A. About Punjab State Electricity Regulatory Commission (PSERC):

1. Punjab State Electricity Regulatory Commission (PSERC) has been constituted by the Government of Punjab under section 17 of the Electricity Regulatory Commissions Act,1998 vide its Notification dated 31.3.1999 to discharge the duties and perform the functions specified under Section 22 of the Act.

2. The Commission is performing various functions as per Section 86 (1) of the Electricity Act, 2003 (36 of 2003).

   Further, the Commission provides advice to the State Government on various issues as per Section 86(2) of the Act.

   The State Commission ensures transparency while exercising its powers and discharging its functions.

   In discharge of its functions, the Commission follows, as far as possible, the National Electricity Policy, National Electricity Plan and Tariff Policy published under Section 3 of the Act.

3. Under the powers vested with it vide Section 181 of the Electricity Act, 2003, the Commission has so far framed the following regulations:

   a. Conduct of Business Regulation
   b. Procedure for filing appeal before the Appellate Authority
   c. Fee Regulation
   d. Income of other Businesses
   e. Open Access Regulations
   f. Forum and Ombudsman
   g. Terms and Conditions for Determination of Tariff
   h. State Advisory Committee
   i. Accounting Policy & Procedures
   j. Engagement of Consultants
   k. State Grid Code
   l. Intra State Electricity Trading
   m. Electricity Supply Code and related matters
   n. Single Point Supply to Co-operative Group Housing Societies
   o. Harnessing of Captive Power Generation
   p. Renewable Purchase Obligation and its compliance
   q. Demand Side Management Regulations
   r. Power Purchase and Procurement Process of Licensee
   s. Multi-Year Tariff Regulations

4. Punjab State Electricity Regulatory Commission (PSERC) in compliance to section 61 of the Electricity Act, 2003 has notified the PSERC (Terms & Conditions for the Determination of Tariff) Regulations, 2005 for determination of Aggregate Revenue Requirement and Tariff of Generating Company/Licensee. PSERC has issued 19 Tariff Orders (including 5 for Transmission licensee) since 2002-03. PSERC is following the due process of law as laid in the Electricity Act, 2003, including inviting objections from all the stakeholders and also conducts public hearings at various places to hear the objections/comments from the public at large. The Aggregate Revenue Requirement of the generator/ licensee is also discussed in the State Advisory Committee, before finalizing the Tariff Order.

For FY 2007-08, the licensee did not file the ARR & Tariff Petition. As such, the Commission determined the Tariff through suo-motu petition and the Tariff Order was issued on Sept. 17, 2007.

The dates of issuance of Tariff Order of PSPCL for the last 5 years are as under:

a) **FY 2011-12 :**

Date of Filing of ARR Petition by the utility : 30.11.2010

Date of Issuance of Tariff Order : 09.05.2011

Note: The licensee (PSPCL) filed the ARR petition on 30.11.2010. As the petition filed by PSPCL did not contain any proposal to cover the projected gap, PSPCL was requested to submit the tariff or any other proposal to cover this gap. The ARR petition was taken on record on 16.12.2010 after receipt of reply from PSPCL in this regard. On scrutiny of the ARR, some deficiencies were observed, which were replied by PSPCL vide its letters dated 02.02.2011 and 10.03.2011.

b) **FY 2012-13 :**

Date of Filing of ARR Petition by the utility : 30.11.2011

Date of Issuance of Tariff Order : 16.07.2012

Note: The delay in issuance of Tariff Order was due to the following:

a. The licensee (PSPCL) filed the ARR petition on 30.11.2011. As the petition filed by PSPCL did not contain any proposal to cover the projected gap, PSPCL was asked to submit the tariff or any other proposal to cover this gap. The ARR was taken on record on 01.12.2012. On scrutiny, it was noted that the ARR was deficient in some respects, the reply to which was submitted by PSPCL vide its letters dated 06.01.2012, 10.01.2012, 16.01.2012, 19.01.2012 and subsequent submissions.

b. The delay in issuance of Tariff Order was due to Model Code of Conduct which remained enforced on account of State Assembly Elections.

c) **FY 2013-14 :**

Date of Filing of ARR Petition by the utility : 30.11.2012

Date of Issuance of Tariff Order : 10.04.2013

Note: The licensee (PSPCL) filed the ARR on 30.11.2012. On scrutiny, it was observed that the ARR was deficient in some respects. The ARR was taken on record on 19.12.2012 after the information was furnished by PSPCL. The Commission sought additional information, which was supplied by PSPCL vide its letters dated 08.01.2013 and 24.01.2013 and subsequent submissions.

