

उत्तराखण्ड UTTARAKHAND

F 605750

BEFORE UTTARAKHAND ELECTRICITY REGULATORY COMMISSION,  
DEHRADUN

FILE NO.

CASE NO. (To be filled by the Office)

**In the matter of:**

Filing of : Petition/Application for Approval for Business Plan of PTCUL for first control Period, under Regulation 9 (1) of the Uttarakhand Electricity Regulatory Commission (Terms and Conditions for Determination of Tariff) Regulations, 2011.

**And In the matter of:**

Power Transmission Corporation of Uttarakhand Limited, 132KV Substation Majra Campus, Near I.S.B.T., Dehradun.

**Affidavit**

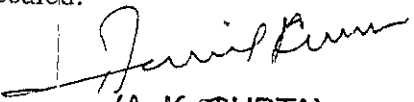
I, Anil Kumar Gupta S/o Sh. Om Prakash aged 58 years, working as Managing Director, resident of 166, Indra Nagar, Dehradun, the deponent named above do hereby solemnly affirm and state on oath as under:-

1. That the deponent is the Managing Director who is authorized as per the resolution of the company dated 19-12-12 (In case the Petitioner is a Company) and is acquainted with the facts deposed to below.

3/11/13

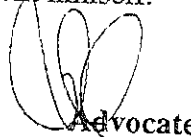
*A.K. Gupta*  
A.K. GUPTA  
MANAGING DIRECTOR  
PTCUL CORPORATION

2. I, the deponent named above do hereby verify that the contents of the paragraph Nos. 1 of the affidavit and those of the paragraph No. \_\_\_\_\_ of the accompanying petition are true to my personal knowledge and those of the paragraph Nos. \_\_\_\_\_ of the accompanying petition are based on the perusal of records and those of the paragraph Nos. \_\_\_\_\_ 1 to 10 of the accompanying petition are based on information received and those of the paragraph Nos. \_\_\_\_\_ 1 to 10 of the accompanying petition are based on the legal advice which I believe to be true and verify that no part of this affidavit is false and nothing material has been concealed.

  
(A. K. Datta)  
MANAGING DIRECTOR  
POWER TRANSMISSION CORPORATION  
OF UTTARAKHAND LTD., DEHRADUN

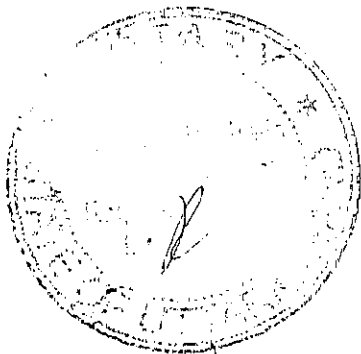
I, Pooja Kumar Advocate,

hereby declare that the person making this affidavit is known to me through the perusal of records and I am satisfied that he is the same person alleging to be deponent himself.

  
Advocate

Solemnly affirmed before me on this 31 day of 12, 2012 at 11 a.m. / p.m. by the deponent who has been identified by the aforesaid Advocate.

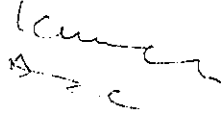
I have satisfied myself by examining the deponent that he understood the contents of the affidavit which has been read over and explained to him. He has also been explained about section 193 of Indian Penal Code that whoever intentionally gives false evidence in any of the proceedings of the Commission or fabricates evidence for purpose of being used in any of the proceedings shall be liable for punishment as per law.



31/12

(Notary Public)

This Affidavit is Sworn before me  
Shri Pooja Kumar  
at Dehradun on 31/12/2012  
Advocate & NOTARY, Dehradun



**BEFORE THE UTTARAKHAND ELECTRICITY REGULATORY  
COMMISSION, DEHRADUN**

File No.

Case No.

(To be filled by the Office of the Commission)

**In the matter of:**

Filing of : Application for Approval for Business Plan of PTCUL first control Period, under Regulation 9 (1) of the Uttarakhand Electricity Regulatory Commission (Terms and Conditions for Determination of Tariff) Regulations, 2011.

**And In the matter of:**

Power Transmission Corporation of Uttarakhand Limited, 132KV Substation Majra Campus,  
Near I.S.B.T., Dehradun

.....Petitioner(s)

**1. Specific Legal Provision under which Petition is being filed**

This petition is being filed under Section 64(I) of Electricity Act, 2003, Regulation of UERC (Conduct of Business) Regulations, 2004

**2. Limitation**

The petitioner further declares that the present petition is within the period specified in Hon'ble Uttarakhand Electricity Regulatory Commission's Code of Business Regulations, 2004.

**3. Facts of the case**

The Petitioner has requested the Honorable Uttarakhand Electricity Regulatory Commission to kindly approve Business Plan of PTCUL for first control Period.

**4. Cause of action**

The Petitioner has submitted Business Plan of PTCUL for first control Period.

**5. Detail of remedies exhausted**

The petitioner declares that he has availed all the remedies available to him under the relevant provisions of applicable law and rules/regulations framed there under.

**6. Matter not previously filed for pending with any other court**

The petitioner further declares that he has not previously filed any petition or writ petition or suit regarding the matter in respect of which this petition has been made, before the Commission, or any court or any other authority, nor any such writ petition or suit is pending before any of them.

**7. Relief sought**

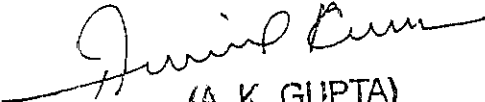
The Petitioner has sought Approval of Business Plan of PTCUL for first control Period.

  
**(A. K. GUPTA)**  
MANAGING DIRECTOR  
POWER TRANSMISSION CORPORATION  
UTTARAKHAND LTD., DEHRADUN

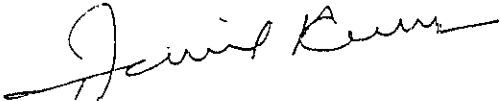
8. Details of Index

9. Particulars of fee remitted: DD No.110473 Dated 25.07.2012 Rs. 25.00

10. List of enclosures: 1. MINUTES OF 39th Meeting of BoD.  
2. Business Plan of PTCUL.

  
(A. K. GUPTA)  
(Signature of Petitioner)  
MANAGING DIRECTOR  
POWER TRANSMISSION CORPORATION  
OF UTTARAKHAND LTD., DEHRADUN

I, Anil Kumar Gupta S/o Sh. Om Prakash aged 58 years, working as Managing Director, resident of 166, Indra Nagar, Dehradun do hereby verify that the contents of the Paras 1 to \_\_\_\_\_ 10 are true to my personal knowledge and para \_\_\_\_\_ 1 to para \_\_\_\_\_ 10 are derived from official records, which are true from record, and Para \_\_\_\_\_ 1 to \_\_\_\_\_ 10 believed to be true on legal advice and that I have not suppressed any material fact.

  
(Signature of Petitioner(s))  
(A. K. GUPTA)  
MANAGING DIRECTOR  
POWER TRANSMISSION CORPORATION  
OF UTTARAKHAND LTD., DEHRADUN

---

# **BUSINESS PLAN FOR FY 2012-13 TO 2016-17**

---



**POWER TRANSMISSION CORPORATION OF  
UTTARAKHAND LIMITED**

---

---

---

## TABLE OF CONTENTS

|  |           |
|--|-----------|
| <b>EXECUTIVE SUMMARY</b> .....   | <b>5</b>  |
| <b>1. INTRODUCTION</b> .....   | <b>5</b>  |
| <b>2. OBJECTIVES</b> .....   | <b>5</b>  |
| <b>3. OPERATIONAL PERFORMANCE</b> .....                                | <b>6</b>  |
| <b>4. UTTARAKHAND INTEGRATED TRANSMISSION PROJECT</b> .....            | <b>6</b>  |
| <b>5. OPERATIONAL PLAN</b> .....                                       | <b>6</b>  |
| <b>6. PROPOSED CAPITAL EXPENDITURE FOR FY 2012-13 TO 2016-17</b> ..... | <b>7</b>  |
| <b>7. AGGREGATE REVENUE REQUIREMENT</b> .....                          | <b>8</b>  |
| <b>1. INTRODUCTION</b> .....   | <b>10</b> |
| <b>1.1. BACKGROUND</b> .....   | <b>10</b> |
| <b>1.2. DUTIES OF AN STU</b> .....                                     | <b>11</b> |
| <b>1.3. OBJECTIVES OF PTCUL</b> .....                                  | <b>11</b> |
| <b>1.4. CORPORATE MISSION</b> .....                                    | <b>11</b> |
| <b>1.5. CORPORATE VISION</b> .....                                     | <b>12</b> |
| <b>1.6. CORE ACTIVITIES</b> .....                                      | <b>12</b> |
| <b>1.7. POWER MAP OF UTTARAKHAND</b> .....                             | <b>13</b> |
| <b>1.8. KEY OBJECTIVES OF THE BUSINESS PLAN</b> .....                  | <b>13</b> |
| <b>2. BUSINESS OVERVIEW: OPERATIONAL</b> .....                         | <b>14</b> |
| <b>2.1. ROLE OF PTCUL AS A TRANSMISSION UTILITY</b> .....              | <b>14</b> |
| <b>2.2. CURRENT INFRASTRUCTURE DETAILS</b> .....                       | <b>14</b> |
| <b>2.3. GROWTH IN SUB STATION LEVEL</b> .....                          | <b>15</b> |
| <b>2.4. GROWTH IN NETWORK LEVEL</b> .....                              | <b>16</b> |
| <b>2.5. OPERATIONAL PERFORMANCE</b> .....                              | <b>17</b> |
| <b>2.6. TRANSMISSION LOSSES</b> .....                                  | <b>18</b> |
| <b>2.7. ENERGY CATERED</b> .....                                       | <b>18</b> |
| <b>3. REGULATORY FRAMEWORK</b> .....                                   | <b>19</b> |
| <b>3.1. BACKGROUND</b> .....   | <b>19</b> |
| <b>3.2. ENABLING PROVISIONS IN ELECTRICITY ACT, 2003</b> .....         | <b>19</b> |
| <b>3.3. LEGAL STRUCTURE OF POWER TRANSMISSION IN INDIA</b> .....       | <b>20</b> |
| <b>3.4. NATIONAL ELECTRICITY POLICY</b> .....                          | <b>21</b> |
| <b>3.5. NATIONAL TARIFF POLICY</b> .....                               | <b>22</b> |
| <b>3.6. SERC REGULATIONS</b> .....                                     | <b>23</b> |
| <b>4. PROJECTS CURRENTLY UNDER EXECUTION</b> .....                     | <b>24</b> |
| <b>5. HUMAN RESOURCES</b> .....  | <b>29</b> |
| <b>5.1 EMPLOYEES' SUGGESTION SCHEME (ESS)</b> .....                    | <b>30</b> |
| <b>5.2 GRIEVANCE REDRESSAL SCHEME (GRS)</b> .....                      | <b>30</b> |
| <b>5.3 PAY REVISION</b> .....  | <b>31</b> |

|      |  |           |
|------|--|-----------|
| 5.4  | <b>TRAINING &amp; DEVELOPMENT</b> .....  | <b>31</b> |
| 6.   | <b>OPERATIONAL PLAN</b> .....  | <b>38</b> |
| 6.1  | <b>PROPOSED CAPITAL EXPENDITURE FOR FY 2012-13 TO 2016-17</b> .....                  | <b>39</b> |
| 6.2  | <b>REC-OLD SCHEME</b> .....  | <b>40</b> |
| 6.3  | <b>REC-NEW SCHEME</b> .....  | <b>41</b> |
| 6.4  | <b>REC-IV SCHEME</b> .....   | <b>43</b> |
| 6.5  | <b>REC-V SCHEME</b> .....  | <b>45</b> |
| 6.6  | <b>PFC SCHEMES</b> .....   | <b>46</b> |
| 6.7  | <b>ADB SCHEMES</b> .....   | <b>47</b> |
| 6.8  | <b>SYSTEM IMPROVEMENT SCHEMES</b> .....  | <b>51</b> |
| 6.9  | <b>OTHER SCHEMES FUNDED BY REC (REC-VI TO REC-X)</b> .....                           | <b>52</b> |
| 6.10 | <b>PLANNED SCHEMES</b> .....   | <b>53</b> |
| 6.11 | <b>PROGRESS OF GIS SUB-STATIONS</b> .....  | <b>53</b> |
| 6.12 | <b>CLASSIFICATION OF SCHEMES INTO UITP AND FOR INTRA-STATE TRANSMISSION</b><br>..... | <b>54</b> |
| 6.13 | <b>YEAR WISE CAPITAL INVESTMENT</b> .....  | <b>57</b> |
| 7.   | <b>FUTURE BUSINESS PLAN</b> .....  | <b>58</b> |
| 8.   | <b>ARR PROJECTIONS</b> .....   | <b>64</b> |
| 9.   | <b>ANNUAL TRANSMISSION CHARGES IN RESPECT OF INTRA STATE<br/>TRANSMISSION</b> .....  | <b>65</b> |
| 9.1  | <b>DEPRECIATION</b> .....  | <b>68</b> |
| 9.2  | <b>INTEREST ON LOAN</b> .....  | <b>70</b> |
| 9.3  | <b>RETURN ON EQUITY</b> .....  | <b>71</b> |
| 9.4  | <b>EMPLOYEE EXPENSES</b> .....   | <b>73</b> |
| 9.5  | <b>REPAIR AND MAINTENANCE EXPENSES</b> .....   | <b>75</b> |
| 9.6  | <b>ADMINISTRATIVE AND GENERAL EXPENSES</b> .....                                     | <b>76</b> |
| 9.7  | <b>TOTAL OPERATION AND MAINTENANCE EXPENSES</b> .....                                | <b>76</b> |
| 9.8  | <b>GUARANTEE FEE</b> .....   | <b>76</b> |
| 9.9  | <b>NON TARIFF INCOMES</b> .....  | <b>77</b> |
| 9.10 | <b>INTEREST ON WORKING CAPITAL</b> .....   | <b>77</b> |
| 9.11 | <b>INCOME TAX AND OTHER TAXES</b> .....  | <b>77</b> |
| 9.12 | <b>INCENTIVE FOR ACHIEVING TARGET AVAILABILITY</b> .....                             | <b>77</b> |
| 9.13 | <b>ANNUAL TRANSMISSION CHARGES FOR FY 2012-13 TO 2013-14</b> .....                   | <b>78</b> |
| 10.  | <b>ANNUAL TRANSMISSION CHARGES OF UITP SCHEMES</b> .....                             | <b>79</b> |
| 10.1 | <b>CAPITAL COST OF UITP PROJECTS</b> .....   | <b>79</b> |
| 10.2 | <b>INTEREST ON LOANS</b> .....   | <b>80</b> |
| 10.3 | <b>DEPRECIATION</b> .....  | <b>81</b> |
| 10.4 | <b>ADVANCE AGAINST DEPRECIATION</b> .....  | <b>82</b> |
| 10.5 | <b>RETURN ON EQUITY</b> .....  | <b>83</b> |
| 10.6 | <b>OPERATION AND MAINTENANCE EXPENSES</b> .....                                      | <b>83</b> |

---

|              |   |           |
|--------------|---|-----------|
| <b>10.7</b>  | <b>GUARANTEE FEE .....</b>                                | <b>83</b> |
| <b>10.8</b>  | <b>INTEREST ON WORKING CAPITAL .....</b>                  | <b>84</b> |
| <b>10.9</b>  | <b>INCOME TAX AND OTHER TAXES.....</b>                    | <b>84</b> |
| <b>10.10</b> | <b>INCENTIVE FOR ACHIEVING TARGET AVAILABILITY .....</b>  | <b>84</b> |
| <b>10.11</b> | <b>ANNUAL TRANSMISSION CHARGES OF UITP PROJECTS .....</b> | <b>84</b> |
| <b>11.</b>   | <b>TRANSMISSION LOSS IMPROVEMENT .....</b>                | <b>86</b> |

---

# EXECUTIVE SUMMARY

## 1. INTRODUCTION

In exercise of powers conferred under sub-section 4 of Section 131 of the Electricity Act 2003, therefore, the Government of Uttarakhand through transfer scheme dated 31st May 2004 first vested all the interests, rights and liabilities related to Power Transmission and Load Dispatch of "Uttaranchal Power Corporation Limited" into itself and thereafter, re-vested them into a new company, i.e. "Power Transmission Corporation of Uttaranchal Limited", now "Power Transmission Corporation of Uttarakhand Limited" (hereinafter referred to as 'PTCUL') after change of name of the State. The State Government, further vide another notification dated 31st May 2004 declared Power Transmission Corporation of Uttarakhand as the State Transmission Utility (STU) responsible for undertaking, amongst others, the following main functions:

- a) To undertake transmission of electricity through intra-state transmission system.
- b) To discharge all functions of planning and co-ordination relating to intra-state transmission system.
- c) To ensure development of an efficient, co-ordinated and economical system of intra-state transmission lines.
- d) To provide open access.

A new company in the State was thus, created to look after the functions of Intra-State Transmission and Load Dispatch w.e.f. 31st May 2004. In view of re-structured function of UPCL and creation of a separate company for looking after the transmission related works, the Uttarakhand Electricity Regulatory Commission (hereinafter referred to as the 'Hon'ble Commission' or the 'UERC' or the 'State Commission' or the 'Commission') amended the earlier 'Transmission and Bulk Supply License' granted to UPCL and Transmission license was vested on PTCUL for carrying out transmission related works in the state vide Commission's order dated June 9, 2004.

## 2. OBJECTIVES

The key objectives of this business plan are:

- Providing a tool for strategic planning - The primary objective of the Business Plan is to analyse and anticipate the future requirements in advance and strategically plan for the capital investments, related means of financing and various associated costs and document them which would serve as an effective tool for monitoring and execution of future works. It is key to project the growth in transmission network infrastructure commensurate with the energy demand required for fuelling the economic growth targets of the State.
- Meeting the regulatory compliance of submission of a business plan as mandated by the UERC Tariff Regulations, 2011
- Aid in decision making leading to better Operational Efficiency: The Business Plan is prepared so as to be useful for the Managing Board, associated stakeholders, the Hon'ble Commission and various government bodies. The future projections in the Plan would help the

---

transmission utility in decision making and taking proactive actions, and thus improving the overall operational efficiency of the transmission network infrastructure

### **3. OPERATIONAL PERFORMANCE**

Operational parameters and performance provide a basis for determining the financial viability and strategies for the company. Some of the operational performance parameters have been analysed in this section.

The availability factor of the transmission network for the year 2011-12 was 99.1%. PTCUL's transmission network availability level has been one of the most efficient among utilities in the country. The availability level for 2011-12 has significantly increased over the previous year. PTCUL was awarded the prestigious "Gold Shield" for the year 2009-10 in the category of "Transmission System Availability" by Ministry of Power, Govt. of India.

PTCUL is one of the most efficient transmission utilities in the country. This fact has been reaffirmed time and again by the low level of transmission losses. The loss level over the past few years has always been below 2%.

### **4. UTTARAKHAND INTEGRATED TRANSMISSION PROJECT**

The Uttarakhand Integrate Transmission Projects were conceived as a means to develop an optimal evacuation system for evacuating the power from the cluster of hydro electric generating stations, like Tapovan Vishnugad (520MW), Lata Tapovan (171MW), Badrinath HEP (300MW), Bawlanand Paryag (300MW), Nandprayag Langrasu (100MW), Devsari (252MW) etc. The UITP was proposed envisaging power evacuation system for generation projects to be developed in the aforementioned four major river basins. For evacuation of power from these hydro projects UITP will involve constructing a system comprising of 22 Nos. Transmission lines of 400/220/132 kV. 8 Nos. of new Substation and Substation extension to evacuate power from the hydro generating plants to the pooling point in Kashipur, Pithoragarh and Dehradun.

### **5. OPERATIONAL PLAN**

PTCUL has prepared the Business/Operational Plan taking into consideration all the factors which would affect the operations of the company. It is submitted that the Business plan being a dynamic document may need to be updated at periodic intervals taking into account the changes in the internal and external environment and these changes would be intimated to the State Commission from time to time. The operational plans include the estimates of each capital expenditure scheme of PTCUL from FY 2012-13 to FY 2016-17.

The list of generators expected to be commissioned in the 12th Plan whose evacuation is proposed through PTCUL system is provided in the table below:

**Table 1: List of Generators expected to be commissioned in the 12<sup>th</sup> Plan**

| <b>S. No.</b> | <b>Name of the Project</b> | <b>Name of the Developer</b> | <b>Capacity</b> | <b>Remark</b>  |
|---------------|----------------------------|------------------------------|-----------------|--|
| 1.            | Lata Tapovan               | NTPC                         | 171 MW          | Under construction & applied for connectivity to PTCUL |

|     |                       |  |                    |  |
|-----|-----------------------|--|--------------------|--|
| 2.  | Tapovan Vishnugad     | NTPC                                     | 520 MW             | Under construction & applied for connectivity to PTCUL       |
| 3.  | Singoli Bhatwari      | M/s L&T                                  | 99 MW              | Under construction & TSA has been signed with PTCUL          |
| 4.  | Phatabyung            | M/s Lanco                                | 76 MW              | Under construction & applied for TSA with PTCUL              |
| 5.  | Srinagar              | M/s GVK                                  | 330 MW             | Under construction & TSA has been Signed with UP             |
| 6.  | Badrinath (Alaknanda) | M/s GMR                                  | 300 MW             | Under construction & applied for connectivity to PTCUL       |
| 7.  | Gama gas based        | M/s Gama Infraprop                       | 225 MW             | Under construction & connectivity has been signed with PTCUL |
| 8.  | Gas based at kashipur | UJVNL & GAIL                             | 350 MW (tentative) | Works to be taken up   |
| 9.  | Gas based at Haridwar | UJVNL & GAIL                             | 350 MW (tentative) | Works to be taken up   |
| 10. | Beta gas based        | M/s Beta Infratech                       | 225 MW             | Under construction & applied for TSA with PTCUL              |
| 11. | Sravanthi Gas based   | M/s Sravanthi Energy Pvt. Ltd.           | 225 MW             | Under construction & applied for TSA with PTCUL              |
| 12. | Bagasse based         | M/s Lakshmi Sugar Mills Corporation Ltd. | 20 MW              | Under construction & connectivity has been signed with PTCUL |
| 13. | Vyasi                 | UJVNL                                    | 120 MW             | Under construction & applied for connectivity to PTCUL       |
| 14. | Lakhwar               | UJVNL                                    | 300 MW             | Under construction & applied for connectivity to PTCUL       |
| 15. | Bawala Nandprayag     | UJVNL                                    | 300 MW             | Under construction & applied for connectivity to PTCUL       |
| 16. | Nandprayag Langrasu   | UJVNL                                    | 100 MW             | Under construction & applied for connectivity to PTCUL       |
| 17. | Tamaklata             | UJVNL                                    | 250 MW             | Under construction & applied for connectivity to PTCUL       |
| 18. | Devsari               | SJVNL                                    | 252 MW             | Under construction & applied for connectivity to PTCUL       |
| 19. | Naitwar Mori          | SJVNL                                    | 60 MW              | Under construction & applied for connectivity to PTCUL       |
| 20. | Jakhol Sankri         | SJVNL                                    | 51 MW              | Under construction & applied for connectivity to PTCUL       |
| 21. | Kotilibhel 1A         | NHPC                                     | 195 MW             | Under construction   |
|     |                       | <b>Total</b>                             | <b>4519 MW</b>     |  |

## 6. PROPOSED CAPITAL EXPENDITURE FOR FY 2012-13 TO 2016-17

PTCUL is developing network for strengthening of Transmission System (132KV & above) to meet out the load growth requirement of Uttarakhand distribution system & also for evacuation of power from various generators i.e. Hydro as well as gas based, which are coming up in Uttarakhand

By the end of 11th five year plan PTCUL Transmission network is suitable to for load requirement of 1300 MW of the state discom as well as capacity to handle power of 1832 MW within Uttarakhand.

After taking up the 12th Plan Transmission Project, PTCUL Transmission Network will be capable to handle over 2000 MW of power requirement of the State Discom (assuming 9% annual growth) as

well as evacuation of power from new generating projects expected capacities(4519 MW) Hydro + Gas/Small Hydro Power Stations to be added in 12th five year Plan.

The following table summarises the physical targets in the 12<sup>th</sup> Plan period:

**Table 2: Physical Targets for the 12<sup>th</sup> Plan Period (FY 2012-13 to 2016-17)**

| S. No | Item                | Unit   | 12th five year Annual Plan (2012-17) targets |                     |                     |                     |                     | 12 <sup>th</sup> Plan 2012-17 |
|-------|---------------------|--------|--|---------------------|---------------------|---------------------|---------------------|-------------------------------|
|       |                     |        | Annual Plan 2012-13                          | Annual Plan 2013-14 | Annual Plan 2014-15 | Annual Plan 2015-16 | Annual Plan 2016-17 |                               |
| 1     | 132 KV Substation   | No/MVA | 1/180  | 2/80                | 1/150               | 2/120               | 0/0                 | 6/530                         |
| 2     | 220 KV Substation   | No/MVA | 0/100  | 1/640               | 2/380               | 2/150               | 3/400               | 8/1670                        |
| 3     | 400 KV Substation   | No/MVA | 0/0  | 1/705               | 0/0                 | 1/630               | -                   | 2/1335                        |
| 4     | 132 KV Line         | Ckt Km | 164.40                                       | 6                   | 188                 | 60                  | 0                   | 418.40                        |
| 5     | 220 KV Line         | Ckt Km | 70.72  | 24                  | 260.6               | 10.4                | 238                 | 603.72                        |
| 6     | 400 KV Line         | Ckt Km | 0  | 0                   | 70                  | 304                 | 184                 | 558                           |
|       | <b>Total MVA</b>    |        | <b>1/280</b>                                 | <b>4/1425</b>       | <b>3/530</b>        | <b>5/900</b>        | <b>3/400</b>        | <b>16/3535</b>                |
|       | <b>Total Ckt Km</b> |        | <b>235.12</b>                                | <b>30</b>           | <b>518.6</b>        | <b>374.4</b>        | <b>422</b>          | <b>1580.12</b>                |

## 7. AGGREGATE REVENUE REQUIREMENT

Presented below is the ARR of PTCUL for the period 2012-17 in respect of intra-state transmission of electricity to be recovered from the UPCL, which is the sole beneficiary at present. The table also provides the indicative transmission charge per unit which has been calculated considered a YoY growth of 9% in the energy wheeled:

**Table 3: ARR for the Business Plan Period**

| Particulars                                | 2012-13       | 2013-14       | 2014-15       | 2015-16       | 2016-17       |
|--|---------------|---------------|---------------|---------------|---------------|
| Depreciation                               | 46.72         | 58.44         | 65.17         | 70.79         | 78.09         |
| Interest on Loan                           | 52.10         | 68.55         | 76.13         | 91.88         | 103.51        |
| Return on Equity                           | 30.81         | 39.16         | 47.81         | 58.25         | 67.21         |
| Operations and Maintenance Expenses        |               |               |               |               |               |
| Employee Expenses                          | 58.32         | 79.11         | 89.78         | 102.65        | 113.51        |
| R&M Expenses                               | 29.00         | 32.44         | 41.44         | 45.97         | 51.76         |
| A&G Expenses                               | 14.27         | 20.29         | 26.74         | 33.65         | 41.05         |
| Guarantee Fees                             | 5.10          | 5.52          | 7.39          | 7.87          | 8.60          |
| Interest on Working Capital                | 8.52          | 10.99         | 12.97         | 15.01         | 16.96         |
| <b>Net Expenditure</b>                     | <b>244.84</b> | <b>314.51</b> | <b>367.43</b> | <b>426.07</b> | <b>480.68</b> |
| Less: Non Tariff Incomes                   | 1.24          | 1.30          | 1.37          | 1.44          | 1.51          |
| <b>Aggregate Revenue Requirement (ARR)</b> | <b>243.60</b> | <b>313.21</b> | <b>366.06</b> | <b>424.63</b> | <b>479.17</b> |
| <b>Transmission Charge (Rs.kWh)</b>        | <b>0.181</b>  | <b>0.213</b>  | <b>0.228</b>  | <b>0.243</b>  | <b>0.252</b>  |

---

The transmission charges in the year 2012-13 are comparable with the neighbouring states as depicted in the table below:

**Table 4: Transmission Charges in Neighbouring States in FY 2012-13**

| <b>State</b>     | <b>Charges<br/>(Rs/kWh)</b> |
|------------------|-----------------------------|
| Himachal Pradesh | 0.16                        |
| Uttar Pradesh    | 0.174                       |
| Haryana          | 0.21                        |
| Punjab           | 0.19                        |

---

# 1. INTRODUCTION

## 1.1. BACKGROUND

In accordance with the provisions of the Uttar Pradesh Reorganization Act 2000 (Act 29 of 2000), enacted by the Parliament of India on 25th August 2000, the State of Uttaranchal came into existence on 9th November 2000. Section 63(4) of the above Reorganization Act allowed the Government of Uttaranchal (hereinafter referred to as "GoU" or "State Government") to constitute a State Power Corporation at any time after the creation of the State. GoU, accordingly, established the Uttaranchal Power Corporation Limited (UPCL) under the Companies Act, 1956, on 12th February 2001 and entrusted it with the business of transmission and distribution in the State. Subsequently, from 1st April 2001, all works pertaining to the transmission, distribution and retail supply of electricity in the area of Uttaranchal were transferred from Uttar Pradesh Power Corporation Limited (UPPCL) to UPCL, in accordance with the Memorandum of Understanding dated 13th March 2001, signed between the Governments of Uttaranchal and Uttar Pradesh.

