National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

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No. NEPRA/TRF-434/CPPCL-2018/19549-19551
December 19, 2018

Subject: **Determination of the Authority in the matter of Petition filed by CIHC Pak Power Company Limited for Approval of Generation Tariff for 300 MW (Gross) Coal-fired Power Plant at Gwadar, Balochistan** (Case No. NEPRA/TRF-434/CPPCL-2018)

Dear Sir,

Please find enclosed herewith the subject Determination of the Authority along with Annex-1 & 2 (46 pages) in Cas No. NEPRA/TRF-434/CPPCL-2018.

2. The Determination of the Authority is being intimated to the Federal Government for the purpose of notification in the official Gazette pursuant to Section 31 (7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

3. The Order of the Authority along with Annex-1 & 2 are to be notified in the official Gazette.

Enclosure: As above

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(Syed Safeer Hussain)
Registrar

Secretary
Ministry of Ministry of Energy (Power Division),
'A' Block, Pak Secretariat
Islamabad

CC: 1. Secretary, Cabinet Division, Cabinet Secretariat, Islamabad.
2. Secretary, Ministry of Finance, 'Q' Block, Pak Secretariat, Islamabad.

National Electric Power Regulatory Authority

(NEPRA)

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Determination of the Authority

In the matter of tariff petition filed by CIHC Pak Power Company Limited for Approval of Generation Tariff for 300 MW (gross) Coal-fired Power Plant at Gwadar, Balochistan.

(Case No. NEPRA/TRF – 434/CPPCL/2018)

December 19, 2018

Commentator:

Engro Energy Limited (EEL)
Energy Department, Government of Balochistan

The Authority, in exercise of the powers conferred on it under Section 7(3) (a) read with Section 31 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, Tariff Standards and Procedure Rules, 1998 and all other powers enabling it in this behalf, and after taking into consideration all the submissions made by the parties, issues raised, evidence/record produced during hearings, and all other relevant material, hereby issues this determination.

AUTHORITY

(Saif Ullah Chattha)
Member 19.11.2018

(Rehmatullah Baloch)
Vice Chairman 19/11/2018

(Brig (R) Tariq Saddozai)
Chairman

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1. BACKGROUND

1.1. According to the Petitioner, keeping in view the strategic importance of Gwadar to CPEC and the anticipated rapid growth thereof, the Joint Cooperation Committee for CPEC (the "JCC"), decided in its sixth (6th) meeting, held in Beijing in December 2016 that a 300 MW imported coal fired power project (the "Project") must be developed on fast track basis at Gwadar. The Project is intended to not only meet the current demand for power in Gwadar and adjoining areas, but will also support future demand growth. The JCC nominated China Communications Construction Company (CCCC), a subsidiary of China Communications Construction Group (CCCG), or its nominated subsidiary to undertake this development on an expedited basis.

1.2. According to the Petitioner, as per the provisions of the Power Policy, the sponsor flied a Letter of Intent ("LOI") application with Private Power and Infrastructure Board ("PPIB") and were issued a Notice to Proceed on April 12, 2017 followed by the LOI on May 26, 2017. As per the terms of the LOI, Sponsors are required to submit, within three (3) months from the date of the Notice to Proceed, petitions before NEPRA to obtain tariff determination and generation license under the NEPRA Act. The Sponsor filed the same on July 12, 2017.

1.3. According to the Petitioner, in the 7th Meeting of the JCC held on November 21, 2017, it was decided that the project shall be undertaken by CCCC Industrial Investment Holding Company Limited ("CIHC" or "Sponsor"), another subsidiary of CCCG, as the main sponsor and the initial shareholder. Necessary approvals for the change have been sought from Government of Pskistan/PPIB. The Sponsor has incorporated CIHC Pak Power Company Limited(CPPCL) as the special purpose company to develop the Project under and in accordance with the requirements of the Power Generation Policy, 2015 of the Federal Government ("Power Policy") and NEPRA Licensing (Generation) Rules, 2000 ("Generation Licensing Rules").

2. INTRODUCTION

2.1. The Project will be located at Gwadar, on the Arabian Sea coast, in the Southwest part of Balochistan, Pakistan within the jurisdiction of Gawadar Development Authority (GDA), near the Surbundar area and will require 207 acres of land, to be acquired from and through the Government of Balochistan (GoB). The project shall be set up under build, own and operate basis.

2.2. The Project is proposed to have two (2) units of 150 MW (gross) consisting of two (2) super-high-pressure boilers, two (2) steam turbines and two (2) generators. The boilers shall be sub-critical and shall be fired by pulverized coal imported from South Africa or other sources through Gwadar Port. From the Port, the coal will be trucked to the coal yards inside the complex. The Project will draw water from the Arabian Sea for cooling and other industrial and domestic uses as the site has no other water resource. Onsite

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purification facilities shall be provided to produce potable water. The site will have enough land for ash disposal for the life of the PPA. Onsite coal storage shall be able to store enough coal for 60 days at 100% capacity. The complex shall be provided with black-start facility enabling it to start on its own in the absence of grid power. The complex shall have effluent treatment facilities in order to minimize such discharges into the environment.

2.3. During construction, at peak times, site will have enough facilities for approximately 1,000 personnel in addition to infrastructure for the security team. The site shall have residential facilities for resident labour and management during the operations phase. It will also cater for temporary labour required to man annual and major outages. Given the security situation, the complex shall have accommodations for security personnel also.

2.4. Security infrastructure shall include boundary wall, topped by security fence, watchtowers, patrol road, security cameras and depending upon the security assessment, drone surveillance may also be considered. However, all such facilities shall be strictly in line with Pakistani laws and policies.

2.5. The project design, technology and equipment selection has been made with the intention to make the Project safe and environmentally compliant to all local laws and conventions. SOx shall be scrubbed by the outgoing seawater i.e. seawater desulfurization. The Project intends to use Selective Catalytic Reduction to further reduce the release of NOx into the air.

2.6. The Project Company intends to indigenize project management and operations as quickly as possible. In order to achieve this goal, an extensive and effective training program, including training in China, will be offered to eligible local youth to become part of the project team.

2.7. The complex is proposed to be connected with the 132kV infrastructure, with two loops of outgoing lines, to be built by NTDC. Interconnection point shall be the outgoing gantry of the switchyard after stepping it up to 132kV. A Grid Interconnection Connection Study ("GIS") is being undertaken by the Project Company in consultation and coordination with NTDCL.

3. FILING OF TARIFF PETITION

3.1. CPPCL vide letter No. nil dated 12th January 2018 submitted the subject Amended and Restated Tariff Petition for approval of the reference generation Tariff for 300MW (Gross) Coal fired power generation facility to be located at Gwadar, Balochistan. In the Petition, CPPCL has, inter alia, stated that "This Tariff Petition supersedes the earlier tariff petition submitted by CCCC on July 12, 2017."

3.2. The Authority admitted the tariff petition on 7th February 2018 for further processing.

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4. SALIENT FEATURES OF THE PETITION

4.1. The salient features of the tariff petition are as under:

i. The petitioner proposed the following project cost:

DESCRIPTION	US$ Million
EPC cost	369.89
Custom Duties, Withholding and Sales Tax	40.11
Non EPC Costs	10.64
Land	5.00
Project Development Costs	21.03
Company and Sponsor Costs	26.84
Insurance during Construction	3.70
O&M Mobilization	6.49
Non-reimbursable Pre-Sync Fuel and Start-up Cost	3.44
SINOSURE Fee during construction	9.21
Financing Fees & Charges	13.12
Interest During Construction	32.90
Total Project Cost	**542.36**

ii. The proposed debt equity ratio is 80:20.

iii. The petitioner assumed interest rate of 3 month's LIBOR of 1.37% plus a premium of 4%/annum.

iv. The return on Equity component of tariff has been calculated on the basis of 17% IRR.

v. The Petitioner assumed SINOSURE Fee @ 0.75%/annum both on equity and outstanding loan plus interest.

vi. Exchange Rate of Rs. 105.00/US$ has been assumed.

vii. The petitioner assumed Net efficiency of 37% (mean Site Conditions).

viii. The proposed annual plant availability is 85%.

ix. The proposed net capacity after auxiliary consumption is 273.10 MW on Coal.

x. The petitioner proposed annual insurance cost @ 1% of the EPC Cost.

xi. The petitioner proposed a tariff control period of 30 Years.

xii. The Petitioner assumed Delivered Coal Price at Site of US$ 101.80/MT.

xiii. The petitioner proposed the following tariff:

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Description	Tariff
Energy Charge (Rs./kWh):	
Fuel Cost Component	4.5196
Variable O&M (foreign)	0.0662
Variable O&M (Local)	0.0717
Total	**4.6574**
Capacity Charge (Rs./kW/hour):	
Fixed O&M (Local)	0.2203
Fixed O&M (Foreign)	0.4276
Cost of working capital	0.1483
Insurance	0.1624
SINOSURE Fee (Average) 1-13 Years	0.1144
SINOSURE Fee (Average) 14-30 years	0.0357
Return on Equity During Construction	0.1961
Return on Equity	0.8095
Debt servicing (1-13 years only)	2.1017
Total 1-13 years	**4.1804**
Total 14-30 years	**1.9998**
Avg. Tariff 1-13 years @ 85% (Rs./kWh)	**9.4802**
Avg. Tariff 14-30 years @ 85% (Rs./kWh)	**7.0101**
Levelized tariff (Rs./kWh)	**8.9182**
Levelized tariff (Cents/kWh)	**8.4935**

5. NOTICE OF ADMISSION

5.1. Notice of Admission along with salient feature of the petition was made public on 23rd February 2018. The petition was also made available on NEPRA website for information of the stakeholders. Stakeholders were invited to become party to the proceedings by filing intervention request and/or to file comments in the matter within 14 days for assistance of the Authority. Individual notices were also sent to important stakeholders on 26thFebruary 2018.

6. COMMENTS / INTERVENTIONS

6.1. In response to the notice of admission, Engro Energy Limited (EEL) vide its letter dated March 7, 2018 submitted comments which are summarized hereunder:

i. The current award of project to a Chinese company on single source as a G2G option without open bidding needs pragmatic revision, where local market may be accorded a chance to show up with competitive rates and offers as per standards and specifications solicited by the owners.

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ii. The technology selection for the power station must be revised to super-critical boiler technology as imported coal specifications are proven to be compatible with this technology offering better efficiencies at the same time.

iii. Other coal power stations under development based on imported coal, besides CIHC Pak Power Company Limited, have made provisions for local coal by selecting circulating fluidized bed (CFB) technology. The application for generation license for the instant project states the technology selected for the power plant is PC instead of CFB. With the use of imported fuel for the generation of power from coal, the forex reserves are likely to deplete gradually while also burdening the consumers. Therefore, it is suggested that the technology be replaced from PC to CFB to effective utilization of indigenous coal.

iv. The market is in the maturing stage and lower tariffs are being offered by the developers. It is imperative that the Authority maintains uniformity by considering upfront tariff as benchmark to compare the cost components such as CAPEX, fixed and variable O&M components.

v. The development cost of the project and the timeframe shown by the company seems to be on fairly higher side. It is thus recommended that such costs be re-evaluated for which open bidding and comparative quotes will be a viable option.