d) **FY 2014-15 :**

Date of Filing of ARR Petition by the utility : 29.11.2013

Date of Issuance of Tariff Order : 22.08.2014

Note: The delay in issuance of Tariff Order was due to the following:

a. *The licensee (PSPCL) filed the ARR on 29.11.2013. On scrutiny of the ARR, some deficiencies were observed which were conveyed to the PSPCL vide Commission's letter dated 04.12.2013, the reply to which was furnished by PSPCL vide its letter dated 10.12.2013. The Commission took the ARR on record on 18.12.2013.The Commission sought additional information from PSPCL, which was furnished by PSPCL vide its letter dated 31.12.2013.*

b. *Model Code of Conduct remained in force on account of Parliament Elections and Elections of State Bodies.*

e) **FY 2015-16 :**

Date of Filing of ARR Petition by the utility : 27.11.2014

Date of Issuance of Tariff Order : 05.05.2015

Note: The delay in issuance of Tariff Order was due to the following:

a. *The licensee (PSPCL) filed the ARR on 27.11.2014. On scrutiny of the ARR, some deficiencies were observed which were conveyed to the PSPCL vide Commission's letter dated 01.12.2014, the reply to which was furnished by PSPCL vide its letter dated 09.12.2014. As the reply submitted by PSPCL was still deficient, the Commission sought additional information from PSPCL, which was furnished by PSPCL vide its letter dated 15.12.2014. The Commission took the ARR on record on 18.12.2014.*

b. *The delay in issuance of Tariff Order was due to Model Code of Conduct which remained enforced on account of bi-election to State Assembly.*

5. The interest of the common people is being kept in view while fixing the tariff for the particular category.

- For domestic consumers, PSERC in its Tariff Orders has fixed the slab wise tariff. The domestic consumers who consume less electricity have to pay at lower tariff rates. PSERC introduced kVAh tariff for Domestic category of consumers having loads exceeding 50 kW and upto 100kW w.e.f. 01.10.2015. Earlier it was available for loads exceeding 100kW. The rates for domestic category as per Tariff Order for FY 2015-16 are as under:

Sr. No.	Category of consumers	Tariff
1	**Domestic (for loads upto 50kW)**	
a)	Upto 100 kWh	452 paise/kWh
b)	Above 100 kWh and upto 300 kWh	614 paise/kWh
c)	Above 300 kWh	656 paise/kWh
2	**Domestic (for loads exceeding 50 kW and upto 100kW) (from 01.04.2015 to 30.09.2015)**	
a)	Upto 100 kWh	452 paise/kWh
b)	Above 100 kWh and upto 300 kWh	614 paise/kWh
c)	Above 300 kWh	656 paise/kWh
3	**Domestic (for loads exceeding 50 kW and upto 100kW) (from 01.10.2015 to 31.03.2016)**	
a)	Upto 100 kWh/kVAh	407 paise/kVAh
b)	Above 100 kWh/kVAh and upto 300 kWh/kVAh	553 paise/kVAh
c)	Above 300 kWh/kVAh	590 paise/kVAh
4	**Domestic (for loads/demand exceeding 100kW/kVA)**	
a)	Upto 100 kVAh	416 paise/kVAh
b)	Above 100 kVAh and upto 300 kVAh	565 paise/kVAh
c)	Above 300 kVAh	604 paise/kVAh

- For Non-residential category consumers also, PSERC in its Tariff Order for FY 2015-16 has fixed the slab wise tariff. The non-residential category consumers (mostly in rural areas) consuming less electricity have to pay at lower tariff rate. PSERC also introduced kVAh tariff for non-residential category of consumers having loads exceeding 50 kW and upto 100kW w.e.f. 01.10.2015. Earlier it was available for loads exceeding 100kW. The rates for non-residential category as per Tariff Order for FY 2015-16 are as under:

Sr.No.	Category of Consumers	Tariff
1	**Non-Residential Supply (for loads upto 50kW)**	
a)	Upto 100 kWh	653 paise/kWh
b)	Above 100 kWh	675 paise/kWh
2	**Non-Residential Supply (for loads exceeding 50 kW and upto 100kW) (from 01.04.2015 to 30.09.2015)**	
a)	Upto 100 kWh	653 paise/kWh
b)	Above 100 kWh	675 paise/kWh
3	**Non-Residential Supply (for loads exceeding 50 kW and upto 100kW) (from 01.10.2015 to 31.03.2016)**	
a)	Upto 100 kWh/kVAh	588 paise/kVAh
b)	Above 100 kWh/kVAh	608 paise/kVAh
4	**Non-Residential Supply (for loads/demand exceeding 100kW/kVA)**	
a)	Upto 100 kVAh	601 paise/kVAh
b)	Above 100 kVAh	621 paise/kVAh

- The tariff for different industrial category has also been fixed keeping in view whether the industry is small, medium or large. The rates for Industrial categories as per Tariff Order for FY 2015-16 are as under:

  For Small Power Category - ₹ 5.85/kWh
  For Medium Supply Category - ₹ 5.87/kVAh
  For Large Supply Category - ₹ 6.14/kVAh

- The Commission determined the Open Access Charges for FY 2015-16, which are as under:

A. Transmission Charges

a)	Transmission Charges for Long Term and Medium Term Open Access customers	₹ 68313/MW/Month of the contracted capacity
b)	Transmission Charges for Short Term Open Access customers	19 paise/kWh or 17 paise/kVAh

B. Wheeling Charges

a)	Wheeling charges for Long Term and Medium Term Open Access customers availing supply at 220/132/66/33/11 kV (in addition to Transmission charges)	₹ 353010/MW/Month of the contracted capacity
b)	Wheeling charges for Short Term Open Access customers availing supply at 220/132/66/33/11 kV (in addition to Transmission charges)	108 paise/kWh or 97 paise/kVAh

C. Transmission and Wheeling charges for wheeling of NRSE power for consumption within the State shall be levied @ 2% of the energy injected into the State Grid, irrespective of distance. In case of wheeling of NRSE Power outside the State, full transmission and wheeling charges shall be leviable.

