120 days for the purpose of calculation of working capital finance component of the tariff. As circular debt is rationalized, the same may revert back to 30 days as per the Thar Coal Pricing Framework.

16. COST OF TRANSPORTATION

The petitioner has requested a transportation cost of USD 0.73 per tonne for Phase II, which is lower than the corresponding cost of USD 0.88 per tonne in Phase I. Concurrently, the petitioner has submitted a transportation contract agreement with M/s DSV. After conducting market checks, it was assessed that fuel consumption per kilometre ought to be in the range of 0.4 litres. After adjusting for the same, the transportation cost is being reassessed at USD 0.51 per tonne. There exists a strong case for the Petitioner to devise a strategic plan for belt conveyor transportation, such that more efficiencies can be built into the system.

The Petitioner is hereby urged to undertake a comprehensive comparative study that juxtaposes the advantages and disadvantages of Truck versus Conveyor Belt transportation methods. Such an analysis should encompass factors such as cost-effectiveness, operational efficiency, environmental impact, and long-term sustainability. The submission of this comparative study will aid in informed decision-making and aligning the transportation strategy with both operational excellence and fiscal responsibility.





Thar Coal & Energy Board

Government of Sindh

COAL TARIFF DETERMINATION ORDER

No. TCEB/Registrar/2-1/2014/COD-Phase.II: This determination is conducted in accordance with the authority vested with Thar Coal Energy Board and pertains to the Petition dated 1st February, 2023, of Sindh Engro Coal Mining Company for Determination of Reference Tariff pursuant to Commercial Operation Stage for 7.6 MTPA which will be enhance up to mine size of 11.2 MTPA after achievement of Phase-II COD at Block II Thar Coalfields, District Tharparkar, Sindh, Pakistan. The Petition is assessed and reviewed in accordance with the parameters and guidelines established under the Thar Coal Tariff Determination Rules, 2014.

The Petitioner has submitted a request for determination of levelized tariff of USD 46.90 per tonne for development & operations of 7.6 MTPA mining capacity.

Pursuant to Rule 10 of the Thar Coal Tariff Determination Rules 2014, Sindh Engro Coal Mining Company is allowed to charge the following ex mine mouth tariff for the production regimes of 7.6 MTPA. The first three years of the following tariff detailed in Annexure-A are applicable for mine with capacity of 7.6 MTPA. Following achievement of COD of Phase III by 30th September, 2025, which expands the capacity to 11.2 MTPA, the relevant tariff applicable will be from the fourth year onwards as detailed in Annexure-A, or as determined in a subsequent tariff for enhanced capacity.

Table I – Determined Composite Tariff for 7.6 MTPA Mine

Project Tariff	Year 1 – 10 Average	Year 11 – 30 Average	Year 1 – 30 Levelized
Total Production Payment Components	16.94	13.85	16.34
Total Capacity Payment Components	23.62	10.72	20.37
Total Project Tariff	40.56	24.57	36.72

All amounts in USD per tonne

Table II – Production Payment Component for 7.6 MTPA Mine

Project Tariff	Year 1 – 10 Average	Year 11 – 30 Average	Year 1 – 30 Levelized
Fuel Cost	5.59	4.88	5.47
Variable O&M	2.02	1.24	1.91
Spares/Consumables	2.69	2.89	2.73
Asset Replacement Cost	3.82	3.08	3.67
Royalty	2.83	1.75	2.56
Total Production Payment	16.94	13.85	16.34

All amounts in USD per tonne

Table III – Capacity Payment Component for 7.6 MTPA Mine

Project Tariff	Year 1 – 10 Average	Year 11 – 30 Average	Year 1 – 30 Levelized
Fixed O & M - Foreign	2.62	1.87	2.54
Fixed O & M - Local	2.59	2.18	2.47
Insurance	0.62	0.50	0.61
Power Cost	1.60	1.37	1.58
Working Capital	1.62	1.43	1.58
Principal Repayment	4.71	-	3.25
Interest Payment	4.33	-	3.13
ROE	3.92	2.39	3.69
ROEDC	1.62	0.97	1.52
Total Capacity Payment	23.62	10.72	20.37

