Socio-economic Effectiveness of Structural Adjustments in the Energy Sector of Georgia

Tbilisi
2003

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Introduction

This report represents one of the first attempts to identify the rights and wrongs of the above mentioned adjustments for the different social groups and elaborate recommendations that will facilitate poverty reduction in Georgia.

The authors realise the complexity of the subject. On the one hand it is determined by the multiple interlinked issues covered by the structural adjustments in the Georgian energy sector : changes in the institutional arrangements of the energy sector; changes in the management of the elements of the sector; changes in property forms and new legislation for the energy sector. To ensure critical assessment of the results of each adjustment, permanent monitoring of the processes is necessary - currently this does not take place in Georgia.

On the other hand the ongoing social-economical processes do not depend only on changes in the energy sector but are the result of complex impacts caused by the changes in different sectors. Therefore it is rather difficult to single out the social-economical impact of the above mentioned sector.

However, taking into account the fact that a majority of the Georgian population lives below the poverty line and are unemployed, any change carried out in energy sector which results in a price deviation on energy resources has a direct and serious impact on human living conditions. Therefore, it can be inferred that, rather than in other branches of industry, the price of energy resources and energy services plays a very significant role in determining the living standards and social-economical conditions of a majority of the Georgian population. . Based on this, the report primarily stresses the structural adjustments implemented in the Georgian energy sector from the price deviation perspective.

The report is based on the results of research into the socio-economic conditions of the Georgian population provided at various times by different experts as well as on official statistic data. The accuracy of the data given in the report complies with general requirements for statistical research.

The deductive method of analysis used by the authors in the report takes into account (as far as possible) the identification of the reasons of the events based on their results. The authors believe that such an approach ensures maximum objectivity in a climate where information is unfortunately of a poor standard.

The aim of the research undertaken in this report is to assess, as far as possible, the impacts of structural adjustments in the energy sector performed in 1996-2000 – did these changes have a positive affect on the socio-economic conditions of the population or not. To reach any conclusions the following questions need to be addressed:

1. Were the structural adjustments performed in the energy sector optimal and sequential?

2. Have the structural adjustments influenced the accessibility of energy for the population?

3. Have the tariffs of and demand for electricity, natural gas and other energy sources changed after the structural adjustments?

4. Have the technical conditions of energy supply improved for the population?

5. Does the income generated by the population correspond with the tariffs they have to pay to satisfy their immediate (minimal) energy needs ; how is the family budget prioritised (food, health care, energy supply, recreation); is the population forced into non-payment for energy services?

6. What is the energy indebtedness of the population after the structural adjustments?

7. To what extent has the level of the energy supply to the population changed? To what extent are the immediate energy needs of the population guaranteed?

8. How have the state budget revenues from the energy sector changed after the structural adjustments and has the social security of the population improved/worsened?.

By addressing these as well as similar related questions, the authors have tried to sequentially analyse the collected data together with the results which are given below.

1. Country demand on energy resources (electricity, natural gas, mazut, firewood, oil, liquid gas, coal)

This chapter aims to determine the sensitivity of the Georgian population's socio-economic conditions with respect to structural adjustments carried out in the energy sector and how strong is the outcome – the impact of national economic conditions on the energy sector conditions. Research of this type has not been performed in Georgia yet. Similarly, there is no statistical and sociological data. That is why an assessment of this relationship is possible only from a qualitative point of view. First of all the national demand for energy and the household share in general energy consumption should be determined.

There is different data about energy demand in Georgia, obtained at differing times during different international projects. But this data is rough, as it is practically impossible now as before to determine the exact demand for energy in Georgia. First, as there is no strict payment regime between suppliers and consumers, most consumers do not calculate the exact amount of energy which they consume. Second, there is no balanced energy market in Georgia: supply does not correspond with demand; consumption does not correspond with requirements, etc. The situation is especially complicated in the regional household sector, which is potentially a large-scale consumer of energy. The energy supply is limited here and an accurate calculation of energy demand in this sector is essentially impossible. It is related to the consumed amount of energy. In the current situation even the consumer has no sequential and accurate view about his/her own need of energy resources.

In spite of this , we can say that a period of new, more or less natural development in demand emerged in 1995-1996. During this time the country achieved a certain political stability and started a new stage in its economic development.

The Charts 1.1 a-e) show the dynamics of change in the existing demand for energy in Georgia in line with the above mentioned accuracy.

Chart 1.1 a) indicates that the household sector has become the main consumer of electricity in recent years. Its share in electricity consumption has become equal to aggregate consumption by industry. This is due to two reasons: the sharp fall in industrial activities in the nineties and the disruption of central heating and gas supplies, both of which increased electricity consumption in the household sector.

Under such conditions, the relationship between households and the power industry has grown stronger – the conditions of one determine the conditions of the other. However, the power industry sector influence on households appears to be stronger. It is natural for developing country as Georgia, where the living standards of the population practically fully depend on the power industry while the power industry get its revenues from two sources –household and industry sectors.

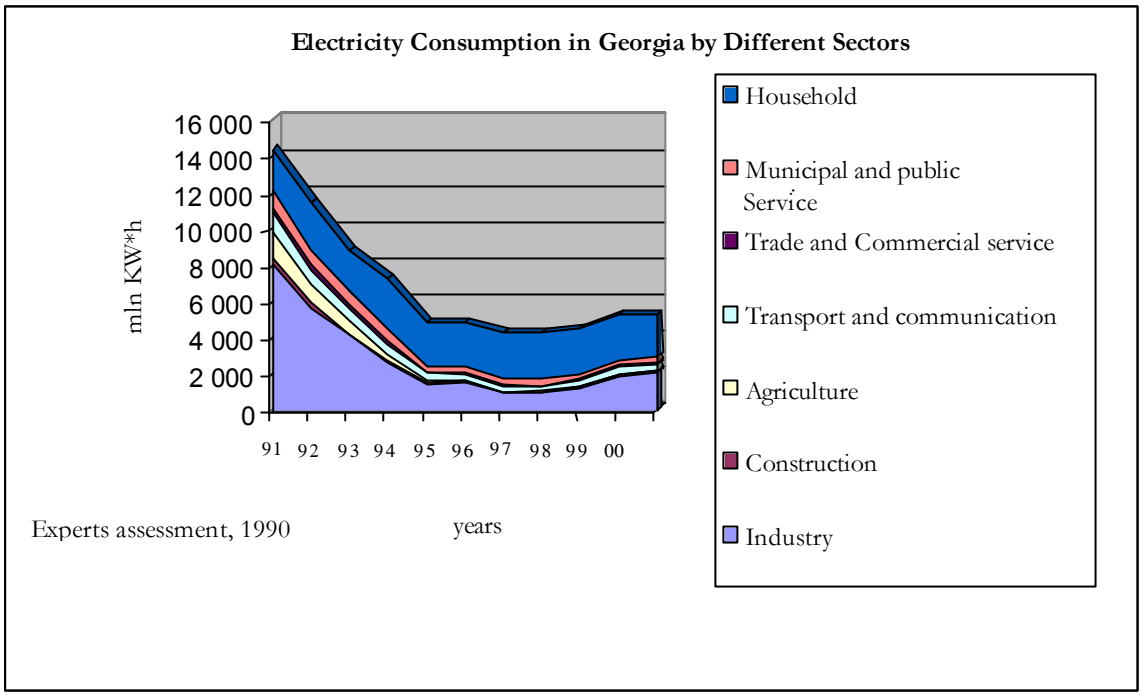


Chart 1.1, a) Electricity consumption in Georgia by sector (the marks should be read from top to bottom)

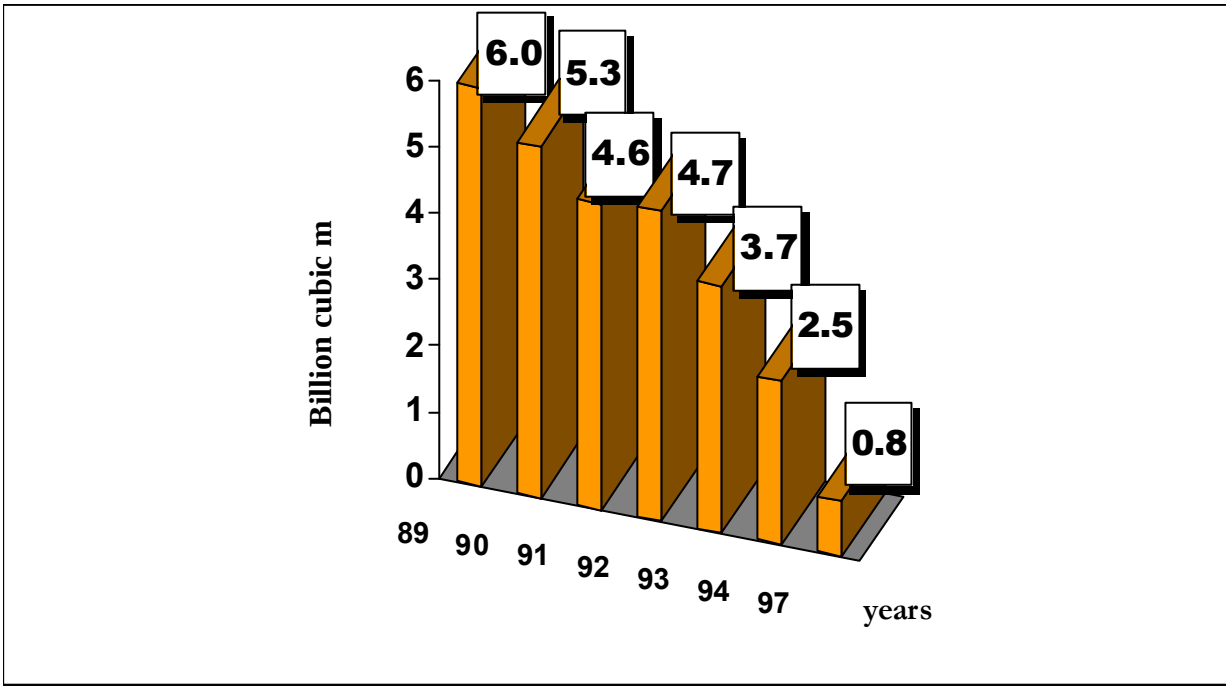


Chart 1.1, b) Natural gas consumption in Georgia

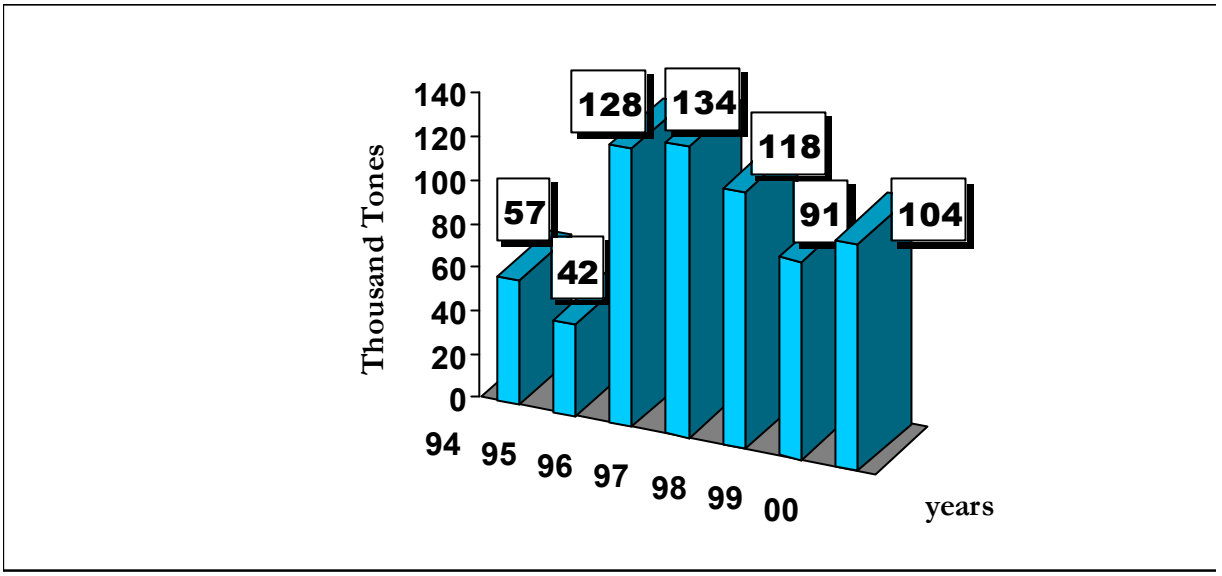


Chart 1.1, c) Oil production in Georgia

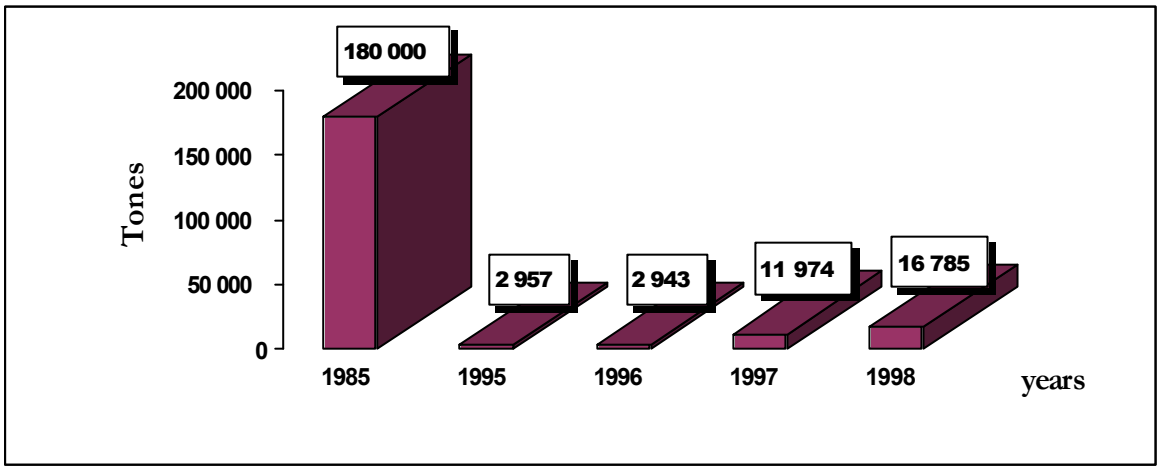


Chart 1.1, d) Liquid gas consumption in Georgia

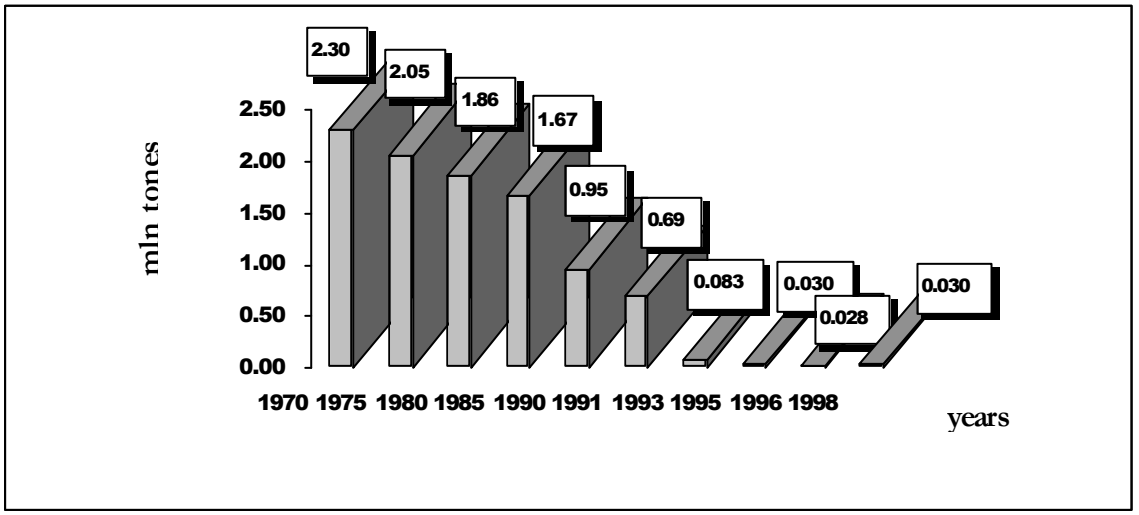


Chart 1.1, e) Cole mining/consuming in Georgia

Nevertheless the significance of the household sector for the power industry, despite high unemployment and unstable low incomes, is very real.