D. SLDC Charges

a)	SLDC Charges for Long Term and Medium Term Open Access Customers	₹ 1324/MW/Month of the contracted capacity
b)	SLDC Charges (composite operating charge) for Short Term Open Access Customers	₹ 2000 per day or part of the day for each transaction

E. Cross Subsidy Surcharge for various categories of Open Access Customers

Large supply	89 paise/kWh (85 paise/kVAh for Large Supply General Industry and 87 paise/kVAh for Large Supply PIU/Arc Furnace industry)
Domestic supply	92 paise/kWh (85 paise/kVAh)

Non-Residential supply	107 paise/kWh (98 paise/kVAh)
Bulk supply	55 paise/kWh (52 paise/kVAh)
Railway Traction	82 paise/kWh (80 paise/kVAh)

F. Transmission & Distribution losses for Open Access customers

(i)	OA customers at 132/220 kV	2.5%
(ii)	OA customers at 66/33 kV	15% of distribution losses (13.55%), which works out to 2.03%, in addition to Transmission Loss of 2.5%.
(iii)	OA customers at 11 kV	40% of distribution losses (13.55%), which works out to 5.42%, in addition to Transmission Loss of 2.5%.

G. In addition, other charges such as additional surcharge, operation charges, UI charges, reactive energy charges, shall be levied as per the Open Access Regulations / Tariff Regulations notified by the Commission.

6. <u>kVAh tariff:</u>

In the Tariff Order for FY 2014-15, kVAh tariff was introduced for Large Supply, Medium Supply, Bulk Supply, Railway Traction, DS (load more than 100 kW) and NRS (load more than 100 kW) categories of consumers with effect from 01.04.2014. In the kVAh tariff regime, the consumers of these categories will be compensated for improvement in their power factor, whereas in the kWh tariff regime, the consumers were getting incentive @ 0.25% for each 1% rise in the power factor beyond the threshold limit.

In the Tariff Order for FY 2015-16, kVAh tariff has been extended to DS & NRS category of consumers having loads exceeding 50 kW and upto 100kW, w.e.f. 01.10.2015.

7. <u>ToD tariff:</u>

In the Tariff Order for FY 2013-14, the Commission introduced ToD tariff for Large Supply industrial categories for the period from 01.10.2013 to 31.03.2014. A rebate of □ 1per kVAh was allowed for consumption during off peak hours i.e.

10.00 PM to 06.00 AM. The Commission extended the ToD tariff further for 2 months i.e. 01.04.2014 to 31.05.2015.

In the Tariff Order for FY 2014-15, the Commission approved ToD tariff for Large Supply and Medium Supply industrial categories for the period 01.10.2014 to 31.03.2015. However, it was optional for both categories, subject to arrangement of meters by the consumers who opt for it. Those who do not opt for ToD tariff, unrevised PLEC (before issuance of Tariff Order for FY 2013-14) was applicable. ToD tariff remained operative from October to March of FY 2014-15. For Large Supply industrial category, the rebate during off peak hours was ₹ 1.50per kVAh and PLEC (peak load exemption charges) was replaced with additional charge of ₹ 3/kVAh during peak load hours. For Medium Supply industrial category, the rebate of ₹ 1/kVAhwas approved during off peak hours. There were no additional charges during Peak Load Hours for Medium Supply industrial category.

In the Tariff Order for FY 2015-16, the Commission decides to continue the ToD Tariff for Large Supply and Medium Supply industrial categories for the period from 01.10.2015 to 31.03.2016, on optional basis. The rebate for Large Supply industrial category during off peak hours was reduced from ₹ 1.50 to ₹ 1per kVAh. The other terms of ToD tariff remained the same as these were in FY 2014-15.

8. <u>Cost of Supply:</u>

The Commission, in the Tariff Order for FY 2015-16, has continued to determine the indicative voltage-wise, category-wise cost of supply. The Cost of Supply concept was introduced for the first time by the Commission in the Tariff Order for FY 2013-14. The Commission noted that it would be ideal to fix electricity tariff for all consumers on cost to serve basis. But, historically, there has been extensive cross subsidization in electricity sector. The tariff for consumers, who pay less than the cost to serve, will need to be hiked significantly to cover the gap between the tariff of subsidized consumers and cost to serve these consumers. As such, the Commission decided to raise tariff of subsidized consumers gradually to reduce such gap, and at the same time avoid tariff shock to subsidized consumers and bring the tariffs of various consumers within reasonable limit when compared to cost to serve these consumers. In order to move in the direction of cost of supply in steps, the Commission, in the Tariff order for FY 2013-14, decided to give rebate of 25 paise/unit to all consumers getting supply at 220/132 kV, 20 paise/unit to all consumers getting supply at 66/33 kV and 15 paise/unit to DS, NRS, AP High-Technology, Compost Plants/Solid Waste Management Plants for Municipalities/ Urban Local Bodies and MS category consumers getting supply at 11 kV.

