National Policy of Georgia on Developing Renewable Energy Sources

May, 2008

Introduction

Georgia has a significant potential for the development of many sources of renewable energy. The rough calculations prepared by the Georgian Energy Academy in fall 2007 upon the request of the United States Agency for International Development put the energy potential from wind, the sun, geothermal, and biomasses at 15-17 billion kilowatt/hr annually. Specifically, the annual wind energy potential is 3-4 billion kilowatt/hr, solar energy – 3-5 billion kilowatt/hr, biomass energy – 2 billion, hydroelectric energy from small hydroelectric power stations – 5 billion. Geothermal energy has the lowest potential at 2 billion kilowatt/hr.

Currently, Georgia consumes approximately 8 billion kilowatt/hr of electricity, 1.8 billion cubic meters of natural gas, and 750,000 tons of oil products annually. Georgia imports 71% of these resources from neighboring countries with only electricity as an exception. A significant portion of electricity (71%) comes from large, medium, and small hydroelectric stations. The remaining 29% is produced by means of imported natural gas.

Georgia's energy consumption reached its highest level in the early 90s just before Georgia declared independence from the Soviet Union. During this period, electricity consumption reached 18 billion kilowatt/hr, gas consumption – 6.5 billion cubic meters, and oil consumption – approximately 2 million tons.

Current consumption lags considerably behind per capita rates of consumption during the Soviet era and of developed countries currently (5,000-7,000 kilowatt/hr annually). Presumably, demand for energy resources will rise in the future in correspondence with Georgia's economic development and the improved purchasing power of the population. Consequently, the government of Georgia has to start thinking about how the increased demand will be satisfied – by increasing imports from neighboring countries or by maximally utilizing Georgia's existing renewable resources and enhancing energy efficiency.

Naturally, as a net importer of energy resources and like the developed importing countries of the EU, it is desirable that Georgia choose a path of enhanced energy efficiency and maximal utilization of local renewable sources. Georgia has already assumed this responsibility by joining the European and international organizations working in energy and environmental areas and the officially announced aspiration towards the EU.

The European Neighbourhood Policy directly obligates the countries participating in this process to coordinate their legislative acts regulating the sphere of energy politics and energetics with the corresponding legislative acts and main regulations on energy politics of the EU member states. The Energy Security Policy of the EU consists of four main directions. These are: 1. the reduction of dependence on imported resources, 2. the enhancement of energy efficiency, 3. maximal utilization of the local renewable sources, and 4. the reduction of greenhouse gas emissions (which is generated

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through the use of hydrocarbons).[1] The utilization of renewable sources supports the reduction of the dependence on imported resources, as well as of the reduction of greenhouse gas emissions to the atmosphere.

According to the decision of the European Commission, the share of the renewable sources (wind, solar, biomass, and geothermal) in the energy balance of EU member states should reach 10% for 2010, 15% for 2015, and 20% for 2020. Achieving this is not easy, given that the prime costs of renewable energy sources (wind, solar, biomass and geothermal) exceed the prime cost of hydrocarbons and, accordingly, cannot yet compete with it. However, the current price structure on hydrocarbons on the international energy market creates favorable conditions for the development of renewable energy sources.

Georgia has no obligatory quotas for reducing greenhouse gases under the Kyoto Protocol. In fact, after the dissolution of the Soviet Union (and the resulting collapse of the regions' energy intensive industries), Georgia's greenhouse gas emissions into the atmosphere were reduced substantially (if in 1990 Georgia emitted 46 million tons of CO^2 into the atmosphere annually, in 1997 Georgia emitted only 14 million tons of CO^2). However, along with economic growth it is very likely that this rate will rise again. Besides, Georgia can profit from implementing projects under the clean development mechanism of the Kyoto protocol and receive significant benefit from the development of renewable energy sources.[2]

If Georgia truly aspires towards EU membership, the country must undertake the following initiatives in order to reduce dependence on imported energy resources and the harmful environmental impact:

- Pursue a policy of strict energy saving and energy efficiency;
- Support maximal utilization of country specific renewable sources as much as possible;
- Not allow the augmentation of greenhouse gas emissions into the atmosphere.

For this purpose, Georgia should take into consideration the experience of the EU member states. In order to support the development of renewable energy sources, it should create a legislative basis and action plan that will serve as a road map for the development and market penetration of Georgia-specific renewable energy sources.

