

Before the
MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
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Case No. 31 of 2006

**In the matter of
Determination of Transmission Tariff for Intra-State Transmission System (InSTS)
for FY 2006-07**

**Dr Pramod Deo, Chairman
Shri A. Velayutham, Member
Shri S.B.Kulkarni, Member**

Dated: 29th September, 2006

The Commission had issued an Order on June 27, 2006 in the matter of development of Transmission Pricing Framework for the State of Maharashtra and other related matters (Case 58 of 2005). As per clause 4.2 of the said Order, the Commission is required to determine Transmission Tariff to be applicable for use of Intra-State Transmission system (InSTS) in accordance with the principles outlined under said Order. The relevant extract of the said Order is as under:-

- 4.2.1 *Intra-State transmission system shall comprise composite transmission network of MSETCL, TPC, REL and any other transmission licensee, in future.*
- 4.2.2 *Each transmission licensee including existing transmission licensees (i.e. MSETCL, TPC and REL) shall submit its ARR Petition to the Commission in accordance with the MERC (Terms and conditions of Tariff) Regulations, 2005 and seek its approval thereof.*
- 4.2.3 *Aggregate of Annual Revenue Requirement of all licensees, as approved by the Commission, shall form “Pooled Cost” (or hereinafter termed as “Total Transmission System Cost – TTSC) of the intra-State transmission system, to be recovered from the Transmission System Users (TSUs).*



- 4.2.4 *The 'Base Transmission Capacity Rights' for 'capacity utilisation' shall be denominated in terms of 'kW'. The TTSC shall be shared amongst the TSUs based on the 'contribution to co-incident peak demand' (CPD) by each TSU. However, the Commission recognises that until adequate metering arrangement is put in place, it may not be possible to ascertain 'CPD' by various TSUs. Hence, for FY2006-07, until adequate metering arrangement is put in place, transmission tariff shall be based on share of 'peak demand' of concerned TSU during each month of the previous year. For this purpose, average of such 12-monthly contributions to peak demand by each TSU shall form basis for arriving at 'Base TCR' and overall share/contribution of each TSU thereof. The Commission **directs** the licensees to submit data pertaining to their peak demand for consumption in their area during each month for FY2005-06 within two weeks from date of issue of this Order. Further, the Commission re-iterates that existing TSUs will have to execute Bulk Power Transmission Agreement with concerned transmission licensee in accordance with Regulation 5.1 and Regulation 5.2 of MERC (Transmission Open Access) Regulations, 2005.*
- 4.2.5 *Accordingly, 'Base Transmission Tariff' for each financial year shall be derived as 'TTSC' of intra-State transmission system divided by 'Base Transmission Capacity Rights' and denominated in terms of "Rs/kW/month" or "Rs/MW/day"*

A] Total Transmission System Cost (TTSC) for InSTS for FY2006-07

2. The Commission has approved Annual Revenue requirement of **Rs 1393.13 Crore** for FY2006-07 in respect of Maharashtra State Electricity Transmission Co. Ltd (MSETCL) vide its Order dated June 29, 2006 (Case 49 of 2005).
3. The Commission has approved Annual Revenue requirement of **Rs 168.59 Crore** for FY 2006-07 in respect of transmission business of Tata Power Company Ltd (TPC) and the Order in the matter will be issued separately (Case 12 and 56 of 2005).
4. The Commission has approved Annual Revenue requirement of **Rs 36.39 Crore** for FY 2006-07 in respect of transmission business of Reliance Energy Ltd (REL) and the Order in the matter will be issued separately (Case 25 and 53 of 2005).



5. Accordingly, the Commission has approved Total Transmission System Cost (TTSC) of **Rs 1598.11 Crore** for the intra-State transmission system (InSTS) for FY2006-07, as summarized in the following table.

Transmission Utilities	Approved ARR for FY 2006-07 (Rs Cr)
MSETCL - Transmission ARR	1393.13
TPC-Transmission ARR	168,59
REL-Transmission ARR	36.39
TTSC (InSTS)	1598.11

B] Peak Demand and Base Transmission Capacity Utilisation

6. In the absence of adequate metering infrastructure, the Commission recognized that it would not be possible to establish utilization of transmission capacity based on co-incident peak demand of various transmission system users (distribution licensees). Accordingly, the Commission directed the licensees to furnish their monthwise 'peak demand' for FY 2005-06 within two weeks from issuance of Order for Transmission Pricing Framework.