Meanwhile, Electricity Act 2003 was enacted by the Parliament of India on 10th June 2003, which mandated separate licenses for transmission and distribution activities. In exercise of powers conferred under sub-section 4 of Section 131 of the Electricity Act 2003, therefore, the Government of Uttarakhand through transfer scheme dated 31st May 2004 first vested all the interests, rights and liabilities related to Power Transmission and Load Dispatch of "Uttaranchal Power Corporation Limited" into itself and thereafter, re-vested them into a new company, i.e. "Power Transmission Corporation of Uttaranchal Limited", now "Power Transmission Corporation of Uttarakhand Limited" (hereinafter referred to as 'PTCUL') after change of name of the State. The State Government, further vide another notification dated 31st May 2004 declared Power Transmission Corporation of Uttarakhand as the State Transmission Utility (STU) responsible for undertaking, amongst others, the following main functions:

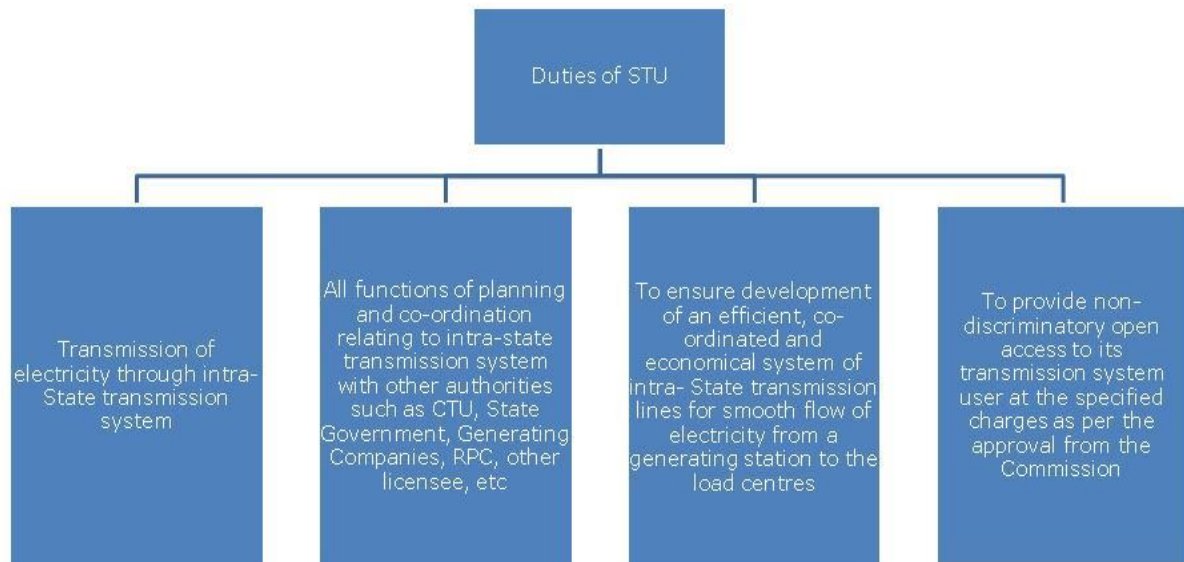
- a) To undertake transmission of electricity through intra-state transmission system.
- b) To discharge all functions of planning and co-ordination relating to intra-state transmission system.
- c) To ensure development of an efficient, co-ordinated and economical system of intra-state transmission lines.
- d) To provide open access.

A new company in the State was thus, created to look after the functions of Intra-State Transmission and Load Dispatch w.e.f. 31st May 2004. In view of re-structured function of UPCL and creation of a separate company for looking after the transmission related works, the Uttarakhand Electricity Regulatory Commission (hereinafter referred to as the 'Hon'ble Commission' or the 'UERC' or the 'State Commission' or the 'Commission') amended the earlier 'Transmission and Bulk Supply License' granted to UPCL and Transmission license was vested on PTCUL for carrying out transmission related works in the state vide Commission's order dated June 9, 2004.

Transmission network serves as an important link between the Generation and Distribution segments of electricity supply business. The issues and challenges pertaining to the Transmission business are

mostly in terms of keeping up with the growth needs of the other two segments. While the growth in the demand along with increasing electrification end drive the need to meet the peak demand and energy requirement by arranging supply from internal and external generation sources, the transmission system has to be strengthened adequately and timely for maintaining grid stability and supply quality.

### 1.2. DUTIES OF AN STU



### 1.3. OBJECTIVES OF PTCUL

To plan and develop a well coordinated intra- state transmission system;

- To provide transmission facilities to the state distribution companies (DISCOM's) and any other Transmission System User (TSU) on payment of transmission charges;
- To provide long term and short term open access to consumers on payment of transmission and allied charges.
- To enter into new growth areas & enhance business value with secondary business

### 1.4. CORPORATE MISSION

- Adopt best practices of Project and Operations & Maintenance Management leading to system efficiency, reliability and commercial viability.
- Create a work environment which motivates & enhances employee performance, value systems and reward contribution.
- Develop and train employees towards upgrading their skills at work, enrich work content to make it more substantive and responsive to company goals.
- Imbibe transparency and accountability in all operational areas, be it procurement, construction, operations and maintenance.

- 
- Expand horizons of activities in to contracting and others by leveraging the Company's available technical and project expertise.
  - Build, in essence PTCUL to a Company geared to high standards of management capabilities and professional performance.

### **1.5. CORPORATE VISION**

PTCUL endeavours to be among the best of Power Transmission utilities in India in operating efficiency, system reliability standards and commercially viable operations.

### **1.6. CORE ACTIVITIES**

#### **Project:**

All the activity streams, comprising of planning execution and control of engineering design, procurement and construction of EHV Transmission lines (TL) Substation (S/S) and other utilities.

#### **Operation & Maintenance (O&M)**

All the objectives comprising of planning, implementation and control of:

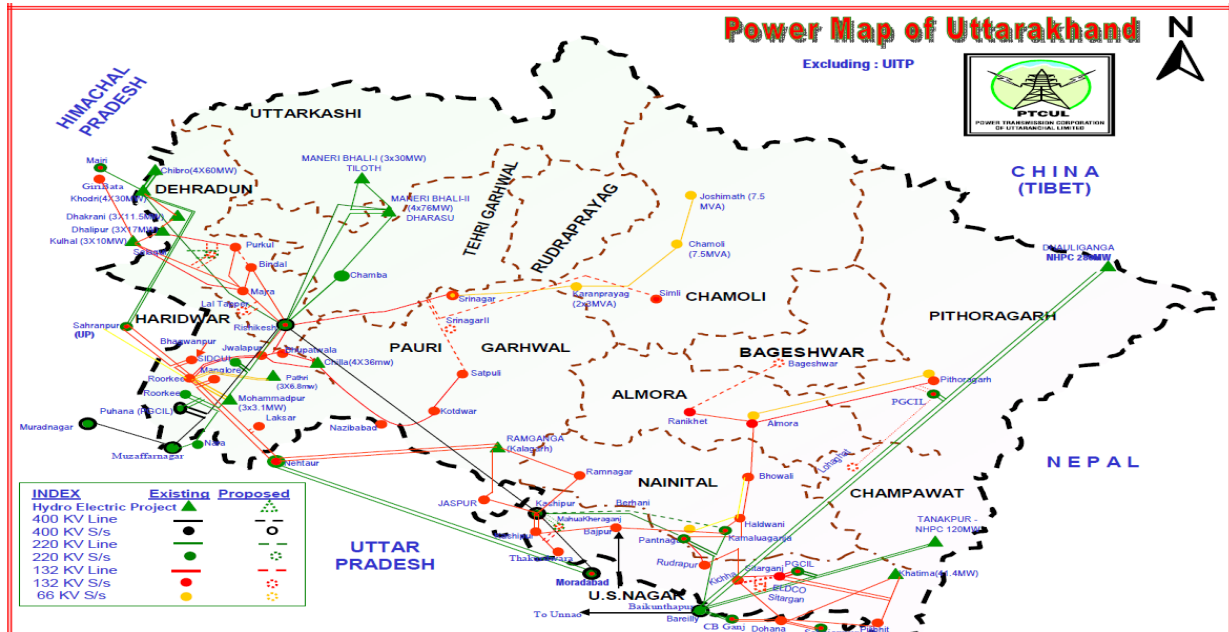
- Operational activities of EHVTLs and S/S and other utilities as per Grid standards.
- Maintenance activities to ensure their efficient and reliable working.
- Asset management activities of the Transmission work to ensure commercial viability.

#### **Load Dispatch (LD)**

All the activities comprising of:

- Scheduling and dispatch of electricity within the state
- Monitoring grid operations
- Accounting for the quantity of electrical energy transmitted through the State Grid
- Supervising and controlling inter-state transmission system
- Carrying out real time operations for grid control and dispatch of electricity within the State

## 1.7. POWER MAP OF UTTARAKHAND



## 1.8. KEY OBJECTIVES OF THE BUSINESS PLAN

The key objectives of this business plan have been listed below:

- Providing a tool for strategic planning - The primary objective of the Business Plan is to analyse and anticipate the future requirements in advance and strategically plan for the capital investments, related means of financing and various associated costs and document them which would serve as an effective tool for monitoring and execution of future works. It is important to project the growth in transmission network infrastructure commensurate with the energy demand required for fuelling the economic growth targets of the State.
- Meeting the regulatory compliance of submission of a business plan as mandated by the UERC Tariff Regulations, 2011
- Aid in decision making leading to better Operational Efficiency: The Business Plan is prepared so as to be useful for the Managing Board, associated stakeholders, the Hon'ble Commission and various government bodies. The future projections in the Plan would help the transmission utility in decision making and taking proactive actions, and thus improving the overall operational efficiency of the transmission network infrastructure

---

## **2. BUSINESS OVERVIEW: OPERATIONAL**

PTCUL is one of the efficient Transmission Utility in India with availability of over 99% and very low transmission loss which has been below 2%.

### **The major strengths of PTCUL are:**

- High system availability- planned shutdown for maintenance being done; Long term & short term open access being provided
- Extremely low transmission losses

In spite of this, PTCUL has been in operational losses with the accumulated losses to the tune of over Rs. 100 crore as on 31.03.2012.

Many Factors such as ageing equipments - failure rate, Quality of Power, Grid Discipline, Network planning commensurate with generation & distribution, strengthening network to cope up with quality of power, Renovation and Modernization have to be considered for efficient power transmission operation.

### **2.1. ROLE OF PTCUL AS A TRANSMISSION UTILITY**

PTCUL handles the load from various generating stations including:

- State generating stations;
- Allocation from central generating stations;
- Independent Power Producers (IPPs);
- Captive power plant;
- Renewable power integration

### **2.2. CURRENT INFRASTRUCTURE DETAILS**

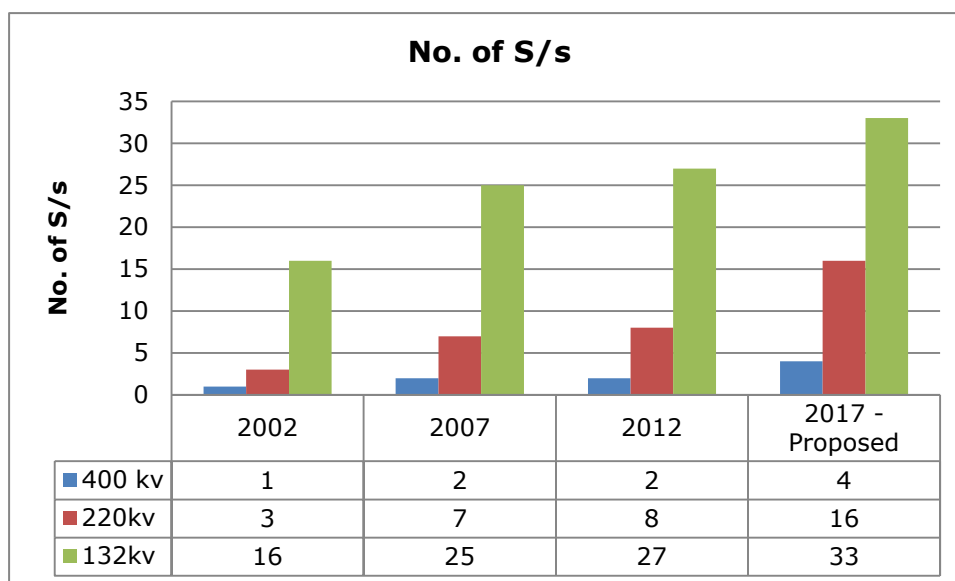
PTCUL has a network which is spread over 2643 Ckt Kms of transmission line and has an installed a total of 35 substations as on 31.3.2012. PTCUL is in the process of rapidly increasing its network capacity and the substations to handle the new generation capacities coming up in the next five years.

PTCUL is divided into 2 zonal offices alongside 8 O&M divisions & 2 Civil divisions for construction of new substations and lines and for operation and maintenance of the existing sub-stations and lines respectively.

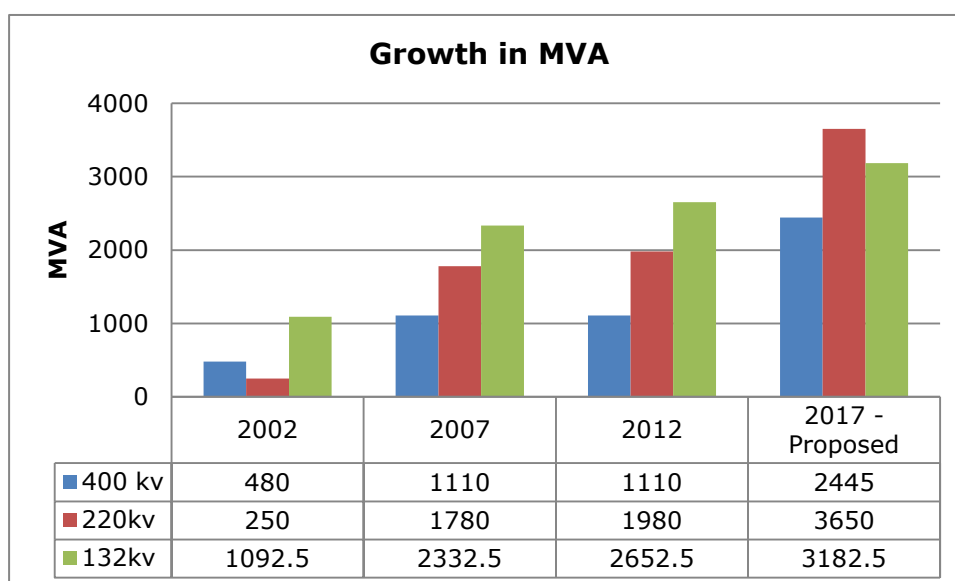
### 2.3. GROWTH IN SUB STATION LEVEL

The growth in the number of sub-stations in the last ten years along with the projected growth in the plan period is depicted below:

**Figure 2.1: No of Sub-station**



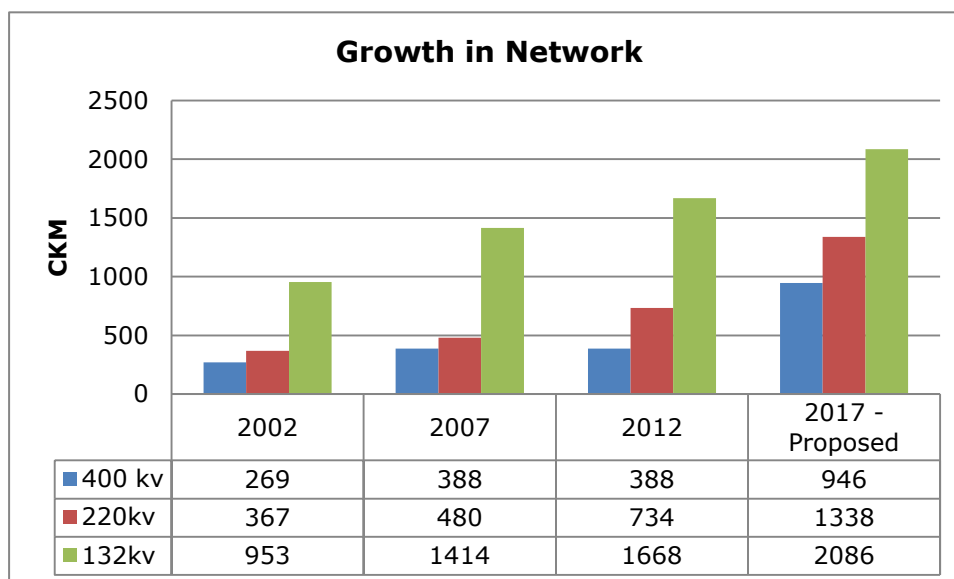
**Figure 2.2: Growth in MVA**



## 2.4. GROWTH IN NETWORK LEVEL

The growth in the network level is shown below.:

**Figure 2.3: Growth in Network**



Even though there has been a substantial increase in the Network, there are a few congestion points in the current network of PTCUL. These have been identified in the table below along with the steps being taken to mitigate this congestion.

**Table 2.1: Congestion points and mitigation solution**

| S.No | Name of Critical Transmission Line | Capacity | Voltage | Mitigation   |
|------|------------------------------------|----------|---------|--|
| 1.   | 220 KV S/C Bareilly-Pantnagar Line | 225MVA   | 220KV   | (a) By stringing 2 <sup>nd</sup> circuit of Berhani Pantnagar 220kV line<br>(b) 220KV D/C Pithoragarh-Almora line (Proposed)<br>(c) 220/132KVS/s Almora(Proposed).<br>(d) 400KV D/C Bareilly-Kashipur-Puhana line (Under construction by PGCIL). |
| 2.   | 132 KV S/C Haldwani-Bhawali Line   | 91MVA    | 132KV   | (a) LILO of 132 Almora-Pithoragarh line (under construction) at 220KV S/s Pithoragarh(PGCIL).<br>(b) 220KV D/C Pithoragarh-Almora line (Proposed)<br>(c) 220/132KV S/s Almora (Proposed).  |
| 3.   | 132 KV Rishikesh-Majra S/C line    | 91 MVA   | 132 KV  | LILO of 132 KV Kulhal-Majra & LILO of 132 KV Dhalipur-Purkul at 220 KV Dehradun.   |
| 4.   | 132 KV Rishikesh-Bindal S/C line   | 91 MVA   | 132 KV  | LILO of 132 KV Kulhal-Majra & LILO of 132 KV Dhalipur-Purkul at 220 KV Dehradun and interconnection of 132kV Bindal-Purkul transmission line   |
| 5.   | 132 KV S/c Rishikesh-Srinagar line | 91 MVA   | 132 KV  | Construction of 400 KV Srinagar Substations & its associated 132KV transmission system.  |
| 6.   | 132 KV S/c Kotdwar-Satpuli line    | 91 MVA   | 132 KV  | (a) Construction of 400 KV Srinagar Substations.   |

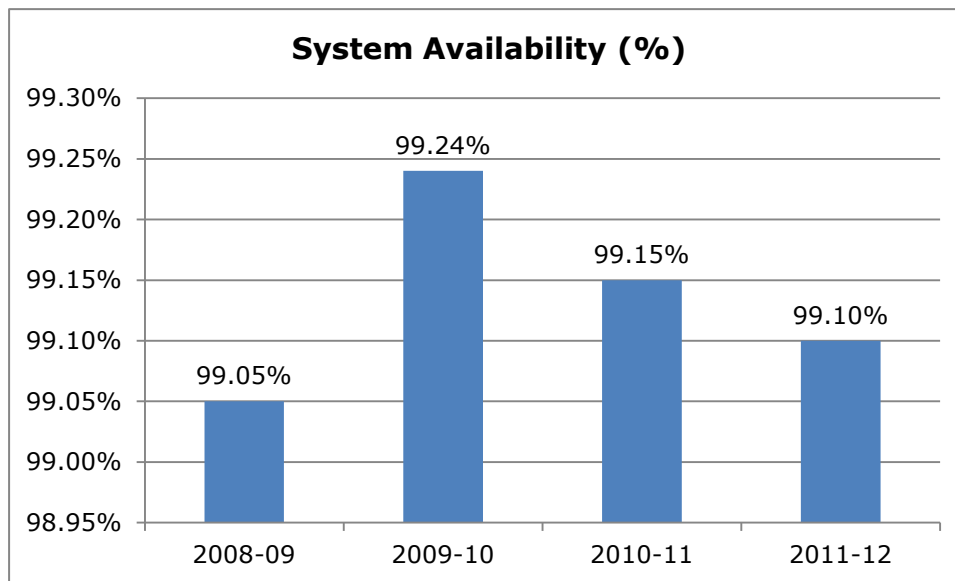
| S.No | Name of Critical Transmission Line              | Capacity | Voltage | Mitigation   |
|------|---|----------|---------|--|
|      |   |          |         | (b) Construction of 132 KV D/c Srinagar-Satpuli line                   |
| 7.   | 400 KV S/C Moradabad -Kashipur Line             | 525MVA   | 400KV   | 400KV D/C Bareilly-Kashipur-Puhana line (Under construction by PGCIL). |
| 8.   | 400 KV S/C Muzaffarnagar -Puhana-Rishikesh Line | 525MVA   | 400KV   | 400KV D/C Bareilly-Kashipur-Puhana line (Under construction by PGCIL). |

## 2.5. OPERATIONAL PERFORMANCE

Operational parameters and performance provide a basis for determining the financial viability and strategies for the company. Some of the operational performance parameters have been analysed in this section.

The availability factor of the transmission network for the year 2011-12 was 99.1%. PTCUL's transmission network availability level has been one of the most efficient among utilities in the country. The availability level for 2011-12 has significantly increased over the previous year. PTCUL was awarded the prestigious "Gold Shield" for the year 2009-10 in the category of "Transmission System Availability" by Ministry of Power, Govt. of India.

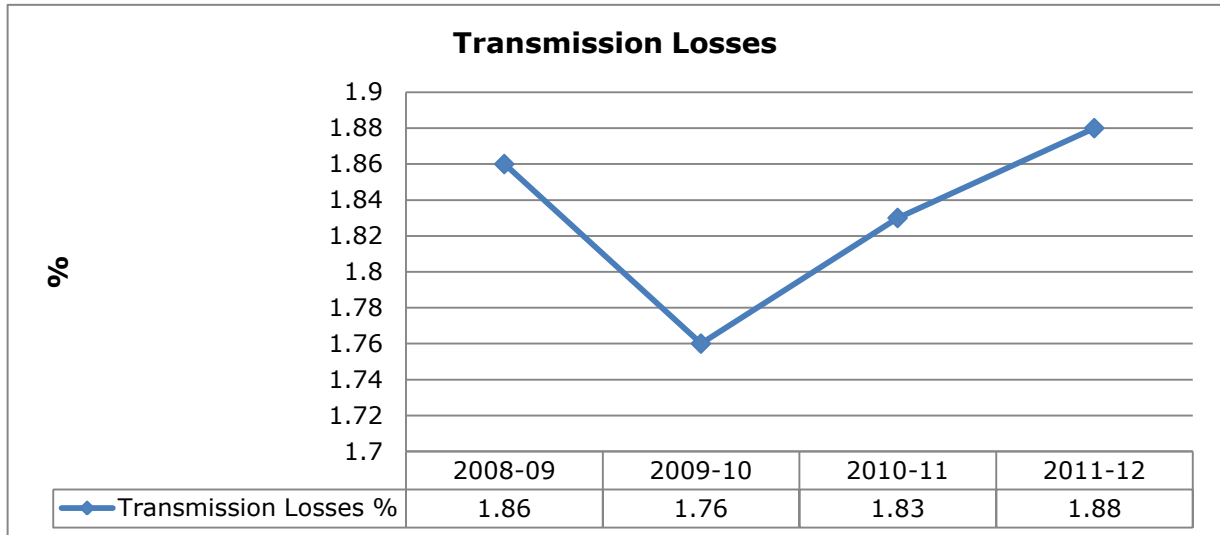
**Figure 2.4: System Availability**



## 2.6. TRANSMISSION LOSSES

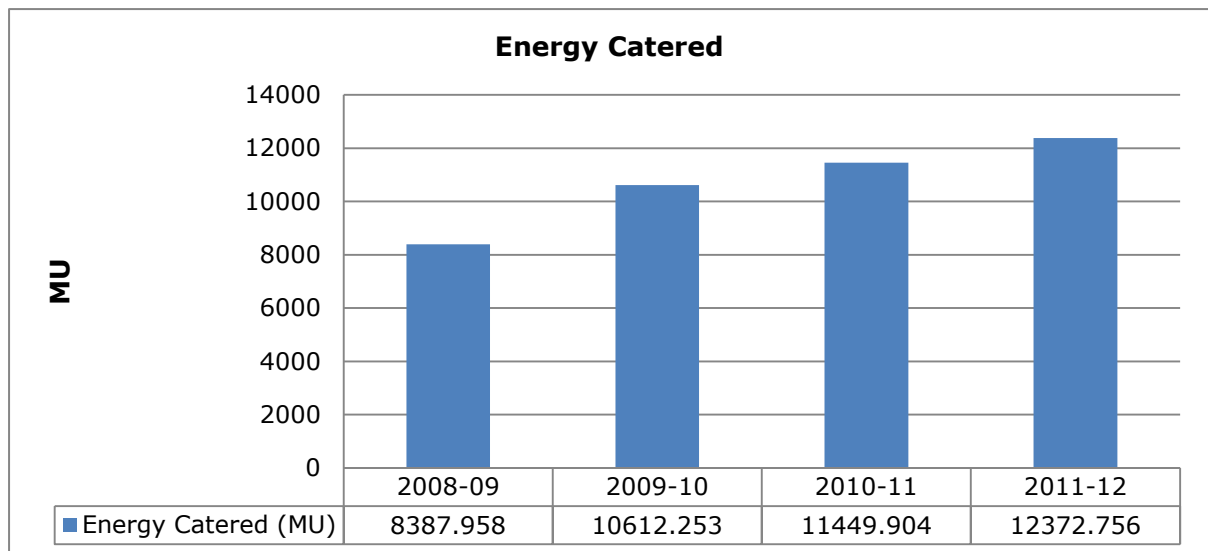
PTCUL is one of the most efficient transmission utilities in the country. This fact has been reaffirmed time and again by the low level of transmission losses. The loss level over the past few years has always been below 2%.

**Figure 2.5: Transmission losses**



## 2.7. ENERGY CATERED

**Figure 2.6: Energy Catered**



---

## **3. REGULATORY FRAMEWORK**

### **3.1. BACKGROUND**

As per the Constitution, the power sector in India was the combined responsibility of Central and State Government. Over the years, reforms in Indian power sector have been driven by the Union Government in an endeavour to achieve sustainable growth & improvement in operational efficiencies. One of the hallmarks of this reform Agenda is the Electricity Act, 2003 (hereinafter referred as EA, 2003 or simply the "Act" unless specified otherwise).

The Electricity Act 2003 attempts to induce competition in electricity sector for creating an environment conducive to supply of good quality of electricity to all categories of consumers at affordable/reasonable prices. The access to electricity markets for captive generators, open access participants and parallel licensees has led to evolution of multi buyer market mechanism. Adequate investment in Intra-state and Inter-state transmission infrastructure would also be required for supporting power generation. This vibrant power market would facilitate competitive merchant power plants to be set up pursuant to the promotional policies like mega power plants etc, and incentives offered by the Government such as availability of state specific resources like land, water, rebate in local taxes, etc.

### **3.2. ENABLING PROVISIONS IN ELECTRICITY ACT, 2003**

The Government of India has notified the Electricity Act, 2003 with effect from 10th June 2003 which requires the State Governments to initiate major changes in the Industry Structure and Operations of the state power sector. The broad objectives of the Electricity Act, 2003 as incorporated in its preamble is to consolidate the laws relating to generation, transmission, distribution, trading and use of electricity and for taking measures conducive to development of electricity industry through way of reforms and restructuring, promoting competition therein, protecting interest of consumers and supply of electricity to all areas, rationalisation of electricity tariff, ensuring transparent policies regarding subsidies, promotion of efficient and environmentally benign policies, constitution of Central Electricity Authority, Regulatory Commissions and establishment of Appellate Tribunal and for matters connected therewith or incidental thereto.

It has introduced a number of innovative concepts like de-licensing of generation, power trading, Open Access, Appellate Tribunal, etc., and special provisions for the rural areas. The Act has made it mandatory for all the States to restructure their SEBs.

The major provisions of the Electricity Act 2003 related to Transmission are:

- As per Section 3 of the Electricity Act 2003, the CEA has been entrusted with the responsibility of preparing the National Electricity Plan in accordance with the National Electricity Policy and notify such plans once in five years.
- Preparation, publication and notification of National Electricity Plan by the Central Electricity Authority. (Section 4)
- Private sector participation in transmission through grant of license by the appropriate Regulatory Commission. (Sections 12,13,14,15)

- CTU (Central Transmission Utility) / STU (State Transmission utility) to be deemed transmission licensee. (Section 14)
- Planning, coordination, development and undertaking transmission of electricity through inter-state system by the Central Transmission Utility. (Section 38)
- Planning, coordination, development and undertaking transmission of electricity through intra-state system by the State Transmission Utilities. (Section 39)
- Licensee to provide non-discriminatory open access to any licensee or generating company and to any consumer as and when open access is provided by SERC in Transmission. (Section 40)
- Open access to be provided against payment of transmission charges as determined by CERC/SERC.
- Advise to the Central Government on matters relating to the national electricity policy, formulate short-term and perspective plans for development of electricity system and coordinate the activities of the planning agencies.
- Governments, licensees or the generating companies for improved and coordinated operation of electricity system under their ownership, and advise the Appropriate Governments and Appropriate Commissions on technical matters relating to generation, transmission and distribution of electricity by the Central Electricity Authority. (Section 73)
- Regulation and tariff determination for inter-state transmission by the Central Electricity Regulatory Commission. (Section 79)
- Facilitation and tariff determination for intra-state transmission by the State Electricity Regulatory Commissions. (Section 86)

Also, the Electricity Act has envisaged competition in transmission and has provisions for grant of transmission licenses by the Central Electricity Regulatory Commission (CERC) as well as State Electricity Regulatory Commissions (SERCs). Further, the Act has created a conducive environment for investments in all segments of the industry, both for public sector and private sector, by removing barrier to entry in different segments.

CTUs and STUs functions as specified in the Act are:

- Transmission;
- Planning & co-ordination of transmission system;
- Development of efficient and economical transmission lines from generating stations to load centres;
- Providing non-discriminatory open access to the system

### **3.3. LEGAL STRUCTURE OF POWER TRANSMISSION IN INDIA**

The Ministry of Power of the Government of India (GoI) is at the helm of Indian Power Industry, providing policy guidance to the sector. The Central Electricity Authority (CEA) constituted under Electricity Supply Act 1948, is a body for advising GoI on technical matters and is responsible for preparing National Electricity Plan in accordance with the National Electricity Policy.

The Central Electricity Regulatory Commission established as per the Electricity Regulatory Commission Act, 1998, regulates the power sector at national level including functioning of central

power utilities like the NTPC and NHPC, which are engaged in generation, and PGCIL, which is engaged in interstate power transmission.

At the state level, state governments control the sector through the erstwhile state electricity boards (SEBs) and electricity departments (EDs). In many states the SEBs are now unbundled or corporatized as per the EA 2003. Separate utilities are responsible for generation, transmission, and distribution, usually within their own states and territories. Intra-state transmission is exclusive domain of SEBs and State Transmission Utilities (STUs) formed out of unbundled SEBs.

|                            | Inter State & Inter Region Transmission   | Intra State Transmission                |
|----------------------------|---|---|
| Policy                     | Ministry of Power, Govt of India          | Energy Department of State Govt         |
| Planning & Standards       | Central Electricity Authority             |   |
| Regulation                 | Central Electricity Regulatory Commission | State Electricity Regulatory Commission |
| Asset Creation, Operations | Central Transmission Utility (PGCIL)      | State Transmission Utility              |

### 3.4. NATIONAL ELECTRICITY POLICY

The National Electricity Policy was notified by GoI as per provisions of the Act on February 12, 2005. This Policy aims at accelerated development of the power sector, providing supply of electricity to all areas and protecting interests of consumers and other stakeholders keeping in view availability of energy resources, technology available to exploit these resources, economics of generation using different resources and energy security issues.