The preconditions for the development of renewable energy sources

In 1973 after the first energy crisis, developed countries were faced with the need to reduce the import of oil and develop renewable energy sources. In the 1990s, the need to reduce dependence on imported oil was supplemented by the realization that hydrocarbons are exhaustible, the fluctuation of prices on the international energy market, and the necessity to reduce emissions that are harmful to the environment and, according to scientists, causing global warming.

[1] Greenhouse gas emissions into the atmosphere cause global warming.
[2] The reduction of greenhouse gas emissions into the atmosphere and participation in trade with the emission certificates by introducing renewable energy sources.

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The exhaustibility of hydrocarbons. Oil and gas are exhaustible resources. According to experts, the peak for oil extraction was in 2005 and now a decrease in extraction is anticipated. In addition, the remaining oil and gas reserves are mostly located in remote areas, technically complicated regions (e.g. the Arctic, deep waters), or politically unstable countries. Such countries often attempt to dictate their own rules of the game to the developed world and to achieve political advantages in return for supplying oil and gas. This creates an unstable environment on the energy market and results in higher prices for natural resources.

The unstable situation on the international energy market and the unjustified increase in prices have some positive effects as well. In particular, high prices on oil and gas create favorable conditions for the development of renewable energy sources. Thus far, these sources cannot compete with oil, coal, and gas.

Financing renewables. Starting from 1975[3] the International Energy Agency member states directed significant financial resources towards the development of the technologies of renewable energy sources and maintained free transfer of the technologies of renewable energy from country to country. During 1995-2002 International Energy Agency member states invested 23.55 billion USD into research and development of renewable energy sources, which was 8% of their total expenditure on energy. Among these countries, the USA, whose annual expenses on the research and development of renewables amounted to 110.9 million USD, and Germany, whose annual expenses were 82.8 million USD, stand out.

In addition, the states pay special attention to those sources of renewable energy that are specific to them. Turkey, which is rich with geothermal resources, has directed 70% of its expenditures to the development of geothermal energy. Denmark, the UK, and Germany, which are rich in wind resources, allocated 43% of financing for the development of wind energy.

Global warming. Concerns of the developed world regarding global warming were initially stated in the Kyoto Protocol in 1997. The signatories to the protocol acknowledged that the intensive use of hydrocarbons is the main cause of greenhouse emissions and thus global warming and assumed the responsibility of reducing harmful emissions by gradually replacing hydrocarbons, developing renewable energies, and introducing clean development technologies.

The role of the state in the development and establishment of renewable energy sources. The role of consistent state policy for the development of renewable energies has particular importance. If International Energy Agency member states do not carry out a consistent state policy, the development of renewable energy sources would be impossible, taking into account that these energies are expensive and cannot appropriately compete with hydrocarbons.

From 1975, International Energy Agency member states have applied different approaches in order to encourage the development of renewable energies. Among these approaches are: guaranteed

[3] The International Energy Agency was created this year.

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prices,[4] compulsory quotas,[5] encouragement of investments, and favorable tax regimes. In addition, each country chose how to develop renewable sources itself.

What is renewable energy?

There exist two types of renewable energy: traditional renewable energy and untraditional renewable energy.

Traditional renewable energies are from: wind,[6] small hydroelectric plants, and biological sources (bio-energy from materials derived from plants, animals, and their byproducts).

Advantage: does not have negative effect on the environment, is completely renewable, and each country controls its own consumption.

Shortcomings: 1. is completely renewable, but the amount is limited – a specific quantity of people, animals, and plants create a specific quantity of byproducts; during droughts some small rivers dry out and electricity is not generated. 2. is not free of charge – cutting, collecting and preserving firewood is connected with expenses. Preserving and reprocessing solid municipal waste, landfills, and of animal remains and the construction and exploitation of small hydro energy stations also require expenses.

Untraditional renewable energies: energy derived from wind, the sun, waves, the tide, and geothermal energy.[7]

Advantage: is completely renewable, does not have a negative effect on the environment, each country controls its consumption itself.

Shortcomings: 1. is free of charge, however is less efficient so far – requires large areas of land and water (windmill in the sea, energy of waves and of the tide of the sea, which limits access to ports); 2. adverse effect on the landscape/view; 3. have a large disparity among the theoretical, technical, practical, and economic potentials of obtaining this energy.

Theoretical potential of renewable energies: total energy of the sun, received by the Earth during a year.

