

## **Revenue Generation in Power Sector Units of Assam**

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### **Abstract:**

Power plays a pivotal role in the development of the economy of any nation and is the backbone of infrastructural development. India is a country which is largely in deficiency of power. Proper management and distribution of power is very essential to ensure efficient and uninterrupted supply of power. The power sector needs greater attention and systematised planning. The power sector in Assam has undergone great revamp in the last two decades with the Assam State Electricity Board being unbundled into five separate entities which was further merged and formed into three organisations namely Assam Power Generation Company Limited (APGCL), Assam Electricity Grid Corporation Limited (AEGCL) and Assam Power Distribution Company Limited (APDCL). In this paper the researcher tries to examine the efficiency of revenue generation in the power sector units of Assam. The researcher has made an attempt to understand the growth in revenue generation and the variability in such revenue earnings as it significantly impacts any managerial decision. Proper utilisation of fixed assets is another important aspect of sound financial planning. This paper has assessed the revenue earned by the power sector units against capital investment and fixed assets. The financial state is pivotal for the prospect of these three power sector units in providing service. In absence of a sound financial health, efficiencies of the entities cannot be expected.

**Keywords:** revenue, growth, variability, correlation.

### **Introduction:**

The power supply is important factor for acceleration of the race of economy. It is accused several times that the power sector units in Assam are not operating efficiently which cause frequent interruption in electric supply in different economic activities of the state. Usually the power sector units of the state comprises of Assam Power Generation Corporation Limited (APGCL), Assam Electricity Grid Corporation Limited (AEGCL) and Assam Power Distribution Corporation Limited (APDCL). The service of APGCL is to generate the power. AEGCL provide the network for delivering the power to the distribution channel and APDCL contributes in arranging the direct distribution of power to domestic and other commercial users.

The operating efficiency of these units can be evaluated in terms of their revenue generation, because, insufficient flow of revenue cannot ensure smooth service of these power sector units.

**Objectives of the Study:**

The study has following objectives:

- 1) To examine the average growth of revenue of the power sector units of Assam,
- 2) To study the degree of the variability in revenue earning,
- 3) To examine the relation of the revenue with expenditure and asset structure,
- 4) To study the different categories of revenue flow in power sector units.

**Research Questions:**

The study has the following research questions.

- 1) Whether there is increasing growth of revenue
- 2) Whether the ratios of revenue earning against expenditure are progressively upward.
- 3) Whether there are differences in the degree of variability in revenue earning of all power sector units.

**Research Methodology:**

The researchers have applied secondary source of data for this investigation. The data have been collected from following documents.

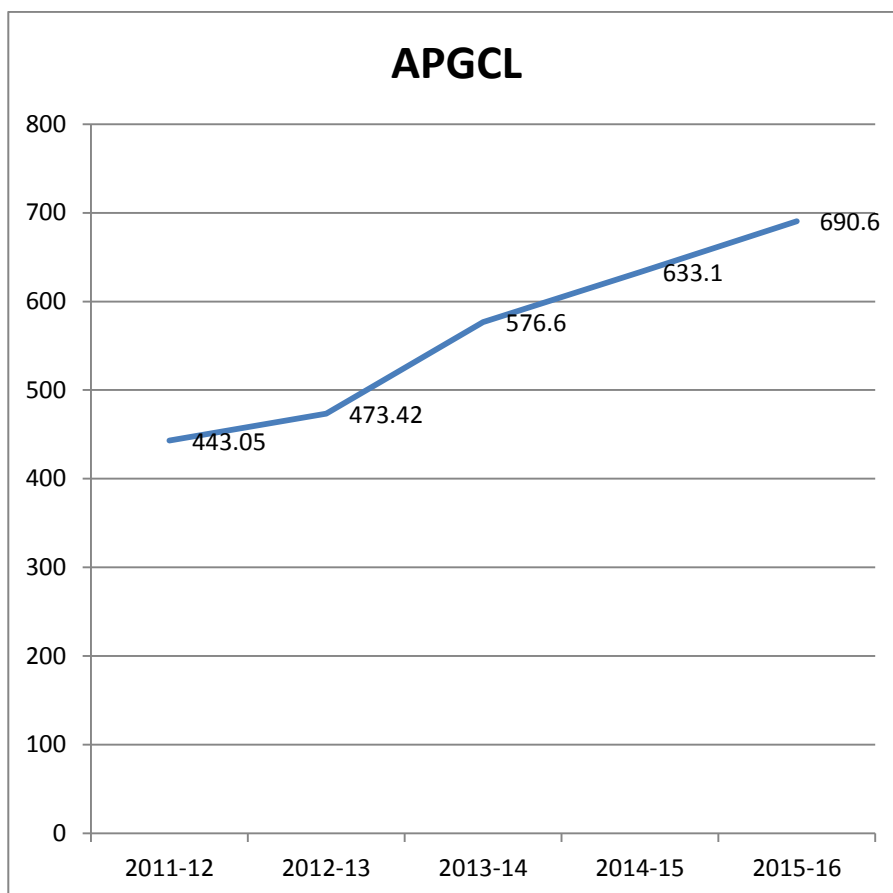
- 1) The Annual Reports of APGCL
- 2) The Annual Reports of AEGCL
- 3) The Annual Reports of APDCL
- 4) The Annual Reports of AERC
- 5) The Reports of C&AG of India