The development of the National Grid is an important feature of the Policy. The Policy states that the Transmission System requires adequate and timely investments and also efficient and coordinated action to develop a robust and integrated power system for the country. It further recognizes that there is need for adequately augmenting transmission capacity in view of the massive increase planned in generation and also for development of power market.

The Policy notes that in view of the required magnitude of the expansion of the sector, a sizeable part of the investment requirement will need to be brought in from the private sector. In keeping with this, it specifies that special mechanisms would be created to encourage private investment in the transmission sector so that sufficient investments are made for achieving the objective of demand to be fully met by 2012.

The National Electricity Policy notified on 12th February, 2005 inter-alia states that –

*"5.3.1 The Transmission System requires adequate and timely investments and also efficient and coordinated action to develop a robust and integrated power system for the country.*

*5.3.2 Keeping in view the massive increase planned in generation and also for development of power market, there is need for adequately augmenting transmission capacity.....*

---

5.3.10 Special mechanisms would be created to encourage private investment in transmission sector so that sufficient investments are made for achieving the objective of demand to be fully met by 2012.

5.8.1 ..... Considering the magnitude of the expansion of the sector required, a sizeable part of the investments will also need to be brought in from the private sector. The Act creates a conducive environment for investments in all segments of the industry, both for public sector and private sector, by removing barrier to entry in different segments. Section 63 of the Act provides for participation of suppliers on competitive basis in different segments which will further encourage private sector investment.”

In order to facilitate the smooth and rapid development of transmission capacity in the country as envisaged in the National Electricity Policy, some transmission projects will be identified for tariff based competitive bidding, in which Private Investors and Transmission Utilities, both Central and State, can participate.

### **3.5. NATIONAL TARIFF POLICY**

Some of transmission related provisions of National Tariff Policy which have implication with regard to the National Electricity Plan are:

- Adequate and timely investments and also efficient and coordinated action to develop a robust and integrated power system for the country.
- Augmenting transmission capacity keeping in view the massive increase planned in generation and also for development of power market.
- While planning new generation capacities, requirement of associated transmission capacity would need to be worked out simultaneously in order to avoid mismatch between generation capacity and transmission facilities.
  - The Central Government would facilitate the continued development of the National Grid for providing adequate infrastructure for inter-state transmission of power and to ensure that underutilized generation capacity is facilitated to generate electricity for its transmission from surplus regions to deficit regions.
  - The Central Transmission Utility (CTU) and State Transmission Utility (STU) have the key responsibility of network planning and development based on the National Electricity Plan in coordination with all concerned agencies as provided in the Act. The CTU would need to coordinate with the STUs for achievement of the shared objective of eliminating transmission constraints in cost effective manner.
  - Network expansion should be planned and implemented keeping in view the anticipated transmission needs that would be incident on the system in the open access regime. Prior agreement with the beneficiaries would not be a pre-condition for network expansion.
  - Structured information dissemination and disclosure procedures should be developed by the CTU and STUs to ensure that all stakeholders are aware of the status of generation and transmission projects and plans.

- Open access in transmission has been introduced to promote competition amongst the generating companies. This should lead to availability of cheaper power. The Act mandates non discriminatory open access in transmission.
- To facilitate orderly growth and development of the power sector and also for secure and reliable operation of the grid, adequate margins in transmission system should be created. The transmission capacity would be planned and built to cater to both the redundancy levels and margins keeping in view international standards and practices.
- Special mechanisms would be created to encourage private investment in transmission sector so that sufficient investments are made for achieving the objective of demand to be fully met by 2012.

### **3.6. SERC REGULATIONS**

Regulations were enacted by the Regulatory Commission in compliance with the provisions of the EA 2003 and as guided by the National Tariff Policy and National Electricity Policy. Some of the key regulations which were enacted by the Uttarakhand State Electricity Regulatory Commission as outlined below:

**Table 3.1: Regulations**

| <b>S.No.</b> | <b>Name of the Regulation</b>                |
|--------------|--|
| 1.           | Grid Code                                    |
| 2.           | Multi Year Tariff Regulations, 2011          |
| 3.           | Intra State Open Access Regulations, 2010    |
| 4.           | Terms and Conditions of Tariff               |
| 5.           | Fees, fines and Charges Regulations          |
| 6.           | Appointment & Functioning of Ombudsman, 2010 |

## 4. PROJECTS CURRENTLY UNDER EXECUTION

PTCUL is undertaking various projects to improve its network strength. These projects have been funded by institutions like the Rural Electrification Corporation (REC), Power Finance Corporation (PFC) and Asian Development Bank (ADB). The table below lists the major projects that are currently being undertaken with their current progress status.

**Table 4.1: Progress status of current projects**

| S No | Name of the Project                         | Scheme    | Estimated Cost (Rs Lakh) | Revised Cost (Rs Lakh) | Physical Progress  | Financial Progress (Rs Lakh) | Note on the Current Status  |
|------|---|-----------|--------------------------|------------------------|--|------------------------------|---|
| 1    | 132 KV Srinagar-Satpuli D/c Line-52.40Km.   | REC-I&III | 1427.6                   | 4046.70                | Tower Foundation -187/187, Tower Erection -187/187, Stringing - 52.385/52.4K.m.Work Progress 99% done.   | 5422.88                      | The 60 Nos. of Trees are under cutting. to energise the line there after.   |
| 2    | 132 KV Srinagar-Simli D/c Line - 64.00Km.   | REC-I&III | 2226                     | 8951.00                | Tower Foundation -105/228, Tower Erection -98/228, Stringing - 22.6/64.00  | 4854.04                      | The final approval from Ministry of Environment & Forest Department - Delhi is awaited  |
| 3    | 132 KV - Switching -S/s - Srinagar- II.     | REC-II    | 1976.87                  | -                      | Contouring of Sub Station land approved. Single Line diagram approved. Work Progress 05% done.   | 970.54                       | Lay-out design, drawing finalised, excavation & civil work is under progress.   |
| 4    | 132 KV Almora-Pithoragarh D/c Line-08.08Km. | REC-II    | 545.56                   | -                      | Foundation -25/36,Work Progress 45% done.  | 215.25                       | The process of lease deed is under progress.  |
| 5    | 132 KV Ranikhet-Bageshwar D/c Line-60Km..   | REC-II    | 2589.79                  | -                      | Detailed survey work completed, Route Ailment tower schedule finalized. The Forest case has been sent to the Ministry of Environmental & Forest Department-Delhi by Nodal officer - Dehradun.Work Progress 10% done. | 104.72                       | The proposal of the forest case is to be sent to the Ministry of Environment & Forest Department - Delhi after getting the approval from GoU. |

| S No | Name of the Project   | Scheme | Estimated Cost (Rs Lakh) | Revised Cost (Rs Lakh) | Physical Progress  | Financial Progress (Rs Lakh) | Note on the Current Status   |
|------|---|--------|--------------------------|------------------------|--|------------------------------|--|
| 6    | 220 KV -S/s- Dehradun-320MVA.   | REC-IV | 5731.65                  | 5173.00                | (1) 220 KV Main Foundation completed (27/27 Nos.)<br>(2) 220 KV Main Tower & Beam completed.<br>(3) 132 KV Main Foundation completed (44/44 Nos.)<br>(4) 132 KV Main Tower & Beam completed.<br>(5) 33 KV Main Foundation completed (29/29 nos.)<br>(6) 33 KV Main Tower & Beam completed. | 932.29                       | -  |
| 7    | 132 KV -S/s- Haridwar road Dehradun -80MVA.   | REC-IV | 2492.85                  | -                      | The land acquisition completed in January 2011.The work of Civil, Drawing and Design in Progress. Work Progress 21% done.  | 318.53                       | -  |
| 8    | 132 KV Bindal- Purkul Line- 10.73Km.  | REC-IV | 367                      | 524.03                 | Tower Foundation -36/53, Tower Erection -15/53, Work Progress 51% done.  | 239.78                       | The process for transfer the Civil Soyam land in favour of the Forest Department is under progress for compensatory plantation, as per terms & condition for Principal Approval. |
| 9    | Construction of SLDC in Dehradun, & 2 No. of Sub-SLDC in Rishikesh & Kashipur along with communication system | REC-II | 5192.08                  | -                      | The Construction of SLDC in Dehradun, along with communication system has been completed and in working from 27-11-2012.   | 922                          | The RTUS reporting work is under progress.   |
| 10   | LILO of 220 KV Khodri-Rishikesh line at 220 KV -S/s Dehradun-02.00Km.   | REC-IV | 108.89                   | -                      | The work of Detailed Survey completed. The line profile approved. The supply of material is under progress. The 01 No. of Tower foundation is completed. Work Progress 10% done.   | -                            | The work has been stopped due to agitation of the villagers.   |

| S No | Name of the Project  | Scheme | Estimated Cost (Rs Lakh) | Revised Cost (Rs Lakh) | Physical Progress  | Financial Progress (Rs Lakh) | Note on the Current Status  |
|------|--|--------|--------------------------|------------------------|--|------------------------------|---|
| 11   | 132 KV S/s Sitarganj (SIDCUL)-80 MVA                               | REC-IV | 1700.15                  | 1804.01                | Sub-station energised on 09-10-2012. work Progress 98% done. Clearance of Punch-Point being undertaken.  | 1,185.84                     | -   |
| 12   | 132 KV Kichha-Sitarganj Line-15.00Km.                              | REC-IV | 381.37                   | 899.69                 | The work is under progress.  | 644.34                       | There is ROW problem at Location No.98 & 99.  |
| 13   | 220 KV -Kashipur - Mahuwakheraganj Line-16.80Km.                   | REC-V  | 1544.73                  | -                      | Tower foundation 56/61, Tower Erection -51/61, Stringing - 4.589/16.799K.m. Work Progress 80% done.  | 912.25                       | There is ROW problem at Location No.55,56 & 57.   |
| 14   | 220 KV -Berhani - Pantnagar Line.                                  | REC-IX | 874                      | -                      | Stringing - 33.40/35.26K.m. Work Progress 90% done.  | 270.13                       | The work has not been completed, as the shutdown of 220 KV Kashipur-Berhani-Pantnagar line could not be received. |
| 15   | 220 KV D/C Rudrpur (Brahmwari) - Ghansali - Srinagar line-91.10Km. | PFC    | 15655.00                 | -                      | The Forest case has been sent to the Ministry of Environment & Forest Department - Lucknow by the Ministry of Environment & Forest Department-Delhi. Work Progress 13% done. | -                            | -   |
| 16   | 220 KV - GIS - Sub Station - Rudrpur (Brahmwari) - 100 MVA         | PFC    | 11887.00                 | -                      | The Contouring of Sub Station land completed. The general arrangement diagram and single line diagram completed. Work Progress 03% done.                                     | 40.4                         | -   |

| S No | Name of the Project  | Scheme | Estimated Cost (Rs Lakh) | Revised Cost (Rs Lakh) | Physical Progress   | Financial Progress (Rs Lakh) | Note on the Current Status   |
|------|--|--------|--------------------------|------------------------|---|------------------------------|--|
| 17   | 400 KV - Sub Station - Srinagar - 630 MVA  | ADB    | 17208.00                 | -                      | Control Room Building GF roof & FF roof slab reinforcement completed. Brick work and internal Plastering work in progress. 220KV Outdoor Cable Trench 575/850 RM(Raft), Wall- 575/850 RM. 400KV Outdoor Cable Trench 60/890 RM, Wall. Retaining Wall - 1472/1839 RMT(Raft), 220KV kiosk Foundation- 7/8 Nos, Beam Erection 34/38, 220KV tower erection 40/46, 220KV Equipment Structure erected 184/269, 220KV Equip erected 178/269, 400KV tower erection 35/48, 400KV Equipment Structure erected 47/238, 400KV Earthmat laying 400/11121 RMT, Earthing in 220KV yard 400/11121 RMT, 400KV Beam Erection 13/41. | 7,284.86                     | The work of Bridge & Road has been awarded by SE- PWD, Pauri (G) on dated 23-12-11 & 24-12-11 respectively. Work of road widening and construction of Bridge has been started. |
| 18   | (A ) LILO of 400 KV Vishnu Prayag - Muzaffarnagar Line at Kuwari Pass (Pipalkoti) S/s.<br>(B) 400KV Tapovan-Pipalkoti line.<br>(C ) 400KV line from 400KV S/s Srinagar to GVK Power house. | ADB    | 10314.00                 | -                      | The Agreement executed with M/s TATA Projects on 06.05.2011. The Detailed Route survey for LILO of 400 KV Vishnu Prayag-Muzaffarnagar Line at Kuwari Pass (Pipalkoti) Substation and 400KV Tapovan-Pipalkoti line completed. The Forest case proposal of 400KV S/s Srinagar to GVK Power house submitted in the office of Nodal Officer - Dehradun.   | 643.79                       | -  |
| 19   | 220KV Lata Tapovan - Joshimath line - 12 Km.   | ADB    | 3347.00                  | -                      | The Agreement was executed with M/s TATA Projects on 06.05.2011. The Detailed Route survey completed. The Joint inspection along with the Forest & Revenue officials is in progress, for  | 246.32                       | -  |

| S No | Name of the Project   | Scheme | Estimated Cost (Rs Lakh) | Revised Cost (Rs Lakh) | Physical Progress  | Financial Progress (Rs Lakh) | Note on the Current Status |
|------|---|--------|--------------------------|------------------------|--|------------------------------|----------------------------|
|      |   |        |                          |                        | preparing the Forest Proposal Case.  |                              |                            |
| 20   | 220KV Joshimath - Pipalkoti line - 20.30 Km.                | ADB    | 8825                     | -                      | The Agreement was executed with M/s TATA Projects on 06.05.2011. The checking of Detailed Route survey & Profile is in progress. The Detailed Route survey for the section of Rope way crossing is in progress. The Joint inspection along with the Forest & Revenue officials is in progress, for preparing the Forest Proposal Case. | 605.87                       | -                          |
| 21   | Construction of the Headquarter Building at Majra-Dehradun. | REC-XI | 1756.22                  | -                      | The Work Progress 96% done. Final Finishing is being carried out.  | 1,376.09                     | -                          |

---

## 5. HUMAN RESOURCES

A vital ingredient in the effective functioning of an organization is the adequacy and efficiency of its work force. By employing competent professionals, the organization can not only achieve higher levels of efficiency, but also bring down costs and make it more profitable. It is not a surprise then that PTCUL, which has been adjudged the best power utility in India by the Ministry of Power, employs an excellent talent pool. It has a satisfactory performance in recruitment, selection, training and then development of the employees.

Changing business environment, market competition and regulatory compliance requirements make it essential for any organization to regularly assess its staffing pattern for optimal utilization. In a typical state utility, the key issues in Human Resources where a focussed approach is required are as follows:

- Shortage of qualified manpower for performing day to day responsibilities
- Norms not updated periodically leading to higher workload on Field Staff
- High levels of employee stagnation, leading to lower motivation levels
- No system to evaluate employee capabilities, job requirements
- Huge number of Cadres, and across cadre disparities
- Not adequate focus on Employee Development
- Performance management system not aligned to business needs
- Lack of rewards and recognition systems for good performance across levels
- Roles and Responsibilities not clearly defined particularly between Field and Corporate Offices
- Lack of communication across the organisation, which hampers creation of positive culture
- Delegation of Powers, not documented and referenced properly leading to misinterpretations
- Discontent among people on implementation of Transfer Policy and long term focus
- Basic Hygiene factors like claims processing, salaries, advances, loans take longer time to clear
- Perception of Right people are not getting posted in the right places

PTCUL has reviewed the organisational structure in the light of the changing business needs and particularly to strengthen the functions such as Regulatory, Commercial, Engineering, Legal, Human Resources and Finance & Accounts and has developed a detailed manpower planning process defined with adequate focus on short, medium and long term needs. It has projected that the net additions to the employee work force would be 383 employees in FY 2013-14, 72 employees in FY 2014-15 and 105 employees in FY 2015-16. **(The HR plan is being separately enclosed as per Annex-1)**

This business plan assesses the cost in respect of such fresh recruitments, their recruitment cost and training and development cost. This section discusses:

- Some of the key initiatives undertaken on the human resource front
- Projections of the training costs in the next 2 years

---

## **5.1 EMPLOYEES' SUGGESTION SCHEME (ESS)**

The ESS has been one of major initiatives undertaken at PTCUL. The programme was introduced in order to encourage creative thinking vis-à-vis inspiring and channelizing the ideas/suggestions to promote organization wide problem solving and improvement/achievement orientation. The aim of the scheme is to foster a sense of belonging, ownership, collaboration and strengthen employee-management relationship.

Awards under the ESS:

- Suggestions resulting in saving which are of recurring nature and likely to benefit the company for time to come, 10% of first years annual savings may be recommended as award subject to a maximum of Rs. 10,000.
- In case of one time savings, 10% of saving may be recommended as award subject to a maximum of Rs. 7,500
- Suggestions where savings/benefits cannot be assessed on monetary terms will be rewarded to a maximum of Rs. 500 per suggestion
- In case the suggestion happens to be of exceptional nature the amount of award may be recommended beyond Rs. 15,000 by the suggestion committee.
- In addition to cash awards, commendation or appreciation letter will be issued to the individual award winner.
- A token of Rs.100 will be given for each suggestion worth considering.

## **5.2 GRIEVANCE REDRESSAL SCHEME (GRS)**

PTCUL aims to be a dynamic, forward looking organization with a motivated and satisfied workforce. In order to maintain high employee morale and motivate them towards better productivity it is essential and important to treat every employee with dignity but to address their genuine grievances in time within framework of company's policies/rules.

Objective of GRS:

- To attempt to resolve grievance through verbal discussion at first instance.
- To handle/redress an individual employee's grievance within framework of policy/rules in a prescribed/reasonable time period.
- To promote better communication, mutual trust, harmonious relationship between employees and management.
- To provide various stages of grievance redressal to enable an aggrieved employee to seek remedy, if necessary, even from the highest level of authority within framework of rules.

### 5.3 PAY REVISION

The erstwhile Uttar Pradesh State Electricity Board (UPSEB) was split into UPPCL, UPCL and UJVNL in the year 2000. Major strength of UPCL consisted of the UPSEB's workforce. In order to protect employee interests, the salaries of employees who migrated from UPSEB, were to be governed by the earlier policies of UPSEB. These employees had the provision of receiving pension after retirement. But the new employees were not given the provision of pension. Also in the year 2005, the Govt. of Uttarakhand also passed a policy eliminating the pension scheme and introducing the Employee Provident Fund scheme for all its employees.

PTCUL was formed after the trifurcation of UPCL. Here as well, the employees of the erstwhile UPSEB still come under the pension scheme whereas the new employees do not. PTCUL has implemented the recommendations of the 6<sup>th</sup> Pay Commission with retrospective effect from 01.04.2006. The employees after the pay revision have migrated to the new pay scales and arrears are being paid for the past years. Comparisons of the old pay scales vis-a-vis the revised pay scales are shown in the table below:

**Table 5.1: Pay Scale**

| S.No. | Pay scale (01.01.96)     | Revised Pay scale (01.01.06) |             |           |
|-------|--------------------------|------------------------------|-------------|-----------|
|       |                          | Pay Band                     | Pay Scale   | Grade pay |
| 1     | 3050-75-3950-80-4590     | I                            | 5200-20200  | 1900      |
| 2     | 3200-85-4900             |                              |             | 2000      |
| 3     | 3500-85-5455             |                              |             | 2200      |
| 4     | 4200-100-6400            |                              |             | 2600      |
| 5     | 4500-125-7500            |                              |             | 3000      |
| 6     | 5300-150-8600            | II                           | 9300-34800  | 4200      |
| 7     | 4300-150-5600-175-9100   |                              |             | 4200      |
| 8     | 5850-175-9000-200-9400   |                              |             | 4200      |
| 9     | 6000-200-10400           |                              |             | 4200      |
| 10    | 6500-200-10500-250-11000 |                              |             | 4400      |
| 11    | 8550-275-13500           | III                          | 15600-39100 | 5400      |
| 12    | 10650-325-15200          |                              |             | 6600      |
| 13    | 14300-400-18300          | IV                           | 37400-67000 | 8700      |
| 14    | 16400-450-20000          |                              |             | 8900      |
| 15    | 18400-500-22400          |                              |             | 10000     |
| 16    | 21350-525-23975          |                              |             | 11000     |

### 5.4 TRAINING & DEVELOPMENT

PTCUL recognises that the key focus of training is on Induction Level training and in house refresher programs. The key objectives for a sound training and development policy are:

- Upgrade standard knowledge for continual improvement
- Skills enhancement of the employees
- Positive behaviour change in employees towards his fellow employees & organization
- Preparing employees for higher responsibility by providing appropriate skills

- Reduction in occurrence of accidents through safety awareness & safety training
- Creating conducive work culture & work environment through knowledge sharing
- Provide opportunity to update business & technology through external interaction

**Table 5.2: Training Initiatives undertaken from 01.04.2011 onwards:**

| S.No | Name of Training  | Name of Institute                              | Venue of Training                     | Date of Training                            | No. of Days      |
|------|---|--|---------------------------------------|---|------------------|
| 1    | Senior Management Programme   | NRPC by MDI Gurgaon                            | MDI Campus, Gurgaon & Europe          | 28/03/11 to 30/03/11 & 10/04/11 to 19/04/11 | 3 days & 10 days |
| 2    | Public Private Partnership for Infrastructure   | IIM, Ahmedabad                                 | IIM, Ahmedabad                        | 18/04/11 to 23/04/11                        |                  |
| 3    | RTI Act, 2005   | PTCUL  | Janta Banquet Hall, Haldwani          | 06.06.11                                    | 1 day            |
| 4    | RTI Act, 2005   | PTCUL  | Hotel Aketa, Dehradun                 | 25.06.11                                    | 1 day            |
| 5    | Competing with Self: Internal Change Agent  | Manushu Uthan, New Delhi                       | Hotel Aketa, Dehradun                 | 28.06.11 to 01.07.11                        | 4 days           |
| 6    | Human Induced cum explosive disaster management action plan                                 | Uttarakhand Academy of Admn, Nainital          | Uttarakhand Academy of Admn, Nainital | 10.08.11 to 12.08.11                        | 3 days           |
| 7    | Disciplinary rules, agencies and procedure (including CCA rules & constitutional provision) | Centre for Training and Social Research, Delhi | The Connaught Hotel, New Delhi        | 07.09.11 to 09.09.11                        | 3 days           |
| 8    | Software for calculation of Induced voltage and related technical guidance                  | CLPTCC, Delhi                                  |                                       |   |                  |
| 9    | First system operator certification examination 2011  | NPTI, Bangalore                                |                                       |   |                  |
| 10   | ABB Automation and Power World  | M/s ABB Ltd.                                   | Manekshaw Centre, New Delhi           | 19.09.11 to 21.09.11                        | 3 days           |
| 11   | Computer Training   | Hilltron, Dehradun                             | NRS Softech Ltd. Dehradun             | 22.11.11 to 13.12.11                        | 48 hours         |
| 12   | Computer Training   | Hilltron, Dehradun                             | NRS Softech Ltd. Dehradun             | 14.12.11 to 31.12.11                        | 48 hours         |
| 13   | MDP on Managerial Skills for Technical Personnel  | ISTD, Dehradun Chapter                         | Hotel Great Value, Dehradun           | 25.11.11 to 27.11.11                        | 3 days           |
| 14   | Developing of skill in field of Noting and  | Institute of Socio                             | New Delhi                             | 16.02.12                                    | 3 days           |

| S.No | Name of Training  | Name of Institute                     | Venue of Training | Date of Training  | No. of Days |
|------|---|---------------------------------------|-------------------|-------------------|-------------|
|      | Drafting, Filling System, Record Management and improving Efficiency and Effectiveness in SOFT skills | Economic Research & Action, New Delhi |                   |                   |             |
| 15   | Training for Account Officer and Staff  | ICWAI                                 | Dehradun          | Feb & March 2012  | 3 days      |
| 16   | Training for HR officer   | NPC, Delhi and Power HR forum         | Delhi             | Feb & March, 2012 | 3 days      |
| 17   | RTI 2005  | PTCUL                                 | Dehradun          | Feb & March, 2012 | 1 day       |
| 18   | Training of Assistant Engineers in SCADA  | Noida                                 | Noida             |                   |             |

PTCUL has proposed to undertake the following training programs in the year 2013-14 and 2014-15. As per PTCUL Training Policy efforts are made to impart an average 05 day Training per employee during each year. The Training needs are identified keeping in view the organizational functions in each area and availability of Trained manpower and existing knowledge/skill for effective discharge of functions. The needs are identified and enlisted after discussion with CE (O&M) Garhwal, CE (O&M) Kumaun & CE (Project) and other Senior Officer's. The Training as per identified needs would be imparted through outside sponsorship and organizing in-house programmes with outside experts during the next two years i.e. 2013-14 & 2014-15.

The projected training expenses for the year 2013-14 and 2014-15 are around Rs. 1.00 crore each.

At the end of each year, Training Incharge would review the training plan w.r.t.

- Training needs executed
- Feed backs of training reviewed
- Training needs not fulfilled during the year and reasons thereof

After identifying the gaps, fresh training needs will be identified as per organizational requirement and budgeting would be revised if required. The following tables provide the details of the proposed number of employees identified for training along with the proposed training expenses in the successive table.

**Table 5.3: Proposed number of Employees for training in 2013-14**

| S.No |                                | Designation      | No of Employees | Total No of Employees | Proposed No. of Employees for Training. | Min. Day's Training | Min. Amount per Day's Training | Manpower Training Day's |
|------|--------------------------------|------------------|-----------------|-----------------------|---|---------------------|--------------------------------|-------------------------|
| 1    | <b>Technical Officer</b>       | C.E. L-II        | 2               | <b>151</b>            | <b>100</b>                              | <b>5</b>            | 6000                           | <b>3000000</b>          |
| 2    |                                | SE+SE-C          | 13              |                       |   |                     |                                |                         |
| 3    |                                | EE               | 39              |                       |   |                     |                                |                         |
| 4    |                                | EE-C             | 4               |                       |   |                     |                                |                         |
| 5    |                                | AE               | 86              |                       |   |                     |                                |                         |
| 6    |                                | AE-C             | 7               |                       |   |                     |                                |                         |
| 7    | <b>HR</b>                      | Dy.GM-HR         | 1               | <b>3</b>              | <b>3</b>                                | <b>5</b>            | 6000                           | <b>90000</b>            |
| 8    |                                | Dy.CPO           | 1               |                       |   |                     |                                |                         |
| 9    |                                | PO               | 1               |                       |   |                     |                                |                         |
| 10   | <b>Finance Officer</b>         | Dy.GM-F          | 2               | <b>7</b>              | <b>7</b>                                | <b>5</b>            | 6000                           | <b>210000</b>           |
| 11   |                                | SAO              | 1               |                       |   |                     |                                |                         |
| 12   |                                | AO               | 2               |                       |   |                     |                                |                         |
| 13   |                                | AAO              | 2               |                       |   |                     |                                |                         |
| 14   | <b>Finance Staff</b>           | Accountant       | 23              | <b>29</b>             | <b>40</b>                               | <b>5</b>            | 4000                           | <b>800000</b>           |
| 15   |                                | Asst. Accountant | 1               |                       |   |                     |                                |                         |
| 16   |                                | OA-III(Acct.)    | 5               |                       |   |                     |                                |                         |
| 17   | <b>Legal</b>                   | Dy.GM-Legal & CS | 1               | <b>2</b>              | <b>2</b>                                | <b>5</b>            | 5000                           | <b>50000</b>            |
| 18   |                                | ALO              | 1               |                       |   |                     |                                |                         |
| 19   | <b>IT</b>                      | Dy. GM-IT        | 1               | <b>1</b>              | <b>1</b>                                | <b>5</b>            | 5000                           | <b>25000</b>            |
| 20   | <b>Technical Staff</b>         | JE               | 162             | <b>493</b>            | <b>250</b>                              | <b>5</b>            | 3000                           | <b>3750000</b>          |
| 21   |                                | JE-C             | 10              |                       |   |                     |                                |                         |
| 22   |                                | TG-I(E)          | 33              |                       |   |                     |                                |                         |
| 23   |                                | TG-I(L)          | 12              |                       |   |                     |                                |                         |
| 24   |                                | TG-II(E)         | 168             |                       |   |                     |                                |                         |
| 25   |                                | TG-II(L)         | 31              |                       |   |                     |                                |                         |
| 26   |                                | S. Collie        | 53              |                       |   |                     |                                |                         |
| 27   |                                | Collie           | 24              |                       |   |                     |                                |                         |
| 28   | <b>Other Ministerial Staff</b> | Admin. Officer   | 1               | <b>73</b>             | <b>60</b>                               | <b>5</b>            | 2000                           | <b>600000</b>           |
| 29   |                                | OS-Spl Gr.       | 2               |                       |   |                     |                                |                         |
| 30   |                                | OS-I             | 16              |                       |   |                     |                                |                         |

| S.No  |                    | Designation   | No of Employees | Total No of Employees | Proposed No. of Employees for Training. | Min. Day's Training | Min. Amount per Day's Training | Manpower Training Day's |
|-------|--------------------|---------------|-----------------|-----------------------|---|---------------------|--------------------------------|-------------------------|
| 31    |                    | OS-II         | 14              |                       |   |                     |                                |                         |
| 32    |                    | OA-I          | 11              |                       |   |                     |                                |                         |
| 33    |                    | OA-II         | 14              |                       |   |                     |                                |                         |
| 34    |                    | OA-III        | 15              |                       |   |                     |                                |                         |
| 35    | <b>Other Staff</b> | Steno-SG      | 3               | <b>9</b>              | <b>9</b>                                | <b>5</b>            | 2000                           | <b>90000</b>            |
| 36    |                    | Steno-I       | 2               |                       |   |                     |                                |                         |
| 37    |                    | Steno-II      | 4               |                       |   |                     |                                |                         |
| 38    |                    | Steno-III     | 0               |                       |   |                     |                                |                         |
| 39    |                    | D.E.O & Other | 63              |                       |   |                     |                                |                         |
| TOTAL |                    |               | <b>831</b>      | <b>831</b>            | <b>522</b>                              |                     |                                | <b>9115000</b>          |