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[4] The state compels distributors or wholesale energy traders to purchase electricity produced on the basis of renewables with established prices (which greatly exceed the price of electricity produced on the basis of hydrocarbons) for some period of time.

[5] The state compels distributors or wholesale energy traders to purchase a specific amount of energy produced on the basis of renewable energies.

[6] Wind is a traditional renewable energy only because it has been used for centuries. At the same time, technologies for the wind energy today are entirely new and do not have anything in common with the past. Unlike biomass, wind energy does not require expenses for growing, collecting, and reprocessing.

[7] Geothermal energy can be renewable only if used hot and already cooled water is returned back to warm up and be utilized again. In addition, geothermal energies require the same expenses as traditional energy sources (borehole to hot water and the technical and energy expenses related to returning the cooled water).

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Technical potential of renewable energies: maximum amount of renewable energy, which can be produced annually from the existing theoretical potential taking into account the existing technologies.

Practically achievable potential of renewable energies: maximum annual amount of renewable energy, which can, in practice, be produced from the technically available amount of energy.[8] Technically achievable renewable energy can be unpractical to produce because of high transportation costs (located far from core consumption areas), the absence of the transmission systems (too costly to be built), or the negative attitude of the society (NIB-not in my backyard).

Economic potential of renewable energies: the amount of renewable energies, the production of which is justified by economic considerations. The economic potential of renewable energies is much less than the technically achievable potential and depends on factors such as the price of capital, expenses (taking into consideration environmental protection[9]), investment climate, and public attitude.

The prime cost of the electricity produced through renewables

Generally, the prime cost of electricity produced through renewable sources is significantly higher (except for large hydroelectric stations and large factories reprocessing municipal waste) than the prime cost of electricity produced through oil and gas. Nevertheless, in some cases the utilization of renewable energy may be more profitable. For example, in sparsely populated mountainous regions, which are isolated from the central regions and are not connected with the central electric system and infrastructure of gas pipelines, it is normally more efficient to use renewable energy sources than to build these systems.

Projects on the generation of electricity through renewable sources, like projects on the generation of electricity through oil and gas, are long-term. Their life-cycle is 20-30 years. While assessing the expenditure and potential profit of the long-term projects, economists convert the building, operations, fuel and maintenance expenses, and profit into the net present value schemes. During such evaluation, if the prime cost of the unit of energy produced through renewable sources is less than the prime cost of the unit of energy produced through hydrocarbons, the project is estimated positively.

Nowadays, this correlation does not depict a positive picture of renewables, but it is important to take into account the fact that factors such as environmental impact are not included in the prime cost of a unit of energy produced through hydrocarbons. If the costs of the impact of greenhouse gasses produced through the burning of coal, oil, and gas on the environment (global warming) were calculated and included in the price of the unit of energy produced through hydrocarbons, the energy produced through renewable sources would be more competitive.

The cost of a long-term energy project includes:

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[8] Producing technically available energy in fact may not be justified given the nonexistence of the network connection or the negative attitude of the society.

[9] How much CO^2 and other harmful emissions would be emitted to the atmosphere, while producing the same amount of energy using hydrocarbons, and what would be their sequestration cost.

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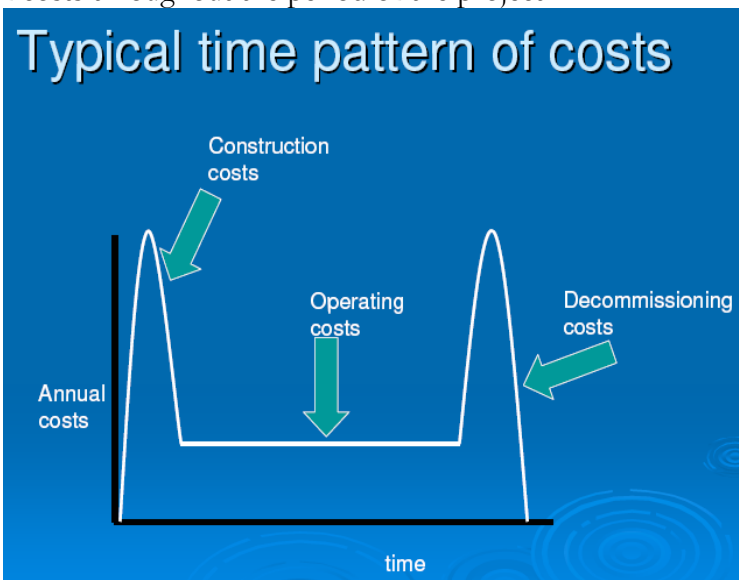
- The costs of capital and construction;
- The cost of fuel;
- Costs of operation and of maintenance and repair;
- Dismantling expenses.