7. MSETCL has furnished month-wise peak demand for State and Mumbai licensees during FY2005-06 vide its letter dated MSETCL/Co/CP-RC/Trans Pricing/Compliance/6929 on July, 12, 2006. TPC has furnished month-wise Peak Demand for TPC-Distribution during FY2005-06 vide its letter MERC/06/145 dated August 8, 2006. REL has furnished month-wise Peak Demand in MVA terms for REL-Distribution vide its letter dated July 15, 2006. TPC had also furnished month-wise details of Peak demand as billed to BEST and REL during FY2005-06 in response to Commission's queries on June 19, 2006. The Annexure-4 and Annexure-6 of the said response provided month-wise details of 'Peak Demand' in MVA terms and average power factor.

8. The Commission notes that the Peak Demand data for MSEDCL is derived based on ex-bus generation of state generating stations as well as power purchase from central generating stations and other sources. Further, above information is based on information as captured by SCADA for the purpose of system operations and monitoring and could be at variance as compared to demand data as recorded by energy meters. However, in the absence of more reliable



source of information, the Commission has considered above information as submitted by MSEDCL Peak Demand for further computations.

9. The Commission also observes that REL has furnished month-wise Peak Demand data in MVA terms (instead of MW terms) and the said data is based on recorded meter readings for energy supply received at its periphery (T<>D interface). Similarly, Peak Demand data as presented in case of BEST is based on meter reading data billed by TPC to BEST at its periphery (T<>D interface). As regards, Peak Demand data for TPC-distribution, TPC has submitted that as there is no metering arrangement to measure Peak Demand, hence the same has been derived as difference of various recorded parameters for generation, consumption and transmission losses.

10. Thus, the Commission recognises that even where metering arrangement is in place, there are several constraints in arriving at aggregate of Non-coincident Peak Demand for the intra-State Transmission system, as Peak Demand of each transmission system user will have to be referred to common reference point (say, ex-generation bus), after taking into account transmission losses and Peak Demand referred in MVA terms will have to be converted into MW terms upon adjusting for power factor. For this purpose, the Commission has considered average power factor as furnished by TPC and the composite transmission loss of 4.85% as already approved by the Commission.

11. Accordingly, the Commission has approved Base Transmission Capacity of **12085 MW** for FY 2006-07 for use of Intra-State transmission system by various TSUs (distribution licensees), based on their actual utilisation (or Peak Demand as derived) during FY 2005-06 as summarized in the following table.

Non-Coincident Peak Demand of various TSUs (MW)					
Months	MSEDCL (MW)	TPC-D (MW)	REL-D (MW)	BEST-D (MW)	SUM (MW)
Apr.05	9829	452	1329	808	12418
May 05	9758	468	1302	801	12329
Jun 05	9582	459	1326	847	12215
Jul 05	8683	441	1290	788	11202



Non-Coincident Peak Demand of various TSUs (MW)					
Months	MSEDCL (MW)	TPC-D (MW)	REL-D (MW)	BEST-D (MW)	SUM (MW)
Aug 05	8617	508	1241	769	11134
Sep 05	9214	481	1279	784	11758
Oct 05	9885	448	1339	815	12486
Nov 05	9911	409	1275	711	12305
Dec 05	9873	450	1278	718	12319
Jan 06	9634	428	1224	691	11976
Feb 06	9720	430	1306	765	12222
Mar 06	10045	521	1302	791	12659
Average	9563	458	1291	774	12085

C] Determination of Transmission Tariff for FY2006-07

12. In line with clause 4.2.5 of the Commission's Order for Transmission Pricing Framework and based on approved TTSC (Clause 5 of this Order) and approved Base Transmission Capacity Utilisation (Clause 11) of the Order, the Commission hereby determines Transmission Tariff for use of intra-State Transmission System for FY 2006-07 as under:

Item Description	Unit	Value
Total Transmission System Cost (TTSC)	Rs Cr	1598.11
Base Transmission Capacity Utilisation (Aggregate of Non-coincident Peak demand)	MW	12085
Base Transmission Tariff	Rs/kW/month	110.20
Base Transmission Tariff	Rs/MW/day	3623

13. Further, it is clarified that Transmission Tariff in case of short term open access transactions shall be 25% of that applicable for long term open access transactions as stipulated under Clause 3.2.5.6 of Commission's Order dated June 27, 2006 (Case 58 of 2005). The relevant extract of said Order is as under:

3.2.5.6 The transmission charge in case of short term transmission open access transactions shall be denominated in Rs/MW/day or Rs/MW/Hr and shall be 25% of that applicable for long term transmission open access transactions. The short term



transmission charges shall be payable for minimum 6 hours duration within a day and shall be accordingly 1/4th of short term transmission open access charge per day. The recovery from short term transmission open access charges shall be used to reduce total transmission system charge (TTSC) for the intra-State transmission system and in turn benefit long term transmission system users.