6.2. Energy Department, Government of Balochistan vide it letter No ED/SO(A/E)/1-182017-18/1178-83 dated 27th April 2018 submitted that its representative during the hearing of the tariff petition for the subject project held on 24th April 2018 raised following observation:

i. Pakistan is a signatory of Paris Agreement for Climate Change, which demand the reduction in the carbon emissions from its member states. The establishment of 300MW Coal Fired Power Plant seems to be deviation from that commitment.

ii. Gwadar is a new port city which requires sustainable modern clean energy resources to meet its energy needs. Some National/International companies have offered better option as compared to Coal Fired Power Plants, like Hybrid Solutions of LNG, Solar & Wind technologies. Unfortunately, the proposed LNG terminal at Gwadar was scrapped by the Federal Government despite heavy amount was spent on its feasibility study.

iii. The following table compares the financial aspects of the project under discussion and the Thar upfront Tariff decision already given by NEPRA, which indicates the vast difference in the cost;

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Aspect	Unit	Upfront Tariff Thar Double Unit	CIHC Double Unit	Remarks
EPC Cost	M USD/MW	0.877	1.23	The CIHC has demanded the EPC cost for the project @369 M USD against the EPC/ cost allowed by NEPRA for similar technology projects in Thar for263 M USD, resulting in an approximate cost difference of 106 M USD.
Non-EPC Cost	M USD/MW	0.121	0.40	The CIHC has demanded Non-EPC cost works out to be 119 M USD against the Non-EPC cost allowed for similar technology projects by NEPRA in Thar of 36.3 M USD, resulting in an approximate cost difference of 32.7 M USD.
Project Cost	M USD/MW	1.184	1.81	The CIHC has demanded total project cost works out to be 542 M USD, against the project cost allowed for similar technology projects by NEPRA in Thar of 355 M USD, resulting in an approximate cost difference of 187 M USD.
Variable O&M Cost	Rs/kWh	0.4357	0.1379	Variable O&M cost proposed by the project company is contrary to the previous benchmarks provided by NEPRA.
Fixed O&M Cost	Rs/kWh	0.3445	0.6479	The project company has proposed higher fixed O&M cost component which is part of the capacity charge including cost such as ash handling, limestone use etc.
Total O&M Cost	Rs/kWh	0.7802	0.7858	The total O&M cost proposed by the project company is higher than that allowed in Thar upfront tariff, which includes an additional cost component of water use charge at Thar which is not applicable for this project.

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iv. The project sponsors have not considered super-critical technology for the project, instead sub-critical technology has been planned for which implementation of new projects across the country has been suspended considering the environmental hazard associated.

v. The project sponsors have not considered the blending of indigenous coal of the country, which will bring down the overall tariff by considerable number.

vi. The project sponsors have demanded the IRR @ 17%, whereas NEPRA has allowed 15% in near recent tariff.

vii. Unlike other Independent Power Producers (IPPs) including CPECprojects such as HUBCO; HUBCO has agreed to allocate 3 %shareholdings for the Government of Balochistan, whereas CIHC has not offered any such provision.

viii. The Balochistan Environment Protection Agency (BEPA) has also communicated various concerns to the project company, due to no response from the sponsor, NOC from the Authority has still not been granted.

ix. The representative of Private Power and Infrastructure Board also seconded that the total cost of project is on higher side which may be revised.

7. ISSUES FRAMED FOR THE HEARING

7.1. Based on the contents of the tariff petition, following issues were framed for the hearing:

i. Whether the EPC Cost of US$ 369.89million is achieved through a transparent and competitive bidding process and is reasonable and justified?

ii. Whether the other items of capital expenditure of US$ 117.25 million reasonable and justified?

iii. Whether the proposed efficiency of 37%is reasonable and justified?

iv. Whether the proposed plant availability of 85% is reasonable and justified?

v. Whether the proposed O&M cost is reasonable and justified?

vi. Whether the requested Insurance Cost during operations is reasonable and justified?

vii. Whether the requested SINOSUREfee is justified?

viii. Whether the requested financing fee & Charges and IDC are reasonable and justified?

ix. Whether the requested cost of working capital is reasonable and justified?

x. Whether the requested premium on KIBOR is reasonable and justified?

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xi. Whether the requested ROE of 17% is reasonable and justified?

xii. Whether the requested Fuel Cost Component and delivered Coal price of US$ 101.80/MT at site is justified?

xiii. Whether the interconnection of the proposed plant with the National Grid will meet the timelines of the project?

8. HEARING

8.1. The Authority decided to hold a hearing in the matter on 24th April 2018. Notice of Hearing along with issues framed were published in the newspaper on 11th April 2018. Individual Notices were also sent to important stakeholders on 12th April 2018.

8.2. Hearing was held as per schedule and was participated by the representatives of the Petitioner, CPPA, Government of Balochistan, PPIB, NTDC and Engro Energy Limited.

9. CONSIDERATION OF THE VIEWS OF THE STAKEHOLDERS, ANALYSIS, FINDINGS AND DECISIONS ON IMPORTANT ISSUES

9.1. The issue wise discussion, submissions of the Petitioner and stakeholders, analysis, findings and recommendations are provided in the succeeding paragraphs.

10. Whether the EPC Cost of US$ 369.89 million is achieved at through transparent and competitive bidding process and is reasonable and justified?

10.1. The Petitioner requested US$ 369.89 million on account of Engineering, Procurement & Construction ("EPC") comprising offshore portion of US$ 250.16 Million and onshore portion of US$ 119.73 Million. The EPC Cost includes costs of procurement, engineering design, site preparation, construction of boundary wall, access road, bridge on river/creek, temporary facilities, main plant (including import, installation, erection, completion, commissioning of boiler, turbine and generator), balance of plant (electrical and mechanical equipment and systems), control and metering, civil works, coal handling system, ash handling system, on-site ash disposal system, seawater intake and outfall channels, black start generator, desalination plant, electrostatic precipitator, selective catalytic reduction ("SCR") to capture NOx, colony, project management, erection and commissioning, security costs and security personnel accommodation.

EPC Bidding Process

10.2. According to the Petitioner, NEPRA's EPC Selection Guidelines prescribe the procedure and process for the determination for an EPC price through a competitive bidding process. A chronology of events in this regard is as under:

- On July 2017, the Bidding process was initiated by the Project Company/Sponsors through publication of an advertisement in four local newspapers Dawn, Business

Recorder, The News and Express Tribune; two international newspapers People's Daily and Reference News; as well as the tendering websites Global Tenders and Power tender.

- A total of thirteen (13) companies/JVs purchased the prequalification documents and following nine (9) submitted the prequalification documents:
    - JV of CHEC and GEDI,
    - Shanghai Electric,
    - Dongfang Electric,
    - Power China,
    - China National Electric Engineering Co., Ltd,
    - Consortium of China Gezhouba Group International Engineering Co. Ltd,
    - Consortium of Northeast Electric Power Design Institute Co. Ltd,
    - China Huadian Engineering Co. Ltd. and
    - China Sinogy Electric Engineering Co., Ltd.
- Of the 9 companies/JVs which submitted the prequalification documents, three (3) companies/JVs failed to provide the required data while two (2) failed to achieve the minimum overall score of 70%. As a result, a Request for Proposal ("RFP") was provided to and bids were received on October 17, 2017 from the following four (4) bidders:
    - JV of CHEC and GEDI,
    - Shanghai Electric,
    - Dongfang Electric,
    - Power China.
- For technical and financial bid evaluation, an independent consulting firm registered with the Pakistan Engineering Council, Zeeruk International (Private) Limited ("**Zeeruk**") was appointed by the Project Company.
- As per bidding guidelines outlined in the RFP, the technical bids were opened same day following the due date of submission. The contents of the bids were evaluated for responsiveness based on completeness of bid documents and qualifications of the bidders. The following table shows the technical scores at the conclusion of the technical evaluation of the bids. A minimum score of 60 percent was required to proceed to the commercial evaluation stage.

Name	Score
Dongfang Electric	75.28
JV of CHEC and GEDI	79.56
Power China	67.39
Shanghai Electric	59.31

- At the technical evaluation stage Shanghai Electric was disqualified due to scoring less than 60 percent.

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- The financial evaluation was carried out for the remaining three (3) bidders. Power China, Dongfang Electric and JV of CHEC and GEDI. EPC prices (excluding taxes) offered by the three (3) bidders were as follows:

Name	Bid (US$ million)
JV of CHEC and GEDI	394.85
Dongfang Electric	415.33
Power China	445.99

- The above bid prices were adjusted for missing Bill of Quantities ("BOQ") items, net capacity and net efficiency. The adjusted bid prices were as follows:

Name	Evaluated Bid Price (US$ Million)
JV of CHEC and GEDI	402.33
Dongfang Electric	437.56
Power China	463.27

- Based on the financial evaluation criteria outlined in the RFP, the following scores were awarded to the respective bidders on the financial evaluation:

Name	Score
JV of CHEC and GEDI	96.67
Dongfang Electric	87.30
Power China	80.19

- Subsequent to the financial and technical evaluation a combined score was awarded by Zeeruk based on a 40% weightage for technical evaluation and 60% weightage for financial evaluation. The final scores and rankings of the bidders on the basis is presented in the table below:

Bidder	Score	Rank
JV of CHEC and GEDI	89.83	1
Dongfang Electric	82.49	2
Power China	75.07	3

10.3. According to the Petitioner, following the bidding process, the Project Company after extensive negotiations with thelowest bidder has been recently able to finalize the EPC price at a total cost of US$ 369.89millioncomprising offshore portion of US$ 250.16 Million and onshore portion of US$ 119.73 Million. The Petitioner has also provided copy of the signed EPC contract.

10.4. According to the Petitioner, the above EPC costrepresents certain attributes which are typical to the Project, its location at Gwadar and theavailable infrastructure for the Project's development and its subsequent operation. Theseinclude:

- A 2-unit configuration;

- Requirement of a desalination system for construction andpotable water;
- Black start generator due to lack of grid connectivity;
- Seawater FGD;
- Higher cost of construction inputs at Gwadar;
- Additional cost for human resource deployment;
- Premium fortechnical services;
- Extraordinary security requirements and costs; and
- The need for fast trackdevelopment of the Project.

10.5. CIHC vide its letter No. CIHC/POCPEC/2018-141 dated 20th July 2018 submitted following details of EPC cost breakup:

Description	Onshore	Offshore	Total
	US$ Million	US$ Million	US$ Million
Civil and Architectural Work	94,927,081	29,000,616	123,927,697
Turbine & Auxiliaries	3,196,490	39,596,316	42,792,807
Boiler & Auxiliaries	4,626,704	44,989,045	49,615,749
Coal Handling System	346,057	5,603,595	5,949,651
Balance of Plant (Auxiliary Facilities)	4,175,208	53,504,284	57,679,492
Control and Instrumentation System	2,301,241	17,093,312	19,394,553
Electrical System	5,360,951	55,736,501	61,097,452
Others	4,800,000	4,636,329	9,436,329
Total	**119,733,732**	**250,159,998**	**369,893,732**

10.6. CIHC vide its letter No. CIHC/POCPEC/2018-147 dated 7th August 2018 provided justification for the higher EPC cost due to tough, unique and challenging circumstances related to the project location which renders the project incomparable to other much larger green-field and brown-field projects having developed sites, readily available infrastructure and access to cheaper input, services and manpower. According to CIHC, the EPC cost is reasonable and justified based on the following:

i. The price has been arrived at through a transparent and competitive bidding process where any bidder was free to participate in the process including the ones who provided bids for larger sized projects.

ii. Due to lack of infrastructure and project site characteristics, the project requires additional items within its EPC scope compared to other projects. The details of additional EPC cost items are as under:

Description	US$ Million
Black Start Generator 14MW	10.80
Construction Power	12.50
Desalination Plant	7.45
Initial Construction Water	0.56
Construction Water	4.70
Bridges	1.70
Residential Colony	10.00
Anti-Corrosion Measures	2.62
Site Leveling	9.35
Boundary Wall	0.98
Incremental Mateial Cost	10.00
Incremental Labour/Manpower & Services Cost	38.00
Total Additional Cost	**108.66**

iii. Adjustments related to unit size.CIHC on the basis of recent EPC cost of US$ 0.66/MW for JPCL, worked out scaled cost of US$ 1.33/MW for Gawadar Project against requested EPC cost of US$ 1.23/MW, applying following formula:

Scaled Cost = 437.5 million X (150 MW/660 MW)^0.53

10.7. It has been noted that civil and architectural work for the instant project of 300MWcosts US$ 124 million (foreign $ 29 million and local $ 95 million) while the civil works including basic design and detailed engineering costs are US$ 126 million (100% local) for 1320 MW JPCL coal fired power plant. Civil works cost is $ 0.41/MW for Gawadar Project as against $ 0.096/MW for JPCL. The comparison clearly shows that the proposed costs are exceptionally on the higher side. Similarly the other EPC cost items of $ 0.82/MW for Gawadar Project as against $ 0.57/MW for JPCL are also on the higher side.