**Interpretation of collected Information:**

The financial performance of a corporate entity can be evaluated first with the potentiality of revenue generation. In absence of progressive flow of revenue, the growth of the enterprise cannot be expected in long run. The revenue should be adequate enough to cover all sort of expenditure. The efficiency of the enterprise is also reflected on volume of revenue against every rupee of expenditure incurred. Besides that, the amount of revenue against value of fixed assets implies how effectively the infrastructure is utilised for revenue generation. The financial health of the organisation always exhibits prospective flow of revenue. Another important fact is that variability in revenue flow always needs to be considered to ensure promising growth in business.

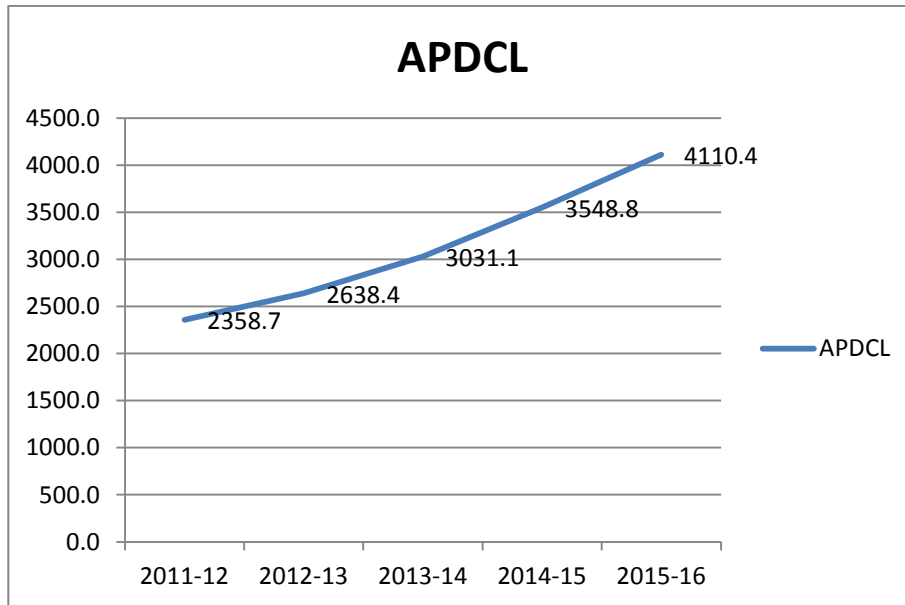
The revenue growth can be visualised with the analysis of revenue trend. It has been observed that the revenue of APGCL rose by 1.56 times from 2011-12 to 2015-16. It was Rs. 443.05 crores in 2011-12 and it became Rs. 690.6 crores in 2015-16. Similarly, we have observed that in APDCL the revenue was increased by 1.74 times in the same period.