**Table 5.4: Projected Expense on Training for the Financial Year 2013-14 & 2014-15**

| S.No                                  | Training  | Duration | Employees Level/ Category | Training Fee per Emp. | No of Emp. In a Batch | Total Training Fee | TA/DA | Estimated Total Exp. |
|---------------------------------------|---|----------|---------------------------|-----------------------|-----------------------|--------------------|-------|----------------------|
| <b>Induction Training</b>             |   |          |                           |                       |                       |                    |       |                      |
| 1                                     | For JE (2 Batch)                                  | 4 Weeks  | C                         | 70000                 | 60                    | 4200000            | 60000 | <b>4260000</b>       |
| 2                                     | For TG-I/II (2 Batch)                             | 4 Weeks  | C                         | 60000                 | 60                    | 3600000            | 60000 | <b>3660000</b>       |
| 3                                     | For Asst. Accountant (1 Batch)                    | 1 Week   | C                         | 30000                 | 30                    | 900000             | 30000 | <b>930000</b>        |
| <b>Technical Training</b>             |   |          |                           |                       |                       |                    |       |                      |
| 1                                     | O&M Related Training for JE (2 Batch)             | 2 Weeks  | C                         | 35000                 | 60                    | 2100000            | 60000 | <b>2160000</b>       |
| 2                                     | O&M Related Training for TG-I/II (2 Batch)        | 2 Weeks  | C                         | 30000                 | 60                    | 1800000            | 60000 | <b>1860000</b>       |
| <b>Specialized Technical Training</b> |   |          |                           |                       |                       |                    |       |                      |
| 1                                     | Power Business, Tariff and Regulations            | 3 Days   | A & B                     | 9900                  | 5                     | 49500              | 10000 | <b>59500</b>         |
| 2                                     | Project Management for Power System Engineers     | 5 Days   | A & B                     | 13500                 | 10                    | 135000             | 20000 | <b>155000</b>        |
| 3                                     | O&M of Transformers and Circuit Breakers          | 5 Days   | A & B                     | 13500                 | 20                    | 270000             | 40000 | <b>310000</b>        |
| 4                                     | IE Act, Rules and Deregulation                    | 3 Days   | A & B                     | 9900                  | 10                    | 99000              | 20000 | <b>119000</b>        |
| 5                                     | O&M of EHV Transmission Lines                     | 5 Days   | A & B                     | 13500                 | 10                    | 135000             | 20000 | <b>155000</b>        |
| 6                                     | Point of Connection Tariff Regulation & Tutorials | 5 Days   | A & B                     | 13500                 | 5                     | 67500              | 10000 | <b>77500</b>         |
| 7                                     | Advanced Power System Protection                  | 5 Days   | A & B                     | 13500                 | 5                     | 67500              | 10000 | <b>77500</b>         |
| 8                                     | Quality Management in O&M of EHV S/s & Lines      | 5 Days   | A & B                     | 18000                 | 10                    | 180000             | 20000 | <b>200000</b>        |

| S.No | Training  | Duration | Employees Level/ Category | Training Fee per Emp. | No of Emp. In a Batch | Total Training Fee | TA/DA | Estimated Total Exp. |
|------|---|----------|---------------------------|-----------------------|-----------------------|--------------------|-------|----------------------|
| 9    | EHV S/s - Design, Erection, O&M   | 5 Days   | A & B                     | 15000                 | 5                     | 75000              | 10000 | <b>85000</b>         |
| 10   | Reactive Power Management   | 4 Days   | A & B                     | 16000                 | 5                     | 80000              | 10000 | <b>90000</b>         |
| 11   | Best Practices in O&M of EHV Switchgear   | 4 Days   | A & B                     | 18000                 | 5                     | 90000              | 10000 | <b>100000</b>        |
| 12   | Overhead Power Transmission Line Survey   | 5 Days   | A & B                     | 23000                 | 5                     | 115000             | 10000 | <b>125000</b>        |
| 13   | Project Planning Monitoring & Control System  | 5 Days   | A & B                     | 19800                 | 5                     | 99000              | 20000 | <b>119000</b>        |
| 14   | Testing & Commissioning of Electrical Equipment in Power Utility  | 5 Days   | A & B                     | 22500                 | 5                     | 112500             | 10000 | <b>122500</b>        |
| 15   | Smart Grid  | 3 Days   | A & B                     | 9900                  | 5                     | 49500              | 10000 | <b>59500</b>         |
| 16   | Disaster Management, Electrical Safety procedure and Accident prevention  | 5 Days   | A & B                     | 5250                  | 5                     | 26250              | 10000 | <b>36250</b>         |
| 17   | 400KV/220KV Sub Station-Design, Operation & Maintenance (Latest Procedures)                                     | 5 Days   | A & B                     | 12000                 | 5                     | 60000              | 10000 | <b>70000</b>         |
| 18   | Unified Load Dispatch & Communication   | 3 Days   | A & B                     | 9000                  | 5                     | 45000              | 10000 | <b>55000</b>         |
| 19   | Open Access, a Role of LDCs and Power Markets   | 4 Days   | A & B                     | 12000                 | 5                     | 60000              | 9000  | <b>69000</b>         |
| 20   | Electricity Regulation Governance, Policy and Commercial Issues   | 2 Days   | A & B                     | 10000                 | 5                     | 50000              | 10000 | <b>60000</b>         |
| 21   | "CSI Workshop on Cyber Security & Surveillance"   | 1 Day    | A & B                     | 5000                  | 5                     | 25000              | 10000 | <b>35000</b>         |
| 22   | Safety in Power Transmission and Behavior Based Safety management   | 2 Days   | A & B                     | 10000                 | 30                    | 300000             | 60000 | <b>360000</b>        |
| 23   | Development in Design & Construction of Transmission Lines  | 5 Days   | A & B                     | 25281                 | 5                     | 126405             | 10000 | <b>136405</b>        |
|      | <b>Professional Training</b>  |          |                           |                       |                       |                    |       |                      |
| 1    | Communication & Presentation Skills   | 4 Days   | B & C                     | 18000                 | 10                    | 180000             | 20000 | <b>200000</b>        |
| 2    | Decision Making & Problem Solving   | 5 Days   | B & C                     | 32500                 | 10                    | 325000             | 20000 | <b>345000</b>        |
| 3    | MDP on Contract Management & Arbitration  | 3 Days   | A & B                     | 30667                 | 4                     | 122667             | 8000  | <b>130667</b>        |
| 4    | Presentation and Disclosures of Financial Statements- As per the revised schedule VI to the companies Act, 1956 | 2 Days   | A & B & C                 | 10000                 | 30                    | 300000             | 60000 | <b>360000</b>        |
| 5    | Accounts and Finance Training   | 3 Days   | B & C                     | 15000                 | 30                    | 450000             | 60000 | <b>510000</b>        |
| 6    | Domestic Inquiry  | 2 Days   | A & B & C                 | 10000                 | 5                     | 50000              | 10000 | <b>60000</b>         |
| 7    | IT & Computer Training  | 15 Days  | A & B & C                 | 4000                  | 60                    | 240000             | 12000 | <b>252000</b>        |
| 8    | RTI-2005  | 2 Days   | A & B & C                 | 1000                  | 60                    | 60000              | 12000 | <b>72000</b>         |

| S.No | Training  | Duration | Employees Level/ Category | Training Fee per Emp. | No of Emp. In a Batch | Total Training Fee | TA/DA          | Estimated Total Exp. |
|------|---|----------|---------------------------|-----------------------|-----------------------|--------------------|----------------|----------------------|
|      | <b>Managerial &amp; Supervisory</b>   |          |                           |                       |                       |                    |                |                      |
| 1    | Interpersonal Effectiveness and Team Building   | 3 Days   | A & B                     | 30000                 | 10                    | 300000             | 20000          | <b>320000</b>        |
| 2    | Interpersonal Skills at workplace   | 2 Days   | B & C                     | 20500                 | 5                     | 102500             | 10000          | <b>112500</b>        |
| 3    | In-House Training Programme on Supervisory Skill Development of PTCUL Employees   | 3 Days   | C                         | 6000                  | 50                    | 300000             | 100000         | <b>400000</b>        |
| 4    | Tax Deduction at Source and Cash & Accounts Management including Double Entry System of Book-keeping  | 3 Days   | B & C                     | 14000                 | 15                    | 210000             | 22500          | <b>232500</b>        |
| 5    | Developing Efficiency and Effectiveness of Pas, PS, and Office Staff Including Multitasking Staff with Special Emphasis on Behaviourial Skills and Use of Latest Information Technology.                          | 3 Days   | C                         | 14000                 | 5                     | 70000              | 7500           | <b>77500</b>         |
| 6    | Administrative Vigilance Deptt. Proceeding and observing Norms & Guide of Apex Court for Protection of Women Employees against Sexual Harassment at Workplace   | 3 Days   | A & B & C                 | 14000                 | 5                     | 70000              | 7500           | <b>77500</b>         |
| 7    | Pension, Revised Pension, Family Pension, New Pension Scheme and Other Retirement benefits. Govt. Purchasing Procedure E-mail Tendering, Drafting of Contract, inspection Negotiation, delivery of Goods & Stores | 3 Days   | B & C                     | 14000                 | 10                    | 140000             | 15000          | <b>155000</b>        |
| 8    | Works and Works Accounts Management Executive of Civil/Electrical Work keeping of Accounts, Duties and Responsibilities of Executive Engineers, Asstt. Engineers & Divisional Accountant.                         | 2 Days   | A & B & C                 | 12000                 | 20                    | 240000             | 30000          | <b>270000</b>        |
| 9    | Establishment Matter (GPF/EPF, Gratuity, Pension etc.)  | 2 Days   | B & C                     | 6000                  | 60                    | 360000             | 108000         | <b>468000</b>        |
| 10   | Development of Skill in field of Noting & Drafting, Filing System, Record Management and improving efficiency and effectiveness and in soft skills.   | 3 Days   | C                         | 14000                 | 20                    | 280000             | 40000          | <b>320000</b>        |
| 11   | Disciplinary Rules, Agencies and Procedure (Including CCA Rules & Constitutional Provisions)  | 3 Days   | A & B & C                 | 18000                 | 5                     | 90000              | 10000          | <b>100000</b>        |
|      |   |          |                           | <b>Total</b>          |                       | <b>18807322</b>    | <b>1201500</b> | <b>20008822</b>      |

## 6. OPERATIONAL PLAN

PTCUL has prepared the Business/Operational Plan taking into consideration all the factors which would affect the operations of the company. It is submitted that the Business plan being a dynamic document may need to be updated at periodic intervals taking into account the changes in the internal and external environment and these changes would be intimated to the State Commission from time to time. The operational plans include the estimates of each capital expenditure scheme of PTCUL from FY 2012-13 to FY 2016-17.

The list of major generators expected to be commissioned in the 12th Plan whose evacuation is proposed through PTCUL system is provided in the table below:

**Table 6.1: List of Generators expected to be commissioned in the 12<sup>th</sup> Plan**

| S. No. | Name of the Project   | Name of the Developer                    | Capacity           | Remark   |
|--------|-----------------------|--|--------------------|--|
| 1.     | Lata Tapovan          | NTPC                                     | 171 MW             | Under construction & applied for connectivity to PTCUL       |
| 2.     | Tapovan Vishnugad     | NTPC                                     | 520 MW             | Under construction & applied for connectivity to PTCUL       |
| 3.     | Singoli Bhatwari      | M/s L&T                                  | 99 MW              | Under construction & TSA has been signed with PTCUL          |
| 4.     | Phatabyung            | M/s Lanco                                | 76 MW              | Under construction & applied for TSA with PTCUL              |
| 5.     | Srinagar              | M/s GVK                                  | 330 MW             | Under construction & TSA has been Signed with UP             |
| 6.     | Badrinath (Alaknanda) | M/s GMR                                  | 300 MW             | Under construction & applied for connectivity to PTCUL       |
| 7.     | Gama gas based        | M/s Gama Infraprop                       | 225 MW             | Under construction & connectivity has been signed with PTCUL |
| 8.     | Gas based at kashipur | UJVNL & GAIL                             | 350 MW (tentative) | Works to be taken up   |
| 9.     | Gas based at Haridwar | UJVNL & GAIL                             | 350 MW (tentative) | Works to be taken up   |
| 10.    | Beta gas based        | M/s Beta Infratech                       | 225 MW             | Under construction & applied for TSA with PTCUL              |
| 11.    | Sravanthi Gas based   | M/s Sravanthi Energy Pvt. Ltd.           | 225 MW             | Under construction & applied for TSA with PTCUL              |
| 12.    | Bagasse based         | M/s Lakshmi Sugar Mills Corporation Ltd. | 20 MW              | Under construction & connectivity has been signed with PTCUL |
| 13.    | Vyasi                 | UJVNL                                    | 120 MW             | Under construction & applied for connectivity to PTCUL       |
| 14.    | Lakhwar               | UJVNL                                    | 300 MW             | Under construction & applied for connectivity to PTCUL       |
| 15.    | Bawala Nandprayag     | UJVNL                                    | 300 MW             | Under construction & applied for connectivity to PTCUL       |
| 16.    | Nandprayag Langrasu   | UJVNL                                    | 100 MW             | Under construction & applied for connectivity to PTCUL       |
| 17.    | Tamaklata             | UJVNL                                    | 250 MW             | Under construction & applied for connectivity to PTCUL       |
| 18.    | Devsari               | SJVNL                                    | 252 MW             | Under construction & applied for connectivity to PTCUL       |

|     |               |              |                |  |
|-----|---------------|--------------|----------------|--|
| 19. | Naitwar Mori  | SJVNL        | 60 MW          | Under construction & applied for connectivity to PTCUL |
| 20. | Jakhol Sankri | SJVNL        | 51 MW          | Under construction & applied for connectivity to PTCUL |
| 21. | Kotilibhel 1A | NHPC         | 195 MW         | Under construction                                     |
|     |               | <b>Total</b> | <b>4519 MW</b> |  |

In addition to the above, UJVNL is developing small hydro power projects of around 60 MW which are under construction stage and projects having a generation capacity of around 125MW are under planning and development stage.

## 6.1 PROPOSED CAPITAL EXPENDITURE FOR FY 2012-13 TO 2016-17

PTCUL is in the process of strengthening its Transmission System (132KV & above) to meet the load growth requirement of Uttarakhand & also for evacuation of power from various generators i.e. Hydro as well as gas based, which are coming up in Uttarakhand.

By the end of 11th five year plan PTCUL Transmission network is suitable for load requirement of 1300 MW of the State Discom as well as capacity to handle power of 1832 MW within Uttarakhand.

After taking up the 12th Plan transmission projects, PTCUL Transmission Network will be capable to handle over 4500 MW of power requirement of the State Discom (assuming 9% annual growth) as well as evacuation of power from new generating projects expected to be added in 12th five year Plan.

The following table summarises the physical targets in the 12<sup>th</sup> Plan period:

**Table 6.2: Physical Targets for the 12<sup>th</sup> Plan Period (FY 2012-13 to 2016-17)**

| S No | Item                | Unit   | 12th five year Annual Plan (2012-17) targets |                     |                     |                     |                     | 12 <sup>th</sup> Plan 2012-17 |
|------|---------------------|--------|--|---------------------|---------------------|---------------------|---------------------|-------------------------------|
|      |                     |        | Annual Plan 2012-13                          | Annual Plan 2013-14 | Annual Plan 2014-15 | Annual Plan 2015-16 | Annual Plan 2016-17 |                               |
| 1    | 132 KV Substation   | No/MVA | 1/180  | 2/80                | 1/150               | 2/120               | 0/0                 | 6/530                         |
| 2    | 220 KV Substation   | No/MVA | 0/100  | 1/640               | 2/380               | 2/150               | 3/400               | 8/1670                        |
| 3    | 400 KV Substation   | No/MVA | 0/0  | 1/705               | 0/0                 | 1/630               | -                   | 2/1335                        |
| 4    | 132 KV Line         | Ckt Km | 164.40                                       | 6                   | 188                 | 60                  | 0                   | 418.40                        |
| 5    | 220 KV Line         | Ckt Km | 70.72  | 24                  | 260.6               | 10.4                | 238                 | 603.72                        |
| 6    | 400 KV Line         | Ckt Km | 0  | 0                   | 70                  | 304                 | 184                 | 558                           |
|      | <b>Total MVA</b>    |        | <b>1/280</b>                                 | <b>4/1425</b>       | <b>3/530</b>        | <b>5/900</b>        | <b>3/400</b>        | <b>16/3535</b>                |
|      | <b>Total Ckt Km</b> |        | <b>235.12</b>                                | <b>30</b>           | <b>518.6</b>        | <b>374.4</b>        | <b>422</b>          | <b>1580.12</b>                |

In the succeeding paragraphs, PTCUL has discussed the capital works undertaken by it in the past years, and has also provided the details of the ongoing and proposed capital investment schemes for the period FY 2012-13 to 2016-17:

## 6.2 REC-OLD SCHEME

There were 23 schemes envisaged under REC Old Schemes with an estimated cost of Rs. 165.75 crore. Out of 23 schemes, 4 schemes were deleted. The loan amount sanctioned from REC was Rs. 139.43 crore for the total project with a Debt/Equity Ratio of 84:16 and counterpart funding in the form of equity was to be provided by GoU. After the actual survey and based on revised quantum of work, the total cost of remaining 19 schemes was revised to Rs. 304.66 crore. Based on revised quantum of work, the REC sanctioned an additional loan of Rs. 110.80 crore at a Debt/Equity ratio of 70:30 towards the increased cost, thereby altering the overall Debt/Equity Ratio to 75.5:24.5

**Table 6.3: Status of REC Old Schemes**

| S No | Projects   | No.       |
|------|--|-----------|
| 1    | Completed Schemes which have been considered by the Commission | 17        |
| 2    | Ongoing Schemes likely to be completed in FY 2012-13           | 2         |
| 3    | Deleted Schemes  | 4         |
|      | <b>Total</b>   | <b>23</b> |

Under the REC Old Scheme, the following schemes have already been completed:

**Table 6.4: Completed REC Old Schemes**

| S No | Year       | Projects  | Date of Completion/<br>Energisation Date |
|------|------------|---|--|
| 1    | FY 2003-04 | Increasing Capacity of 132 kV Substation Bindal                               | 26 April 2003                            |
| 2    |            | Increasing Capacity of 220 kV Substation Rishikesh                            | 25 February 2004                         |
| 3    |            | Increasing Capacity of 132 kV Substation Rishikesh                            | 15 March 2004                            |
| 4    |            | Increasing Capacity of 132 kV Substation Jwalapur                             | 24 May 2003                              |
| 5    |            | Increasing Capacity of 220 kV Substation Haldwani                             | 10 February 2004                         |
| 6    |            | Increasing Capacity of 132 kV Substation Bajpur                               | 15 March 2004                            |
| 7    |            | Increasing Capacity of 132 kV Substation Roorkee                              | 07 May 2003                              |
| 8    | FY 2004-05 | Increasing Capacity of 132 kV Substation Haldwani                             | 02 April 2004                            |
| 9    |            | LILO of 220 kV Rishikesh - Muzafarnagar line at 220 kV Substations Roorkee    | 11 February 2005                         |
| 10   |            | Increasing Capacity of 220 kV Substation Chamba                               | 06 November 2004                         |
| 11   |            | Construction of 220 kV Substation Roorkee                                     | 11 February 2005                         |
| 12   | FY 2006-07 | Increasing Capacity of 220 kV Substation Maneri Bhali-1                       | 17 September 2006                        |
| 13   | FY 2009-10 | Construction of 220 kV Single Circuit Maneri Bhali-II to Rishikesh Line       | 23 April 2009                            |
| 14   |            | Construction of Bay at 220 kV Substation Rishikesh for 220 kV Maneri Bhali-II | 23 April 2009                            |
| 15   |            | Construction of 132 kV Satpuli-Kotdwar line                                   | 28 January 2010                          |
| 16   |            | Construction of 132 kV Substation Shimli                                      | 24-07-2009                               |

| S No | Year       | Projects                                     | Date of Completion/<br>Energisation Date |
|------|------------|--|--|
| 17   | FY 2010-11 | Construction of 132 kV Substation at Satpuli | 16 January 2011                          |

The list of ongoing projects under Old REC Scheme is listed below.

**Table 6.5: Ongoing REC Old Schemes**

| S No | Year       | Projects  | Date of Actual/<br>Proposed<br>Completion<br>Date | Scheme<br>Cost<br>Rs Crore | Revised<br>Cost<br>Rs Crore |
|------|------------|---|---|----------------------------|-----------------------------|
| 1    | FY 2012-13 | Construction of 132 kV Srinagar-Satpuli Line  | Feb 2013  | 14.276                     | 54.23                       |
| 2    | FY 2014-15 | Construction of 132 kV Double Circuit Line Srinagar-Shimli & LILO of 132 kV Substation Srinagar | June 2014   | 22.26                      | 89.51                       |

### 6.3 REC-NEW SCHEME

Under the REC-New scheme, 22 works were planned having a total capital outlay of Rs. 217.56 crore. REC had granted the approval to fund the entire cost of the schemes. Out of the aforementioned 22 schemes, 14 schemes have already been completed, 2 have been deleted and the remaining 6 are in advanced stages of completion.

**Table 6.6: Status of REC-New Schemes**

| S No | Projects                                      | No.       |
|------|---|-----------|
| 1    | Completed Schemes which have been capitalised | 14        |
| 2    | Ongoing Schemes                               | 6         |
| 3    | Deleted Schemes                               | 2         |
|      | <b>Total</b>                                  | <b>22</b> |

The projects which have attained completion are provided below:

**Table 6.7: Completed projects under REC-New Schemes**

| S No | Year       | Projects  | Date of Completion/<br>Energisation Date |
|------|------------|---|--|
| 1    | FY 2006-07 | LILO of 132 kV Kiccha Pantnagar Line at Rudrapur                    | 05 August 2006                           |
| 2    |            | Upgradation of 132/33 kV Mazra Substation                           | 16 October 2006                          |
| 3    |            | Upgradation of 132/33 kV Purkul Substation                          | 06 November 2006                         |
| 4    |            | LILO of 132 kV Kashipur Jaspur line at 400 kV substation Kashipur   | 12 February 2007                         |
| 5    |            | LILO of 132 kV Kashipur Ramnagar line at 400 kV Substation Kashipur | 30 September 2006                        |
| 6    |            | Construction of 4 Nos. 132 kV Bay at 132 kV S/S Kotdwar             | 21-09-2006                               |
|      |            |   |  |

| S No | Year       | Projects  | Date of Completion/<br>Energisation Date |
|------|------------|---|--|
| 7    | FY 2007-08 | 132 kV Substation Laksar  | 16 July 2007                             |
| 8    |            | LILO of 132 kV Roorkee-Nehtaur II Line for 132 kV substation Laksar | 16 July 2007                             |
| 9    |            | LILO of 132 kV Dohana-Khatima line at 132 kV substation Sitarganj   | 25 August 2007                           |
| 10   | FY 2008-09 | Upgradation of 132/66/33 kV Haldwani Substation                     | 02 December 2008                         |
| 11   | FY 2009-10 | 132 kV Line from 400 kV Substation Kashipur to Bazpur               | 17 January 2010                          |
| 12   | FY 2010-11 | 220 kV Single Circuit Barhani-Pantnagar Line                        | 07 April 2010                            |
| 13   |            | 220 kV Double Circuit Kashipur-Barhani Line                         | 01 January 2011                          |
| 14   | FY 2011-12 | LILO of 132 kV Rishikesh - Srinagar line at 132 kV S/s at Srinagar  | December 2011                            |

The ongoing projects are listed below:

**Table 6.8: Ongoing Projects under REC-New Scheme**

| S No | Year       | Projects   | Date of Actual/<br>Proposed<br>Completion Date | Scheme<br>Cost<br>Rs Crore |
|------|------------|--|--|----------------------------|
| 1    | FY 2012-13 | Construction of 132 kV Bay Ranikhet-Pithoragarh  | 24 Sept 2012                                   | 1.68                       |
| 2    | FY 2012-13 | LILO of 132 kV Almora - Pithoragarh line at 220 kV S/s at Pithoragarh (Power Grid)   | Mar 2013                                       | 5.46                       |
| 3    | FY 2013-14 | Construction of SLDC at Rishikesh and 2 Nos Sub SLDC at Kashipur and Dehradun and its associated communication network civil works | June 2013                                      | 16.11*                     |
| 4    | FY 2013-14 | Construction of 132 kV S/s Srinagar-II   | June 2013                                      | 19.77                      |
| 5    | FY 2014-15 | 132 KV S/C Ranikhet - Bageshwar line on D/C tower for 132 KV S/s at Bageshwar  | June 2014                                      | 25.90                      |
| 6    | FY 2014-15 | Construction of 132 KV S/s Bageshwar   | June 2014                                      | 13.93                      |

\* The project cost was Rs. 51.92 cr, however as per the revised estimates the expenditure envisaged is only Rs. 16.11 crore over the plan period.

## 6.4 REC-IV SCHEME

A total of 23 schemes having a total capital outlay of Rs. 236.44 crore are planned under the REC-IV Scheme with a Debt/Equity Structure of 70:30. Out of 23 schemes, 8 schemes have attained completion, 9 schemes are ongoing and remaining 6 schemes have been deleted.

**Table 6.9: Status of REC-IV Schemes**

| S No | Projects                        | No.       |
|------|---------------------------------|-----------|
| 1    | Completed Schemes               | 8         |
| 2    | Ongoing Schemes                 | 9         |
| 3    | Schemes that have been deleted. | 6         |
|      | <b>Total</b>                    | <b>23</b> |

The list of the completed schemes is provided in the table below:

**Table 6.10: Completed REC-IV Schemes upto FY 2011-12**

| S No | Year       | Projects  | Date of Completion/Energisation Date | Completed Cost Rs Crore |
|------|------------|---|--------------------------------------|-------------------------|
| 1    | FY 2007-08 | Construction of Bay at 132 kV Substation Laksar           | 28.3.2008                            | 0.80                    |
| 2    | FY 2007-08 | Construction of Line at 132 kV Substation Laksar          | 28.3.2008                            | 1.30                    |
| 3    | FY 2009-10 | Construction of 220 kV Chamba Ghansali Line <sup>1</sup>  | 30-09-2009                           | 17.89                   |
| 4    | FY 2010-11 | Stringing of 132 KV LILO of Sitarganj - Kicha Line (32Km) | 17-01-2011                           | 1.85                    |
| 5    | FY 2011-12 | 220 kV D/C Ghansali-Bhilangana III (Ghuttu) Line          | 04-11-2011                           | 21.51                   |
| 6    | FY 2011-12 | 220 kV Bay at Chamba                                      | 09-12-2011                           | 2.07                    |
| 7    | FY 2011-12 | 18 Nos. 33 KV Bay   | March 2012                           | 0.80                    |
| 8    | FY 2011-12 | 132 KV Bay at Kicha                                       | 15-2-2012                            | 0.67                    |

The list of the ongoing REC-IV schemes is provided in the table below:

**Table 6.11: List of Ongoing REC-IV Schemes**

| S No | Year       | Projects   | Proposed Completion Date | Scheme Cost Rs Crore |
|------|------------|--|--------------------------|----------------------|
| 1    | FY 2012-13 | 132 KV S/S Sitarganj (SIDCUL) 80MVA  | Energised on 09.10.2012  | 18.04                |
| 2    | FY 2012-13 | 132 KV DC Line from 132 kV S/S Sidcul to 132 kV Sitarganj Kicha line                             | Energised on 09.10.2012  | 8.997                |
| 3    | FY 2012-13 | 132 KV Purkul - Bindal Link Line (11.5KM)  | Mar 2013                 | 5.24                 |
| 4    | FY 2012-13 | LILO of 220 KV Khodri-Rishikesh Line at 220 KV Dehradun  | Mar 2013                 | 1.09                 |
| 5    | FY 2013-14 | 220 KV S/S Dehradun (320 MVA) involving works of (2x160 MVA of 220/132 and 2x40 MVA of 132/33kV) | June 2013                | 51.73                |

<sup>1</sup> Evacuation system from Bhilangana has been planned to cater to future generators expected in the valley, as a part of the UITP. However, 220 kV Ghansali substation, which is expected to come up by June 2014 has been planned to offtake power from the power plants in this valley to Chamba to serve UPCL demand and local demand. Therefore, the 220 kV sub-station at Ghansali, the 220 kV line from Ghansali to Chamba and 220 kV Bay at Chamba will be taken as serving the demand of Uttarakhand w.e.f June 2014.

| S No | Year       | Projects  | Proposed Completion Date | Scheme Cost Rs Crore |
|------|------------|---|--------------------------|----------------------|
| 6    | FY 2013-14 | LILO of 132 KV Purkul - Dhalipur line at 220 KV Dehradun (2.5 Km) | June 2013                | 0.80                 |
| 7    | FY 2013-14 | LILO of 132 KV Kulhal - Mazra line at 220 KV Dehradun             | June 2013                | 0.80                 |
| 8    | FY 2013-14 | 132 KV S/S Haridwar Road Dehradun (80 MVA)                        | June 2013                | 24.93                |
| 9    | FY 2013-14 | LILO of 132 KV Mazra - Rishikesh Line at 132 KV Dehradun          | June 2013                | 1.74                 |

Brief Snapshots of the Ongoing REC-IV Schemes is presented below:

- i. **Construction of 18 Nos. 33 KV Bays** - PTCUL has planned to provide the 33 KV bays in the new systems under system strengthening as and when the new projects are about to be commissioned. The cost envisaged in the construction of these bays is Rs. 2.73 crore.
- ii. **Construction of 132 KV S/s Hardwar Road, Dehradun, LILO of 132 KV Majra – Rishikesh line at 132 S/s Hardwar Road, Dehradun and 132 KV S/C link line between 132 KV S/s Purkul & Bindal** – To cater to the increased load demand at Dehradun, 132 KV S/s is proposed at Hardwar Road, Dehradun which will be fed through LILO of 132 KV Rishikesh – Majra line approx. 2x2 Km. Presently, all existing sub-stations at Dehradun have reached maximum load up-to 70–80% of rated capacity. So, for meeting increased load demand & reliable power supply, construction of 132 KV S/s at Hardwar Road, Dehradun of approx. 2x40 MVA is being undertaken. For making ring main system for increasing reliability of power supply in Dehradun, 132 KV S/s Purkul is to be connected with 132 KV S/s Bindal, which is already connected to 132 KV S/s Majra. So, 132 KV S/C line approx. 11.5 Km from 132 KV S/s Purkul to 132 KV S/s Bindal is being undertaken for making ring main system at Dehradun. The cost of these three works is estimated to be Rs. 31.91 crore.
- iii. **Construction of 132 KV S/s at Sitarganj (SIDCUL) 80 MVA and 132kV DC line from 132 kV S/s SIDCUL to 132 kV Sitarganj-Kichha Line** - For meeting the proposed demand, a 132 KV S/s at ELDECO, SIDCUL, Sitarganj is being constructed which will be connected through LILO of 132 KV Sitarganj–Kichha line. The estimated cost of this scheme has been envisaged at Rs. 27.04 crore.
- iv. **Construction of 220 KV S/s at Dehradun of 320 MVA, LILO of 220 KV Khodri-Rishikesh line at 220 KV S/s Dehradun, LILO of 132 KV Dhalipur–Purkul line at 220 KV S/s Dehradun, LILO of 132 KV Kulhal–Majra line at 220 KV S/s Dehradun** - Presently, maximum power flows from 132 KV S/s Rishikesh to 132 KV S/s Bindal & 132 KV S/s Majra. So, during peak demand, when one of the 132 KV line from Rishikesh gets overloaded, power supply of Dehradun gets disrupted. There is existing 220 KV S/C line from Khodri HEP to 220 KV S/s Rishikesh. So, for reliable power supply at Dehradun, one 220/132/33 KV S/s is being constructed at Dehradun which will be charged by LILO of 220 KV S/C Khodri–Rishikesh line. This proposed 220 KV S/s will be connected to 132 KV Sub-

stations at Majra & Purkul. By this arrangement, power supply would be reliable & losses of the system will be reduced. The envisaged cost of these four schemes is Rs. 54.42 crore.