10.8. CERC India has prescribed benchmark capital cost for coal power projects for 500 MW and above. However, no benchmark capital cost has been prescribed for less than 500 MW as the likely additions were 500 MW and above in India.The comparison of benchmark capital cost by CERC is as under:

Description	2011 Indices	2014 Indices	March 2017 Indices	
	IRs. Million	IRs. Million	IRs. Million	US$ Million
1*500MW	50.8	57.91	59.94	0.92
2*500MW	47.1	53.69	55.58	0.86
1*600MW	48.7	55.52	57.47	0.88
2*600MW	45.4	51.76	53.57	0.82
1*660MW	53.7	61.22	63.37	0.97
2*660MW	50.1	57.11	59.12	0.91
WPI	157.3	178.9	185.8	IRs. 65/US$

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10.9. In 2014 upfront coal tariff, the Authority determined capital cost of US$ 1.2367 million/MW for upto 220 MW size single unit. The breakup of the cost to arrive at EPC cost is provided hereunder:

Description	US$ Million
CAPEX without custom duties	1.24
Less Impact of Indexation	(0.05)
Indexed CAPEX	1.19
Less additional cost for European Boiler	(0.10)
CAPEX with Chinese Boiler	1.09
Less Non-EPC Cost	(0.14)
EPC Cost	0.95

10.10. The Petitioner's requested EPC cost of US$ 1.23 million/MW seems substantially high even if compared to the 2014 upfront tariff hence can not be accepted. In order to assess the reasonability of the EPC cost, it would be pertinent to keep in view the EPC cost of US$ 0.66 million/MW (US$ 875 million) for 2*660 MW JPCL project in Jamshoro, Province of Sindh arrived at through a transparent and competitive bidding process under the umbrella of Asian Development Bank (ADB). The scope of work for JPCL plant includes Design, Engineering, Manufacture, Supply, Transportation to site, Storage, Insurance, Installation, Testing, Commissioning and putting into successful operation, of the complete thermal power plant on single EPC turnkey basis including all Mechanical, Electrical, Civil, Structural, Architectural, Control & Instrumentation and all infrastructural work inclusive of site levelling, road, drain, railway siding, landscaping, detailed survey and geotechnical investigation work, area drainage study, studies for railway siding and river water intake. Spare for two years of service shall also be included in the EPC portion of the contract.

10.11. In order to arrive at reasonable EPC cost for the instant project, the EPC cost for JPCL may be adjusted for cost of railway siding not required in the instant project, appropriate increase in EPC cost due to smaller size of the Gawadar project and inclusion of additional cost items required for the instant project. It would also be pertinent to mention that due to rapid technological development and mass scale production of solar and wind power systems, the demand for fossil fuel power technologies has gone down substantially and so as the cost. This has been evident in the case of gas turbines and in case of coal as well. Therefore, benchmarking of JPCL cost for estimating the cost for Gawadar project with due consideration to size and other peculiarities is justified in all respects.

10.12. In case of JPCL cost of coal handling system and railway siding is US$ 86.68 million in offshore portion and civil works also include cost on account of railway siding. Neither the bifurcation of the cost of coal handling system and railway siding nor the breakup of

cost of civil works is available in the EPC contract documents. In the absence of the cost breakup of the coal handling system in JPCL, reliance has been made on the offshore cost of coal handling system of US$ 5.6 million for 300 MW submitted by the Petitioner to work out the coal handling system cost for 1320 MW without railway siding. Accordingly, the proportionate coal of US$ 24.64 million may be a reasonable estimate for the cost of coal handling system if no railway siding is involved. Accordingly the cost of US$ 62.04 million has been estimated forthe railway siding in JPCL and has been set aside while comparing with projects without having the need for railway siding. Accordingly the JPCL EPC cost has been taken as US$ 813 million or US$ 0.616 million/MW without railway siding for comparison purposes.

Adjustment for Scale

10.13. In case of India, benchmark cost of single unit of 500 MW and above is available but cost of 2*150 MW or nearest is not available, therefore the relationship for scaling can not be established. The scaling formula provided by the Petitioner is also not acceptable as the down scaling results in doubling the cost US$ 1.33 million/MW against US$ 0.66 million/MW. It will be simply unreasonable to assume that cost will be exactly double for 300 MW project as compared to 1320 MW project in terms of cost/MW.

10.14. In case of 2014 upfront coal tariff, capital costs of 660MW and upto 220 MW projects are available and can be relied upon to work out reasonable EPC cost in terms of size adjustment. The 220 MW cost of sub-critical boiler is 6% higher as compared to cost of super-critical boiler of 660 MW. By applying 6% increase to JPCL's adjusted cost of US$ 0.616 million/MW, the cost/MW in case of Gawadar project works out US$ 0.653/MW or US$ 195.90 million except for the additional cost items which needs to be included to this cost to work out final EPC cost.

Additional Cost Items Within the EPC Scope

10.15. The Petitioner requested US$ 108.66 million on account of project specific additional costs. These additional cost items are not covered in JPCL scope. The details, analysis and assessment of additional cost items is provided in the succeeding Paragraphs.

Black-Start Generator:

10.16. According to Petitioner, unlike others, the project requires black start generator facility of approximately 14 MW (DG sets) as the local grid is isolated, unreliable and erratic and in case of a shut down, plant will be restarted through self-generated power and considering the response rapidity and stability, a high speed diesel generator based black start solution has been recommended and the EPC scope includes cost of black start solution at US$ 10.80 million.

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10.17. The request of the Petitioner has been examined carefully keeping in the view the availability of power from the local grid and proposed interlinking of the project with national grid. The Authority is of the considered opinion that in case of complete shutdown of the power plant, 12 MW power shall be required to restart the first unit. The power requirement of 12 MW shall be easily met through the imported power available in the local grid. Moreover, by the the time the project shall be completed, the availability of national grid shall also be required and interlinking of the project with national grid shall minimize the need of black start facility. Therefore, the Authority has decided not to approve the black start facility for the instant project.

10.18. Not used

Construction Power:

10.19. According to the Petitioner, current energy situation in the coastal grid is extremely erratic with unpredictable outages and there is no guarantee of construction power from the QESCO system. Keeping in view the current energy situation in Gwadar and in the foreseeable future, it is prudent not to depend on supplies from QESCO. In view of the above and having an accelerated construction schedule for the project, it has been decided by the company to make the construction activity self-reliant in its construction power and water requirements.

10.20. The Petitioner further submitted that the EPC contractor will bring in generators to meet the power requirement during construction and total power requirements during construction period is estimated at 30 million kWh which shall be mainly used for construction, installation, commissioning, testing, lighting and living etc. As per the Petitioner, cost of providing power during construction phase will be around PKR 56-57 per kWh as compared to PKR 13.2 per kWh available via National Grid. It is further submitted that HSD fuel cost alone is expected to be in the range of PKR 33.0 per kWh (at December 2017 prices) and the remaining price pertains to civil works, rental, maintenance, labour, installation, dismantling etc. of the generators. According to the Petitioner, the price of diesel has increased substantially from PKR 85 per litre at the date of submission of Tariff Petition to around PKR 113 per litre today. Hence, the incremental cost of construction power for the Project can be estimated in the range US$ 12.50 million. The company did not provide any further details about Electricity usage during the construction phase.

10.21. The request of the Petitioner for construction power of US$ 12.5 million has been analyzed carefully. Information has been sought from the local grid about the reliability and availability of power for the construction phase of the instant project. According to the feedback received from the local grid, power will be available for the project site most of the time. The EPC contractor normally keeps some backup arrangement. Accordingly, the

Authority considers that the request of the Petitioner for differential in cost of construction power is not justified and the same is rejected.

Desalination Plant:

10.22. According to the Petitioner, Gwadar has no water for domestic, commercial, industrial and/or construction use and unlike other projects including Jamshoro (located on River Indus), where water availability is not an issue, Gwadar requires provision of usable water during operations for which a full scale desalination solution is warranted at incremental capital and operating costs when compared with power projects located at better sites like Jamshoro. According to the Petitioner, the desalination system will meet the requirements of the whole complex for freshwater (including industrial, fire fighting, potable, boiler make-up waters etc.). The requested cost for desalination plant is included in EPC price at US$ 7.45 million.

10.23. The company in respect of desalination plant further submitted as follows:

Capacity during construction = 1 x 40 ton per hour [10,566 gallons per hour] Capacity during operations = 2 x 88 ton per hour (including standby) [2 x 23,245 gallonsper hour]

Annual water requirement during operationsphaseis 675,000 tons [178.3 million gallons] based on following assumptions:

i. Average water consumption of 80-88 tons per hour [21,000 to 23,000 gallons per hour]; and

ii. 7,500 operating hours during the year.

10.24. Keeping in view the scarcity of water in Gawadar, the requirement of having a desalination plant at the project site is justified. However, the cost requested by the Petitioner for the desalination plant seems on the higher side when compared with elsewhere in the world. Based on the capital cost of desalination plants in the Middle East and regional benchmarksUS$ 5.45 millionhas been considered a reasonable estimate on account of desalination plant and the same is being approved.

Initial Construction Water:

10.25. The Petitioner submitted that no water is available at Project Site. Due to this water scarcity, the EPC Contractor shall be required to meet, at a minimum, its first 50 days of construction activity water requirements by procurement from local tanker operators. Further it is submitted that at the end of this period, a desalination plant is expected to come online when this practice will be discontinued. As per company, initial cost of construction water works out to be US$ 0.562 million based on estimated water requirement of 13.889 million litres and cost of water of Rs. 4.25 per litre. Therefore,

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incremental cost of US$ 0.562 has been requested in respect of initial construction water for this Project by the company.

10.26. The request of the petitioner has been analyzed and owing to requirement of initial construction water, the requested amount seems reasonable and approved as such.

Construction Water

10.27. The Petitioner submitted that the Contractor will bring in desalination plant to meet the water requirement during construction phase. The cost includes relevant civil works, plant rental, maintenance, operating cost, labor, chemicals, installation, dismantling etc. of the desalination plant. The cost for the same has been requested as US$ 4.70 million by the developer.

10.28. The company further submitted that the water requirement during construction hasbeen estimated at 190,320 tons [50.3 million gallons or 190.4 million litres] based on following assumptions:

i) Average water consumption of 30 tons per hour [7,925 million gallons];

ii) Water consumption for 8 hours per day;

iii) Average monthly construction days of 30.5; and

iv) Construction period of 26 months.

10.29. The company did not provide any further details under this head. The petitioner mainly focused on O&M aspect of desalination plant during the construction phase of the subject project which include civil works, plant rental, maintenance, operating cost, labor, chemicals, installation, dismantling etc. Moreover, the company did not provide any details about O&M of desalination plants during construction and operation phase. The Authority considers that annual O&M cost of US$ 0.341 million @ 5.69% of Capital cost of desalination plant is a reasonable estimate and on the basis of 30 months construction period, the cost of construction water works out US$ 0.853 million and the same is being approved.

Bridges

10.30. The Petitioner submitted that due to non-perennial stream of water within the Project Site, concrete bridges are required between production area and residential area. As per company, main bridge will be used for heavy transport vehicles entry while the other will be used for commuting of employees from residential area to plant area. The company further submitted that such a requirement does not arise in other projects, making this cost incremental to this Project. The bridges will have lengths of 130 meters and 140 meters each, cost of which have been included in EPC price at US$ 1.70 million by the project developer.

10.31. The company did not provide any details under this head. The claim of the petitioner has been analyzed and owing to requirement of bridges, the Authority decided to allow the requested amount of US$ 1.70 million as maximum cap subject to downward adjustment on the basis of actual cost supported by verifiable documentary evidences at the time of COD.

