

Financial Performance of the Armenian Power Sector

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1. INTRODUCTION

This report presents a review of the financial performance of the electric power sector of Armenia for 12 months of 2002. PA Consulting (PA's) analysis is based on the official report of the RoA Ministry of Energy (MoE) to the World Bank (WB), which was shared with PA by the WB. PA understands that data provided by the MoE to the WB is based on legal reporting (financial statements) of the energy companies for 12 months of 2002 and, accordingly, represents the official financial results of the corresponding period. This, however, does not necessarily mean that the MoE cannot change the data retroactively in the future.

Information on thermal energy purchases and sales has not been reported officially to PA. For this reason, analysis of thermal energy operations is missing in this report. This report is focused on sector's electricity consumption, collection rates and losses. Information on sector's accrued fuel costs, O&M expenditures, capital costs, loans from the Government and banks, taxes, receivables and payables is not presented in this report.

PA has not verified the accuracy, reliability or completeness of the MoE data. Accordingly, PA makes no representation or warranty as to the accuracy, reliability or completeness of any of the information contained in this memorandum, and PA's respective employees and consultants shall have no liability for any statements, opinions, information or matters (expressed or implied) contained in, arising of, or derived from, or for any omissions from, this memorandum.

2. PURPOSE OF THE ANALYSIS

The objectives of this report are to:

1. Analyze the changes in electric power generation, exports and domestic consumption;
2. Identify trends in the Transmission and Distribution Losses;
3. Analyze the flow of funds among retail consumers, distribution company (ArmEINet), Armenergo and generators;
4. Identify Financial Losses in the Armenian electric power sector and their major drivers;
5. Revise the evolution of domestic and export tariffs.

3. TERMS USED AND ASSUMPTIONS

Terms used

The following are the definitions of the terms used in this report¹:

- Net Internal Demand (NID) – generated electric energy, which is available domestically, expressed in GWh;
- Input to Armenergo – electric energy purchased by Armenergo from Generators and Importers, expressed both in GWh and \$ terms;
- Bulk Supply to Distribution – electric energy actually received by the distribution company /ArmEINet from Armenergo, expressed both in GWh and \$ terms;
- Metered Domestic Consumption – metered sales of ArmEINet to end users;
- Transmission Losses – the difference between energy purchased and sold by Armenergo, expressed in GWh terms;
- Technical Losses in Distribution – losses, associated with the technical parameters of the distribution network, as calculated by the Energy Institute, expressed in GWh terms;
- Non-payment in Distribution - the difference between the amounts billed by ArmEINet and the amounts actually paid for in the reporting periods, expressed in \$ terms;
- Commercial Losses – electric energy purchased from Armenergo by ArmEINet less energy sold to the end-users, less Technical Losses in Distribution; expressed both in GWh and \$ terms; ArmEINet average sales tariff is used to calculate the Commercial Losses in \$ terms;
- System Losses – the sum of Transmission and Distribution Losses, expressed in \$ terms;
- Financial Losses – the sum of Non-payment and Commercial Losses, expressed in \$ terms;
- Potential Distribution Revenue – cash receipts of ArmEINet plus Commercial Losses and Non-payment in Distribution, expressed in \$ terms;

Assumptions

- In the calculation of the Potential Distribution Revenue, it is assumed that the Metered Domestic Consumption levels would not be affected if collection rate increased to 100% and no Commercial Losses occurred. In reality, though, the decrease in non-payment and Commercial Losses would mean an increase in actual electricity payments for certain customers, which, most likely, would decrease the Metered Domestic Consumption.
- It is assumed that the commercial points for energy sales to ArmEINet remained the same as before the transfer of 110KV substations to ArmEINet.

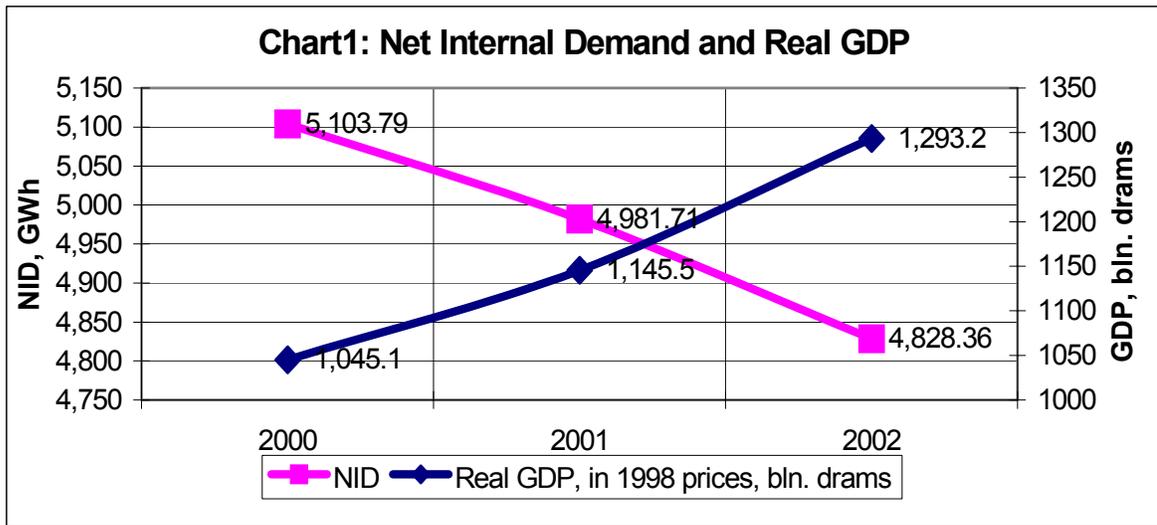
¹ The calculation formula and interrelationship of the defined terms are given in Appendix A.

4. FINDINGS

The findings from the analysis are summarized below. More details are also provided in the Appendices.