All amounts in USD per tonne



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GENERAL CONDITIONS

- i. The reference tariff is computed on the basis of net coal extraction capacity of 7.6 MTPA until COD for expansion to 11.2 MTPA is achieved by 30th September 2025. The first three years of the tariff as detailed in Annexure A will be applicable till the time capacity is 7.6 MTPA. Tariff as detailed in Annexure A from the fourth year onwards will be applicable for enhanced capacity of 11.2 MTPA. The same may be updated in a subsequent tariff determination for enhanced capacity.
- ii. The above tariff is applicable on BOO basis commencing from Commercial Operations Date of mine until Company achieve its Phase III mine Commercial Operation (COD), which is on 30th September, 2025.
- iii. The cost of financing for Phase II is based upon 6-months KIBOR + 1.75% for local financing guaranteed by sovereign debt, and at 6-months LIBOR + 2.5%, for local financing that is not guaranteed by sovereign debt. Tariff is computed on basis of PKR 24.19 billion local debt. Debt assumed for Phase I continues at original terms as approved earlier.
- iv. The basis of this determination is a Debt-to-Equity ratio of 75:25.
- v. Tariff is configured on prorated debt and equity drawdowns, with proceeds from Pre-COD sales being assumed in last three quarters of construction period.
- vi. Debt assumed for Phase II will be serviced, and repaid within 10 years post-COD, with semi-annual repayments.
- vii. The reference coal tariff is determined such that it covers 100% repayment of local and international debt against approved project cost.
- viii. Working Capital facility and the resultant cost is permitted for a maximum of, 30 days of coal inventory, 30 days of (foreign) O&M advance, 6 months of spares inventory and 21 days of fuel inventory. The financing cost of the working capital facility is permitted at a maximum of 1-Month KIBOR + 2.00%. Considering liquidity constraints due to circular debt, a maximum of 120 days of receivables of production payments, is being considered for this specific reference tariff only, subject to weighted average of receivable days in which payment is realized against invoices. The same would be adjusted on the basis of actuals during indexation, and would revert back to 30 days as circular debt issue is resolved.
- ix. Project Tariff is based on a reference exchange rate of PKR 228.45 per USD and diesel price of PKR 238.63 per litre, project cost of USD 158.64 million for incremental expansion up to 7.6 MTPA capacity.
- x. The Petitioner is entitled to indexations in accordance with the mechanisms laid down under the 'REFERENCE TARIFF INDEXATIONS' section of this document.
- xi. The detailed cost components of tariff are tabulated in Annexure-A appended to the end of this Order.





Thar Coal & Energy Board Government of Sindh

REFERENCE TARIFF INDEXATIONS

The indexations shall be applicable on the reference tariff shall only be as detailed hereunder.

i. Fuel Cost

$$\text{Fuel Cost}_{(\text{rev})} = \text{Fuel Cost}_x \times \frac{\text{Diesel Price}_{(\text{rev})}}{238.63}$$

Where,

Fuel Cost_(rev) is the revised Fuel Cost Component

Fuel Cost_x is the Fuel Cost of x^{th} year of operations

Diesel Price_(rev) is the Delivered Diesel Price in terms of PKR per Litre notified by OGRA for Islamkot, District Mithi adjusted for NCV-GCV factor (Reference – 1.0574), Specific gravity (Reference – 0.84), and Calorific Value (Gross) (Reference – 44.2MJ/kg)

Frequency of indexation shall be on a quarterly basis, based on prices as notified by Oil & Gas Regulatory Authority

ii. Variable O&M

$$\text{Variable O\&M}_{(\text{rev})} = \text{Variable O\&M}_x \times \frac{\text{US CPI}_{(\text{rev})}}{296.81} \times \frac{\text{PKR/USD}_{(\text{rev})}}{228.45} \times \frac{7.12}{\text{RMB/USD}_{(\text{rev})}}$$

Where,

Variable O&M_(rev) is the revised Variable O&M Component

Variable O&M_x is the Variable O&M Component of x^{th} year of operations

US CPI_(rev) is the latest United States Consumer Price Index for All Urban Consumers (CPI-U) notified by the US Bureau of Labor Statistics

PKR/USD_(rev) is the revised TT & OD selling rate of US Dollars as on the date on which the indexation is applicable, as notified by the National Bank of Pakistan