The Commission increased the rebate to 30 paise/kVAh to all consumers getting supply at 220/132 kV, 25 paise/kVAh to all consumers getting supply at 66/33 kV and 20 paise/kVAh to DS, NRS, AP/AP High–Technology, Compost Plants/Solid Waste Management Plants for Municipalities/ Urban Local Bodies and MS category consumers getting supply at 11 kV in the Tariff Order for FY 2014-15.

In the Tariff Order for FY 2015-16, the Commission approved rebate of 30 paise/kVAh to all consumers getting supply at 400/220/132 kV, 25 paise/kVAh to all consumers getting supply at 66/33 kV and 20 paise/kVAh to DS, NRS &MS consumers getting supply at 11 kV and 20 paise/kWh to AP/AP High-Technology, High Density Farming, Compost Plants/Solid Waste Management Plants for Municipalities/ Urban Local Bodies consumers getting supply at 11 kV.

9. **<u>Contract Demand system:</u>**

The contract demand system for Large supply Industrial was already in vogue. The contract demand system for Bulk supply consumers and DS/NRS consumers was introduced with effect from 01.04.2010.

In the Tariff Order for FY 2014-15, the Commission introduced Contract Demand system for Medium Supply industrial category consumers, to facilitate the consumers of this category to install the load as per their requirement, so long as the consumers remain within the sanctioned contract demand.

In the Tariff Order for FY 2015-16, the Commission has introduced the contract demand system for DS & NRS category of consumers having loads exceeding 50 kW and upto 100kW w.e.f. 01.10.2015.

10. The following two Thermal Power Projects have been successfully awarded by the distribution licensee in the State through competitive bidding process under the ‘Guidelines for Determination of Tariff by Bidding Process for Procurement of Power by Distribution Licensees’ issued by the Government of India, Ministry of Power, framed under the provisions of section 63 of The Electricity Act, 2003:

a) Talwandi Sabo Thermal Power Project (1800 MW ± 10%):

The Commission adopted the evaluated levellised Tariff of ₹2.8643/kWh vide its Order dated 14.01.2009 after the procurer PSEB (now PSPCL) signed the PPA on 01.09.2008 with Talwandi Sabo Power Ltd., the SPV company incorporated by the then PSEB and taken over by the successful bidder Sterlite Energy Ltd.

b) Rajpura Thermal Power Project [1200 MW ± 10% (revised to 2x700 MW)]:

The Commission adopted the evaluated levellised Tariff of ₹2.89 /kWh vide its Order dated 14.07.2010 after the procurer PSEB (now PSPCL) signed the PPA on 18.01.2010 with Nabha Power Ltd., the SPV company incorporated by the then PSEB and taken over by the successful bidder L&T Power Development Ltd.

11. To ensure that the private generators in the State get adequate return, the Commission, on directions from the Hon'ble APTEL, approved the competitive bidding process undertaken by the private generators for procurement of coal from alternative sources including imported coal for a period of 12 months from expected commencement of operation of the first unit of the project, to the extent of established shortfall in supply of coal by the linked sources as per the Fuel Supply Agreement (FSA) and pass on the cost of such coal to the procurer as per the terms & conditions of the PPA. The first unit of both the projects i.e. NPL, district Patiala and TSPL, district Mansa stand commissioned on 01.02.2014 and 05.07.2014 respectively. Similarly, in case of a private hydro generator (Malana-II) dedicating its 100% power to the State, the cap on the hydro tariff was removed by the Commission and a viable Tariff was allowed for a period of 40 years.

B. Impact of decisions taken by the Commission:

1. Fuel Audit of Thermal Stations of Punjab State Power Corporation Limited

PSERC completed a Fuel Audit study through Central Power Research Institute (CPRI), whereby a capital investment of ₹8.58 crore shall lead to an annual saving of ₹ 317.20 crore. PSERC is the first Commission in India to get it implemented by the State utility.

The salient areas of fuel saving and cost reduction are:

- Review of the measuring methods and points of measurement of GCV of coal.
- Reduction in the drop of GCV of bunkered coal vis-à-vis receipted coal restricted to 150 kCal/kg against the then prevailing drop of 900 kCal/Kg.
- Reduction in transit loss between the mine and the TPS (Thermal Power Station).

- Reduction in demurrages through improvement in unloading infrastructure.
- Reduction in quantities of stones received through more vigilance at the loading end.
- Review of contract with washeries regarding the quantity and quality of coal inputs and outputs.
- Achievable station heat rate.

This Fuel Audit Report was sent to CERC, other SERCs and Forum of Regulators, to enable similar fuel audits across India. Now, CERC in its Terms and Conditions of Tariff Regulations, 2014, for time block 2014-2019, has taken cognizance of this pro-consumer step of PSERC and has decided to determine Energy Charge Rate of Thermal Generating Stations on the basis of weighted average Gross Calorific Value of Coal ‘as received’ (instead of earlier provision of ‘as fired’ in its earlier Tariff Regulations).