14. Accordingly, Transmission Tariff for short term open access transactions for FY2006-07 shall be **Rs 907.75 per MW per day or Rs 37.74 per MW per hour**. Further, it is clarified that as stipulated under clause 3.2.5.6 of Order for Transmission Pricing Framework, the short term transmission charges shall be payable for minimum 6 hours duration within a day and shall be accordingly 1/4th of short term transmission open access charge per day. The recovery from short term transmission open access charges shall be used to reduce total transmission system charge (TTSC) for the intra-State transmission system and in turn benefit long term transmission system users.

D] Sharing of TTSC amongst Transmission System Users (TSUs) for FY 2006-07

15. The total transmission system cost (TTSC) shall be shared amongst the long term transmission system users comprising distribution licensees such as MSEDCL, TPC-D, REL-D and BEST-D in accordance with their share of non-coincident peak demand as summarised in the following table.

TSU - Distribution Licensees	Share of Non-Coincident Peak Demand	TTSC for FY2006-07	% Sharing of TTSC
	(MW)	(Rs Cr)	%
MSEDCL	9563	1264.53	79.1%
TPC-Distribution	458	60.55	3.8%
REL-Distribution	1291	170.70	10.7%
BEST-Distribution	774	102.33	6.4%
TOTAL	12085	1598.11	100.0%

16. As outlined under paragraph 34 below, this Transmission Tariff Order shall be applicable with effect from October 1, 2006. STU shall collect Transmission Tariff from transmission system users on monthly basis at the end of each calendar month with first monthly period



commencing from October 1, 2006. STU shall collect 'Transmission Tariff' from transmission system users over 6 monthly period from October 2006 to March 2007 in following manner.

TSU - Distribution Licensees	Monthly TTSC or Transmission Tariff	Oct-06 to Mar-07
	(Rs Cr/month)	(Rs Cr)
MSEDCL	105.38	632.26
TPC-Distribution	5.05	30.27
REL-Distribution	14.23	85.35
BEST-Distribution	8.53	51.17
TOTAL	133.18	799.06

17. It is clarified that above Transmission charges are payable by all long term transmission system users irrespective of their actual utilisation (peak demand) recorded during the period of operation. In case, actual utilisation of transmission capacity by any long term TSU exceeds the allocated transmission capacity then, the same shall be governed as per MERC (Transmission Open Access) Regulations, 2005. Further, it is clarified that the usage, assignment and surrendering of un-utilised transmission capacity by transmission system user shall be governed by Regulation 9 of MERC (Transmission Open Access Regulations) 2005. The transmission system users shall be entitled to use surplus transmission capacity through short term open access subject to payment of short term open access charges and governed by MERC (Transmission Open Access) Regulations, 2005 and other regulations, as applicable. Additional penal charges shall be levied for excess utilisation of transmission capacity in accordance with Regulation 11.4 of MERC (Transmission Open Access) Regulations 2005.

18. The recovery of ARR of transmission licensees for FY2006-07 is discussed separately in the following paragraph.

E] Recovery of ARR by Transmission Licensees for FY2006-07

19. As per Clause 4.2.3 and Clause 4.2.14 of the Commission's Order for Transmission Pricing Framework (Case 58 of 2005), the ARR of transmission licensees is pooled together to form TTSC for intra-State transmission system and each transmission licensee is entitled to recover its approved ARR from the transmission tariff collected by STU from transmission



system users (i.e. distribution licensees) as outlined in clause 15 above. The relevant extract of said Order is as under:

“4.2.3 Aggregate of Annual Revenue Requirement of all licensees, as approved by the Commission, shall form “Pooled Cost” (or hereinafter termed as “Total Transmission System Cost – TTSC) of the intra-State transmission system, to be recovered from the Transmission System Users (TSUs).