**Graph-1: Graph showing revenue trend of APGCL**

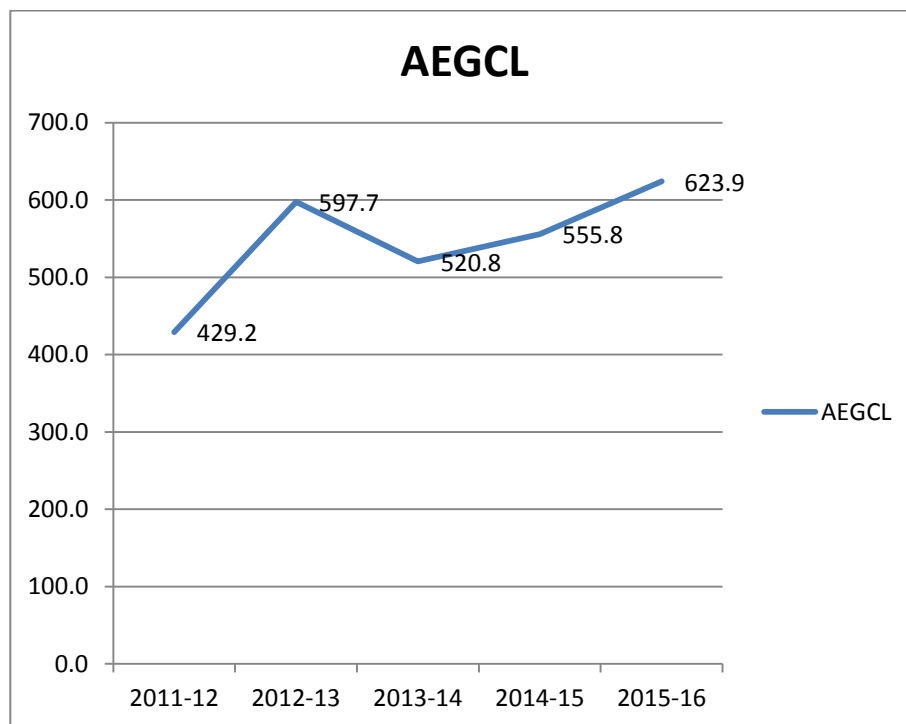


It was Rs. 2358.7 crores in 2011-12 and it rose upto Rs. 4110.4 crores in 2015-16. The revenue growth of APDCL is more than APGCL. In fact, APDCL has more scope for selling their service because of their direct attachment with ultimate consumer. Another important fact is that the revenue received by AEGCL was Rs.623.9 crores in 2015-16 which was 1.45 times more than the revenue earned by that corporation in 2011-12. But, it has been observed that the revenue growth of AEGCL was fluctuating more. In 2011-12 the revenue of AEGCL was Rs. 429.2 crores and it increased to Rs. 597.7 crores in 2012-13. After that it reduced to Rs.520.8 crores in 2013-14. The revenue received by the corporation in 2014-15 was also lesser than the revenue earned in 2012-13. In 2015-16 it again increased to Rs. 623.9 crores. Though the average revenue earned by AEGCL (i.e., Rs. 545.5 crores) was more than the average revenue of APGCL in the period of study, the trend of revenue of AEGCL was more fluctuating in comparison to APGCL. APGCL exhibited steady growth in revenue earning. Another important fact is that the average

**Graph 2: Graph showing revenue trend of APDCL**



Graph 3: Graph showing revenue trend of AEGCL



growth rate of AEGCL was lesser than the same of APGCL and APDCL.

The table-1 exhibits that the average growth rate of AEGCL was 10.9% whereas the average growth rates of APGCL and APDCL were 11.09% and 11.48% respectively in the period of the study. The direct relation of APDCL with consumer gives advantage to APDCL for having high growth of revenue.

**Table 1: Analysis of Revenue generated by PSUs**

(Rs. in crores)

PARTICULAR	2011-12	2012-13	2013-14	2014-15	2015-16	Average	Average growth rate (in %)
APGCL	443.05	473.42	576.6	633.1	690.6	563.4	11.09
P.C. ON BASE YEAR	100	107	130	143	156		
AEGCL	429.2	597.7	520.8	555.8	623.9	545.5	10.9
P.C. ON BASE YEAR	100	139	121	129	145		
APDCL	2358.7	2638.4	3031.1	3548.8	4110.4	3137.5	11.48
P.C. ON BASE YEAR	100	112	129	150	174		

Source: Annual Reports of APGCL.AEGCL and APDCL

N.B. Logarithm is applied to calculate the value

### **Revenue against per Rupee of Expenditure**

Though the table-1 exhibits the growth of revenue of the power sector units, but these units were unable to earn revenue to cover the expenditure in most of the years of the period of the study. It has been stated earlier that the growth of revenue of APDCL is highest among the power sector units of Assam. The researcher has seen a reverse picture in table-2. The revenues of APDCL were lesser than the expenditure in all the years of the period of the study. In case of AEGCL, loss was incurred in 4 years out of 5 years of the period of the study. In comparison to aforesaid two corporate units, APGCL performed better in this aspect, because, APGCL incurred loss only for 3 years.

