



Energy and Environmental Protection in Georgia Main Aspects

July, 2008

After scientists ascertained that the technogenic influence by humans on the environment causes climate change, developed countries began devoting special attention to the issue of environmental protection. Global warming will cause floods, storms, droughts, and desertification. To avert the results of these natural disasters will cost the developed part of the world approximately 20% of its GDP by the year of 2050, unless it implements severe environmental protection policy today. Such is the main conclusion of the Kyoto Protocol Intergovernmental Expert Group Report No IV which was published in 2007. This report was prepared under the leadership of Nicolas Stern, adviser of the British Chancellor on economic issues.¹

The countries of the European Union have established quite strict environmental standards. Compliance with these standards is controlled and monitored by different state institutions. Globally, electricity generation produces the major part of emissions (44%), followed by transportation (20%), industry (18%), and household and service (17%)². Accordingly, in terms of environmental protection, the European Union most strictly regulates energy and transportation.

Though environmental protection is not a priority of the Georgian state, but certain attention towards this issue can already be observed. The Georgian authorities justify the lack of due attention to the environment by the fact that after the disintegration of the Soviet Union and ensuing collapse of the economy Georgia produces fewer emissions compared with 1990 and therefore has no obligation to reduce emissions under the Kyoto Protocol. Thus to introduce modern environmental standards - and what's more important – to implement these standards is not viewed as an immediate and imperative task³.

Accordingly, it should be no surprise that Georgia's environmental protection legislation does not comply with modern environmental protection standards and criteria. In addition, there are no mechanisms for implementing this legislation, neither the mechanism to monitor whether the companies responsible for negative impact on the environment comply with the obligations they have undertaken under the current legislation. Public participation in discussions about environmental protection issues is minimal and the subsequent influence on the decision making process is limited.

¹ Un accord de Principe pour des Negotiations Post-Kyoto, Bullitin de l'Industrie Petrolier Le Maie 2008

² Transport et Changement Climatiques, Bulletin de l'Industrie Petrolier, 18 October 2004

³ Such is the position of the state institutions and the Ministry of the Environment according to Georgian environmental NGOs and my own interview with the adviser to the minister of the Environment (Liana J)





The evaluation of the environmental impact in Georgia is conditional and is mainly based on the information obtained from the companies and industrial units that have negative impact on the environment as a result of their activities. The absence of monitoring mechanisms makes it impossible to control how these companies fulfill their environmental obligations under the existing legislation. As a result, there are many questions regarding how reliable are the data on environmental impact, and the amount and types of emissions.

In Georgia, as well as in the whole world, in terms of negative impact on the environment energy (35%) and transportation (11%) are the largest sources of emissions⁴. But again because of the lack of modern evaluation criteria and the absence of independent laboratories, these data can only be estimates.

General and Political Aspects

The representatives of non-governmental environmental organizations (Green Alternative, CENN) in Georgia believe that the lack of a well-structured energy policy is the reason for the absence of modern evaluation criteria for energy sector and transportation. In their opinion, the government has not yet decided what should be the main sources of electricity generation and how should be should the modern environmental standards for each potential source of electricity generation (big hydro, coal, nuclear, renewable). There are no standards in relation to transport whatsoever.⁵

Large Hydroelectric Power Stations: If the government of Georgia decides that the country's hydro potential must be fully used, including big and small hydroelectric power stations, the strict environmental standards should be set exactly towards these big and small hydroelectric power stations. Environmentalists think that large hydroelectric power stations have a very serious negative impact on the environment. However, in Georgia while designing new power stations, only old standards have been applied such as – evacuating local inhabitants, damages to biodiversity and mirror effect.⁶ In reality, large hydroelectric power stations impact the environment in other ways, too. For example hazardous release of water⁷ from a large reservoir could result in increasing levels

⁴ The preliminary report of the Climate Change Office of Georgia, 2006

⁵ According to present regulation in force in the European Union the emissions of CO₂ from different transport means should not exceed 160 grams per kilometer. In 2012 the average permitted emissions of CO₂ will be reduced to 130 grams per kilometer. BIP December 2007

⁶ The Mirror Effect is when a big amount of water is evaporated from a big water reservoir, which causes the change of microclimate in the surroundings

⁷ This can happen when there is no demand for electricity especially in Summer and the excesses water is released from the reservoir hazariously





of ground water,⁸ and cause landslides, or falling water from the dam of large reservoirs can produce increased levels of methane emissions.⁹

