

**CENTRAL ELECTRICITY REGULATORY COMMISSION  
NEW DELHI**

**Coram:  
Shri P.K.Pujari, Chairperson  
Shri I.S.Jha, Member  
Shri Arun Goyal, Member  
Shri P.K.Singh, Member**

**Petition No. 7/SM/2021**

**Date of order : May 29, 2021**

**In the matter of**

Methodology for Computing the Escalation Rates and other Parameters for the Purpose of Bid Evaluation and Payment for Procurement of Power from Renewable Energy Projects Complemented with Firm Power from any other source through Competitive Bidding.

**ORDER**

**A: Background**

Ministry of Power, Government of India notified the Resolution dated 22.07.2020 on “Guidelines for Tariff Based Competitive Bidding Process for Procurement of Round-The-Clock Power from Grid Connected Renewable Energy Power Projects, complemented with Power from Coal Based Thermal Power Projects”.

2. Subsequently, vide Resolution dated 03.11.2020, the aforesaid Guidelines were amended. The provisions of the Guidelines vide Resolution dated 22.07.2020 read with amendment to the Guidelines vide Resolution dated 03.11.2020 are henceforth referred to as “the amended 2020 MOP Guidelines”. Relevant paragraphs of the amended 2020 MOP Guidelines provide as under:

a) *Paragraph 2.1:*



**“2.1 Applicability of Guidelines:** These Guidelines are being issued under the provisions of Section 63 of the Electricity Act, 2003 for long term procurement of electricity by the Procurers’, on Round-The-Clock (RTC) basis, from Renewable (RE) Power Projects (**‘RE Projects’**), complemented/balanced with firm power from any other source through competitive bidding.”

b) Paragraph 5.1:

“The quoted tariff shall comprise of four parts – Fixed component [RE power (fixed), non-RE power (fixed)] and Variable component [Non -RE power (escalable for fuel), and non-RE power (escalable for transportation)]. The Fixed component of tariff of the RE power and Non RE power shall be quoted for each year of the term of PPA. The variable component of the Non RE power shall be quoted as on scheduled date of commissioning. The levelised tariff shall be arrived at using the CERC escalation indices for the type of fuel quoted by the bidder and the discount factor to be specified in the bidding document. The bidder shall also quote the proportion of energy from RE sources and non-RE source that he wishes to supply. The weighted average levelised tariff shall be arrived at for the term of PPA and proportion of energy from RE sources and Non RE power source.”

c) Paragraph 5.4:

“The escalable component of Non RE power, both for fuel and transportation, shall be adjusted as per the index notified by Central Electricity Regulatory Commission (CERC) for payment purposes from time to time. This shall be clearly mentioned in RfS document by the Procurer.”

d) Paragraph 5.5:

“The Renewable energy supplied shall be paid at the rate of RE (fixed) tariff applicable for that year as quoted by the successful bidder.

For Non RE power, the fixed component of Non RE power shall be paid based on the monthly available capacity from Non RE sources at the rate of non RE power fixed tariff quoted by the Bidder applicable for that year.

The variable component of Non RE power shall be paid for the energy supplied from other source of energy and shall be paid at the rate of variable component of non RE power (escalable for fuel), and variable component of non-RE power (escalable for transportation)] tariff applicable for that year after adjusting as per escalation index notified by CERC for payment purposes.”

e) Paragraph 6.4:

**“Weighted Average Levelised Tariff as the Bidding Parameter:** The bidding evaluation parameter shall be the weighted average levelised tariff per unit supply of RTC power. The Procurer shall invite bids wherein the bidder shall quote the first year weighted average levelised Tariff in Rs./kWh. The quoted tariff shall comprise of four part – Fixed component [RE power (fixed), non-RE power (fixed)] and Variable component [Non -RE power (escalable for fuel), and non-RE power (escalable for transportation)]. The Fixed component of tariff of the RE power and Non RE power shall be quoted for each year of the term of PPA. The variable

*component of the Non RE power shall be quoted as on scheduled date of commissioning .The levelised tariff shall be arrived at using the CERC escalation indices for the type of fuel quoted by the bidder and the discount factor to be specified in the bidding document. The bidder shall also quote the proportion of energy from RE sources and non-RE source that he wishes to supply. The weighted average levelised tariff per unit supply shall be arrived at for the term of PPA and proportion of energy from RE sources and Non RE source.*

*The bidder shall be selected on the basis of least quoted weighted average levelised Tariff. The bidder (called the L1 bidder) quoting the least weighted average levelised Tariff (called the L1 tariff) shall be allocated the quantum of power offered by him. If the allocated quantum of power is less than the total quantum of power to be contracted, the remaining qualified bidders will be asked to match their Tariff with the L1 tariff. The originally lowest bidder that agrees to match the L1 tariff shall be allocated the remaining quantum or the quantum offered by it, whichever is lower. If still some quantum is left, it will be allocated to the next originally lowest bidder and so on.”*

3. As per above-mentioned Paragraphs 2.1, 5.1, 5.4, 5.5 and 6.4 of the amended 2020 MOP Guidelines, Central Electricity Regulatory Commission (CERC) is required to notify various escalation rates and other parameters for the purpose of bid evaluation as well as payment as under:

- (1) Escalation Rate for Domestic Coal
- (2) Escalation Rate for Domestic Gas
- (3) Escalation Rate for Inland Transportation Charges of Coal
- (4) Escalation Rate for Inland Transportation Charges of Gas
- (5) Escalation Rate for Imported Coal
- (6) Escalation Rate for Imported Gas
- (7) Escalation Rate for Transportation of Imported Coal
- (8) Escalation Rate for Transportation of Imported Gas
- (9) Discount rate

4. As required under the “Guidelines for Determination of Tariff by Bidding Process for procurement of Power by Distribution Licensees” dated 19.01.2005 (as amended from time to time) issued by the Ministry of Power, CERC has been notifying various escalation rates and other parameters for the purpose of evaluation and payment. The escalation rates and other parameters have been computed based on the methodology/ explanation published along with the notification dated

22.11.2006, 03.07.2009 and 28.12.2010; Order dated 23.12.2013 in Petition No.308/SM/2013; Order dated 18.10.2019 in Petition No.10/SM/2019; and Order dated 15.01.2020 in Petition No.11/SM/2019 (see CERC website [www.cercind.gov.in](http://www.cercind.gov.in)).

