Determination of Generation Tariff

18th September 2019

National Electric Power Regulatory Authority (NEPRA)

NEPRA & its Mandate

- NEPRA was established through promulgation of the Regulation of Generation, Transmission and Distribution of Electric Power, Act No. XL of 1997 on 16th December 1997 (i.e. NEPRA Act).
- To develop and pursue a Regulatory Framework that ensures provision of safe, reliable, efficient and affordable electric power to the electricity consumers of Pakistan.
- Facilitate transition from a protected monopoly service structure to a competitive environment.
- Maintain balance between the interests of the consumers and investors.

Power to Determine Tariff

Section 7(3) of the NEPRA Act conferred upon the Authority exclusive powers to determine tariff, rates, charges and other terms and conditions for supply of electric power services by the generation, transmission and distribution companies and recommend to the Federal Government for Notification in the official Gazette.

Different Types of Generation Tariffs

Under Tariff Rules 1998:

The sponsor/owner file a tariff petition for determination of generation tariff under NEPRA Tariff (Standards and Procedure) Rules 1998.

Upfront Tariff:

Tariff developed, declared, determined, or approved by the Authority on a petition moved by any relevant agency or in exercise of suo moto powers by the Authority.

Competitive Bidding Tariff

A process of obtaining bids/offers for generation tariff administered by the relevant agency.

Nature of Tariff

Take or Pay basis:

- Parties entered into Power Purchase Agreement for the purchase of capacity as in the case of thermal power plants.
- Capacity or Fixed charge is paid on the availability of the contracted capacity.
- Energy or variable Charge is paid on unit delivered basis.

Take and Pay basis:

- Parties entered into Energy Purchase Agreement for the purchase of energy e.g. Renewable Energy projects.
- Payment is made on unit delivered basis.

Nature of Projects

Build Own Operate (BOO) basis:

- Return on Equity is allowed.
- Redemption of Equity is not allowed.
- At the end of the tariff control period, the owner shall retain the project.

Build Own Operate & Transfer (BOOT) basis:

- Return on Equity is allowed.
- Redemption of Equity is also allowed.
- At the end of the tariff control period, the project shall be transferred to GoP.

Generation Costs

Project Costs:

- Engineering, Procurement and Construction (EPC) Cost
- Non EPC Costs e.g. project development cost, land and its development, consultancy services, insurance during construction, administration costs, mobilization costs, emergency spare parts, custom duties and taxes etc.
- Financing fees; and
- Interest during construction

Operational Costs:

- Fuel cost
- Operations & Maintenance cost
- Insurance cost; and
- Financing cost of working capital

PROJECT COST

Description	Requested	Approved
	USD Millions	
EPC cost:	**564.76**	**554.42**
Offshore EPC Cost	424.02	424.02
Onshore EPC Cost	115.24	115.24
Items not covered in the EPC contract scope	25.50	15.16
Non EPC Cost	90.76	52.86
Customs Duties & Cess	25.65	25.65
LTSA Initial Spare Parts	20.88	20.88
Gas Pipeline Cost	13.60	13.60
HSD Inventory	26.56	-
CAPEX	**742.21**	**667.42**
Financing Fees & Charges	22.60	18.46
Interest During Construction	64.85	48.77
DSRA	53.49	-
One month LNG Escrow Account	36.65	35.77
Total Project Cost	**919.80**	**770.42**

NON - EPC COST

Description	**Requested**	**Approved**
Engineering consultancy	15.00	10.00
O&M mobilization & training	6.00	6.00
Land Cost	2.00	2.00
Insurance during construction	7.62	5.54
Testing & Commissioning	29.63	10.72
Security Surveillance	12.50	8.08
Administrative Expenses	18.00	10.51
Total	**90.76**	**52.86**

Financing of Project Cost

- The project shall be financed through debt and equity
- Minimum equity requirement is 20%.
- No limit on the maximum equity investment, however, equity exceeding 30% shall be treated as debt.
- Debt portion shall be financed through long-term local or foreign loans or by both.

Recovery of Project Costs

- The debt portion of the project cost shall be recovered through debt servicing component comprising principal repayment generally in first 10 years and interest on outstanding balance.
- Interest rate is KIBOR+3% or LIBOR+4.5%
- Regarding the equity portion of the project financing, only return is allowed except in the case of BOOT project where equity is also redeemed.
- ROE (IRR based) of around 14% is being allowed currently.

Fuel Cost

Fuel Cost Component = Heat Rate × Fuel Price per Btu

Where:

Heat Rate means energy (Btus) required to produce one unit of electricity

Heat Rate = 3412 Btus/kWh ÷ Thermal Efficiency

Price per Btu = Fuel Price ÷ Calorific Value

Operations & Maintenance Cost

- Long-term Service Agreement Cost comprising fixed annual fee and variable rate per Factored Fired Hour (FFH)
- Operations & Maintenance Cost comprising fixed annual fee and variable rate per Factored Fired Hour (FFH)
- Project Company's annual general & administrative expenses fixed in nature.