4.1 GENERATION, EXPORT AND DOMESTIC CONSUMPTION

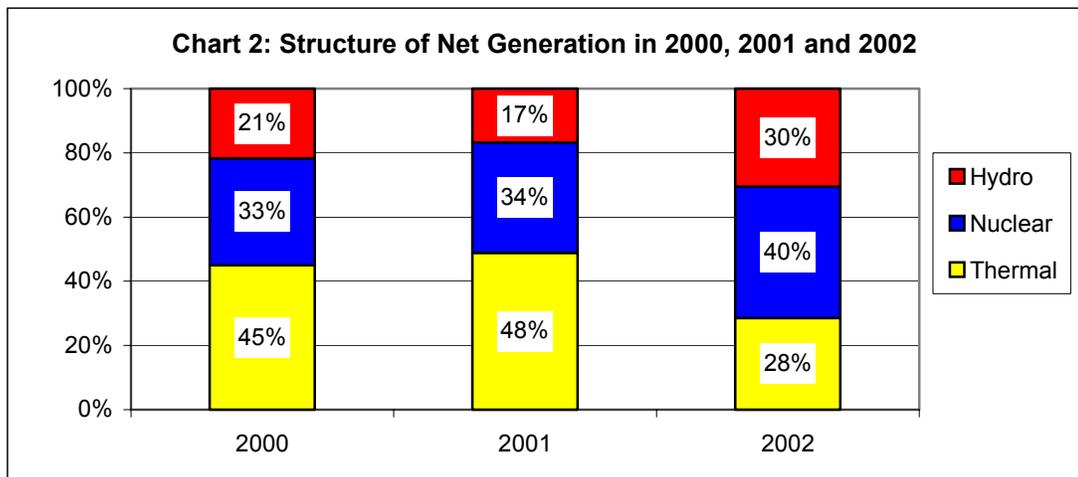
- Net Internal Demand demonstrates a continuous downward trend throughout the observed periods. In 2002, it has declined by 3.1%, which is slightly larger than the decline in the corresponding period of 2001 (see Table 1 in Appendix B). This decline mirrors the decline in the Net Generation, which is driven mainly by the lower System Losses. A small decrease in the Net Exports, which has a positive effect in terms of increasing NID, was fully absorbed by the decline in the Net Generation.
- Chart 1² below depicts an almost linear decrease in NID and an increase in real GDP in 1998 prices. Normally, there is a positive relationship between GDP and electricity consumption. The following factors could help rationalize this paradox:
 - a) GDP growth comes mainly from the sectors, which are not energy intensive;
 - b) In the expectation that Non-payment and theft would become more and more intolerable in the system, the economy realizes the full cost of electricity and becomes more energy-efficient;
 - c) Both GDP and NID figures might be materially misstated, due to the existence of a large ‘gray’ economy in Armenia and significant unaccounted for losses in the energy sector.



Note: NID and GDP are plotted on the same chart for presentation purposes only and are not proportional to each other.

² GDP data source: National Statistical Service of the RoA.

- Net Generation has declined by 3.3% in 2002, which is comparable to 3.8% decline in 2001 (see Table 1 in Appendix B).
- The ratio of Net Exports over Net Generation is almost the same in 2002 as in 2001. It has declined compared to 2000, though. In absolute terms Net Exports have declined by 5.8% in 2002. The following factors contributed to this decrease (classified by importance): reduction in exports to Georgia, increase in imports from Artsakh, decrease in exports to Artsakh and Kashatagh. The decrease in imports from Iran as well as the increase in exports to Iran, which both have positive effects in terms of increasing the Net Export, have been offset by the above-mentioned factors (see Table 2 in Appendix B).
- For the purposes of this report, Net Exports are analyzed only in comparative terms. Analysis in absolute terms and estimation of Net Exports on the basis of an annual analysis would be misleading since the export-import transactions have a seasonal nature. Details about their seasonality are presented below:
 - a) Swap transactions with Iran are conducted in two cycles. Armenia exports electricity during April – September and imports electricity during October – March.
 - b) Armenia usually exports electricity to Georgia in the first and the fourth quarters.
- In 2002, there was a shift in the structure of Net Generation toward an increase in the share of nuclear and hydro generations and a decrease in thermal generation. In 2001, though, the share of the thermal generation grew and the share of the hydro generation decreased.



- In absolute terms, this shift is described as follows:
 - a) Decrease in thermal generation by 1,133.3 GWh;
 - b) Increase in hydro generation by 694.5 GWh;
 - c) Increase in nuclear generation by 263.8 GWh.

The increase in nuclear generation was possible partly because of the installation of relay equipment in the distribution network, which has increased the stability of the energy system and allowed for the increase in the operative capability of the nuclear generation.

The increase in hydro generation is explained by the unusually high level of precipitation in 2002.

The decrease in thermal generation, on the other hand, is explained by the increases in other types of generation. Under economic dispatch, it is more cost-efficient to reduce the most costly thermal generation, when it is possible to increase other types of electricity generation without endangering system stability and security (see Tables 3 and 4 of Appendix B).

- A shift in the structure of Metered Domestic Consumption towards the increase in the shares of industrial and 'other' consumption and a decrease in the shares of irrigation and drinking water sectors is observed in the reporting periods. In 2002, the share of residential consumption in Metered Domestic Consumption has increased, exceeding its value for 2000. Metered Domestic Consumption has decreased only by 1% compared to 3.6% decrease in 2001 (see Table 5 of Appendix B).
- In absolute terms, the following are the major changes that have occurred in the Metered Domestic Consumption in 2002:
 - a) Consumption in the irrigation sector has dropped by 163.3 GWh, that is, by 41.6%; this could be attributed both to higher than normal precipitation and the implementation of the water sector rehabilitation program;
 - b) Consumption by budgetary organizations has risen by 60.1 GWh, i.e. by 25.9%. Further investigations are needed to identify the reasons for this increase;
 - c) Industrial consumption has increased by 59.2 GWh, that is, by 8.4%
 - d) Residential consumption has increased by 35.3 GWh, i.e. by 3.0%. On the other hand, the 2002 consumption level is still below that of 2000.
 - e) Less significantly, consumption has decreased in drinking water (by 5.5%) and 'other consumers' sectors (by 2.7%) and has increased in the transportation sector (by 2.6%) (See Tables 5 and 6 of Appendix B)

4.2 TRANSMISSION AND DISTRIBUTION LOSSES

- Transmission Losses, expressed in GWh terms, have decreased by 24.1% in 2002. The ratio of the Transmission Losses over the Input to Armenergo, which, in MoE's view, is an indication of the Transmission Losses, has decreased from 6.02% to 4.73% (see Tables 8 and 9 of Appendix C). This is the reflection of two USAID-funded projects: the introduction of the Data Acquisition System in the High Voltage Network and the creation of the Settlements Center.
- Total Distribution Losses, expressed as a % from Bulk Supply to Distribution, have increased slightly in 2002. Technical Losses in Distribution, expressed as a % from Bulk Supply to Distribution, have increased both in 2001 and in 2002. In 2002, they have increased from 11.6% to 11.8% of Bulk Supply to Distribution (see Tables 8 and 9 of Appendix C).