5. The Ministry of Power, vide its Resolutions dated 21.09.2013 and 09.11.2013, issued guidelines for Case-2 bidding and Case-1 bidding respectively. As per these guidelines, CERC was not required to notify the escalation rates and other parameters for the purpose of evaluation. In line with Resolutions dated 21.09.2013 and 09.11.2013 of Ministry of Power, CERC issued an Order dated 21.02.2014 in Petition No.002/SM/2014 as under:

*"8. As mentioned in the above paras, as per the new MoP guidelines, no escalation rates are required to be notified by CERC. However, for agreements signed or actions taken prior to the date of these new guidelines, the escalation rates for payment are required to be notified by CERC (i.e. under MoP guidelines of 2005).*

*9. We direct that the notification of escalation rates for evaluation applicable for the six months commencing 1.4.2014 and onwards shall be discontinued in accordance with the provisions discussed in Para 3 to 7 of this order."*

Pursuant the above order, CERC has discontinued notifying the escalation rates for the purpose of evaluation from 1.4.2014, while it continued to notify the escalation rates for the purpose of payment.

## **B: Proposed Methodology in the Staff Paper**

6. CERC has been notifying the escalation rates for the purpose of payment under the Guidelines dated 19.1.2005 issued by the Ministry of Power. As regards escalation rate for payment, the same escalation rates shall be used for meeting the requirement under Paragraphs 2.1, 5.1, 5.4, 5.5 and 6.4 of the amended 2020 MOP Guidelines. For this purpose, a Staff Paper on "Methodology for Computing the Escalation Factors and other Parameters for the Purpose of Bid Evaluation and Payment for Procurement of Power from Renewable Energy Projects Complemented

with Firm Power from any other source through Competitive Bidding” was issued on 23.02.2021.

7. For computing the escalation factors and other parameters for the purpose of evaluation to meet the requirements under Paragraphs 2.1, 5.1, 5.4, 5.5 and 6.4 of the amended 2020 MOP Guidelines, the Staff Paper had proposed the following methodology for computation of various escalation rates and discounting factor.

- a. Through its Order dated 21.2.2014, CERC has discontinued to notify the escalation rates for the purpose of evaluation. The methodology that was used till 1.4.2014 shall be used for computing the escalation rates for the purpose of evaluation after incorporating necessary changes, if any.
- b. As in the previous methodology, the method of Minimum Mean Square Error and the time series data for latest twelve calendar years shall be considered for computing the escalation rates.
- c. To the extent possible, the data series, which were earlier being used for computing the escalation rates for payment, shall be used for computing the escalation rates for evaluation. In case of non-availability of the time series data for latest twelve calendar years, alternative data series shall be considered for computing the escalation rates.

## 8. Escalation Factors for Bid Evaluation

After consulting various experts and a study conducted by the Indian Statistical Institute (ISI), Kolkata, CERC had decided to use the method of Minimum Mean Square Error for determining the escalation factors for the purpose of evaluation of bids. Using the method of Minimum Mean Square Error on the time series data for latest twelve calendar years, the annual escalation factors for bid evaluation have been computed for the Notification dated 28.12.2010 and subsequent notifications.

The formula of the method is as under:

*e*: annual escalation rate in percent =  $g \times 100$ , where:

*g*: escalation factor =  $[\exp\{\{(6 \times \sum_{t=2}^{n-1} (t-1) \times \log_e(R_t))\} / \{(n-1) \times n \times (2n-1)\}\}] - 1$

$$R_t = (Y_t/Y_1)$$

$Y_t =$  "t" <sup>th</sup> observation

$Y_1 =$  initial observation

$n =$  number of observations

**8.1 Escalation Rate for domestic coal (for Evaluation):** CERC has been using its own index based on the price of non-coking coal applicable for power sector (CERC Coal Price Index, Base 2017-18=100) for computing the escalation rate for domestic coal for payment and the same is available from April 2018 onwards. However, for computing the escalation rate for evaluation, time series data for latest 12 years is required. Due to non-availability of the time series data on CERC coal price index (being available only from April 2018 onwards), it is proposed to use Wholesale Price Index (WPI) for non-coking coal to compute escalation rate of domestic coal for evaluation. In the past also, CERC had used WPI of non-coking coal for computing the escalation rate for domestic coal for evaluation.

*Name of the Index:* WPI for non-coking coal

*Source/Publisher:* Ministry of Commerce and Industry, Government of India  
(website: [www.eaindustry.nic.in](http://www.eaindustry.nic.in))

*Reasons:* Use of Single index of WPI for non-coking coal is proposed for the following reasons:

- WPI is a measure of inflation at the wholesale level. It is the only general index capturing price movements of various commodities (including non-coking coal) in a comprehensive way.
- WPI for non-coking coal is published by Government of India.
- WPI for non-coking coal is available on a monthly basis with the shortest possible time lag.
- Time series data on CERC coal price index is not available for 12 years.

*Description:* The escalation rate for domestic coal shall be computed based on the time series data on WPI for non-coking coal for the latest 12 years.

**Model computation:** The escalation rate for domestic coal has been computed based on the time series data on WPI for non-coking coal for the period from 2008 to 2019. The data on WPI for non-coking coal for the period 2013-2019 has been taken from the website of Ministry of Commerce & Industry (2011-12 series) and the data for the period prior to that has been arrived at by using conversion factor on the previous WPI series (2004-05 series). The escalation rate for domestic coal has been computed as under:

ESCALATION RATE FOR DOMESTIC COAL (FOR EVALUATION)						
Year No. (t)	Year	WPI for Non-Coking Coal	$Y_t/Y_1 = R_t$	$\log_e(R_t)$	Year-1 (t-1)	Product [(t-1) x $\log_e(R_t)$ ]
1	2008	62.57				
2	2009	64.70	1.03	0.03	1	0.03
3	2010	72.84	1.16	0.15	2	0.30
4	2011	89.60	1.43	0.36	3	1.08
5	2012	107.92	1.72	0.55	4	2.18
6	2013	105.40	1.68	0.52	5	2.61
7	2014	109.60	1.75	0.56	6	3.36
8	2015	109.60	1.75	0.56	7	3.92
9	2016	110.20	1.76	0.57	8	4.53
10	2017	110.70	1.77	0.57	9	5.14
11	2018	118.80	1.90	0.64	10	6.41
12	2019	119.00	1.90	0.64	11	7.07
A = Sum of "product" column						36.64
B= 6 times (6 x A)						219.83
C= (n-1) x n x (2n-1); n = No. of Years of data = 12						3036.00
D = B/C						0.07
g (Exponential Factor) = Exponential (D) -1						0.0751
e = Annual Escalation Rate (%) = g x 100						7.51

The annual escalation rate computed in the above table (7.51%) is to be notified as escalation rate for domestic coal for evaluation.