Coal: Georgian Environmentalists (Green Alternative, CENN) believe that if the government intends to use coal for generating electricity (as is stated on the Ministry of Energy's official webpage), obligatory environmental standards should be established for coal. Compared to other hydrocarbons, coal has an especially negative impact on the environment. It discharges large amounts of dust and CO². The maximum effectiveness of the modern coal electricity station is 48%. A thermal power station with the capacity of 1,000 MW emits 700 tons of CO² per hour.¹⁰

Accordingly, environmentalists are very cautious about the issue of bringing coal back to the Georgian energy sector. They believe that coal can be returned only if modern, expensive methods and technologies are used to treat it, which in turn means that the electricity produced from coal will not be cheap.

Nuclear Production: In 2006 the government of Georgia announced that it was planning to build a nuclear power station and a state commission was created to study this issue. The commission did not work very actively, however there has been no official statement that the government definitely quit this project. Environmentalists think that modern environmental protection standards for nuclear generation must be adopted if the government decides to build a nuclear power station.

Low Public Awareness about the Importance of Environmental Protection

Georgian Environmentalists (Green Alternative, CENN) are especially worried about the low public awareness about the importance of environmental protection. In their opinion, people are so busy with their elementary day-to-day difficulties that they are less interested in the problems of environmental security. For this reason, Georgian environmental organizations view their main task in raising public awareness about the importance of environment protection,

Environmental Impact Evaluation Criteria

Internationally, before starting a new industrial project (including energy projects), it is standard to evaluate its environmental impact. A system of evaluating environmental impact was first introduced in the 1970s and has since been significantly refined. Environmental impact assessments (EIA) are obligatory for any state or private project that may influence the natural and social environment.

⁸ Environmentalists think that frequent landslides in Tsalenjikha must be caused from the hazardous release of water out of Enguri HPS in summer when there is no demand for electricity generation.

⁹ The Brazilian experts ascertained that the water falling from a big reservoir dam discharges methane. Georgian experts believe that this will not cause any serious problems for the current climate conditions in Georgia.

¹⁰ BIP Février 2008, Les Technologies du Charbon Propre – Captage et Stockage Géologique du CO₂, Institut Français du Pétrole.





The main task of EIA is to identify the degree of the impact on the environment, foresee the possible effects, and outline ways to mitigate the potential negative consequences before approving a project. Environmental impact assessments vary from country to country, but they usually include the following components: screening the project,¹¹ scoping out the project,¹² conducting an experiment to test the environmental impact, drawing out the mitigating measures, preparing a report on the environmental impact, reviewing the EIA report, adopting a decision whether to approve the project or not, and, if permission is granted, monitoring the environmental impact during implementation of the project.

In Georgia, assessing environmental impact does not include the following steps – screening,¹³ scoping,¹⁴ and monitoring.¹⁵ The process of assessing environmental impact and the procedures for granting approval for projects are regulated by law (the Law on Licenses and Permissions and the Law on Environmental Impact).¹⁶ The legislation implies that manufacturers should submit to the Ministry of Environment and Natural Resources EIA of their projects before getting a license. The law determines which projects require environmental impact assessments and which do not. Entities working in the energy sphere do have to present an EIA report. If there is an industrial project that is not explicitly required by law to submit an EIA report, but there is concern that it may have a negative impact on the environment, the Ministry of Environment and Natural Resources forms a special group of experts to determine the need for an EIA. The group of experts, as a rule, uses the already existing list of EIA as a guide.

The Ministry of Environment and Natural Resources sets the EIA standards - for the industrial units seeking for the license - in the frames of the obligations they take upon themselves. After receiving the license and starting work, the industrial unit is obliged to submit annually an EIA report to the Ministry of Environment and Natural Resources to prove that it is not violating obligations. The current regulation does not provide for The Ministry of Environment and Natural Resources to verify the submitted annual EIA unless it has a substantial doubt that the information is reliable. Even in this case authorization from a court is required. This procedure, in the absence of specialized laboratories, practically excludes the possibility to check the information submitted by the industrial units¹⁷

¹¹ Making a decision about whether the project needs the EIA procedures or not.

¹² Establishing the issues that the EIA should include.

¹³ Making a decision about whether the project needs the EIA procedures or not.

¹⁴ Establishing the issues concerning the environmental protection that the EIA should include.