Residential Colony

10.32. According to the Petitioner, the Project requires a full-scope residential complex for Chinese staff, Pakistani staff and security personnel, with requisite amenities at Project Site as personnel would be hired from other cities in Pakistan and from China as well, at least in the beginning, who would require to be accommodated at Project Site with additional facilities commensurate with the hardships and associated risks. As per company Jamshoro has no residential colony at all in their EPC scope (has been classified under Non-EPC cost), so the entire cost of residential colony for the Project of US$ 10 million needs to be taken into account when comparing with Jamshoro.

10.33. The company further submitted that the requested cost is based on following items:

a. Training center: 1,500 m^2
b. Dormitory for O&M staff: 9,000 m^2 for 200 Chinese staff and 200 Pakistani staff,
c. Four (4) canteens with 500 m^2 each: 2,000 m^2
d. Sports center: 2,000 m^2
e. Mosque: 400 m^2,
f. Military camp and Security dormitory: 2,000 m^2

10.34. According to the Petitioner, the total covered area is 16,900 m^2. With total cost of residential colony of US$ 10 million, cost per m^2 works out to be US$ 592 per m^2 (PKR 5,700/ ft^2.).

10.35. The request of the Petitioner has been examined in detail. The requested estimated construction cost of Rs. 5700/ ft^2 is found on higher side as compared to NEPRA's approved benchmark of Rs. 5000/ ft^2 in similar cases. The incremental impact in cost in respect of labour and material prices shall be considered under a separate head, therefore, the approved benchmark of the Authority provides a reasonable reference for estimating construction cost in the instant case.

10.36. While analyzing recent tariff determinations in respect of RLNG based CCPP like Bhikki, Balloki and HBS, the Authority has approved different covered areas and housing complex costs owing to several reasons. In this regard, we consider that being a remote location the project may require full fledge housing colony (like HBS power plant having approved covered area i.e. 246,500 ft^2. so the requested covered area i.e. 181,910 ft^2 seems reasonable.

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10.37. On the basis of information available on record, construction cost of Rs. 5000/ft²and covered area of 181,910 ft², US$ 8.662 million on account of residential colony is being approved as maximum cap subject to its adjustment as per actual at COD on the basis of verifiable documentary evidence.

Anti-corrosion measures

10.38. According to the Petitioner, unlike Jamshoro, the Project is in a coastal area and needs to take into account anti-corrosive measures for its steel structure, foundation surface, enclosure material etc. to prevent them from corroding. Such measures include galvanizing, anti-corrosion coating and painting. The total cost of anti-corrosion measures as requested by the company is US$ 2.62 million with following breakdown:

- Anti-corrosion paint for steel structure at US$ 1.15 million.
- Anti-corrosion coating for re-bars concrete foundation at US$ 0.43 million.
- Anti-corrosion paint to boiler steel frame and other equipment, pipe, supporting and hanger gallery at US$ 1.04 million.

10.39. The request of the petitioner has been examined keeping in view the requirement of galvanizing, anti-corrosion coating and painting. The Authority considers that the requirement of anti corrosive measures is justified owing to coastal location of power plant, however, the requested cost seems on the higher side and needs rationalization. Accordingly, the Authority has decided to approve US$1.30 million on account of anti-corrosion measures in the instant case.

Site levelling

10.40. According to the Petitioner, project site has topography and geological conditions which requires site levelling, unlike other projects developed on flat land. The site elevation varies between 3-55 meters, proportion of soil to rock ratio is 1:9 with soil having medium weathering and breeze mudstone characteristics; hence requiring additional earth work related to excavation, levelling and backfilling.

10.41. The Petitioner further submitted that the terrain needs to be levelled up to 9 meters which requires expected excavation of 0.7 million m3 and backfilling of 0.4 million m3 and the cost for levelling would be around US$ 8.5/m³ (includes the cost of soil as well required for backfilling, as the soil to rock ratio in this area is 1:9). According to the Petitioner, total site levelling cost as requested is US$ 9.35 million for the project equivalent to PKR 4.7 million per acre.

10.42. Keeping in view the project site at Gwadar which require additional site levelling etc and international benchmarks, the Authority has decided to allow requested cost of US$ 9.35 million with maximum cap subject to its adjustment as per actual on the basis of verifiable documentary evidences at the time of COD.

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Boundary wall

10.43. The company submitted that unlike Jamshoro, where the boundary wall already exists on the GENCO project site, the project requires a full-scope boundary wall, both inside and outside. The cost of outside walls of US$ 0.98 million for the project would therefore be incremental to Jamshoro as claimed by the petitioner.

10.44. The company did not provide any details under this head. The claim of the petitioner has been analyzed and owing to requirement of boundary wall for safety and security, the Authority has decided to allow the requested cost of US$ 0.98 millionas maximum cap subject to its adjustment as per actual on the basis of verifiable documentary evidence at the time of COD.

Incremental Labor/Material Costs

10.45. According to the Petitioner, the labor would constitute around 65-70% of on shore cost of US$ 120+ million and as per quotation for manpower supply received labor rates are at least 100-150% higher compared to other areas of the country. Based on the above, it is estimated that approximately incremental US$ 38 million will be incurred on account of labor/manpower and services costs for this Project.

10.46. The onshore EPC contract provides that *"the Contractor shall pay rates of wages, and observe conditions of labour, which are not lower than those established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by employers whose trade or industry is similar to that of the Contractor".*

10.47. The request of the Petitioner has been evaluated in the light of variation in price of labour/manpower/service costs prevailing in Gawadar and Karachi. According to the intercity prices published in Monthly Bulletin of Statistics January 2018 by Pakistan Bureau of Statistics, the average labour/manpower/service rates are higher by 28.58% in Gawadar as compared to Karachi. Accordingly US$ 11.38 million has been assessed on account of additional cost of labour/manpower/service and the same is being approved.

10.48. Regarding material prices,the petitioner submitted thatthe material cost would constitute around 30-35%of on shore cost of US$ 120+ million and at a minimum, an additional cost of 30-35% has been witnessed for civil works material due to unavailability of these inputs nearby and higher transportation costs. As a result, the company requested an additional US$ 10.0 million shall be paid on account of civil wroks material cost during the construction for the project as compared to projects which are located in developed/accessible areas.

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10.49. The request of the Petitioner for increase in material cost in Gawadar has also been evaluated in the light of variation in price of construction material prevailing in Gawadar and Karachi. According to the intercity prices published prices, the prices in Gawadar and Karachi are approximately the same. Accordingly, the Authority has decided to reject the request of the Petitioner for additional cost.

Summary of the Approved EPC Cost

10.50. Summary of the approved EPC cost is as under:

	US$ Million
Main EPC Cost	195.900
Additional Cost in the EPC Scope:	
Black Start Generator	-
Construction Power	-
Desalination Plant	5.450
Initial Construction Water	0.562
Construction Water	0.853
Bridges	1.700
Residential Colony	8.662
Anti-Corrosion Measures	1.300
Site Leveling	9.350
Boundary Wall	0.980
Incremental Material Cost	-
Incremental Labour/Manpower & Services Cost	11.380
Total EPC Cost	**236.137**
Offshore EPC	159.702
Onshore EPC	76.435

11. Whether the other items of capital expenditure of US$ 117.25 million are reasonable and justified?

11.1. Other items of capital expenditure include followings:

Custom Duties, Withholding and Sales Tax	40.11
Non EPC Costs	10.64
Land	5.00
Project Development Costs	21.03
Company and Sponsor Costs	26.84
Insurance during Construction	3.70
O&M Mobilization	6.49

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Non-reimbursable Pre-Sync Fuel and Start-up Cost	3.44
Total	**117.25**

Custom Duties, Withholding and Sales Tax

11.2. The Petitioner requested total duties and taxes of US$ 40.11 million which include followings:

- Customs duties of US$ 12.51 million @ 5.00% of the offshore supply have been assumed in the Project cost which as per precedent will be adjusted at the time of COD on actual basis.
- An amount of US$ 9.64 million on account of withholding tax has been budgeted for onshore construction and services in the Project cost
- An amount of US$ 17.96 million as provincial sales tax on onshore construction and services has been assumed in the Project cost. This is essential since it is practically impossible to recover such construction period taxes in the operation period since sales tax is only levied on the energy portion of the tariff and after adjusting for inputs applicable to fuel pricing and variable O&M costs, no sales tax surplus is available to adjust the sales tax paid on capital costs during construction.

11.3. The Petitioner also requested that any duties, charges or taxes in excess thereof (or any new taxes, charges or duties) be incorporated in the Project cost at COD through a one-time adjustment.

11.4. In line with the decisions of the Authority in similar cases custom duties of US$ 7.985 million @ 5% of the revised offshore EPC cost has been included in the project cost. At the time of COD adjustment, the actual customs duties shall be incorporated in the project cost on the basis of verifiable documentary evidence. No withholding tax on contracts is being assumed. Actual withholding tax not being of refundable/adjustable nature shall be incorporated at the time of COD on the basis of verifiable documentary evidence. Sales tax is a value added tax and has not been considered as part of the project cost.

Non-EPC Cost

11.5. The Petitioner requested Non-EPC cost of US$ 10.64 million which includes cost related to the followings:

i. US$ 5.77 million for private security to be arranged by the Project Company for a 30-month period;

ii. US$ 1.64 million for satellite communication system at the Project site;

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iii. US$ 2.33 million for on-job training of 150 local engineers and personnel in China and at Project site; and

iv. US$ 0.90 million for owner's vehicles.

11.6. In support of the security cost, the Petitioner has provided a signed security agreement itself and Beijing Qianxiang Securities Co. Ltd. Keeping in view the security requirements at Gawadar and the security cost allowed to other thermal power projects, US$ 5.77 million is being approved with maximum cap which shall be subject to downward adjustment on the basis of actual cost with verifiable documentary evidence at the time of COD.

11.7. The Authority considers that satellite communication cost should be the part of EPC price under the head of controls and instrumentation and claiming it as a separate item is not justified. Similarly training cost is part of the EPC scope and O&M mobilization cost, therefore, additional training cost is not justified. Vehicle cost is typically part of pre-operation cost and cannot be considered under this head.

Land

11.8. According to the Petitioner, the total estimated land required for the Project is 207 acres, at a cost of approximately US$ 5. million which includes land for the power complex, coal yard, ash yard, residential colony, public facilities, roads, open area etc. The land is being acquired by the Government of Balochistan under the LAA for and on behalf of the Project Company. The Petitioner has provided correspondence with GoB and details of land cost. Land utilization of 207 acres by the Project is as under:

Description	Area (Acres)
Thermal System	3.98
Coal Handling System	14.00
Ash Handling System	60.43
Electrical System	4.57
Desalination Plant & Water Treatment Plant	2.82
Desulfurization and Denitrification	1.52
Public Facility	1.73
Contractor Living Section	20.07
Living Area for Pakistan Employee	14.33
Colony	14.08
River, Plant, Roads	69.47
Total	**207.00**

11.9. According to the Letter No. 8180-81/DC/RB/2017 dated 10th November 2017 from the office of Deputy Commissioner Gawadar, the compensation amount including

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compulsory acquisition charges and other applicable taxes are Rs. 496,322,147/-. As of today 20th September 2018, Sale/Purchase of land has still to be finalized.

11.10. In response to NEPRA enquiry regarding justification of 207 acres of land in view of the international benchmarks i.e. acres/MW the petitioner submitted that area of the power plant is 0.69 acre/MW and reasonable in view of the international benchmarks. It is further submitted that the ratio for coal fired power plant in Sahiwal is 0.77 acres/MW. Land areas for Sahiwal coal power project and Port Qasim coal power project of 1320MW each are 1,020 acres and 330 acres respectively.

11.11. The process of land acquisition is still under way. In the absence of actual land acquisition at this stage, the referred compensation amount has been considered subject to its verification at the time of COD. On the basis of reference exchange rate of Rs. 105/US$, compensation amount works out US$ 4.727 million and the same is being approved subject to adjustment as per actual at the time of COD on the basis of verifiable documentary evidence.