**8.2 Escalation rate for domestic gas (For Evaluation):** The main producers of natural gas in India are (i) Oil & Natural Gas Corporation Ltd (ONGC); (ii) Oil India Ltd (OIL); (iii) Joint Ventures (JVs) of Tapti, Panna Mukta and Ravva; and (iv) Reliance

Industries Ltd. The Ministry of Petroleum & Natural Gas, Government of India (MOP&NG) has been regulating allocation and pricing of gas produced by ONGC and OIL by issuing administrative orders from time to time. Since 2006, Petroleum and Natural Gas Regulatory Board (PNGRB) has been regulating the refining, processing, storage, transportation, marketing and sale of natural gas. Petroleum and Planning Analysis Cell of MOP&NG publishes the statistics relating to consumer and producer prices of natural gas. Since the consumer price of gas for North-Eastern States is different from the consumer price for the rest of India, hybrid index of consumer price of gas (allocating the weights based on production) is proposed to be used for computing the escalation rate for domestic gas. CERC has been using this hybrid index to compute the escalation rate for domestic gas for payment.

*Name of the Index:* Hybrid index of consumer price of gas (based on 10% weightage to Consumer Price of gas applicable for North-Eastern States and 90% weightage to Consumer Price of gas applicable for rest of India).

*Source/Publisher:* Ministry of Petroleum & Natural Gas, Government of India and GAIL (India) Ltd.

*Reasons:* Use of Hybrid index of consumer price of gas is proposed for following reasons:

- There is no single price available for gas.
- The weightage has been decided based on the gross production of natural gas in India. The production of natural gas in the NE Region is around 10% of the total production of natural gas in India.
- Instead of producer price of natural gas, consumer price of natural gas has been proposed to be used for computing the escalation rate for two reasons: (i) there is a subsidy component involved between the producer price and consumer price; and (ii) the consumer price is the price at which the supplier supplies the natural gas to various consumers and this is exclusive of transportation charges of gas.



*Description:* The escalation rate for domestic gas shall be computed based on the time series data on consumer price of gas for the latest 12 years.

### **8.3 Escalation rate for inland transportation charges of coal (For Evaluation):**

The transportation of coal to power plants takes place mainly by rail. The Ministry of Railways notifies freight rates for transportation of coal from time to time. The coal freight rates are available, in slabs, for distances from 1 km to 5000 km. The coal freight rates are sensitive to distance. Keeping in view different distances between the power plants and coal mines, the escalation rate for inland transportation charges of coal is proposed to be computed for different distances. The data on coal freight rate for 100 km, 500 km, 1000 km, 2000 km and 3000 km is proposed to be used for computing the escalation rate for inland transportation of coal for distance upto 100 km, upto 500 km, upto 1000 km, upto 2000 km and beyond 2000 km respectively. CERC has been using this methodology and coal freight rates for computing the escalation rates for transportation charges of coal for payment.

*Name of the Index:* Coal freight rate.

*Source/Publisher:* Ministry of Railways, Government of India (website: [www.indianrailways.gov.in](http://www.indianrailways.gov.in))

*Reasons:* Use of Single index of coal freight rate is proposed for following reasons:

- Coal freight rates are published by Ministry of Railways, Government of India
- The rates are available in public domain.

*Description:* The escalation rate for inland transportation charges of coal shall be computed based on the time series data on coal freight rates for the latest 12 years.

#### 8.4 Escalation rate for inland transportation charges of gas (For Evaluation):

Domestic and imported natural gas is being transported mainly by GAIL at the rate prescribed by PNGRB. Petroleum and Planning Analysis Cell of Ministry of Petroleum & Natural Gas publishes the statistics relating to transportation charges of natural gas. HVJ pipeline is the major pipeline for transportation of gas in India. The transportation charges applicable for HVJ pipeline charged by GAIL is proposed to be considered for computing the escalation rate for transportation charges of gas. CERC has been using the transportation charges applicable for HVJ pipeline charged by GAIL for computing the escalation rate for payment.

*Name of the Index:* Transportation charges of gas applicable for HVJ pipeline charged by GAIL.

*Source/Publisher:* Ministry of Petroleum & Natural Gas, Government of India/ PNGRB (website: [www.petroleum.nic.in](http://www.petroleum.nic.in))/ (website: [www.pngrb.gov.in](http://www.pngrb.gov.in)) and GAIL (India) Ltd ([www.gailonline.com](http://www.gailonline.com)).

*Reasons:* Use of Single Index on Transportation charges of gas applicable for HVJ pipeline charged by GAIL is proposed for the following reasons:

- GAIL is the main transporter of gas in India
- HVJ pipeline is the major pipeline for transportation of gas.
- Transportation Charges of Gas is determined by PNGRB.

*Description:* The Escalation Rate for Inland Transportation Charges of Gas shall be computed based on the time series data for transportation charges of gas applicable for HVJ pipeline charged by GAIL for the latest 12 years.

8.5 **Escalation Rate for Imported Coal (For Evaluation):** CERC has been using composite index, assigning 25% weightage to price/ price index of Australian Coal, NEWC (Global Coal Index), 25% weightage to South African Coal (API4), 25% weightage to Indonesian Coal (ICI3 of Argus) and 25% weightage to Indonesian Coal (Platts Index), for computing the escalation rate for imported coal for payment. The

same composite index for latest 12 years is proposed to be used for computing the escalation rate for imported coal for evaluation.