4.2.14 Each transmission licensee shall be entitled to recover its approved ARR from intra-State transmission system charges (InSTS charges) collected by STU.”

20. As outlined under paragraph 34 below, this Transmission Tariff Order shall be applicable with effect from October 1, 2006. STU shall collect Transmission Tariff from transmission system users on monthly basis at the end of each calendar month with first monthly period commencing from October 1, 2006. Thus, each Transmission licensee, in turn, shall be entitled to recover its approved ARR from Transmission Tariff collected by STU on monthly basis at the end of each calendar month with first monthly period commencing from October 1, 2006. Thus, each transmission licensee shall claim recovery of its ARR by way of raising monthly bill on STU covering its component of intra-State transmission charges in the following manner:

Transmission Utilities	Approved ARR for FY 2006-07	Approved Monthly ARR	Oct-06 to Mar-07
	(Rs Cr)	(Rs Cr/ month)	(Rs Cr)
MSETCL – Transmission ARR	1393.13	116.09	696.57
TPC-Transmission ARR	168.59	14.05	84.30
REL-Transmission ARR	36.39	3.03	18.20
TTSC (InSTS)	1598.11	133.18	799.06

21. All transmission system users shall ensure timely payment of Transmission Tariff to STU so as to enable STU for timely settlement of claims raised by transmission licensees. All payments related to transmission charges shall be due for payment within 7 days from date of invoice. In case, there is delay in payment by any of the TSU, late payment surcharge at the rate of 1.25% per month or part thereof shall be applicable. The Commission recognises that modalities of ‘Pooling’ necessitate appropriate payment security arrangement to be put in place



and procedure for disbursement to settle claims of various transmission licensees, in case of shortfall in payment by any of the TSU for a particular month. The Commission is of the view that the Grid Co-ordination Committee (GCC) should propose a suitable payment security mechanism and procedure of payment disbursement in case of shortfall in collection in any particular month, upon due consultation amongst transmission licensees and transmission system users. The GCC should propose appropriate mechanism for Commission's approval within one month from date of this Order.

F] Energy Accounting and Treatment of transmission loss

22. The Commission under its Order (Clause 3.8.2 – Case 58 of 2005) directed MSETCL as Government Company undertaking SLDC operations to submit its Status Report and Action Plan for establishment of 'Energy Accounting Centre' within one month from date of issue of that Order.

23. MSETCL, vide its letters dated July 26, 2006 and August 11, 2006 has furnished its phasewise plan for installation of meters at interface points and establishment of Energy Accounting Cell to undertake State-wide energy accounting. During Phase-I of the proposed plan, MSETCL intends to cover inter-State and inter-Utility lines within State in following manner:

- Ø Providing 224 nos of ABT compliant meters at interface points
- Ø Hardware and software required at sub-station level for Automatic Meter Reading of ABT compliant meters
- Ø Time synchronisation of equipment at each sub-station
- Ø Hardware and software required for data processing at central location i.e. SLDC-Kalwa
- Ø Communication system through V-SAT link between various sub-stations and SLDC for on-line data transfers.
- Ø Software and hardware for monitoring at five transmission zones.

24. SLDC has established Energy Accounting Cell headed by SE alongwith deployment of requisite supporting staff as on August 2006. Until December 2006, it plans to undertake and complete various activities related to energy accounting such as defining processes, procedures for data gathering and energy accounting, manpower training etc.

25. The Commission hereby directs SLDC to expedite establishment of Energy Accounting Centre and co-ordinate with all transmission licensees and distribution licensees to establish procedures for information sharing, flow of data, including demand forecast and records energy



flow at various interface points as outlined under paragraph 28 below. The Energy Accounting Centre should be operational not later than December 31, 2006.

26. As regards accounting of transmission losses for intra-State transmission system, the Commission observes that as per Regulation 14 of the MERC (Transmission Open Access) Regulations, 2005 the energy losses in an intra-State transmission system, as determined by SLDC and approved by the Commission are required to be borne by the Transmission System User pro-rata to their usage of intra- State transmission system. The relevant extract of said Regulations is as under:

“The energy losses in an intra-State transmission system, as determined by the State Load Despatch Centre and approved by the Commission, shall be borne by the Transmission System Users pro rata to their usage of the intra-state transmission system” (Regulation 14 of TOA Regulations).”

