Thar Coal & Energy Board
Government of Sindh

No. TCEB/Registrar/2-1/2014/CS-Phase.III
June 1, 2023

DETERMINATION OF THAR COAL & ENERGY BOARD IN THE MATTER OF REFERENCE CONTRACT STAGE TARIFF FOR EXPANSION OF OPEN CAST LIGNITE MINE FROM CAPACITY OF 7.6 MTPA TO 11.2 MTPA BY SINDH ENGRO COAL MINING COMPANY (SECMC) AT BLOCK II THAR COALFIELDS, DISTRICT THARPARKAR, SINDH, PAKISTAN

Thar Coal & Energy Board
Government of Sindh

No. TCEB/Registrar/2-1/2014/CS-Phase.III
June 1, 2023

Determination of Reference Contract Stage Tariff for the Expansion of Open Cast Lignite Mine from Capacity of 7.6 MTPA to 11.2 MTPA by Sindh Engro Coal Mining Company (SECMC) 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

Mr Ammar Habib Khan
Member

Mr Khadim Hussain Channa
Presiding Officer / Member

Thar Coal & Energy Board
Government of Sindh

No. TCEB/Registrar/2-1/2014/CS-Phase.III
25th July 2023

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 Contract Stage Tariff for Expansion of Open Cast Lignite Mine from Capacity of 7.6 MTPA to 11.2 MTPA for Sindh Engro Coal Mining Company at Block II Thar Coalfields, District Tharparkar, Sindh, Pakistan, appended in the following pages.

Khadim Hussain Channa
Managing Director
Thar Coal & Energy Board

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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
EPC	Engineering, Procurement & Construction
EPP	Energy Purchase Price
FC	Financial Close
GCV	Gross Calorific Value
GoS	Government of Sindh
GoP	Government of Pakistan
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
SCOD	Scheduled Commercial Operations Date
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' or 'Company') for determination of the Reference Contract Stage Tariff for expansion of the open cast lignite mine from a capacity of 7.6 MTPA to 11.2 MTPA at Block II Thar Coalfields, District Tharparkar, Sindh, Pakistan, dated February 24, 2023. The coal tariff determination relates to the specific mine lease of Block II Thar Coalfields. The Petition has been assessed and reviewed in accordance with the parameters and guidelines established under the Thar Coal Tariff Determination Rules, 2014 dated November 27, 2014, as notified by Government of Sindh. The coal tariff, so determined shall form the basis of fuel cost for downstream power generation to be determined by NEPRA.

TARIFF SOUGHT BY PETITIONER

The Petitioner has submitted a request for determination of levelized tariff of USD 37.26 per Tonne for Expansion of open cast lignite mine from a capacity of 7.6 MTPA to 11.2 MTPA mining capacity. The Company has achieved COD for Phase II of the mine dated October 1, 2022. The mine expansion cost submitted for reaching up-to 11.2 MTPA capacity over a period of 18 months is USD 104.97 million. The details of the project cost and petitioned tariff is provided in Tables I to IV here below:

Table I – Petitioned Project Cost for Development of 11.2 MTPA Mining Capacity

Petitioned Project Cost for 11.2 MTPA	Amount
EPC Cost	69.18
Non-EPC Cost	21.75
Insurance Cost	0.93
Financing Fee	3.15
Interest During Construction	9.96
Income from Pre-COD Sale	(19.69)
Total Project Cost	**85.28**

All amounts in USD Million

Table II – Petitioned Project Tariff for 11.2 MTPA Mining Capacity

Project Tariff	Year 1 – 10 Average	Year 11 – 30 Average	Year 1 – 30 Levelized
Total Production Payment Tariff Components	19.00	17.85	18.99
Total Capacity Payment Tariff Components	19.74	13.22	18.27
Total Project Tariff	**38.75**	**31.07**	**37.26**

All amounts in USD per Tonne

Table III – Petitioned Production Payment Tariff for 11.2 MTPA Mining Capacity

Production Payment Tariff Components	Year 1 – 10 Average	Year 11 – 30 Average	Year 1 – 30 Levelized
Fuel Cost	6.58	6.16	6.58
Variable O&M - Tyres	1.71	1.71	1.71
Foreign Contractor – Variable	4.92	4.92	4.92
Asset Replacement Cost	3.09	2.89	3.19
Royalty	2.70	2.17	2.60
Total Production Payment Tariff Components	**19.00**	**17.85**	**18.99**

All amounts in USD per Tonne

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Table IV – Petitioned Capacity Payment Tariff for 11.2 MTPA Mining Capacity

Capacity Payment Tariff Components	Year 1 – 10 Average	Year 11 – 30 Average	Year 1 – 30 Levelized
Fixed O & M - Foreign	2.90	2.90	2.90
Fixed O & M - Local	3.13	2.97	3.11
Insurance	0.67	0.67	0.67
Power Cost - By Solar (14%)	1.65	1.55	1.64
Cost of Working Capital	1.28	1.28	1.28
Principal Debt Repayment	2.99	0.00	2.18
Interest Payment	1.95	0.00	1.52
ROE	3.61	2.69	3.47
ROEDC	1.56	1.16	1.50
Total Capacity Payment Tariff Components	**19.74**	**13.22**	**18.27**