*Name of the Index:* Composite index based on Global Coal Index, API4, ICI3 of Argus and Platts index.

*Source/Publisher:* globalCOAL, Argu Media Ltd (API4 and ICI3) and Platts

*Reasons:* Use of Composite index based on Global Coal Index, API4, ICI3 of Argus and Platts index is proposed for the following reasons:

- The four indices are internationally acceptable indices.
- Coal is imported by power producers from different countries.
- A similar trend is observed in the prices/ price indices of Australian Coal, South African Coal and Indonesian coal.

*Description:* The Escalation Rate for imported coal shall be computed based on the time series data on composite index based on Global Coal Index, API4, ICI3 of Argus and Platts index for the latest 12 years.

**8.6 Escalation Rate for Transportation of Imported Coal and Imported Gas (For Evaluation):** The import of coal/ gas to India has been taking place from many countries. Keeping this in view, in place of actual freight rates of each country, CERC has been using the price of fuel used for transportation by shipping as a proxy for computing the escalation rate for transportation of imported coal for payment. Singapore 380 CST Bunker Fuel Price has been used for computing the escalation rate for payment upto December 2019. However, consequent to implementation of MARPOL Regulation with effect from 01.01.2020, CERC has started using the price of Low Sulphur Fuel Oil (LSFO) published by Clarksons Research in place of Singapore 380 CST Bunker Fuel Price for computing the escalation rate for payment applicable from January 2020 onwards (CERC order dated 15<sup>th</sup> January 2020 in Petition No.11/SM/2019). As the time series data on LSFO not being available for 12 years, it is proposed to use Singapore 380 CST Bunker Fuel Price for computing the escalation rate for evaluation.

*Name of the Index:* Singapore 380 CST Bunker Fuel Price.

*Source/Publisher:* Clarkson Research

*Reasons:* Use of Single index of Singapore 380 CST Bunker Fuel Price is proposed for the following reasons:

- Fuel prices form a significant component of total ocean freight costs.
- Singapore is a major fuelling point for shipping in the Asian region, and fuel prices in Singapore are seen as leading indicators.
- 380 CST bunker fuel is mainly used in shipping.
- The time series data on LSFO is not available for 12 years
- Clarkson research has historical data and credibility to provide data on shipping transportation.

*Description:* The escalation rate for transportation of imported coal/ gas shall be computed based on the time series data on FOB prices of Singapore 380 CST bunker fuel for the latest 12 years.

**8.7 Escalation rate for Imported Gas (For Evaluation):** There is no published data available on historical FOB/CIF price of imported LNG in India. A proxy can be used for computing the escalation rate for imported gas. CERC has been using Japan JCC LNG CIF price for computing the escalation rate for imported gas for payment. Therefore, the same is proposed to be used for computing the escalation rate for imported gas for evaluation.

In February 2009, Platts has launched Asian LNG spot prices under the benchmark name Japan/ Korea Market (JKM). Once the time series data is available, JKM can be used as proxy for price of imported LNG in India in place of Japan JCC LNG CIF price.

*Name of the Index:* Japan JCC NLG CIF price.

*Source/Publisher:* Platts (website: www.platts.com)

*Reasons:* Use of Single index of Japan JCC NLG price is proposed for the following reasons:

- Import of LNG in Japan is similar to import of LNG in India.
- Japan JCC LNG price is the CIF price which includes transportation through shipping. Unlike transportation by pipeline in USA and in European countries, the transportation of LNG in Asian countries including India is similar.
- Platts provides services to various clients including Federal Energy Regulatory Commission (FERC, USA).

*Description:* The escalation rate for imported gas shall be computed based on the time series data on Japan JCC LNG price published by Platts for the latest 12 years.

## 9. **Discount Rate for Bid Evaluation**

As required under the "Tariff based Competitive-bidding Guidelines for Transmission Service" (as amended up to 10th October, 2008) issued by the Ministry of Power, CERC has been notifying the discount rate for evaluation from time to time. The methodology that has been used for computing the discount rate for the notification "escalation factors and other parameters for tariff based competitive bidding for transmission service" dated 05.10.2020 is proposed to be used for computing the discount rate for evaluation required under various paragraphs of the amended 2020 MOP Guidelines. This is mainly for the reason that the discount rate has been computed considering the parameters applicable for power sector in general. Relevant Extract from the 'Explanation for the notification on escalation factors and other parameters for tariff based competitive bidding for transmission service, dated 5.10.2020' is reproduced below and it explains the methodology that shall be used for computing the discount rate for bid evaluation.

*"Weighted Average Cost of Capital (WACC) has been considered as discount rate and computed as under:*

$$WACC = \text{Cost of Debt} + \text{Cost of Equity}$$

Where,

Cost of Debt = 0.70 (Market Rate of Interest) X (1-Corporate Tax Rate)

Cost of Equity= 0.30 (Risk Free Rate + b (Equity Market Risk Premium))

The computation of WACC can be seen in the following table.

<b>DISCOUNT RATE TO BE USED FOR BID EVALUATION</b>		
<b>Weighted Values</b>	<b>Cost of Debt/Equity</b>	<b>WACC (%)</b>
<b>1. Cost of Debt (after tax)</b>		
0.70(Cost of Debt)x(1-CTR)	<b>6.21</b>	
<b>2. Cost of Equity</b>		
0.30((RF+b (ERP))	<b>2.63</b>	
<b>Discount Rate (1+2)</b>		<b>8.84</b>
<b>Assumptions used for computing the Discount Rate</b>		
<b>Components of Debt/Equity</b>		<b>Assumptions (%)</b>
Debt		70.00
Equity		30.00
Corporate Tax Rate (CTR)		22.00
Risk Free rate (RF)		6.99
Beta Value (b)		0.72
Equity Market Risk Premium (ERP)		2.47
Cost of Debt		12.67
Cost of Equity		8.75

The Debt and Equity of 70:30 has been assumed based on CERC norms on Debt and Equity in its Tariff Regulations for the 2019-24 period. The basic corporate tax rate proposed in the Union Budget for the year 2020-21 (i.e. excluding surcharge and cess) has been assumed while computing the discount rate.