27. Based on CPRI study, the Commission has approved transmission losses for Intra-State Transmission system as 4.85% for FY2006-07. In addition, Commission in its Order dated June 27, 2005 (Case 58 of 2005) for Transmission Pricing Framework has extensively dealt with the issue of treatment of transmission loss for intra-State transmission system and energy accounting thereof. The relevant extract of said Order is as under:

4.2.10 Transmission loss shall be borne by all TSUs (off-takers) on pro-rata basis based on their energy drawal depending on actual transmission loss level. Any variation in the actual transmission loss level from the normative transmission loss level, if any, set by the Commission shall be adjusted in accordance with the provisions contained under MERC (Terms and Conditions for Tariff) Regulations 2005.

4.2.13 MSETCL, as Government Company operating the SLDC, shall be responsible for undertaking recording of State-wide energy accounts, monitoring of power flows and recording of utilization of capacity across intra-State transmission system.

28. Further, in the said Order, the Commission has observed that as per Section 32 of the EA 2003, the SLDC is required to maintain the records of quantity of energy flowing through the State grid. In the earlier scenario of bundled utilities, this can be done using very simple



accounting procedures. However, under restructured scenario, the SLDC will have to maintain the records of energy flows for following interface points.

- **Generation-Transmission interface:** Energy flow from each generating station to the transmission company;
- **Transmission-Distribution interface:** Energy drawn by each Distribution Licensee from its interconnection with transmission licensee including inter-se energy flow amongst existing Licensees at each of the interface points;
- **STU-CTU interface:** Energy injected by the Central Generating Stations into the State grid;
- **Generation-Distribution interface:** Energy generated by the generators who are supplying power to the consumers on the basis of bilateral contracts connected at distribution level.
- **Distribution-Distribution interface:** Energy exchange amongst distribution licensees at sub-transmission or distribution level.

29. The Commission would like to emphasise that in an integrated power system operations, composite transmission loss of the Intra-State transmission system will have to be borne by all transmission system users (distribution licensees in this case) in proportion to their drawal, it is important to ascertain transmission loss of InSTS. The Commission has outlined under Appendix-1 a detailed methodology for determination of Transmission loss based on energy meter readings to be recorded by SLDC.

30. The Energy loss determined in accordance with Appendix-1 shall be borne by all Transmission system users in proportion to their actual drawl for the period (say, calendar month) under consideration for which such transmission loss is determined.

31. In other words, actual energy units drawn by TSU (as recorded by T\leftrightarrowD interface) shall be grossed up by applying composite transmission loss factor (i.e. multiplication factor of $1/(1-\text{loss}\%)$), as determined based on methodology outlined under Appendix-1 on monthly basis. The grossed up energy drawal by each TSU (or distribution licensee) shall be compared against the energy contracted (through own generation or power purchase by concerned TSU) to establish overdrawal or under-drawal by the concerned TSU (or distribution licensee). The overdrawal and underdrawal by various TSUs shall be settled on the basis of weighted average system marginal price prevalent for the month and shall be paid for by overdrawing TSU to under-drawing TSU.



SLDC will have to develop a centralised pooling mechanism to undertake such financial settlement of over-drawal/under-drawal of energy transactions. The SLDC will have to put in place an energy account reconciliation and settlement mechanism before December 31, 2006. The Commission hereby directs SLDC to submit and present before the Commission, its action plan and proposed settlement mechanism to undertake energy accounting and settlement of energy transactions amongst TSUs within three weeks from date of this Order.

32. It is clarified that the TSUs (or distribution licensees) shall continue to pay to generating companies based on their actual energy injections in accordance with their power purchase agreements.

33. As regards, day ahead scheduling, the demand forecast of each TSU (at T\leftrightarrowD interface) shall be grossed up Loss factor of 4.85% (approved level of transmission loss for InSTS for FY 2006-07) to arrive at ex-bus energy input requirement of each TSU. This information would be utilised by SLDC to schedule generation on day-ahead basis considering merit order despatch principles.

G] Applicability of Order

34. This Order shall be valid till March 31, 2007 and shall be deemed to be effective prospectively, from the month of October 2006. The Transmission licensees are required to submit their multi-year ARR/Tariff application for FY 2007-08 to FY 2009-10 by November 30, 2006.