## 6.5 REC-V SCHEME

A total of 5 schemes having a total capital outlay of Rs. 137.94 crore were planned under the REC-V Scheme with a Debt/Equity Structure of 70:30. Out of 5 schemes, 2 schemes involving construction of 220 KV S/S Mahuakheraganj and LILO of 132 KV Thakurdwara line at Mahuakheraganj have been completed and energised on 25.11.2011 and 24.11.2011 respectively. Further the scheme involving Construction of 2 No. 132 KV Bay at 132 KV S/S Purkul & Bindal are partially complete All the scheme are likely to be completed in FY 2012-13.

**Table 6.12: Abstract of REC-V Schemes**

| S No                       | Year       | Projects  | Date of Actual/ Proposed Completion Date                            | Scheme Cost Rs Crore |
|----------------------------|------------|---|---|----------------------|
| <b>Plant and Machinery</b> |            |   |   |                      |
| 1                          | FY 2011-12 | 220 KV S/S Mahuakheraganj   | 25.11.2011  | 111.22               |
| 2                          | FY 2012-13 | 2 No. 132 KV Bay at 132 KV S/S Purkul & Bindal                          | Bindal - 12.5.2011<br>Purkul -By Jan 2013                           | 1.91                 |
| 3                          | FY 2012-13 | 2 No. 220 kV Bay at 400 kV S/S Kashipur                                 | 1 <sup>st</sup> Bay is complete.<br>2 <sup>nd</sup> Bay by Jan 2013 | 5.48                 |
| <b>Lines &amp; Cables</b>  |            |   |   |                      |
| 4                          | FY 2011-12 | LILO of 132 KV Thakurdwara line at Mahuakheraganj                       | 24.11.2011  | 3.88                 |
| 5                          | FY 2012-13 | 220 kV DC Line from 400 KV Kashipur S/S to 220 kV Mahuakheraganj (10Km) | March 2013  | 15.45                |

*Note: The approved cost of 220 KV S/S Mahuakheraganj scheme was Rs. 111.22 crore. The Hon'ble Commission has already allowed Rs. 61.11 crore towards such scheme in the FY 2012-13 tariff order dated 04.04.2012. The actual expenditure as on 31.3.2012 towards such scheme as per provisional accounts was Rs. 64.35 crore. Further an expenditure of Rs. 15 crore is projected for FY 2012-13 towards balance payments to contractors, etc. The PTCUL would suitably approach the Hon'ble Commission to consider the additional capitalisation based on audited accounts.*

Brief Snapshots of the Ongoing REC-V Schemes is presented below:

- i. **Construction of 220/132/33 kV Sub-station at Mahuakheraganj of ( 2 x 100 MVA+2 x 80 MVA), LILO of 132 KV Kashipur – Thakurdwara line of approx 5 Km at 220/132/33 kV Sub-station Mahuakheraganj, 220 KV D/C line from 400 KV S/s Kashipur to 220 KV S/s of Mahuakheraganj of approx 15 Km and 2 No. 220 KV Bay at 400 kV Kashipur for 220 KV DC Kashipur- Mahuakheraganj line** - For reliable power supply to industrial load, a sub-station is being constructed which will be connected to existing 400 KV S/s Kashipur through 220 KV D/C line and also through LILO of 132 KV Kashipur–Thakurdwara line thereby resulting in better quality supply to industries. The estimated cost of these schemes is Rs. 136.03 crore.
- ii. **Construction Of 1 No. 132 kV Bay At 132 kV S/S Bindal & 1 No. 132 kV Bay At 132 kV S/S Purkul For The Link Line Between Bindal & Purkul S/S** - For making ring main system for increasing reliability power supply in Dehradun, 132 KV S/s Purkul is to be connected with 132 KV S/s Bindal, which is already connected to 132 KV S/s Majra &

generating stations of UJVNL. So, 132 KV S/C line approx. 11.5 Km from 132 KV S/s Purkul to 132 KV S/s Bindal is being proposed for making ring main system at Dehradun. For this 132 KV link line 1 no. 132 KV Bay each at 132 KV S/s Bindal & Purkul is to be constructed. The envisaged cost of this scheme is Rs. 1.91 crore

## 6.6 PFC SCHEMES

Under the PFC Scheme, 4 schemes having a total capital outlay of Rs. 688.58 crore was envisaged having a Debt/Equity of 70:30. Debt capital is being funded by Power Finance Corporation and counterpart equity is being made by GoU equity. PTCUL has already filed a Petition (Ref: letter no. 1398/MD/PTCUL/UERC dated 15th October 2009) seeking capital investment approval from the Hon'ble Commission toward such schemes. The order on the said petition is awaited.

Out of the 4 schemes, 1 scheme involving work of LILO of 220 kV Roshnabad-Roorkee Line at 400 kV S/S Puhana has already been completed in FY 2010-11. However the capitalisation was not approved by the Hon'ble Commission as the investment approval was pending. The PTCUL has already submitted the application for investment approval of such scheme. The PTCUL humbly submits that the Hon'ble Commission may consider the capitalisation of such scheme with effect from its date of commercial operation and pass necessary adjustments in future tariff orders. Further 2 schemes are expected to be completed in FY 2013-14 and the fourth scheme is expected to be completed by FY 2015-16.

**Table 6.13: Abstract of PFC Schemes**

| S No                       | Year       | Projects   | Date of Actual/<br>Proposed<br>Completion Date | Scheme<br>Cost<br>Rs Crore |
|----------------------------|------------|--|--|----------------------------|
| <b>Plant and Machinery</b> |            |  |  |                            |
| 1                          | FY 2014-15 | 220 kV GSI S/S Rudrapur (Brahmwari)                        | June 2014                                      | 118.87                     |
| <b>Lines &amp; Cables</b>  |            |  |  |                            |
| 2                          | FY 2010-11 | LILO of 220 kV Roshnabad-Roorkee Line at 400 kV S/S Puhana | Nov-2010                                       | 7.44                       |
| 3                          | FY 2014-15 | 220 kV D/C Line Rudrapur (Brahmwari)-Srinagar Line         | June 2014                                      | 156.55                     |
| 4                          | FY 2016-17 | 400 kV D/C Pipalkoti-Karanprayag-Srinagar Line             | June 2016                                      | 405.72                     |

Brief Snapshots of the Ongoing PFC Schemes is presented below:

- i. **220 KV DC HEP – Rudrapur (Baramwari) – Srinagar line (approx 110 Km), 220 KV DC LILO Line of Roshnabad (Haridwar)-Roorkee at 400 KV sub-station Puhana Roorkee (PGCIL)- (approx 6.64 Km) & 220 KV GIS S/s Baramwari (2x50 MVA) –**  
The 220 kV Sub-station at Baramwari will be the pooling point for Power generated from Singoli Bhatwari, Phatabyung, Rambhara & Gaurikund HEPs at 220 KV level and generation from Kaliganga I, II & Mahdyameshwar SHPs at 33KV level which will stepped to 220 KV at Baramwari. 220 KV GIS S/s will be constructed at Baramwari due to paucity of required land for AIS S/s. From 220 KV S/s Baramwari power will be pooled at 400 KV S/s Srinagar through Baramwari-Srinagar line. From 400 KV S/s Srinagar power will be evacuated to 400 KV Kashipur S/s which is an interstate pooling point.

---

ii. **Construction of 220 KV DC LILO line of 200 Haridwar- Roorkee line at 400 KV Substation, Roorkee (PTCUL) (PGCIL) (approx 6.64 Km):** This connecting line will be required for system reliability and connection with regional grid system. Additional power flow of Approximate 40 MW to 220 KV S/s Roorkee through this line will, reduce the loadings of 220 KV Roorkee-Haridwar line & in low generation case 220 KV Nara-Roorkee line. This will avoid load shedding in Haridwar-Roorkee area due to overloading of above lines during peak load conditions. This line will be constructed using single Zebra conductor.

iii. **Construction of 220 KV DC HEP - Baramwari – Srinagar line (approx 110 Km):** This line is being constructed to evacuate pooled power for generating stations at Rambhara (76 MW), Singoli Bhatwari (99 MW) and Phatabyung (76MW) at proposed 220 KV S/s Baramwari and SHPs (30MW) at 33KV level totalling to approximately 280 MW. For evacuation of this quantum of power, single zebra conductor (Rated Capacity-~300MW) will be used. Double circuit line will be required for 100% redundancy and N-1 contingency to avoid deemed generation loss.

The aforementioned schemes received the consent of the Board of Directors on 29th September 2005. The Ministry of Power approved the schemes vide letter no. OM 11th May 2004-IC dt. 4th May 2007 and the Central Electricity Authority vide letter No. 12A/G/2006-SP&PA/39 dt. 09th January 2007

iv. **400 KV DC Kuwaripass (Pipalkoti) – Karanprayag- Srinagar line (approx 92.21 Km)**  
- This line is being constructed to evacuate Pooled Power at proposed 400 KV S/s Pipalkoti totalling to approximately 1500 MW. Further this line will be required to evacuate Pooled Power at proposed 400 KV S/s Karanprayag totalling to approximately 2100 MW. For evacuation of such amount of power, Quad Moose conductor (Rated Capacity-~2400MW) is being used. Double circuit line will be required for 100% redundancy and N-1 contingency to avoid deemed generation loss. From 400 KV S/s at Srinagar, power will be evacuated to 400 KV Kashipur S/s which is an interstate pooling point through 400 KV D/C Quad Moose line between Srinagar & Kashipur.

The estimated cost of the project is Rs. 405.72 crore. The Board of Directors accorded their approval on 29th September 2005; the Central Electricity Authority on 9th January 2007 and the Ministry of Power on 4th May 2007.

## **6.7 ADB SCHEMES**

Under the ADB Scheme, 7 schemes having a total capital outlay of Rs. 1630.93 crore (originally envisaged at Rs. 1464.28 crore) have been envisaged. Although the Asian Development Bank is providing financial support towards these scheme but such support would be routed through the GoU and there would be no direct financial interface between PTCUL and ADB

The capital structure of such scheme is such that it would be funded through 63% grant from GoU, 7% through GoU Loan (with a rate of interest of 9%) and balance 30% equity would be contributed by GoU.

**Table 6.14: Schemes funded by Asian Development Bank (ADB)**

| S.No | Name of the Project   | Unit (MVA)  |              | Project Cost (In Crore) | Date of Actual/ Proposed Completion Date |
|------|---|-------------|--------------|-------------------------|--|
|      |   | MVA         | Ckt km       |                         |  |
| 1    | 400 KV S/s Srinagar (400/220 kV – 2x315 MVA; 220/132 kV – 2x160 MVA)  | 630         | -            | 172.08                  | Sept 2013                                |
| 2    | 220 KV Tapovan – Joshimath  |             | 24           | 33.47                   | March 2014                               |
| 3    | 400 KV D.C. Vishnugad - Kuwari Pass (Pipalkoti) Line and 400 KV D.C. Srinagar 400 KV S/s - Srinagar Power House (HEP) (ADB) and LILO of 400 KV D/C Muzaffarnagar-Vishnuprayag Line at Pipalkoti |             | 70           | 103.14                  | June 2014                                |
| 4    | 220 KV Joshimath - Pipalkoti Line   |             | 40.6         | 88.25                   | June 2014                                |
| 5    | 2 nos. 400 KV Bay at 400 KV Kashipur  |             |              | 10.42                   | Dec-14                                   |
| 6    | 400 KV GIS S/s Pipalkoti  | 630         |              | 235.55                  | June-15                                  |
| 7    | 400 KV Srinagar-Kashipur Line   |             | 304          | 988.02                  | March 2016                               |
|      | <b>TOTAL</b>  | <b>1260</b> | <b>438.6</b> | <b>1630.93</b>          |  |

In the case of 400 KV GIS S/s Pipalkoti, the project cost has been revised from Rs. 218.82 crore (original cost based on 2008 estimates) to Rs. 235.55 crore as per 2012 estimates. Similarly in the case of 400 KV Srinagar-Kashipur Line, the project cost has been revised from Rs. 838.10 crore (original cost based on 2008 estimates) to Rs. 988.02 crore as per 2012 estimates.

Brief Snapshots of the ADB schemes is presented below:

- i. **400 KV S/S Srinagar (2 x 315 MVA) + (2 x 160 MVA)** - At 400KV Sub-station at 3Srinagar, 2 nos. 315MVA, 400/220 KV Transformer and 2 nos. 160MVA, 220/132KV Transformer are being constructed. Approximately 2500 MW power from Pipalkoti and Karanprayag substations will be injected at this substation at 400KV and 251MW power from Alaknanda valley at 220KV level from Ram Bara HEP (76MW) of M/s Lanco, Phatabyong HEP (76MW) M/s Lanco and Singoli Bhatwari HEP (99MW) of M/s Larsen & Toubro. 330MW power from Srinagar HEP of M/s GVK at 400KV level will also be injected at this Sub-station. 251MW power at 220KV level will be transmitted to this substation through 220KV D/C Rudrapur-Ghansali-Srinagar line. Besides this, 106.5MW of Bhagirathi valley at 220KV from Bhilangana-I 22.5MW, Bhilangana-II 60MW & Bhilangana-III 24MW) pooled at 220KV Ghansali substation may also be transmitted to 400KV substation Srinagar through 220KV D/C Rudrapur-Ghansali-Srinagar line under N-1 conditions (breakdown of 220KV Ghansali-Chamba line). Thus in order to handle 357.5 MW power, 2 nos. 315MVA 400/220 KV Transformer have been proposed. As per CEA Manual on Transmission Planning Criteria Clause 8.5. "Size and number of ICTS shall be planned in such as way that the outage of any single unit would not over load the remaining ICTS or the underlying system" so considering the above, the capacity of ICTs is taken as 2x315 MVA, 400/220KV. In addition to 400/220KV transformers, 2 nos. 160MVA 220/132KV transformers are also proposed to cater the load demand of approx. 200MVA of Uttarakhand network which will be met by connecting 3 nos. 132KV double circuit lines. As Uttarakhand is predominantly hilly state and availability

---

of land for substation is limited, instead of constructing 2 nos. substations separately 1 no. 400/220/132KV substation is proposed. This will also result in reduction of the cost of land, its development, equipments and infrastructure. The envisaged cost of this scheme is Rs. 172.08 crore. The Board of Directors of PTCUL have accorded their approval to the project on 29.09.05. The Central Electricity Authority had accorded its approval vide letter no. 12A/G/2006-SP&PA/39 dt. 09.01.2007 whereas the Ministry of Power had accorded its approval vide letter no. OM 11/5/2004-IC dt. 04.05.2007

- ii. **400KV D/C Tapovan (Vishnugad)–Kuwaripass (Pipalkoti) Line** - This line is being constructed to evacuate appx.171MW power from Lata Tapovan HEP to the substation at Joshimath. 220 KV voltage level has been selected for this evacuation as per approval of CEA and system studies keeping in view the quantum of power (171MW) over a distance of approx 12.2 Km. ACSR ZEBRA conductor in TWIN bundle per phase has been chosen for this line in each circuit, so that each circuit is capable of handling this power and other generators coming in 12th plan taking into consideration surge impedance loading (SIL) of ZEBRA conductor and N-1 contingency conditions. As the state is predominantly having hilly terrain, availability of corridors for the construction of lines is a main constraint, hence double circuit line on twin Zebra conductor is proposed.
- iii. **400kV D/C Srinagar HEP – 400kV Srinagar Substation Line** - 400KV D/C Srinagar- 400 KV Srinagar substation line is being constructed to evacuate approximately 330MW power of Srinagar HEP GVK to 400KV/220KV substation at Srinagar. 400KV voltage level has been selected for this evacuation as per approval of CEA and system studies keeping in view the quantum of power (330MW) over a distance of apprx-14Km. ACSR MOOSE conductor in TWIN bundle per phase has been chosen for this line in each circuit, so that each circuit is capable of handling the entire power taking into consideration surge impedance loading (SIL) of MOOSE conductor and N-1 contingency conditions. As the state is predominately having hilly terrain, availability of corridors for the construction of lines is a main constraint, hence double circuit line on Twin conductor is proposed.
- iv. **LILLO OF 400 KV D/C Vishnuprayag – Muzaffarnagar Line On Twin Moose** - This line is being constructed to evacuate appx. 1000MW power to 400KV/220 substation Kuwaripass (Pipalkoti). 400KV voltage level has been selected for this evacuation as per approval of CEA and system studies keeping in view the quantum of power over a distance of approx. 1.0Km. ACSR MOOSE conductor in TWIN bundle per phase has been chosen for this line in each circuit, so that each circuit is capable of handling the entire power taking into consideration surge impedance loading (SIL) of MOOSE conductor and N-1 contingency conditions.

The envisaged cost of aforementioned three schemes (ii to iv) is Rs. 103.14 crore. The Board of Directors have accorded their approval to the schemes on 29.09.05; Central Electricity Authority has approved the project vide letter no. 12A/G/2006-SP&PA/39 dt. 09.01.2007 and the Ministry of Power has approved the project vide letter no. OM 11/5/2004-IC dt. 04.05.2007

- 
- v. **220KV D/C Lata Tapovan–Joshimath Line** - This line is being constructed to evacuate approx. 171 MW power from Lata Tapovan HEP to substation at Joshimath. 220 KV voltage level has been selected for this evacuation as per approval of CEA and system studies keeping in view the quantum of power (171MW) over a distance of approx 12.2 Km. ACSR ZEBRA conductor in TWIN bundle per phase has been chosen for this line in each circuit, so that each circuit is capable of handling this power and other generators coming in 12th plan taking into consideration surge impedance loading (SIL) of ZEBRA conductor and N-1 contingency conditions. As the state is predominantly having hilly terrain, availability of corridors for the construction of lines is a main constraint, hence double circuit line on twin Zebra conductor is proposed. The estimated cost of this project is Rs. 33.47 crore. The project received the accord of the Board of Directors on 29.09.05. The Central Electricity Authority had granted approval of the project on 09.01.2007 vide its letter no. 12A/G/2006-SP&PA/39 dt and the Ministry of Power had granted approval vide letter no. OM 11/5/2004-IC dt. 04.05.2007.
- vi. **220 KV D/C Joshimath–Kuaripass (Pipalkoti) Line On Quad Zebra** - This line is being constructed to evacuate approx. 1,000MW power to 220KV/220 substation at Kuwaripass (Pipalkoti). 220KV voltage level has been selected for this evacuation as per approval of CEA and system studies keeping in view the present quantum of power in XI PLAN and proposed Generators in 12th plan over a distance of approx. 20.3Km. ACSR ZEBRA conductor in QUAD bundle per phase has been chosen for this line in each circuit, so that each circuit is capable of handling the entire power taking into consideration surge impedance loading (SIL) of ZEBRA conductor and N-1 contingency conditions. As the state is predominantly having hilly terrain, availability of corridors for the construction of lines is a main constraint, hence double circuit line on Quad conductor is proposed. The estimated cost of the project is Rs. 88.25 crore. The Board of Directors had accorded their approval on 29.09.05; Central Electricity Authority on 09.01.2007 vide letter no. 12A/G/2006-SP&PA/39 and the Ministry of Power on 04.05.2007 vide letter no. OM 11/5/2004-IC dt. 04.05.2007.
- vii. **400/220 KV GIS Substation Kuwaripass (Pipalkoti)** - At 400/220KV GIS substation Pipalkoti, 2 nos. 315MVA, 400/220KV Transformer are being constructed. Approximately 600MW power from Joshimath substation at 220KV and 520MW power from Tapovan-Vishnugad (NTPC) at 400KV level will be injected at this Substation. This power will be transmitted at 400KV through 400 KV D/C Pipalkoti-Karanprayag lines to 400KV S/S Karanprayag. Thus to step up about 600 MW power at 220 KV from Joshimath to 400 KV ,2 Nos. 315 MVA 400/220KV T/F are proposed. As Uttarakhand is predominantly hilly state and availability of land for substation is limited GIS is proposed in place of conventional AIS substation which will reduce cost of development of land and civil works which are very high in hilly terrain. The estimated cost of this project is Rs. 218.82 crore. The Board of Directors had accorded their approval on 29.09.05; Central Electricity Authority on 09.01.2007 vide letter no. 12A/G/2006-SP&PA/39 and the Ministry of Power vide letter no. OM 11/5/2004-IC dt. 04.05.2007.
- viii. **400KV D/C Srinagar - Kashipur Line** - This line is being constructed to evacuate approx. 2,500 MW power from 400 KV S/S Srinagar to 400KV/220KV pooling substation at Kashipur.
-

400KV voltage level has been selected for this evacuation as per approval of CEA and system studies keeping in view the quantum of power (2500MW) over a distance of appx.152.8 Km. ACSR BERSIMIS conductor in QUAD bundle per phase has been chosen for this line in each circuit, so that each circuit is capable of handling the entire power taking into consideration surge impedance loading (SIL) of BERSIMIS conductor and N-1 contingency conditions. As the state is predominantly having hilly terrain, availability of corridors for the construction of lines is a main constraint; hence double circuit line on QUAD conductor is proposed to meet contingency conditions. The envisaged cost of this project is Rs. 838.1 crore. The project has received the consent of the Board of Directors on 29.09.05; the Central Electricity Authority had approved the project vide letter no. 12A/G/2006-SP&PA/39 dt. 09.01.2007 and the Ministry of Power had approved the project vide letter no. OM 11/5/2004-IC dt. 04.05.2007.

- ix. Construction Of 2 Nos. 400 kV Bays At Existing 400 kV Substation Kashipur** - The Bays are necessary for termination of 400 KV D/C Srinagar-Kashipur Line at 400/220 KV substation Kashipur which is Interstate Pooling Point of UITP approved by CEA & MOP, Govt. of India. Srinagar- Kashipur line will evacuate approx. 2500MW power to 400/220 KV pooling substation of Kashipur from Srinagar. 400 KV voltage level has been selected for this evacuation as per approval of CEA and system studies keeping in view the quantum of power over a distance of apprx. 152.8 Km. The space for construction of bays at Kashipur S/S is already available. The estimated cost of the construction of the bays is Rs. 10.42 crore. The project was approved by the Board of Directors on 29.09.05; by Central Electricity Authority: on 09.01.2007 vide letter no. 12A/G/2006-SP&PA/39 dt. 09.01.2007 and by Ministry of Power on 04.05.2007 vide letter no. OM 11/5/2004-IC.

## 6.8 SYSTEM IMPROVEMENT SCHEMES

Augmentation of 220kV S/S Roorkee by 220/33kV, 2x50 MVA Transformers along with 220kV & 33kV bays at a total cost of Rs. 11.415 crore is being undertaken in Roorkee (Haridwar). Rural Electrification Corporation has approved to fund the debt portion of the capital expenditure to the tune of Rs. 10.2735 crore. Balance would be met through counterpart equity funding by Government of Uttarakhand. Thus the debt equity ratio of the scheme would be 90:10. The expected date of completion of the scheme is December 2012.

In addition to the above, there are more schemes which are at the DPR stage. The same have been considered in the business plan based on the details mentioned in the table below:

**Table 6.15: System Improvement Schemes at the DPR Stage**

| SYSTEM STRENGTHENING |  |                |                             |
|----------------------|--|----------------|-----------------------------|
| S No                 | Scheme   | Estimated Cost | Expected Date of Completion |
| 1                    | Increasing capacity of 400/220kV Rishikesh S/S from 2x240 MVA to 1x240+1x315 MVA | Rs. 12.50 cr   | December 2013               |
| 2                    | Increasing capacity of 220/33kV Pantnagar S/s (2x50 MVA)                         | Rs 13 cr       | May 2014                    |

| <b>SYSTEM STRENGTHENING</b> |   |                       |                                    |
|-----------------------------|---|-----------------------|------------------------------------|
| <b>S No</b>                 | <b>Scheme</b>   | <b>Estimated Cost</b> | <b>Expected Date of Completion</b> |
| 3                           | Increasing capacity of 132/33kV Bazpur S/s from 2x40 MVA to 1x40 MVA + 1x80 MVA)  | Rs 12 cr              | June 2014                          |
| 4                           | Increasing capacity of 132/33kV Kathgodam S/S from 1x40 MVA to 2x40 MVA           | Rs 4.50 cr            | June 2014                          |
| 5                           | Increasing capacity of 132/33kV Bhowali S/S from 2x15 MVA to 2x15+1x20MVA         | Rs. 4.50 cr           | June 2014                          |
| 6                           | Increasing capacity of 132/33kV Almora S/S from 2x20 MVA to 3x20MVA               | Rs 3.00 cr            | June 2014                          |
| 7                           | Increasing capacity of 220/132 kV SIDCUL Haridwar S/S from 2x100 MVA to 2x160 MVA | Rs 20 cr              | December 2014                      |
| <b>NEW SUBSTATIONS</b>      |   |                       |                                    |
| 1                           | 132/33 Khatima II S/S of 2x40 MVA   | Rs 20 cr              | December 2015                      |
| 2                           | 220/33kV GIS Puhana S/S 2x50 MVA  | Rs 70 cr              | September 2015                     |
| <b>NEW LINES</b>            |   |                       |                                    |
| 1                           | LILO of 132 kV Khatima-Sitarganj line (PGCIL) at Khatima II                       | Rs 7 cr               | December 2015                      |

## **6.9 OTHER SCHEMES FUNDED BY REC (REC-VI TO REC-X)**

Certain capital expenditures schemes have envisaged under the following nomenclatures:

### **1. REC-6 Scheme** (Like completion date - June 2015)

- a. Construction of 220 kV Pirankaliyar S/s (50MVA) and associated lines at 220 kV Pirankaliyar S/s at an envisaged cost of Rs. 34.64 crore crore.

### **2. REC-7 Scheme** (Like completion date - June 2015)

- a. Construction of 132 kV S/s at Lohaghat (40MVA) and 132 kV S/C Lohaghat-Pithoragarh line at an envisaged cost of Rs. 64.38 crore.

### **3. REC-8 Scheme** (Like completion date - April 2016)

- a. Construction of 220 kV DC Lakhwar Dehradun and its LILO at Vyasi and Mori on Twin Zebra at an envisaged cost of Rs. 65.18 crore.

### **4. REC-9 Scheme**

- a. Stringing of 2nd Circuit of Berhani-Pantnagar Line at an envisaged cost of Rs. 8.74 crore (Like completion date - March 2013)
- b. Construction of 1 No. 220 kV Bay at Pantnagar at an envisaged cost of Rs. 2.73 crore. (Like completion date - Dec 2012)

### **5. REC-10 Scheme** (Like completion date - December 2014)

- a. 220 KV S/S Ghansali (60 MVA) at an envisaged cost of Rs. 122.65 crore

All the aforementioned schemes would be funded by loan from REC to the extent of 70% and the counterpart funding would be through Govt of Uttarakhand equity.

## 6.10 PLANNED SCHEMES

There are certain more schemes which have been planned by PTCUL but are at the DPR stage. Financial tie-ups with PFC/REC shall be done after the preparation of their DPRs. The lists of such schemes along with their tentative cost are provided in the table below:

**Table 6.16: Schemes at DPR Stage**

| S.No | Name of the Project   | Unit (MVA) |     | Project Cost (Rs Cr) | Proposed Completion Date | UITP/ Non UITP | Funding institution |
|------|---|------------|-----|----------------------|--------------------------|----------------|---------------------|
|      |   | MVA        | Ckm |                      |                          |                |                     |
| 1    | 220 KV Almora GIS   | 200        |     | 87.50                | June 2016                | UITP           | REC/ PFC            |
| 2    | 220 KV Almora-Pithoragarh Line  |            | 146 | 165.00               | June 2016                | UITP           | REC/ PFC            |
| 3    | 220/33 KV S/s Selaqui GIS (Dehradun)  | 100        |     | 65.00                | June 2016                | Non UITP       | REC/ PFC            |
| 4    | 220/33 KV S/s IIP Harawala (Dehradun)   | 100        |     | 65.00                | June 2016                | Non UITP       | REC/ PFC            |
| 5    | LILO of 220 KV S/C of Khodri-Dehradun Line at 220 KV S/s Selaqui approximate 6 Km. (Dehradun)         |            | 12  | 11.52                | June 2016                | Non UITP       | REC/ PFC            |
| 6    | LILO of 220 KV S/C of Rishikesh-Dehradun Line at 220 KV S/s IIP Harawala approximate 5 KM. (Dehradun) |            | 10  | 9.60                 | June 2016                | Non UITP       | REC/ PFC            |
| 7    | 400/220 KV Karanprayag GIS  | 630        |     | 350.00               | Nov 2017                 | UITP           | REC/ PFC            |
| 8    | 220 kv D/C Devsari-Karanprayag Line on Twin Zebra   |            | 52  | 50.00                | Nov 2017                 | UITP           | REC/PFC             |

The DPRs and the financial closure would be completed shortly. However as the current business plan has envisaged the capital investment for the next five years, the tariff implications of such schemes have been considered in the business plan with the exception of 400/220 KV Karanprayag GIS and 220 kv D/C Devsari-Karanprayag Line on Twin Zebra as they are likely to be completed by November 2017 i.e., beyond the plan period under consideration.

## 6.11 PROGRESS OF GIS SUB-STATIONS

PTCUL has decided to construct GIS Substation where space is constraint. The GIS Sub-station offers the following advantages over AIS Sub-station.

- o Land development cost is very less due to lesser space requirement for substation.