Another important fact is that the revenues earned against per rupee of expenditure by APGCL and AEGCL were fluctuating, whereas in case of APDCL revenue earning per rupee was increasingly upward though it exhibits loss in every year. It has also been observed in table-3 that the coefficient variation of the revenue against per rupee expenditure of APDCL was lowest, i.e only 4.7%.In case of APGCL, the coefficient variation was 5.2%.But AEGCL exhibits highest variability in earning revenue against per rupee of expenditure with coefficient variation 20.3%. Therefore, it can be stated that the stability of the performance in revenue generation is less on the part of AEGCL.

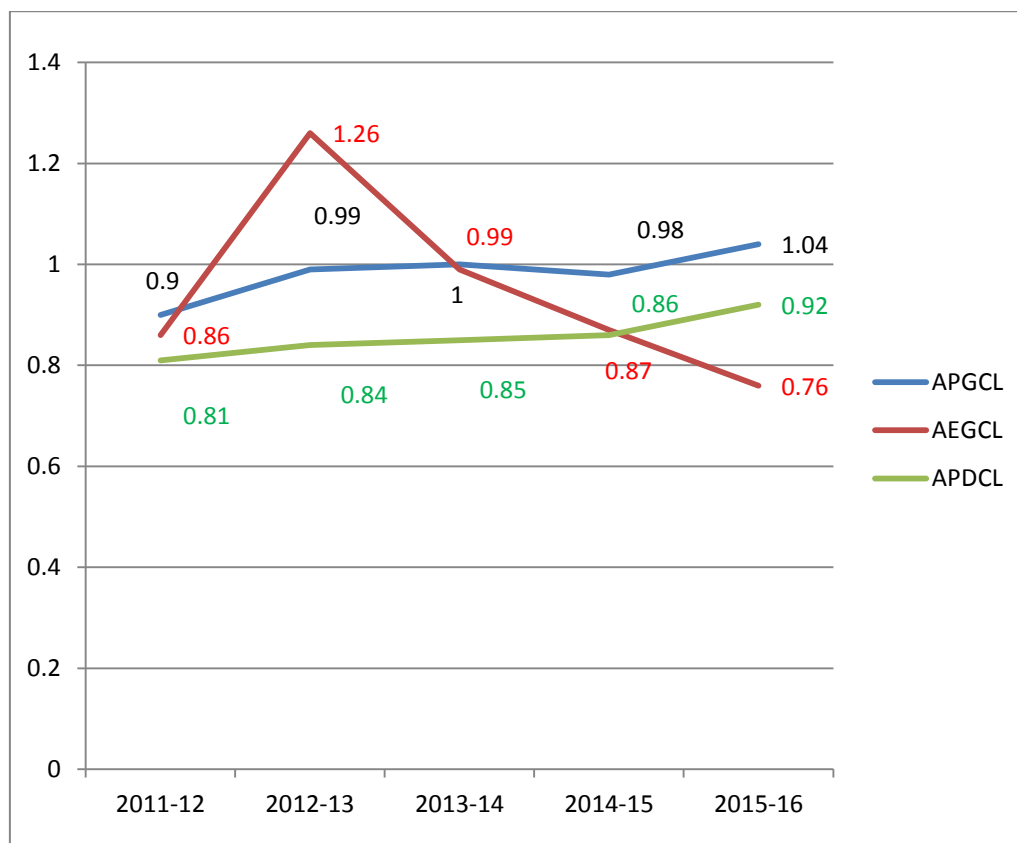
**Table 2: Analysis of revenue per rupee of expenditure**

(Rs. in crores)