The above mentioned refers not only to the power industry but to the energy sector as a whole.

2. Power industry balance

Is it possible to satisfy the demand for electricity from the electricity generated within the country? At least it would increase the level of energy independence. It is the main issue discussed below.

The Georgian energy system, along with those of Armenia and Azerbaijan, was part of the Trans-Caucasian power grid in the former Soviet Union. The Trans-Caucasian power grid was connected with the Southern Russia power grid. Such connections eased the energy supply of the Trans-Caucasian republics as well as the Southern Russia region via a purposeful exchange of the peak capacity. After the collapse of the Soviet Union the connections between the energy systems were broken. As a result the former Soviet republics have to depend on their own energy resources.

The electric power generation system of Georgia consists of hydro- and thermal electric power plants. The total capacity installed generated 4,700 MW of which 2,700 MW was generated by hydropower plants and 2,000 MW by thermal power plants. During the past 12 years, due to the deterioration of the technical conditions of plants and equipment, it became practically impossible to achieve the maximum capacity levels of the power plants. Nowadays (January 2003) operational capacities have been significantly reduced and power generation amounts only to 1,700 MW (this value as well as the values given in table 2.1 could be changed at any moment of current period). Table 2.1 below shows the installed as well as the current generating capacity of the thermal and large hydropower plants .

Table 2.1

Large Hydro Power Plants		**Thermal Power Plants**	
Installed capacity MW	**Generating capacity MW**	**Installed capacity MW**	**Generating capacity MW**
Enguri 1300	800	Tbilsresi (Gardabani) 1250	0
Vardnili I 220	110	AES-Mtkvari (Gardabani) 600	250 *
Jinvali 130	70	Tbiltetsi (Tbilisi) 18 70(Tb)	5.5 14 (Tb)
Khrami I 113	113	metal. plant's thermal plant (Rustavi) 149 590(Tb)	0 0 (Tb)
Lajanur i	30	Tkvarcheli therm. plant (Tkvarcheli)	0

112		200	
Khrami II 110	35	car manufacturing plant's thermal plant (Kutaisi) 15	0
Tkibuli 80	50		
Rioni 49	35		
VartsikheI-IV 184	145		
Gumati I 44	27		
Shaori 38	27		
Vardnili II 40	0		
Vardnili III 40	0		
Vardnili IV 40	0		
Zahesi 44	44		
Gumati II 23	23		

* Since the AES-Mtkvari plant failure in 22 December 2001, its exploitation capacity reduced to 300 MW, and currently only 250 MWs are ready to use.

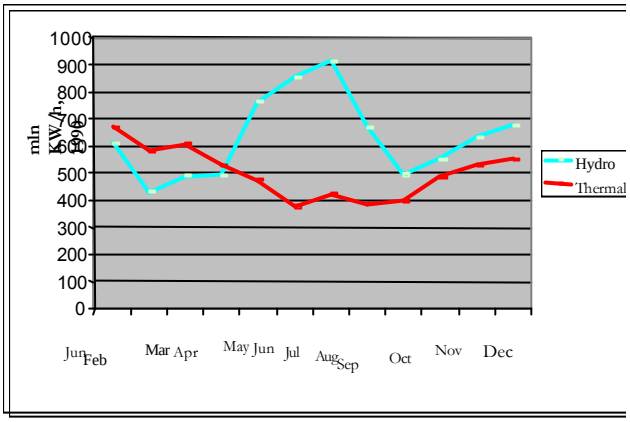
According to the official version, despite the sharp decrease in energy consumption (from 14 billion kw/h to 6-8 billion kw/h a year), the technical conditions of the existing power generating objects as well as transmission and distribution systems in Georgia can not supply enough electrical power in winter. It is difficult to accept the above mentioned as the only reason for the annual problems in winter energy supply (Table 2.1). The seasonal energy generation diagrams in Georgia show that most likely the main reason is an annual decrease in the thermal power plants' share and an increase in the hydro power plants' share in the base electric power generation (see Chart 2.1 a, b). Such conditions (Chart 2.1) make it impossible to regulate hydro power stations in order that they reserve power to cover the winter peaks. Therefore expensive electrical power is imported from neighbouring countries. Essentially irrational management is to blame rather than deteriorating technical conditions of the equipment.

The contested results of the analysis made by the Georgian National Energy Regulating Commission (GNERC) showed that the optimal variant of electric power distribution between hydro power plants and thermal power plants generated locally is proportionally 85%/15%[1]. GNERC alleges that if the thermal plants' share in annual electric power production is more than 15%, they would not be able to cover plant exploitation expenses. And if their share is less than 15%, then regulating hydro power stations would not be able to reserve capacities sufficient, together with the imported electric power, to cope with winter demand. Evidently, the power generating diagrams for the years 1999 and 2002 (Chart 2.1, c, d) were planned in compliance with the above mentioned attitude and failed

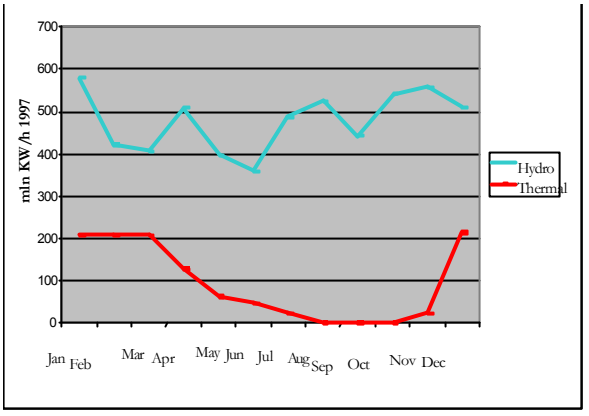
[1] Georgian National Energy Regulatory Commission, Basics of Energy Regulation, Chapter I, p.53

to be realised as the generating objects were not properly ready for the winter. The assumption that power generated only by AES-Mtkvari, together with the hydro generation, would guarantee electric power stability in the country was truly exaggerated.

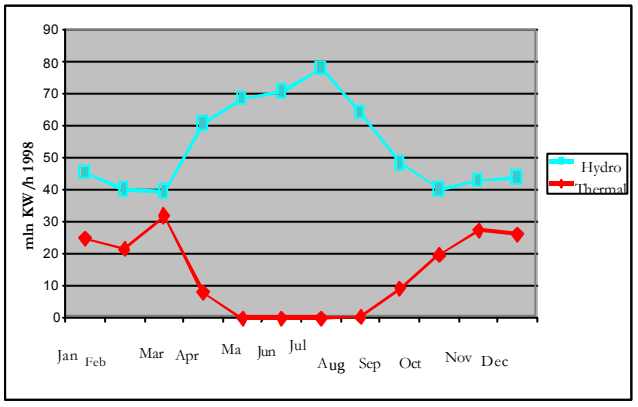
The previous as well as the latest winter seasons showed that the present level of mobilisation of the local power generation objects is not enough to provide the country with a stable power supply. Tbilisi thermal power plant power generating units should be prepared and rationally used as a base part of the load. The authors think that it is the only way to achieve a stable power supply for Georgia in the near future.



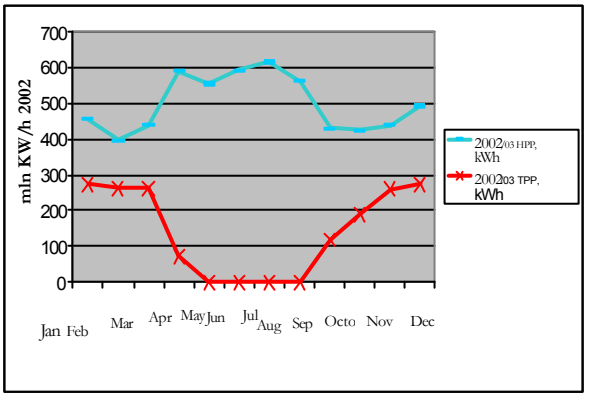
a) year 1990



b) year 1997



c) year 1998



d)year 2002

In conclusion we would add that Georgia has the potential to satisfy its electrical power needs from the power generated within the country. The easiest way for this is to rehabilitate two energy generating units (130-140 mgwt. each) in the Tbilisi thermal power plant. The research provided last year[2] indicated that this would require approximately USD 2 million .

[2] Volume and Timescale of Repairing #3, #4 and #8 Energy Generating Units of Tbilsresi, Ltd Geoengineering, Project Report, Tbilisi, 2002

2. Structural changes in Georgian energy sector (institutional and legislative changes, privatization)

Until it gained its independence, Georgia represented part of the Soviet Union power grid. It was managed directly by the state in compliance with socialist planning principles. These were of course totally different from market management principles. The current expenditure of the power plants as well as the funds for their development was provided by the state budget. Thus the system was subsidised by the state and did not depend on individual plant efficiencies.

The Georgian energy system included several structural elements: "Saqenergo" (power), "Saqgazi" (gas), "Saqnavtobi" (oil), 'Saqnavtobprodukti" (oil products), "Saqnakhshiri" (coal), heating system municipal offices.

"Saqenergo" included power generation, transmission, dispatching, distribution objects and daughter enterprises. It was responsible for financial arrangements; energy tariffs were regulated by the Ministry of Economics.

The structures of "Saqnavtobi", "Saqgazi" and "Saqnakhshiri" were arranged in a similar way. All these organisations were governed by the Cabinet of Ministers. The structure of the sector was vertical.

From the very first stage of the market relations that were established after the collapse of the Soviet Union, it was evident that existing working and managing principles could not ensure the reliable functioning of the power industry. These practices included widespread corruption (resulting in bad management), non-payment of consumed energy, irrational use of funds allocated for capital repair works, paralysis of the industry and so forth. The industry was on the brink of total paralysis.

In 1992, based on the resolution of the Cabinet of Ministers[3], the Ministry of Fuel and Energy was established, which merged "Saqnavtobi", "Saqenergo", "Saqgazi", "Saqnakhshiri", and their daughter enterprises.

Since 1993, the International Financial Institutions have been active in Georgia[4]. Their aim was to study the current situation in the energy sector, develop the legislative basis for sequential privatisation and prepare specific recommendations for the government on the provision of mandatory structural changes in the energy sector.

In 1994 the Ministry of Fuel and Energy was abolished. Its branches were established as independent departments, and came to be controlled by a specially created service established by the government – the Energy Coordinating Service. At this time the municipal heating agencies were cancelled.

In 1995 the Energy Coordinating Service was cancelled and power enterprises were governed by the newly established Fuel and Energy Corporation.

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[3] Resolutions of Cabinet of Ministers 14/12/92 #1105 and 10/02/93 #78

[4] The World Bank Group, the International Monetary Fund, the European Bank for Reconstruction and Development

In 1996, based on Georgian Law[5], the Ministry of Fuel and Energy was established which merged the same departments and a new one – "Saqnavtobprodukti". The Ministry was responsible for:

- ?? the performance of the energy policy in the country
- ?? Determining development strategy and priorities in the field
- ?? Determining the investment policy in the energy sector and the strategy of raising energy effectiveness in other fields of economics
- ?? Ensuring the HR policy and the rational performance of reforms in the field
- ?? Normative and legislative development
- ?? Technical and financial monitoring
- ?? Determining the state policy in emergency energy situations.

The main goals of this structural reorganisation of the energy sector were to [7]:

1. Provide a rational state policy, with separate regulatory functions and commercial activities
2. Ensure the step-by-step liquidation of the state monopoly; establish different forms of property; create a competitive environment; develop a transparent market; attract foreign investments
3. Improve the power supply and reduce the power deficit in the energy sector
4. Increase the production volume in the energy sector; increase its effectiveness; maintain financial discipline; improve the quality of customer service
5. Provide a continuous power supply; increase company revenues; improve the technical conditions and management of the energy system.

In 1996, according to presidential decree #437 on "Restructuring the Power Energy Sector" signed on 4 July:

- ✍ On the bases of "Saqenergo" three financially independent sectors were established – generation, transmission-dispatching and distribution. [6]
- Within the generation sector several joint-stock companies were established which are managed by the Ministry of Fuel and Energy. The owner of the shares is the government. They are joined in joint-stock company "Saqenergogeneratsia", with the function of power generation;
- The transmission-dispatching structure was firstly transformed into a commercially and financially independent budget enterprise – "Saqenergo" - which, in its turn, was transformed into "Saqartvelos Saxelmtsifo Eleqtrosistema"

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5 Law of Georgia on Establishment of Ministry of Fuel and Energy of Georgia, adopted 26th of June 1996

6 D. Chomakhidze, Economic and Ecological Problems of Use of Energy Potential of Georgia, Tbilisi, 2001, p.276

Ltd. (Georgian State Power Systems), and eventually was broken up into joint-stock "Eleqtrogadatsema" (responsible for high-voltage transmission network) and "Eleqtrodispecherizatsia" Ltd. (responsible for dispatching). A merger process involving these two companies is currently in progress. As a joint company it will provide power system management, stable working regimes, effective use of a high-voltage (35, 110, 220, 300, 500 KW) transmission network and corresponding sub-stations.

- The distribution sector has completely separated from "Saqenergo". Initially it divided into joint-stock companies according to territorial principles and acted under the jurisdiction of local authorities. Later they joined together as regional energy companies.
- The power energy regulating commission, established under the Ministry of Economics, was initially responsible for regulating the wholesale and retail energy tariffs.

In 1997 the Georgian Parliament adopted the "Power Energy" law, which separated the Power Energy Regulating Commission from the Ministry of Economics and established it as an independent service Georgian National Power Energy Regulating Commission.

In April 1999, the Georgian Parliament adopted the "Power Energy and Natural Gas" law. Based on this law, the Georgian National Energy Regulating Commission was established (GNERC) as a legal body of public law. The creation of such a commission was based on general motivations, such as[7]:

- The strengthening of regulation process, maximum advantages to the public, the minimal tariffs have been set assuming natural monopoly of the energy sector and it growth the faith in justice within general public;
- Increasing the positive influence on the energy sector's rate and scale of development e, the power supply level of the country, scientific-technical progress, etc.;
- Reduced risk for investors , private investments to the sector are stimulated, the amount of the investments is increasing, and investments are taxed at low rates and this results in low tariffs for the consumer;
- The possibility of paying for the consumed electricity and natural gas would rise; it would create a basis for self-financing;
- It would improve the electricity quality and increase its volume.

The Energy Regulating Commission had a wider rage of functions than the Power Energy Regulating Commission, namely:

- The establishment of wholesale and retail tariffs on power and natural gas
- The granting, renewal, stoppage, and withdrawal of licenses for exploited power objects and natural gas sector
- The consideration and resolution of disputes in the power and natural gas sector
- The supporting of competition in the power and natural gas sector, balancing the interests of the power producers, suppliers and consumers
- The supervision of power wholesale market activity
- The organising and coordinating of certification in the power energy sector

[7] Georgian National Energy Regulatory Commission, Basics of Energy Regulation, Chapter I, p.49

?? Regulating imports and exports in the power sector
?? Controlling the licensing conditions in the power and natural gas sector and providing appropriate legislative measures in case of violation.