2. Implementation of Time of Day (ToD) Tariff

The Commission in its Tariff Order for FY 2013-14 decided for introduction of Time of Day (ToD) Tariff for 6 months (October to March) of the year, during off peak hours from 2200 Hrs to 0600 Hrs for Large Supply Industrial category consumers, and approved rebate of ₹ 1/unit on the normal tariff for this category. The period of ToD was subsequently extended upto May, 2014.

In the Tariff Order for FY 2014-15, the Commission extended the ToD Tariff to Medium Supply industrial category also. The Commission approved the ToD Tariff during 6 months (October to March) of FY 2014-15 for Large Supply and Medium Supply industrial categories, with a rebate to ₹ 1.50/kVAh for Large Supply Category and ₹1.00/kVAh for Medium Supply on the normal tariff of these categories.

In the Tariff Order for FY 2015-16, the Commission decided to continue the ToD Tariff for Large Supply and Medium Supply industrial categories during 6 months (October to March) of FY 2015-16, on optional basis, with a rebate to ₹ 1/kVAh on the normal tariff of these categories.

3. Demand Side Management (DSM) Measures

The Commission has notified its Demand Side Management (DSM) Regulations in March, 2012. The Commission in the Tariff Order for FY 2013-14 has suggested the distribution licensee to take following measures to achieve energy savings:

- Replacing electro-magnetic chokes with electronic chokes for tube lights.
- Replacing old fans with energy efficient fans.
- Replacing old ACs and Refrigerators with energy efficient ones.

The licensee has already distributed 16,38,059 nos. CFLs in 4,93,999 households.

The licensee has also been directed to ensure installation of 4 Star labeled pump sets for all new AP connections. Energy audit on a pilot scale was carried out in Punjab by BEE in over 2000 pumps across 6 feeders during the year 2009 to evaluate their operating efficiency and to estimate the savings by replacing the inefficient pumps with star labeled energy efficient pumps (4 star & above). As per finding of the study, in case all 11 lac agriculture pump sets are replaced with efficient pump sets, an investment of ₹ 4500 crore spread over a period of 6-7 years shall be required and an energy saving of 3000 MU worth over ₹ 1300 crore annually (at an average AP rate of ₹4.56 per unit) can be achieved. The simple payback on investment is 3 to 4 years. The licensee has also been directed to come up with a plan for replacement of 100% AP sets with efficient pump sets over coming 3 to 5 years.

PSPCL has signed MoU with Bureau of Energy Efficiency (BEE) for preparation of complete Demand Side Management (DSM) Plan and The Energy & Resource Institute (TERI) has been engaged to carry out load/market survey.

4. Transmission & Distribution (T&D) Loss trajectory

Year	T&D Loss (fixed by the Commission) (%)	T&D Loss projected by PSPCL (%)	T&D Loss determined by the Commission (%) (in True-up)
2009-10	22.00	19.80	21.76
2010-11	20.00	18.49	19.13
2011-12	19.00	17.42	19.10
2012-13	18.00	16.77*	True up yet to be carried out
2013-14	17.00	16.89*	True up yet to be carried out
2014-15	16.00	16.50*	True up yet to be carried out
2015-16	15.50	16.00*	True up yet to be carried out

*as submitted in the ARR for FY 2015-16

5. Revision of Tariff

PSERC has been giving regular tariff rise annually. The revenue gap and the tariff rise from FY 2002-03 to FY 2015-16 has been shown in the table below:

Year	Revenue Gap	Increase in tariff
FY 2002-03	₹ 1421.96 crore (out of which ₹ 1047 crore wasexpected revenue from agriculture consumers and	about 10%

Year	Revenue Gap	Increase in tariff
	balance passed on to consumers through tariff increase)	
FY 2003-04	₹ 487.10 crore	7.45%
FY 2004-05	₹ 438.29 crore (surplus)	(-) 6.00% (decrease)
FY 2005-06	₹ 768.65 crore	10.27%
FY 2006-07	₹ 8.81 crore	0.00% (No increase/ decrease)
FY 2007-08	₹ 423.78 crore	4.90%
FY 2008-09	₹ 249.64 crore	2.60%
FY 2009-10	₹ 1300.08 crore	12.42%
FY 2010-11	₹ 950.86 crore	7.58%
FY 2011-12	₹ 2651.51crore (out of which Regulatory Asset of ₹ 1325.76 crore was created and ₹ 1325.75 crore passed on to consumers through tariff increase)	9.19%
FY 2012-13	₹ 1899.32 crore (including Regulatory Asset of ₹ 1325.76 crore created in FY 2011-12)	12.08%
FY 2013-04	₹ 1782.50 crore	9.06%
FY 2014-15	₹ 593.63 crore	2.74%
FY 2015-16	₹ 45.98 crore	0.00% (No increase/ decrease)*

*However, tariffs of some categories were adjusted in view of social and regulatory requirements.

The Commission has determined the total Revenue Gap during the years 2002-03 to 2015-16 as ₹10819.77 crore and during 2010-11 to 2015-16 as ₹6598.04 crore.