¹⁵ EIA process in Georgia, observer's reports, Orhus Center in Georgia, March of 2008

¹⁶ Also the Law of Georgia on State Ecological Expertise, the Law of Georgia on State Environmental Protection and the General Administrative Code of Georgia, which establishes the rules for administrative procedures for giving the permission for EIA.

¹⁷ The experts at the Ministry of Environment and Natural Resources sometimes use the following method to check the submitted EIA: they take the raw materials and the type of energy used by the industrial unit and based on the existing technology at the industrial unit calculate the presumable type and approximate amount of emissions that the unit discharges. However such a procedure is not officially required and cannot have legal or other consequences for the companies





According to a Ministry of Environment and Natural Resources representative, because there are no modern EIA criteria, the Ministry uses the old Soviet EIA standards to approve applications. It is generally admitted that the old Soviet Union practiced weak environmental standards. However the Ministry of Environment and Natural Resources does not share this skepticism towards the Soviet environmental protection standards and thinks that in separate cases these standards were even better structured and more strict than modern standards.¹⁸

Generally, the absence of some EIA procedures for developing countries like Georgia may be justified, especially towards those outdated soviet period industrial units that are temporarily functioning. Although, it is important that new industrial units are planned and built with new technologies and that the modern EIA obligatory standards are set towards them and Ministry of Environment and Natural Resources conducts the monitoring of these standards. In such cases application of differentiated environmental standard could be justified.

Environmental Impact Indicators: Emissions in the Energy Sphere

Worldwide, most greenhouse gas emissions are produced by electricity generation (44%)¹⁹, although this differs from country to country. For example, in France where electricity is mainly sourced from nuclear power plants, the level greenhouse gas emissions is lower than in countries where thermal generation mainly based on coal and gas, accounts for most of the electricity supply.

It is within the competence of the Ministry of Environment and Natural Resources of Georgia to monitor the level of greenhouse gas emissions from stationary units, but the absence of EIA monitoring procedures makes it hard to fulfill this function properly.

The greatest part of the electricity produced in Georgia (approximately 75%) is generated by hydroelectric power stations²⁰. There are two big hydroelectric power stations – Rionhess and Zhinvalhess as well as some other medium sized and small hydroelectric power stations. The rest of the electricity (25 %) is produced with imported gas, based on quite outdated systems of gas production. The only modern gas turbine (cogeneration) is owned by JSC Energy Invest, but the produced thermal effect is not used at all.

According to data presented by the Climate Change Office of Georgia, emissions produced in power generation have the most negative influence on the environment, accounting for 35% of total emissions.

¹⁸ Interview with Mr. Zaal Lomtadze, Special Adviser to the Minister of Environment of Georgia.

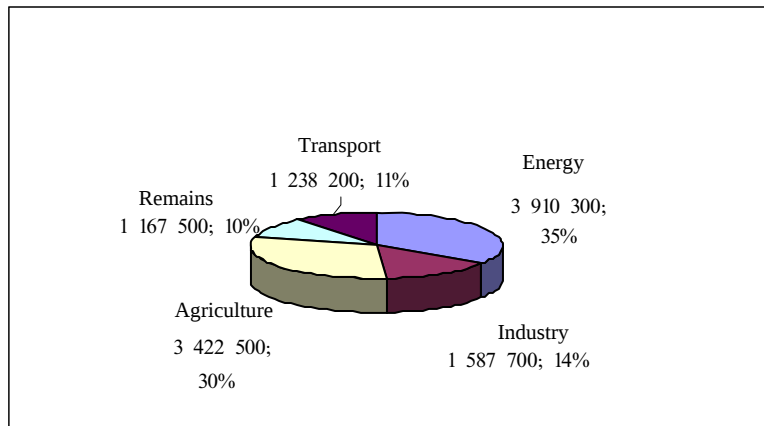
¹⁹ Transport et Changement Climatiques, Bulletin de L' Industrie Petrolir, 18 October 2004

²⁰ Annual Summary Energy Balance of Georgia, Ministry of Energy of Georgia.





Diagram 1. Emissions in Georgia in 2005, preliminary findings



Source: The Office of Climate Change of Georgia

As we can see from this diagram, the equivalent of 11 326 200 tons of CO₂ was discharged into the atmosphere in Georgia in 2005, which is equivalent to 2.5 tons per inhabitant²¹. According to this data Georgia is almost at the level of European countries (the amount of CO₂ discharged in Europe is 2.2 tons per inhabitant).