Project Development Costs and Company and Sponsor Costs

11.12. The Petitioner requested project development costs of US$ 21.03. Project development cost include followings:

Owner's Engineer & Project Manager	10.00
Project Studies i.e. feasibility, geological, topographic, jetty, flood, seismic, main hydrology, grid interconnection, coal assessment, site investigation, environment impact assessment, testing & modeling of marine intake and outfall structure etc.	6.62
Cost of Consultants legal, financial, tax, audit, technical	3.81
Regulatory Fees NEPRA, PPIB, SECP	0.60
Total	**21.03**

11.13. The Petitioner requested that any fees and charges related to government agencies in excess of the aforementioned amounts be adjusted at COD through a one-time adjustment.

11.14. The Petitioner also requested company and sponsor costs of US$ 26.84 million. Company and sponsor costs include administrative costs expected to be incurred by the owner and sponsors during the development and construction period for a 42-month period. This includes cost related to salaries of local and expat employees, insurances, office and vehicle rentals, travel, utilities and other establishment costs. The company also submitted the details under these heads which are mostly based on quotations of several companies.

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11.15. The request of the Petitioner has been examined carefully. CMEC for its approximately similar size project requested US$ 14 million on account of Project Development Cost & Company and Sponsor Cost while the Petitioner is requesting US$ 47.87 million for similar cost. The requested cost is clearly on very high side. The commentator also highlighted that the project development costs were on higher side.

11.16. The Authority in earlier cases of thermal power projects determined around 3% of capital cost as project development & company and sponsor cost. CMEC requested cost under this head was approximately 2.87% of the capital cost. Accordingly, the Authority has decided to allow project development & company and sponsor cost on the basis of 2.87% of the capital cost in the instant case which works out US$ 7.73 million and the same is being approved with maximum cap and shall be subject to adjustment at actual based on production of verifiable documentary evidences at the time of COD.

Insurance During Construction

11.17. The Petitioner requested insurance during construction of US$ 3.70 million at 1% of EPC Cost (excluding any local taxes) as part of Project cost. The Petitioner also proposed that insurance will be adjusted at COD based on the finalized EPC cost. The Project, in view of the PPA requirements and in accordance with the requirements typically set out by lenders funding the Project, intends to procure following insurances during the construction period:

i. Construction All Risk Insurance;
ii. CAR Delay in Start-up Insurance;
iii. Marine and Inland Transit Insurance;
iv. Marine Delay-in-Start-up Insurance;
v. Comprehensive General Liability.

11.18. The Authority vide SRO 763 (I)/2018 dated June 19, 2018 issued NEPRA (Benchmarks for Tariff Determination) Guidelines, 2018. According to the guidelines, the benchmark insurance rate during construction shall be 0.75% of the EPC cost and the same is being approved in the instant case. Accordingly, on the basis of revised EPC cost, insurance during construction works out US$ 1.771 million for the instant project.

O&M Mobilization Cost

11.19. The Petitioner requested O&M mobilization cost of US$ 6.49 million. According to the Petitioner, about six months prior to commissioning, the O&M contractor is expected to be available on site to begin the process of acclimatizing and transitioning ownership of the complex from the EPC contractor.

11.20. The literature provides that O&M mobilization cost hovers around 1% of EPC Cost in case of thermal power projects. The Authority in respect of a thermal power project allowed 1% of EPC Cost as O&M mobilization and training cost. In line with its earlier decision

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and on the basis of revised EPC cost, O&M mobilization cost works out US$ 2.361 million and the same is being approved.

Non-reimbursable Fuel and Start-up Cost prior to synchronization

11.21. The Petitioner requested non-reimbursable fuel and start-up cost prior to synchronization of US$ 3.44 million. According to the Petitioner, this represents costs related to coal, diesel, consumables and other start-up costs expected to be incurred prior to the synchronization of the plant to the grid. The Petitioner has also proposed that such costs be adjusted at COD based on actual.

11.22. The request of the Petitioner for non-reimbursable fuel and start-up cost prior to synchronization is in line with the similar cost allowed to other thermal power plants. On the basis of cost allowed to a similar power plant, US$ US$ 2.738 million on account of non-reimbursable fuel and start-up cost prior to synchronization is being approved with maximum cap subject to adjustment as per actual on the basis of verifiable documentary evidence at the time of COD.

12. Whether the requested SINOSURE fee is justified?

12.1. The Petitioner requested SINOSURE fee of US$ 9.21 million during construction period. The Petitioner also requested average SINOSURE tariff component of Rs. 0.1144/kW/Hour for 1-12.5 years and average SINOSURE tariff component of Rs. 0.0357/kW/Hour for the remaining period of the proposed PPA term of 30 years.

12.2. According to the Petitioner, Chinese financial institutions are required to procure coverage under a SINOSURE insurance policy in case of overseas project lending. Similarly, state owned-enterprises undertaking overseas investments are also required to procure overseas investment insurance from SINOSURE. As per recent precedents, rate for such insurance has been assumed at 0.75% (including tax) and the insurance premium for the construction period both for debt and equity has been budgeted as part of the Project cost. In addition to the construction period, the policy will also be applicable during the operations period and a similar fee will be charged. According to the Petitioner, SINOSURE fee during operations on both debt and equity have been budgeted @ 0.75% of the insured amount of debt and equity, respectively. In case of debt, the insured amount comprises of opening debt balance and interest payable during the year, whereas in case of equity, such amount is based on equity invested by the Project Company.

12.3. The Petitioner further submitted that in certain cases depending on lender and sponsor requirements, the applicable SINOSURE policy may require that the entire premium be paid upfront and has been budgeted by the projects in the project cost. Since the terms and modalities of the SINOSURE policy are still under discussions with the lenders and SINOSURE, it is proposed that a provision may be included in the tariff where an

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adjustment may be allowed in case of an upfront premium payment. In case, the Project Company is required to make an upfront payment for the SINOSURE premium, no fee shall be payable during operations period.

12.4. The request of the Petitioner has been examined carefully keeping in view the provision of SINOSURE in similar coal power projects and power projects on other fuels/technologies. The Authority did not allow SINOSURE fee on equity investment in similar cases. There is no reason to allow high IRR based ROE, if the insurance premium has also to be provided to cover the risks of the equity investor. Accordingly, SINOSURE fee on equity investment has not been considered.

12.5. In case of debt financing by Chinese banks/lenders for coal power projects in upfront coal tariff, the Authority allowed an upfront SINOSURE fee @ 7% on the total debt servicing amount payable during the loan repayment period post COD and the total upfront Sinosure fee @7% was included in the project cost. The Authority also decided that in case of alternative better SINOSURE fee arrangement, the same shall also be considered and adjustment in tariff shall be made at the time of COD.

12.6. In recent cases of determination of generation tariff for hydro, solar and wind, the provision of Sinosure has been allowed for power projects with Chinese financing. Some of these projects have secured Sinosure at the rate of 0.6% of the yearly outstanding principal and interest. On the basis thereof, the Authority has decided to allow Sinosure fee at the maximum limit of 0.6% of yearly outstanding principal and interest amount during construction and during operation period. Accordingly, Sinosure fee during construction works out US$ 2.102 million which shall be subject to adjustment as per actual with maximum of 0.6% of the yearly outstanding principal and interest amount during the construction period. Separate tariff component has been worked out for Sinosure fee during operation on the basis of outstanding loan amount and interest payment.

13. <u>Whether the requested financing fee & Charges and IDC are reasonable and justified?</u>

13.1. The Petitioner requested financing fees and charges of US$ 13.12 million @ 3% of the debt amount (excluding any sales or withholding taxes). According to the Petitioner, financing fees and charges cover arrangement, commitment and other fees payable to the lending banks as well as fees payable to legal, technical, insurance and other advisors employed by the bank for the purposes of the financing. According to the Petitioner, the budget amount shall be adjusted at COD on the basis of actual on production of verifiable documentary evidence.

13.2. According to the NEPRA Guidelines 2018, the benchmark rate for financing fees and charges for thermal power projects is 2% of the loan amount and the same is being approved in the instant case. Accordingly, financing fees & charges work out US$ 4.308 million for the instant project

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13.3. The Petitioner requested interest during construction (IDC) of US$ 32.90 million. According to the Petitioner, IDC has been calculated on the basis of 30-month construction period, 80:20 debt to equity ratio and financing from Chinese banks. According to the Petitioner, a lending rate of 3-month LIBOR of 1.37% plus a spread of 4.00% has been assumed. The Petitioner further submitted that IDC shall be subject to adjustment on the basis of actual debt to equity ratio, debt disbursement schedule and changes in LIBOR during construction period.

13.4. Based on the 30 month construction period, debt equity ratio of 80:20, interest rate of 5.37%, proposed loan draw-downs and loan amount of 80% of the revised CAPEX, the IDC works out US$ 17.139 million and the same is being approved. The IDC shall be re-established at the time of COD on the basis of actual construction period subject to maximum of 30 months, actual loan draw-downs, actual premium on LIBOR subject to maximum of 4% and actual quarterly LIBOR.

14. Summary of Project Cost

14.1. Summary of the approved project cost is as under:

Description	US$ Million
EPC Cost	236.137
Custom Duties, Withholding and Sales Tax	7.985
Non EPC Costs	5.770
Land	4.727
Project Development Costs	7.73
Company and Sponsor Costs	
Insurance during Construction	1.771
O&M Mobilization	2.361
Non-reimbursable Pre-Sync Fuel and Start-up Cost	2.738
CAPEX	**269.219**
SINOSURE Fee during construction	2.102
Financing Fees & Charges	4.308
Interest During Construction	17.139
Project Cost	**292.769**

15. Whether the proposed efficiency of 37% is reasonable and justified?

15.1. The Petitioner proposed net thermal efficiency of 37% of the complex at mean site conditions with. The Petitioner further requested heat rate degradation, output degradations as well as partial load adjustment charge as per the manufacturer's curves. As per Annex E Performance Guarantees under the EPC Contract, the guaranteed gross

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output of each unit is 150 MW, the guaranteed net output of each unit is 136.5 MW and guaranteed net efficiency of the complex is 37%.

15.2. The Petitioner requested auxiliary consumption of 8.98% of the gross output which has an impact on the net output and efficiency of the complex. In case of CMEC 330 MW project at Kalar Kahar auxiliary consumption of 8% was allowed for PCC sub-critical boiler. In case of imported and Thar Coal upfront tariffs in 2014, an auxiliary consumption of 9% was allowed for sub-critical boilers. The Petitioner while replying an inquiry, submitted that the power consumption ratio of the CFBC boiler is at least 2~3% higher than that of the PCC boiler, which affects the thermal efficiency of the power complex. In the subject project the PCC boiler has been selected. It is noted that lower quality coal having higher ash, moisture and sulfur content etc requires bigger size of auxiliary equipment, hence results in increased auxiliary consumption. The proposed coal calorific value is better than the local coal of salt range and Thar coal as well.

15.3. While analyzing the regional benchmarks in respect of auxiliary consumption it is noted that the auxiliary consumption for CFBC boilers is higher than PCC boiler based power plants. The report published by IEA clean coal centre reveals that the net thermal efficiencies of CFBC boilers are often less competitive owing to the high auxiliary power consumption by fans used to generate the fluidizing air, which can be greater than the power drawn by the coal pulverizes and FGD unit required for PCC. The report further divulges that the power consumed by utility scale CFBC is usually in the range of 8~10% of the gross output, depending on boiler design and fuel type, whilst PCC plants with FGD are able to approach 6% of the gross output. As per Indian regulator, the auxiliary energy consumption of the imported coal fired generating stations at the rated capacity shall not generally exceed 7.5% of gross capacity with certain assumptions which may revise the aforementioned value upwards/downwards by 1.5%. Reference is also being made to the guaranteed auxiliary consumption value of 4.7% of gross output as per the EPC contract of 2*660 MW JPCL coal fired supercritical power plant.