The total increase in the average tariff since 2002-03 (inception of the Commission) is 88.29% and during 2009-10 to 2015-16 is 40.65%. The average increase in tariff since 2002-03 is 6.31% and during 2009-10 to 2015-16 is 6.78%.

The consistent revision & adequate tariff has helped the state distribution utility to turn around & earn profit since FY 2012-13.

6. Reduction in Transmission and Distribution Losses:

The Commission in its Tariff Orders issued the directions to the utility to implement a low cost T&D loss Reduction Programme involving shifting of consumer meters outside consumer premises in pillar boxes, besides re-laying the distribution system by replacing old conductor, balancing load of transformers, executing low resistance earthing system (as per IEEE Guide 80) for distribution transformers etc. In the project executed so far on rural non-AP feeders (most of AP & non-AP feeders have already been segregated in Punjab), about 25 lac consumers out of a total of 38.03 lac. consumers have been covered and the balance 13.03 lac number rural consumers shall be covered shortly. The total project cost is ₹ 1702.60 crore. This project has enabled the state utility to bring down T&D losses substantially. In a pilot low cost T&D loss reduction programme, city of Patiala has been covered by PSPCL departmentally and losses have been reduced from 21.9% (2010-11) to 8% (2013-14) at a cost of ₹ 40 crore per one lac consumers. With completion of R-APDRP programme in Punjab by March 2016, the T&D losses are likely to be less than 15%.

The issue of T&D losses has been extensively discussed by the Commission in its various Tariff Orders. Having determined these losses to be 27.52% (against 25.5% claimed by the erstwhile PSEB) in 2001-02, the Commission had laid down a programme of phased reduction. As per directions issued by the Commission, following steps are being taken by PSPCL for reduction of T&D Losses as well as for strengthening of the distribution system:

(i) Conversion of LT distribution system to HVDS. About 2.21 lac AP connections have been shifted from LVDS to HVDS by installing one DT per AP connection. Balance 7 lac AP connections to be covered under less LT Scheme (maximum length 150 meters). All new AP connections are being released on HVDS.

(ii) Replacement of electro-mechanical meters by electronic meters.

(iii) Installation of line capacitors at all 11 KV feeders in urban and rural areas. Capacitors of about 2600 MVAR have been added.

(iv) Shifting of meters outside consumer premises. About 24.94 lac meters have been shifted under Non-APDRP scheme. Over 5 lac maters have been shifted under R-APDRP scheme.

(v) Providing effective earthing at all the sub-stations and distribution transformers. Out of about 80000 No. DT's, the earthing of 71311 nos DTs has been checked and re-earthing of 33561 DT's has been done.

(vi) Installation of LT capacitors on all AP connections.

(vii) IT implementation by introducing measures like spot billing, GIS mapping and centralized call centres for complaint registration, remote metering etc.

(viii) Refurbishing/strengthening of distribution system including replacement of old conductor.

(ix) Augmentation of overloaded feeders and deloading of distribution transformers.

(x) Theft detection by enforcement agencies.

By taking these steps, the T&D loss of the utility has come down and the Commission has approved T&D loss level at 15.50% in the Tariff Order for FY 2015-16.

C. Innovative Studies carried out by PSERC and their implications:

Innovative studies are being conducted by PSERC with the help of consultants &

a strong support from internal sources. The studies conducted so far are in the matter of:

(a) **<u>Fuel Audit Study</u>**

The Fuel Audit Study conducted through CPRI as explained at para B(1) above was first detailed study in India for Fuel Audit. The Commission accepted the report vide its order dated 08.10.2012, and the recommendation 'to bring down the drop in GCV between receipted coal and bunked coal within 150 kCal/kg' was implemented from 1st November, 2012. From 1st April, 2014, this drop allowed has been reduced to zero.

(b) **<u>Study regarding treatment to be meted to Billet/Induction Heating Load</u>**

The issue of considering the billet/induction heating load as power intensive was analysed by the Commission. The Commission directed the distribution licensee (PSPCL) in the State of Punjab to get the study conducted with regard to treatment to be meted out to the billet/induction heating load. Central Power Research Institute (CPRI), Bangalore carried out a study during which a team of CPRI visited the premises of various consumers having billet/induction heating load. CPRI in its report concluded that consumer load comprising billet heaters and surface hardening machines aggregating to 100 kW or more can be considered as power intensive industry like induction furnaces already treated as power intensive industry by the distribution licensee (PSPCL), as the working principle and operational behavior with respect to power supply and power quality parameters for billet heaters, surface hardening machines and induction furnaces are similar. The distribution licensee (PSPCL) also agreed to CPRI findings in its comments and recommended that all large supply industrial consumers (Connected load of 100 kW or more) where the induction billet heaters/surface hardening machines are installed should be treated under power intensive category. The Commission, accordingly, issued an Order to this effect. The study got carried out by the Commission was first of its kind in the country.