While calculating the cost of debt, the market rate of interest is being linked to the marginal cost of funds based lending rate (MCLR) that refers to the minimum interest rate of a bank below which it cannot lend, except in some cases allowed by the RBI. The market rate of interest for the year 2019 shall be taken as the MCLR (9.17%, i.e., average of MCLR of five major banks) + 350 basis points. Accordingly, the market rate of interest has been taken as 12.67%.

10 year GOI securities rate for 2019 is being considered as the risk-free rate.

For the calculation of cost of equity, the market risk premium is assumed as the difference between the expected market return and the risk free rate. Accordingly, the market risk premium in this Notification has been arrived at by subtracting the average risk-free rate for the last 10 years from the average rate of return on market portfolio over the past 10 years. Sensex values for the past eleven years have been used to arrive at rate of return on the market portfolio for the past 10 years. Historical

*approach has been adopted for arriving at the expected market return assuming the expected future return to be the same as past returns. The beta value has been computed based on the data on Bombay Stock Exchange (BSE) Indices for Power Sector and Sensex for the year 2019.*

*The WACC computed in the above table (8.84%) shall be notified as discount rate for bid evaluation.”*

## **C: Comments/Suggestions of Stakeholders**

10. Comments/suggestions of the stakeholders and other interested persons on the proposed methodology were invited through a public notice dated 23.2.2021. In response to the public notice, the comments/ suggestions have been received from the following:

- (1) Adani Power (Mundra) Ltd (AEL)
- (2) Association of Power Producers (APP)
- (3) DB Power Ltd (DBPL)
- (4) Dhariwal Infrastructure Ltd (DIL)
- (5) GE India Industrial (P) Ltd (GEIPL)
- (6) GMR Energy Ltd (GMREL)
- (7) Greenko Energies (P) Ltd (GEPL)
- (8) International Energy Agency (IEA)
- (9) JSW Energy Ltd (JSWEL)
- (10) MB Power (Madhya Pradesh) Ltd (MBPL)
- (11) Renew Power (P) Ltd (RPPL)
- (12) Sembcorp Energy India Ltd (SEIL)
- (13) Shell Energy India (P) Ltd (SEIPL)
- (14) Tata Power Company Ltd (TPCL)
- (15) Torrent Power Ltd (TPL)

11. The comments and suggestions submitted by these stakeholders are discussed in brief in the following paragraphs (paragraphs 11.1 to 11.9). Comments of stakeholders are available on website of the Commission. It is possible that names

of some stakeholders have been missed in the following paragraphs. However, issues raised by all the stakeholders have been mentioned.

11.1 Escalation Rates for Bid Evaluation: SEIL, JSWEL and APP submitted that as required under the 2005 Guidelines of the Ministry of Power, the Commission has been notifying (i) Escalation Rate for inland handling of imported coal; and (ii) Escalation Rate for inland handling of imported gas, for the purpose of payment. These two escalation rates, along with other escalation rates proposed in the staff paper are required for the purpose of bid evaluation for the bidders offering non-RE power based on imported coal. Therefore, SEIL, JSWEL and APP have suggested to notify these two escalation rates along with other escalation rates proposed in the staff paper for the purpose of bid evaluation. APP also suggested that suitable weightage may be given to re-gasification charges while computing the escalation rate for inland handling of imported gas.

11.2 Escalation Rates for Payment: APP has submitted that:

(i) The price of imported gas is quite volatile. Therefore, the gas suppliers find this as a major risk while linking their supply prices to CERC index that has a lag of six months. To avoid the time lag, it has suggested to publish the index, based on JKM/ WIM prices, for imported gas on monthly basis for the purpose of payment.

(ii) Re-gasification charges are a major component of inland handling of imported gas. Therefore, suitable weightage may be given to re-gasification charges while computing the escalation rate for inland handling of imported gas.

(iii) Escalation rate may be notified for exchange rate for the purpose of payment for obtaining the foreign exchange rate variation. In this regard, SBI TT selling rate may be used for arriving at the escalation rate for exchange rate.



11.3 Escalation Rate for Domestic Coal (For Evaluation): TPCL, GMREL, APP, DBPL and MBPL have suggested to consider the data on WPI for non-coking coal for the period from 2012 onwards while computing the escalation rate for domestic coal for evaluation. This is mainly for the reason that (i) Coal India Ltd changed its pricing methodology from UHV to GCV in January 2012; and (ii) WPI for non-coking coal (G7 to G14) is appropriate to be used in place of general WPI for non-coking coal (G1 to G17), which is available from 2011-12. DIL suggested that the data on WPI for non-coking coal for the latest 5 years should be considered for computing the escalation rate for domestic coal.

11.4 Escalation rate for inland transportation charges of coal (For Evaluation): DIL and APP have suggested that escalation rate for inland transportation of coal should include transportation charges via road mode in addition to rail mode. In this regard, they have suggested that diesel prices may be used as an index for computing the escalation rate.

11.5 Escalation rate for inland transportation charges of gas (For Evaluation): GMREL, APP and IEA have submitted that there are pipelines other than HVJ pipeline for transportation of gas, which caters to the requirement of many power plants. For example, power plant in AP is connected to EWPL. Therefore, transportation charges of all the pipelines should be considered while arriving at the escalation rate. Weightage may be given based on the length of the respective pipeline. TPL submitted that the escalation rate for inland transportation charges of gas is to be computed based on the transportation charges for each zone/ area as published by PNGRB.

11.6 Escalation Rate for Imported Coal (For Evaluation): Stakeholders have submitted as under:

(i) TPCL and MBPL have submitted that the escalation rate for imported coal has been proposed to be computed based on global indices which are in US Dollars whereas the levelized tariff is to be calculated in rupees. Hence, the impact of exchange rate is not factored in the escalation indices. Therefore, there should be a component in the methodology to address the foreign exchange rate variation.

(ii) TPCL and IEA submitted that the composite index shall be based on actual import of coal in India. In this regard, SEIL suggested that considering the import of coal from Indonesia to India, the index of lower calorific value of coal of ICI4 (4200 GAR) may be considered in place of ICI3 (5000 GAR) in the composite index.

(iii) TPCL has suggested to consider the data for 5 to 8 years while computing the escalation rate.