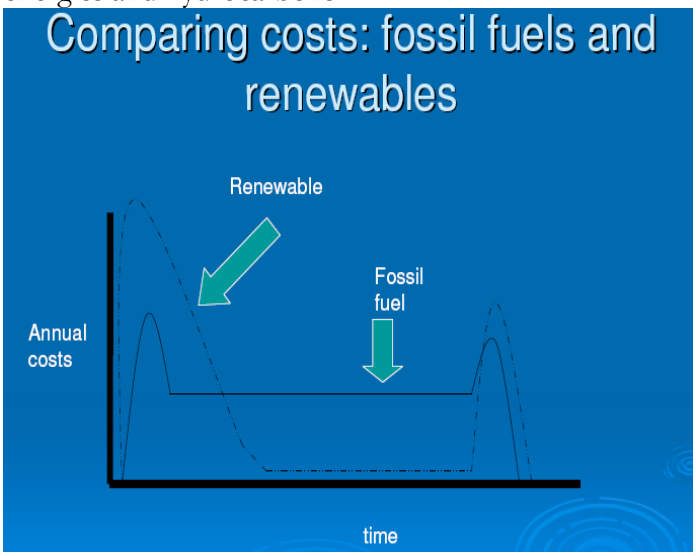
The costs of capital and building are calculated at the initial stage of the project before the commencement of production. The costs of fuel, operation, maintenance, and repair are spent throughout the whole project. The costs of dismantling occur after the conclusion of the project.

Graph 1: Structure of costs throughout the period of the project



Source: Reading University Business School

Graph 2: Comparison of the costs on the initial stage, during the project and after its conclusion in projects on renewable energies and hydrocarbons



Source: Reading University Business School

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According to the graph, the expenses of the projects on renewables are especially high at the first stage, before the commencement of production, and exceed the expenses of the projects on hydrocarbons considerably. As an alternative, nontraditional renewable energy projects do not have fuel expenses at all, have low maintenance expenses, and zero impact on the environment. Moreover, the metal and other materials used in these projects are used as scrap-iron after dismantling.

By developing renewable energy sources and reducing the country's dependence on imports, it is possible to enhance energy security. Moreover, this would lessen the harmful impact on the environment by reducing greenhouse gas emissions into the atmosphere.[10] Renewables have other positive effects as well. The recent years have witnessed rapid progress in renewable energy technologies and a readiness of the developed countries to allow the free flow of these technologies from country to country, creating an unprecedented cooperation among them. Today any renewable energy technology is available for less developed countries if they create favorable market conditions for the establishment of these technologies. However, there are specific renewable energy sources for each country, which are less expensive than others. For instance, in England the electricity generated on the basis of gas, which is produced at landfills is relatively cheap compared to the electricity generated through solar panels. In North Africa and Israel electricity produced through solar panels would be considerably cheaper, given that the solar radiation in these countries is much higher and the number of sunny days in the year exceeds the number of such days in England. Thus, in Georgia, small hydroelectric stations placed on mountain rivers will yield less expensive energy production costs than those produced by identical stations in lowland England.

Potential of renewable energy sources in Georgia

The initial calculation of the renewable potential of Georgia was prepared by the Georgian Energy Academy upon the request of the United States Agency for International Development. Subsequently, USAID's contracting organization – (subcontracting organization of Winrock International) World Experience for Georgia – made an effort to collect all research conducted in Georgia about the development of renewable energy. These research works were carried out with small financial support from clean energy enthusiasts and, accordingly, are not protected from inaccuracies.

Chart 1: Theoretical, technical, practically achievable, and economic potential of renewables in Georgia

Type of Energy	Theoretical potential, billion kilowatt per hr./sec.	Technical potential, billion kilowatt per hr./sec.	Achievable potential, billion kilowatt per hr./sec.	Economic potential, billion kilowatt per hr./sec.
Small hydro energy stations	40	19.5	5	
wind	1300	5	5	

[10] Given that unlike hydrocarbons the development of renewable energy sources excludes the emission of greenhouse gases into the atmosphere and the harmful impact on the environment.