All amounts in USD per Tonne

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 228.452 per USD
iii.	RMB to USD Exchange Rate Parity	RMB 7.12 per USD
iv.	US CPI	296.81
v.	Local CPI	185.68
vi.	Cost of Local Financing – Sovereign Guarantee	6-month KIBOR + 1.75%
vii.	Cost of Local Financing – Market Base	6-month KIBOR + 2.50%
viii.	1-month KIBOR Assumption	15.51%
ix.	6-Month KIBOR Assumption	15.91%
x.	Debt Repayment Period	10 Years
xi.	Equity IRR	18.00%
xii.	Mining Technology	Trucks (60t/70t & 90t/100t) & Shovel (6.5/7m³ & 12/15m³)
xiii.	Construction Period	18 Months
xiv.	Overburden Removal Volume (During Construction)	19.75 million BCM
xv.	Average overall Slope Angle of the Mine	24° (Degrees)
xvi.	Average Rate of Dewatering	78,590 m³/d

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MATERIAL ASPECTS OF THE PETITION - ANALYSIS & DECISIONS

The following is a summary of the salient aspects of the 11.2 MTPA Contract Stage Tariff Petition:

1. CONSOLIDATED TARIFF

The TCEB has determined that the mine development project, consisting of Phase I and II, along with the subsequent expansion into Phase III, should be considered as one project. Therefore, there should not be two separate sets of tariffs for the same pit once the COD (Commercial Operation Date) for Phase III expansion is achieved, or by December 31, 2024, whichever comes earlier. Starting from January 1, 2025, the mine will be treated as a single project, and all operational and maintenance expenses, asset replacements, and other related expenses will be considered as part of one mine and reflected in one tariff. Furthermore, any future expansions within the same pit will also be subject to the same treatment once their respective CODs are achieved. This approach will help to streamline the regulatory process and promote consistency in tariff assessment for similar projects in the future.

2. PUBLIC HEARING

The public hearing for the contract stage tariff petition to expand Block II open-cast lignite mine from a capacity of 7.6 MTPA to 11.2 MTPA in Phase III was advertised in the Daily Dawn, Daily Jang and Daily Kawish on Sunday, April 16, 2023.

The hearing was conducted on May 4, 2023 at 11:00 am at Movenpick Hotel (Ballroom A) in Karachi, where Mr. Aamir Iqbal, the CEO of SECMC, briefed the attendees about the overall aspects and the necessity for the Thar lignite mine expansion. The expansion aims to provide cheaper fuel to Lucky Electric, which currently uses expensive imported coal. Following the briefing by CEO, the SECMC technical team presented the EPC and Non-EPC aspects of the Phase III expansion to the audience during the public hearing.

After the SECMC team provided a detailed presentation, the floor was opened to the audience for a question-and-answer session. The participants from NEPRA headquarters raised some queries regarding the pre-COD sales after October 1, 2022, specifically to Lucky Electric. Since the Thal-Nova power plant achieved COD on February 17, 2023, and is already paying capacity payments as the off-takers of Phase II, NEPRA stated that any coal sales to Lucky Electric after February 17, 2023, should be made at the variable cost component.

NEPRA also highlighted that 18% IRR is on the higher side as compared to the IRR allowed to Power Plants. The participants from NEPRA headquarters also stressed that SECMC needs to adhere to the Calorific Value adjustment formula outlined in TCEB's Determination, and pricing framework. NEPRA representatives also pointed out that the petitioned insurance benchmark is relatively high at 1.35% and needs to be rationalized to around 0.75%. The NEPRA representative recommended that SECMC should take due efforts for the electrification of mine infrastructure, which not only enhances efficiencies but also results in savings of foreign exchange spent heavily on imported diesel. The representative assured that necessary support may be extended by NEPRA in mine electrification.

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In response to the queries raised by NEPRA representatives, the SECMC team maintained that the pre-COD sales to Lucky Electric from October 1, 2022, to February 17, 2023 were based on the actual tariff to bridge the capacity gap. Regarding the issue of coal sales to Lucky Electric after February 17, 2023, SECMC has sought guidance from TCEB in this regard. The decision of 18% IRR is made by the competent authority, i.e. Thar Coal Energy Board (TCEB), to attract future investments in Thar coal. In relation to the issue of higher IRR, the CEO of SECMC added that the reasonable IRR is essential as the first investment in Thar coal was made in 2010, and a significant portion of the investment was made in 2015-16. However, to-date, shareholders have not received any returns due to multifaceted reasons, including circular debt and other issues related to sovereign risk. Due to the same, it is becoming increasingly difficult to secure investments in coal, as even local banks are hesitant to finance coal projects. The SECMC team acknowledged that the adjustment formula for calorific value would be made in line with the TCEB guidelines.

In response to the NEPRA representatives' recommendation for the electrification of mine infrastructure, the CEO of SECMC expressed appreciation for their support and informed that a letter had already been sent to CPPA-G for the allocation of auxiliary load from mine-mouth power plants at Thar. Dedicated and sustainable electric power will improve the efficiency of existing infrastructure, and the potential use of EVs dump trucks will further enhance the economics of coal mining operations at Thar, resulting in lower fuel prices.

Mr. Ali Nawaz Bhand, DG Coal, PPIB, emphasized that Thar coal is the only sustainable solution to the energy crisis in Pakistan. He further noted that the progress on Phase III is slow and needs to be expedited. It was highlighted that SECMC has deviated from its original plan of using large capacity dump trucks and shovels in the Phase III expansion, compromising the economies of scale. While considering SECMC's plea that procurement of a large-size fleet has a longer lead time, it was suggested that the procurement of large size equipment should be considered in the operational stage of Phase III. DG Coal, PPIB further emphasized that the railway link should not be included in the coal tariff and should not be considered as part of the non-EPC cost component.