The wholesale power market was established in July 1999 (legal body of private law). Its main function is wholesale power purchase, sale management and step-by-step development of competition.

The Georgian power sector executive structure and its relations after restructuring are shown on Chart 3.1.

During the same period the fuel industry underwent organisational changes. Based on "Saqgazi" department and joint-stock company "Transgaz", the budget enterprise "Saqtransgazmretsvi" was established. "Georgian International Gas Corporation" was created later on, to be delegated with the gas main pipelines previously delegated to "Saqtransmretsvi" (as a result "Saqtransmretsvi" has started a legal action, which is still ongoing). The "Saqnavtobi" and "Saqnaxshiri" departments were also reorganised.

The privatisation process of the Georgian energy sector started in 1992 .

In compliance with resolution #829 of the Georgian Cabinet of Ministers dated August 11, 1992, hydropower plants with an aggregate capacity of approximately 10 MW were entered into the list of power objects that were to be privatised.

According to resolution #809 issued on December 17, 1993, hydropower plants with an aggregate capacity of approximately 30 MW were added to this list.

Under resolution #916, adopted on December 31, 1994, the capacity limit for the privatised hydropower plants was cancelled.

As of July, 1 1995, 14 small hydropower plants were privatised. Their aggregate capacity amounted to two percent of the total power system capacity: output - 1,85%; production assets – 1%.

The following forms of privatisation have been used: competitive sale, auction, direct sale and establishment of joint-stock companies.

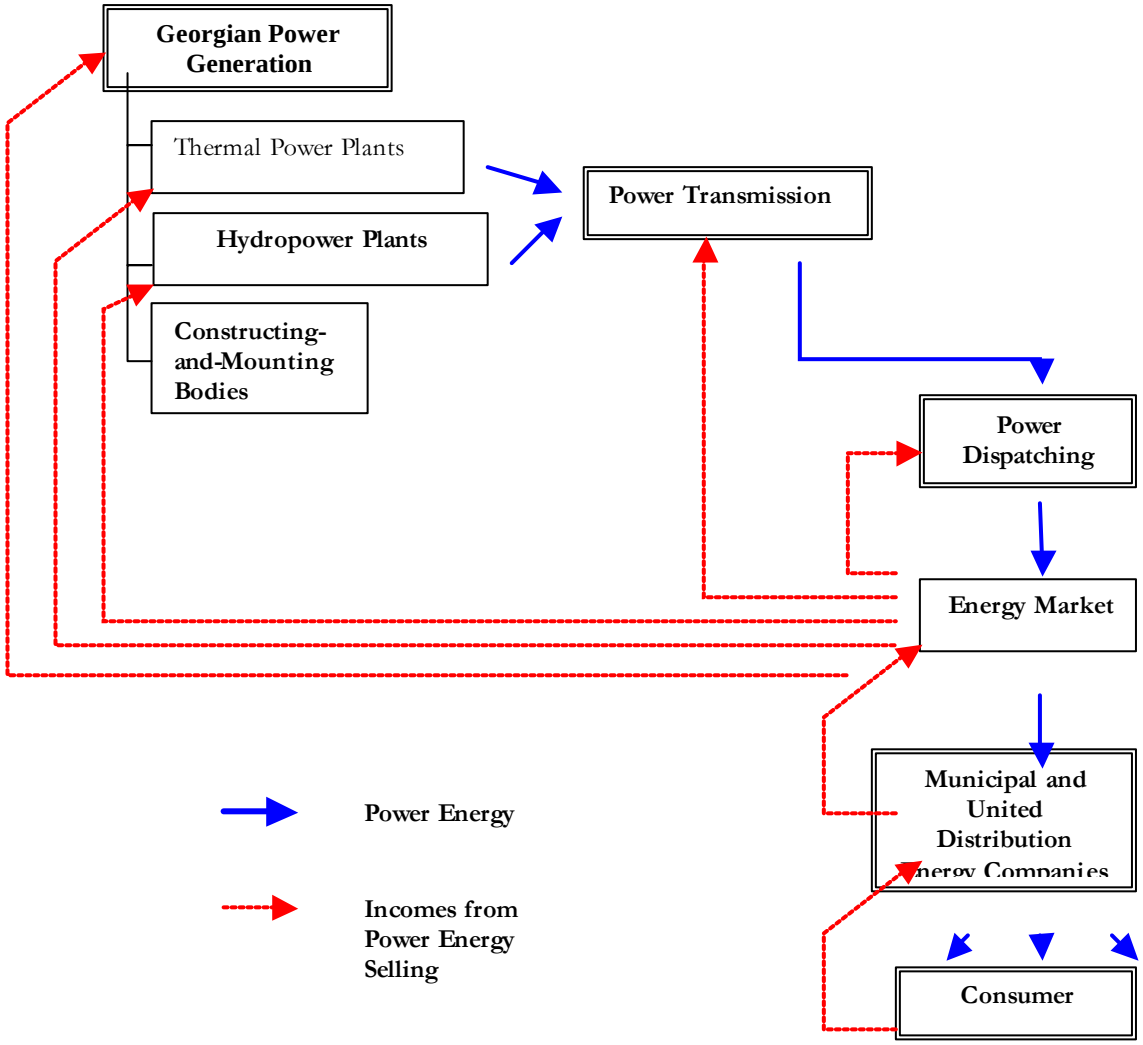
Based on the recommendations and the financial support of the international financial institutions[8], in 1997-1999 the Georgian parliament developed a legislative base, which had to ensure the achievement of the above-mentioned goals and the large-scale privatisation of the energy sector. This legislative base has covered the following:

✍ The "Law on State Property Privatisation" adopted in 1997, which delegated all rights of state property disposal to the Ministry of Property Management and introduced the new forms of privatisation.

[8] WB, Report No. 17152GE, December 16, 1997

✍ The "Law on Power Energy" adopted in 1997, which was amended[9] and finally named the "Law on Power Energy and Natural Gas".

Chart 3.1 Executive-organisational structure of the Georgian power energy sector after restructuring



✍ The amendments of the "Law on State Property Privatisation" adopted in 1998, which had created the legal basis for privatisation of the distribution companies.

The "Law on Oil and Gas" adopted in 1999, which established the Oil and Gas State Regulation Agency (the legal body of public law).It performs the licensing activities connected with oil and gas resources and operations in Georgia. It also determined the functions of the Georgian National Oil Company (joint-stock company "Saqnaftobi").Over and above this, in 1997 and 1998 the president issued decrees on "Privatisation Strategy of Georgian Power System Companies" and "Unified Plan of Privatisation of Georgian National Industry Branches", which determined the list of power sector enterprises to be privatised.

9 By the laws of Georgia of 10/17/97 #984, 04/30/99 #1934

Thus by the end of 1999 the following institutions had been established in the Georgian energy sector:

- Ministry of Fuel, responsible for determining and developing the state energy policy. It also provides power production object collocation licensing;
- Georgian National Energy Regulation Commission, independent department, legal body of public law which regulates tariffs on electricity and natural gas for generation, transmission, dispatching, distribution, import and export licensing;
- Georgian wholesale power market, legal body of private law which regulates trade relationships in power sector;
- State Oil and Gas Resources Regulating Agency, legal body of public law which provides licensing of the activities connected with oil and gas resources in Georgia;
- Georgian National Oil Company, joint-stock company with main function of managing the state share of oil and gas produced in Georgia;
- Georgian International Oil Corporation, joint-stock company responsible for oil and gas transportation from Caspian region;
- Georgian International Natural Gas Transportation Corporation, joint-stock company responsible for main gas pipelines and gas transportation (except the Caspian Sea region).

In addition to the above mentioned enterprises, a number of limited liability and joint-stock companies (with not less than 51 per cent state share) of power generation, transmission, distribution, natural gas production, transportation, oil production, transportation profiles was established. All of them have been included in privatisation list.

In 1998, according to presidential decree #403 issued on July 5, the Privatisation Strategy of Georgian Energy System Companies and large-scale privatisation in energy sector got underway.

The international tender for privatisation of "Telasi" took place at the end of 1998. Seventy five per cent of Tbilisi distribution company "Telasi" was bought by "AES" company. It also received the right to increase the tariff gradually in the course of 4 years and its long-term adoption (10 years).

In 1999 local investors bought the Kakheti distribution network.

In 2000 "AES" bought 80 per cent of shares of "Tbilsresi" power units #9 and #10 by direct purchase. The purchase contract was signed in April 2000. The investor paid USD 5 million and assumed the obligations to pay the credits spent on rehabilitation of these power units which, together with the interest, comprises USD 135 million. This also necessitated a USD 28.7 million investment over the course of six years (by the year 2000 it had already invested USD 11.2 million). Over the same period "AES" bought 100 per cent of the shares in the Khrami-1 and Khrami-2 hydropower plants with right to control. These cost "AES" USD 2.5 and 3.5 million respectively. "AES" had took obligations to pay the debts of both hydro, total 1.5 million US dollars and during 10 years invest correspondingly 9.65 and 18.2 million US dollars.

In the same year the joint-stock company 'Saqgazi', the shares of which belonged to the Russian company 'Itera', and which was providing the natural gas supply from Russia, bought 90 per cent of the shares in the joint-stock company 'TETS' by direct purchase.

Following World Bank recommendations[10] it was decided to delegate 'Georgian Wholesale Power Market', Joint-stock 'Power Transmission' and 'Power Dispatching' Ltd to foreign companies to manage for five years,[11] starting in 2001.

As of June 1, 2001, 35 large and small power plants had been privatised in Georgia. Forty eight joint-stock companies had been established in the natural gas sector. “Telavgazi” and “Tkibulgazi” shares had been completely sold. “Kaspigazi”, “Bolnisgazi”, “Gorigazi”, “Tetritskarogazi”, “Kutaisigazi” and “Rustavigazi” control packets of shares had been sold. Thirty-eight joint-stock companies remained to be privatised.

Among the ongoing processes especially important is the enlargement of the distribution companies and the fact that all Georgian power generation entities (with the exception of the Enguri hydropower plant), as well as distribution, transmission and dispatching companies and natural gas distribution companies, are engaged in the privatisation process.

Up to now, 'AES', viewed as a strategic investor, is recognised as the main achievement of the privatisation. The company had purchased 16 per cent of the power capacities, 23 per cent[12] of the distribution network and it had established the distribution company 'AES Telasi' and the generation company 'AES Mtkvari'.

An uncritical assessment has been made by some leading specialists of GERC. They think that privatisation has brought about the following important results:[13]

- Corruption has been almost entirely eradicated within the privatised entities;
- Part of the debts have been paid by the investors; payment of the other part has been stopped.
- Consumed power cost collection issue is regulated by the investor;
- The issue of power saving is gradually settling down;
- The usage of foreign credits and state liabilities are practically delegated to the investors;
- To some extent the tax payment and the state revenues have increased;
- The purchase of the energy resources and rehabilitation of the branch is provided by the investor;
- Complete payment of the consumed power had a positive influence on the other energy branches;
- The export potential usage of the branch has increased.

Such results following privatisation indicate that the state declined duties and responsibilities connected with the functioning and development of the energy sector,

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[10] Energy Sector Adjustment Credit Project, WB, 6/29/99; Electricity Market Support Project, WB, 05/03/2001

[11] Decree of president of Georgia, 28/06/2001, #254

[12] based on the population number and 21 per cent based on the energy supply

before it created social guarantees for the population. In fact it has deregulated the energy sector and that needs a much higher level of industry and social readiness. At the same time, we currently have no basis for believing that the National Energy Regulation Commission is adequately controlling, regulating and managing the situation.

The analysis shows that as a result of privatisation, by 2000 (comparing with 1990) the production volume of the Khrami-1 and Khrami-2 hydropower plants had reduced by 13 per cent; the production volume of Tbilsresi power units #9 and #10 had increased by 21 per cent, though after the 'AES Mtkvari' power unit #10 failure in 2001 its production volume significantly reduced; the power production of 'Tbiltetsi' fell by 20 per cent and then completely stopped. It should be mentioned that after privatisation, power production volumes increased on several small hydropower plants.

There are certainly some discrepancies between the current problems in the energy sector and the 'significant results' of privatisation and structural changes mentioned above. The authorities of the branch recognise:

- Consumed power charges are not fully collected;
- The power plants are not supplied with spare parts and they can not provide repair works;
- Provision of the thermal power plants with fuel is not managed;
- The plants have to pay state taxes as well as fines which take into account the amount transmitted from the plants. Though the amount actually delivered to the buyer is significantly less while the plants are paid only for the delivered amount and it is quite difficult to prove the technical causes, such as disordered or abusive relationships between producers, distributors, consumers and tax collectors. Such cases force producers to stop unprofitable power production, as they can not improve the situation alone;
- The situation of the principal funds in the branch remains problematic. Debts in the sector are gradually increasing.

In conclusion it should be noted that the first results of the structural changes performed within the Georgian energy sector have not lived up to expectations:

- results of a sociological research show that the general public does not consider itself well-off in terms of the current power supply situation;
- development and growth rate, as well as power supply reliability, within the energy sector does not appear to have risen;
- in fact the private investment and investor participation process has stopped at the level reached in 2000;
- the self-financing potential of enterprises in the branch has not risen. This is proved by the wage arrears and the existence of state subsidies, as well as by the reduction in power production (e.g. the stoppage of TETSI and power units owned by Tbilsresi) and power supply quality.

Thus the changes in the energy sector do not have suitable results. This process needs to be corrected through monitoring and critical analysis of the phased results.

4. Social conditions in Georgia (family income analysis)

Current socio-economic conditions are extremely difficult in Georgia. The standard and quality of living of 90 per cent of the population is one of the worst in the world. For years the majority of the population has lived below the poverty line. By December 2000 the minimal monthly salary of one employee out of a four member family was 45.5 Lari, while the subsistence wage was 114.5 Lari per month – Table 4.1

Table 4.1 Subsistence wage and incomes in Georgia 1996-2000, Lari/month [14]

Years	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Subsistence wage for one employee	-	105.3	101.6	115.8	114.5	115.8	123.6
Subsistence wage for average family (4 members)	199.3	191.6	182.9	-	199.2	201.3	215.0
Nominal average salary	29.0	42.5	55.4	67.5	72.3	90.1	-
Average family income		149.0					

In 1999 GDP fell 622.5 US dollars per person. It is 53 times less than in the US and 15 times less than the global average (Table 4.2).

Table 4.2 Gross Domestic Product (GDP) per person in 1999 (US dollars)

NP structure	USA	Austria	Belgium	Dane	Finland	Ireland	Luxembourg
NP per head	32 800	26 800	25 100	32 500	25 200	19 700	41 500

The dynamics of the Georgian GDP in 1995-2002 is given in Table 4.3 [15].