15.4. Keeping in view all above, regional benchmarks, utilization of better quality imported coal and installation of once through PCC boiler instead of CFBC boiler, 8% auxiliary consumptionof gross capacity i.e. 24 MW has been considered for the subject project in line with the approved and requested auxiliary consumption of CMEC power plant. Accordingly, the revised net capacity at reference site conditions shall be 276 MW.

15.5. The Petitioner vide its letter dated 20th July 2018 provided following performance guaranteed values:

Gross Efficiency of boilers at RSC	92.79%
Gross Efficiency of steam turbine at RSC	44.78%
Gross Efficiency of generators at RSC	98.50%

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15.6. Based on the above guaranteed performance values and auxiliary consumption of 8%, net LHV thermal efficiency of 37.65% at RSC at full load has been approved. The output degradation, heat rate degradation and partial load shall be applicable as per standard clauses of the PPA as per curves provided by the OEM. Start up costs shall also be dealt with by the Power purchaser in accordance with the earlier signed PPAs.

15.7. Net efficiency and net output shall be subject to performance tests at the time of COD and in case the net efficiency and net output of the complex are established higher than the approved values, downward adjustments shall be made in fuel cost component and capacity charge components respectively. No adjustments shall be made in tariff components in case the net efficiency and net output of the complex are established lower than the approved values.

16. Whether the proposed plant availability of 85% is reasonable and justified?

16.1. The Petitioner proposed annual plant availability of 85%. The requested plant availability is in line with the decision of the Authority in the matter of coal fired power projects and is being approved as such.

17. Whether the proposed O&M cost is reasonable and justified?

17.1. According to the Petitioner, The Project Company conducted a bidding process for the finalization of the O&M contractor of the Project. Five (5) companies namely SEPCO I, CHD Power Plant Operation Co. Ltd., Energy China Power Test Research Institute Co. Ltd, Si Chuan Nengtong Electric Technology Company Limited and Anhui No. 2 Electric Power Construction Company Limited were invited to bid for the Project. Bids were received from SEPCO I, CHD and Energy China and based on final evaluation, Energy China has been chosen as the O&M contractor for the Project. The total annual O&M cost budgeted for the Project is US$ 12.76 million. The above amount does not include cost related to the Project Company, its employees and establishment which have been budgeted at US$ 2.41 million. Security costs, typical for Gwadar, are under negotiation and are currently budgeted at US$ 2.26 million. Summary of estimated O&M costs is as follows:

Item	Requested Cost	Tariff Component
Variable O&M Cost:	US$ 2.67 million	**Rs. 0.1379/kWh**
Local	52%	Rs. 0.0717/kWh
Foreign	48%	Rs. 0.0662/kWh
Fixed O&M Cost:	US$ 14.76 million	**Rs. 0.6479/kW/h**
Local	34%	Rs. 0.2203/kW/h
Foreign	66%	Rs. 0.4276/kW/h

17.2. According to the Petitioner, the Project Company is in process of finalizing the O&M contract, details of which will be shared with the Authority upon finalization. In

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summary, the above are expected to cover costs related to local and expatriate O&M staff, routine scheduled maintenance, periodic overhauls, ash disposal, chemicals, consumables, tools, spare parts etc.

17.3. In reply to an inquiry from NEPRA, the Petitioner submitted that during the operation and maintenance phase of the facility, manpower employed is estimated 350 personnel with ratio 1.17 Man/MW and associated security personnel are estimated 200 personnel with ratio 0.67 Man/MW.

17.4. The Petitioner's requested O&M cost is approximately equal to the indexed O&M cost allowed in the upfront coal tariff for 220MW. According to the feasibility study of the project, O&M cost has been estimated at 3.5% of CAPEX with 75% fixed and 25% as variable. The requested O&M cost is approximately 3.5% of CAPEX cost.

17.5. The request of the Petitioner has been examined keeping in view the cost allowed in the upfront tariff for 220 MW. It needs to be noted that cost of ash handling and lime stone of Rs. 0.31/kWh allowed in the upfront tariff is subject to adjustment as per actual and is likely to be adjusted downward. The Petitioner did not indicate separately the O&M cost of ash handling. There shall be no use of lime stone in the process.

17.6. Keeping in view the O&M benchmarks in India and the cost allowed in the upfront tariff, The Authority considers that the annual O&M cost @ 3.5% of capital cost is a reasonable estimate and adopted as such. Accordingly annual O&M cost works out US$ 9.42 million and the same is being approved. On the basis of the approved cost, the O&M components of tariff are as under:

Item	Cost	Tariff Component
Variable O&M Cost:	US$ 2.67 million	**Rs. 0.1364/kWh**
Local	52%	Rs. 0.0709/kWh
Foreign	48%	Rs. 0.0655/kWh
Fixed O&M Cost:	US$ 6.75 million	**Rs. 0.3034/kW/h**
Local	34%	Rs. 0.0997/kW/h
Foreign	66%	Rs. 0.1936/kW/h

18. <u>Whether the requested Insurance Cost during operations is reasonable and justified?</u>

18.1. The Petitioner requested insurance cost component of Rs. 0.1624/kW/Hour post COD operational period of the project on the basis of annual insurance cost of US$ 3.70 million @1% of the EPC cost. According to the Petitioner insurance cost has been requested keeping in view the PPA requirements and in accordance with the requirements typically set out by lenders funding the project. The project intends to procure all-risk insurance, business interruption insurance following all risk, machinery breakdown, business-interruption insurance following machinery breakdown and comprehensive general liability insurance. The Petitioner also proposed that the insurance cost will be adjusted at

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COD based on the finalized EPC cost and thereafter annually on the basis of PKR/US$ rate on 1st day of each agreement year.

18.2. According to the NEPRA (Benchmarks for Tariff Determination) Guidelines, 2018, the benchmark insurance rate during operation for a thermal project shall be 0.70% of the EPC cost and the same is being approved in the instant case. Accordingly, on the basis of revised EPC cost, annual insurance cost during operation works out US$ 1.653 million and the insurance component works out Rs. 0.0718/kW/Hour and the same is being approved The insurance cost component shall be adjusted annually on actual subject to maximum of 0.7% of the EPC cost and prevailing exchange rate on the first day of the insurance coverage period.

19. <u>Whether the requested premium on LIBOR/KIBOR is reasonable and justified?</u>

19.1. The Petitioner proposed a premium of 4% over LIBOR for debt portion of the project and a premium of 2% on KIBOR for working capital loan. According to the Petitioner, the project is to be funded based on debt to equity ratio of 80:20. According to the Petitioner, discussions are still underway with the Project lenders on the terms of the financing and as per precedent, it is proposed that the Authority allow an adjustment in the debt to equity ratio based on final term sheet with the Project lenders subject to a maximum of 30% equity. The Petitioner assumed a total loan tenor of 15 years with a loan repayment period of 12.5 years after COD in equal quarterly instalments.

19.2. The Authority in the case of new Thar coal upfront tariff allowed a premium of 4% over LIBOR with SINOSURE for debt financing and 2% over KIBOR for working capital financing. Same has also been allowed in case of RLNG power project of Punjab Thermal (Pvt) Limited. The request of the Petitioner is in line with the earlier decisions of the Authority and recommended for approval. In case the actual premium over LIBOR is less than the maximum limit of 4%, the saving shall be shared in the ratio of 60:40 between power purchaser and the power producer respectively.

19.3. Flexibility has been provided in Debt Equity ratio of 80:20 to 70:30 for project financing in the Power Policy 2015. The Authority has provided adjustment in tariffs for actual variation in equity financing from 20% to 30% e.g. coal upfront tariffs in the past. However, the Authority has recently decided that once proposed by the Petitioner and determined by the Authority, change in the capital structure resulting in higher tariff shall not be allowed. Accordingly, the Authority has decided to allow debt equity ratio of 80:20 in the instant case with no adjustment for actual equity investment higher than 20%.

19.4. The request of the Petitioner for repayment period of 12.5 years will result in lower tariff and approved as such. On the basis of discussion in the foregoing paragraphs and revised project cost, the debt servicing component works out Rs. 1.1224/kW/Hour and the same is being approved.

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20. Whether the requested cost of working capital is reasonable and justified?

20.1. The Petitioner has requested cost of working capital of Rs. 0.1483/kW/Hour According to the Petitioner the Cost of working capital has been calculated based on a 90 days coal inventory and 30 days fuel cost receivable as has been allowed by Authority in previous cases. Interest on working capital has been calculated on the basis of 3-month KIBOR of 6.53% plus a spread of 2.00%.

20.2. The request of the Petitioner is in line with the decision of the Authority in similar cases. Accordingly, on the basis of calorific value of 21,824 BTU/Kg., coal price of US$ 107.40/ton, exchange rate of Rs.105/US$ and revised thermal efficiency of 37.65%, cost of working capital works out Rs. 0.1537/kW/Hour and approved as such.

21. Whether the requested ROE of 17% is reasonable and justified?

21.1. The Petitioner requested ROE component Rs. 0.8095/kW/Hour and ROEDC component of Rs. 0.1961/kW/Hour. According to the Petitioner, NEPRA in its Upfront Tariff for Coal Power Projects dated 26th June 2014, allowed a 17% US$ based IRR for imported coal projects. Given the strategic importance of the Gwadar project and the inherent risks of the development and operation of the Project, a similar IRR of 17% has been assumed for the purpose of calculation of the tariff. For the purposes of IRR calculation, a separate Return on Equity during Construction ("ROEDC") has been included in the proposed tariff. ROEDC and ROE components are proposed to be adjusted at COD based on actual Project costs, finalized debt to equity ratio, actual equity disbursement schedule and PKR/US$ exchange rate.

21.2. The request of the Petitioner for allowing 17% IRR on equity was carefully examined. The Authority in the case of upfront tariff on imported coal did allow an IRR of 17% keeping in view the acute energy shortfall and immediate investment required in the power projects in the country. The Authority even allowed higher IRR on Thar coal projects to develop the Thar coal mines and resultantly fulfilling the energy needs of the country. This has worked and two imported coal power projects of 1320MW each have achieved CODs and one similar project is in construction phase. Similarly number of coal fired power projects in Thar region are at various stages of development and one of them is expected to synchronize to the grid in December 2018. Keeping in view the facts that the overall country risk has come down as compared to few years back, number of power projects on different fuels have achieved commercial operations, some more power projects are near completion and many more projects are at different stages of development, the Authority has gradually brought down the IRRs e.g. 18% in case of Thar from 20%, 14% in case of renewable sources from 17% and 15% in case of RLNG from 16%. In line with the decisions of the Authority for other fuels/technologies, an IRR on equity of 14% is approved in the instant case. Accordingly the return on equity component including ROEDC works out Rs. 0.4295/kW/Hour on the basis of revised project cost and equity investment of 20% of the total financing. The equity component

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shall be adjusted on the basis of actual equity drawdown at the time of COD and thereafter quarterly on the basis of variation in Rs./Dollar rate.

22. Whether the requested Fuel Cost Component and delivered Coal price of US$ 101.80/MT at site is justified?

22.1. The Petitioner requested fuel cost component of Rs. 4.5196/kWh based on a net thermal efficiency of 37%, assumed coal price of US$ 101.80/ton and CV of 5,500 kcal/Kg. According to the Petitioner, the Project is expected to primarily use coal from Richard's Bay South Africa. The breakup of the coal price is as under:

FOB Coal Price (NAR 6,000 kcal/kg) *	US$ 90.99 /MT
Adjusted FOB Coal Price (NAR 5,500 kcal/kg)	US$ 83.41 /MT
Marine Freight including embarkation port charges and costs	US$ 10.00 /MT
Marine Insurance	0.10% of CIF Coal Price
Port Handling & Other Costs at Disembarkation Port	US$ 5.50 /MT
Custom Duty on Coal @ 3% of CIF coal price	US$ 2.80 /MT
Transportation Cost to Site	At Actual
Delivered Coal Price at Site	US$ 101.80 /MT

* Average API-4 index for the month of October 2017 for RBI Coal.