Mr. Nawaz pointed out that the timelines for the construction of Phase III were not clearly stated in the petition. The petitioner has only provided a general statement that the construction period would span over 18 months after financial close. However, the timeframe for financial close has not been discussed, raising concerns about the timely completion of the project. Mr. Nawaz also expressed concern over the high financial & LC confirmation charges, stating that 4% of the loan amount was higher and should be rationalized. DG Coal, PPIB expressed strong support for the initiative of electrifying the mine infrastructure and electric vehicle. He pointed out that Thar has abundant electricity generation capacity which can be utilized by the mining operations, thereby avoiding the usage of expensive diesel fuel. Regarding the issue of LCs for spare parts and consumables i.e. tyres, he suggested that mine operators should make efforts to collaborate with local fabrication and manufacturing industries and explore the possibility of indigenization.

The CEO, SECMC expressed gratitude for the valuable suggestions and critical comments shared by DG PPIB. With regards to the project timelines, SECMC stated that delays in Phase III expansion are due to non-payment to the existing O&M contractor and pending LCs. He expressed that SECMC is making every effort towards sustainable electrical power, including assessing the potential of Electric Vehicles (EVs) in mining operations and planning to implement an EVs pilot project by the end of this year.

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Mr. Atiq Ahmed from Geological Survey of Pakistan (GSP) inquired about SECMC's Research and Development projects, specifically asking whether they are conducting any problem-oriented research aimed at value-addition, minimizing extraction costs, utilizing waste materials, and enhancing coal recovery. In response to the query, the CEO of SECMC confirmed that the company was actively working towards the efficient and sustainable use of Thar coal. Among the various directions being pursued were briquetting and gasification.

Mr. Afroze, Bureau Chief, Daily Pakistan highlighted the significant role of Thar coal in addressing Pakistan's energy crisis. However, despite ongoing efforts, the business community continues to face considerable difficulties due to high electricity prices. Additionally, general public is increasingly concerned about the rising cost of electricity. In response, the CEO of SECMC explained that their company provides the most affordable fuel in Pakistan. Furthermore, he emphasized that electricity prices in Pakistan can be lowered by converting imported coal-fired power plants to utilize Thar coal, as increased usage of Thar coal will have a positive impact on the overall electricity price.

Mr. Abul Fazal Rizvi from Lucky Electric mentioned that they are the off-taker of Phase III expansion project and eagerly anticipating its completion. As Lucky Electric is currently procuring imported coal amounting to US$ 25 million each month, timely completion of the project would greatly benefit Lucky Electric by allowing it to transition from imported coal to utilizing Thar coal, thereby reducing its operating costs, while also reducing import bill and conserving precious foreign currency in the process. He also mentioned that Lucky Electric has already procured *1.2 million tons* of coal from SECMC, resulting in significant foreign exchange savings. He further requested clarification on the tentative completion time for the Phase III expansion project. In response, the CEO of SECMC confirmed that Lucky Electric has already received *1.2 million tons* of coal from SECMC, and that the company will continue to supply coal wherever possible from its existing capacity. However, the CEO also mentioned that delays in the Phase III expansion project were primarily caused by non-payment to the existing Operations & Maintenance (O&M) contractor, as well as pending LCs.

Following are some of the key questions raised in Public Hearing on 4th May, 2023

- The IRR at 18% is on the higher side, and thereby needs to be rationalized
- SECMC needs to adhere to calorific value as per guidelines of TCEB
- The Insurance premium at 1.35% is high, and needs to be rationalized
- SECMC should make efforts on electrifying the mine through auxiliary power
- Why do we need to embed cost of railway line in the petition?
- Why should financial charges be added to the tariff?

3. MINING TECHNOLOGY

The Petitioner is expanding the Phase III mine on a fast-track basis, but the lead times for larger class equipment will delay the project and impact the reduction of coal prices. To address this, the Petitioner has evaluated and determined that 70-ton class dump trucks and 6.5 m^3 shovels are optimal in terms of pricing, and lead times and will procure 93 dump trucks and 6 shovels for the Phase III Mine Expansion. The Petitioner plans to replace this equipment with larger class equipment in the future for the removal of recent/sub-recent formation. The existing machinery pool of SECMC is presented in Table V below:

Table V - Existing Equipment

Sr. No.	Equipment	Quantity
1.	7 m^3 Shovels	30
2.	12 m^3 Shovels	05
3.	60 tonne Dump Trucks	184
4.	90 tonne Dump Trucks	12

The Petitioner has submitted additional information regarding the deployment of equipment and replacement of assets through letter no. SECMC-1184-05-2023, dated 23rd May 2023, and have justified the need for an increased quantity of dump trucks by explaining that the distances for dumping and the depth of the mine in Phase III expansion will be greater compared to previous phases. The overburden (OB) extracted during Phase III will be directed towards an external dump. Excessive internal dumping could result in traffic congestion on the mine haul roads.

TCTDC has noted that the Phase III expansion is located towards the western side of the pit, while the external dumps are situated on the northeastern and eastern sides. The overburden of Phase III will be extracted evenly from recent formation to Bara formation, hence the argument of increased depth of mine will not applicable however dumping distances may be increased. The Petitioner can enhance operational efficiency by effectively managing the OB from Phase II operations to external dumps while maintaining the balance between external and internal dumps.

TCTDC recalculated the machinery requirement based on revised asset replacement and production schedule submitted by the Petitioner. The machinery requirement for development and operational period of Phase III (11.2 MTPA) is tabulated in Table VI.

Table VI - Machinery Requirement for Phase III

Machinery	SECMC Requirement			TCTDC Calculations		
	Development period	*Mining period*	*Total*	*Development period*	*Mining period*	*Total*
6.5 / 7 m^3 Excavator	6	133	139	4	67	71
12 / 15 m^3 Excavator	-	19	19	-	25	25
Truck, 60 / 70 tonnes	93	1913	2006	78	1645	1723
Truck, 90 / 100 tonnes	-	101	101	-	136	136

The Petitioner must consider exploring the latest technologies to optimize the overall project cost and environmental impact. In particular, the use of electric vehicles (EVs), electric surface miners, and In-Pit Crushing and Conveying (IPCC) systems for dumping material could significantly reduce operational costs and improve efficiency. These innovative technologies are rapidly evolving and can help achieve the project's sustainability goals, while also improving profitability. TCTDC advised SECMC to submit a comprehensive comparative study evaluating different EV based equipment configurations at the time of declaration of Financial Close of Phase III.