**11.7 Escalation Rate for Transportation of Imported Coal and Imported Gas (For Evaluation):** TPCL has submitted that the Commission, vide its notification dated 22.1.2020, has provided one-time escalation of 83.94% for the purpose of payment for changeover of indices from Singapore 380 CST Bunker Fuel to Low Sulphur Fuel Oil (LSFO). Keeping this in view, the one-time escalation should be suitably adjusted while computing the Escalation Rate for Transportation of Imported Coal and Imported Gas for evaluation.

**11.8 Escalation rate for Imported Gas (For Evaluation):** Stakeholders have submitted as under:

(i) GEIPL has submitted that globally and in India, there is a shift from the traditional fixed-destination, long-term, oil-linked imported gas contracts. Currently, the market for gas is taking place based on gas-based indices like Henry Hub Index, USA, Asia specific indices like Japan/ Korea marker (Platts JKM) and West India Marker (Platts WIM).

The recent Reliance R3 Cluster gas auction dated February 5, 2021 was linked to JKM. Therefore, it has suggested to consider the escalation indices for imported gas in line with current market practices.

(ii) APP has submitted that India is located in Asia-Pacific region and many of the LNG supply contracts are signed linking to JKM. WIM reflects the imported gas prices specifically for India. Therefore, it is recommended that JKM or WIM prices may be considered for computing the escalation rate for imported gas for evaluation and payment. The price of JKM/WIM may be used for evaluation and payment after converting into Indian rupees using SBI TT selling rate applicable for the period.

(iii) TPL has submitted that imported gas prices no longer move in tandem with Japan Crude Cocktail (JCC). In this context, it is worth noting that (a) JCC and JKM wholly represent LNG prices for South Asia-Pacific region; and (b) India's imported gas price is strongly linked with JKM prices. Hence, the price of JCC may not be credible reference for gas imported in India. The price of JKM may be treated as credible reference for the reasons that: (a) JKM market is immensely liquid as Japan, South-Korea, and China, which accounts for 48% of the total global imports; (b) JKM price is published by Platts; and (c) JKM price is on Delivered Ex Ship (DES) basis, hence, there is no need for separate escalation index for transportation of imported gas.

(iv) GMREL has submitted that all gases in India are procured from Qatar or from countries like US/Australia. Prices are fixed on long term basis either linked to Henry Hub index or slope of Brent crude. Therefore, the index of JKM is not appropriate.

(v) Except GMREL, all other stakeholders, who have submitted their comments on the issue, have suggested to consider JKM for computing the escalation rate for imported gas for the purpose of evaluation and payment.

11.9 Discount Rate for Bid Evaluation: Stakeholders have submitted as under:

(i) GMREL has suggested that while computing the WACC, the cost of equity and cost of debt should be based on historical data for a reasonable period of 9-12 years.

(ii) MBPL has submitted that the cost of equity should not be less than the cost of debt.

(iii) MBPL and APP have submitted that the 2019 Tariff Regulations has considered 15.5% as return on equity. Therefore, 15.5% should be considered as risk-free rate for computation of cost of equity. MBPL has also submitted that the computed beta value is based on BSE indices for power sector which represent few listed power sector companies.

(iv) APML has submitted that the staff paper has proposed cost of debt as post-tax and cost of equity as pre-tax. In this regard, it has suggested to calculate WACC based on cost of debt and cost of equity either post-tax or pre-tax.

(v) APP and APML have submitted that since tariffs are derived inclusive of direct taxes, discount rate used for bid evaluation should also be inclusive of direct taxes, i.e. pre-tax. Therefore, the cost of debt should be on pre-tax basis. APML has also suggested that if post-tax is considered, the corporate tax rate should be inclusive of surcharge.

12. For wider public consultation, the Commission conducted a public hearing on 12.4.2021. About 35 representatives from various organizations attended the public hearing (see Annexure to this order). Oral submissions were made by the representatives of the following organizations:

- (1) Dhariwal Infrastructure Ltd (DIL)
- (2) Tata Power Company Ltd (TPCL)
- (3) Sembcorp Energy India Ltd (SEIL)
- (4) Greenko Energies (P) Ltd (GEPL)
- (5) Torrent Power Ltd (TPL)
- (6) DB Power Ltd (DBPL)

13. The submissions made during the public hearing are briefly discussed in the succeeding paragraphs (paragraphs 13.1 to 13.6).

13.1 The representative of DIL reiterated submissions made in written submissions as regards data to be considered for computing the escalation rates for evaluation stating that the latest 5 years data should be considered for computing the escalation rates for evaluation and that the escalation rate should be positive. There should be a single index for coal, whether it is imported coal or domestic coal.

13.2 The representative of TPCL has submitted that the price of imported coal used for computing the escalation rate is in US Dollars whereas the tariff is required to be quoted in Indian rupees as per the amended 2020 MOP Guidelines. In this regard, it suggested that the price of imported coal may first be converted into Indian rupees and then the escalation rate may be computed. They submitted that the Commission may also like to consider issuing notification of the escalation rate for Dollar-Rupee exchange variation for the purpose of evaluation. TPCL also submitted that the billing takes place on monthly basis. Therefore, commensurate with the billing cycle, the escalation rates for the purpose of payment may be notified on monthly basis instead of on six monthly basis.

13.3 The representative of SEIL has submitted that the import of coal from Indonesia to India is mainly low GCV coal. In this regard, it suggested to consider ICI-4 (4200 GAR) in place of ICI-3 (5000 GAR) while arriving at the composite index for imported coal.

13.4 The representative of GEPL has submitted that the data for 15 years and above may be considered for computing the escalation rates for evaluation. Negative escalation rate may be avoided. GEPL also suggested that the Commission may like to come out with draft notification before finalization.

13.5 With regard to escalation rate for inland transportation charges of gas, the representative of TPC has submitted that the escalation rate may be computed transporter-wise for major transporters (GAIL, GSPL, etc.) considering the transportation charges determined by PNGRB.

13.6 The representative of DBPL has submitted that the cost of equity may be computed considering the returns based on the financial year data for the latest 10 years i.e. up to 2021.