- On the other hand, due to the decrease in Transmission Losses, the share of the Commercial Losses in System Losses has increased in 2002 (see Tables 7 and 8 of Appendix C).

4.3 FLOW OF FUNDS AND COLLECTIONS

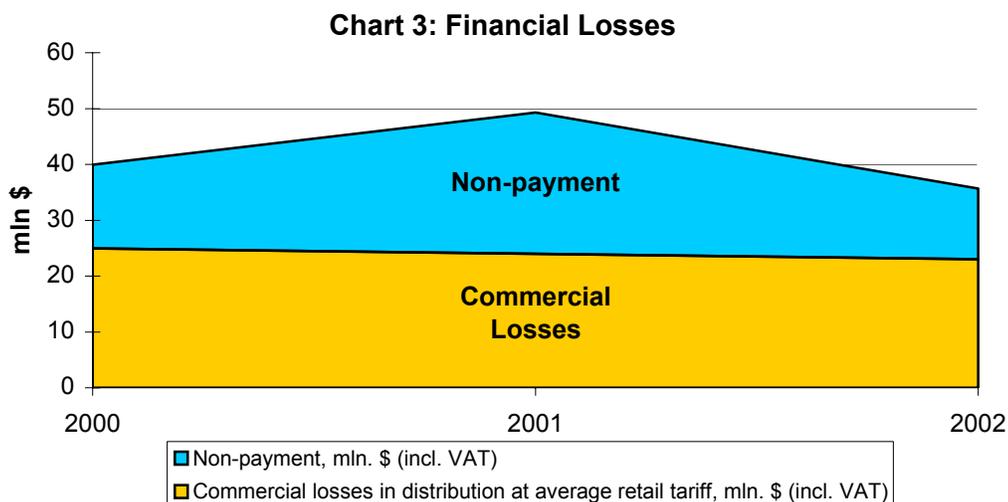
- The invoices from Generators to Armenergo have been significantly lower (\$88.8 million in 2002 versus \$122.7 million in 2001). There are two explanations for this:
 - a) The overall cost of generation has decreased due to the increase in the share of cheaper hydro and nuclear generation;
 - b) Net Generation has decreased by 3.3%.
- Although the Metered Domestic Consumption has dropped by 1%, the 1.3% increase in the weighted average retail tariff has brought up ArmEINet sales, expressed in drams, by 0.3%. After adjustments for 2% inflation it translates into a 1.7% decline in real terms. On the other hand, due to higher than normal devaluation of Armenian dram versus US \$, ArmEINet sales in \$ terms have decreased by 3.8%.
- Cash receipts of ArmEINet have increased by \$7.6 million, that is, by 7.1% in the same period. ArmEINet's total rate of collection in distribution has recovered after its decline in 2001, reaching 90% in 2002. This is slightly higher than that of 2000.
- Payments of ArmEINet to Armenergo have improved greatly in 2002 - ArmEINet has actually overpaid its bills in 2002, paying some of their past due debts, while in 2001 it paid only 66.6% of its bills.
- Higher payments of ArmEINet made it possible for Armenergo to pay all of its bills for 2002 and some of its past due debts to Generators, increasing the collection rate for Generators to 102.6%. The collection rate for Generators was 58.4% in 2001.
- Both the collection rate and the consumption in absolute terms have grown for the residential sector in 2002. Higher levels of collection could be attributed to stricter disconnection policies of ArmEINet in 2002. Massive disconnections of non-payers have especially been implemented after ArmEINet's privatization in November 2002. It is worth mentioning that the new management of ArmEINet has disconnected even Nairit, which is a major chemical plant.
- A positive shift could be observed in the payment discipline of the budgetary, irrigation and drinking water sectors, which have been underpaying their electricity bills chronically. Budgetary and drinking water sectors have actually overpaid their bills. The collection rate for the drinking water sector, which has been the largest non-payer for years, has jumped from 26.7% to 100.7%.
- It should be noted that the increased collection rate in the irrigation sector might not reflect the improvement in payment discipline by the consumers in that sector. The increase in collection rate is rather explained by a sharp decline in the consumption of electricity in the sector, which occurred, to a large effect, due to higher level of precipitation in 2002.

- Collection rates have decreased in the transportation and 'other consumers' (service sector and other non-governmental entities) sectors. As for the Industry sector, the collection rate has remained virtually the same - 81%, while the consumption is continuously growing.

More details about the flow of funds during 2000, 2001 and 2002 are provided in the Tables 10 and 11 and Charts 7, 8 and 9 of Appendix D.

4.4 NON-PAYMENT, COMMERCIAL AND FINANCIAL LOSSES

- In GWh terms, Commercial Losses have decreased by 1.1% in 2002, which is almost as much as the decline in the Metered Domestic Consumption in the same period. In terms of Armenian drams, Commercial Losses have grown insignificantly due to the 1.3% increase in the weighted average retail tariff. This corresponds to a 1.8% decline in real terms, after adjustments for 2% inflation.
- In the same period, Commercial Losses in \$ terms have decreased by 3.9% due to higher than normal devaluation of Armenian dram versus US \$. Expressed in \$ terms, Commercial Losses have decreased by about \$1 million in 2001 and in 2002. Nevertheless, in 2002 Commercial Losses, expressed as a % from Bulk Supply to Distribution, remained at the same level as in 2001 (see Table 12 of Appendix E).
- Non-payment in Distribution in 2002 has decreased from \$25.6 million to \$13 million, falling below the level of 2000. This has pushed the share of Non-payment in Financial Losses to the lowest value in observed years – 35.4% (see Table 12 of Appendix E).
- Largely due to the decrease in Non-payment, Financial Losses have decreased significantly (by 27.6%) in 2002, falling to \$36 million (see Table 12 of Appendix E).
- Potential Distribution Revenue, expressed in \$ terms, has decreased by 3.8%. This decline is explained by the decline in ArmEINet sales in \$ terms as well as the decline in Commercial Losses in \$ terms, as discussed above. Commercial Losses take a similar share of the Potential Distribution Revenue as in 2001 (see Table 12 of Appendix E).