Sd/-
(S B Kulkarni)
Member

Sd/-
(A. Velayutham)
Member

Sd/-
(Dr. Pramod Deo)
Chairman

Sd/-
Secretary, MERC



APPENDIX-1

Accounting of Transmission Loss for Intra-State transmission System

1. Transmission loss for Intra-State Transmission System = $(E_I - E_O) \times 100 / E_I$

Where, E_I = Total Energy Input to the Intra-State Transmission System at all generation to transmission (G<>T) and transmission to distribution (T<>D) interface points (typically at 400kV, 220kV, 132kV, 66kV) for each calendar month

E_O = Total Energy Output from the Intra-State Transmission System at all transmission to distribution (T<>D) interface points (typically at 132kV, 66kV, 33kV & 11kV) for each calendar month

2. $E_I = E_{MSPGCL(I)} + E_{CGS(I)} + E_{IPPs(I)} + E_{CPPs(I)} + E_{TPC-G(I)} + E_{REL-G(I)} + E_{EHT-TOA(I)} + E_{UI(I)}$

Where,

- $E_{MSPGCL(I)}$ = Gross energy import to InSTS from Thermal and Hydel station of MSPGCL at 400kV, 220kV, 132kV, 66 kV interface points
- $E_{CGS(I)}$ = Net energy import to the InSTS from all CGS and interstate interface points. This information is supplied on a weekly basis from the REA.
- $E_{UI(I)}$ = Net energy import to the InSTS on account of UI energy. This information is supplied on a weekly basis from the REA.
- $E_{IPPs(I)}$ = Gross energy import to InSTS from Independent Power Producers (RGPPL or future IPPs)
- $E_{CPPs(I)}$ = Gross energy import to InSTS from Captive Power Plants at 220kV & 132kV
- $E_{TPC-G(I)}$ = Gross energy import to InSTS from TPC-Generation
- $E_{REL-G(I)}$ = Gross energy import to InSTS from REL-Generation
- $E_{EHT-TOA(I)}$ = Gross energy import to InSTS from Conventional and Non-conventional Transmission OA Users at 132kV



$$3. \mathbf{E}_O = \mathbf{E}_{\text{MSEDCL-LV(E)}} + \mathbf{E}_{\text{MSEDCL-EHT(E)}} + \mathbf{E}_{\text{TPC-D-LV(E)}} + \mathbf{E}_{\text{TPC-D-EHT(E)}} + \mathbf{E}_{\text{REL-D-LV(E)}} + \mathbf{E}_{\text{REL-D-EHT(E)}} + \mathbf{E}_{\text{BEST-D-LV(E)}} + \mathbf{E}_{\text{BEST-D-EHT(E)}} + \mathbf{E}_{\text{EHT-TOA(E)}}$$

Where,

$E_{\text{MSEDCL-LV(E)}}$	=	Gross Energy supplied to MSEDCL at 33kV and 11kV LV side of power transformers (energy measured at Grid sub-station premises)
$E_{\text{MSEDCL-EHT(E)}}$	=	Gross Energy Supplied to MSEDCL at 220kV, 132kV and 66kV interface points to direct EHT consumers (energy measured in Grid sub-station premises)
$E_{\text{TPC-D-LV(E)}}$	=	Gross Energy supplied to TPC-D at 33kV and 11kV LV side of power transformers (energy measured at Grid sub-station premises)
$E_{\text{TPC-D-EHT(E)}}$	=	Gross Energy Supplied to TPC-D at 220kV, 132kV and 66kV interface points to direct EHT consumers (energy measured in Grid sub-station premises)
$E_{\text{REL-D-LV(E)}}$	=	Gross Energy supplied to REL-D at 33kV and 11kV LV side of power transformers (energy measured at Grid sub-station premises)
$E_{\text{REL-D-EHT(E)}}$	=	Gross Energy Supplied to REL-D at 220kV, 132kV and 66kV interface points to direct EHT consumers (energy measured in Grid sub-station premises)
$E_{\text{BEST-D-LV(E)}}$	=	Gross Energy supplied to BEST-D at 33kV and 11kV LV side of power transformers (energy measured at Grid sub-station premises)
$E_{\text{BEST-D-EHT(E)}}$	=	Gross Energy Supplied to BEST-D at 220kV, 132kV and 66kV interface points to direct EHT consumers (energy measured in Grid sub-station premises)
$E_{\text{EHT-TOA(E)}}$	=	Gross Energy Supplied from InSTST to Transmission Open Access Users at 220kV and 132kV