PSUs	Particulars	2011-12	2012-13	2013-14	2014-15	2015-16
APGCL	Revenue	443.05	473.42	576.6	633.1	690.6
	Expenditure	491.8	479	578	649	664.9
	Ratio	0.90	0.99	1.00	0.98	1.04
AEGCL	Revenue	429.2	597.7	520.8	555.8	623.9
	Expenditure	496.8	473.9	527.5	636.3	823.7
	Ratio	0.86	1.26	0.99	0.87	0.76
APDCL	Revenue	2358.7	2638.4	3031.1	3548.8	4110.4
	Expenditure	2914.9	3140.4	3577.8	4120.04	4473.07
	Ratio	0.81	0.84	0.85	0.86	0.92

Source: Annual Reports of APGCL.AEGCL and APDCL

**Graph 4: Graph showing revenue per rupee of expenditure of power sector units**



**Table 3-Analysis of variability in revenue per rupee of expenditure**

UNITS	2011-12	2012-13	2013-14	2014-15	2015-16	Average	S.D	C.V	Correlation Coefficient
APGCL	0.9	0.99	1	0.98	1.04	0.982	0.05	5.2	0.98
AEGCL	0.86	1.26	0.99	0.87	0.76	0.948	0.19	20.3	0.57
APDCL	0.81	0.84	0.85	0.86	0.92	0.856	0.04	4.7	0.99

Source: Annual Reports of APGCL.AEGCL and APDCL

In fact, revenue generation depends on expenditure incurred by the corporate units. If a corporate unit is running efficiently, the expenditure of this corporation will have definitely high correlation with revenue. The table-3 shows that the expenditure of APGCL and APDCL have high correlation with revenue, i.e. 0.98 and 0.97 respectively, whereas, AEGCL shows moderate correlation coefficient i.e. 0.57. It implies that the expenditure of AEGCL was not leading revenue effectively.

The overall performance of corporate units can also be reviewed in terms of revenue earning against the long-term fund (i.e. Share holder Fund and Long term Debt). It will imply how efficiently corporate units utilise long term fund for earning revenue.

**Table-4 - Revenue on Long term Fund** (Rs. in crores)

PSUs	Particulars	2011-12	2012-13	2013-14	2014-15	2015-16	Average	C.V on the ratio of revenue to capital investment
APGCL	Revenue	443.05	473.42	576.60	633.09	690.6	563.35	
	Capital Investment	1112.5	1290.5	1138.4	1117.6	1381.7	1208.14	
	Ratio	0.40	0.37	0.51	0.57	0.50	0.47	16%
AEGCL	Revenue	429.2	597.7	520.8	555.8	623.9	545.46	
	Capital Investment	828.8	1255.4	1631.93	1787.1	1797.7	1460.19	
	Ratio	0.52	0.48	0.32	0.31	0.35	0.39	22%
APDCL	Revenue	2358.7	2638.4	3031.1	3548.8	4110.4	3137.48	
	Capital Investment	3029.9	3451.4	2997.9	3126.8	3543.4	3229.88	
	Ratio	0.78	0.76	1.01	1.13	1.16	0.97	17%

Source: Annual Reports of APGCL, AEGCL and APDCL

The table-4 shows the fluctuating ratios of the power sector units for revenues against long term funds in the period of the study. The coefficient variation of AEGCL was highest (i.e., 22%) in case of the ratio of revenue on capital investment. It implies variability on revenue to investment is more in case of AEGCL. But, among all the power sector units, APDCL exhibits highest average revenue earning ratio (i.e., 0.97), whereas AEGCL shows lowest average ratio (i.e., 0.39 only).

In practice, the performance of corporate units in earning revenue can also be evaluated by comparing the revenue earnings against the fixed assets of the enterprises. It will highlight the effective utilisation of the facilities of fixed assets for revenue generation. The table-5 shows that average revenue earning against per rupee value of fixed asset of APDCL is more in comparison to other two power sector units(i.e. 0.84).APGCL performance is lowest in this aspect(i.e. only 0.44).AEGCL could earn Rs.0.52 against per rupee value of fixed asset. It is also mentionable that the APDCL has more stability in revenue earning against the value of their fixed asset. The coefficient variance of revenue earning of APDCL against per rupee of fixed asset value was only 6%, whereas, AEGCL and APGCL exhibit only 24% and 12% respectively.