4.5 TARIFFS

- In 2002 the weighted average retail tariff (inclusive of VAT) for ArmEINet sales has increased from 21.08 to 21.36 drams/kWh (by 1.3%). Average tariffs for the 'other consumers', residential and industrial sectors have increased. In the meantime, they have decreased in the irrigation and budgetary sectors (see Table 13 of Appendix F).
- Average tariffs have decreased for nuclear and hydro generators, and increased for thermal generators. The overall weighted average tariff for Generators has decreased by 26% (see Table 13 of Appendix F).
- Average Bulk Supply tariff has declined both in 2001 and 2002. In 2002, though it has declined by 6.5 % vs. 2.5% decline in 2001. The latter was possible because of a large decrease in Generators' tariffs (see Table 13 of Appendix F).
- In 2002, the Energy Regulatory Commission (ERC) established new tariff for the bulk supply of electricity to ArmEINet by Armenergo by the ERC Resolution # 27, dated April 16, 2002. It has been calculated as a weighted average of tariffs of the four distribution companies and constitutes 11.263 Drams per kWh without VAT (13.516 with VAT). ArmEINet has been formed as a result of a merger of the four distribution companies in accordance with the GoA Decision #166, dated February 22, 2002.
- New tariffs are set for generators by the ERC Resolution #31, dated July 31, 2002, which became effective in September 1, 2002.

New tariffs established by the ERC in 2002 are provided in Table 14 of Appendix F.

APPENDIX A: FORMULA AND INTERRELATIONSHIP OF TERMS

Energy Balance, GWh

1	Gross Generation
2	Auxiliary needs
$3 = 1 - 2$	Net Generation
4	Import
$5 = 3 + 4$	Input to Armenergo
6	Export
$7 = 5 - 6$	Net Internal Demand
8	Transmission Losses
$9 = 5 - 8$	Delivery of Armenergo
10	Own consumption by Generating companies
$11 = 9 - 6 - 10$	Bulk Supply to Distribution
$12 = 11 - 15$	Distribution Losses, of which:
13	<i>Technical Losses in Distribution</i>
$14 = 12 - 13$	<i>Commercial Losses in Distribution</i>
15	Retail Sales of Armelnet

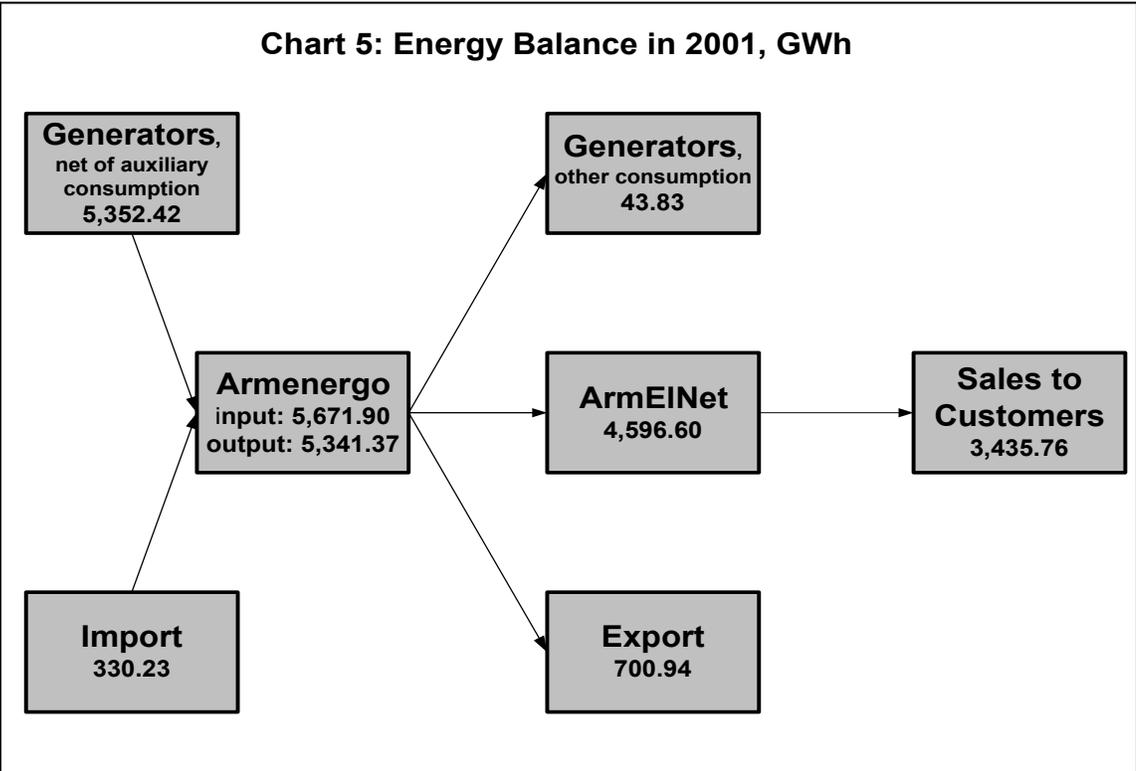
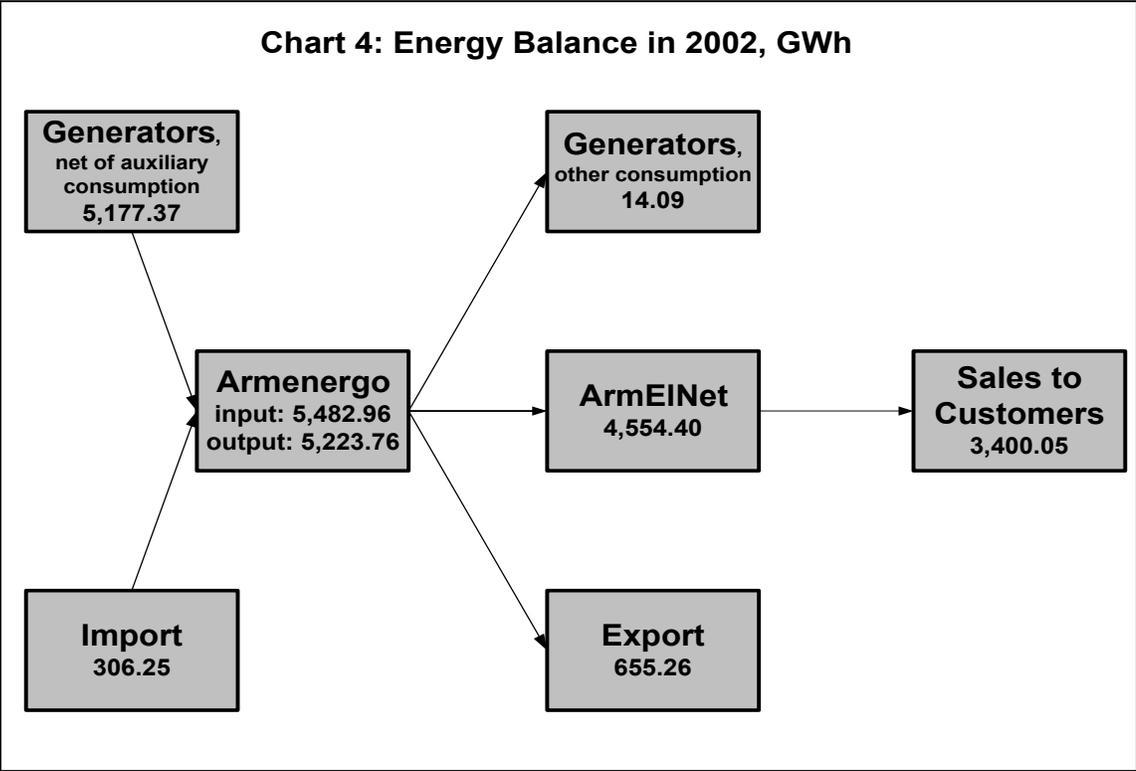
Weighted Average Tariff