According to official statistics (State Department of Statistics), families can be divided into five groups (based on income)[16]:

beggary	- below -100 Lari	~ 42%
poor	- 100-300 Lari	~45%
middle class	- 300-800 Lari	~7.2%
well-to-do	- 800-1500 Lari	~4.9%
rich	- more than 1500 Lari	~0.9%

Table 4.3 Dynamics of GDP in 1995-2002

NP structure/years	1995	1996	1997	1998	1999	2000	2001	2002
NP, total (million. US dollar)	2 866.0	3 071.6	3 603.8	3 645.6	2 869.5	3 222.4	3 350.0	2....,0
NP per head (US	623.0	665.9	784.5	791.4	622.5	676.5	2.....…	2.....…

[14] Georgian Centre for Strategic Research and Development, Bulletin # 58, August 2001, p.p. 22-35
[15] Georgian Centre for Strategic Research and Development, Bulletin # 62, October 2001, p.p. 3-26
[16] Georgian Centre for Strategic Research and Development, Bulletin # 1, June 1997, p.p. 57-63

dollar)							0	0
NP growth, %		+6.9	+17.4	+1.2	-21.5	+9.7	....	....

Structural analysis of the population shows that 42 per cent of the families can not exist even if they spend 100 per cent of their income on food. Such families do not pay any communal-general service charges and the state does not have any tools and moral basis to force the families with such income to pay the above mentioned charges.

The middle class, the base for social stability and economic development in the country, comprises only 7.2 per cent of the population, in other words it is practically non-existent (the same category reaches 70-80 per cent in democratic countries).

This asymmetry between income distributions among the different social layers is catastrophic. Decile coefficient, which shows the discrepancy between the incomes of 10 per cent of the richest population and 10 per cent of the poorest population, is 85 while in developed countries this coefficient is about 6-8 [17]. As we mentioned above this is official data; independent experts claim that the real situation is even worse.

According to official data, in 1999-2000 the power and fuel expenses of the population had increased from 14.2 million Lari to 17.5 million Lari (from 7.8 to 9.9 million Lari in cities and from 6.4 to 7.6 million Lari in the countryside); the average monthly income of one household had increased from 12.5 to 15.8 Lari (from 12.7 to 16.6 Lari in cities, and from 12.2 to 14.8 Lari in the countryside); the average monthly expenses per person had also increased from 3.6 to 4.2 Lari (from 3.6 to 4.5 Lari in cities and from 3.5 to 3.9 Lari in country side).

Table 4.4 shows monthly communal-general and fuel expenses of families with various incomes in recent years.

Table 4.4 Monthly communal-general service and fuel expenses of families with various incomes

	Income below 100 lari	Income 100-300 lari	Income 300-800 lari	Income 800-1500 lari	Income more then1500 lari
Communal-general service and fuel	2% (2lari)	3% (9lari)	4%(32lari)	3% (45lari)	3% (60lari)

The figures given above show that the current socio-economic situation, as well as emotional-psychological conditions in Georgia, do not provide a basis for ensuring the complete payment of energy resources and electricity charges. Is the income generated by the population enough to pay for the minimum required energy consumption? It could be calculated by comparing the parameters given above with the energy requirement values. This latter point is discussed in the following chapter.

[17] Georgian Centre for Strategic Research and Development, Bulletin # 64, January 2002, p.p. 33-59

5. Energy demands, paying capacity and energy comfort of the population. Psychological environment and paying culture

Basically energy demand[18] and paying capacity are interdependent parameters. When paying capacity is high, energy demand is rising and vice versa. The correspondence between energy demand and paying capacity fails if the population is unable to pay for the minimum required energy resources. In that case it is forced to reduce energy consumption below the required minimum and thus puts its well-being in danger or it uses the required energy but cannot pay the charges. Both cases are present in Georgia. It is caused mainly by low income levels.

The existing energy/energy resources standards of use represent the projected values and are figured out according to human living conditions and sanitary-hygienic requirements. These requirements, according to construction regulations, are obligatory for all types of household sector objects. The strict changes in living conditions in recent years have brought about a necessity for revising the above mentioned standards. This issue is even more important as it deals with the inevitable reduction of demand on energy for the consumer paying capacity on the one hand and with maintaining nominal living standards of the population on the other hand.

The household energy demand of the average Georgian family (4 members) is given in Table 5.1. The values are based on different experts' assessment, social survey results conducted by the Sociological Research Center (SRC), also comparing the previous standards and current statistical data.

Table 5.1. The household energy demand of the average Georgian family (4 members) experts assessment

Electricity Consumption by Household Equipments

KW*hour/year./family		1930
Meal preparation		
energy demand for meal preparation	KW/family	2
average time needed for meal preparation	hour/day	5
energy demand for meal preparation for 1 family	KW*h/year/family	3650
	KW*h/day/family	10
energy demand for meal preparation for 1 person	KW*h/year/person	830
	KW*h/day/person	2.3

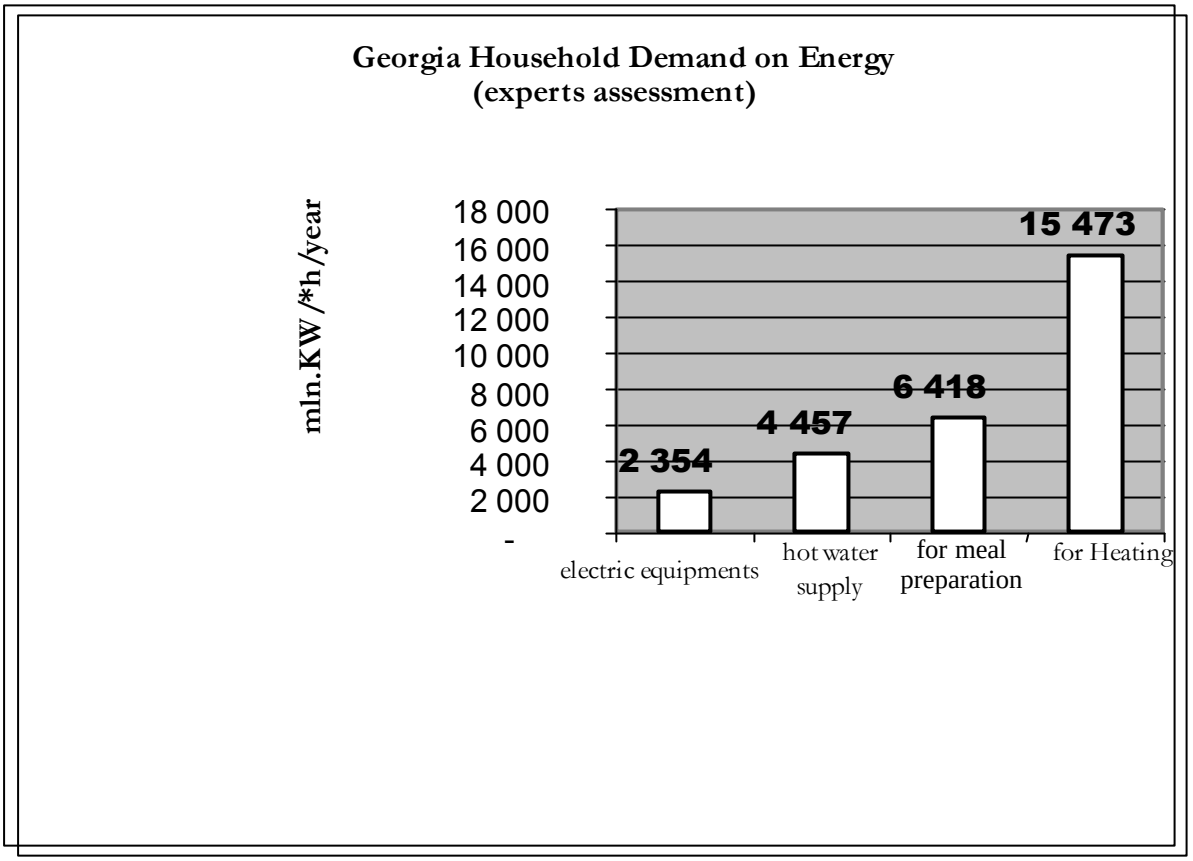
[18] The following definitions are introduced: 'energy demand' – demanded level of comfort energy; 'comfort energy' – level of satisfaction of energy demand

Water Supply

capacity	KW/family	1.2
Coefficient of capacity using hours	-	0.5
Water Supply Session Duration	Day/year	365
energy demand for 1 family water heating	KW*h/year/family	5 256
	KW*h/day/family	14.4
energy demand for 1 person water heating	KW*h/year/person	1 195
	KW*h/day/person	3

Heating

heating capacity needed for living space heating	W/m^2	80
heating capacity needed for 1 family living space heating	KW/family	3.52
Heating season duration	day/year	150
Thermal Energy needed for 1 family living space	KW*h/y/family	12 672
	KW*h/day/family	84.5
Thermal Energy needed for 1 person	KW*h/year/person	2 880
	KW*h/day/person	19



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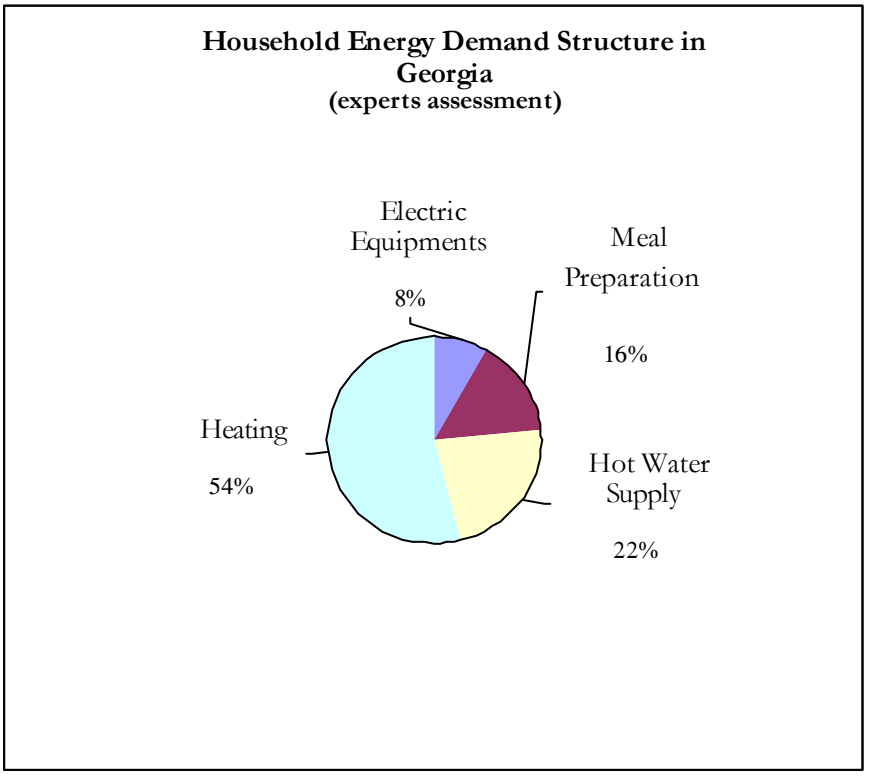

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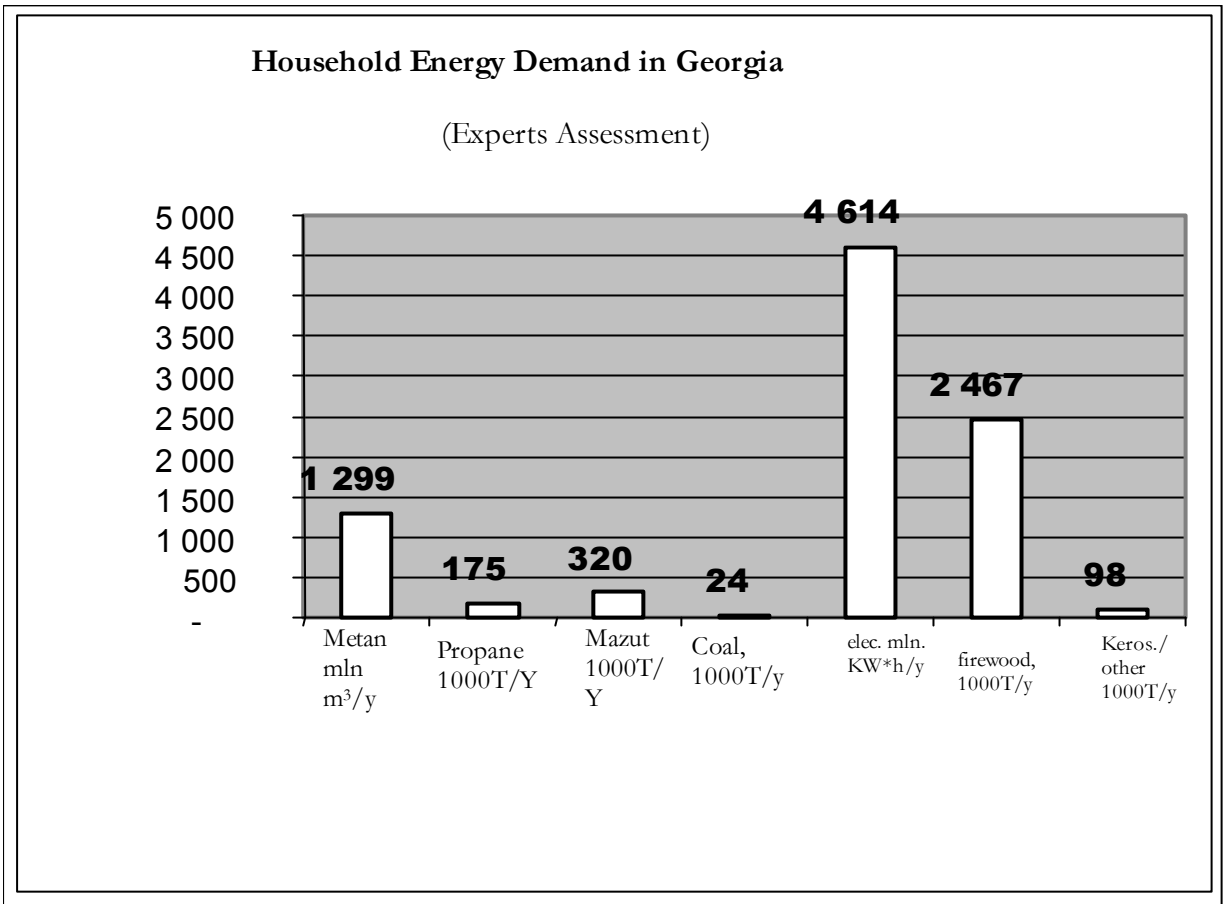

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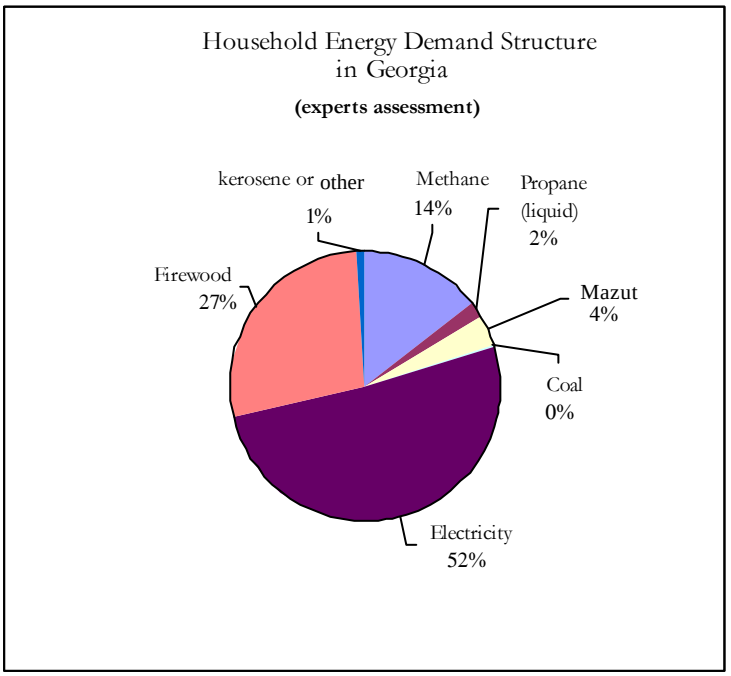