RMB/USD_(rev) is the revised TT & OD selling rate of Chinese RMB as on the date on which the indexation is applicable, as notified by the People's Bank of China

Frequency of indexation shall be quarterly





Thar Coal & Energy Board Government of Sindh

iii. Asset Replacement

$$\text{Asset Replacement}_{(\text{rev})} = \text{Asset Replacement}_x \times \frac{\text{US CPI}_{(\text{rev})}}{296.81} \times \frac{\text{PKR/USD}_{(\text{rev})}}{228.45} \times \frac{7.12}{\text{RMB/USD}_{(\text{rev})}}$$

Where,

Asset Replacement_(rev) is the revised Asset Replacement Component

Asset Replacement_x is the Asset Replacement Component of xth year of operations

US CPI_(rev) is the latest United States Consumer Price Index for All Urban Consumers (CPI-U) notified by the US Bureau of Labor Statistics

PKR/USD_(rev) is the revised TT & OD selling rate of US Dollars as on the date on which the indexation is applicable, as notified by the National Bank of Pakistan

RMB/USD_(rev) is the revised TT & OD selling rate of Chinese RMB as on the date on which the indexation is applicable, as notified by the People's Bank of China

Frequency of indexation shall be quarterly

iv. Royalty

$$\text{Royalty}_{(\text{rev})} = \text{Coal Price}_y \times \text{Royalty}$$

Where,

Royalty_(rev) is the revised Royalty Component

Coal Price_y is the Price of Coal (excluding Royalty) in yth month of operations

Royalty is the minimum of 7.5% of Production Payment Price of Coal (excluding Royalty) or PKR 150 per tonne or as otherwise notified by GoS for Royalty in Thar Coalfields

Frequency of Indexation shall be as and when notified by GoS

v. Fixed O&M – Local

$$\text{Fixed O\&M – Local}_{(\text{rev})} = \text{Fixed O\&M – Local}_x \times \frac{\text{Local CPI}_{(\text{rev})}}{185.68}$$

Where,

Fixed O&M – Local_(rev) is the revised Fixed O&M – Local Component

Fixed O&M – Local_x is the Fixed O&M – Local Component in xth year of operations

Local CPI_(rev) is the latest is Consumer Price Index of Pakistan as notified by the Pakistan Bureau of Statistics

Frequency of Indexation shall be quarterly





Thar Coal & Energy Board

Government of Sindh

vi. Fixed O&M – Foreign

$$\text{Fixed O\&M Foreign}_{(rev)} = \text{Fixed O\&M Foreign}_x \times \frac{\text{US CPI}_{(rev)}}{296.81} \times \frac{\text{PKR/USD}_{(rev)}}{228.45} \times \frac{7.12}{\text{RMB/USD}_{(rev)}}$$

Where,

Fixed O&M – Foreign_(rev) is the revised Variable O&M Component

Fixed O&M – Foreign_x is the Variable O&M Component of x^{th} year of operations

US CPI_(rev) is the latest United States Consumer Price Index for All Urban Consumers (CPI-U) notified by the US Bureau of Labor Statistics

PKR/USD_(rev) is the revised TT & OD selling rate of US Dollars as on the date on which the indexation is applicable, as notified by the National Bank of Pakistan

RMB/USD_(rev) is the revised TT & OD selling rate of Chinese RMB as on the date on which the indexation is applicable, as notified by the People's Bank of China

Frequency of indexation shall be quarterly

vii. Power Cost – By Diesel

$$\text{Power Cost – By Diesel}_{(rev)} = \text{Power Cost – By Diesel}_x \times \frac{\text{Diesel Price}_{(rev)}}{238.63} \times \frac{\% \text{ of Diesel}_{(rev)}}{85.29\%}$$

Where,

Power Cost – By Diesel_(rev) is the revised Power Cost – By Diesel Component

Power Cost – By Diesel_x is the Power Cost – Diesel Component in x^{th} year of operations

Diesel Price_(rev) is the Delivered Diesel Price in terms of PKR per Litre notified by OGRA for Islamabad, District Mithi adjusted for NCV-GCV factor (Reference – 1.0574), Specific gravity (Reference – 0.84), and Calorific Value (Gross) (Reference – 44.2MJ/kg)