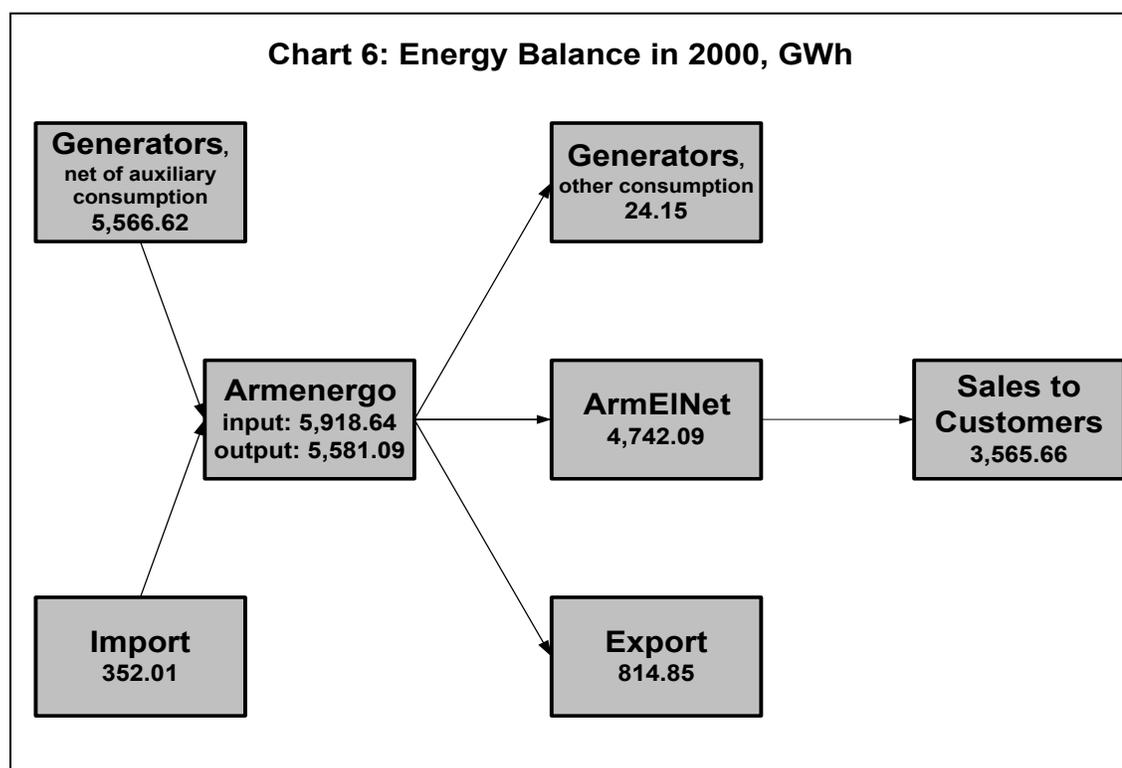
16	Weighted Average Tariff of ArmEINet Sales, dram/KWh
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Potential Revenue and Loss Calculation, \$

$17 = 16 * 15$	Retail Sales of Armelnet
18	Non-payment in Distribution
$19 = 17 - 18$	Cash Receipts of ArmEINet
$20 = 16 * 14$	Commercial Losses in Distribution
$19 = 17 + 20$	Potential Distribution Revenue

APPENDIX B: GENERATION, EXPORT AND CONSUMPTION



**Table 1. Net Generation, Exports and Internal Demand**

	2000	2001	2002
Net generation, GWh	5,566.62	5,352.42	5,177.37
Change, %	-3.4%	-3.8%	-3.3%
Net exports, GWh	462.84	370.71	349.01
Change, %	28.9%	-19.9%	-5.9%
Net internal demand, GWh	5,103.79	4,981.71	4,828.36
Change, %	-5.6%	-2.4%	-3.1%
Net exports, as % of Net generation	8.3%	6.9%	6.7%

Table 2. Net Exports by Countries, GWh

	2000	2001	2002
Net exports to Iran	-20.98	36.79	94.93
Imports from Iran	346.52	317.73	272.94
Exports to Iran	325.55	354.52	367.87
Net export to Georgia	371.89	231.59	192.04
Net exports to Artsakh and Kashatagh	111.92	102.32	62.05
Imports from Artsakh and Kashatagh	5.49	12.50	33.30
Exports to Artsakh and Kashatagh	117.41	114.82	95.35
Net exports, GWh	462.84	370.71	349.01

Table 3: Structure of Net Generation, %

	2000	2001	2002
Nuclear:	33.0	33.9	40.1
ANPP	33.0	33.9	40.1
Thermal:	44.6	48.2	27.9
Hrazdan TPP	38.1	43.6	23.4
Yerevan CPP	6.5	4.6	4.6
Hydro:	22.5	17.9	31.9
Sevan-Hrazdan HPP	6.6	5.7	7.2
Vorotan HPP	14.0	9.8	21.5
Dzora HPP	0.9	1.0	1.3
Small HPPs	1.0	1.4	1.9
Total	100.0	100.0	100.0