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4. Coal Quality Assessment

The Petitioner has apprised that Phase III has a Reference Heating Value of 11.61 MJ/Kg. However, the approved BFS by SCA shows an average heating value of 10.86 MJ/Kg. The Petitioner has entered into coal supply agreements with off-takers, requiring coal supply within a heating value range of 10.312 MJ/Kg to 12.771 MJ/Kg, which is linked to the power plant design. The tonnage of coal shall be adjusted as per the actual heating value supplied, with 11.6 MJ/Kg being the Reference Heating Value for coal quantities. To confirm the heating values, TCTDC will conduct a coal quality mapping of various coal working benches within three (03) from the date of this determination. This process involves the collection and analysis of samples from different areas of the mine to determine the heating value and other chemical and physical properties. By conducting this mapping, TCTDC can gain a better understanding of the coal quality across the mine.

5. EPC Contractor Selection

The Petitioner has opted to engage the same EPC contractor for the Phase III expansion to limit their risk and avoid potential violations, as this approach provides better control and ensures consistency in operations. The Petitioner believes that engaging multiple contractors for construction and operation work could make it difficult to identify potential issues during the expansion, which could adversely affect the bankability of the existing Phase I and II mines. The Petitioner conducted an internationally competitive bidding process to select the best EPC contractor for Phase III mine expansion and shortlisted five contractors based on technical criteria. However, only three of them submitted commercial proposals, while the other two declined, citing different challenges related to sovereign risks. After evaluating the commercial proposals and negotiations, the Petitioner issued a Letter of Intent to the lowest bidder, which is one of the largest coal producing companies in China. The Petitioner held detailed negotiations with them, leading to the initialization of a draft O&M agreement. However, the lowest bidder declined to sign the O&M agreement, citing the rapidly deteriorating economic situation, and heightened sovereign risk.

TCTDC recognizes the challenges in engaging other EPC contractors due to the prevailing economic environment. Engaging multiple contractors could result in duplication of resources, such as assembly warehouses, settlement facilities, workshops, etc., which could increase production costs and ultimately lead to higher coal tariffs. Therefore, the TCTDC believes that using the same EPC contractor for the Phase III expansion is the most viable option in given circumstances. However, it is the prime responsibility of the Petitioner to complete all formalities regarding hiring of EPC contractor.

6. Power Generation Mix

The Petitioner had initially planned to secure 80% of the power supply from the National Grid and 20% through self-generation from diesel. However, due to the unstable grid supply, they had to resort to diesel for their power needs. Despite their efforts to secure grid supply from relevant stakeholders, no support was provided, and the Petitioner had to enter into a 15-year agreement for the provision of 5 MW solar power with a private party. The solar power system has been operational since 2019 and has allowed them to negotiate a fixed ex-GST price of 9.25 PKR/kWh for 15 years without any indexation, resulting in significant savings for the project.

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To further optimize power generation costs, the Petitioner has handed over diesel-based power generation operations to a local contractor through a competitive bidding process, resulting in significant savings. Currently, the only sources of power available to the Petitioner are from the solar power system and diesel gensets, and they are considering the installation of a small coal-fired power plant. However, due to the non-availability of lignite boilers and forex issues, this initiative can only commence once these issues are resolved. The Petitioner requested the TCEB to allow power generation through diesel and the solar power, as per their tariff petition, for the next three years, until they can determine the cost of RFO-based power generation, which they will then petition to the TCEB under MYT.

The Petitioner continues to evaluate options to generate power from a captive power plant having a capacity of 8-10 MW, and that can be operated on lignite. The Petitioner also submits that it is considering RFO based power generation system. Establishing a captive power unit when the mine is literally supplying lignite to mine-mouth power plants is inefficient utilization of resources, and capital. Furthermore, RFO and diesel are imported fuels, and hence have a foreign exchange component. At a time when there is a severe shortage of foreign currency at a macro level, all efforts must be made to minimize import of fuels. It is essential that the foreign exchange component of the mine's operations is minimized, and the same can be done through utilization of auxiliary power of mine-mouth power plants.

All efforts must be made to establish auxiliary power arrangements with mine-mouth power plants such that reliance on imported fuels can be minimized, and the mine can be operated in a more efficient manner. The cost savings would directly translate into lower fuel cost, and eventually lower price for the consumer. Establishing auxiliary power arrangements can also provide the necessary power required to scale up mines and replace existing diesel-based equipment with electric equipment, including EV dumpers, and excavators. Scaling up by embracing efficiency should be a high priority not just for the Petitioner, but the Thar Coalfields at large.

At this stage, TCTDC only allows utilization of diesel for the next 12 months only. All efforts must be made to phase out diesel and establish auxiliary power arrangements with mine-mouth power plants to make the operations more efficient, and cost-effective.