(c) **Technical Audit of Transmission Works of the Distribution and Transmission Utility.**

The Commission has undertaken the technical audit of Transmission Works of the Distribution Utility and Transmission Utility for FY 2010-11 to

FY 2012-13, for which CPRI has been appointed as consultants. The consultants have covered the following aspects regarding technical audit of works executed by PSPCL and PSTCL for the period from 01.04.2010 to 31.03.2013:

(a) Alignment of methodology adopted by the Transmission and Distribution Licensees (PSTCL and PSPCL) for development of a reliable Transmission/Sub-Transmission System for meeting with load demand and evacuation of power from the generating stations

(b) Implementation of provisions of Grid Code

(c) Implementation of various facets of planning and construction by PSTCL & PSPCL

(d) Validation of the technique/software used for Assessment of Demand, Load flow analysis, Contingency Analysis, Short Circuit Analysis and Dynamic Stability Analysis for Voltage wise Capacity Addition Plan

(e) Scrutiny of procedure for award of contracts by PSTCL/PSPCL with reference to principles of economy, efficiency, effectiveness and quality

(f) Scrutiny of physical and financial progress reports relating to project execution, procurement, receipt of funds and expenditure, scheduled date of Commissioning and budgeted expenditure

(g) Scrutiny of time overrun and cost overrun

(h) Whether the companies took up various preparatory activities

(i) Loss due to delay in upgradation/Commissioning of transmission system in terms of flow of energy with respect to Available Transmission Capability (ATC) & Total Transmission Capability (TTC). Financial loss due to blockade of funds due to poor planning

(j) Unfruitful payment of transmission charges to PGCIL due to delay in development of linking system

(k) Matching of construction of substations, related lines and downstream sub-transmission and distribution network

(l) Financial and Technical Loss on account of damage to equipments due to poor design, poor quality of construction (non compliance of requisite specifications/standards) or inadequate protection system

(m) Losses on account of mismatch between available generation capacity and development of transmission and sub-transmission facilities

(n) Whether adequate number of shunt capacitors provided for reactive compensations by PSTCL & PSPCL?

(o) Losses on account of poor planning for inventory management, material at site and purchase of spares

(p) Extent of overloading of the Transmission & Sub-transmission substations

(q) Capital Expenditure incurred/planned to be incurred towards development of smart grid operations, SCADA & SLDC

(r) Expenditure on safety measures and training as per CEA

(s) Cross checking the Transmission System Projects executed by PSTCL to ascertain their necessity

(t) Laid down 'Future Road Map' for development of Transmission and Sub-transmission system

A suo-motu petition (No. 54 of 2014) in the matter was initiated by the Commission for taking appropriate decision in the matter. On the basis of the analysis carried out by the consultants, recommendations given in the report by the consultants and comments of PSPCL on the report, the Commission has given its recommendations/ decisions on the various issues covered in the assignment awarded to the consultants as brought out above. The details of the recommendations/ decisions in the matter are available in the Commission's Order dated 04.12.2014 in case of suo-motu petition no. 54 of 2014.

(d) **Audit of Purchase of Power by the Distribution Utility**

Power purchase being a major item of expense is got verified and compared with the data filed in the ARR petition by PSPCL at the time of processing of the ARR. However, there are number of factors which remain unchecked. In order to check more precisely, the methodology adopted by PSPCL with regard to assessment of demand and energy requirement and availability of power from all contracted sources, the Commission considered it proper and fair to get the Power Purchase Audit of PSPCL. This assignment was given to ABPS Infrastructure Advisory Pvt. Ltd., Mumbai. ABPS Infrastructure Advisory Pvt. Ltd., Mumbai submitted the final report to the Commission. The consultants covered the following aspects regarding the power sold and purchased by PSPCL for the period from 01.04.2010 to 31.03.2013:

- Analysis of Sales
- Energy Availability from Own Generating Stations
- Quantum of Power Procurement from CGSs and other sources
- Power Procurement Cost
- Short Term Power Purchase
- Costly Power Procurement
- UI Transactions
- Drawal/Surrender of Power under UI Mechanism

- Energy Banking
- Financial Implication of Power Purchase
- Transmission Infrastructure

A suo-motu petition (No. 12 of 2014) in the matter was initiated by the Commission for taking appropriate decision in the matter. In this context, a public notice was issued separately inviting comments/ suggestions from the general public and the stakeholders. In response to public notice, PSPCL submitted its comments on the report of the consultants. A public hearing in the matter was also held on 01.04.2014. On the basis of the analysis carried out by the consultants, recommendations given in the report by the consultants and comments of PSPCL on the report, the Commission has given its recommendations/ decisions on the various issues covered in the assignment awarded to the consultants as brought out above. The details of the decisions in the matter are available in the Commission's Order dated 10.10.2014 in case of suo-motu petition no. 12 of 2014. For providing more transparency in power purchase, the Commission has also directed PSPCL to submit various reports on daily basis and monthly basis as brought out in the Commission's ibid order.

(e) The utility has been asked to conduct a third party audit of loss reduction projects executed by PSPCL and conduct study for Implementation Model for T&D loss reduction on the pattern of South Korea where losses have been reduced from 40% to less than 4%.