**Table-5 - Revenue on Total Fixed Assets** (Rs. in crores)

PSUs	Particulars	2011-12	2012-13	2013-14	2014-15	2015-16	Average	CV on the ratio of revenue to capital investment

<b>APG CL</b>	<b>Revenue</b>	<b>443.05</b>	<b>473.42</b>	<b>576.60</b>	<b>633.09</b>	<b>690.6</b>	<b>563.35</b>	
	<b>Total Fixed Assets</b>	<b>1143.22</b>	<b>1252.66</b>	<b>1268.34</b>	<b>1305.38</b>	<b>1434.32</b>	<b>1280.78</b>	
	<b>Ratio</b>	<b>0.39</b>	<b>0.38</b>	<b>0.45</b>	<b>0.48</b>	<b>0.48</b>	<b>0.44</b>	<b>12%</b>
<b>AEG CL</b>	<b>Revenue</b>	<b>429.2</b>	<b>597.7</b>	<b>520.8</b>	<b>555.8</b>	<b>623.9</b>	<b>545.46</b>	
	<b>Total Fixed Assets</b>	<b>679.32</b>	<b>900.16</b>	<b>1178.95</b>	<b>1293.47</b>	<b>1515.66</b>	<b>1113.51</b>	
	<b>Ratio</b>	<b>0.63</b>	<b>0.66</b>	<b>0.44</b>	<b>0.43</b>	<b>0.41</b>	<b>0.52</b>	<b>24%</b>
<b>APDCL</b>	<b>Revenue</b>	<b>2358.7</b>	<b>2638.4</b>	<b>3031.1</b>	<b>3548.8</b>	<b>4110.4</b>	<b>3137.48</b>	
	<b>Total Fixed Assets</b>	<b>2603.79</b>	<b>2967.67</b>	<b>3679.76</b>	<b>4501.06</b>	<b>5063.39</b>	<b>3763.13</b>	
	<b>Ratio</b>	<b>0.91</b>	<b>0.89</b>	<b>0.82</b>	<b>0.79</b>	<b>0.81</b>	<b>0.84</b>	<b>6%</b>

Source: Annual Reports of APGCL, AEGCL and APDCL

### **Contribution of revenue to total expenditures**

Revenues are generated in the power sector units by providing services to the customers. But, the power sector units of Assam are diverse and they carry on their operations in diverse fields like generation, transmission and distribution. APGCL is engaged in the generation of power which is sold to AEGCL who transmits it to APDCL for distribution to each and every household of Assam. AEGCL purchases power from APGCL and sells it to APDCL which forms their revenue from operations. APDCL comes last in the chain whose principal business activity is to transmit the power purchased from AEGCL to different household in Assam. In addition to that, APDCL also purchases power from Power Grid Corporation of India. All these power sector units have also other incomes along with income from business operations.

Since, the revenue from operation is pivotal to evaluate the performance of the corporate units; therefore, the researcher has attempted to investigate the trend of the ratios in between revenue from operation and expenditure. It has been observed that the growth of revenue against expenditure was not steadily upward in all the aforesaid corporate units. The Table -6 exhibits that the coefficient variance of the ratios was more (i.e., 22%) in case of AEGCL in comparison to APGCL and APDCL. It again signifies the instability of AEGCL in revenue earning from business operation.

**Table-6 - Revenue from Operations on Expenditure**

(Rs. in cores)

<b>PSUs</b>	<b>Particulars</b>	<b>2011-12</b>	<b>2012-13</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16</b>	<b>CV on the ratio of revenue from</b>

							Average	operations to expenditures
APGCL	Revenue from Operation	433.96	459.7	547.05	617.5	679.7		
	Expenditure	491.8	479	578	649	664.9		
	Ratio	0.88	0.96	0.95	0.95	1.02	0.95	5%
AEGCL	Revenue from Operation	391.14	536.45	456.03	462.52	537.92		
	Expenditure	496.8	473.9	527.5	636.3	823.7		
	Ratio	0.79	1.13	0.86	0.73	0.65	0.83	22%
APDCL	Revenue from Operation	2046.5	2301.8	2777.2	3190.1	3664.39		
	Expenditure	2914.9	3140.4	3577.8	4120.04	4473.07		
	Ratio	0.70	0.73	0.78	0.77	0.82	0.76	6%

Source: Annual Reports of APGCL, AEGCL and APDCL

Another noticeable fact is that though the average amount of revenue earning of APDCL was more than other two power sector units during the period of the study, the average revenue from business operation of this power sector unit against per rupee of expenditure was lowest among all the power sector units of Assam.