- o Maintenance cost is very less as compare to AIS as all the switching devices are operating in the SF6 insulating medium.
- o GIS substation increases the availability and reliability of power system as all parts of GIS are inside the close metallic enclosure and not affected by environment.
- o In GIS substation automation system can be easily installed due to its modular design. This type of substation can be operated from remote end and reduces the operation cost.
- o Due to smaller size of substation the earth cutting and tree cutting (in case of hilly region having trees) involved is very less hence good for environment point of view.
- o The life of GIS equipment is very high as compare to AIS equipment. All internal components of GIS are guaranteed for maintenance free for minimum 10 years.

The following works of GIS substation of PTCUL are in various stages of implementation.

**Table 6.17: Current progress of GIS S/s**

| S. No. | Name of Substation   | Status  |
|--------|----------------------|---|
| 1      | 220 KV GIS Brahmwari | Project has been awarded to M/s Siemens Limited in August 2012. The Construction of above Project is in progress. The completion period of above project is 24 months from the date of LOA i.e. 14-12-2011. |
| 2      | 220 KV GIS Ghansali  | Price Bid Evaluation is in Progress   |
| 3      | 400 KV GIS Pipalkoti | Tendering is in progress  |

Apart from above other GIS substation in place of AIS is also under consideration.

## **6.12 CLASSIFICATION OF SCHEMES INTO UITP AND FOR INTRA-STATE TRANSMISSION**

The GoU has indentified that hydro potential of Uttarakhand exists along four major river basins namely Alaknanda basin, Bhagirathi basin, Yamuna basin and Sharada basin. An integrated transmission system was planned in Uttarakhand under the aegis of the CEA to evacuate power from these new generation capacities being developed in the four major basins in the region having regard to the environmental considerations and also the difficulty in developing separate transmission systems for each of the generator. Hydro power potential is river basin specific and both generation and transmission needs to be developed on an integrated basin approach. The integrated transmission project was conceived as an integrated and optimal development transmission system to pool power from several hydro generating plants in the state to designate pooling points within Uttarakhand, from where inter-state lines could be developed to convey power to beneficiaries outside the state.

The GoU signed MoU's with various central sector generating companies and IPP's for development of various hydro generation projects in the different basins in the state. It was therefore, essential for PTCUL to develop a reliable, optimal and cost effective transmission network for evacuation of power from the generating stations which are primarily Central Sector Generating Stations or Private sector projects located in the river basins. This required strengthening and augmentation of the intra-state and inter-state transmission systems for Uttarakhand. The Uttarakhand Integrate Transmission

Projects were conceived as a means to develop an optimal evacuation system for evacuating the power from the cluster of hydro electric generating stations, like Tapovan Vishnugad (520MW), Lata Tapovan (171MW), Badrinath HEP (300MW), Bawlanand Paryag (300MW), Nandprayag Langrasu (100MW), Devsari (252MW) etc. The UITP was proposed envisaging power evacuation system generation projects to be developed in the aforementioned four major river basins. For evacuation of power from these hydro projects UITP will involve constructing a system comprising of 22 Nos. Transmission lines of 400/220/132 kV. 8 Nos. of new Substation and Substation extension to evacuate power from the hydro generating plants to the pooling point in Kashipur, Pithoragarh and Dehradun.

In the aforementioned sections, the capital investment plans have been discussed. The table below provides the classification of all the aforementioned schemes into UITP schemes which are primarily intra-state lines being used by generators for inter-state transfer of power and non-UITP schemes which cater to the intra state transmission lines (of which currently the sole beneficiary is UPCL)

**Table 6.18: Classification of Capex Schemes into UITP and Non-UITP**

| Scheme  | Name of the Project   | UITP/Non UITP |
|---------|---|---------------|
| PFC     | 400 KV DC Kuwaripass (Pipalkoti)–Karanprayag-Srinagar line (approx 92.21 Km)  | UITP          |
|         | 220 KV DC HEP – Rudrapur (Baramwari) – Srinagar line (approx 110 Km).   | UITP          |
|         | 220 KV GIS S/s Baramwari (2 x 50 MVA)   | UITP          |
| ADB     | 400 KV S/s Srinagar   | UITP          |
|         | 400 KV D.C. Vishnugad - Kuwari Pass (Pipalkoti) Line and 400 KV D.C. Srinagar 400 KV S/s - Srinagar Power House (HEP) (ADB) and LILO of 400 KV D/C Muzaffarnagar-Vishnuprayag Line at Pipalkoti | UITP          |
|         | 220 KV Tapovan – Joshimath  | UITP          |
|         | 220 KV Joshimath - Pipalkoti Line   | UITP          |
|         | 400 KV GIS S/s Pipalkoti  | UITP          |
|         | 400 KV Srinagar-Kashipur Line   | UITP          |
|         | 2 nos. 400 KV Bay at 400 KV Kashipur  | UITP          |
| Old-REC | Construction of 132 kV Srinagar-Satpuli Line  | Non UITP      |
| Old-REC | Construction of 132 kV Double Circuit Line Srinagar-Shimli & LILO of 132 kV Substation Srinagar   | Non UITP      |
| New-REC | Construction of 132 kV Bay Ranikhet-Pithoragarh   | Non UITP      |
|         | LILO of 132 kV Almora - Pithoragarh line at 220 kV S/s at Pithoragarh (Power Grid)  | Non UITP      |
|         | Construction of 132 kV S/s Srinagar-II  | Non UITP      |
|         | 132 KV S/C Ranikhet - Bageshwar line on D/C tower for 132 KV S/s at Bageshwar   | Non UITP      |
|         | Construction of 132 KV S/s Bageshwar  | Non UITP      |
|         | Construction of SLDC at Rishikesh and 2 Nos Sub SLDC at Kashipur and Dehradun and its associated communication network civil works  | Non UITP      |
| REC 4   | 18 Nos. 33 KV Bay   | Non UITP      |
|         | 132 KV Bay at Kichha  | Non UITP      |
|         | 132 KV Purkul - Bindal Link Line (11.5KM)   | Non UITP      |
|         | 132 KV S/S Sitarganj (SIDCUL) 80MVA   | Non UITP      |
|         | 132 KV DC Line from 132 kV S/S Sidcul to 132 kV Sitarganj Kicha line  | Non UITP      |

| Scheme  | Name of the Project   | UITP/Non UITP |
|---------|---|---------------|
|         | 220 KV S/S Dehradun (320 MVA)   | Non UITP      |
|         | LILO of 220 KV Khordi-Rishikesh Line at 220 KV Dehradun   | Non UITP      |
|         | LILO of 132 KV Purkul - Dhalipur line at 220 KV Dehradun (2.5 Km)                                     | Non UITP      |
|         | LILO of 132 KV Kulhal - Mazra line at 220 KV Dehradun   | Non UITP      |
|         | 132 KV S/S Haridwar Road Dehradun (80 MVA)  | Non UITP      |
|         | LILO of 132 KV Mazra - Rishikesh Line at 132 KV Dehradun  | Non UITP      |
|         |   |               |
| REC 5   | 2 No. 132 KV Bay at 132 KV S/S Purkul & Bindal  | Non UITP      |
|         | 220 kV DC Line from 400 KV Kashipur S/S to 220 kV Mahuakheraganj (10Km)                               | Non UITP      |
|         | 2 No. 220 kV Bay at 400 kV S/S Kashipur   | Non UITP      |
|         |   |               |
| REC 6   | 220 kV Pirankaliyar   | Non UITP      |
|         | 220 kV Pirankaliyar S/s associated lines  | Non UITP      |
| REC 7   | 132 kV S/s Lohaghat   | Non UITP      |
|         | 132 KV S/C Lohaghat-Pithoragarh   | Non UITP      |
| REC 8   | 220 kV DC Lakhwar Dehradun and its LILO at Vyasi and Mori on Twin Zebra                               | Non UITP      |
| REC 9   | Stringing of 2nd Circuit of Berhani-Pantnagar Line  | Non UITP      |
|         | 1 No. 220 kV Bay at Pantnagar   | Non UITP      |
| REC 10  | 220 KV S/S Ghansali (100 MVA)   | Non UITP      |
| Planned | 400/220 KV Karanprayag GIS  | UITP          |
| Planned | 220 kV D/C Devsari-Karanprayag Line on Twin Zebra   | UITP          |
| Planned | 220 KV Almora GIS   | UITP          |
| Planned | 220 KV Almora-Pithoragarh Line  | UITP          |
| Planned | 220/33 KV S/s Selaqui GIS (Dehradun)  | Non UITP      |
| Planned | 220/33 KV S/s IIP Harawala (Dehradun)   | Non UITP      |
| Planned | LILO of 220 KV S/C of Khodri-Dehradun Line at 220 KV S/s Selaqui approximate 6 Km. (Dehradun)         | Non UITP      |
| Planned | LILO of 220 KV S/C of Rishikesh-Dehradun Line at 220 KV S/s IIP Harawala approximate 5 KM. (Dehradun) | Non UITP      |
| SI      | 220kV S/S Roorkee by 220/33kV, 2x50 MVA Transformers along with 220kV & 33kV bays                     | Non UITP      |
| SI      | Increasing capacity of 400/220kV Rishikesh S/S from 2x240 MVA to 1x240+1x315 MVA                      | Non UITP      |
| SI      | Increasing capacity of 220/33kV Pantnagar S/s (2x50 MVA)  | Non UITP      |
| SI      | Increasing capacity of 132/33kV Bazpur S/s from 2x40 MVA to 1x40 MVA + 1x80 MVA)                      | Non UITP      |
| SI      | Increasing capacity of 132/33kV Kathgodam S/S from 1x40 MVA to 2x40 MVA                               | Non UITP      |
| SI      | Increasing capacity of 132/33kV Bhowali S/S from 2x15 MVA to 2x15+1x20MVA                             | Non UITP      |
| SI      | Increasing capacity of 132/33kV Almora S/S from 2x20 MVA to 3x20MVA                                   | Non UITP      |
| SI      | Increasing capacity of 220/132 kV SIDCUL Haridwar S/S from 2x100 MVA to 2x160 MVA                     | Non UITP      |

SI – System Improvement

---

## 6.13 YEAR WISE CAPITAL INVESTMENT

The year wise phasing of the capital investment is provided in the table below.

**Table 6.19: Year wise Phasing of the Capital Investment**

*(Figures in Rs Crore)*

| <b>Planned Schemes</b> | <b>2012-13</b> | <b>2013-14</b> | <b>2014-15</b> | <b>2015-16</b> | <b>2016-17</b> | <b>Total</b>   |
|------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Non UITP Scheme        | 120.57         | 210.12         | 277.42         | 101.98         | 137.90         | 847.99         |
| UITP Schemes           | 112.49         | 385.69         | 1040.83        | 826.08         | 317.28         | 2682.38        |
| <b>Total</b>           | <b>233.06</b>  | <b>595.81</b>  | <b>1318.25</b> | <b>928.05</b>  | <b>455.19</b>  | <b>3530.37</b> |

*Note: The figures provided are in respect of capital investment proposed to be undertaken in each financial year. In case of certain schemes, the capitalisation would spill over beyond the plan period. Similarly at the start of the plan period, there are opening CWIP balance in respect of certain schemes which would get completed in the plan period.*

---

## 7. FUTURE BUSINESS PLAN

The current Business Plan involves:

- Development of "Reliability" Infrastructure – defined as transmission system and associated equipment required for system strengthening;
- Development of "Economic" Infrastructure – defined as transmission system and associated equipment required for transfer of electricity from power plants in the state to various load centers inside and state and out of the state.
- Development of Control Centers for better visibility of the state power system.
- In addition to the above, PTCUL has submitted a base paper, draft regulations, a copy of Transmission Services Agreement (TSA), Revenue Sharing Agreement (RSA) and Billing, Collection and Disbursement (BCD) Mechanism as base work to support Hon'ble UERC to implement Point of Connection (PoC) mechanism in the state of Uttarakhand in pursuance of the requirements of the National Tariff Policy in this regard.

As can be seen, the current business plan, explicitly takes into account only issues on the electricity generation side whereas the demand side is also equally important if PTCUL were to design efficient transmission networks. PTCUL has to clearly identify, its state wide demand in the future so as to build transmission networks to cater to this demand. Once this is identified, it can strengthen its inter-state transmission networks for power evacuation in an appropriate manner.

However, currently there is no commitment to demand forecasting from Uttarkhand Power Corporation Limited (UPCL), the distribution utility. It is essential that UPCL provide approximate demand forecasts, which would allow PTCUL to design its transmission networks serve the load within the state and evacuate the balance outside the state.

Beyond the manpower requirement to implement and operationalize the above investments, PTCUL proposes to develop the following during the next financial year through development of various processes:

### A. DEMAND FORECASTING

#### **Procedure for Assessment of Demand and Energy Requirements involving Long Term Forecasting of Demand (MW) and Energy Requirement**

PTCUL requests the Government of Uttarakhand to direct the board of the distribution Licensee to be responsible for making assessment of demand (MW) and energy requirement for next 10 years on monthly basis. The forecast shall include the unrestricted demand and energy requirement of all categories of consumers. The assessment shall be based on historical data, load requirement projections in accordance with the business plan and forecasted impact of implementation of efficiency improvement programmes including but not limited to T&D loss reduction initiatives and DSM programmes.

While making forecast, Distribution Licensee shall also take into consideration the following along with other relevant factors –

- 
- ✓ The distribution Licensee shall estimate the current demand levels and energy requirement for peaks and for off-peak hours for all categories. The seasonal variation in demand & energy requirement due to various factors including paddy and non-paddy seasons etc should be taken in to account.
  - ✓ Overall economic growth projections
  - ✓ Likely impact of implementation of DSM Regulations
  - ✓ Projected efficiency gains due to implementation of T&D loss reduction initiatives and other improvement programmes
  - ✓ The analysis must also consider the impact of the provisions of the Act and possible movement of consumers to open access and captive generation.

**Such Long Term Demand Forecast Estimates provided by UPCL will help PTCUL to better project the capital investment and manpower augmentation required for enhancement of its transmission network.**

## **B. SHORT TERM FORECASTING OF DEMAND (MW) AND ENERGY REQUIREMENT**

Short Term demand forecast shall duly consider for each month, both restricted and unrestricted forecast for peak as well as for off-peak periods of the day. The seasonal variation in demand & energy requirement due to various factors such as needs during agriculture seasons, winter seasons etc should be taken in to account.

**This will help the PTCUL as a System Operator to better plan for or recommend procurement of power from balancing capacities. This will allow PTCUL to put the EMS and state estimators – that are being installed in the SLDC to actual use, else the capital productivity of this investment would be very low.**

## **C. SUPPLY FORECASTING**

Along with the Demand Forecasts, SLDC must be informed about all the Long Term and Short Term Sources of Power Contracted by the Distribution Licensee for procurement of power in the long term and the short term.

PTCUL will develop a methodology to determine the planning and operation of its transmission networks. This would include developing a 'dual criteria' approach which incorporates both demand security and economic criteria to be considered in the development of the transmission network. Each of these criteria would include specific assumptions about different types of generation, including intermittent generation.

- The Demand Security Criterion requires sufficient transmission system capacity such that peak demand can be met without intermittent generation.
- The Economy Criterion requires sufficient transmission system capacity to accommodate all types of generation in order to meet varying levels of demand efficiently. The proposed approach involves a set of deterministic parameters which have been derived from a Cost Benefit Analysis (CBA) seeking to identify an appropriate balance between the constraint

---

costs with the costs of transmission reinforcements

The approach intends to put increased emphasis on ensuring appropriate balance between the constraint costs with the costs of the transmission reinforcements. It also aims to provide a better overall view of what the optimum investment is likely to be and give an assessment likely to be closer to the right minimum cost solution. By providing a better 'first estimate' of the optimal capacity requirements it brings efficiency to the planning process as it provides a better starting point before a more detailed assessment is carried out and this will simplify and streamline the design process

The new transmission network needed can be planned by scaling the registered capacity of generation, and calculating the difference between generation and the summer peak demand during summer season and winter peak demand during winter season which gives rise to the net power flow from one region of the network to another. A load flow study is performed for this based upon generation/demand scenario against the planned network. The planned network consists of the current transmission system, all current sanctioned reinforcements by that year plus all reinforcements identified, during studies for previous years, required to meet compliance.

#### **D. Need to make SLDC operational**

Section 32 of the Electricity Act 2003 requires that:

*(1) The State Load Despatch Centre shall be the apex body to ensure integrated operation of the power system in a State.*

*(2) The State Load Despatch Centre shall -*

*(a) be responsible for optimum scheduling and despatch of electricity within a State, in accordance with the contracts entered into with the licensees or the generating companies operating in that State;*

*(b) monitor grid operations;*

*(c) keep accounts of the quantity of electricity transmitted through the State grid;*

*(d) exercise supervision and control over the intra-state transmission system; and*

*(e) be responsible for carrying out real time operations for grid control and despatch of electricity within the State through secure and economic operation of the State grid in accordance with the Grid Standards and the State Grid Code.*

*(3) The State Load Despatch Centre may levy and collect such fee and charges from the generating companies and licensees engaged in intra-State transmission of electricity as may be specified by the State Commission.*

PTCUL has sought approval of capital expenses for making SLDC operational. Currently in the absence of the required infrastructure, SLDC in Uttarakhand is not able to perform its duties under the Electricity Act.

As required by sections 32(1), 32(2)(b), 32(2)(d) and 32(2)(e) of the EA 2003, integrated operations are not possible in the absence of RTUs at all generating stations and sub-stations.

---

Further, communication equipment which can transmit time synchronized information to SLDC is required.

Optimal Scheduling and Dispatch, as required by section 32(2)(a) is possible only when the Declared Capacity (DC) of all generation plants, and demand at various interface points between PTCUL and UPCL for all 15 minute blocks in a day is available with the SLDC. Not only does this require infrastructure but also procedures for submission of DC by generators connected in the control area of SLDC Uttarakhand and demand by UPCL.

Further, SLDC is also required to maintain energy accounts of electricity transmitted through the state grid. This requires energy and transmission flow accounting procedures to be in place besides the infrastructure requirement.

Secure and Reliable operation is a critical requirement. SLDC is bound by section 33 of the Electricity Act, 2003 to give directions to various grid connected entities and also penalize them in case of violation. This again, requires infrastructure and procedures for the same to be in place.

For quick reference, Section 33 of the EA, 2003 is reproduced below:

*33. (1) The State Load Despatch Centre in a State may give such directions and exercise such supervision and control as may be required for ensuring the integrated grid operations and for achieving the maximum economy and efficiency in the operation of power system in that State.*

*(2) Every licensee, generating company, generating station, substation and any other person connected with the operation of the power system shall comply with the direction issued by the State Load Despatch Centre under subsection (1).*

*(3) The State Load Despatch Centre shall comply with the directions of the Regional Load Despatch Centre.*

*(4) If any dispute arises with reference to the quality of electricity or safe, secure and integrated operation of the State grid or in relation to any direction given under sub-section (1) , it shall be referred to the State Commission for decision:*

*Provided that pending the decision of the State Commission, the direction of the State Load Despatch Centre shall be complied with by the licensee or generating company.*

*(5) If any licensee, generating company or any other person fails to comply with the directions issued under sub-section(1), he shall be liable to penalty not exceeding rupees five lacs.*

The following sections briefly discuss the above mentioned requirements.

## **E. STANDARDIZATION OF ENERGY ACCOUNTING / TRANSMISSION ACCOUNTING PROCEDURES**

PTCUL has sought approval for investments in development of SLDC. To be able to reduce the burden of Unscheduled Interchange from the Inter-State grid, it is imperative that proper procedures of energy accounting be developed. PTCUL will develop and submit Energy Accounting Procedures for approval by the Hon'ble UERC. This will enable:

- 
- ✓ Accounting of energy injected into the state grid by each power plant, its deviation from the schedule and hence contribution of each generator towards Unscheduled Interchange from the grid;
  - ✓ Accounting of energy withdrawal from the grid by the distribution licensee, deviation from the schedule at each location in the state grid, contribution of each large consumer and the distribution company individually in causing Unscheduled Interchange from the Inter-State Transmission System;
  - ✓ Computation of losses at all voltage levels and feeder-wise;
  - ✓ Transmission accounting is necessitated because
    - Regional Transmission deviation Accounts prepared by RPCs penalize the beneficiary states for using the Inter-State transmission systems beyond the schedule and these penalties need to be charged from the actual users which cause such deviation;
    - Transmission scheduling needs to be done at the level of the state also to have a signal for the need for capacity augmentation.

**The development of above procedures is important from the point of view of not only reducing the costs of operation of the power system but also aligning the developments in the state power system with those in the wholesale power market, which is regulated by Hon'ble CERC.**

#### **F. STANDARDIZATION OF SCHEDULING AND DISPATCH PROCEDURES**

This procedure shall apply to all long term/medium term and short term open access transactions whether engaged in intra-state and/or inter-state. The communication of 'declaration of capability'(DC), 'generation or injection schedule' and 'drawl schedule' to SLDC shall be the primary responsibility of the generating station or beneficiary/licensee and open access customer, as the case may be.

Dispatch procedures govern the 'dispatch schedule' for 'generating stations and injecting entities' which typically comprise of MW as per 'drawl schedule' and MWh derived by apportioning MWh in DC in the ratio of 'MW in DC' and that declared in the 'drawl schedule'.

As per Electricity Act 2003 and IEGC Regulations No. L-1/18/2010-CERC dated 28th Apr.2010, all IPP/ CPP stations have to make real-time data available at SLDC / ALDC. The requirements for data visibility and interfacing requirements at SLDC / ALDC are as detailed below.

For effective utilization of the SLDC investments, PTCUL requests the Hon'ble UERC to direct all the Power Plants (including those owned by UJVNL) in the state to abide by the following:

1. Install Remote Terminal Units which are capable of communication with LD Centres in IEC-104 Protocol.
2. Install suitable Communication media for data transmission. The typical bandwidth requirement for real-time data communication is 64 Kbps and depends upon data volume.
3. IPP/ CPP/State-owned Power plants may be required by the Hon'ble UERC to submit complete proposal along with schematic diagram for RTU installation and data communication with LD Centres

- 
4. Integration of IPP/ CPP station data into the SCADA systems at SLDC & ALDC on IEC 104 protocol.
  5. Completion of all above should be under the scope and responsibility of IPP/ CPP /State-owned Power Station.
  6. SCADA system provided at nearest substation of PTCUL shall serve the purpose of monitoring/ control of power plant data/ operations at local level and also of visibility of real-time data at SLDC / ALDC

Effective implementation of the business plan requires PTCUL to take a responsibility of processes that would aid efficient utilization of the proposed assets. Therefore, PTCUL proposes the following time time-line:

1. Complete Operationalization of the infrastructure at SLDC – September 2013
2. Submission of “Procedures for Energy and Transmission Accounting” to Hon’ble UERC – February 2013
3. Submission of “Procedure for Scheduling and Dispatch (including generation from new and renewable sources)” to Hon’ble UERC – February 2013

---

## 8. ARR PROJECTIONS

The UERC Tariff Regulations 2011 provide that the Annual Transmission Charges for each financial year of the Control Period shall provide for the recovery of the Aggregate Revenue Requirement of the Transmission Licensee for the respective financial year of the Control Period, as reduced by the amount of non-tariff income, income from Other Business and short-term open access charges, as approved by the Commission and shall be computed in the following manner:

Aggregate Revenue Requirement, is the sum of:

- (a) Operation and maintenance expenses;
- (b) Lease Charges
- (c) Interest and Finance Charges on loan capital;
- (d) Return on equity capital;
- (e) Income-tax;
- (f) Depreciation;
- (g) Interest on working capital and deposits from Transmission System Users; and

Annual Transmission Charges of Transmission Licensee = Aggregate Revenue Requirement, as above,

**minus:**

- (h) Non-Tariff Income;
- (i) Short-Term Open Access Charges and
- (j) Income from Other Business to the extent specified in these Regulations.

Going forward, PTCUL would have two revenue streams:

- Revenue from intra state transmission of energy which would be recoverable from UPCL (currently the sole beneficiary)
- Revenue from intra-state lines being used by generators for inter-state transfer of power and charges for the use of these lines to inter-state consumers through CTU in accordance with the PoC mechanism adopted by the Hon'ble CERC.

Accordingly the projected Aggregate Revenue Requirement has been computed in two parts.

---

## **9. ANNUAL TRANSMISSION CHARGES IN RESPECT OF INTRA STATE TRANSMISSION**

Power Transmission Corporation of Uttarakhand Ltd. was incorporated in June 2004 after bifurcation of Uttarakhand Power Corporation Ltd as per notification no. 87/1/2004-06(3)/259/2003 dated May 31, 2004. For the transfer of assets and liabilities between Uttarakhand Power Corporation Ltd. and Power Transmission Corporation of Uttarakhand Ltd., Provisional Transfer Scheme was mutually finalized as per the instruction of Government of Uttarakhand.

The UERC has dealt with the issue of opening value of GFA, as on November 9, 2001, in the FY 2005-06 Tariff Order dated 25.04.2005, wherein it had fixed the opening value of GFA transferred to PTCUL based on the total asset base of Rs. 508 Crore for UPCL as on November 9, 2001 instead of provisional value of Rs. 1058.18 Crore taken by UPCL in its accounts. Accordingly on pro-rata basis, the Commission had considered the value of old transmission assets transferred to Petitioner from transmission assets of UPCL as Rs. 108.26 Crore.

The Commission had further allowed additional capitalizations upto 31.3.2003 such that the original value of the GFA as on 31.3.2003 was fixed at Rs. 126.34 crore for PTCUL against the value of Rs. 263.17 crore assigned in the provisional transfer scheme.

The UERC in all the tariff orders upto FY 2012-13 has consistently directed PTCUL to approach the UERC for suitable adjustment in the opening value of GFA upon finalisation of the Transfer Scheme.

By an order No. 117/I(2)/2011-05/19/2002 dated 27<sup>th</sup> April 2012, the Govt of Uttarakhand has approved the value of GFA of Rs. 1058.18 crore taken by UPCL in its accounts as on November 9, 2001. (The copy of the same has been endorsed to Hon'ble UERC by the GoU). Accordingly this business plan has considered the opening assets of Rs. 263.17 crore assigned to PTCUL in the transfer scheme.

Further, some Inter Unit Transactions (IUTs) remained pending with Uttarakhand Power Corporation Ltd. Further for better control and supervision, the project units were created and separated from the O&M units and work and resources were transferred accordingly. The executed works prior to separation of units were also transferred accordingly by way of IUTs. As a result of that, some un-reconciled balances remained outstanding in various accounting heads of the concerned units of PTCUL. Considering the above there appears that some of the capital expenditure has not been capitalized in the accounts. This position has also been stated by the Statutory Auditors in their Audit Reports. In this regard, the UERC in its order dated 06.04.2010 had also directed PTCUL to get the scheme wise audit of the transmission assets done:

*"The Commission also directs PTCUL to get a scheme-wise audit of the value of transmission assets capitalized since 09-11-2001 which should cover the date of capitalization, cost of assets including IDC and other expenses capitalised and its financing, segregating the capital cost into loan, equity and grants/consumer contribution and submit the report of the same to the Commission within six months from the date of this Order. The Petitioner should also ensure to get the scope of the assignment approved by the Commission before initiating the same."*

Considering the importance of the matter, the PTCUL management had assigned the task to an independent Chartered Accountant firm. This will not only help to reconcile the old pending IUT balances but also serve as audit by an independent third party.

The reconciliation of the scheme wise capital cost is complete and the report of the independent chartered accountant firm is available (**Enclosed as Annex-2**). The PTCUL in the business plan has considered the gross fixed asset balances in line with its audited accounts for FY 2010-11 and provisional accounts for FY 2011-12 and tariff components for the plan period have been computed accordingly.