D. Other data Related with Punjab State Electricity Regulatory Commission:

(a) Punjab State Electricity Regulatory Commission created Regulatory Asset of ₹ 1325.76 crore in the Tariff Order for FY 2011-12. The entire Regulatory Asset of ₹ 1325.76 crore alongwith the carrying cost was fully amortised in the Tariff Order for FY 2012-13.

(b) Cross subsidy Surcharge for last few years:

Sr. No.		Consumer Category	Cross Subsidy Levels (%age)				
			FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
1.		Domestic					
	a)	Upto 100 Units	-18.84	-16.06	-15.27	-17.18	-18.57
	b)	101-300 Units	11.27	9.93	10.00	9.07	8.52
	c)	Above 300 Units	17.08	15.87	17.27	15.97	15.34
2.		NRS					
	a)	0-100 units	25.90	19.96	17.44	16.38	15.05
	b)	Above 100 Units			19.69	15.66	17.85
3.		Public Lighting	23.96	19.96	19.69	18.43	17.72
4.		Industrial					

a)	Small Power	2.45	2.69	5.15	4.14	3.67
b)	Medium Supply	12.78	12.16	14.15	13.15	12.54
c)	Large Supply	16.02	16.35	18.49	16.21	14.89
5.	Bulk Supply					
a)	HT	13.42	11.79	14.67	9.71	9.25
b)	LT	19.40	16.98	19.52	18.23	17.52
6.	Railway Traction	30.63	19.96	19.69	13.66	13.66
7.	AP	-19.72	-16.77	-22.97	-19.92	19.65

From the above, it is clear that cross subsidy levels reduced for all categories in FY 2012-13 viz a viz FY 2011-12. However, cross subsidy levels increased for some categories in FY 2013-14, but they were within ±20% for all categories, except AP category. In the Tariff Orders for FY 2014-15 and FY 2015-16, the cross subsidy levels reduced for all categories except Domestic (upto 100 units) category in FY 2014-15 and for DS/NRS (upto 100 units) in FY 2015-16, but they were within ±20% for all categories.

(c) Renewable Energy Regulations and Enforcement of Renewable Energy Purchase Obligation:

Punjab State Electricity Regulatory Commission notified PSERC (Renewable Purchase Obligation and its compliance) Regulations, 2011 on 03.06.2011. An amendment to the said regulations has been notified on 06.05.2015 specifying the RPO from FY 2015-16 to FY 2019-20.

As per these Regulations, the RPO can be complied with by the Obligated Entity by purchasing electricity from renewable sources of energy or alternatively by purchasing Renewable Energy Certificates (RECs) from the Power Exchange(s) or a combination of both. However, in case the Obligated Entity fails to comply with the obligation to purchase the required percentage of electricity from renewable sources of energy or the RECs, it is liable for proceedings under section 142 of the Act.

The Commission has issued directions in its Tariff Orders to the utility i.e. PSPCL to comply with the RPO specified in the RPO Regulations.

PSERC provides funds in the Tariff Order for purchase of RECs/RE power for RPO compliance.

The status of RPO compliance by the distribution licensee is as under:

Description	**Status of RPO compliance by PSPCL**			
	FY 2011-12	**FY 2012-13**	**FY 2013-14**	**FY 2014-15**
Target (as per PSERC RPO regulations 2011) (%)	2.4 (2.37 Non solar, 0.03 solar)	2.9 (2.83 Non solar, 0.07 solar)	3.5 (3.37 Non solar, 0.13 solar)	4.0 (3.81 Non solar, 0.19 solar)
Compliance (%)	Fully complied	Fully Complied	Fully Complied	2.34 (provisional)

Description	Status of RPO compliance by PSPCL			
	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15
				(2.15 Non solar, 0.19 solar) (PSPCL has filed petition for allowing carry forward of shortfall in RPO compliance for FY 2014-15 to FY 2015-16, which is under consider-ation of the Commission)
Amount provided by PSERC in Tariff Order for meeting shortfall in RPO comp-liance crore)	-	80.35	100.00	98.00

(d) DSM Regulations:

Punjab State Electricity Regulatory Commission has notified its Demand Side Management Regulations, 2012 on 16.03.2012.

(e) Plans and Monitoring Initiatives:

PSERC has a statutory function under Electricity Act, 2003 to guide the Distribution Licensee into becoming an efficient, commercially viable entity and to function at a high level of efficiency. The Commission issues directives to achieve these objectives through its Tariff Order every year to enable the Licensees to achieve higher performance and efficiency. Measures to improve quality of service being rendered to consumers have also been given due importance in these directives. The major directives issued in the Tariff Orders are on the issues of:

- T&D Loss reduction
- Demand Side Management & Energy Conservation
- Agricultural Consumption & metering Plan
- Employee Cost
- Receivables
- Power Purchase from Traders and through UI
- Loading status of transmission/sub-transmission system
- Improvement in quality of service
- Cost Audit of generating stations

- Energy audit of Distribution System
- Energy audit of Thermal & Hydro Generating Stations

The Commission's directives are an integral part of the Tariff Order which the Distribution Licensee is obligated to comply with in order to lower its cost of supply to the consumers and improve consumer service.

The status of compliance of directives issued in the Tariff Orders is monitored by the Commission regularly.