7. EPC Costs

EPC Costs were petitioned at USD 69.18 million, however the same has been rationalized to USD 52.77 million following reconfiguration of equipment required during the development stage as detailed in Section 2 of this determination. Table VII presents the breakup and comparison of Petitioned and Determined EPC Cost

Table VII – EPC Cost Comparison and Breakup

EPC Costs	Petitioned	Determined
Over-Burden Cost	41.79	30.77
Equipment Procurement and Installation	27.38	22.00
Total	**69.17**	**52.77**

All amounts in USD Million

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8. NON-EPC COSTS

Non-EPC Costs of USD 21.75 million were petitioned, however, the same has been rationalized to USD 9.33 million. The Petitioner had requested USD 10 million for establishment of facility to connect the Coal Handling System to the potential Thar Railway Link project. It is to be noted here that the Thar Railway Link project is still in its fairly early stages, and thereby allocation of costs for the same at this stage may not be reasonable. However, going forward, once firm plans for the Thar Railway Link project are in place, and project can achieve financial close, the petitioner may request capital expenditure associated with linking the Coal Handling System to the Thar Railway Link project at that point in time. At this stage, it may not be reasonable to allow the same.

Similarly, amount requested for Project Development Cost, and Consultancy & Studies has been rationalized to USD 1.5 million, and USD 1 million, respectively. Costs pertaining to security, salaries, wages & benefits, and other operating expenses have been allowed as proposed. However, they need to be actualized at the COD stage, and all efforts must be made to efficiently utilize the same. Costs pertaining to colony has been allowed as proposed. Table VIII presents the breakup and comparison of Petitioned and Determined Non-EPC Cost

Table VIII – Non- EPC Cost Comparison and Breakup

Non-EPC Costs	Petitioned	Determined
Capital Item (Railways and Colony)	11.90	1.90
Security	2.81	2.81
Project Development Cost	2.81	1.50
SWB	1.13	1.13
Operating Expenses	0.99	0.99
Consultancies and Studies	2.11	1.00
Total	**21.75**	**9.33**

All amounts in USD Million

9. CAPITAL STRUCTURE & PRE-COD SALES

Pre-COD Sales of PKR 4.5 billion (approx. USD 19.69 million) as recorded by the Petitioner will be utilized to fund expansion of the mine, thereby reducing overall requirement of capital, and enabling the mine, and eventually consumers to benefit from economies of scale. The Petitioner had initially petitioned debt contribution of USD 78.73 million, and equity contribution of USD 6.54 million resulting in a total project cost of USD 104.97 million, with the difference being plugged by Pre-COD Sales.

However, the Petitioner through its letter no. SECMC-1184-05-2023, dated 23rd May 2023, following the public hearing held on May 4, 2023, requested that the equity component be reduced as considering the overall macroeconomic environment, it may not be possible to arrange external equity injection in a timely manner, which may lead to delays in project execution. In view of this updated information, the Petitioner revised the capital structure, such that total project cost became USD 105.99 million, of which USD 15.77 million is to be funded by Pre-COD Sales, and remaining amount of USD 90.22 million to be covered through debt.

After due deliberation, there has been rationalization in both EPC Costs, and Non-EPC Costs, such that overall project cost has reduced to USD 72.7 million, however after adjusting for

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Pre-COD Sales of 19.69 million, total project cost has reduced to USD 53.01 million. A reduction in both EPC Costs, and Non-EPC Costs, as well as availability of Pre-COD Sales has reduced the requirement of external capital. The petitioner requested that funding of the proposed expansion be covered through a mix of debt, and Pre-COD sales, such that no fresh equity injection is required. Overall quantum of debt relative to what was petitioned, has reduced to USD 53.01 million, while there is no fresh equity component that is being considered. It may be noted here that absence of fresh equity reduces the overall cost impact associated with ROE and ROEDC, while also completely avoiding any fresh exposure to depreciation of PKR against the USD. This will ensure that certain tariff components associated with the expansion, remain isolated from USD indexation. Furthermore, as all debt will also be raised in PKR, there will be no USD indexation for the same either. Given absence of any dollarized indexation on the fresh equity component, as well as potential reduction in tariff, which will greatly serve public interest – TCTDC has accepted the request of the Petitioner, to not inject any fresh equity at current stage.

As the mine has scaled up, and overall project execution risks have considerably gone down, the Petitioner should make efforts to reduce the pricing associated with external debt. The current spread over benchmark is petitioned at 2.5 percent. The same is restricted to 1.5 percent over benchmark, and the petitioner should make all efforts to rationalize the same, considering the overall quality of the project, and its sponsors.

Equity IRR associated with Phase III is restricted to 18% in-line with decision of the Thar Coal Energy Board (TCEB), notified on March 16, 2023, however, the same is not applicable during this phase, since there is no fresh equity injection. Relevant interest rate, and actual PKR amount of debt, will be actualized at the time of Phase III COD Tariff Determination in-line with relevant framework.

It may also be noted here that Financing & LC Charges proposed at USD 3.15 million are not allowed at this stage. In a scenario, where any inadvertent LC Charges must be paid due to higher LC confirmation charges given elevation of sovereign risk, the same can be incorporated in the COD Stage tariff on an *actual* basis, backed by relevant documentation.

Pre-COD sales of 1.2 million tons as alluded to during the public hearing, as well as any additional pre-COD sales on an actual basis, must be adjusted against capital expenditure for development of Phase III. The same should also be reported to TCEB in subsequent petitions.

10. RETURN FOR EXISTING SHAREHOLDERS

The Petitioner has requested ROEDC at 18% to be allowed for 10% of the project on the pretext of deteriorating economic environment. It is to be noted here that a guaranteed IRR of 20% in dollarized terms allowed for development of the mine takes into consideration sovereign risk, and hence compensates shareholders for the same on a recurring basis. Scaling up the mine is also in interest of the shareholders, as they can more effectively utilize the mining lease, and enhance overall profitability in absolute terms.

The expectation of a fragile economic environment is by virtue of a guaranteed dollarized IRR already allowed for the project. In view of the above, the Petitioner's request is not accepted.