Table 4: Net Generation by Type, GWh

	2000	2001	2002
Nuclear:	1,836.65	1,814.47	2,078.25
<i>Change, %</i>	<i>29.2%</i>	<i>-1.2%</i>	<i>14.5%</i>
ANPP	1,836.65	1,814.47	2,078.25
Thermal:	2,480.09	2,580.34	1,447.03
<i>Change, %</i>	<i>-11.9%</i>	<i>4.0%</i>	<i>-43.9%</i>
Hrazdan TPP	2,120.27	2,336.21	1,209.63
Yerevan CHP	359.82	244.13	237.40
Hydro:	1,249.88	957.61	1,652.10
<i>Change, %</i>	<i>-18.2%</i>	<i>-23.4%</i>	<i>72.5%</i>
Sevan-Hrazdan HPP	366.99	303.54	373.51
Vorotan HPP	777.64	526.85	1,112.82
Dzora HPP	50.36	54.13	65.49
Small HPPs	54.90	73.09	100.28
Net Generation, GWh	5,566.62	5,352.42	5,177.37
<i>Change, %</i>	<i>-3.4%</i>	<i>-3.8%</i>	<i>-3.3%</i>

Table 5: Structure of Metered Domestic Consumption, %

	2000	2001	2002
Residential	34.61%	34.52%	35.92%
Industrial	19.53%	20.63%	22.59%
Budgetary Organization	6.58%	6.75%	8.59%
Irrigation	13.31%	11.39%	6.71%
Drinking Water	9.07%	8.48%	8.09%
Transportation	3.45%	3.50%	3.63%
Other Consumers	13.44%	14.73%	14.47%
Total	100.00%	100.00%	100.00%

Table 6: Metered domestic consumption, GWh

	2000	2001	2002
Residential	1,234.14	1,185.87	1,221.14
Change, %	-15.1%	-3.9%	3.0%
Industrial	696.45	708.80	768.03
Change, %	9.1%	1.8%	8.4%
Budgetary Organizations	234.56	231.95	292.07
Change, %	-2.5%	-1.1%	25.9%
Irrigation	474.74	391.46	228.13
Change, %	38.8%	-17.5%	-41.7%
Drinking Water	323.44	291.36	275.22
Change, %	4.6%	-9.9%	-5.5%
Transportation	123.12	120.37	123.45
Change, %	-18.5%	-2.2%	2.6%
Other Consumers	479.22	505.95	492.04
Change, %	3.9%	5.6%	-2.7%
Metered Domestic Consumption	3,565.66	3,435.76	3,400.05
Change, %	-0.9%	-3.6%	-1.0%

APPENDIX C: TRANSMISSION AND DISTRIBUTION LOSSES

Table 7: Structure of System Losses, %

	2000	2001	2002
Total distribution losses	78%	77%	82%
<i>Commercial losses in distribution</i>	42%	42%	44%
<i>Technical losses in distribution</i>	36%	36%	38%
Transmission losses	22%	23%	18%
System losses	100%	100%	100%

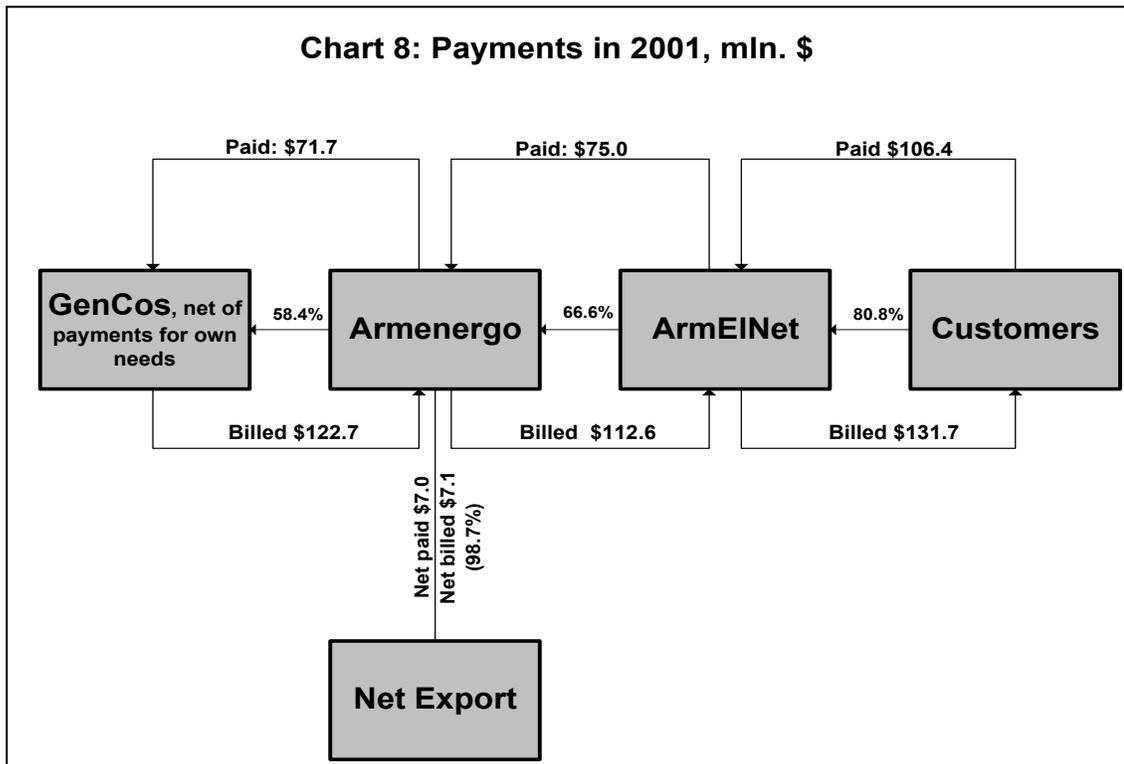
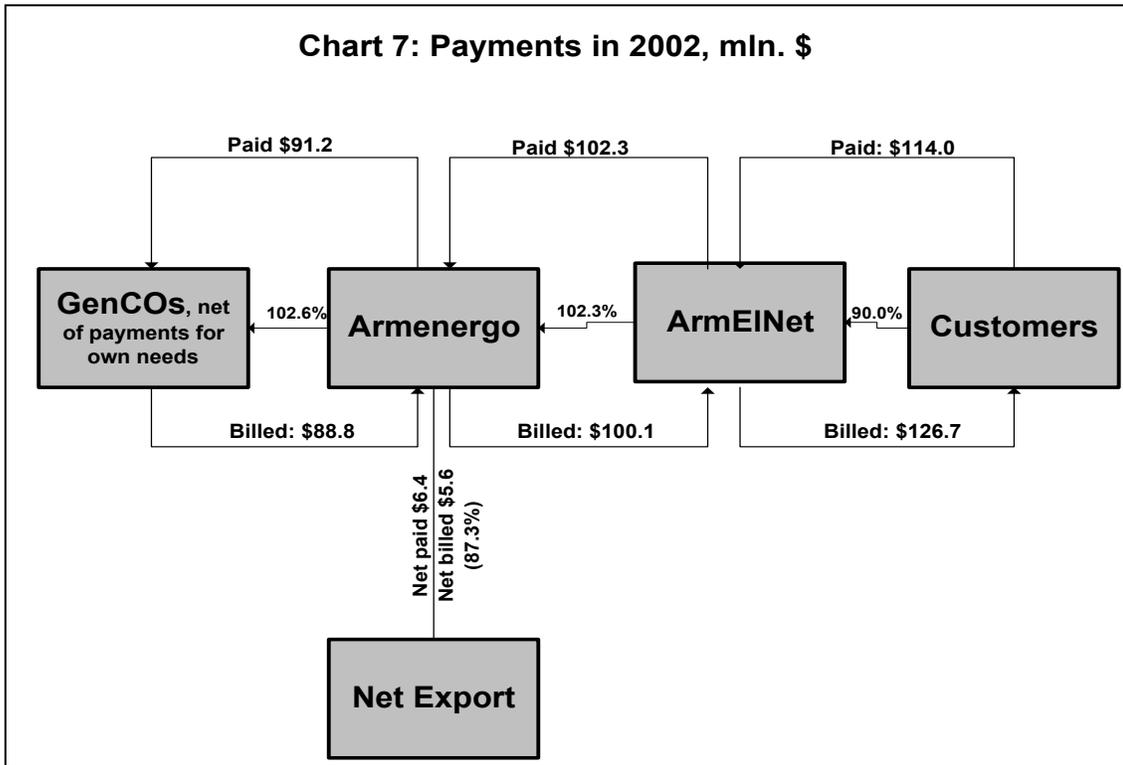
Table 8: System Losses, Input to Armenergo and Bulk Supply to Distribution, GWh