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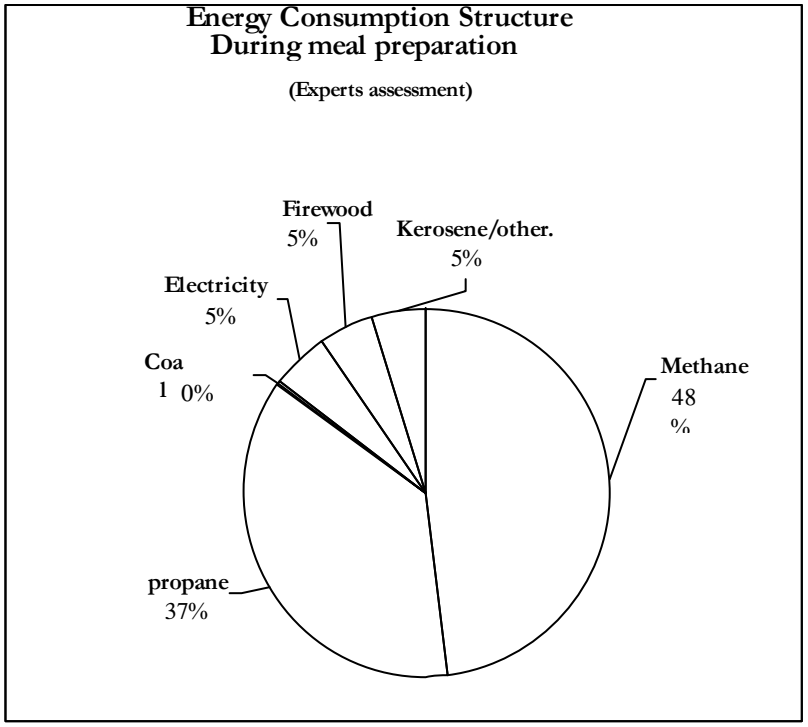

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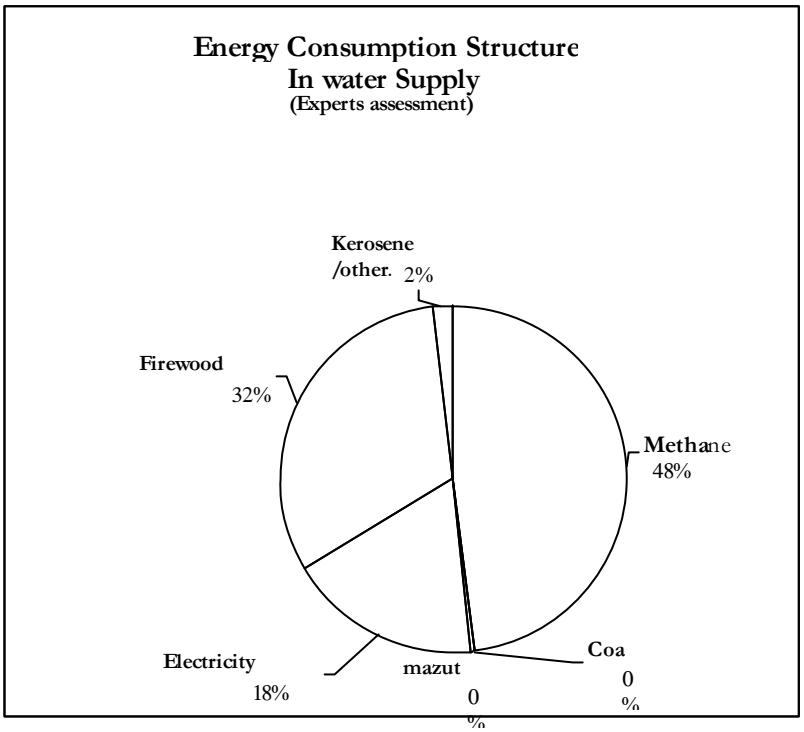

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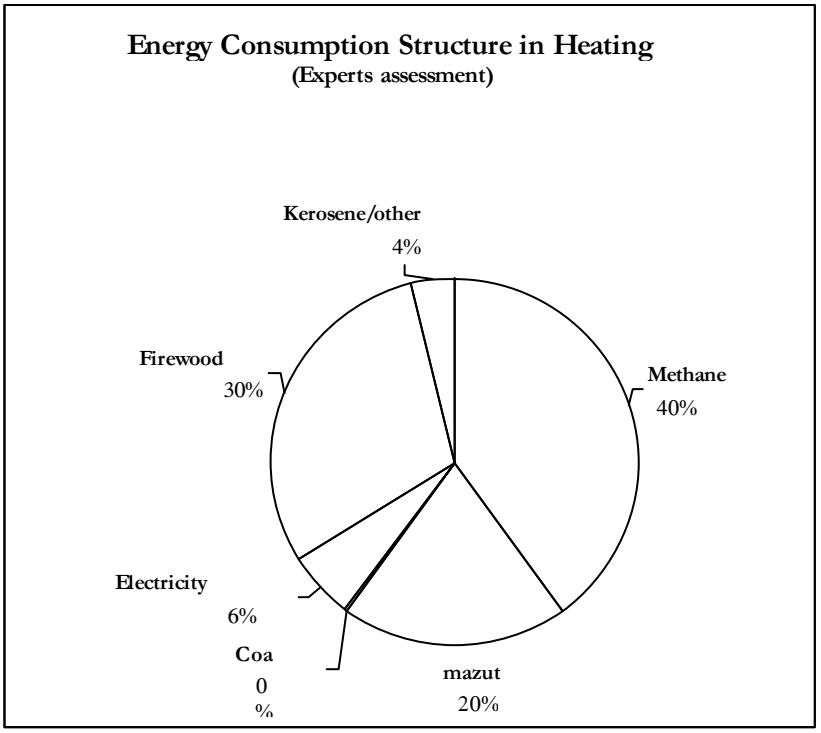


Picture 5.1,g)

Table 5.2 shows average charges, adjusted in 1998-2001, for different energy resources in Georgia.

In recent years access to energy resources for the population has reduced significantly. Numerous reasons account for this including a worsening of the supply systems and management as well as a drastic increase in energy resource charges.

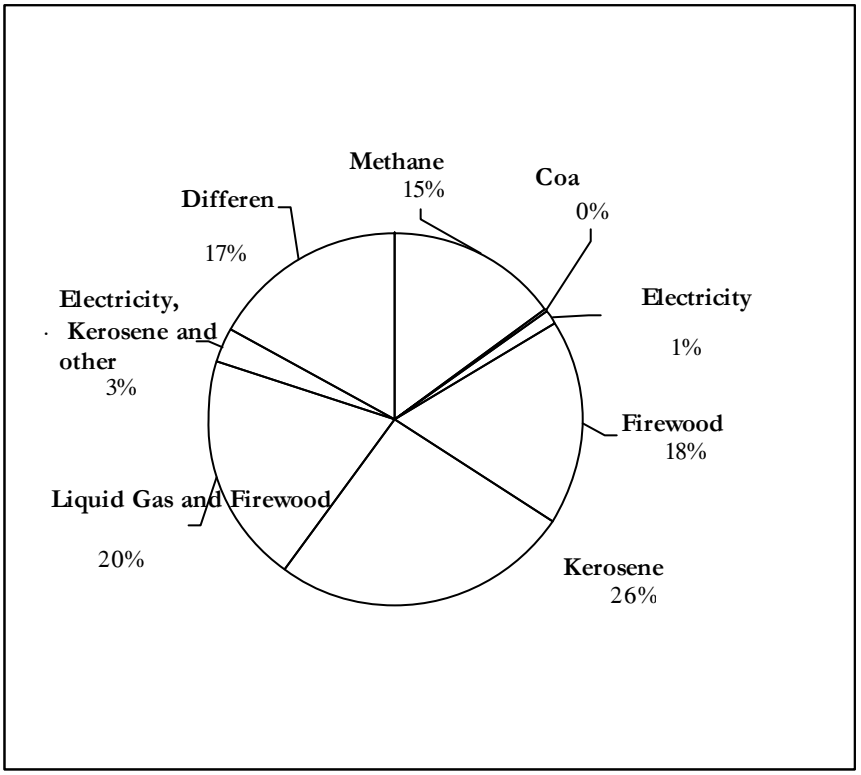
Currently, based on energy resource use, the population can be divided into the following categories:

?? Category I – families who use only natural gas for heating cooking and water heating only natural gas (so called methane group);
?? Category II –families who use only coal for the same purposes (coal group);
?? Category III –families who use only electricity (electricity group);
?? Category IV – only firewood (firewood group);
?? Category V – only kerosene or other (kerosene group);
?? Category VI – families who use liquid gas for cooking and firewood for water heating and heating (liquid gas and firewood group);
?? Category VII – families who use electricity for cooking and water heating and kerosene for heating (electricity, kerosene and other alternative sources group);
?? Category VIII – families who use mixed resources (mixed sources group).

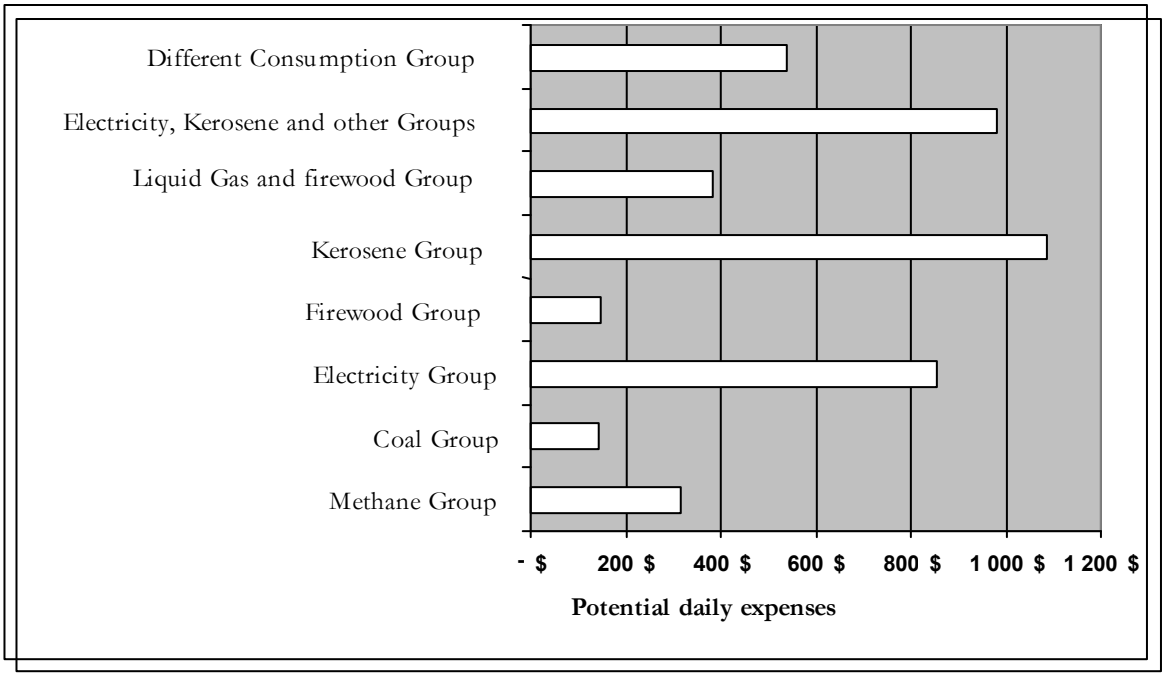
The percentage of each category and the cost of energy resources consumed annually by each group are shown correspondingly in charts 5.2 and 5.3

Table 5.2 Average charges, adjusted in 1998-2001, for different energy resources in Georgia.

Kind of energy Resource	Purchasing Price	Measure
Natural Gas	0.27	lari/m^3
Propane (liquid)	1.40	lari/kg
mazut	0.14	lari/L
Kerosene	1.00	lari/L
Light oil products.	1.00	lari/L
Petrol	1.00	lari/L
Diesel Fuel	0.80	lari/L
Firewood	15-25	lari/m^3
Coal	15-35	lari/t



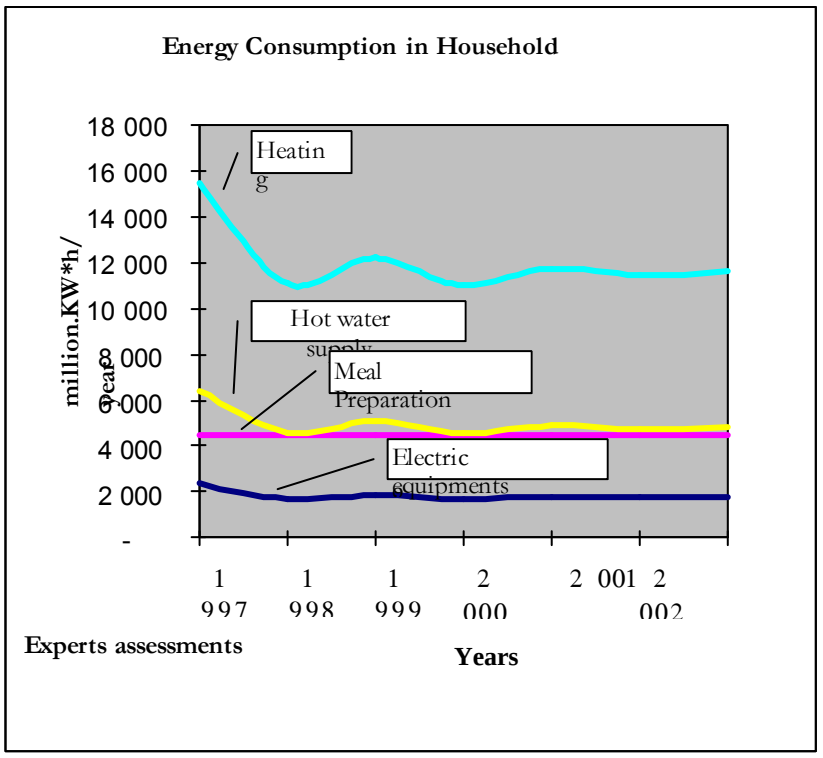
Picture 5.2 The percentage of consumers using different energy sources in 2001-2002 (experts assessment)



Picture 5.3 Cost of energy sources (including electricity) consumed by different category of consumers in 2001-2002 (experts assessment)

According to official data, the subsistence wage for one able-bodied man in 1998 constituted 96.7 lari per month (USD 545 per year); in 1999 this rose to 127.3 lari per month (USD 720 per year), though the average annual income of 65-80 per cent of Georgian families is less then USD 230-600 . If we compare these figures to the data given in chart 5.3 it becomes evident that even in the case of the cheapest energy use (coal and firewood groups) the majority of the population will be spending 25-50 per cent of their income. Taken together with expenditures of vital necessity (subsistence wage), this exceeds the annual income of the families. This clearly demonstrates the extremely low paying capacity of the population.

Chart 5.4 shows the dynamics of energy and energy resource consumption changes in the Georgian household sector between 1997 and 2002. The abscissa axis according to "the experts' assessment" corresponds to the energy demand/consumption standards. It is clear that a decrease in energy consumption in the household sector over the period 1997-2002 took place in line with a reduction in water heating and power tools' usage . The power usage for cooking purposes remained more or less constant.