22.2. According to the Petitioner, coal is expected to be received at nearby Gawadar Port and transport the same to the Project Site at a distance of approximately 40km via trucks. It is proposed that the FOB Coal Price and Marine Freight shall be adjusted based on applicable indices and formulas determined by NEPRA with a provision for discount or premium on FOB coal price. Port handling costs, port to site transportation costs, other port costs and any taxes and duties shall be claimed as part of the fuel cost at actual.

22.3. The designed coal requirement of the Petitioner is NAR 5,500 kcal/kg. while the Petitioner has suggested to use API-4 index for NAR 6,000 kcal/kg. in line with the decision of the Authority dated 23rd September 2016. It has been observed from the fuel price adjustments of coal based IPPs that coal of 5,500 kcal/kg. shall normally be traded at a discount if benchmark index of API-4 is used and linear adjustment of API-4 for lower CV shall not give true price. Therefore, the appropriate index in the instant case is Argus Mcloski's API-3 (NAR 5,500 kcal/kg.). Accordingly, the Authority has decided to use API-3 for NAR 5,500 kcal/kg. as the benchmark index along with other indices approved by the Authority in its decision dated 23rd September 2016. Accordingly the revised reference coal price for calculation of fuel cost component shall be as under:

Description	US$/Ton
API-3 FOB Coal Price (NAR 5,500 kcal/kg) April 2018	78.67
Marine Freight including embarkation port charges and costs	12.67

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Marine Insurance	0.09
CIF Price	91.43
Handling Loss during Marine Transportation 1% maximum	0.91
Port Handling & Other Costs	7.13
Custom Duty on Coal @ 3% of CIF coal price	2.77
LC Charges	0.10
Estimated Inland Transportation Cost to Site	4.00
Delivered coal price before adjustment of handling loss of 1%	106.34
Handling Loss during Road Transportation 1% maximum	1.06
Delivered coal price after adjustment of handling loss of 1%	107.40

22.4. On the basis of coal price of US$ 107.4/ton, CV of 5,500 kcal/kg., conversion factor of 3.968 for kcal to BTU, Exchange rate of Rs. 105/US$, net thermal efficiency of 37.65% and 3,412.15 BTUs/kWh, the reference fuel cost component works out Rs. 4.6830/kWh and the same is being approved. The fuel cost component shall be adjusted in accordance with the decision of the Authority dated 23rd September 2016 modified from time to time.

23. <u>Whether the interconnection of the proposed plant with the National Grid will meet the timelines of the project?</u>

23.1. According to the Petition, the complex is proposed to be connected with the 132kV infrastructure, with two loops of outgoing lines, to be built by NTDC. Interconnection point shall be the outgoing gantry of the switchyard after stepping it up to 132kV. A Grid Interconnection Connection Study {"GIS") is being undertaken by the Project Company in consultation and coordination with NTDCL.

23.2. Timelines for the interconnections are still unknown. In case the project meets its timelines for COD but interconnection is delayed and power could not be evacuated, capacity charges shall have to be paid to the project even if no energy is taken. The financial impact of monthly capacity charges at the approved tariff shall be approximately Rs. 434 million. In case, national grid is not available at the time of COD of the power project and due to limited local demand, entire power will not be utilized and still the project will be paid idle capacity charges.

23.3. Accordingly, the Authority has decided that if the project achieves COD and national grid is not available, the project will be paid tariff on take & pay basis so that there shall be no idle capacity charges. As soon as the national grid is available and project is interlinked, the project will be dispatched and paid on the basis of take or pay in line with the Power Policy.

23.4. Keeping in view the uncertainties in availability of the national grid in Gawadar and interlinking of the project with the national grid, the power purchaser is directed to agree COD timelines accordingly.

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24. Summary of Tariff

24.1. Summary of the tariff is as under:

Description	Tariff
Energy Charge (Rs./kWh):	
Fuel Cost Component	4.6830
Variable O&M (foreign)	0.0655
Variable O&M (Local)	0.0709
Total	**4.8194**
Capacity Charge (Rs./kW/Hour):	
Fixed O&M (Local)	0.0997
Fixed O&M (Foreign)	0.1936
Cost of working capital	0.1537
Insurance	0.0718
Average SINOSURE Fee 1-13 Years	0.0337
Return on Equity including ROEDC	0.4295
Debt servicing 1-13 Years	1.1224
Average 1-13 years	**2.1043**
Average 14-30 years	**0.9482**
Avg. Tariff 1-13 years @ 85% Plant Factor (Rs./kWh)	**7.2950**
Avg. Tariff 14-30 years @ 85% Plant Factor (Rs./kWh)	**5.9349**
Levelized tariff (Rs./kWh)	**6.9654**
Levelized tariff (Cents/kWh)	**6.6337**

25. ORDER

I. In pursuance of Section 7(3)(a) read with Rule 3 of the Tariff Standards and Procedure Rules 1998, the Authority hereby determines and approves the generation tariff along with terms & conditions for CIHC Pak Power Company Limited for its 300 MW coal Power Project at Gawadar and adjustments/indexations for delivery of electricity to the power purchaser. The schedule of tariff and debt servicing schedule are attached as Annex-I and Annex-II respectively.

II. One-time Adjustment at COD

i) Since the exact timing of payment to EPC contractor is not known at this point of time, therefore, an adjustment for relevant foreign currency fluctuation for the EPC portion of payment in the foreign currency shall be made against the reference

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exchange rate of Rs. 105/US$ on the basis of actual payment. The adjustment shall be made only for the currency fluctuation against the reference parity values.

ii) For cost items other than foreign EPC cost, the amounts allowed in USD will be converted in PKR using the reference PKR/USD rate of 105 to calculate the maximum limit of the amount to be allowed at COD.

iii) Adjustment as per actual with maximum cap of the cost allowed for bridges, housing colony, site levelling, boundary wall, security cost, project development and company & Sponsor cost and fuel & startup cost before synchronization.

iv) The Customs Duties and Cess shall be adjusted as per actual.

v) Adjustment of the cost of land on actual basis.

vi) Adjustment of Sinosure fee as per actual with maximum of 0.6% of the yearly outstanding principal and interest amount during the construction period.

vii) Adjustment as per actual of the Financing Fees & Charges subject to maximum of 2.0% of the debt amount.

viii) The IDC shall be re-established at the time of COD on the basis of applicable LIBOR, actual premium, actual loan and actual loan drawdown.

ix) ROE component of tariff shall be adjusted for variation in actual equity drawdown during the construction period.

III. Adjustments due to Performance Test

Net efficiency and net output shall be subject to performance tests at the time of COD and in case the net efficiency and net output of the complex are established higher than the approved values, downward adjustments shall be made in fuel cost component and capacity charge components respectively. No adjustments shall be made in tariff components in case the net efficiency and net output of the complex are established lower than the approved values.

IV. Adjustment in Insurance as per actual

The actual insurance cost for the minimum cover required under contractual obligations with the Power Purchaser not exceeding 0.7% of the EPC cost shall be treated as pass-through. Insurance component of reference tariff shall be adjusted annually as per actual upon production of authentic documentary evidence according to the following formula:

AIC	=	$Ins_{(Ref)} / P_{(Ref)} * P_{(Act)}$
Where		
AIC	=	Adjusted Insurance Component of Tariff
$Ins_{(REF)}$	=	Reference Insurance Component of Tariff
$P_{(Ref)}$	=	Reference Premium US$ 1.653 million at Rs. 105/US$.

$P_{(Act)}$	=	Actual Premium or 0.7% of the EPC cost at exchange rate prevailing on the 1st day of the insurance coverage period whichever is lower

V. Indexations

The following indexations shall be applicable to the reference tariff;

i) Indexation of Return on Equity (ROE)

ROE component of tariff shall be quarterly indexed on account of variation in Rs./US$ parity according to the following formula:

$ROE_{(Rev)}$	=	$ROE_{(Ref)}*ER_{(Rev)}/ ER_{(Ref)}$
Where		
$ROE_{(Rev)}$	=	Revised ROE Component of the Tariff
$ROE_{(Ref)}$	=	Reference ROE Component of the Tariff
$ER_{(Rev)}$	=	The revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan
$ER_{(Ref)}$	=	The reference exchange rate of Rs. 105/US$

ii) Indexation applicable to O&M

O&M components of tariff shall be adjusted on account of local CPI, US CPI and exchange rate quarterly on 1st July, 1st October, 1st January and 1st April based on the latest available information with respect to CPI notified by the Pakistan Bureau of Statistics (PBS), US CPI (All Urban Consumers) issued by US Bureau of Labor Statistics and revised TT & OD selling rate of US Dollar notified by the National Bank of Pakistan as per the following mechanism:

$F\ V.\ O\&M_{(REV)}$	=	$F\ V.\ O\&M_{(REF)} * US\ CPI_{(REV)} / US\ CPI_{(REF)} * ER_{(REV)}/ER_{(REF)}$
$L\ V.\ O\&M_{(REV)}$	=	$L\ V.\ O\&M_{(REF)} * CPI_{(REV)} / CPI_{(REF)}$
$L\ F.\ O\&M_{(REV)}$	=	$L\ F.\ O\&M_{(REF)} * CPI_{(REV)} / CPI_{(REF)}$
$F\ F.\ O\&M_{(REV)}$	=	$F\ F.\ O\&M_{(REF)} * US\ CPI_{(REV)} / US\ CPI_{(REF)} * ER_{(REV)}/ER_{(REF)}$
Where:		
$F\ V.\ O\&M_{(REV)}$	=	The revised Variable O&M Foreign Component of Tariff
$L\ V.\ O\&M_{(REV)}$		The revised Variable O&M Local Component of Tariff
$L\ F.\ O\&M_{(REV)}$	=	The revised Fixed O&M Local Component of Tariff
$F\ F.\ O\&M_{(REV)}$	=	The revised Fixed O&M Foreign Component of Tariff
$F\ V.\ O\&M_{(REF)}$	=	The reference Variable O&M Foreign Component of Tariff
$L\ V.\ O\&M_{(REF)}$		The reference Variable O&M Local Component of Tariff
$L\ F.\ O\&M_{(REF)}$	=	The reference Fixed O&M Local Component of Tariff

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F F. O&M$_{(REF)}$	=	The reference Fixed O&M Foreign Component of Tariff
CPI$_{(REV)}$	=	The revised CPI (General)
CPI$_{(REF)}$	=	The reference CPI (General) for February 2018
US CPI$_{(REV)}$	=	The revised US CPI (All Urban Consumers)
US CPI$_{(REF)}$	=	The reference US CPI (All Urban Consumers) for February 2018
ER$_{(REV)}$	=	The revised TT& OD selling rate of US dollar
ER$_{(REF)}$	=	The reference TT& OD selling rate of RS. 105/US$

iii) Indexation for LIBOR Variation

The interest part of capacity charge component will remain unchanged throughout the term except for the adjustment due to variation in interest rate as a result of variation in 3 months LIBOR according to the following formula;

Δ I	=	$P_{(REV)}$* (LIBOR$_{(REV)}$-1.37%) /4
Where:		
Δ I	=	the variation in interest charges applicable corresponding to variation in 3 months LIBOR. Δ I can be positive or negative depending upon whether LIBOR$_{(REV)}$ is > or < 1.37%. The interest payment obligation will be enhanced or reduced to the extent of ΔI for each quarter under adjustment applicable on quarterly basis.
$P_{(REV)}$	=	The outstanding principal (as indicated in the attached debt service schedule to this order) on a quarterly basis on the relevant period calculation date. Period 1 shall commence on the date on which the 1st installment is due after availing the grace period.
LIBOR$_{(Rev)}$	=	Revised 3 month LIBOR as at the last date of the preceding quarter

iv) Cost of Working Capital

The cost of working capital shall be adjusted quarterly for variation in KIBOR and fuel price.

v) Fuel Price Adjustment

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The fuel cost component of tariff subsequent to adjustment of heat rate test at COD shall be adjusted on account of fuel price variation in accordance with the mechanism stipulated in the decision of the Authority dated 23rd September 2016 modified from time to time.

vi) **SINOSURE FEE**

Sinosure fee component of tariff during operation will be adjusted based on the revised principal and interest components.