11. ADJUSTMENTS

Petitioner has requested that withholding tax on interest income will be actualized as per actual. The same is not allowed, as if withholding tax needs to be actualized, then any interest income also needs to be adjusted against the guaranteed equity IRR, or the same may also be utilized for any potential expansion, as is the case with Pre-COD Sales. The request for the same as stated in 4.7(c) of the Petition, is not allowed. Similarly, in case of any taxation matters that go against the spirit of relevant incentives allowed to coal mining projects over the years, the same need to be taken up with relevant tax authorities, and respective forums.

In view of the maturing nature of the project, and reduction in overall execution risk, the TCTDC also advises that interest rate associated with working capital finance should also be renegotiated with financiers and should preferably kept to a maximum of 1% over benchmark. The same is not being restricted at this stage, but an update would be required on the same in the FC Stage Petition for Phase III.

As requested in 4.9 of the Petition, any additional costs incurred due events beyond the control of the Petitioner, and due to overall foreign currency liquidity constraints of the sovereign, may be considered in a subsequent petition on a case-to-case basis on availability of relevant supporting evidence.

12. COAL TRANSPORTATION

The Petitioner has not made any request for coal transportation for Phase III, as it is the responsibility of the off taker to transport the coal from the mine site to the power plant located in Karachi. It is strongly recommended that the Petitioner switches from truck coal dispatch to a conveyor belt system. This will not only optimize the transportation process but also reduce the operational costs. The Petitioner is advised to submit a detailed report on the conveyor belt system before the commercial operation date of Phase III.

Considering the significant environmental impacts of coal transportation for long hauls, the Petitioner should conduct an environmental impact assessment study. The report may be submitted to TCEB within three (03) months from the date of this determination.

THAR COAL AND ENERGY BOARD * GOVERNMENT OF SINDH *

COAL TARIFF DETERMINATION ORDER

No. TCEB/Registrar/2-1/2014/CS-Phase.III: This determination is conducted in accordance with the authority vested with Thar Coal & Energy Board and pertains to the Petition dated February 24, 2023, of Sindh Engro Coal Mining Company for Determination of Reference Contract Stage Tariff for expansion of SECMC's Mine 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 37.26 per Tonne for development & operations of 11.2 MTPA mining capacity.

The determination is based upon an initial production of 3.8 MTPA lignite, which was ramped up to 7.6 MTPA as per the mine expansion plan, and the same is being proposed to be further ramped up to 11.2 MTPA, as submitted by the Petitioner.

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 of 11.2 MTPA:

Table IX – Determined 11.2 MTPA Tariff

Project Tariff	Year 1 – 10 Average	Year 11 – 30 Average	Year 1 – 30 Levelized
Total Production Payment Tariff Components	14.32	12.34	13.97
Total Capacity Payment Tariff Components	18.87	9.57	16.43
Total Project Tariff	**33.19**	**21.91**	**30.40**

All amounts in USD per Tonne

Table X – Production Payment Component 11.2 MTPA

Production Payment Tariff	Year 1 – 10 Average	Year 11 – 30 Average	Year 1 – 30 Levelized
Fuel Cost	4.75	4.54	4.77
Variable O&M - Tyres	1.32	1.22	1.32
Spares/Consumables	2.41	2.42	2.45
Asset Replacement	3.53	2.63	3.30
Royalty	2.32	1.53	2.12
Total Production Payment Tariff Components	**14.32**	**12.34**	**13.97**

All amounts in USD per Tonne

Table XI –Capacity Payment Component 11.2 MTPA

Capacity Payment Tariff	Year 1 – 10 Average	Year 11 – 30 Average	Year 1 – 30 Levelized
Fixed O & M - Foreign	1.85	1.82	1.85
Fixed O & M - Local	2.40	2.15	2.34
Insurance	0.52	0.43	0.50
Power Cost	1.32	1.32	1.32
Working Capital	1.33	1.23	1.32
Principal Repayment	3.94	-	2.68
Interest Payment	2.64	-	1.97
ROE	3.45	1.88	3.15
ROEDC	1.42	0.76	1.30
Total Capacity Payment Tariff Components	**18.87**	**9.57**	**16.43**

All amounts in USD per Tonne

THAR COAL AND ENERGY BOARD * GOVERNMENT OF SINDH

Table XII – Petitioned and Determined Project Cost for Development of 11.2 MTPA Mining Capacity

Project Cost for 11.2 MTPA	Petitioned	Determined
EPC Cost	69.18	52.77
Non-EPC Cost	21.75	9.33
Insurance Cost	0.93	0.71
Financing Fee	3.15	-
Interest During Construction	9.96	9.89
Income from Pre-COD Sale	(19.69)	(19.69)
Total Project Cost	**85.28**	**53.01**

All amounts in USD Million

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GENERAL CONDITIONS

i. The above tariff is applicable for a period of 30 years on BOO basis commencing from Commercial Operations Date or December 31st, 2024, whichever is earlier of the 11.2 MTPA mine.

ii. The basis of this determination is a mix of Debt and Pre-COD sales for the purpose of funding the project.

iii. Tariff is configured on upfront drawdown of amount pertaining to Pre-COD sale, and pro-rata drawdowns of debt.

iv. Pre-COD sale of lignite in Phase III will be priced at the full first year tariff of coal as per this Determination. Any Pre-COD sale realized will be utilized to finance the capital for expansion of Phase III mine.

v. The proposed power mix through diesel generator and solar is allowed up to a period of 1 year, or date of any upcoming tariff petition, whichever is earlier. All efforts needs to be made to establish auxiliary power arrangement with mine-mouth power plants.

vi. Working Capital facility and the resultant cost is permitted for a maximum of 30 days of receivables on production payment tariff, 30 days of coal inventory, 21 days of diesel inventory, 6 months of spares inventory. The financing cost of the working capital facility is permitted at a maximum of 1 Month KIBOR + 2.0%. Reference 1 Month KIBOR embedded in the tariff determination is 21.62%

vii. Project Tariff is based on a reference exchange rate of PKR 285.74 per USD and a diesel price of PKR 261 per litre.

viii. The detailed cost components of tariff are tabulated in Annexure-A appended at the end of this Order.