**Categories of Revenues**

The analysis of financial performance needs investigation on types and categories of revenue which may focus the pattern in generating revenue from the different sources. The revenues earned by corporate units can be classified as revenue from operation, other income and other receipt. In case of APGCL, the revenue from operation includes flow of revenue from selling of power to APDCL while other income comprises of Interest from House Building Advances to Staff, Fixed Deposits, Rebates, and Rentals from Staff Quarters etc. Other receipt includes only government’s subsidies. Table 7 exhibits the proportion of various items of income that forms the total revenue of APGCL. The average growth rate in revenue of APGCL for the period 2011-12 to 2015-16 was 11% with average growth in revenue from operations at 11.19% and other incomes at 10.44%. It implies that the growth of revenue from operation of APGCL was better than other two source of

**Table 7 - Revenue generation pattern of APGCL (Rs. in crores)**

Power Sector Units	2011-12	2012-13	2013-14	2014-15	2015-16	Average	Average Growth rate
	(in Rs.)	(in Rs.)	(in Rs.)	(in Rs.)	(in Rs.)		

							(%)
<b>Revenue from Operations</b>	<b>433.96</b>	<b>459.7</b>	<b>547.05</b>	<b>617.5</b>	<b>679.7</b>	<b>547.6</b>	<b>11.19</b>
<b>Percentage of Total (%)</b>	<b>97.95</b>	<b>97.11</b>	<b>94.88</b>	<b>97.54</b>	<b>98.42</b>	<b>97.2</b>	
<b>Other Income</b>	<b>9.08</b>	<b>13.7</b>	<b>10.5</b>	<b>15.6</b>	<b>10.8</b>	<b>11.9</b>	<b>10.44</b>
<b>Percentage of Total (%)</b>	<b>2.05</b>	<b>2.89</b>	<b>1.82</b>	<b>2.46</b>	<b>1.56</b>	<b>2.2</b>	
<b>Other Receipts</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>0</b>	<b>0</b>	<b>3.8</b>	<b>NA</b>
<b>Percentage of Total (%)</b>	<b>0</b>	<b>0</b>	<b>3.30</b>	<b>0</b>	<b>0</b>	<b>0.6</b>	
<b>Total</b>	<b>443.04 (100%)</b>	<b>473.4 (100%)</b>	<b>576.6 (100%)</b>	<b>633.09 (100%)</b>	<b>690.6 (100%)</b>	<b>563.3 (100%)</b>	<b>11.00</b>

Source: Annual Reports of APGCL, AEGCL and APDCL N.B. Logarithm is applied to calculate the value of average growth

income. Another noticeable fact is that the average 97.2% of the total revenue earned by APGCL was from revenue from business operation. Similarly in case of AEGCL average 87.52% revenue came from business operation during the period of the study. In case of AEGCL, the growth of revenue from business operation (i.e.10.83%) was lesser than the growth of Other income (i.e., 12.28%) which comprises of Interest from House Building Advances to Staff, Fixed Deposits, Rebates, and Rentals from Staff Quarters etc. The revenue from operation comes from flow of revenue from selling of power to APDCL while other income.

**Table 8 - Revenue generation pattern of AEGCL (Rs. in crores)**

Power Sector Units	2011-12	2012-13	2013-14	2014-15	2015-16	Average	Average Growth rate (%)
	(in Rs.)	(in Rs.)	(in Rs.)	(in Rs.)	(in Rs.)		
<b>Revenue from Operations</b>	<b>391.14</b>	<b>536.45</b>	<b>456.03</b>	<b>462.52</b>	<b>537.92</b>	<b>476.81</b>	<b>10.83</b>
<b>Percentage of Total (%)</b>	<b>91.13</b>	<b>89.75</b>	<b>87.57</b>	<b>83.22</b>	<b>86.22</b>	<b>87.58</b>	
<b>Other Income</b>	<b>38.05</b>	<b>61.25</b>	<b>64.73</b>	<b>93.24</b>	<b>85.99</b>	<b>68.65</b>	<b>12.28</b>
<b>Percentage of Total (%)</b>	<b>8.87</b>	<b>10.25</b>	<b>12.43</b>	<b>16.78</b>	<b>13.78</b>	<b>12.42</b>	
<b>Total</b>	<b>429.2</b>	<b>597.7</b>	<b>520.8</b>	<b>555.8</b>	<b>623.9</b>	<b>545.46</b>	<b>10.9</b>

