

Simulation of Hybrid Method for Determination of Point of Connection (POC) based transmission charges on 2011-12 Indian power system

Background

1. The Commission has conducted a study to determine the transmission charges for 2011-12 power system with the aim to better understand the impact of generation and transmission capacity addition on transmission charges.
2. The transmission charges reported here have been determined for the 2011-12 power system using the Hybrid Method proposed by the Commission vide draft regulations (CERC (Sharing of Inter State Transmission Charges and Losses, 2010) dated February 09, 2010).

Data and Methodology

1. The base network of for August 2009 condition was obtained from the National Load Dispatch Centre (NLDC).
2. The data on capacity addition in generation was obtained from the SP&PA division of the Central Electricity Authority.
3. The data on capacity addition in transmission was obtained from the Power Grid Corporation of India Limited.
4. Network truncation, as described in the Attachment-1 of the draft regulations dated February 09, 2010, was carried out by Power Grid Corporation of India Limited (PGCIL) using PSS/E software.
5. Average ARR of the lines was computed using the current average ARR (in Rs Lakh / Ckt km) of the lines owned by ISTS transmission licensees.
6. The Hybrid Method as described in the Attachment-1 of draft regulations was implemented at Power Anser Laboratory at IIT Bombay, Mumbai.
7. Network Data used for the analysis have also been put on the website.

Observations

1. The transmission charges have slightly declined in most cases.
2. Orissa has been divided into two generation zones essentially because Sterlite (Orissa-STR) is expected to supply inter-state consumers.
3. Demand access charges in Punjab and Haryana have declined because of the new generation in these states.

GENERATION:

4. AP E&C: Essentially because new generation at Gautami, Konaseema, Kothagudem, Kondapalli have been added over and above 2008-09 scenario. This brings in extra generation (summer peak: 6295 MW in 2011-12 against 2383.6 MW in summer peak of 2008-09). Since these stations are close to existing pooling points, corresponding transmission capacity addition is less and the existing gets utilized well. This causes a decrease in the charge.
5. Tamil Nadu - North: In 2011-12 new power plants at Vallur, North Chennai, and Mettur have been added. This causes the generation to increase from 1182.86 MW in summer peak in 2008-09 to 4270 MW in 2011-12. Since these power plants are close to load centres, the corresponding transmission investment is less and the per unit transmission charges decline.
6. Tamil Nadu - South: New generators are added at Kudankulam. This leads to increase in generation to 2090 MW in summer peak in 2011-12 from 473 MW 2008-09.

DEMAND:

7. Punjab: Demand access charges have declined because of capacity addition in generation.
8. Kerala: Three more demand nodes are connected by 400 kV lines in 2011-12: Kozhikode, Cochin and Chulliar. The total demand increases to 1588 MW in 2011-12 from 805 MW in 2008-09. Further, the existing node at Trivandrum is being fed from Tirunelveli (in TN), which is being fed by new generation at Kudankulam. Thus there is new generation close to demand nodes here also.
9. Tamil Nadu: The decline in rates is due to increase in generation - as indicated above in Tamil Nadu- North and Tamil Nadu – South. Further the demand in Tamil Nadu is expected to increase, as per the 17th EPS by approximately 4000 MW from 2008-09 to 2011-12.

Table 1: GENERATION ZONES - NEW GRID

Zones	2011-12		2008-09	
	Rs Lakh/MW/Annum	Ps/kWh	RsLakh/MW/Annum	Ps/kWh
Bhutan	10.31	11.77	12.56	14.34
Bihar-KH	9.84	11.23	13.06	14.91
CHTIS-KOR	7.64	8.72	10.15	11.59
CHTIS-OTHER	10.41	11.88	12.97	14.81
Delhi, HR, Raj, UP-W	2.09	2.38	2.98	3.40
GUJ	3.63	4.15	4.25	4.85
HP-CHM	5.06	5.78	10.77	12.30
HP-DH	4.49	5.12	4.89	5.58
HP-NJB	8.51	9.72	13.87	15.83
JandK	4.78	5.46	6.88	7.85
Jharkhand	8.66	9.88	15.51	17.70
Maha	2.65	3.02	2.90	3.32
MP	7.70	8.79	9.45	10.79
NER	7.18	8.19	8.25	9.42
Orissa-STR	9.01	10.29		
ORISSA	3.74	4.27	4.85	5.54
Sikkim	15.14	17.28	17.75	20.27
UK	4.78	5.46	5.92	6.76
UP-E&C	6.72	7.67	8.71	9.95
UP-W	1.67	1.91	2.98	3.40
WB-BFP	6.71	7.66	8.72	9.95

Table 2: GENERATION ZONES - SR GRID

	2011-12		2008-09	
	Rs Lakh / MW / Annum	Ps / kWh	Rs Lakh / MW / Annum	Ps / kWh
AP - OTHER Total	1.69	1.93	2.80	3.20
AP E&C Total	3.43	3.91	7.93	9.05
KAR - OTHER Total	3.76	4.29	4.40	5.03
KAR-KTB Total	3.76	4.29	7.27	8.30
TN-N Total	1.43	1.64	3.79	4.32
TN-S Total	4.54	5.19	10.84	12.38
Kerala	2.99	3.41	7.32	8.35

Table 3: DEMAND ZONES - NEW GRID

Zone	2011-12		2008-09	
	Rs Lakh / MW / Annum	Ps / kWh	Rs Lakh / MW	Ps/kWh
Bihar	6.63	7.57	8.84	10.09
Chattisgarh	3.50	4.00	4.39	5.01
Delhi	5.87	6.70	10.20	11.65
Goa	10.50	11.98	8.37	9.56
Gujarat	5.60	6.39	6.98	7.97
Haryana	5.75	6.56	11.80	13.47
Himachal Pradesh	4.41	5.03	8.13	9.28
JandK	5.46	6.23	13.75	15.70
Jharkhand	4.23	4.83	7.69	8.77
Maharashtra	4.87	5.56	6.75	7.71
Madhya Pradesh	8.47	9.67	11.55	13.19
NER	14.36	16.39	12.85	14.67
Orissa	5.16	5.89	3.78	4.32
Punjab	11.06	12.62	16.81	19.19
Rajasthan	9.98	11.39	9.65	11.02
Uttarakhand	5.98	6.83	7.39	8.43
Uttar Pradesh	5.63	6.42	7.43	8.49
West Bengal	2.19	2.51	3.24	3.69

Table 4: DEMAND ZONES - SR GRID

	2011-12		2008-09	
	Rs Lakh / MW / Annum	Ps / kWh	Rs Lakh / MW / Annum	Ps / kWh
Andhra Pradesh	4.81	5.49	8.54	9.75
Karnataka	5.67	6.47	8.23	9.4
Kerala	7.89	9.00	15.78	18.02
Tamil Nadu	4.33	4.94	13.15	15.01