## **D: Analysis and Decision**

14. We have considered the submissions, comments and suggestions of all the stakeholders.

14.1 Escalation Rates for Bid Evaluation: As per the amended 2020 MOP Guidelines, the quoted tariff comprises of four parts – (a) RE power (fixed); (b) non-RE power (fixed); (c) Non-RE power (escalable for fuel), and (d) non-RE power (escalable for transportation). Therefore, the amended 2020 MOP Guidelines do not provide for the requirement of escalation rate for inland handling

of imported coal/gas. Stakeholders like SEIL, JSWEL and APP, in their written and oral submissions, mentioned that the escalation rate for inland handling of imported coal/gas is required for the bidders offering non-RE power which are using imported coal/gas for power generation. Therefore, the stakeholders have suggested to notify the escalation rate for inland handling of imported coal/ gas. APP also suggested to consider re-gasification charges while computing the escalation rate for inland handling of imported gas. TPL, JSWEL and GMR suggested to notify escalation rate for Dollar-Rupee exchange variation for the purpose of evaluation. The stakeholders have suggested various data points for computing the escalation rates for evaluation. Considering the requirement of the amended 2020 MOP Guidelines and the views of stakeholders, the Commission decides as under:

- (i) As proposed in the staff paper, the method of Minimum Mean Square Error shall be used for computing the escalation rates for evaluation. Data for the latest 12 calendar years has been considered for computing the escalation rates for evaluation. This is mainly for the reason that 12 years data provides reasonable results while computing the escalation rate for evaluation using the Minimum Mean Square Error method.
- (ii) The amended 2020 MOP Guidelines do not provide for the requirement of the escalation rate for inland handling of imported coal/gas and the escalation rate for Dollar-Rupee exchange variation. Therefore, there is no need to notify these escalation rates.

14.2 Escalation Rates for Payment: The Commission has been notifying the escalation rates for the purpose of payment under the Guidelines dated 19.1.2005 issued by the Ministry of Power. The same escalation rates shall be used for meeting the requirement under paragraphs 2.1, 5.1, 5.4, 5.5 and 6.4 of the amended 2020 MOP Guidelines. There are no objections from the stakeholders on the escalation rates proposed for the purpose of payment. However, TPCL and GMREL submitted that billing takes place on monthly basis and, therefore,

commensurate with the billing cycle, they have suggested that the escalation rates for the purpose of payment may be notified on monthly basis instead of six monthly basis. However, the Commission has observed that the data on several of the parameters (for example, escalation rate for transportation of domestic coal, escalation rate for domestic gas, escalation rate for transportation of domestic gas) is not available in the public domain. Therefore, the Commission has been obtaining these data, every six months, from the concerned organizations. Based on the experience, the Commission is extremely apprehensive that the concerned organizations would be in a position to make available such data on monthly basis regularly and on time. Therefore, the Commission has decided to notify the escalation rates for the purpose of payment, on six monthly basis, as proposed.

#### 14.3 Escalation Rates:

14.3.1 Escalation Rate for Domestic Coal: Most of the stakeholders have suggested to consider the data on WPI for non-coking coal for the period from 2011-12 onwards in place of last 12 years data as proposed in the staff paper while computing the escalation rate for domestic coal for evaluation. The Commission has noted that Coal India Limited has changed pricing methodology of coal from UHV to GCV in January 2012 and WPI for Non-coking coal for G7 to G14 is available only from the year 2012 onwards. Considering the views of stakeholders, the Commission has decided to use the WPI for non-coking coal (G7- G14) for the period from 2011-12 onwards to start with, and gradually consider as data becomes available, the data points up to the last 12 years, while computing the escalation rate for domestic coal for evaluation.

14.3.2 Escalation Rate for Inland Transportation Charges of Coal: APP and GMR have suggested to notify the escalation rate for transportation of coal via road mode, in addition to rail mode. They have suggested that diesel prices may be considered for computing the escalation rate for



transportation of coal via road mode. The Commission, based on the data relating to transportation of coal, observes that bulk of transportation of coal takes place through rail. Therefore, the escalation rate for transportation of coal based on rail freight rates only has been considered, as proposed in the staff paper.

14.3.3 Escalation Rate for Inland Transportation Charges of Gas: Some of the stakeholders have suggested that the escalation rate for inland transportation charges of gas may be computed considering the transportation charges applicable for all the gas pipelines in India. Some other stakeholders have suggested that there should be a separate escalation rate for each zone considering length of the pipeline. GMREL submitted that power plants may be located closer to the other pipelines other than HVJ pipeline. Therefore, the escalation rate based on the price of HVJ pipeline may not be appropriate. It has suggested that in addition to length of the pipeline, the volume transacted through the pipeline is also important. The Commission has noted that the transportation charges of gas for each pipeline are being notified by PNGRB through various orders from time to time. However, time-series data on the same separately for each pipeline and in a comparable format is not available in the public domain. Considering the lack of data and the limitation of available data on transportation charges of gas of all the pipelines, the Commission has decided to compute the escalation rate for inland transportation charges of gas based on the transportation charges applicable for HVJ pipeline as proposed in the staff paper.

14.3.4 Escalation Rate for Imported Coal: As decided in its order dated 23.12.2013 in Petition No.308/SM/2013, the Commission has been following the composite index for computing the escalation rate for imported coal applicable for the period from April 2014 onwards for the purpose of payment and the same composite index has been proposed in the staff

paper for computing the escalation rates for evaluation too. In the composite index, 5000 GAR has been taken as base and the high GCV coal indices (Global coal index of Australia, 6000 NAR and API4 of South Africa, 6000 NAR) have been normalized to 5000 GAR. One of the Indonesian coal index, ICI3 (5000 GAR) published by Argus is part of the composite index. In the context of composite index, SEIL has submitted that ICI4 (4200 GAR) would be a better representative over the ICI3 (5000 GAR). However, SEIL has not provided adequate justification with supporting data (for example, the extent of the import of coal from Indonesia to India with 4200 GAR etc.) for consideration of ICI4 in place of ICI3. Therefore, the Commission has decided to use the composite index as proposed in the staff paper.