	2000	2001	2002
Total distribution losses	1,176.43	1,160.84	1,154.35
<i>Change, %</i>	-18.4%	-1.3%	-0.6%
<i>Commercial losses in distribution</i>	628.44	625.67	618.52
<i>Change, %</i>	-29.4%	-0.4%	-1.1%
<i>Technical Losses in distribution</i>	547.98	535.17	535.83
<i>Change, %</i>	0.6%	-2.3%	0.1%
Transmission losses	337.55	341.28	259.20
<i>Change, %</i>	-4.0%	1.1%	-24.1%
System losses	1,513.98	1,502.12	1,413.55
<i>Change, %</i>	15.5%	-0.8%	-5.9%
Input to Armenergo	5,918.64	5,671.90	5,482.96
<i>Change, %</i>	2.4%	-4.2%	-3.3%
Bulk Supply to Distribution	4,742.09	4,596.60	4,554.40
<i>Change, %</i>	0.5%	-3.1%	-0.9%

Table 9: Relative System, Transmission and Distribution Losses

	2000	2001	2002
System Losses (as per cent of input to Armenergo)	25.58%	26.48%	25.78%
<i>Transmission Losses</i>	<i>5.70%</i>	<i>6.02%</i>	<i>4.73%</i>
<i>Distribution Losses</i>	<i>19.88%</i>	<i>20.47%</i>	<i>21.05%</i>
Distribution losses (as per cent of bulk supply to distribution grid)	24.81%	25.25%	25.35%
<i>Technical Losses in Distribution</i>	<i>11.56%</i>	<i>11.64%</i>	<i>11.77%</i>
<i>Commercial Losses</i>	<i>13.25%</i>	<i>13.61%</i>	<i>13.58%</i>