The situation with regard to emissions discharged per kW/hours of electricity is totally different. The major part of electricity in Georgia (75%) is produced by environmentally friendly HPSs and the remaining 25% by mostly outdated gas generation units. If we calculate the amount of emissions produced per kWh by the whole power generation system in Georgia (through dividing the total amount of emissions by total amount of power generation per annum) the figure is insignificant/ But if we calculate the amount of emissions per kWh produced by outdated gas generation units (through dividing the total amount of emissions produced by electricity generation by the amount of power generated by outdated gas generation units), the results will be less alluring. ²².

Therefore, it is hugely important to take this issue into consideration when planning to build new generating units, especially if these units will be based on gas or coal.

²¹ Europe discharges emissions equivalent to 2.2 tons of CO₂ per inhabitant, France discharges only 1.7 tons, which is because there is a big share of nuclear production in France ; Bulletin de l'Industrie Pétrolière, Février 4, 2008

²² If from 8 billion kWh of the electricity produced annually in Georgia only 2 billion kWh is produced with gas and if we divide the amount of electricity produced with gas by the total number of emissions discharged from the energy, we will find that emissions equivalent to 195 grams of CO₂ are discharged from every 1 kWh electricity produced, this figure is less than in Europe, where it is 340 grams per 1 kWh, but is more than in France, where it is 70 grams per 1 kWh



Environmental Impact Indicators: Transportation

Transport has a more negative influence on the environment than either industry and agriculture does. 20% of emissions discharged into the atmosphere in Europe come from transport²³.

Even though most cars are quite outdated in Georgia and a big proportion of imported oil products do not comply with modern standards, emissions discharged from transportation amount to just 11%²⁴.

Control over the EIA in the transportation sector is not the function of the Ministry of Environment and Natural Resources. Despite this, the Ministry of Environment and Natural Resources studied the level of air pollution in Georgia and inserted a separate chapter about the environmental situation in the annual national report in 2005. According to this report transportation comes first with 46% in the share of environmental pollution, and then it is agriculture with 28% and only after that – energy with 20%²⁵. It is obvious that the information regarding the level, condition, and the actors causing environmental pollution submitted by the Office of Climatology of Georgia and the Ministry of Environment and Natural Resources do not coincide²⁶.

Thus according to the report of the Ministry of Environment and Natural Resources, transportation is the primary source of pollution in Georgia. As the environmental impact of transportation is not controlled, the quality of imported oil products depends on the good will of importers. According to information provided by the Association of Oil Product Importers the member importers of this association bring 750 000 tons of oil products into the country²⁷. According to the association's information, these oil products comply with the standards of Euro-1. Euro-1 standard oil products are not considered satisfactory in European countries and this brand is no longer in use in Europe.

Euro-1 contains large amounts of various harmful materials, which have a very bad effect on the environment when discharged into the atmosphere. The diagram shown below demonstrates the difference between Euro-1 standard and other standards and proves how Euro-1 standard diesel contains many more harmful ingredients. There is a similar situation among the different types of gasoline and Euro-1 standard gasoline. Euro-1 standard diesel contains twice as many harmful elements as Euro-2 and many more times the amount present in Euro-5 and Euro-6 standard diesel which is common throughout Europe.

²³ Transport et Changement Climatiques, Bulletin de l'Industrie Pétrolier, 18 October 2004

²⁴ The figures are even more perturbing if we count them per unit product. If 1 million tons of oil products used per annum discharges emissions equivalent to 1 238 200 tons of CO₂, it means that as the result of burning 1 tons of oil products emissions equivalent of 1.3 tons of CO₂ are discharged, which is a very high indicator.

²⁵ National Report about Environmental Condition, sub-chapter – Air ; 2005

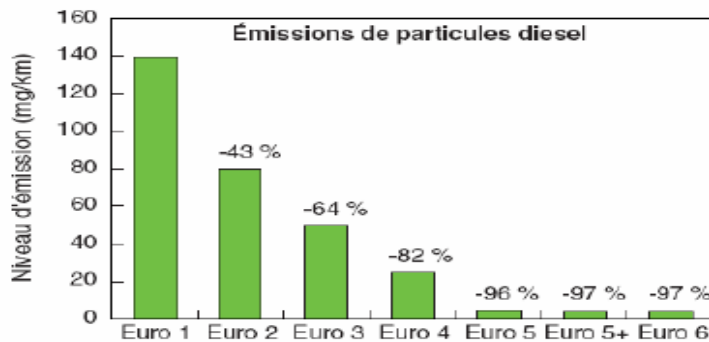
²⁶ The figures of this research are based on the information about discharged emissions submitted by the Office of Climatology of Georgia. This information is presented to different international organizations.