% of Diesel_(rev) is the percentage of power generated by Diesel in x^{th} year of operations

Frequency of indexation shall be on a quarterly basis, based on prices as notified by Oil & Gas Regulatory Authority

viii. Cost of Working Capital

$$\text{WC}_{(rev)} = \text{WC}_x \times \left(a_x \frac{\text{Prod Pmt}_{(rev)}}{\text{Prod Pmt}_x} + b_x \frac{\text{Coal}_{(rev)}}{\text{Coal}_x} + c_x \frac{\text{Diesel}_{(rev)}}{238.63} + d_x \frac{\text{US CPI}_{(rev)} \times \text{PKR/USD}_{(rev)} \times 7.12}{296.81 \times 228.45 \times \text{RMB/USD}_{(rev)}} \right) \times \frac{\text{KIBOR}_{(rev)} + 2.00\%}{15.91\%}$$

Where,

Cost of WC_(rev) is the revised Cost of Working Capital Component

Cost of WC_x is the Cost of Working Capital in x^{th} year of operations





Thar Coal & Energy Board

Government of Sindh

a_x is the proportion of Coal Inventory Cost for 30 days calculated at Production Payment Price to amount of working capital facility in x^{th} year of operations

b_x is the proportion of Production Payment Price for 30 days to amount of working capital facility in x^{th} year of operations. *The same may be increased to a maximum of 120 days at the time of indexation, depending on average number of days outstanding for invoices during a particular quarter. The same is being allowed for an interim period only, specifically for capacity up to 7.6 mtpa, and will revert to 30 days once payment cycle improves as circular debt is rationalized.*

c_x is the proportion of Fuel Cost for 21 days to amount of working capital facility in x^{th} year of operations

Prod Pmt_(rev) is the Production Payment Price as determined by TCEB after incorporating indexations till latest month

Prod Pmt_x is the Production Payment Price as determined by TCEB for x^{th} year of operations

Coal_(rev) is the Coal Price (excluding Working Capital Component) as determined by TCEB after incorporating indexations till latest month

Coal_x is the Coal Price (excluding Working Capital Component) as determined by TCEB at COD for x^{th} year of operations

Diesel Price_(rev) is the Delivered Diesel Price in terms of PKR per Litre notified by OGRA for Islamabad, District Mithi adjusted for NCV-GCV factor (Reference – 1.0574), Specific gravity (Reference – 0.84), and Calorific Value (Gross) (Reference – 44.2MJ/kg)

KIBOR_(rev) is 1-Month KIBOR rate at the end of the 1 month period prior to the month in which indexation is applicable, as notified by the State Bank of Pakistan

ix. Interest Payments – Local Phase II (Sovereign Guarantee)

$$\text{Interest} - \text{Local}_{(rev)} = \text{Interest} - \text{Local}_x \times \frac{\text{KIBOR}_{(rev)} + 1.75\%}{15.91\%}$$

Where,

Interest – Local_(rev) is the Interest Payment – Local Component

Interest – Local_x is Interest Payment – Local Component determined by TCEB for x^{th} year of operations, subject to adjustment on account of escalations till COD.

KIBOR_(rev) is the relevant KIBOR rate prevailing for x^{th} year of operations, as notified by State Bank of Pakistan

Frequency of Indexation shall be semi-annually.





Thar Coal & Energy Board Government of Sindh

x. Interest Payments – Local Phase II (Non-Sovereign Guarantee)

$$\text{Interest} - \text{Local}_{(\text{rev})} = \text{Interest} - \text{Local}_x \times \frac{\text{KIBOR}_{(\text{rev})} + 2.5\%}{15.91\%}$$

Where,

Interest – Local_(rev) is the Interest Payment – Local Component

Interest – Local_x is Interest Payment – Local Component determined by TCEB for x^{th} year of operations, subject to adjustment on account of escalations till COD.