APPENDIX D: FLOW OF FUNDS AND COLLECTIONS



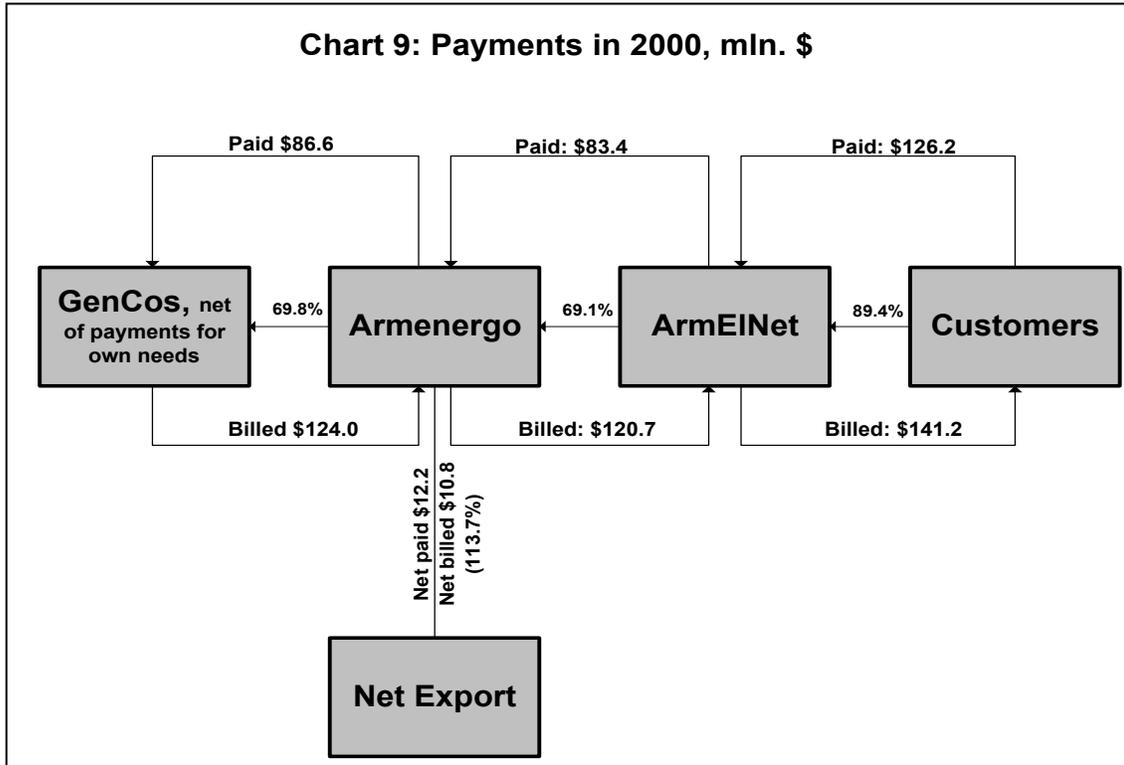


Table 10: Collection Rates of ArmEINet by End Users, %

	2000			2001			2002		
	Billed, \$	Paid, \$	Collection rate, %	Billed, \$	Paid, \$	Collection rate, %	Billed, \$	Paid, \$	Collection rate, %
Payments to ArmEINet by customers	141.68	126.69	89.4%	131.68	106.35	80.8%	126.66	114.01	90.0%
Payments to Armenergo by ArmEINet	121.13	83.68	69.1%	112.60	74.96	66.6%	100.09	102.33	102.2%
Payments to GenCos by Armenergo ³	124.42	86.90	69.8%	122.71	71.65	58.4%	88.83	91.14	102.6%
Payments to Armenergo in line of net exports	10.79	12.28	113.7%	7.10	7.01	98.7%	6.35	5.55	87.3%
Payments to Armenergo by GenCos, in line of own consumption	0.71	0.44	62.4%	1.22	0.84	68.8%	0.39	0.47	119.2%
Payments to GenCos by Armenergo	125.13	87.34	69.8%	123.93	72.49	58.5%	89.22	91.61	102.7%

Table 11: Collection rates of ArmEINet by customer classes, %

	2000	2001	2002
Residential	80.6	85.1	89.9
Industrial	93.4	81.7	81.1
Budgetary organizations	77.4	75.3	102.3
Irrigation	146.1	52.4	91.8
Drinking water	43.3	26.7	100.7
Transportation	66.3	94.9	74.0
Other consumers	95.5	119.6	91.0
Total	89.4	80.8	90.0

³ Net of payments for own consumption.

APPENDIX E: NON-PAYMENT, COMMERCIAL AND FINANCIAL LOSSES

Table 12: Financial Losses of the Electric Energy Sector

	2000	2001	2002
Exchange rate, dram/\$, average annual ⁴	540	550	573
Total Financial Losses, million \$	\$ 40.0	\$ 49.3	\$ 35.7
Non-payment, million \$ (incl. VAT)	\$ 15.0	\$ 25.3	\$ 12.7
Domestic Electricity Sales, million \$	\$ 141.7	\$ 131.7	\$ 126.7
Collected on Domestic Electricity Sales, million \$	\$ 126.7	\$ 106.4	\$ 114.0
Commercial Losses in Distribution at Weighted Average Retail Tariff, million \$ (incl. VAT)	\$ 25.0	\$ 24.0	\$ 23.0
Share of Non-payment in Financial Losses, %	37.5%	51.4%	35.4%
Share of Commercial Losses in Financial Losses, %	62.5%	48.6%	64.6%
Potential Distribution Revenue, million \$ (incl. VAT)	\$ 166.6	\$ 155.7	\$ 149.7
Financial Losses as per cent of Potential Distribution Revenue, %	24.0%	31.7%	23.8%
Non-payment Losses as per cent of Potential Distribution Revenue, %	9.0%	16.3%	8.5%
Commercial Losses as per cent of Potential Distribution Revenue, %	15.0%	15.4%	15.4%

⁴ Source: Central Bank of Armenia

APPENDIX F: TARIFFS

Table 13: Average Tariffs, Drams/kWh (VAT included)

Average ArmEINet Sales Tariffs			
	2000	2001	2002
Total	21.46	21.08	21.36
1. Residential	24.91	24.81	24.87
2. Industry	17.46	17.54	17.58
3. Budget organizations	24.34	24.11	23.62
4. Irrigation	20.66	20.20	19.19
5. Drinking water	18.55	18.36	18.31
6. Transport	16.97	16.76	16.70
7. Other consumers	20.87	19.17	21.09

Average Armenergo Sales Tariffs			
	2000	2001	2002
Total	13.64	13.35	11.77
1. ArmEINet	13.79	13.47	12.60
2. Generation companies, in line of own needs	15.86	15.26	16.01
3. Export, of which:	11.99	11.53	5.91
a) Karabagh	7.00	7.00	7.01
b) Iran	-	-	-
c) Georgia	13.57	13.76	16.56
d) Kashatagh	-	7.94	8.05

Average Generators' and Import tariffs			
	2000	2001	2002
Total	12.13	12.73	9.33
1. ANPP	10.46	10.73	8.86
2. Hrazdan TPP	17.31	16.79	18.07
3. Yerevan TPP	19.08	20.46	20.52
4. Sevan -Hrazdan HPP Cascade	5.44	6.49	5.89
5. Vorotan HPP Cascade	2.72	3.42	2.11
6. Dzora HPP	-	-	2.53
7. Privatized HPPs	11.54	10.78	10.67
8. Import, of which:	7.01	7.00	0.76
<i>a) Karabagh</i>	7.00	7.00	6.96
<i>b) Georgia</i>	18.75	-	-
<i>c) Iran</i>	-	-	-

Table 14: ERC Approved Tariffs (VAT included)

	2000	2001	2002
35kV=>	16; 12	16; 12	16; 12
6/10kV direct	20; 12	20; 12	20; 12
6/10kV non-direct	25; 12	25; 12	25; 12
0.4kV	25; 15	25; 15	25; 15
Bulk supply to ArmEINet, Dram/kWh			13.516
Transmission:			
<i>Electricity charge, Dram/kWh</i>			0.0768
<i>Monthly charge, Dram</i>			161,004,000
Generation, Dram/kWh			
ANPP	10.527	9.341	
<i>Electric energy charge, Dram/kWh</i>			3.078
<i>Capacity charge per month, Dram/kW</i>			2648.184
Hrazdan TPP	17.503	17.751	
<i>Electric energy charge, Dram/kWh</i>			14.9592
<i>Capacity charge per month, Dram/kW</i>			611.58
Yerevan CHP	18.967	18.967	
<i>Electric energy charge, Dram/kWh</i>			15.8688
<i>Capacity charge per month, Dram/kW</i>			1740.996
Sevan-Hrazdan Cascade	5.472	6.299	
<i>Electric energy charge, Dram/kWh</i>			1.1592
<i>Capacity charge per month, Dram/kW</i>			502.788
Vorotan Cascade	2.848	3.004	
<i>Electric energy charge, Dram/kWh</i>			0.9468
<i>Capacity charge per month, Dram/kW</i>			199.824