The movement of GFA balances along with the scheme wise classification is provided in the table below:

**Table 9.1: Classification of GFA balance along major schemes**

(Figures in Rs Crore)

| Particulars                  | FY 2005       | FY 2006       | FY 2007       | FY 2008       | FY 2009       | FY 2010       | FY 2011       | FY 2012       |
|------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Opening Value                | 263.39        | 267.47        | 295.50        | 392.94        | 524.78        | 557.76        | 612.81        | 690.94        |
| <b>Additions in the year</b> |               |               |               |               |               |               |               |               |
| REC Old Scheme               | 3.21          | 18.86         | -             | 4.61          | -             | 0.02          | 45.28         | 44.54         |
| NABARD Scheme                | -             | -             | 69.15         | 93.12         | 27.87         | 42.88         | 12.16         | 49.41         |
| REC New Scheme               | -             | -             | -             | 30.89         | 2.90          | 9.66          | 20.84         | 24.32         |
| REC-IV Scheme                | -             | -             | -             | -             | -             | -             | 20.67         | 22.64         |
| REC-V Scheme                 | -             | -             | -             | -             | -             | -             | -             | 67.14         |
| Other than schemes           | 0.91          | 1.31          | 1.34          | 1.30          | 2.20          | 2.71          | 2.20          | 16.32         |
| Deposit Works                | -             | 8.92          | 28.31         | 2.09          | -             | -             | -             | 42.00         |
| Less: Deletion of Assets     | 0.03          | 1.07          | 1.36          | 0.16          |               | 0.23          | 23.03         | 16.40         |
| <b>Total Net Additions</b>   | <b>4.08</b>   | <b>28.02</b>  | <b>97.44</b>  | <b>131.84</b> | <b>32.98</b>  | <b>55.05</b>  | <b>78.13</b>  | <b>249.96</b> |
|                              |               |               |               |               |               |               |               |               |
| <b>Closing Value</b>         | <b>267.47</b> | <b>295.50</b> | <b>392.94</b> | <b>524.78</b> | <b>557.76</b> | <b>612.81</b> | <b>690.94</b> | <b>940.91</b> |

The table below shows the means of financing as per the debt equity ratio of various schemes:

**Table 9.2: Means of Finance of each scheme**

| Scheme             | Loan   | Equity | Total |
|--------------------|--------|--------|-------|
| REC Old Scheme     | 75.5%  | 24.5%  | 100%  |
| NABARD Scheme      | 78.0%  | 22.0%  | 100%  |
| REC New Scheme     | 100.0% | 0.0%   | 100%  |
| REC IV             | 70.0%  | 30.0%  | 100%  |
| REC V              | 70.0%  | 30.0%  | 100%  |
| Other than Schemes | 70.0%  | 30.0%  | 100%  |

Based on the above, the debt and equity as on 1.4.2012 has been determined below:

**Table 9.3: Opening Debt and Equity as on 1.4.2012**

(Figures in Rs Crore)

| Particulars                     | Equity | Loan   | Grant | Total  |
|---------------------------------|--------|--------|-------|--------|
| Opening Value                   |        |        |       |        |
| <b>Additions in the year</b>    |        |        |       |        |
| GFA Assigned in Transfer Scheme | 79.01  | 184.37 |       | 263.38 |
| REC Old Scheme                  | 28.55  | 87.97  |       | 116.52 |
| NABARD Scheme                   | 64.81  | 229.79 |       | 294.60 |
| REC New Scheme                  |        | 88.62  |       | 88.62  |

| Particulars              | Equity        | Loan          | Grant        | Total         |
|--------------------------|---------------|---------------|--------------|---------------|
| REC-IV Scheme            | 12.99         | 30.32         |              | 43.31         |
| REC-V Scheme             | 20.14         | 47.00         |              | 67.14         |
|                          |               |               |              |               |
| Other than schemes       | 8.49          | 19.81         |              | 28.29         |
| Deposit Works            |               |               | 81.32        | 81.32         |
| Less: Deletion of Assets | 12.68         | 29.60         |              | 42.28         |
| <b>Closing Value</b>     | <b>201.31</b> | <b>658.27</b> | <b>81.32</b> | <b>940.91</b> |

The various capital expenditure schemes along with their capital cost and expected commissioning schedule has been detailed in the aforementioned sections. Accordingly the opening gross fixed asset base and the capitalisations over the plan period are provided in the table below:

**Table 9.4: Opening Gross Fixed Assets and Capitalisations over the Plan Period**

(Figures in Rs Crore)

| Particulars                             | Opening GFA as on 1.4.2012 | Additions in FY 2012-13 | Additions in FY 2013-14 | Additions in FY 2014-15 | Additions in FY 2015-16 | Additions in FY 2016-17 |
|---|----------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Old Assets <sup>2</sup>                 | 221.11                     |                         |                         |                         |                         |                         |
| REC Old Scheme                          | 116.52                     | 54.23                   | 0.00                    | 89.51                   | 0.00                    | 0.00                    |
| NABARD Scheme                           | 294.60                     |                         |                         |                         |                         |                         |
| REC New Scheme                          | 88.62                      | 7.14                    | 35.88                   | 39.83                   | 0.00                    | 0.00                    |
| REC IV                                  | 43.31                      | 34.84                   | 80.01                   | 0.00                    | 0.00                    | 0.00                    |
| REC V                                   | 67.14                      | 22.84                   | 0.00                    | 0.00                    | 0.00                    | 0.00                    |
| REC-VI                                  |                            | 0.00                    | 0.00                    | 0.00                    | 34.64                   | 0.00                    |
| REC-VII                                 |                            | 0.00                    | 0.00                    | 0.00                    | 64.38                   | 0.00                    |
| REC-VIII                                |                            | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 65.18                   |
| REC-IX                                  |                            | 11.47                   | 0.00                    | 0.00                    | 0.00                    | 0.00                    |
| REC-X                                   |                            | 0.00                    | 0.00                    | 122.65                  | 0.00                    | 0.00                    |
| Planned Schemes to be funded by PFC/REC |                            | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 151.12                  |
| Grants, Deposit Works, etc              | 81.32                      |                         |                         |                         |                         |                         |
| Other than schemes (SI)                 | 28.29                      | 11.42                   | 12.50                   | 84.00                   | 70.00                   | 0.00                    |
| <b>Total</b>                            | <b>940.91</b>              | <b>141.92</b>           | <b>128.38</b>           | <b>335.99</b>           | <b>169.02</b>           | <b>216.30</b>           |

<sup>2</sup> Assets assigned in the transfer scheme net of deletions over the years

## 9.1 DEPRECIATION

The projected gross fixed asset has been provided in the foregoing section. Depreciation for the year has been calculated on the opening gross fixed asset base considering the rates prescribed by the Tariff Regulations, 2011. Pro-rata depreciation has been calculated for assets which are in operation for part of the year. Average rate of 5.28% has been considered for computing the depreciation.

The tables below indicate the Depreciation for the plan period:

**Table 9.5: Depreciation for FY 2012-13**

*(Figures in Rs Crore)*

| Particulars                             | Opening GFA as on 1.4.2012 | Grants       | Depreciable Opening GFA | Additions in FY 2012-13 | Total Depreciation |
|---|----------------------------|--------------|-------------------------|-------------------------|--------------------|
| Old Assets                              | 221.11                     |              | 221.11                  | 0.00                    | 11.67              |
| REC Old Scheme                          | 116.52                     |              | 116.52                  | 54.23                   | 6.39               |
| NABARD Scheme                           | 294.60                     |              | 294.60                  | 0.00                    | 15.56              |
| REC New Scheme                          | 88.62                      |              | 88.62                   | 7.14                    | 4.70               |
| REC IV                                  | 43.31                      |              | 43.31                   | 34.84                   | 3.07               |
| REC V                                   | 67.14                      |              | 67.14                   | 22.84                   | 3.80               |
| REC-VI                                  | 0.00                       |              | 0.00                    | 0.00                    | 0.00               |
| REC-VII                                 | 0.00                       |              | 0.00                    | 0.00                    | 0.00               |
| REC-VIII                                | 0.00                       |              | 0.00                    | 0.00                    | 0.00               |
| REC-IX                                  | 0.00                       |              | 0.00                    | 11.47                   | 0.04               |
| REC-X                                   | 0.00                       |              | 0.00                    | 0.00                    | 0.00               |
| Planned Schemes to be funded by PFC/REC | 0.00                       |              | 0.00                    | 0.00                    | 0.00               |
| Grants, Deposit Works, etc              | 81.32                      | 81.32        | 0.00                    | 0.00                    | 0.00               |
| Other than schemes                      | 28.29                      |              | 28.29                   | 11.42                   | 1.49               |
| <b>Total</b>                            | <b>940.91</b>              | <b>81.32</b> | <b>859.59</b>           | <b>141.92</b>           | <b>46.72</b>       |

**Table 9.6: Depreciation for FY 2013-14**

*(Figures in Rs Crore)*

| Particulars                             | Opening GFA as on 1.4.2013 | Grants       | Depreciable Opening GFA | Additions in FY 2013-14 | Total Depreciation |
|---|----------------------------|--------------|-------------------------|-------------------------|--------------------|
| Old Assets                              | 221.11                     |              | 221.11                  | 0.00                    | 11.67              |
| REC Old Scheme                          | 170.75                     |              | 170.75                  | 0.00                    | 9.25               |
| NABARD Scheme                           | 294.60                     |              | 294.60                  | 0.00                    | 15.56              |
| REC New Scheme                          | 95.75                      |              | 95.75                   | 35.88                   | 5.72               |
| REC IV                                  | 78.15                      |              | 78.15                   | 80.01                   | 8.08               |
| REC V                                   | 89.98                      |              | 89.98                   | 0.00                    | 5.00               |
| REC-VI                                  | 0.00                       |              | 0.00                    | 0.00                    | 0.00               |
| REC-VII                                 | 0.00                       |              | 0.00                    | 0.00                    | 0.00               |
| REC-VIII                                | 0.00                       |              | 0.00                    | 0.00                    | 0.03               |
| REC-IX                                  | 11.47                      |              | 11.47                   | 0.00                    | 0.64               |
| REC-X                                   | 0.00                       |              | 0.00                    | 0.00                    | 0.99               |
| Planned Schemes to be funded by PFC/REC | 0.00                       |              | 0.00                    | 0.00                    | 0.00               |
| Grants, Deposit Works, etc              | 81.32                      | 81.32        | 0.00                    | 0.00                    | 0.00               |
| Other than schemes                      | 39.71                      |              | 39.71                   | 12.50                   | 1.49               |
| <b>Total</b>                            | <b>1082.83</b>             | <b>81.32</b> | <b>1001.51</b>          | <b>128.38</b>           | <b>58.44</b>       |

**Table 9.7: Depreciation for FY 2014-15***(Figures in Rs Crore)*

| Particulars                             | Opening GFA as on 1.4.2014 | Grants       | Depreciable Opening GFA | Additions in FY 2014-15 | Total Depreciation |
|---|----------------------------|--------------|-------------------------|-------------------------|--------------------|
| Old Assets                              | 221.11                     |              | 221.11                  | 0.00                    | 11.67              |
| REC Old Scheme                          | 170.75                     |              | 170.75                  | 89.51                   | 12.80              |
| NABARD Scheme                           | 294.60                     |              | 294.60                  | 0.00                    | 15.56              |
| REC New Scheme                          | 131.63                     |              | 131.63                  | 39.83                   | 7.51               |
| REC IV                                  | 158.15                     |              | 158.15                  | 0.00                    | 9.14               |
| REC V                                   | 89.98                      |              | 89.98                   | 0.00                    | 5.00               |
| REC-VI                                  | 0.00                       |              | 0.00                    | 0.00                    | 0.00               |
| REC-VII                                 | 0.00                       |              | 0.00                    | 0.00                    | 0.00               |
| REC-VIII                                | 0.00                       |              | 0.00                    | 0.00                    | 0.04               |
| REC-IX                                  | 11.47                      |              | 11.47                   | 0.00                    | 0.64               |
| REC-X                                   | 0.00                       |              | 0.00                    | 122.65                  | 1.32               |
| Planned Schemes to be funded by PFC/REC | 0.00                       |              | 0.00                    | 0.00                    | 0.00               |
| Grants, Deposit Works, etc              | 81.32                      | 81.32        | 0.00                    | 0.00                    | 0.00               |
| Other than schemes                      | 52.21                      |              | 52.21                   | 84.00                   | 1.49               |
| <b>Total</b>                            | <b>1211.21</b>             | <b>81.32</b> | <b>1129.90</b>          | <b>335.99</b>           | <b>65.17</b>       |

**Table 9.8: Depreciation for FY 2015-16***(Figures in Rs Crore)*

| Particulars                             | Opening GFA as on 1.4.2015 | Grants       | Depreciable Opening GFA | Additions in FY 2015-16 | Total Depreciation |
|---|----------------------------|--------------|-------------------------|-------------------------|--------------------|
| Old Assets                              | 221.11                     |              | 221.11                  | 0.00                    | 11.67              |
| REC Old Scheme                          | 260.26                     |              | 260.26                  | 0.00                    | 13.98              |
| NABARD Scheme                           | 294.60                     |              | 294.60                  | 0.00                    | 15.56              |
| REC New Scheme                          | 171.46                     |              | 171.46                  | 0.00                    | 8.03               |
| REC IV                                  | 158.15                     |              | 158.15                  | 0.00                    | 9.14               |
| REC V                                   | 89.98                      |              | 89.98                   | 0.00                    | 5.00               |
| REC-VI                                  | 0.00                       |              | 0.00                    | 34.64                   | 1.37               |
| REC-VII                                 | 0.00                       |              | 0.00                    | 64.38                   | 2.55               |
| REC-VIII                                | 0.00                       |              | 0.00                    | 0.00                    | 0.04               |
| REC-IX                                  | 11.47                      |              | 11.47                   | 0.00                    | 0.64               |
| REC-X                                   | 122.65                     |              | 122.65                  | 0.00                    | 1.32               |
| Planned Schemes to be funded by PFC/REC | 0.00                       |              | 0.00                    | 0.00                    | 0.00               |
| Grants, Deposit Works, etc              | 81.32                      | 81.32        | 0.00                    | 0.00                    | 0.00               |
| Other than schemes                      | 136.21                     |              | 136.21                  | 70.00                   | 1.49               |
| <b>Total</b>                            | <b>1547.20</b>             | <b>81.32</b> | <b>1465.89</b>          | <b>169.02</b>           | <b>70.79</b>       |

**Table 9.9: Depreciation for FY 2016-17***(Figures in Rs Crore)*

| Particulars    | Opening GFA as on 1.4.2016 | Grants | Depreciable Opening GFA | Additions in FY 2016-17 | Total Depreciation |
|----------------|----------------------------|--------|-------------------------|-------------------------|--------------------|
| Old Assets     | 221.11                     |        | 221.11                  | 0.00                    | 11.67              |
| REC Old Scheme | 260.26                     |        | 260.26                  | 0.00                    | 13.98              |
| NABARD Scheme  | 294.60                     |        | 294.60                  | 0.00                    | 15.56              |
| REC New Scheme | 171.46                     |        | 171.46                  | 0.00                    | 8.03               |
| REC IV         | 158.15                     |        | 158.15                  | 0.00                    | 9.14               |
| REC V          | 89.98                      |        | 89.98                   | 0.00                    | 5.00               |
| REC-VI         | 34.64                      |        | 34.64                   | 0.00                    | 1.83               |
| REC-VII        | 64.38                      |        | 64.38                   | 0.00                    | 3.40               |
| REC-VIII       | 0.00                       |        | 0.00                    | 65.18                   | 0.04               |

| Particulars                             | Opening GFA as on 1.4.2016 | Grants       | Depreciable Opening GFA | Additions in FY 2016-17 | Total Depreciation |
|---|----------------------------|--------------|-------------------------|-------------------------|--------------------|
| REC-IX                                  | 11.47                      |              | 11.47                   | 0.00                    | 0.64               |
| REC-X                                   | 122.65                     |              | 122.65                  | 0.00                    | 1.32               |
| Planned Schemes to be funded by PFC/REC | 0.00                       |              | 0.00                    | 151.12                  | 5.98               |
| Grants, Deposit Works, etc              | 81.32                      | 81.32        | 0.00                    | 0.00                    | 0.00               |
| Other than schemes                      | 206.21                     |              | 206.21                  | 0.00                    | 1.49               |
| <b>Total</b>                            | <b>1716.22</b>             | <b>81.32</b> | <b>1634.91</b>          | <b>216.30</b>           | <b>78.09</b>       |

## 9.2 INTEREST ON LOAN

The interest expenditure on account of long-term loans depends on the outstanding loan, repayments, and prevailing interest rates on the outstanding loans. Further, the projected capital expenditure and the funding of the same also have a large bearing on the long-term interest expenditure.

The funding for new capital expenditure in the control period has been assumed to be undertaken at a normative debt: equity ratio of 70:30 in accordance with the Tariff Regulations, 2011 and accordingly the new loan additions during the year has been estimated. However in case of Old REC scheme, the debt equity ratio has been considered at 74.5:24.5. Further the New REC scheme has been considered to be funded entirely by debt. For the purpose of calculation of interest on these loans, the rate of interest has been considered at 12% in respect of Old REC, New REC, REC IV, REC-V, REC-VI, REC-VII and REC-IX schemes loans and 12.5% in respect of Planned Scheme loans. The Tariff Regulation, 2011 prescribe that the normative loan outstanding shall be worked out by deducting the cumulative repayment as admitted by the Commission from the gross normative loan. The normative repayment for each year has been considered equal to the depreciation for that year.

Accordingly, considering the accumulated depreciation assigned in the transfer scheme and the depreciation allowed in various tariff orders, the cumulative normative repayment has been worked out. The interest on loans is projected in the table below:

**Table 9.10: Interest on loans projected in the plan period**

*(Figures in Rs Crore)*

| Debt Profile                        | FY 2012-13 | FY 2013-14 | FY 2014-15 | FY 2015-16 | FY 2016-17 |
|-------------------------------------|------------|------------|------------|------------|------------|
| Opening Normative Loan              | 452.32     | 510.07     | 552.27     | 739.17     | 786.69     |
| Addition during the year            | 104.47     | 100.63     | 252.06     | 118.31     | 151.41     |
| Normative repayment during the year | 46.72      | 58.44      | 65.17      | 70.79      | 78.09      |
| Closing Loan balance                | 510.07     | 552.27     | 739.17     | 786.69     | 860.01     |
| Interest charged to capital (IDC)   | 14.38      | 12.86      | 15.89      | 8.03       | 3.00       |
| Interest charged to revenue         | 52.10      | 68.55      | 76.13      | 91.88      | 103.51     |

IDC- Interest during construction period

### 9.3 RETURN ON EQUITY

The business plan has considered return on the equity portion of the capitalised assets. Considering the opening equity computed in aforementioned table, and considering the planned capitalisation, the computations in respect of equity eligible for return for the plan period are provided in the tables below:

**Table 9.11: Equity Base Eligible for Return for FY 2012-13**

(Figures in Rs Crore)

| Particulars                             | Opening Equity base as on 1.4.2012 | Additions to GFA during the year | Equity % of capitalised assets | Equity portion of capitalised assets | Closing Equity as on 31.3.2013 |
|---|------------------------------------|----------------------------------|--------------------------------|--------------------------------------|--------------------------------|
|   | (a)                                | (b)                              | (c)                            | (d=b*c)                              | (e=a+d)                        |
| Old Assets                              | 66.33                              | -                                |                                |                                      | 66.33                          |
| REC Old Scheme                          | 28.55                              | 54.23                            | 24.5%                          | 13.29                                | 41.83                          |
| NABARD Scheme                           | 64.81                              | -                                | 22.0%                          | -                                    | 64.81                          |
| REC New Scheme                          | -                                  | 7.14                             | 0.0%                           | -                                    | -                              |
| REC-IV Scheme                           | 12.99                              | 34.84                            | 30.0%                          | 10.45                                | 23.44                          |
| REC-V Scheme                            | 20.14                              | 22.84                            | 30.0%                          | 6.85                                 | 26.99                          |
| REC-VI                                  |                                    | -                                | 30.0%                          | -                                    | -                              |
| REC-VII                                 |                                    | -                                | 30.0%                          | -                                    | -                              |
| REC-VIII                                |                                    | -                                | 30.0%                          | -                                    | -                              |
| REC-IX                                  |                                    | 11.47                            | 30.0%                          | 3.44                                 | 3.44                           |
| REC-X                                   |                                    | -                                | 30.0%                          | -                                    | -                              |
| Planned Schemes to be funded by PFC/REC |                                    | -                                | 30.0%                          | -                                    | -                              |
| Grants, Deposit Works, etc              |                                    | -                                |                                | -                                    | -                              |
| Other than schemes                      | 8.49                               | 11.42                            | 30.0%                          | 3.42                                 | 11.91                          |
| <b>Total Eligible Equity</b>            | <b>201.31</b>                      | <b>141.92</b>                    |                                | <b>37.45</b>                         | <b>238.77</b>                  |

**Table 9.12: Equity Base Eligible for Return for FY 2013-14**

(Figures in Rs Crore)

| Particulars                             | Opening Equity base as on 1.4.2013 | Additions to GFA during the year | Equity % of capitalised assets | Equity portion of capitalised assets | Closing Equity as on 31.3.2014 |
|---|------------------------------------|----------------------------------|--------------------------------|--------------------------------------|--------------------------------|
|   | (a)                                | (b)                              | (c)                            | (d=b*c)                              | (e=a+d)                        |
| Old Assets                              | 66.33                              | -                                |                                |                                      | 66.33                          |
| REC Old Scheme                          | 41.83                              | -                                | 24.5%                          | -                                    | 41.83                          |
| NABARD Scheme                           | 64.81                              | -                                | 22.0%                          | -                                    | 64.81                          |
| REC New Scheme                          | -                                  | 35.88                            | 0.0%                           | -                                    | -                              |
| REC-IV Scheme                           | 23.44                              | 80.01                            | 30.0%                          | 24.00                                | 47.45                          |
| REC-V Scheme                            | 26.99                              | -                                | 30.0%                          | -                                    | 26.99                          |
| REC-VI                                  | -                                  | -                                | 30.0%                          | -                                    | -                              |
| REC-VII                                 | -                                  | -                                | 30.0%                          | -                                    | -                              |
| REC-VIII                                | -                                  | -                                | 30.0%                          | -                                    | -                              |
| REC-IX                                  | 3.44                               | -                                | 30.0%                          | -                                    | 3.44                           |
| REC-X                                   | -                                  | -                                | 30.0%                          | -                                    | -                              |
| Planned Schemes to be funded by PFC/REC | -                                  | -                                | 30.0%                          | -                                    | -                              |
| Grants, Deposit Works, etc              | -                                  | -                                |                                | -                                    | -                              |
| Other than schemes                      | 11.91                              | 12.50                            | 30.0%                          | 3.75                                 | 15.66                          |
| <b>Total Eligible Equity</b>            | <b>238.77</b>                      | <b>128.38</b>                    |                                | <b>27.75</b>                         | <b>266.52</b>                  |

**Table 9.13: Equity Base Eligible for Return for FY 2014-15***(Figures in Rs Crore)*

| Particulars                             | Opening Equity base as on 1.4.2014 | Additions to GFA during the year | Equity % of capitalised assets | Equity portion of capitalised assets | Closing Equity as on 31.3.2015 |
|---|------------------------------------|----------------------------------|--------------------------------|--------------------------------------|--------------------------------|
|   | (a)                                | (b)                              | (c)                            | (d=b*c)                              | (e=a+d)                        |
| Old Assets                              | 66.33                              | -                                |                                |                                      | 66.33                          |
| REC Old Scheme                          | 41.83                              | 89.51                            | 24.5%                          | 21.93                                | 63.76                          |
| NABARD Scheme                           | 64.81                              | -                                | 22.0%                          | -                                    | 64.81                          |
| REC New Scheme                          | -                                  | 39.83                            | 0.0%                           | -                                    | -                              |
| REC-IV Scheme                           | 47.45                              | -                                | 30.0%                          | -                                    | 47.45                          |
| REC-V Scheme                            | 26.99                              | -                                | 30.0%                          | -                                    | 26.99                          |
| REC-VI                                  | -                                  | -                                | 30.0%                          | -                                    | -                              |
| REC-VII                                 | -                                  | -                                | 30.0%                          | -                                    | -                              |
| REC-VIII                                | -                                  | -                                | 30.0%                          | -                                    | -                              |
| REC-IX                                  | 3.44                               | -                                | 30.0%                          | -                                    | 3.44                           |
| REC-X                                   | -                                  | 122.65                           | 30.0%                          | 36.80                                | 36.80                          |
| Planned Schemes to be funded by PFC/REC | -                                  | -                                | 30.0%                          | -                                    | -                              |
| Grants, Deposit Works, etc              | -                                  | -                                |                                | -                                    | -                              |
| Other than schemes                      | 15.66                              | 84.00                            | 30.0%                          | 25.20                                | 40.86                          |
| <b>Total Eligible Equity</b>            | <b>266.52</b>                      | <b>335.99</b>                    |                                | <b>83.92</b>                         | <b>350.44</b>                  |

**Table 9.14: Equity Base Eligible for Return for FY 2015-16***(Figures in Rs Crore)*

| Particulars                             | Opening Equity base as on 1.4.2015 | Additions to GFA during the year | Equity % of capitalised assets | Equity portion of capitalised assets | Closing Equity as on 31.3.2016 |
|---|------------------------------------|----------------------------------|--------------------------------|--------------------------------------|--------------------------------|
|   | (a)                                | (b)                              | (c)                            | (d=b*c)                              | (e=a+d)                        |
| Old Assets                              | 66.33                              | -                                |                                |                                      | 66.33                          |
| REC Old Scheme                          | 63.76                              | -                                | 24.5%                          | -                                    | 63.76                          |
| NABARD Scheme                           | 64.81                              | -                                | 22.0%                          | -                                    | 64.81                          |
| REC New Scheme                          | -                                  | -                                | 0.0%                           | -                                    | -                              |
| REC-IV Scheme                           | 47.45                              | -                                | 30.0%                          | -                                    | 47.45                          |
| REC-V Scheme                            | 26.99                              | -                                | 30.0%                          | -                                    | 26.99                          |
| REC-VI                                  | -                                  | 34.64                            | 30.0%                          | 10.39                                | 10.39                          |
| REC-VII                                 | -                                  | 64.38                            | 30.0%                          | 19.31                                | 19.31                          |
| REC-VIII                                | -                                  | -                                | 30.0%                          | -                                    | -                              |
| REC-IX                                  | 3.44                               | -                                | 30.0%                          | -                                    | 3.44                           |
| REC-X                                   | 36.80                              | -                                | 30.0%                          | -                                    | 36.80                          |
| Planned Schemes to be funded by PFC/REC | -                                  | -                                | 30.0%                          | -                                    | -                              |
| Grants, Deposit Works, etc              | -                                  | -                                |                                | -                                    | -                              |
| Other than schemes                      | 40.86                              | 70.00                            | 30.0%                          | 21.00                                | 61.86                          |
| <b>Total Eligible Equity</b>            | <b>350.44</b>                      | <b>169.02</b>                    |                                | <b>50.71</b>                         | <b>401.15</b>                  |

**Table 9.15: Equity Base Eligible for Return for FY 2016-17***(Figures in Rs Crore)*

| Particulars                             | Opening Equity base as on 1.4.2016 | Additions to GFA during the year | Equity % of capitalised assets | Equity portion of capitalised assets | Closing Equity as on 31.3.2017 |
|---|------------------------------------|----------------------------------|--------------------------------|--------------------------------------|--------------------------------|
|   | (a)                                | (b)                              | (c)                            | (d=b*c)                              | (e=a+d)                        |
| Old Assets                              | 66.33                              | -                                |                                |                                      | 66.33                          |
| REC Old Scheme                          | 63.76                              | -                                | 24.5%                          | -                                    | 63.76                          |
| NABARD Scheme                           | 64.81                              | -                                | 22.0%                          | -                                    | 64.81                          |
| REC New Scheme                          | -                                  | -                                | 0.0%                           | -                                    | -                              |
| REC-IV Scheme                           | 47.45                              | -                                | 30.0%                          | -                                    | 47.45                          |
| REC-V Scheme                            | 26.99                              | -                                | 30.0%                          | -                                    | 26.99                          |
| REC-VI                                  | 10.39                              | -                                | 30.0%                          | -                                    | 10.39                          |
| REC-VII                                 | 19.31                              | -                                | 30.0%                          | -                                    | 19.31                          |
| REC-VIII                                | -                                  | 65.18                            | 30.0%                          | 19.55                                | 19.55                          |
| REC-IX                                  | 3.44                               | -                                | 30.0%                          | -                                    | 3.44                           |
| REC-X                                   | 36.80                              | -                                | 30.0%                          | -                                    | 36.80                          |
| Planned Schemes to be funded by PFC/REC | -                                  | 151.12                           | 30.0%                          | 45.34                                | 45.34                          |
| Grants, Deposit Works, etc              | -                                  | -                                |                                | -                                    | -                              |
| Other than schemes                      | 61.86                              | -                                | 30.0%                          | -                                    | 61.86                          |
| <b>Total Eligible Equity</b>            | <b>401.15</b>                      | <b>216.30</b>                    |                                | <b>64.89</b>                         | <b>466.04</b>                  |

The rate of return has been considered at 14% in FY 2012-13 and thereafter at 15.50% in line with the Tariff Regulations. The table below provides the projections in respect of return on equity for the plan period:

**Table 9.16: Projected Return on Equity***(Figures in Rs Crore)*

| Particulars   | 2012-13       | 2013-14       | 2014-15       | 2015-16       | 2016-17       |
|---|---------------|---------------|---------------|---------------|---------------|
| Opening Equity base eligible for Return               | 201.31        | 238.77        | 266.52        | 350.44        | 401.15        |
| Equity portion of capitalised assets                  | 37.45         | 27.75         | 83.92         | 50.71         | 64.89         |
| <b>Closing Equity Base</b>                            | <b>238.77</b> | <b>266.52</b> | <b>350.44</b> | <b>401.15</b> | <b>466.04</b> |
| Return on Equity (%)                                  | 14.00%        | 15.50%        | 15.50%        | 15.50%        | 15.50%        |
| Full year Return on Opening Equity                    | 28.18         | 37.01         | 41.31         | 54.32         | 62.18         |
| Pro-rata Return on assets capitalised during the year | 2.62          | 2.15          | 6.50          | 3.93          | 5.03          |
| <b>Total Return on Equity</b>                         | <b>30.81</b>  | <b>39.16</b>  | <b>47.81</b>  | <b>58.25</b>  | <b>67.21</b>  |

#### 9.4 EMPLOYEE EXPENSES

The Tariff Regulations provide that the Operation and Maintenance (O&M) expenses shall comprise of the following:-

- salaries, wages, pension contribution and other employee costs;
- administrative and general expenses including insurance charges if any;
- repairs and maintenance expenses;

The Tariff Regulations provide that the O&M expenses for the first year of the Control Period will be approved by the Commission taking into account the actual O&M expenses for last five years till Base Year subject to prudence check and any other factors considered appropriate by the Commission. In the Tariff Regulations the Base Year has been considered as FY 2011-12.

The Tariff Regulations further provide that the O&M expenses for the nth year and also for the year immediately preceding the Control Period, i.e. 2012-13, shall be approved based on the formula given below:-

$$\mathbf{O\&M_n = R\&M_n + EMP_n + A\&G_n}$$

Where -

O&M<sub>n</sub> – Operation and Maintenance expense for the nth year;

EMP<sub>n</sub> – Employee Costs for the nth year;

R&M<sub>n</sub> – Repair and Maintenance Costs for the nth year;

A&G<sub>n</sub> – Administrative and General Costs for the nth year;

Further the regulations provide that the employee expenses shall be computed in the manner specified below:

$$EMP_n = (EMP_{n-1}) \times (1+G_n) \times (CPI_{inflation})$$

Where -

EMP<sub>n-1</sub> – Employee Costs for the (n-1)th year;

CPI<sub>inflation</sub> – is the average increase in the Consumer Price Index (CPI) for immediately preceding three years;

G<sub>n</sub> is a growth factor for the nth year. Value of G<sub>n</sub> shall be determined by the Commission in the MYT tariff order for meeting the additional manpower requirement based on Transmission Licensee's filings, benchmarking and any other factor that the Commission feels appropriate:

The table below provides the Consumer Price Indices for the past few years.

**Table 9.17: Consumer Price Indices**

| Year | Jan | Feb | Mar | April | May | June | July | August | Sept | Oct | Nov | Dec | Average |
|------|-----|-----|-----|-------|-----|------|------|--------|------|-----|-----|-----|---------|
| 2006 | 119 | 119 | 119 | 120   | 121 | 123  | 124  | 124    | 125  | 127 | 127 | 127 | 122.9   |
| 2007 | 127 | 128 | 127 | 128   | 129 | 130  | 132  | 133    | 133  | 134 | 134 | 134 | 130.8   |
| 2008 | 134 | 135 | 137 | 138   | 139 | 140  | 143  | 145    | 146  | 148 | 148 | 147 | 141.7   |
| 2009 | 148 | 148 | 148 | 150   | 151 | 153  | 160  | 162    | 163  | 165 | 168 | 169 | 157.1   |
| 2010 | 172 | 170 | 170 | 170   | 172 | 174  | 178  | 178    | 179  | 181 | 182 | 185 | 175.9   |
| 2011 | 188 | 185 | 185 | 186   | 187 | 189  | 193  | 194    | 197  | 198 | 199 | 197 | 191.5   |
| 2012 | 198 | 199 | 201 | 205   |     |      |      |        |      |     |     |     |         |

Source: [www.labourbureau.nic.in](http://www.labourbureau.nic.in); Base 2001= 100 (New Series)

The average increase in the CPI indices for immediately preceding three years is 10.58%. Further the PTCUL has prepared elaborate additional employee recruitment projections for the plan period. It has projected that the net additions to the employee work force would be 383 employees in FY 2013-14, 72 employees in FY 2014-15 and 105 employees in FY 2015-16.