KIBOR_(rev) is the relevant KIBOR rate prevailing for x^{th} year of operations, as notified by State Bank of Pakistan

Frequency of Indexation shall be semi-annually.

xi. Interest Payments - Foreign

Since Phase II does not have any foreign debt, any indexation for interest payments pertaining to foreign debt will be as per COD Stage Determination of Phase I.

xii. Equity Returns

$$\text{Equity Returns}_{(\text{rev})} = \text{Equity Returns}_x \times \frac{\text{PKR/USD}_{(\text{rev})}}{228.45}$$

Where,

Equity Returns_(rev) is the revised Equity Returns Component

Equity Returns_x is the Equity Returns component determined by TCEB for x^{th} period of operations

PKR/USD_(rev) is the revised TT & OD selling rate of US Dollars as on the date on which the indexation is applicable, as notified by the National Bank of Pakistan

Frequency of Indexation shall be quarterly.

xiii. Cost of Transportation

$$\text{Cost of Transportation}_{(\text{rev})} = \text{Cost of Transportation}_x \times \frac{\text{Diesel Price}_{(\text{rev})}}{238.63}$$

Where,

Cost of Transportation_(rev) is the revised Cost of Transportation applicable on tariff

Cost of Transportation_x is the Cost of Transportation applicable on tariff as determined by TCEB for x^{th} period of operations





Thar Coal & Energy Board Government of Sindh

Diesel Price_(rev) is the Delivered Diesel Price in terms of PKR per Litre notified by OGRA for Islamkot, District Mithi adjusted for NCV-GCV factor (Reference – 1.0574), Specific gravity (Reference – 0.84), and Calorific Value (Gross) (Reference – 44.2MJ/kg)

Frequency of indexation shall be on a quarterly basis, based on prices as notified by Oil & Gas Regulatory Authority

xiv. Heat Content Adjustment

$$\text{Adjusted Prod Pmt}_{(\text{rev})} = \text{Prod Pmt}_x \times \frac{\text{Heating Value}_{(\text{ref})}}{\text{Heating Value}_{(\text{rev})}}$$

Where,

Adjusted Prod Pmt_(rev) is the Production Payment Price adjusted for heating value (LHV)

Indexed Prod Pmt_x is the reference Production Payment Price in xth year of operations

Heating Value_(ref) is the heat content of coal, which for Year 1 – 8 is equal to 11.30 MJ / kg (LHV) and for Year 9 – 30 is equal to 11.61 MJ / kg (LHV)

Heating Value_(rev) is the actual average heating value (LHV) during the relevant quarter of xth of operations subject to a minimum heating value (LHV) permitted for Year 1 – 8 of 11.0175 MJ / Kg and for Year 9 – 30 of 11.31975 MJ / Kg

Indexation shall be computed annually.





Thar Coal & Energy Board

Government of Sindh

ANNEXURE A – TARIFF TABLE SECMC PHASE II 7.6 MTPA MINE:

Yearly Profile for Coal Price of 7.6Mt/a Mine Capacity in (USD/tonne)