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Reference Tariff Indexations

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

i. Fuel Cost

$$\text{Fuel Cost}_{(rev)} = \text{Fuel Cost}_{x} \times \frac{\text{Diesel Price}_{(rev)}}{261}$$

Where,

Fuel $\text{Cost}_{(rev)}$ is the revised Fuel Cost Component

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

Diesel $\text{Price}_{(rev)}$ 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 as and when notified by Oil & Gas Regulatory Authority

ii. Variable O&M

$$\text{Variable O\&M}_{(rev)} = \text{Variable O\&M}_{x} \times \frac{\text{US CPI}_{(rev)}}{303.36} \times \frac{\text{PKR/USD}_{(rev)}}{285.74} \times \frac{7.07}{\text{RMB/USD}_{(rev)}}$$

Where,

Variable $\text{O\&M}_{(rev)}$ is the revised Variable O&M Component

Variable $\text{O\&M}_{x}$ is the Variable O&M Component of x^{th} year of operations

US $\text{CPI}_{(rev)}$ is the latest United States Consumer Price Index for All Urban Consumers (CPI-U) notified by the US Bureau of Labor Statistics

$\text{PKR/USD}_{(rev)}$ 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

$\text{RMB/USD}_{(rev)}$ 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

iii. Asset Replacement

$$\text{Asset Replacement}_{(rev)} = \text{Asset Replacement}_{x} \times \frac{\text{US CPI}_{(rev)}}{303.36} \times \frac{\text{PKR/USD}_{(rev)}}{285.74} \times \frac{7.07}{\text{RMB/USD}_{(rev)}}$$

Where,

Asset $\text{Replacement}_{(rev)}$ is the revised Asset Replacement Component

Asset Replacement_x is the Asset Replacement Component of x^{th} year of operations

US $\text{CPI}_{(rev)}$ is the latest United States Consumer Price Index for All Urban Consumers (CPI-U) notified by the US Bureau of Labor Statistics

$\text{PKR/USD}_{(rev)}$ 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

$\text{RMB/USD}_{(rev)}$ 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

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

Where,

$\text{Royalty}_{(rev)}$ is the revised Royalty Component

Coal Price_y is the Price of Coal (excluding Royalty) in y^{th} 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

$$\text{Fixed O\&M} - \text{Local}_{(rev)} = \text{Fixed O\&M} - \text{Local}_x \times \frac{\text{Local CPI}_{(rev)}}{224.41}$$

Where,

Fixed O&M – $\text{Local}_{(rev)}$ is the revised Fixed O&M – Local Component

Fixed O&M – Local_x is the Fixed O&M – Local Component in x^{th} year of operations

Local $\text{CPI}_{(rev)}$ is the latest is Consumer Price Index of Pakistan as notified by the Pakistan Bureau of Statistics

Frequency of Indexation shall be quarterly

vi. Fixed O&M – Foreign

$$\text{Fixed O\&M Foreign}_{(\text{rev})} = \text{Fixed O\&M Foreign}_{\text{x}} \times \frac{\text{US CPI}_{(\text{rev})}}{303.36} \times \frac{\text{PKR/USD}_{(\text{rev})}}{285.74} \times \frac{7.07}{\text{RMB/USD}_{(\text{rev})}}$$

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

$$\text{Power Cost} - \text{By Diesel}_{(\text{rev})} = \text{Power Cost} - \text{By Diesel}_{\text{x}} \times \frac{\text{Diesel Price}_{(\text{rev})}}{261} \times \frac{\text{\% of Diesel}_{(\text{rev})}}{86\%}$$

Where,

Power Cost – By Diesel 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 Islamkot, 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 as and when notified by OGRA

viii. Cost of Working Capital

$$\text{WC}_{(\text{rev})} = \text{WC}_{\text{x}} \times \left(a_x \frac{\text{Prod Pmt}_{(\text{rev})}}{\text{Prod Pmt}_x} + b_x \frac{\text{Coal}_{(\text{rev})}}{\text{Coal}_{\text{x}}} + c_x \frac{\text{Diesel}_{(\text{rev})}}{261} + d_x \frac{\text{US CPI}_{(\text{rev})} \times \text{PKR/USD}_{(\text{rev})} \times 7.07}{303.36 \times 285.74 \times \text{RMB/USD}_{(\text{rev})}} \right) \times \frac{\text{KIBOR}_{(\text{rev})} + 2.00\%}{21.62\%}$$

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

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 60 days to amount of working capital facility in x^{th} year of operations

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 Islamkot, 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

Frequency of Indexation shall be monthly

ix. Interest Payments

$$\text{Interest} - \text{Local}_{(\text{rev})} = \text{Interest} - \text{Local}_x \times \frac{\text{KIBOR}_{(\text{rev})} + 1.5\%}{22.11\%}$$

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 or as repayments are agreed with lender

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x. Equity Returns

$$\text{Equity Returns}_{(\text{rev})} = \text{Equity Returns}_x \times \frac{\text{PKR/USD}_{(\text{rev})}}{285.74}$$

Where,

Equity $\text{Returns}_{(\text{rev})}$ 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 $_{(\text{rev})}$ 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 quarterly

xi. 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 $\text{Pmt}_{(\text{rev})}$ is the Production Payment Price adjusted for heating value (LHV)

Indexed Prod Pmt_x is the reference Production Payment Price in x^{th} year of operations

Heating $\text{Value}_{(\text{ref})}$ 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 $\text{Value}_{(\text{rev})}$ is the actual average heating value (LHV) during the relevant quarter of x^{th} of operations subject to a minimum heating value (LHV) permitted for Year 1 – 8 of 11.0175 MJ / Kg and for Year 9 – 3 of 11.31975 MJ / Kg

Indexation shall be computed annually.