The projected cost of additional manpower would be Rs. 14.62 crore in FY 2013-14, Rs. 2.29 crore in FY 2014-15 and Rs. 3.37 crore in FY 2015-16. Considering the above, the projected employee expenses in the plan period are provided below:

**Table 9.18: Projected Employee Expenses in the plan period**

(Figures in Rs Crore)

| Particulars                 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 |
|-----------------------------|---------|---------|---------|---------|---------|
| Projected Employee Expenses | 58.32   | 79.11   | 89.78   | 102.65  | 113.51  |

## 9.5 REPAIR AND MAINTENANCE EXPENSES

The tariff regulations provide that the repair and maintenance expenses shall be computed in the manner specified below:

$$R\&Mn = K \times (GFAn-1) \times (WPIinflation)$$

Where -

'K' is a constant specified by the Commission in %. Value of K for each year of the control period shall be determined by the Commission in the MYT Tariff order based on Transmission Licensee's filing, benchmarking of repair and maintenance expenses, approved repair and maintenance expenses vis-à-vis GFA approved by the Commission in past and any other factor considered appropriate by the Commission;

GFAn-1 - Gross Fixed Asset of the Transmission Licensee for the n-1th year;

WPIinflation - is the average increase in the Wholesale Price Index (CPI) for immediately preceding three years;

The repair and maintenance expenses approved by the Hon'ble Commission in the last three financial years have been in the range of 2.09% to 2.49% of the opening gross fixed asset base approved by it. Accordingly the PTCUL has considered repair and maintenance expenses to be 2.50% of the opening GFA base over the plan period.

Further the Wholesale Price Indices over the last few years is provided in the table below:

**Table 9.19: Wholesale Price Indices**

| Financial Year | 2010-11 | 2009-10 | 2008-09 | 2007-08 | 2006-07 | 2005-06 |
|----------------|---------|---------|---------|---------|---------|---------|
| WPI            | 143.32  | 130.81  | 126.02  | 116.63  | 111.35  | 104.47  |

Source: [www.eaindustry.nic.in](http://www.eaindustry.nic.in)

The average increase in the WPI indices for immediately preceding three years is 7.14%. Considering the above, the repair and maintenance expenses in the plan period have been projected at 2.50% of the gross fixed asset base and escalated at the rate of 7.14% to offset the effect of inflation.

**Table 9.20: Projected Repair and Maintenance Expenses in the plan period**

(Figures in Rs Crore)

| Particulars            | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 |
|------------------------|---------|---------|---------|---------|---------|
| Closing GFA Base       | 1082.83 | 1211.21 | 1547.20 | 1716.22 | 1932.52 |
| Projected R&M Expenses | 29.00   | 32.44   | 41.44   | 45.97   | 51.76   |
| WPI Index              | 7.14%   |         |         |         |         |

## 9.6 ADMINISTRATIVE AND GENERAL EXPENSES

The tariff regulations provide that the A&G expenses shall be computed in the manner specified below:

$$\text{A\&G}_n = (\text{A\&G}_{n-1}) \times (\text{WPIinflation}) + \text{Provision}$$

Where -

A&G<sub>n-1</sub> – Administrative and General Costs for the (n-1)th year;

WPIinflation – is the average increase in the Wholesale Price Index (CPI) for immediately preceding three years;

Provision: Cost for initiatives or other one-time expenses as proposed by the Transmission Licensee and approved by the Commission after prudence check.

The A&G expenses have been projected considering Rs. 14.27 crore in FY 2012-13 (which is the approved A&G expense as per the tariff order dated April 4, 2012) and thereafter escalated each year by the WPI index of 7.14%. An adhoc provision of Rs. 5.00 crore has been considered from FY 2013-14 and onwards. The detailed proposal towards the nature of such expenses to be incurred under such provision would be submitted with the MYT/APR petitions.

**Table 9.21: Projected Administrative and General Expenses in the plan period**

*(Figures in Rs Crore)*

| Particulars            | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 |
|------------------------|---------|---------|---------|---------|---------|
| Projected A&G Expenses | 14.27   | 20.29   | 26.74   | 33.65   | 41.05   |

## 9.7 TOTAL OPERATION AND MAINTENANCE EXPENSES

Considering the foregoing sections, the total Operation and Maintenance Expenses have been summarised in the table below:

**Table 9.22: Projected Operation and Maintenance Expenses in the plan period**

*(Figures in Rs Crore)*

| Particulars                   | 2012-13       | 2013-14       | 2014-15       | 2015-16       | 2016-17       |
|-------------------------------|---------------|---------------|---------------|---------------|---------------|
| Employee Expenses             | 58.32         | 79.11         | 89.78         | 102.65        | 113.51        |
| R&M Expenses                  | 29.00         | 32.44         | 41.44         | 45.97         | 51.76         |
| A&G Expenses                  | 14.27         | 20.29         | 26.74         | 33.65         | 41.05         |
| <b>Total O&amp;M Expenses</b> | <b>101.59</b> | <b>131.84</b> | <b>157.96</b> | <b>182.26</b> | <b>206.32</b> |

## 9.8 GUARANTEE FEE

The guarantee fee is payable on loans for which the GoU has given guarantee and has been calculated on the outstanding loan balances:

**Table 9.23: Projected Guarantee Fee**

*(Figures in Rs Crore)*

| Particulars              | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 |
|--------------------------|---------|---------|---------|---------|---------|
| Outstanding Loan Balance | 510.07  | 552.27  | 739.17  | 786.69  | 860.01  |
| Projected Guarantee Fees | 5.10    | 5.52    | 7.39    | 7.87    | 8.60    |

## 9.9 NON TARIFF INCOMES

The Hon'ble Commission had approved a non-tariff income of Rs. 1.24 crore for FY 2012-13 in the tariff order dated April 4, 2012. For the purposes of projections in the business plan, PTCUL has considered a year on year increase of 5% in the non tariff incomes.

## 9.10 INTEREST ON WORKING CAPITAL

It is understood that the payments received by PTCUL from UPCL would be subject to the provisions of tax deducted at source under Section 194 J of the Income Tax Act as the payment for transmission and wheeling charges are considered as 'fees for technical services'. According to the current provisions of Section 194J, 10% TDS is the applicable charge. This would lead to certain cash flow deferment as 10% tax would be withheld by UPCL upon payment of transmission and wheeling charges to PTCUL. However since the normative working capital is provided to the PTCUL as per the framework of the regulations, it will tide over the cash flow issue on this account.

The interest on working capital is worked out on normative basis and is based on norms specified under the Regulation 34 (2) of Tariff Regulations, 2011. The rate of interest for calculation of interest on working capital has been considered at 13.25% which is the rate approved by the Hon'ble Commission in its tariff order for PTCUL for FY 2012-13 dated April 4, 2012.

Accordingly the interest on working capital has been calculated as given below:

**Table 9.24: Interest on Working Capital**

*(Figures in Rs Crore)*

| Particulars                           | 2012-13      | 2013-14      | 2014-15      | 2015-16       | 2016-17       |
|---------------------------------------|--------------|--------------|--------------|---------------|---------------|
| <b>Computation of Working Capital</b> |              |              |              |               |               |
| O&M Expenses of one month             | 8.47         | 10.99        | 13.16        | 15.19         | 17.19         |
| Maintenance spares                    | 15.24        | 19.78        | 23.69        | 27.34         | 30.95         |
| Two months receivables                | 40.60        | 52.20        | 61.01        | 70.77         | 79.86         |
| <b>Working Capital</b>                | <b>64.31</b> | <b>82.96</b> | <b>97.87</b> | <b>113.30</b> | <b>128.00</b> |
| Rate of interest on working capital   | 13.25%       | 13.25%       | 13.25%       | 13.25%        | 13.25%        |
| <b>Interest on Working Capital</b>    | <b>8.52</b>  | <b>10.99</b> | <b>12.97</b> | <b>15.01</b>  | <b>16.96</b>  |

## 9.11 INCOME TAX AND OTHER TAXES

As per Regulation 35 of the Tariff Regulations, 2011; income tax payable for each year of the control period is based on the actual income tax paid. Any variation in income tax actually paid & approved shall be reimbursed at the time of truing up for each year of the control period. Taxes on incomes and other taxes would be recovered on actual basis as and when incurred.

## 9.12 INCENTIVE FOR ACHIEVING TARGET AVAILABILITY

In accordance with the Tariff Regulations 2011, Incentive depends on the actual availability at the end of the year, hence same shall be considered at the time of truing up.

### 9.13 ANNUAL TRANSMISSION CHARGES FOR FY 2012-13 TO 2013-14

The table below depicts the Aggregate Revenue Requirement in respect of intra-state transmission of electricity to be recovered from the UPCL, which is the sole beneficiary at present. The payments, however, shall be subject to adjustment, if any other beneficiary (including long term open access customer) is using the Petitioner's system, by an amount equal to the charges payable by that beneficiary. In that case, the charges recoverable from the new beneficiary(ies), including long term open access customers, shall be refunded to UPCL within one month after close of the financial year.

**Table 9.25: ARR for Intra State Transmission for FY 2012-13 to FY 2016-17**

*(Figures in Rs Crore)*

| <b>Particulars</b>                         | <b>2012-13</b> | <b>2013-14</b> | <b>2014-15</b> | <b>2015-16</b> | <b>2016-17</b> |
|--|----------------|----------------|----------------|----------------|----------------|
| Depreciation                               | 46.72          | 58.44          | 65.17          | 70.79          | 78.09          |
| Interest on Loan                           | 52.10          | 68.55          | 76.13          | 91.88          | 103.51         |
| Return on Equity                           | 30.81          | 39.16          | 47.81          | 58.25          | 67.21          |
| Operations and Maintenance Expenses        |                |                |                |                |                |
| Employee Expenses                          | 58.32          | 79.11          | 89.78          | 102.65         | 113.51         |
| R&M Expenses                               | 29.00          | 32.44          | 41.44          | 45.97          | 51.76          |
| A&G Expenses                               | 14.27          | 20.29          | 26.74          | 33.65          | 41.05          |
| Guarantee Fees                             | 5.10           | 5.52           | 7.39           | 7.87           | 8.60           |
| Interest on Working Capital                | 8.52           | 10.99          | 12.97          | 15.01          | 16.96          |
| <b>Net Expenditure</b>                     | <b>244.84</b>  | <b>314.51</b>  | <b>367.43</b>  | <b>426.07</b>  | <b>480.68</b>  |
| Less: Non Tariff Incomes                   | 1.24           | 1.30           | 1.37           | 1.44           | 1.51           |
| <b>Aggregate Revenue Requirement (ARR)</b> | <b>243.60</b>  | <b>313.21</b>  | <b>366.06</b>  | <b>424.63</b>  | <b>479.17</b>  |

---

## **10. ANNUAL TRANSMISSION CHARGES OF UITP SCHEMES**

Uttarakhand has a huge hydro power potential. Currently, approximately 2100 MW is under development by IPPs, 7300 MW by CPSUs and approximately 2500 MW by UJVNL. Further to improve power security of the state and improve hydro-thermal mix, UJVNL has signed an MOU with GAIL to set up a 300-500 MW gas based plants at Kashipur and Haridwar. Beyond the above capacities under execution/planning, the state has the second largest potential (first being Himachal Pradesh) amongst the Indian states for small hydro (< 25 MW) - which according to Ministry of New and Renewable Energy, Government of India is approximately 1577 MW (as on 31.1.2011). Such huge development of Hydro Power Plants needs to be encouraged through a transmission pricing mechanism which allows the generators to have a seamless access to the pan-India market. This can be facilitated by adapting the Point of Connection (PoC) mechanism at the state level. This is critical for states like Uttarakhand because:

- i. The mechanism allows sharing of burden of transmission charges between generators and beneficiaries – both inter-state and intra-state.
- ii. The Hydro power plant development in a basin happens in stages, whereas the transmission investment is made taking into consideration the future development also. Hence there is a need to adopt a mechanism which obviates the burden of transmission charges on initial investors in generation.

To facilitate the Hon'ble Commission, PTCUL has instituted a study of alternative PoC mechanisms that can be adopted at the level of the state and yet be integrated with the mechanism adopted by CERC.

Further, the PoC mechanism adopted by CERC requires identification of state-owned lines which are being utilized for transfer of inter-state power. The charges for such lines will be reimbursed by the CTU after PTCUL signs Revenue Sharing Agreement (RSA) – which has been approved by CERC- with the CTU. However, for this purpose the ARR of the assets being used for transfer of inter-state power needs to be approved by the Hon'ble Commission. Such an approval will allow PTCUL to charge for the intra-state lines being used by generators for inter-state transfer of power.

PTCUL will submit the computations of PoC mechanisms for consideration by Hon'ble Commission along with proposed regulations on the subject. In this section, the PTCUL has computed the ARR for such lines and associated transmission system which will facilitate PTCUL to charge for the intra-state lines being used by generators for inter-state transfer of power and to charge for the use of these lines to inter-state consumers through CTU in accordance with the PoC mechanism adopted by the Hon'ble CERC.

### **10.1 CAPITAL COST OF UITP PROJECTS**

The opening gross fixed asset base has been considered from the latest ARR filings made by PTCUL in respect of the Associated Transmission System of Bhilangana III for FY 2012-13 comprising of 220 kV D/C Ghansali-Bhilangana III (Ghuttu) Line, 220 kV Chamba Ghansali Line and 220 kV Bay at

Chamba<sup>3</sup>. The various capital expenditure schemes under UITP along with their capital cost and expected commissioning schedule has been detailed in the aforementioned sections. Accordingly the gross fixed asset base over the plan period is provided in the table below:

**Table 10.1: Gross Fixed Asset of UITP Schemes**

(Figures in Rs Crore)

| Particulars                             | Opening GFA as on 1.4.2012 | Additions in FY 2012-13 | Additions in FY 2013-14 | Additions in FY 2014-15 | Additions in FY 2015-16 | Additions in FY 2016-17 |
|---|----------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| REC-IV                                  | 39.37                      | -                       | -                       | -                       | -                       | -                       |
| PFC Schemes                             |                            | -                       | -                       | 275.42                  | -                       | 405.72                  |
| ADB Schemes                             |                            | -                       | 205.55                  | 201.81                  | 1,223.57                | -                       |
| Planned Schemes to be funded by PFC/REC |                            | -                       | -                       | -                       | -                       | 252.50                  |
| <b>Total</b>                            | <b>39.37</b>               | <b>-</b>                | <b>205.55</b>           | <b>477.23</b>           | <b>1,223.57</b>         | <b>658.22</b>           |

## 10.2 INTEREST ON LOANS

The interest expenditure on account of long-term loans depends on the outstanding loan, repayments, and prevailing interest rates on the outstanding loans. Further, the projected capital expenditure and the funding of the same also have a large bearing on the long-term interest expenditure.

The funding for new capital expenditure in the control period has been assumed to be undertaken at a normative debt: equity ratio of 70:30 in accordance with the Tariff Regulations, 2011 and accordingly the new loan additions during the year has been estimated. For the purpose of calculation of interest on these loans, the rate of interest has been considered at 11.50% in respect of REC-IV loans (Bhilangana III), 12.50% of PFC loans, 3% for ADB loans, 12% for REC 8 and 10 loans and 12.5% for planned scheme loans

The interest on loans in respect of UITP projects are projected in the table below:

**Table 10.2: Interest on loans towards UITP Projects**

(Figures in Rs Crore)

| Particulars  | 2012-13 | 2013-14 | 2014-15  | 2015-16  | 2016-17  |
|--|---------|---------|----------|----------|----------|
| Opening Loan   | 72.42   | 149.59  | 410.89   | 1,103.65 | 1,557.41 |
| Receipts during the year (including IDC)             | 79.79   | 269.95  | 734.88   | 581.58   | 221.90   |
| Repayments during the year                           | 2.62    | 8.64    | 42.13    | 127.82   | 164.47   |
| Closing Loan   | 149.59  | 410.89  | 1,103.65 | 1,557.41 | 1,614.84 |
| Interest during construction period (included above) | 7.67    | 20.10   | 41.39    | 76.39    | 21.68    |
| Interest charged to revenue                          | 2.86    | 7.91    | 40.56    | 56.10    | 148.55   |

<sup>3</sup> Evacuation system from Bhilangana has been planned to cater to future generators expected in the valley, as a part of the UITP. However, 220 kV Ghansali substation, which is expected to come up by June 2014 has been planned to offtake power from the power plants in this valley to Chamba to serve UPCL demand and local demand. Therefore, the 220 kV sub-station at Ghansali, the 220 kV line from Ghansali to Chamba and 220 kV Bay at Chamba will be taken as serving the demand of Uttarakhand w.e.f June 2014.

### 10.3 DEPRECIATION

The projected gross fixed asset has been provided in the foregoing section. Depreciation for the year has been calculated on the opening gross fixed asset base considering the rates prescribed by the Tariff Regulations, 2011. Pro-rata depreciation has been calculated for assets which are in operation for part of the year. Average rate of 5.28% has been considered for computing the depreciation. Regulations 29 of the Tariff Regulations 2011 provide that depreciation would not be allowable on assets funded through consumer contributions, capital subsidies and grants. Accordingly the PTCUL has deducted the proportionate depreciation from ADB scheme related capital additions which have been created out of grants.

The tables below indicate the Depreciation for the plan period:

**Table 10.3: Depreciation for FY 2012-13 in respect of UITP Projects**

*(Figures in Rs Crore)*

| Particulars  | Opening GFA as on 1.4.2012 | Additions in FY 2012-13 | Depreciation for FY 2012-13 |
|--|----------------------------|-------------------------|-----------------------------|
| REC-IV   | 39.37                      | -                       | 1.03                        |
| PFC Schemes  | -                          | -                       | -                           |
| ADB Schemes  | -                          | -                       | -                           |
| Planned Schemes to be funded by PFC/REC                | -                          | -                       | -                           |
| Less: Depreciation on ADB assets created out of grants |                            |                         |                             |
| <b>Total</b>   | <b>39.37</b>               | <b>-</b>                | <b>1.03</b>                 |

**Table 10.4: Depreciation for FY 2013-14 in respect of UITP Projects**

*(Figures in Rs Crore)*

| Particulars  | Opening GFA as on 1.4.2013 | Additions in FY 2013-14 | Depreciation for FY 2013-14 |
|--|----------------------------|-------------------------|-----------------------------|
| REC-IV   | 39.37                      | -                       | 2.08                        |
| PFC Schemes  | -                          | -                       | -                           |
| ADB Schemes  | -                          | 205.55                  | 4.54                        |
| Planned Schemes to be funded by PFC/REC                | -                          | -                       | -                           |
| Less: Depreciation on ADB assets created out of grants |                            |                         | -2.86                       |
| <b>Total</b>   | <b>39.37</b>               | <b>205.55</b>           | <b>3.76</b>                 |

**Table 10.5: Depreciation for FY 2014-15 in respect of UITP Projects**

*(Figures in Rs Crore)*

| Particulars  | Opening GFA as on 1.4.2014 | Additions in FY 2014-15 | Depreciation for FY 2014-15 |
|--|----------------------------|-------------------------|-----------------------------|
| REC-IV   | 39.37                      | -                       | 2.08                        |
| PFC Schemes  | -                          | 275.42                  | 10.91                       |
| ADB Schemes  | 205.55                     | 201.81                  | 18.57                       |
| Planned Schemes to be funded by PFC/REC                | -                          | -                       | -                           |
| Less: Depreciation on ADB assets created out of grants |                            |                         | -11.70                      |
| <b>Total</b>   | <b>244.92</b>              | <b>477.23</b>           | <b>19.86</b>                |

**Table 10.6: Depreciation for FY 2015-16 in respect of UITP Projects***(Figures in Rs Crore)*

| Particulars  | Opening GFA as on 1.4.2015 | Additions in FY 2015-16 | Depreciation for FY 2015-16 |
|--|----------------------------|-------------------------|-----------------------------|
| REC-IV   | 39.37                      | -                       | 2.08                        |
| PFC Schemes  | 275.42                     | -                       | 14.54                       |
| ADB Schemes  | 407.36                     | 1,223.57                | 30.84                       |
| Planned Schemes to be funded by PFC/REC                | -                          | -                       | -                           |
| Less: Depreciation on ADB assets created out of grants |                            |                         | -19.43                      |
| <b>Total</b>   | <b>722.15</b>              | <b>1,223.57</b>         | <b>28.03</b>                |

**Table 10.7: Depreciation for FY 2016-17 in respect of UITP Projects***(Figures in Rs Crore)*

| Particulars  | Opening GFA as on 1.4.2016 | Additions in FY 2016-17 | Depreciation for FY 2016-17 |
|--|----------------------------|-------------------------|-----------------------------|
| REC-IV   | 39.37                      | -                       | 2.08                        |
| PFC Schemes  | 275.42                     | 405.72                  | 14.54                       |
| ADB Schemes  | 1,630.93                   | -                       | 86.11                       |
| Planned Schemes to be funded by PFC/REC                | -                          | 252.50                  | 10.00                       |
| Less: Depreciation on ADB assets created out of grants |                            |                         | -54.25                      |
| <b>Total</b>   | <b>1,945.72</b>            | <b>658.22</b>           | <b>58.48</b>                |

#### 10.4 ADVANCE AGAINST DEPRECIATION

Advance against Depreciation for FY 2012-13 has been projected in accordance with Regulation 19 of the Uttarakhand Electricity Regulatory Commission (Terms and Conditions for Determination of Tariff) Regulations, 2004.

**Table 10.8: Advance Against Depreciation for FY 2013-14 towards UITP Projects***(Figures in Rs Crore)*

| Particulars  | 2012-13     |
|--|-------------|
| 1/10th of the Loan(s)  | 2.62        |
| Repayment of the Loan(s) as considered for working out Interest on Loan            | 2.62        |
| Minimum of the Above   | 2.62        |
| Less: Depreciation during the year   | 1.03        |
| (A <sup>1</sup> )  | <b>1.59</b> |
| Cumulative Repayment of the Loan(s) as considered for working out Interest on Loan | 2.62        |
| Less: Cumulative Depreciation  | 1.49        |
| (B <sup>1</sup> )  | <b>1.13</b> |
| Advance Against Depreciation (Minimum of A & B)                                    | <b>1.13</b> |

No advance against depreciation has been claimed for FY 2013-14 to FY 2016-17 as the depreciation rates have been revised by the Tariff Regulations, 2011 and advance against depreciation has been dispensed with.

## 10.5 RETURN ON EQUITY

The equity capital employed towards UITP projects is provided in the table below:

**Table 10.9: Equity Employed towards UITP Projects**

*(Figures in Rs Crore)*

| Particulars                | 2012-13      | 2013-14       | 2014-15       | 2015-16       | 2016-17       |
|----------------------------|--------------|---------------|---------------|---------------|---------------|
| Opening Equity Base        | 39.45        | 72.15         | 187.89        | 493.84        | 738.34        |
| Additions                  | 32.70        | 115.74        | 305.95        | 244.50        | 95.38         |
| <b>Closing Equity Base</b> | <b>72.15</b> | <b>187.89</b> | <b>493.84</b> | <b>738.34</b> | <b>833.73</b> |

The rate of return has been considered at 14% for FY 2012-13 in accordance with the Uttarakhand Electricity Regulatory Commission (Terms and Conditions for Determination of Tariff) Regulations, 2004. Thereafter for FY 2013-14 to 2016-17, the rate of return on equity capital has been considered at 15.5% in accordance with the Tariff Regulations, 2011. The return on equity has been calculated only on the equity component of the capitalised assets.

**Table 10.10: Return on Equity towards UITP Projects**

*(Figures in Rs Crore)*

| Particulars      | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 |
|------------------|---------|---------|---------|---------|---------|
| Return on Equity | 1.84    | 5.87    | 27.80   | 41.80   | 113.44  |

## 10.6 OPERATION AND MAINTENANCE EXPENSES

The Tariff Regulations, 2011 do not prescribe any norms towards Operation and Maintenance expenses in respect of new transmission assets. Further the O&M norms have no distinction between the assets for intra-state transmission and inter-state transmission. For the purposes of this plan, the PTCUL projects that the overall O&M expenses (including employee expenses, repair and maintenance expenses and administrative and general expenses) would be 1.50% of the gross fixed asset base. Further to offset the effect of inflation, last three years average increase in the CPI indices (which amounts to 10.58%) be provided while computing the O&M expenses for subsequent years.

**Table 10.11: Operation and Maintenance Expenses towards UITP Projects**

*(Figures in Rs Crore)*

| Particulars                    | 2012-13 | 2013-14 | 2014-15 | 2015-16  | 2016-17  |
|--------------------------------|---------|---------|---------|----------|----------|
| Closing Gross Fixed Asset Base | 39.37   | 244.92  | 722.15  | 1,945.72 | 2,603.94 |
| O&M Expenses @ 1.50%           | 0.65    | 4.06    | 11.98   | 32.27    | 43.19    |
| CPI Index                      | 10.58%  |         |         |          |          |

## 10.7 GUARANTEE FEE

The guarantee fee is payable on loans for which the GoU has given guarantee and has been calculated on the outstanding loan balances:

**Table 10.12: Projected Guarantee Fee towards UITP Projects**

*(Figures in Rs Crore)*

| Particulars              | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 |
|--------------------------|---------|---------|---------|---------|---------|
| Outstanding Loan Balance | 149.59  | 410.89  | 1103.65 | 1557.41 | 1614.84 |
| Projected Guarantee Fee  | 1.50    | 4.11    | 11.04   | 15.57   | 16.15   |

## 10.8 INTEREST ON WORKING CAPITAL

The interest on working capital is worked out on normative basis and is based on norms specified under the Regulation 34 (2) of Tariff Regulations, 2011. The rate of interest for calculation of interest on working capital has been considered at 13.25% which is the rate approved by the Hon'ble Commission in its tariff order for PTCUL for FY 2012-13 dated April 4, 2012. Accordingly the interest on working capital has been calculated as given below:

**Table 10.13: Interest on Working Capital for UITP Projects**

*(Figures in Rs Crore)*

| Particulars                           | 2012-13     | 2013-14     | 2014-15      | 2015-16      | 2016-17      |
|---------------------------------------|-------------|-------------|--------------|--------------|--------------|
| <b>Computation of Working Capital</b> |             |             |              |              |              |
| O&M Expenses of one month             | 0.05        | 0.34        | 1.00         | 2.69         | 3.60         |
| Maintenance spares                    | 0.10        | 0.61        | 1.80         | 4.84         | 6.48         |
| Two months receivables                | 1.54        | 4.40        | 19.02        | 29.79        | 64.96        |
| <b>Working Capital</b>                | <b>1.69</b> | <b>5.35</b> | <b>21.82</b> | <b>37.32</b> | <b>75.04</b> |
| Rate of interest on working capital   | 13.25%      | 13.25%      | 13.25%       | 13.25%       | 13.25%       |
| <b>Interest on Working Capital</b>    | <b>0.22</b> | <b>0.71</b> | <b>2.89</b>  | <b>4.94</b>  | <b>9.94</b>  |

## 10.9 INCOME TAX AND OTHER TAXES

As per Regulation 35 of the Tariff Regulations, 2011; income tax payable for each year of the control period is based on the actual income tax paid. Any variation in income tax actually paid & approved shall be reimbursed at the time of truing up for each year of the control period. Taxes on incomes and other taxes would be recovered on actual basis as and when incurred.

## 10.10 INCENTIVE FOR ACHIEVING TARGET AVAILABILITY

The incentive would be claimed in accordance with the Tariff Regulations 2011 on month to month basis based on the procedure prescribed in Appendix IV of the Tariff Regulations, 2011.

## 10.11 ANNUAL TRANSMISSION CHARGES OF UITP PROJECTS

The table below depicts the Aggregate Revenue Requirement of UITP projects for the time slice of FY 2012-13 to 2016-17

**Table 10.14: ARR of UITP Projects for FY 2012-13 to FY 2016-17**

*(Figures in Rs Crore)*

| Particulars                                | 2012-13     | 2013-14      | 2014-15       | 2015-16       | 2016-17       |
|--|-------------|--------------|---------------|---------------|---------------|
| Depreciation                               | 1.03        | 3.76         | 19.86         | 28.03         | 58.48         |
| Advance Against Depreciation               | 1.13        |              |               |               |               |
| Interest on Loan                           | 2.86        | 7.91         | 40.56         | 56.10         | 148.55        |
| Return on Equity                           | 1.84        | 5.87         | 27.80         | 41.80         | 113.44        |
| Operations and Maintenance Expenses        | 0.65        | 4.06         | 11.98         | 32.27         | 43.19         |
| Guarantee Fees                             | 1.50        | 4.11         | 11.04         | 15.57         | 16.15         |
| Interest on Working Capital                | 0.22        | 0.71         | 2.89          | 4.94          | 9.94          |
| <b>Aggregate Revenue Requirement (ARR)</b> | <b>9.24</b> | <b>26.43</b> | <b>114.13</b> | <b>178.73</b> | <b>389.75</b> |

---

The charges for the UITP assets will be recovered through the Point of Connection mechanism as adopted under CERC (Sharing of Inter State Transmission Charges and Losses) Regulations 2010. Under these regulations, such assets will be declared as deemed ISTS assets. The recovery of charges for deemed ISTS assets will be made by the Central Transmission Utility (CTU) consequent to PTCUL signing the Revenue Sharing Agreement with the CTU.

---

## 11. TRANSMISSION LOSS IMPROVEMENT

Currently PTCUL has less than 2% transmission loss. PTCUL has 400 kV, 220 kV and 132 kV transmission lines. It is a well known fact that % losses increase with increase in line length and % losses are higher at lower voltage levels. Line Length at 400 kV is less than 175 km. At 220 kV, the average line length is approximately 39 kms, with range between 4.8 km to 80 km. At 132 kV, average line length is 26 kms, with a range of 0.42 km - 105.5 km. With these line lengths the technical losses should be technically between 1%-2%. Further the losses also depend on:

- real power loading of the lines - which depends on the extent of over-drawal by UPCL - which is recorded by the UI charges payable by the state of Uttarakhand - losses increase as a square of real power loading of its transmission lines;
- reactive power that the lines carry - which is beyond the discretionary control of PTCUL because the same depends on the nature of demand drawn by UPCL

Therefore, based on the above facts, PTCUL has been doing its best to achieve low transmission loss levels. Loss reduction beyond the current level depends entirely on the users of the transmission network.