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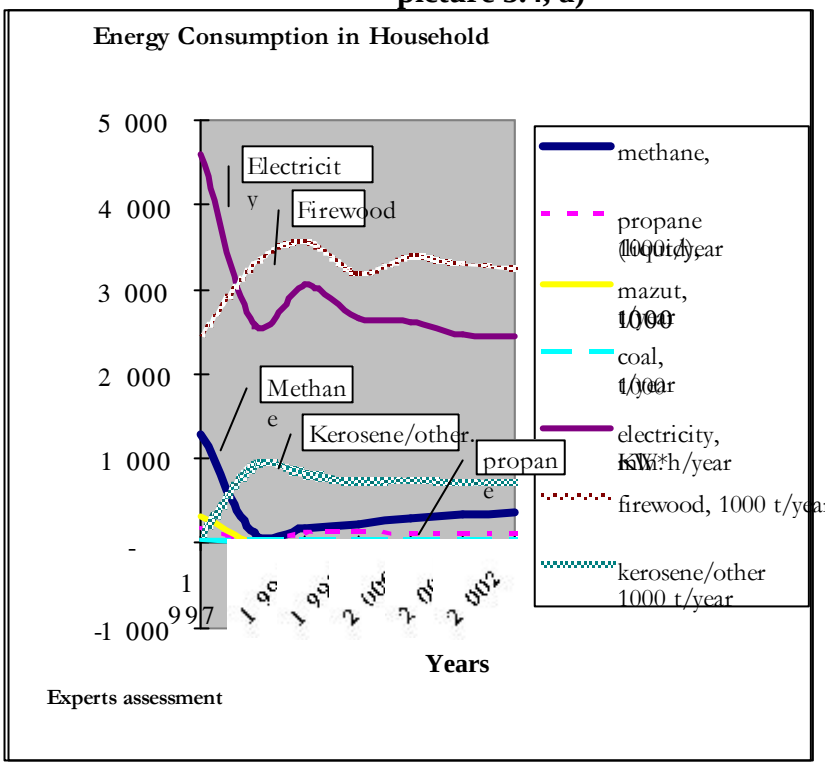


picture 5.4, b)

Picture. 5.4 Dynamics of energy and energy resources consumption changes in Georgian household sector in 1997-2002.(experts assessment)

Chart 5.4 shows that the energy comfort level of the population is 30-50 per cent less than required. This negatively impacted on health standards.

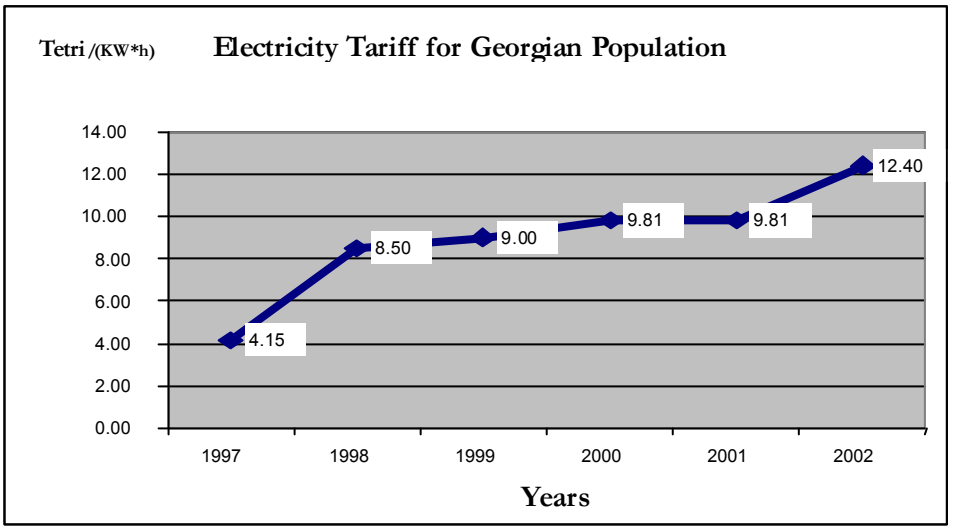
The low level of professionalism and high level of corruption in the management system causes distrust among the population and makes any reforms inconsistent. The population does not believe that power charges will go to the state budget and thus result in a rise in the overall standard of living.

On the other hand, scanty or no incomes do not mean that there is an absence of needs (including power needs). A person with a salary of 35 lari per month needs the same energy comfort (heating, light, hot water, etc.) as any top official.

That is why the unwritten market law "if there is a demand – it should be satisfied" forces citizens to overlook power charges by all means (deals with the power company representatives, spoiling the power meters, etc.). Currently only 35-40 per cent (based on the different sources) of the total consumed power cost is collected in Georgia; 65-72 per cent from the household sector in Tbilisi and about 12-15 per cent throughout the countryside, according to data collected in 2003 (source: United Power Distribution Company). It should be stressed that in the countryside only 2-3 per cent is collected in monetary form. The rest is paid in various forms – debt set offs, etc.

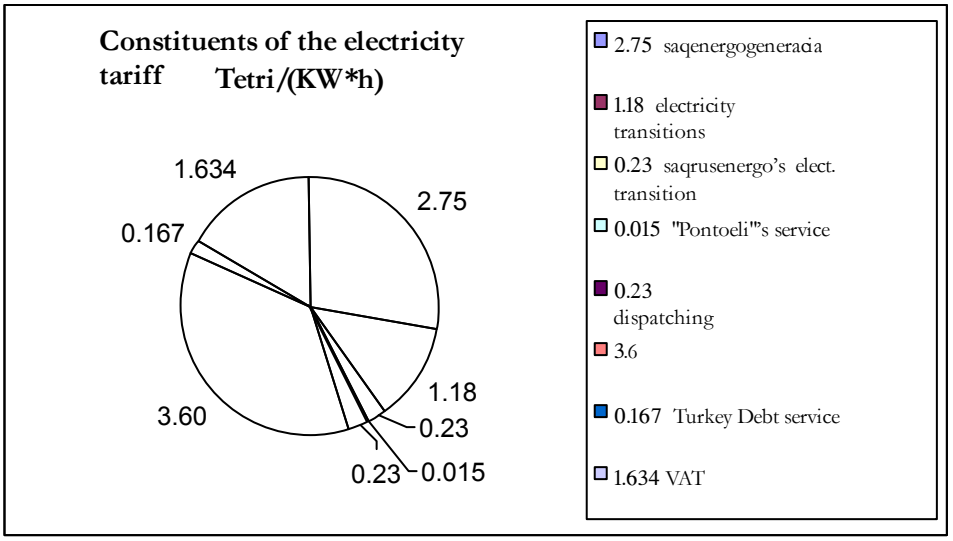
6. Tariff changes caused by structural changes

On the basis of these facts above it is clear that any changes in the Georgian energy sector that cause tariff deviation will have maximum and direct influence on the living conditions of the population. As a result of recent structural changes in the sector the energy tariffs have risen significantly . A good example of this is the power tariff rise in Tbilisi – Chart 6.1.



Picture 6.1 Dynamic of electricity tariff change for Georgian (Tbilisi) population in 1997-2002

This extremely sharp rise took place in 1998, when the strategic investor AES entered the power sector and started to implement tariffs based on the total cost of power. Every institution established during this and the following period of restructuring has made its contribution to the tariff structure – Chart 6.2



Picture 6.2 Constituents of the electricity tariff for population of Tbilisi in accordance with energy system institutional bodies in 2000-01

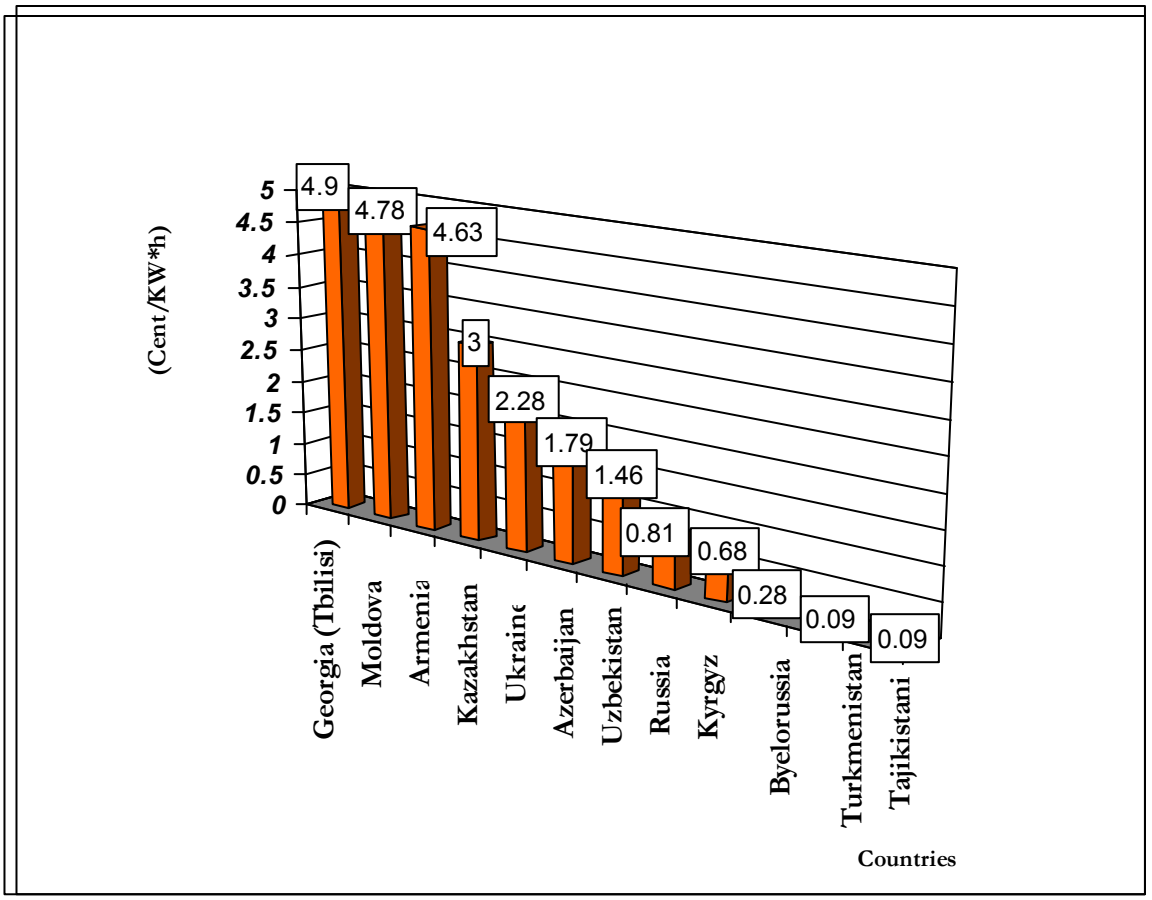
As a result Georgia maintained the highest power tariff among the countries of the Commonwealth of Independent States (Chart 6.3), notwithstanding the fact that the hydropower plants' share in the country power production comprised 80-85 per cent.

Was such a sharp power tariff rise so inevitable and were there objective grounds for it in Georgia? There are conflicting opinions surrounding this issue. Below we detail some of them, with our comments added.

According to GNERC (Georgian National Energy Regulation Commission) the causes of tariff rise are as follows:

?? The fund- profit component (annual accrued interest to the funds value) was added to the electricity tariff The fund-profit accrued interest deviates from 10 to 20 per cent per year ;
?? The market cost of the funds rose and was determined as a final revaluation result;
?? Amortization accrued interests have increased from 2-3 per cent to 7-8 per cent per year;
?? Repair materials have risen in price;
?? Repair expenses have been added to the electricity cost - these comprise 5 per cent of the main funds cost.

We believe that the given explanations are of a general character and cannot serve as a complete (exact) justification of the reasons for increasing the rates. At present the method for establishing the tariff rates, the rate for electricity, could have been fixed at an even higher extent, due to the lack of restrictions in determining the market cost of funds, not even mentioning the interest rates on amortization extra charges, repairs expenditures, etc.. It is supposed that the role of "GNERC" in establishing the rates is minimal. It appears that GNERC is deprived of the possibility of carrying out expert judgment and auditing and is confined to the approval of the rates, presented by the licensees.



Picture 6.3 Average retail tariff for electricity in countries of the Commonwealth of Independent States in 1999-2000

Under Article 12 of Tariff Methodology, use of the tariff, based on total value, is advisable at the first stage of the formation of the wholesale market and takes as its first objective the attraction of investments at maximum extent. After the first round of privatisation, since the strategic investor was established in Georgia, the process of privatisation has in fact been stopped, and the tariff, based on the total value of electricity, converted into the product of "Identified Need". This is at present used for the state power enterprises, with the result that while tariff methodology may well correspond to the main principles of economics and power engineering it does not, however, tally with the present situation.

For instance, the theoretical consumption of electric industry throughout the second half of 1999 was 14,058,000 GEL, and the output constituted 3,106,400,000[19] KW*hour, i.e. the theoretical cost of electric generation was 4.6 Tetri/(KW/hour). At thermoelectric power stations the cost of fuel, necessary to generate 3, 800,000,000 KW*hour/year electricity, was 200,000,000 GEL[20], i.e. the cost of electrical generation was 5.2 Tetri/(KW*hour). Accordingly, it is difficult to explain why the final tariff is twice as high (as minimum) as that of the electricity, generated through thermoelectric power stations; even more puzzling is the fact that the share of hydroelectric power plants in electric power generation much exceeds the share of thermoelectric power stations.

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[19] Georgian National Energy Regulatory Commission, Basics of Energy Regulation, Chapter I, p.165

[20] Georgian National Energy Regulatory Commission, Basics of Energy Regulation, Chapter I, p.54

It is the view of some independent experts[21] that the tariff based on total value has lost its significance for most of the enterprises in the sector. Under the present circumstances , real fees are impossibly far from the total value which serves as a basis for determining the tariff. At the same time, the level of tariff has no affect on the amount of money which is received by the enterprises. This is caused by the fact that credit and debit debts of the state power enterprises balance each other and settlement is effected by means of offsetting. At any given time, those poor amounts, transferred to the enterprise accounts, are not used for covering their operational costs and are transmitted to the accounts of tax services.

It can be assumed from this that the tariff methodology, as well as tariff policy in general, needs to be subjected to serious changes if it is to be made more accurate. We believe, as regards the methodology, it is necessary to carry out auditing of components of fund gain and amortization extra charge within the tariff for electricity. They should be determined and re-estimated on a periodic basis, and this should be executed by using western methodology which requires an undisputed forecasting of common market conditions. This method will ensure the correct estimation of present and future costs of the mentioned parameters, and lays the foundation for the impartial determination of tariffs.

In respect of policy, it is currently quite hard to define the basis for the country's tariff policy throughout the electrical power sector – foreign commerce with electricity or the provision of meeting the consumer's needs, attraction of additional investments or the effort to realise the present resources more effectively, privatisation or the establishment of social enterprises, etc. The situation in place today demonstrates that the power policy pursued throughout the country is oriented towards the import of electricity rather than towards the rehabilitation and realisation of internal resources. If this is the starting point, purposefully directed towards the effort to help foreigners render maximum assistance in respect of energetic sector, to carry out its thorough rehabilitation within the period of time, envisaged in advance(!); and there is the established forecast (!) that during the given period in our neighbouring countries the tariff for electricity will considerably increase and at the end country will turn out to be competitive throughout the broadened power market, having in addition, "technically reliable power engineering" – in such a case, the established situation may be estimated as a strategically necessary stage. However, this is perhaps not a fair basis for this kind of forecasting, for on the one hand, the results which should have been of benefit long ago throughout the power sector have not been realised; on the other hand, there are no guarantees for social (as well as national) safety as a result of the executed reforms.