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Thar Coal & Energy Board

Government of Sindh

ANNEXURE A – TARIFF TABLE CONTRACT STAGE 11.2 MTPA MINE

Yearly Profile for Coal Price of 11.2 Mt/a Mine Capacity in (USD/ton)

	PRODUCTION (VARIABLE) PAYMENTS						CAPACITY (FIXED) PAYMENTS										
Year	Fuel Cost	Variable O&M - 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	Total
1	5.40	1.62	2.58	3.53	2.58	15.71	1.92	2.59	0.52	1.32	1.47	4.26	4.28	3.45	1.42	21.23	36.93
2	5.01	1.44	2.44	3.53	2.50	14.91	1.87	2.38	0.52	1.32	1.38	3.90	4.64	3.45	1.42	20.87	35.78
3	4.65	1.29	2.33	3.53	2.45	14.25	1.84	2.50	0.52	1.32	1.31	4.34	4.20	3.45	1.42	20.89	35.14
4	4.49	1.22	2.27	3.53	2.42	13.92	1.82	2.46	0.52	1.32	1.27	4.85	3.69	3.45	1.42	20.79	34.72
5	4.39	1.18	2.23	3.53	2.41	13.74	1.81	2.44	0.52	1.32	1.25	5.44	3.10	3.45	1.42	20.74	34.48
6	4.59	1.26	2.36	3.53	2.44	14.18	1.83	2.43	0.52	1.32	1.30	6.11	2.43	3.45	1.42	20.81	34.99
7	4.59	1.26	2.36	3.53	2.23	13.97	1.83	2.39	0.52	1.32	1.29	4.10	1.65	3.45	1.42	17.97	31.94
8	4.54	1.24	2.34	3.53	2.00	13.66	1.82	2.25	0.52	1.32	1.27	1.75	1.21	3.45	1.42	15.01	28.67
9	4.96	1.35	2.57	3.53	2.07	14.49	1.87	2.32	0.52	1.32	1.37	2.12	0.84	3.45	1.42	15.22	29.71
10	4.91	1.33	2.60	3.53	2.06	14.43	1.86	2.27	0.52	1.32	1.36	2.57	0.39	3.45	1.42	15.15	29.58
11	5.12	1.40	2.70	3.04	1.84	14.10	1.88	2.25	0.52	1.32	1.38			3.45	1.42	12.21	26.31
12	5.04	1.39	2.67	3.04	1.82	13.97	1.87	2.22	0.52	1.32	1.37			3.45	1.42	12.16	26.13
13	4.95	1.35	2.64	3.04	1.81	13.79	1.86	2.20	0.52	1.32	1.35			3.45	1.42	12.11	25.90
14	4.58	1.25	2.46	3.04	1.75	13.09	1.82	2.13	0.52	1.32	1.27			3.45	1.42	11.93	25.01
15	4.96	1.35	2.64	3.04	1.81	13.81	1.86	2.21	0.52	1.32	1.35			3.45	1.42	12.13	25.93
16	4.95	1.32	2.67	3.04	1.81	13.79	1.86	2.18	0.52	1.32	1.35			3.45	1.42	12.09	25.88
17	4.95	1.32	2.67	3.04	1.81	13.80	1.86	2.18	0.52	1.32	1.35			3.45	1.42	12.10	25.90
18	5.04	1.36	2.70	3.04	1.82	13.96	1.87	2.20	0.52	1.32	1.37			3.45	1.42	12.15	26.11
19	4.98	1.33	2.68	3.04	1.81	13.84	1.86	2.19	0.52	1.32	1.35			3.45	1.42	12.11	25.95
20	4.76	1.24	2.58	3.04	1.77	13.40	1.84	2.15	0.52	1.32	1.30			3.45	1.42	12.00	25.39
21	4.70	1.21	2.55	3.04	1.47	12.99	1.83	2.15	0.52	1.32	1.27			0.75	0.26	8.10	21.09
22	4.69	1.21	2.54	3.04	1.47	12.95	1.83	2.16	0.52	1.32	1.27			0.75	0.26	8.11	21.06
23	4.45	1.20	2.36	3.04	1.43	12.48	1.81	2.14	0.52	1.32	1.22			0.75	0.26	8.01	20.50
24	4.59	1.26	2.41	3.04	1.46	12.77	1.82	2.18	0.52	1.32	1.25			0.75	0.26	8.10	20.87
25	4.73	1.32	2.46	3.04	1.40	12.96	1.84	2.21	0.52	1.32	1.28			0.00	0.00	7.16	20.12
26	4.05	1.05	2.14	3.04	1.28	11.55	1.76	2.11	0.52	1.32	1.12			0.00	0.00	6.82	18.37
27	4.00	1.05	2.10	0.97	1.08	9.19	1.76	2.10	0.06	1.32	1.02			0.00	0.00	6.25	15.45
28	3.74	1.01	1.95	0.97	1.03	8.69	1.73	2.06	0.06	1.32	0.96			0.00	0.00	6.14	14.83
29	3.65	0.99	1.90	0.97	1.02	8.53	1.72	2.05	0.06	1.32	0.94			0.00	0.00	6.09	14.62
30	2.92	0.77	1.53	0.97	0.89	7.09	1.64	1.93	0.06	1.32	0.78			0.00	0.00	5.73	12.82
Levelized Tariff																	**30.40**