O&M Detail

Description	Requested	Approved	Difference
	US$		
Variable O&M-Foreign	29,614,798	28,130,989	1,483,810
Fixed O&M-Foreign	15,410,879	14,018,879	1,392,000
Fixed O&M-Local	13,245,685	6,245,685	7,000,000
Total	**58,271,362**	**48,395,553**	**9,875,809**
Variable O&M-Foreign (Rs./kWh)	0.3336	0.3169	0.0167
Fixed O&M-Foreign (Rs./kW/h)	0.1597	0.1453	0.0144
Fixed O&M-Local (Rs./kW/h)	0.1373	0.0647	0.0726
Total	**0.6306**	**0.5269**	**0.1037**

Other Costs

- Actual insurance cost subject to maximum of 1% of the EPC cost is allowed annually.

- Cost of working capital is also allowed.

- Working capital requirement is determined on the basis of payment cycle agreed in PPA and GSA.

- If required, fuel inventory cost shall also be part of working capital.

Indexations/Adjustments

Tariff Components	Indexation
Fixed O&M (Local)	CPI (General)
Fixed O&M (Foreign)	US CPI &Rs./US$
Insurance	Actual subject to maximum limit
Cost of working capital	KIBOR and Fuel Price
ROE	Rs./US$
Debt Servicing	KIBOR
Fuel cost Component	Fuel Price
Variable O&M (Foreign)	US CPI &Rs./US$

TARIFF

Tariff Components	1-10 Years	11-30 Years	Indexation/Adjustment
Capacity Charges (Rs./kW/hr):			
Fixed O&M (Local)	0.0647	0.0647	CPI (General)
Fixed O&M (Foreign)	0.1453	0.1453	US CPI &Rs./US$
Cost of working capital	0.0970	0.0970	KIBOR and Fuel Price
Insurance	0.0574	0.0574	Actual subject to maximum limit
ROE	0.4481	0.4481	Rs./US$
Debt Servicing	0.9281	-	KIBOR
Total	**1.7405**	**0.8125**	
Energy Charge RLNG (Rs./kWh):			
Fuel cost Component	4.5101	4.5101	Fuel Price
Variable O&M (Foreign)	0.3169	0.3169	US CPI &Rs./US$
Total	**4.8270**	**4.8270**	

TARIFF

Description	Tariff
Energy Charge (Rs./kWh):	
Fuel cost component	4.5101
Variable O&M	0.3169
Total	**4.8270**
Capacity Charge (Rs./kW/hour):	
Fixed O&M (Local)	0.0647
Fixed O&M (Foreign)	0.1453
Cost of working capital	0.0970
Insurance	0.0574
Return on Equity	0.4481
Debt servicing (1-10 years only)	0.9281
Total 1-10 years	1.7405
Total 11-30 years	0.8125
Avg. Tariff 1-10 years @ 92% (Rs./kWh)	6.7189
Avg. Tariff 11-30 years @ 92% (Rs./kWh)	5.7101
Levelized tariff (Rs./kWh)	**6.3676**
Levelized tariff (Cents/kWh)	**6.0644**

Reference Tariff Table

Year	Energy Purchase Price (Rs./kWh)			Capacity Purchase Price (Rs./kW/Hour)									Total Tariff	
	Fuel	Var. O&M	Total EPP	Fixed O&M local	Fixed O&M foreign	Cost of W/C	Insurance	ROE	Debt Repayment	Interest Charges	Total CPP	Capacity charge@ 92%	Rs. / kWh	Cents/kWh
1	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.3810	0.5470	1.7405	1.8919	6.7189	6.3989
2	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.4180	0.5101	1.7405	1.8919	6.7189	6.3989
3	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.4585	0.4696	1.7405	1.8919	6.7189	6.3989
4	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.5029	0.4251	1.7405	1.8919	6.7189	6.3989
5	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.5517	0.3764	1.7405	1.8919	6.7189	6.3989
6	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.6052	0.3229	1.7405	1.8919	6.7189	6.3989
7	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.6638	0.2642	1.7405	1.8919	6.7189	6.3989
8	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.7282	0.1999	1.7405	1.8919	6.7189	6.3989
9	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.7988	0.1293	1.7405	1.8919	6.7189	6.3989
10	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.8762	0.0519	1.7405	1.8919	6.7189	6.3989
11	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
12	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
13	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
14	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
15	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
16	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
17	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
18	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
19	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
20	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
21	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
22	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
23	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
24	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
25	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
26	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
27	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
28	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
29	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
30	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
Average														
1-10	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.5984	0.3296	1.7405	1.8919	6.7189	6.3989
11-30	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.0000	0.0000	0.8125	0.8831	5.7101	5.4382
1-30	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.1995	0.1099	1.1218	1.2194	6.0464	5.7585
Levelized														
1-30	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.3629	0.2420	1.4174	1.5407	**6.3676**	**6.0644**

6.3676Rs./kWh **6.0644US Cents/kWh**

Levelized Tariff

The term Levellized tariff means a tariff calculated for the life of the project at a specified discount rate on the basis of generation worked out applying the specified availability factor.

THANK YOU