Source: Annual Reports of APGCL, AEGCL and APDCL  
N.B. Logarithm is applied to calculate the value

The average growth rate in revenue of APDCL (i.e., 11.48%) earned in the period 2011-12 to 2015-16 was larger than the growth of revenue of APGCL and AEGCL. In fact, the average growth of the revenue earned from business operation by APDCL was also larger

than that of the APGCL and AEGCL. But, it is also mentionable that the average growth of the revenue of APDCL earned from business operation was also lesser than the revenue earned from other receipts whereas other receipt includes only government grants. Though APDCL’s earning from business operation was more than average 88%, its inability to acquire enhanced growth rate in revenue from business operation in comparison to the government subsidy/grant indicates its deficiency in business operation

**Table 9- Revenue generation pattern of APDCL**

(Rs. in crores)

Power Sector Units	2011-12	2012-13	2013-14	2014-15	2015-16	Average	Average Growth rate (%)
	(in Rs.)	(in Rs.)	(in Rs.)	(in Rs.)	(in Rs.)		
Revenue from Operations	2046.5	2301.8	2777.2	3190.1	3664.39	2796.00	11.57
Percentage of Total (%)	86.76	87.24	91.62	89.89	89.15	88.93	
Other Income	162.2	186.6	76.83	89.8	111.31	125.35	-10.97
Percentage of Total (%)	6.88	7.07	2.53	2.53	2.71	4.34	
Other Receipts	150	150	165.2	268.82	334.68	213.74	12.22
Percentage of Total (%)	6.36	5.69	5.45	7.57	8.14	6.64	
<b>Total</b>	<b>2358.7</b>	<b>2638.4</b>	<b>3031.1</b>	<b>3548.8</b>	<b>4110.4</b>	<b>3137.48</b>	<b>11.48</b>

Source: Annual Reports of APGCL, AEGCL and APDCL

N.B. Logarithm is applied to calculate the value

**Observations:**

After above interpretation the researchers have made following observations:

1. The average revenue earned by APGCL was more than the average revenue of AEGCL and APDCL in the period of study but the growth of revenue of APDCL was more than other two power sector units.
2. The degree of the variability of revenue earning is very high in all power sector units. It implies less predictability in revenue generation of power sector units. Among the entire power sector units, APDCL exhibited highest coefficient variation in revenue earning against per rupee of expenditure.
3. Although the growth of revenue of APDCL was highest among the power sector units of Assam, the revenues of APDCL were lesser than the expenditure in all the years of the period of the study. In case of AEGCL, loss was incurred in 4 years out of 5 years of the period of the study. In comparison to aforesaid two corporate units, APGCL performed better in this aspect, because, APGCL incurred loss only for 3 years. This information indicates poor financial performance of power sector units.

4. The expenditures of APGCL and APDCL had high correlation with revenue whereas AEGCL had shown moderate correlation coefficient i.e. 0.57. It implies that the expenditure of AEGCL was not leading revenue effectively.
5. The ratios of revenue earning against capital investment and value of fixed assets were not satisfactory (i.e., less than 1). APGCL and AEGCL exhibited low ratio in comparison to APDCL. It indicates the fixed facilities were not efficiently utilised by the power sector units for revenue generation.
6. The revenue earning by power sector units other than revenue from operation were very negligible and fluctuating.

**Conclusion:**

The research investigation indicates the poor operating performance of power sector units of Assam, which reflected in their financial result. There is need of appropriate strategy in upgrading the operating management of power sector units. The coordination of these units is utmost essential. The fixed assets and other infrastructure should be utilised adequately for revenue generation which demand the suitable mechanism for monitoring and planning. The government intervention is also required for development of these units. There is scope for scientific application of performance budgeting to rebuild the operating zeal.

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