14.3.5 Escalation Rate for Imported Gas: The Commission is required to notify escalation rate for imported gas and transportation of imported gas separately. For computing the escalation rate for imported gas, the index based on FOB price is required. Most of the stakeholders (GEIPL, APP, IEA and TPL) have suggested to use either JKM or WIM for computing the escalation rate for imported gas. JKM represents landed price in Japan and Korea whereas WIM represent landed price in India. JKM represents more liquid market (48% of the total global imports) and widely used index even for LNG contracts by Indian entities (the Reliance R3 cluster gas auction dated February 5, 2021 was linked to JKM). Considering the credibility of the index in terms of acceptability and liquidity, the Commission has decided that JKM shall be used in place of Japan JCC LNG for computing the escalation rate for imported gas for evaluation and payment. JKM shall also be used for the purpose of computing escalation rate for imported gas for payment with effect from the next notification (i.e. October 2021 Notification) and onwards.

14.3.6 Escalation Rate for Transportation of Imported Coal and Transportation of Imported Gas: The Commission has been using LSFO for

computing the escalation rate for Transportation of Imported Coal and Transportation of Imported Gas for payment applicable for the period from January 2020 onwards. Due to non-availability of time series data on LSFO, the price of Singapore 380 CST Bunker Fuel was proposed to be used for computing the escalation rate for Transportation of Imported Coal and Imported Gas for evaluation. In this regard, TPCL submitted that the Commission has considered one-time escalation for the purpose of payment (i.e. for changeover of indices from Singapore 380 CST Bunker Fuel to LSFO from 22.1.2020). TPCL, therefore, has suggested that the same may be adjusted while computing the escalation rate for evaluation as well. The Commission is of the view that the price of Singapore 380 CST Bunker Fuel should be used for computing the escalation rate for evaluation till availability of the data on LSFO for the latest 12 years. Therefore, the Commission has decided to use only one data series for computing the escalation rate for evaluation as proposed in the staff paper.

14.4 Specification of Price/Price Indices: Thus, the specification of Price/Price Indices for computing the escalation rate for domestic coal and for imported gas shall be in accordance with paragraphs 14.3.1 and 14.3.5, respectively of this Order, and those for computing the other escalation rates shall be as proposed in the staff paper.

14.5 Discount Rate for Evaluation: The weighted average cost of capital (WACC = Cost of Debt + Cost of Equity) has been considered as discount rate for evaluation. Some of the stakeholders have suggested to make changes on the computation of cost of debt and cost of equity. MBPL and APP submitted that 15.5% as return on equity has been considered in the 2019 Tariff Regulations and, therefore, the same should be considered as return on equity while computing the discount rate. MBPL pointed out that the cost of equity works out lower than the cost of debt, which is against the principle of finance. APP suggested to consider both cost of equity and cost of debt either pre-tax or post-

tax. For cost of debt, the Commission is of the view that loans for power sector are generally for longer duration. Therefore, 200 basis points in place of 350 basis points on top of base lending rate of top five banks would be more appropriate, considering that for working capital which are for shorter duration, 350 basis points have considered. The cost of debt used for calculation of WACC is inclusive of cess and surcharge. The Commission has considered the cost of debt and cost of equity based on the Capital Asset Pricing Model (CAPM). As proposed in the staff paper, the Commission has decided to continue with historical approach while computing the equity market risk premium. However, the average risk-free rate and the average rate of return on market portfolio has been changed from the latest 10 years to the latest 12 years. The Commission has decided to compute the equity market risk premium by subtracting the average risk free rate for the last 12 years from the average rate of return on market portfolio over the past 12 years.

15. We direct that the escalation rates for evaluation applicable from the date of notification of this Methodology till 31<sup>st</sup> March 2022 shall be notified in accordance with paragraph 14 of this order.

**Sd/-  
(P.K.Singh)  
Member**

**Sd/-  
(Arun Goyal)  
Member**

**Sd/-  
(I.S.Jha)  
Member**

**Sd/-  
(P.K.Pujari)  
Chairperson**

**Parties Present**

- 1 Shri. Agam Kumar, Acme
- 2 Shri. Dhaval Trivedi, Adani Green Energy Ltd.
- 3 Shri. Chintan Mankad, Adani Power Ltd
- 4 Shri. Ravi Sharma, Advocate
- 5 Shri. Dhananjay Mattam, DB Power
- 6 Shri. Manu Krishnan Namboothiri, DB Power
- 7 Shri. Bhaskar Gangully, Dhariwal Infrastructure Ltd
- 8 Shri. Omkar Bhattacharya, Dhariwal Infrastructure Ltd
- 9 Shri. Shamik Das, Dhariwal Infrastructure Ltd
- 10 Shri. Ambrish Kumar Khare, GMR Energy Ltd
- 11 Shri. Santu Pal, GMR Energy Ltd
- 12 Shri. Shatanshu Agrawal, Greenko Energies (P) Ltd
- 13 Shri. Manoj Tanwar, Greenko Energies (P) Ltd
- 14 Shri. Anish Pasrija, Greenko Energies (P) Ltd
- 15 Shri. Abhishek Shringi, ReNew Power (P) Ltd
- 16 Shri. Chandra Prabhu, ReNew Power (P) Ltd
- 17 Shri. Rakesh Swaroop, ReNew Power (P) Ltd
- 18 Shri. Ishan Nagpal, ReNew Power (P) Ltd
- 19 Shri. Mahesh Vipradas, Sembcorp Energy India Ltd
- 20 Shri. Milind Nigudkar, Sembcorp Energy India Ltd
- 21 Shri. Nukala Kishore, Statkraft Markets (P) Ltd
- 22 Ms. Paramita Sahu, Tata Power Company Ltd
- 23 Shri. Abhijeet Rajendra, Tata Power Company Ltd
- 24 Shri. Jaydipsinh Chudasama, Torrent Power Ltd
- 25 Shri. Tanmay Vyas, Adani Power Ltd
- 26 Shri. Muthu Veerappan
- 27 Shri. Saeyansh Bhaunt

- 28 Shri. Sanket Maloo  
29 Shri. Surendranath  
30 Shri. Abhishek Tyagi  
31 Shri. A.S. Pandey  
32 Shri. Ashok Kumar Prusty  
33 Ms. Anusha G  
34 Shri. Rakesh H. Shah  
35 Shri. Rajesh Bhadarwahi