One of the reasons for increasing the electricity tariff is connected with the requirement of the International Monetary Fund, under which, as far as we are aware , the debt of the population, accumulated throughout the current year, is to be paid off by next year's tariff. The Fund considers that by this measure the payment to the state budget will increase the possibility of safeguarding the social security of vulnerable groups within society. Namely, through the additional amounts of money paid to the budget, projects designed to aid vulnerable groups should become possible.

We think that in today's climate, when national income levels compare unfavourably with the growth in the tariff, this kind of approach will entail continuous tariff growth. Thus

[21] M. Margvelashvili, Some Issues of Tariff Methodology, Tbilisi, 2002

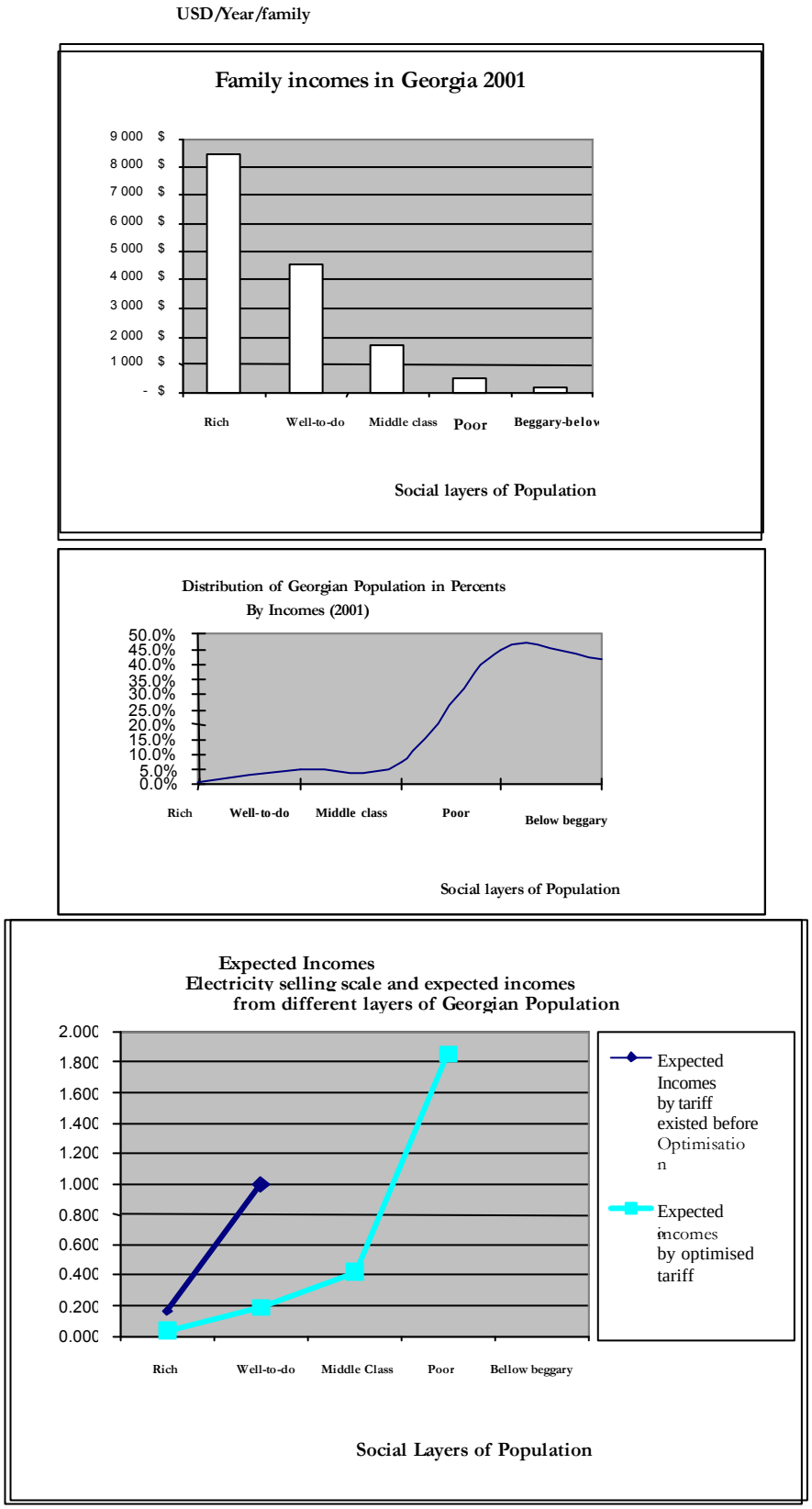
increases in the tariff will cause increases in the number of financially insecure members of the population. The extent of charging the value of electricity will accordingly decrease, and the debt of the population will increase. Paying the "new" debts to the following year's electricity tariff will increase the latter; the above-described cycle of tariff growth will take place repeatedly and spiral endlessly.

It can be surmised that the final outcome of this will be not only growth in the tariff, but also a reduction in budgetary income. Due to this, welfare allowance for the vulnerable groups in Georgian society will only become possible if the national employment rate increases in parallel with the tariff growth process, and therefore also the population's income.

Alternatively, it is worth paying attention to the following formula: production value decreases, its consumption extent increases so that the total income from the production realisation increases. Application of the given formula is possible within the electrical power sector by the following diagram: tariff optimisation (reduction) takes place; therefore, the numbers of financially secure citizens increases (many more people are able to pay the tariff for electricity compared with the number who can during the higher tariff regime); the income from electricity increases.

Evaluative calculations carried out demonstrate that as a result of the tariff optimisation (reduction) for electricity throughout Georgia, the groups of population able to pay the tariff will be added by two other solvent groups – middle and poor. As a result, the amount of money paid for electricity will be more (Picture. 6.4).

In conclusion, it can be noted that there are several reasons for increasing the energy supply service. Among them are the irrational state economic policy, the density of institutional red tape within the power sector, faulty tariff methodology, and the absence of active mechanisms directed towards the protection of the population.



Picture 6.4. Expected results of energy tariff optimisation in Georgia

7. Practice and perspectives for establishing energy efficient technologies and energy saving measures in Georgia

At the very outset of the reform process in the Georgian power sector, the question of applying energy efficient technologies and energy saving measures became urgent. To this end, the estimation of the potential available in the country was first carried out within the limits of the project for the optimal development of the Georgian power engineering sector[22]. The evaluation activities included the block of energy saving and energy efficient technologies. For the industrial sector this represented the application of multi-speed electric engines, optimisation of transformer power and working mode, exploitation of reactive jacks and anti-overload safety device for engines, establishment of metering systems for power consumption of power resources, economic decentralised systems of energy-saving illumination and power generation. The evaluations demonstrated that by systematic introduction of the mentioned systems it would become possible throughout the industrial sector to save at least 200 million K Wt h/year of electricity by 2005.

For the domestic sector the potential of technologies and measures such as the reduction of heat waste by means of double glazing or so-called warming, the use of compact fluorescence bulbs to save energy, the application of A/C provision systems based on heat pumps and high-efficient electric device, and the application of sun collectors for hot water provision have all been estimated.

Lately an agency-type service has been established in Georgia – "Energy Efficiency Center" - which undertook important activities in relation to the energy auditing of the industrial enterprises. This service also worked out and established the methods for energy auditing.

Practical implementation of the first energy efficiency projects began in 1998. The pioneers of this activity were the so-called " Green Brigades", who implemented energy saving demonstration projects in different regions of Georgia.

The process of implementation of large-scale energy efficiency projects began in 2000 within the limits of program "S1" by the company "Consulting". The Association of Engineers and Power Engineering Specialists, as a sub-contractor, is managing these activities. At the first stage of this program, 42 demonstration projects were carried out. The projects were implemented via domestic, educational, industrial and commercial sectors and were aiming for the following results:

a) Warming activity for the purpose of reducing infiltration-and-exfiltration waste in buildings;

b) Installation of heating systems, operable on natural-gas radiators;

c) Installation of heating system based on natural-gas and liquid-fuel boiler and standard water radiators;

d) Substitution of the present fluorescent bulb system in order to save energy;

[22] Least Costly Plan for Energy Sector in Georgia, Final Report, Energy Efficiency and Market Reform Project, 1998

e) Repairing of roofs and roof warming.

Economic efficiency gained through energy saving measures is referred to in Table 7.1.

Table 7.1. Economic efficiency indicators gained through energy saving measures, implemented on various entities

Object	Power saving activity	Annual Saving		Initial investment	Simple feedback	S/i*
		Heat consump. MW*h/y	Amount USD/y	USD	year	
Mini-market	a, b, d	7	1637	3496	2.1	1.86
Secondary school #56	a, b, d, e	11	5506	22740	4.1	1.01
Restaurant "Aragvi"	a, b, d	65	2752	9183	3.3	1.2
Fashion house	a, b, d	7	1526	4220.5	2.8	1.45

*) s/i – saving divided on the investment in entire exploitation cycle

During the period of 2001-2002, the second stage of the program was implemented. During this period, 34 demonstration projects for energy efficiency were implemented mainly in the industrial sector. The projects included: the optimisation of the operational modes of transformer and water-pumping stations; the introduction of automatically controlled illumination systems at hotels, hospitals and arrangement of complex energy supply systems in clinics; the construction of micro hydro power stations; the manufacture of bio-gas generators and their installation throughout the farming sector ; the assembly of solar collectors at hotel service entities; the implementation of energy saving measures in Tbilisi Metropolitan; the implementation of stable and efficient energy supply systems at food-stuff enterprises, etc.

Evaluative calculations demonstrate that there is significant potential for energy saving in Georgia. Through the optimisation of power and operational modes of transformer assemblies four million KW*h of electricity can be saved annually; by using energy-effective bulbs for outdoor illumination in big cities 6-7 million KW*h of electricity can be saved annually; by waste reduction in the drinking water supply system, 30 million KW*h of electricity can further be saved annually; and by the optimisation of operational modes of water pumping stations, 40 million KW*h of electricity can also be saved annually.

In conclusion, it should be mentioned that the further realisation and employment of energy efficient potentials is necessary in Georgia. This could play a major part in the future improvement of national power engineering and the living conditions of every citizen in the country.

8. Energy supply security for the population, economic criteria for living standards and social security programs

Energy supply reliability for the Georgian population is connected with two different technical and economic factors. The effect of the technical factor depends on the technical condition and the degree of readiness of the power engineering system. To this end, by the end of 2002/beginning of 2003, the official reason for frequent interruptions to the energy supply was often attributed to technical faults in the power system. The economic factor vis-à-vis energy supply reliability is dependant on the state of the population's income and social security.

The general economic situation in Georgia over the period 1996-2001 is shown below. During this period, on no occasion was the state budget balanced (Table 8.1.)[23]. This table also demonstrates the annual energy consumption per person (See Picture 8.1.).

One of the reasons for the budgetary crisis was the so-called "Traditional seasonal factor, taking place in economy" or the drop industrial production during the winter period due to obstacles in the energy supply sector[24].

Table 8.1. Indicators of implementation of state budgetary income plan for the period 1996-2001

Budget/years	1996	1997	1998	1999	2000	2001
Plan, million. lari	562.8	680.4	752.2	922.5	695.1	845.2
Factual, million. lari	518.1	593.2	621.9	650.2	640.3	758.3
discrepancy, million. lari	-44.7	-87.2	-130.3	-272.3	-54.8	-86.9
Plan fulfilment, %	92.0	87.2	82.7	70.5	92.1	89.7

A production decrease, when compared with private sectors, takes place more rapidly in state sectors, where tax collection to a certain extent is always possible. Non-payment of taxes within the private sector is not an impossibly difficult task. Most of the production in the private sector goes unregistered. According to the data of the Corruption Research Center, 75-80 per cent of entrepreneurs do not show their actual profits in accounting. Under this present widespread corruption, neither do effective tax tariffs provide a basis for encouraging payment. Within the present operational mode of the tax system there is no advantages of or fair legal financial approaches and transparent accounting for the entrepreneurs.. Accordingly, the present taxation system and its apparatus in Georgia are considered to be impediments to growth in the legal economy, and therefore there are great incentives for corruption and the black economy. According to rough calculations , via a payment of USD 72 million as a bribe in 1999, private entrepreneurs gained the right to conceal half a billion US dollars from the tax authorities[25].

[23] Georgian Centre for Strategic Research and Development, Bulletin # 73, 2002, p.p. 26-37

[24] Georgia Economy Trends, GEPLAC, Quarterly Review, #1, 2001, p. 14

[25] Georgian Centre for Strategic Research and Development, Bulletin # 44, September 2002, p.p. 3-10

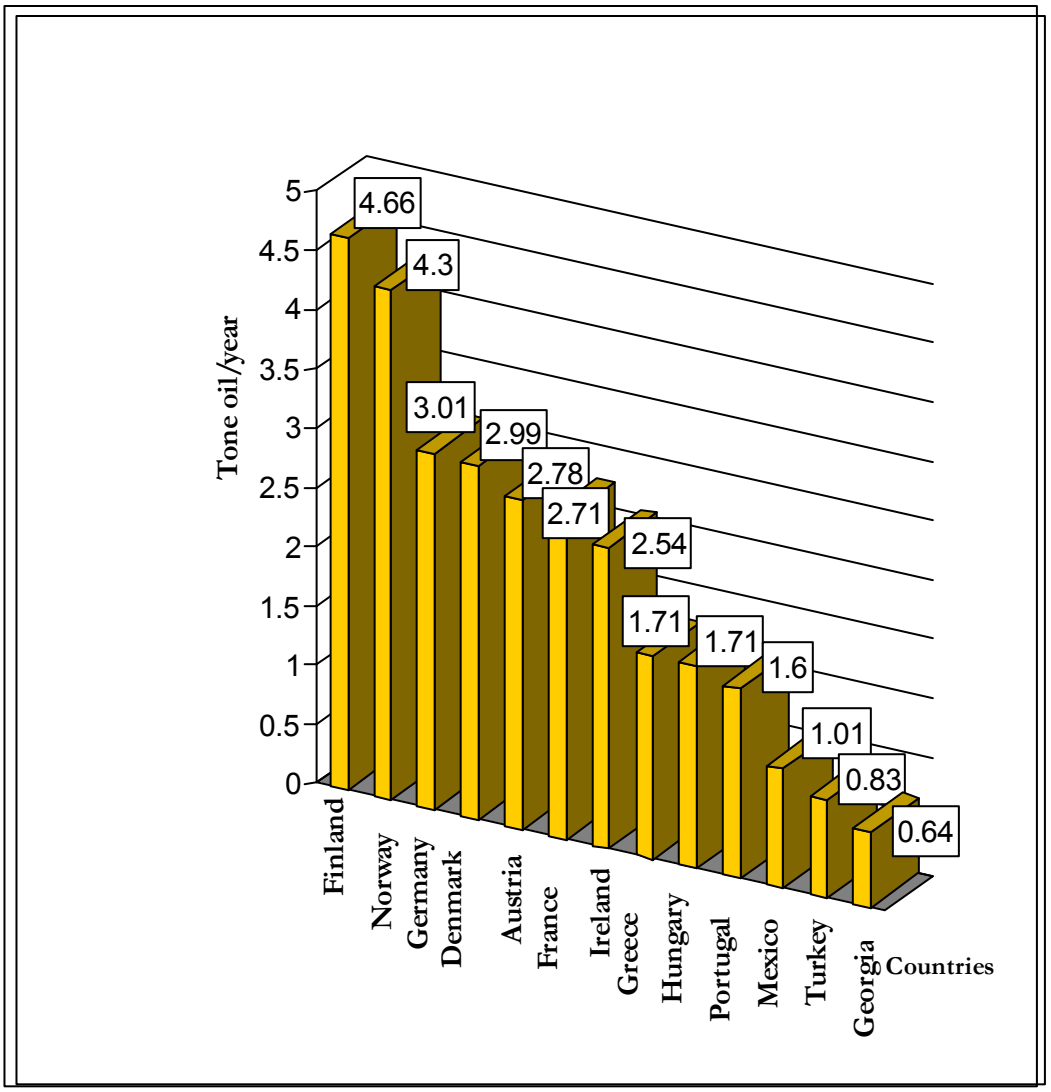


Chart. 8.1. Annual energy consumption per citizen in various countries.