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biomass		12.5	3-4	
Biomass for the fuel for transport				
The sun	1550 kilowatt/hr (m2/ sec.)		0.15	0.06-0.012
Thermal water	300 megawatt	100 megawatt	0.7-0.8	
total			13.85-14.95	

Source: World Experience for Georgia

As is revealed from this chart, the economic potential of renewables is not explored (this data does not exist). How fast the economic potential of renewables specific for Georgia will be explored depends on the state policy, financial support, and time. Given the fact that Georgia has significant experience in developing hydropower, it can be assumed that the data on small hydro potential for Georgia is more accurate. Meetings and discussions with the team leaders of groups who provided their research on other renewable sources potential for Georgia, revealed the following:

Wind Energy

The potential of wind energy has been analyzed by the organization Karenergo. This organization has been operating with the financial support of a Scientific Institute of Moscow. The research is based on the data of 30 years of synoptic observation and comprises only the intensiveness of the wind and dynamics of seasons on the land area of Georgia.

Due to the observation and research, 10 main areas favorable for the development of the wind energy have been identified. However, important parameters for planning the development of wind energy, such as security, environmental protection, and civil expediency, are not analyzed in the framework of the conducted research.

Security: windmills have a negative effect on aerodynamics. Accordingly, locating them near airports and military bases (where helicopters take off and land) can be done only at a safe distance and secure height. Georgian researchers of the potential of wind energy have not taken this aspect into consideration.

Environmental protection: windmills have a negative influence on migrating bird populations. This is especially so if turbines are located on migration routes. Not only can birds crash into the turbines, but they can also lose orientation with respect to their migration route and thus endanger their own survival. It is unlikely that investors will support the development of wind energy without the existence of a positive environmental impact assessment; Georgian researchers of wind energy potential have not taken this aspect into account.

Civil expediency: in many developed countries, windmills are not located near historic or religious monuments or near traditional (centuries-old) settlements that have particular architectural value. Furthermore, European citizens object to placing wind turbines near their dwellings, given that they make the landscape unattractive and potentially depreciate the value of their houses. If Georgia

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chooses international tourism as a strategic course, this aspect needs to be considered.

Taking into account these issues, it is difficult to predetermine how many of the established 10 areas of wind energy will satisfy the three parameters analyzed above and all of the other parameters. Substantial research has shown recently that wind energy is the least expensive renewable fuel. Tapping into this source would be particularly beneficial for Georgia, since wind energy potential is especially high during the winter months and early spring, when there is the greatest deficit in the current Georgian energy system.

Solar Energy

In the report of the organization World Experience for Georgia, which was prepared with data from the Sustainable Energy Center, the Sun House, there exist two maps of the solar radiation intensity in Georgia and there is a significant divergence between them. The experts of the Sun House think that the solar potential of Georgia has not been adequately explored and the research requires financial support and time.

Previously, this organization worked with the financial support of the Scientific Institute of Moscow. Nowadays the main source of its financing is the Georgian Foundation for Supporting the Development of Science. In the context of the small financial aid received from this foundation, the organization has set solar panels in the sparsely populated villages of the mountainous regions of Georgia. The total output of the panels is 25 kilowatt/hr annually, which is, obviously, not a high figure; however, the panels are located in villages situated far from the central transmission lines, where the construction of new transmission lines would be much more expensive than setting up individual solar panels. In addition, these panels enable the families to light up their lodgings, watch TV, and listen to the radio and not feel isolated from the rest of the world.

According to the assessment of the Sun House, in order to satisfy the minimal demand for electricity for the population in these regions, the capacity of the solar panels should be increased to 45 kilowatt/hr annually. For this capacity, financial support of the project would need to be increased to 1-1.5 million USD.

In the opinion of the same experts, there is a good potential in the sector of solar water heaters (mostly in families with medium- and high-income). They have already received several orders from individual home-owners on setting up the solar water heaters.

Provided that in Georgia the solar radiation atlas is not yet finally compiled, the experts at the Sun House have not examined the potential of concentrated solar power systems[11] in Georgia.

Geothermal Resources

Georgia has a potential for geothermal resources. This includes the 250 medium and high-temperature (30°C – 180°C) springs and bores, which are located in the areas of Tbilisi and

[11] A glass system, which moves on the horizon synchronously with the sun and transfers its energy to the turbine system that produces electricity. Spain develops these systems. Some projects exist in North Africa as well. From there the produced electricity should be transferred to Europe through high voltage transmission lines.