²⁷ In 2005 Georgia and Azerbaijan signed the Agreement on Mutual Recognition of Certificates. On the bases of this agreement the participating sides trust each other and the certificates issued by them, which means that there is no need to ascertain the gas imported from Azerbaijan.





Diagram 2. Emissions of harmful elements by Euro-1 diesel²⁸



Due to the absence of laboratories it is extremely hard, perhaps even impossible to ascertain the degree of negative influence caused by poor quality imported oil products in Georgia.

Because of the increasing number of people falling seriously ill in areas of high vehicle concentration, international organizations working in the sphere of environmental protection have become interested in the air pollution situation in Georgia. The research conducted by the environmental security organizations Green Alternative and Cooperation for a Green Future (CGF) showed that the concentration of dust and carbonic acid in the atmosphere in the area of the Vera district of Tbilisi is very high²⁹.

In the areas surrounding major transport arteries large amounts of lead have been found in the soil, which indicates that fuel contains lead. According to tests taken in Tbilisi in the year 2007, the soil contained two or three times more lead than is normally permitted³⁰. One of the reasons for this is that lead was used in the production of oil products in order to increase the level of octane. This technology has not been used in developed countries for a long time. In these countries, oil products that contain lead have been entirely out of use since 1996.

According to a 1999 resolution adopted by the Parliament of Georgia, it is prohibited to have in realization or sell petrol that contains lead. In order to take lead contained petrol out of use it was necessary to adopt another resolution that would set the limited permissible amount of lead in petrol. This resolution was scheduled for adoption in 2002; the adoption of this resolution was then delayed until the year 2007. However despite this, it has still not been adopted.

²⁸ Bulletin de L'Industrie Pétrolier, 6 Février 2008

²⁹ The research was sponsored by the US Agency for International Development.

³⁰ The research was conducted by the environmental security organization "Cooperation for a Green Future" in 2008 with the financial support of the Bureau of Educational and Cultural Affairs, Department of State.





The Association of Oil Product Importers categorically denies the presence of lead in products that it imports. Again, due to the lack of laboratories capable of checking the quality of oil products, it is impossible to find out whether imported fuel contains lead. Organizations working in the field of environmental protection do not exclude the possibility that lead is added to fuel by individual retailers. They found such a case in 2001 while conducting research in cooperation with Danish experts³¹. Though it is worth mentioning that small distribution companies would not be able to block the resolution that would set the standards and permissible amount of lead in fuel.

Several organizations working in the field of environmental protection in Georgia (CENN, Green Alternative, Cooperation for a Green Future, etc) and the Association of Oil Product Importers agreed to monitor the lead content of fuel. For this purpose 14 districts were chosen in Tbilisi (according to traffic density in the area); the tests will be taken and the lead content of fuel will be monitored³² in these areas.

Conclusion

Despite the fact that Georgia has no obligation to reduce its' level of emissions according to the Kyoto Protocol, it is desirable and recommended that in order to implement environmental protection standards in the Georgian energy sector the following actions must take place:

- Draw up an energy policy and set modern environmental standards according to the priorities identified in this policy.
- Create different EIA's for both outdated Soviet industrial units and newer equivalents.
- EIA's drawn up for new industrial units should contain screening, scoping and monitoring phases as well as mechanisms to conduct this monitoring.
- Decide which institution or department should monitor the EIA and the volume of emissions discharged from non-stationary units.
- Create independent laboratories in order to control the quality of imported fuel and conduct, in accordance with the appropriate EIA's, environmental protection monitoring over stationary and non-stationary units.

³¹ The research was conducted in 2001 by the environmental security organization CENN in cooperation with Danish experts

³² The agreement between the organizations working in the field of environmental protection and the "Association of Oil Product Importers" was signed in spring of 2008. The districts of Tbilisi were selected according to the intensity of transport in those areas.





- Carry out active campaigns about environmental security (in the energy sector, transportation and other spheres) in order to increase public awareness and knowledge.
- Ensure public involvement in discussions and decision making processes concerning the energy sector and other general issues.