The result of this is that growth in budgetary costs is higher than income growth: as a result there is a budgetary crisis in the country.

The budgetary crisis produces acute social effects, for it seems to be inevitable that budgetary costs should be cut, where of course social transfers are affected. Neither is the salary and welfare allowances pegged to the rate of inflation. Due to this, in spite of the fact that income rate being maintained or increased marginally, the real income of the population decreases. Accordingly, the state budget is deprived of one of its functions, namely ensuring fair income distribution, social impartiality and the improvement of general living standards.

In recent years, the costs for social insurance and social security measures, envisaged by the plan, constituted 3,8 per cent of GDP. According to this index, Georgia is well behind not only developed but also developing countries . (Table 8.2.)

Table 8.2. Share of welfare allowance in GDP

Count	Austr	Byelorus	Latv	Finla	Roma	Singap	Georg	Turk	Hunga

ry	ia	sia	ia	nd	nia	ore	ia	ey	ry
Share, %	24.5	12	9.1	30.5	16.9	7.2	3.8	4.9	14.8

One of the most important areas of social spending is pensions. Today there are about 1 million pensioners in Georgia. Their monthly pension is 14 GEL (Table 8.3.)

Table 8.3. Registered number of pensioners and pension tariff in Georgia

Years	1996	1997	1998	1999	2000
Quantity of pensioner, head	1022.0	979.4	967.4	927.7	900.4
Amount of pension, lari/month	10.2	11.1	14.0	14.0	14.0

According to the data for 2000, the share of pensions in living wage of the average consumer constituted 14 per cent, and by March 2001 this figure was 13, 7 per cent. Compounding these miniscule figures is the fact that pensions often go unpaid for 3-4 months, and there have been cases of pension misappropriation and overpayment., Thus we have an acute crisis in the Georgian pension system today.

As for the state welfare allowance, this is intended for families, constituting of orphans and/or lone unemployed pensioners, who have no official breadwinner. This is in fact a small extra which together with symbolic pensions is supposed to be given to the most vulnerable group of pensioners, and is also a minor assistance for orphan children. By Presidential Decree of August 21, 2000, the state welfare allowance sum for suitable one-person families or for each orphan child under guardianship is 20GEL; for suitable two- or more-person families the sum is 29GEL. At present, under the Presidential Decree of February 10, 2001, the state welfare allowance for suitable one-person families is up to 22GEL, and for suitable two- or more-person families it has risen to 35 GEL.

Like the pensions and state welfare allowances, the unemployment allowance is also symbolic (Table 8.4.). In order to be granted this kind of allowance, an unemployed person should undertake registration and should accordingly have a certificate to work in the state sector. Due to this fact, those unemployed who have bothered to register are less than the actual real unemployed total. Thus, the number of unemployed receiving the allowance is lower than the actual number of unemployed (in the first quarter of 2001, 2per cent of the registered unemployed).

Table 8.4. Number of registered unemployed and unemployment allowance

Years	**1991**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
Registered unemployed, thousand	3.5	61.1	57.7	142.5	98.7	100.4	117.3
Number of unemployed, who receive dole, thousand	1.8	2.6	8.0	4.9	2.0	1.9	2.8
Average amount of unemployment benefit per person/ a month, lari	129.6	4.2	7.9	9.2	9.5	10.3	11.8

There were about 22 kinds of allowances in Georgia for electricity consumers. On December 24, 1999, these allowances were limited to those consumers who were exempt from electricity tax - free-of-charge electricity was limited to 50 KW*h/month; for families with two or more members, free electricity was limited to 75 KW*h/month; for those people who were getting half of their consumed electricity paid for by the state, the free electricity was limited to 30 KW*h/month; and for families in similar circumstances, with two or more members, the rate of free electricity was limited to 45 KW*.h/month.

Conclusions

? ? It is currently impossible to determine the real level of energy demand (electricity, natural gas, mazut, firewood, liquid gas, coal, etc.) in Georgia: There are no strict, documented payments between energy consumers and suppliers; neither are there objective calculations of the consumed energy in the majority of regions; for a majority of consumers the supply of energy is limited; and energy consumption does not relate to necessity. According to official data energy consumption is identified as energy demand, though while energy supply as well as paying capacity is limited this does not reveal the real energy demand.

? ?The existing power generating entities as well as transmission and distribution systems in Georgia, due to technical problems could not satisfy demand on electricity during the winter time, despite the sharp decrease in energy consumption (from 14 billion kw/h to 6-8 billion kw/h a year).

? ?Thermal power plants' share of the base electric power generation is sharply decreasing while hydro power plants' share is increasing yearly. Such conditions make it impossible for regulating hydro power stations so that they reserve power for the winter peaks. As a result expensive electric power is imported from neighbouring countries.

? ?Established conditions show that Georgia's energy policy is geared towards importing power instead of rehabilitating and capitalising on domestic resources.

? ?The household sector has become the main energy consumer. Correspondingly the consumed energy cost collected in this sector comprises a vital revenue source for the energy sector and is used to cover the annual expenses necessary for the functioning of the branch and to provide a constant, reliable income for the state budget. But this is not the case.

? ?The management of the energy enterprises controlled by the state is unrestricted – employee turnover is high; strikes take place often; skill levels are maintained artificially; as soon as the law on bankruptcy comes into effect, these enterprises will be immediately declared bankrupt.

? ?Existing energy resources and energy services price formation methodology as well as tariff regulation methods, existing payment capacity and payment relationship regimes, limited liabilities and technical abilities of working under direct contracts, management of the separate energy units and the quality of the entire interrelationship have not permitted the development of mutually acceptable and productive relations between energy subjects in most regions of the country. This has resulted in permanent non-payment, increased company debts, decreases in production , permanent salary arrears for branch employees, regular interruptions in the power supply, etc.

? ?The results of privatisation indicate that before it created social guarantees for the population the state reneged on its duties and responsibilities connected with the energy sector's proper functioning and development.. In fact it deregulated the energy sector and that requires a much higher level of industry and social readiness.

? ?It is evident that the state financial and economic services have not studied the country energy market. They do not know the real paying capacity of the population and have a rigid attitude towards the tariff formation issue, or knowingly rely on shady revenues of the population. In this way they contribute to bad business practices and corruption and from the very beginning they have provoked distrust among the population.

? ?The low level of professionalism and high level of corruption of the management system causes distrust among the population and makes any attempts at reforms counter-productive.

? ?The power and other energy resources' tariff growth over the last five years is connected with the beginning of privatisation and the restructuring processes in the Georgian energy sector. It is also connected with the IMF demand to include the national energy debts accumulated during the year into the following year's tariff.

? ?The Georgian National Energy Regulation Commission's (GNERC) role in tariff determination is insignificant. It has no ability to provide qualified expertise and revisions and is limited by the tariff adoption presented by the license-holders. At this stage the GNERC is failing to sufficiently control, regulate and manage the situation.

? ?Nowadays the tariff based on total value has lost its significance for most of the enterprises in the sector. This is because, under present surroundings, real fees are impossibly far from the total value which serves as a basis for determining the tariff.

? ?Evaluative calculations which were carried out demonstrated that as a result of the tariff optimisation (reduction) for electricity throughout Georgia, the number of people able to pay the tariff could be increased by 1.5-2 times, chiefly via the influence of two solvent groups – the middle class and the poor.

Assessment

The assessment given below may be rather strict, but it ought not to be considered as exaggerated strictness. In the interest of business we deliberately pay less attention to the positive changes in the energy sector, which surely exist. From our point of view it is more important to draw attention to the negative issues that should be solved in the near future.

To what extent have the goals outlined by the energy sector restructuring been achieved? Table A1 shows the authors' assessment.

Table A2 gives an assessment of the results that could be achieved in the energy sector with the support of the Independent National Energy Regulating Commission, as well as by implementation of the restructuring and privatisation.

Table A3 shows the answers to the questions which, as we proposed in the beginning of this report, should be the determinants of the socio-economic effectiveness of the structural changes carried out in the Georgian energy sector over the period 1996-2002.

Table A1 Goals of the structural reorganisation of the energy sector and assessment of the results achieved to date

Goal	Assessment of the result
✍Provide rational state policy, delimit regulating functions and commercial activities	✍Based on results the state could not provide rational policy regulating functions and commercial activities have been delimited
✍Step by step liquidation of the state monopoly ✍Property diversity adoption ✍Create competitive environment, establish transparent market ✍Attract foreign investments	✍The state monopoly liquidation has been carried out partially ✍Property diversity has been established but property of the joint-stock companies is still under state control ✍Neither a competitive environment or a transparent market have been created; ✍Strategic investor AES corporation has entered the power market; other investments have not been achieved
✍Improvement of the power supply ✍Deficit reduction in the energy sector	✍The power supply has improved in Tbilisi but it is not sufficient; power supply improvement in the regions has been negligible ✍The deficit in the energy sector still persists
✍Power production volume increase ✍Increase its effectiveness	✍Power production has fallen ✍The power production effectiveness has

✍ Preserve financial discipline ✍ Improve power service for the consumer	not increased ✍ Appropriate discipline has not been achieved in the financial sector ✍ Power service has improved partially (Tbilisi)
✍ Provide permanent power supply ✍ Profit growth for the companies ✍ Improve technical conditions and management of the power system	✍ Permanent power supply has not been achieved. The situation deteriorated significantly in 2003 ✍ The companies were unable to switch to a profitable working regime ✍ Technical conditions as well as company management has not been improved; salary arrears and strikes are still commonplace

Table A2. Assessment of the results that could be achieved in the energy sector with the support of the independent national energy regulating commission, as well as with the implementation of restructuring and privatisation

Expected result	Assessment of the factual results
✍ The regulation process is getting stronger; the society gains maximum benefits; the energy charges are set to minimum – under conditions of natural monopoly of the energy sector; the trust of society is increasing	✍ Sociological research shows that the general public do not consider themselves to be benefiting from power supply initiatives
✍ The positive influence on energy development rates and scales, the national power supply, the scientific-technical progress of the branch, etc.	✍ There is no growth in energy development rates and scale, neither in the national power supply
✍ Investor risk is receding; private investments in the sector are stimulated; investment volume is rising; low taxes for invested capital as well as low charges for consumers are established	✍ In reality private investor and investment entrance into the energy sector has been frozen at year 2000 levels
✍ The paying capacity of power and natural gas charges rises; self-financing of the branch is initiated	✍ The power plants are not supplied with spare parts and repair works do not take place ✍ The thermal power plants are not supplied with fuel ✍ The situation regarding the existing funds of the branch remains complicated with debts increasing ✍ The self-financing potential of the

	branch enterprises could not be improved, thus arrears in salaries and state subsidies are continuing
✍ The power quality and its volume are rising	✍ The power production volume is falling – Tbilsresi power units and Tbilisi Tess have stopped entirely. The power quality has not improved
✍ Fully collected energy charges stimulate the other energy branches	✍ The power charges are not fully collected

Table A3 Influence of the energy sector structural changes performed over the period 1996-2002 on socio-economic conditions

Question	Assessment
✍ How optimal and sequential were the structural changes in the energy sector?	✍ The chronology of the structural changes performed in the energy sector shows that the changes were not of a sequential nature, especially in the initial stages (1992-96). During the restructuring process departmental interests prevailed. None of the ”new” steps were based on the critical analysis of the “old” ones, thus they were far from being optimal
✍ How has access to power for the population changed since the implementation of structural changes?	✍ Recent price rises have significantly reduced energy accessibility for the Georgian population. As a result the energy comfort rate has decreased by 30-50 per cent and this has had negative impacts on human health
✍ To what extent have energy consumption as well as power, natural gas and other energy resource tariffs been changed?	✍ Power consumption has decreased by 2-3 times in comparison to 1990; the tariff has increased threefold in comparison to 1997 ✍ Natural gas consumption has decreased by 3-5 times in comparison to 1989; the tariff has doubled in comparison to 1997 ✍ Liquid gas consumption has decreased tenfold in comparison to 1985; the tariff has jumped by a factor of 12 in comparison to 1985
✍ To what extent have the technical conditions of the energy resources supplied to the	✍ The technical conditions of the energy resources supply have deteriorated

population improved?	(failure of high-voltage transmission lines is quite frequent); AES - Mtkvari power unit #9 frequent failure (technical and other reasons); according to official data the natural gas distribution network is in a critical condition, etc.
✍ Does the population income relate to the charges it has to pay to satisfy its immediate (minimal) power needs? ✍ The priorities of family budget distribution (food, health care, power supply, recreation) ✍ Was the population forced to refuse to pay power charges?	✍ The majority of the Georgian population earns 2-5 times less than a subsistence wage ✍ Even under the cheapest energy regime the majority of the population would spend 25-50 per cent of their income on energy. Together with the expenditures of vital necessity (subsistence wage) it exceeds the annual income of families. ?? Current socio-economical conditions as well as the psychological-moral environment are not such that complete payment of power as well as other energy sources' charges can be undertaken at the present time
✍ What is the level of the population's power debts following the structural changes?	✍ There is no objective data about the power debts of the population (it is assumed that such data does not exist)
✍ How has the population power supply level changed? Are there any safeguards for ensuring that the population receives at least a minimum level of required power?	✍ The consumed power of 80-85 per cent of the Georgian population is equal to or less than the subsistence wage. At the same time power supply guarantees are minimal. The population living conditions are such that civil unrest should not be ruled out in the near future
✍ How have state revenues from the energy sector been affected after the structural changes and have Georgian social security provisions improved or deteriorated?	✍ Such data has still to be collected

Recommendations

? ?To assess the effectiveness of the performed as well as ongoing changes in the Georgian energy sector it is necessary to carry out a permanent and objective observation of the processes followed by an analysis of the results. Thus it is necessary to provide a climate where there is proper access to official information.

? ?Tbilisi thermal power plant power generating units should be prepared and rationally used as an integral part of the national capacity. The authors believe that this is the only way to secure a stable power supply for Georgia in the near future.

? ?Through low cost rehabilitation, Georgia has the potential to satisfy its electric power needs via the power generated within the country. It would increase energy independence and safety levels in the country.

? ?The self-cost of the power produced locally should be made precise. This would create a basis for optimal decision making for modernisation and long-term use of the generation objects, as well as for defining of the power import-export scale.

? ?The tariff setting methodology as well as the tariff policy in general needs serious changes and adjustment. From the methodological point of view, the fund-profit and amortization interest rates' share of the tariff should be revised. From the tariff policy point of view, the country policy needs to be sharply formulated – export power or satisfy domestic needs, attract new investments to the sector or use existing resources more effectively, privatisation or establishment of public enterprises, etc.

? ?It is necessary to continue promoting the use of energy effectiveness potential. It is an important resource which would significantly improve the national energy conditions as well as the living standards of the population.

? ?The energy enterprises' funds should be audited according to western standards, debt payment should be deferred, new relationships between energy system entities should be started from a zero financial point and the law on bankruptcy should be adopted.

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