VI. Terms & Conditions

The following terms and conditions shall apply to the determined tariff:

i. All plant and equipment shall be new and shall be designed, manufactured and tested in accordance with the acceptable standards.

ii. The verification of the new machinery will be done by the independent engineer at the time of the commissioning of the plant duly verified by the power purchaser.

iii. The tariff has been determined on the basis of debt equity ratio of 80:20. For equity share of more than 20%, allowed IRR shall be neutralized for the additional cost of debt : equity ratio.

iv. The sponsor of the project can arrange foreign financing in American Dollar ($), British Pound Sterling (£), Euro (€) and Japanese Yen (¥) or in any currency as the Government of Pakistan may allow.

v. Debt servicing & Sinosure fee components of tariff shall be applicable for the 1st twelve and a half years of the tariff control period.

vi. The plant availability shall be 85%.

vii. The tariff control period shall be 30 years from the date of commercial operation.

viii. The dispatch will be at appropriate voltage level mutually agreed between the power purchaser and the power producer.

ix. The dispatch shall be in accordance with economic merit order.

x. In case the project achieves COD and national grid is not available, the project will be paid tariff on take & pay basis so that there shall be no idle capacity charges. As soon as the national grid is available and project is interlinked, the project will be dispatched and paid on the basis of take or pay in line with the Power Policy.

xi. In case the company is obligated to pay any tax on its income from generation of electricity, or any duties and/or taxes, not being of refundable nature, are imposed on the company, the exact amount paid by the company on these accounts shall be reimbursed on production of original receipts. This payment shall be considered as a

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pass-through payment. However, withholding tax on dividend shall not be passed through.

xii. No provision for the payment of Workers Welfare Fund and Workers Profit Participation has been made in the tariff. In case, the company has to pay any such fund, that will be treated as pass through item in the PPA.

xiii. General assumptions, which are not covered in this determination, may be dealt with as per the standard terms of the Power Purchase Agreement.

VII. CSR Activities

The Petitioner shall ensure completion of following CSR activities communicated vide letter No. CIHC/POCPEC/2018-186 dated 19th November 2018:

i. CPPCL will comply with various federal, state, and local community regulations.

ii. CPPCL will recruit law-abiding corporate citizens for the development of the local communities.

iii. CPPCL will provide services to the local communities that at least meet minimal legal requirements.

iv. CPPCL is bound to observe health and safety and healthy working conditions.

v. CPPCL follows non-discriminatory employment policy.

vi. CPPCL will construct a training centre for fishermen of Gawadar District to uplift their life style and to increase their business activities.

vii. Tree plantation shall be carried out by CPPCL, the figure would be commonly concurred amongst CPPCL and GOB.

viii. The company will provide solar energy panels to the surrounding communities.

ix. The maximum number of unskilled and skilled occupations will be given to local people preferably Gawadar District and then of Makran and different parts of Baluchistan Province.

x. Small contracts and use of logistic services like dumpers, tractors, water tankers shall be given to the local community based on transparency and fair competitiveness.

xi. The CPPCL will build up a school for boys and girls in vicinity of power plant. The running of the school shall be carried out with the assistance of GOB and concerned organization.

xii. The Company will look after the health, general medical, education, mobility, dignity and different needs of 100 debilitate individuals of both genders from local families of Gwadar. The selection criteria will be finalized in consultation with steering committee.

xiii. CPPCL will contribute a certain level of profit after an assessment on CSR i.e. wellbeing, education, occupation and other community welfare activities.

xiv. CPPCL will give preferential employment to local communities and other parts of

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Baluchistan. Local Engineers will be also hired for the power plant operations, and local engineers will also be sending to China to get them trained in relevant fields.

xv. CPPCL shall meet the national environmental protection emission standards of Pakistan in line with international standards.

xvi. CPPCL shall ensure that the marine life feeding, resting or reproductive habitat is not harmed and their ability to survive is ensured.

xvii. CPPCL shall carry out training and awareness of waste handling workers.

xviii. CPPCL shall adhere to the concerns of the GOB regarding CSR and environmental health issues.

xix. CPPCL shall establish bricks factories for recycling of ash produced from the Power Plant.

VIII. NOTIFICATION

The above Order of the Authority along with 2 Annexes shall be notified in the Official Gazette in terms of Section 31(7) of the Regulations of Generation, Transmission and Distribution of Electric Power Act, 1997.

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CIHC PAK POWER COMPANY LIMITED
REFERENCE TARIFF TABLE

Year	Energy Purchase Price (Rs./kWh)				Capacity Purchase Price (PKR/kW/Hour)									Capacity Charge@ 85%	Total Tariff	
	Fuel Cost Componen	Var. O&M Foreign	Var. O&M Local	Total EPP	Fixed O&M Local	Fixed O&M Foreign	Cost of W/C	Insurance	ROE	Sinosure Fee	Debt Repaymen	Interest Charges	Total CPP		Rs. /kWh	Cents/kWh
1	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	0.0605	0.5879	0.5345	2.1311	2.5072	7.3266	6.9777
2	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	0.0569	0.6201	0.5023	2.1275	2.5029	7.3223	6.9736
3	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	0.0530	0.6541	0.4683	2.1236	2.4984	7.3178	6.9693
4	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	0.0490	0.6899	0.4325	2.1195	2.4936	7.3130	6.9648
5	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	0.0447	0.7277	0.3947	2.1153	2.4886	7.3080	6.9600
6	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	0.0402	0.7676	0.3548	2.1108	2.4832	7.3026	6.9549
7	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	0.0354	0.8097	0.3127	2.1060	2.4776	7.2970	6.9496
8	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	0.0304	0.8540	0.2684	2.1010	2.4717	7.2911	6.9439
9	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	0.0251	0.9008	0.2216	2.0957	2.4655	7.2849	6.9380
10	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	0.0195	0.9502	0.1722	2.0901	2.4589	7.2783	6.9317
11	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	0.0136	1.0022	0.1202	2.0842	2.4520	7.2714	6.9251
12	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	0.0074	1.0572	0.0653	2.0780	2.4447	7.2641	6.9182
13	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	0.0025	1.1002	0.0222	2.0731	2.4389	7.2583	6.9127
14	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
15	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
16	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
17	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
18	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
19	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
20	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
21	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
22	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
23	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
24	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
25	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
26	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
27	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
28	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
29	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
30	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
Average																
1-13	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	0.0337	0.8247	0.2977	2.1043	2.4756	7.2950	6.9477
14-30	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	-	-	-	0.9482	1.1155	5.9349	5.6523
1-30	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	0.0146	0.3574	0.1290	1.4491	1.7049	6.5243	6.2136
Levelized																
1-30	4.6830	0.0655	0.0709	4.8194	0.0997	0.1936	0.1537	0.0718	0.4295	0.0301	0.5796	0.2662	1.8241	2.1460	**6.9654**	**6.6337**

Levelized Tariff = 6.9654 Rs./kWh 6.6337 USc/kWh

Annex - 2

CIHC PAK POWER COMPANY LIMITED

Debt Servicing Schedule

Gross Capacity (MW)	300.00	Rs./US$ Parity	105.00
Net Capacity (MW)	276.00	Debt (US$ Million)	234.21
LIBOR	1.37%	Debt (Rs. Million)	24,592.56
Spread over LIBOR	4.00%		
Total Interest Rate	5.37%		

Period	Principal	Principal Repayment	Interest	Balance Outstanding	Debt Servicing	Principal Repayment	Interest	Debt Servicing
	US$ Mln.	US$ Mln.	US$ Mln.	US$ Mln.	US$ Mln.	Rs./kW/h	Rs./kW/h	Rs./kW/h
1	234.21	3.32	3.14	230.90	$6.46			
2	230.90	3.36	3.10	227.54	6.46			
3	227.54	3.41	3.05	224.13	6.46			
4	224.13	3.45	3.01	220.68	6.46	0.5879	0.5345	1.1224
1st Year		**13.54**	**12.31**		**25.85**			
5	220.68	3.50	2.96	217.18	6.46			
6	217.18	3.55	2.92	213.63	6.46			
7	213.63	3.59	2.87	210.04	6.46			
8	210.04	3.64	2.82	206.40	6.46	0.6201	0.5023	1.1224
2nd Year		**14.28**	**11.57**		**25.85**			
9	206.40	3.69	2.77	202.71	6.46			
10	202.71	3.74	2.72	198.97	6.46			
11	198.97	3.79	2.67	195.18	6.46			
12	195.18	3.84	2.62	191.34	6.46	0.6541	0.4683	1.1224
3rd Year		**15.06**	**10.78**		**25.85**			
13	191.34	3.89	2.57	187.44	6.46			
14	187.44	3.94	2.52	183.50	6.46			
15	183.50	4.00	2.46	179.50	6.46			
16	179.50	4.05	2.41	175.45	6.46	0.6899	0.4325	1.1224
4th Year		**15.89**	**9.96**		**25.85**			
17	175.45	4.11	2.36	171.34	6.46			
18	171.34	4.16	2.30	167.18	6.46			
19	167.18	4.22	2.24	162.97	6.46			
20	162.97	4.27	2.19	158.69	6.46	0.7277	0.3947	1.1224
5th Year		**16.76**	**9.09**		**25.85**			
21	158.69	4.33	2.13	154.36	6.46			
22	154.36	4.39	2.07	149.97	6.46			
23	149.97	4.45	2.01	145.53	6.46			
24	145.53	4.51	1.95	141.02	6.46	0.7676	0.3548	1.1224
6th Year		**17.68**	**8.17**		**25.85**			
25	141.02	4.57	1.89	136.45	6.46			
26	136.45	4.63	1.83	131.82	6.46			
27	131.82	4.69	1.77	127.13	6.46			
28	127.13	4.75	1.71	122.37	6.46	0.8097	0.3127	1.1224
7th Year		**18.64**	**7.20**		**25.85**			
29	122.37	4.82	1.64	117.56	6.46			
30	117.56	4.88	1.58	112.67	6.46			
31	112.67	4.95	1.51	107.72	6.46			
32	107.72	5.02	1.45	102.71	6.46	0.8540	0.2684	1.1224
8th Year		**19.67**	**6.18**		**25.85**			
33	102.71	5.08	1.38	97.63	6.46			
34	97.63	5.15	1.31	92.48	6.46			
35	92.48	5.22	1.24	87.26	6.46			
36	87.26	5.29	1.17	81.97	6.46	0.9008	0.2216	1.1224
9th Year		**20.74**	**5.10**		**25.85**			
37	81.97	5.36	1.10	76.61	6.46			
38	76.61	5.43	1.03	71.17	6.46			
39	71.17	5.51	0.96	65.67	6.46			
40	65.67	5.58	0.88	60.09	6.46	0.9502	0.1722	1.1224
10th Year		**21.88**	**3.97**		**25.85**			
41	60.09	5.65	0.81	54.43	6.46			
42	54.43	5.73	0.73	48.70	6.46			
43	48.70	5.81	0.65	42.89	6.46			
44	42.89	5.89	0.58	37.01	6.46	1.0022	0.1202	1.1224
11th Year		**23.08**	**2.77**		**25.85**			
45	37.01	5.96	0.50	31.04	6.46			
46	31.04	6.04	0.42	25.00	6.46			
47	25.00	6.13	0.34	18.87	6.46			
48	18.87	6.21	0.25	12.67	6.46	1.0572	0.0653	1.1224
12th Year		**24.34**	**1.50**		**25.85**			
49	12.67	6.29	0.17	6.38	6.46			
50	6.38	6.38	0.09	0.00	6.46	1.1002	0.0222	1.1224
13th Year		**12.67**	**0.26**		**12.92**			

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