PRODUCTION (VARIABLE) PAYMENTS							CAPACITY (FIXED) PAYMENTS										Total
Year	Fuel Cost	Variable O&M - Site Services/ Tyres	Spares / Consumables	Asset Replacement	Royalty	Total Production Payments	Fixed O & M - Foreign	Fixed O & M - Local	Insurance	Power Cost	Working Capital	Principal Repayment	Interest Payment	ROE	ROEDC	Total Capacity Payments	
1	6.06	2.93	2.54	4.57	3.45	19.55	5.57	2.32	0.84	2.15	1.70	4.01	6.23	5.02	2.09	29.92	49.47
2	6.40	3.61	1.90	4.57	3.40	19.88	3.97	2.83	0.84	2.15	1.76	4.50	5.73	5.02	2.09	28.88	48.77
3	6.48	3.84	1.63	4.57	3.37	19.89	3.19	3.13	0.84	2.15	1.76	5.06	5.15	5.02	2.09	28.38	48.27
4	6.36	1.76	3.51	3.49	2.80	17.92	2.04	2.68	0.52	1.37	1.82	4.29	4.63	3.45	1.42	22.23	40.14
5	6.11	1.73	3.34	3.49	2.75	17.43	2.01	2.52	0.52	1.37	1.76	3.93	4.99	3.45	1.42	21.98	39.41
6	5.63	1.53	3.13	3.49	2.68	16.47	1.96	2.65	0.52	1.37	1.65	4.39	4.53	3.45	1.42	21.95	38.41
7	4.79	1.22	2.73	3.49	2.53	14.76	1.87	2.47	0.52	1.37	1.45	4.91	4.01	3.45	1.42	21.47	36.23
8	4.79	1.22	2.73	3.49	2.53	14.76	1.87	2.47	0.52	1.37	1.45	5.52	3.40	3.45	1.42	21.47	36.22
9	4.59	1.17	2.64	3.49	2.49	14.38	1.85	2.41	0.52	1.37	1.40	6.22	2.70	3.45	1.42	21.35	35.73
10	4.69	1.22	2.70	3.49	2.30	14.40	1.86	2.39	0.52	1.37	1.42	4.24	1.89	3.45	1.42	18.56	32.96
11	4.64	1.20	2.68	3.49	2.07	14.08	1.84	2.25	0.52	1.37	1.40	1.94	1.40	3.45	1.42	15.59	29.68
12	5.08	1.31	2.94	3.49	2.15	14.97	1.89	2.31	0.52	1.37	1.50	2.36	0.98	3.45	1.42	15.82	30.79
13	4.92	1.24	2.90	3.49	2.12	14.67	1.87	2.25	0.52	1.37	1.47	2.88	0.46	3.45	1.42	15.70	30.37
14	5.03	1.27	2.96	3.13	1.85	14.25	1.88	2.20	0.52	1.37	1.47	0.00	0.00	3.45	1.42	12.32	26.57
15	5.06	1.30	2.99	3.13	1.86	14.34	1.89	2.19	0.52	1.37	1.48	0.00	0.00	3.45	1.42	12.32	26.66
16	4.96	1.26	2.94	3.13	1.84	14.14	1.87	2.17	0.52	1.37	1.46	0.00	0.00	3.45	1.42	12.27	26.41
17	4.58	1.16	2.73	3.13	1.78	13.39	1.83	2.11	0.52	1.37	1.37	0.00	0.00	3.45	1.42	12.07	25.46
18	4.98	1.26	2.95	3.13	1.85	14.17	1.88	2.18	0.52	1.37	1.46	0.00	0.00	3.45	1.42	12.29	26.45
19	5.18	1.32	3.10	3.13	1.88	14.61	1.90	2.18	0.52	1.37	1.51	0.00	0.00	3.45	1.42	12.36	26.97
20	5.18	1.32	3.10	3.13	1.88	14.62	1.90	2.18	0.52	1.37	1.52	0.00	0.00	3.45	1.42	12.36	26.98
21	5.27	1.36	3.14	3.13	1.90	14.80	1.91	2.20	0.52	1.37	1.54	0.00	0.00	3.45	1.42	12.41	27.21
22	5.20	1.33	3.11	3.13	1.89	14.66	1.90	2.18	0.52	1.37	1.52	0.00	0.00	3.45	1.42	12.37	27.04
23	4.98	1.24	2.99	3.13	1.84	14.19	1.88	2.15	0.52	1.37	1.46	0.00	0.00	3.45	1.42	12.26	26.44
24	4.92	1.21	2.96	3.13	1.54	13.77	1.87	2.14	0.52	1.37	1.44	0.00	0.00	0.75	0.26	8.36	22.12
25	4.91	1.21	2.94	3.13	1.54	13.73	1.87	2.15	0.52	1.37	1.43	0.00	0.00	0.75	0.26	8.36	22.09
26	4.66	1.20	2.74	3.13	1.50	13.24	1.84	2.14	0.52	1.37	1.37	0.00	0.00	0.75	0.26	8.26	21.50
27	4.81	1.26	2.81	3.13	1.53	13.54	1.86	2.18	0.52	1.37	1.41	0.00	0.00	0.75	0.26	8.35	21.90
28	4.94	1.32	2.87	3.13	1.48	13.75	1.87	2.21	0.52	1.37	1.44	0.00	0.00	0.00	0.00	7.42	21.17
29	4.24	1.05	2.49	3.13	1.35	12.25	1.79	2.10	0.52	1.37	1.26	0.00	0.00	0.00	0.00	7.05	19.29
30	4.19	1.05	2.45	0.97	1.13	9.78	1.79	2.09	0.07	1.37	1.15	0.00	0.00	0.00	0.00	6.47	16.26
Levelized Tariff																	36.72