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Zugdidi/Tsaishi and the performance of which is 160,000 cubic meters a day. The potential of the annual production is 350-400 thousand cubic meters.

The temperature of the existing geothermal waters does not allow for the generation of electricity. Utilization of these waters is more convenient in the population for sanitary purposes and for green-houses.

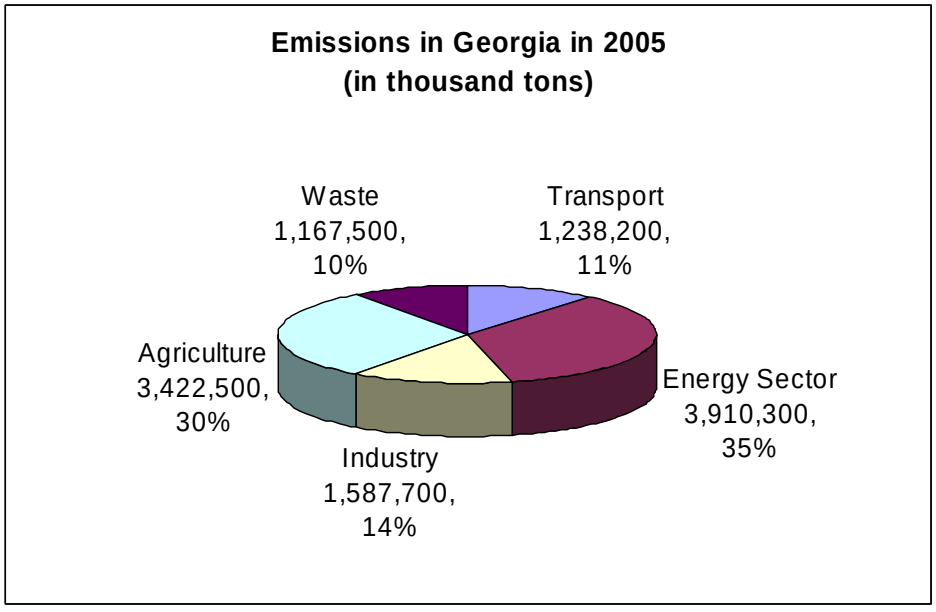
The utilization of the potential of geothermal resources in Georgia started in 1951.

Biomass

Biomass includes all kinds of animal and plant remains – remains after reprocessing the forest and wood, agricultural, animal and plant remains, waste of food industry, and domestic, municipal, and canalization waste. Animal waste in the process of decomposition produces methane, which is 21 times more harmful than CO^2. Old and sick trees and their remains also produce CO^2, if they are not reprocessed and isolated.

After Georgia's declaration of independence, production in energy intensive factories, which constitute the main source of the greenhouse gasses, was reduced. As indicated above, in 1990 Georgia emitted 46 million tons (equivalent to CO^2 into the atmosphere). In 2005 this figure amounted to 12 million tons. According to the inventory conducted by the Climate Change Office of Georgia in 2005, in this period the main source of emissions in Georgia had been energy, agriculture, industry, transport, and waste.

Graph 3: Emissions in Georgia in 2005



Source: Climate Change Office of Georgia

As revealed by this graph, agricultural and urban waste constitutes an important source of emissions. Removing this waste from the country is not a choice for Georgia, but rather a necessity. This is

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convenient not only from a sanitary and aesthetic standpoint, but also for the participation in the emissions trade[12] through the clean development mechanism provided by the Kyoto Protocol.

The research conducted by the experts of World Experience for Georgia depicts the following picture of producing energy from different types of biomasses:

Chart 2: Energy potential of different types of biomasses

Type of biomass	Quantity (thousand tons)	Energy (million kilowatts per hr/sec.)	Fossil fuel spared (substituted) annually
The waste from cereals and legumes	870	1.3	112 thousand tons
The remains of cattle-breeding and poultry raising	1670	6.9	$734x10^6$ cubic meters of natural gas
Domestic remains	900	0.6	$64x10^6$ cubic meters of natural gas
From the canalization water and the equipments for cleaning fecal masses of Tbilisi	250	1.0	$100x10^6$ cubic meters of natural gas
Timber and its remainder	700	2.7	200 thousand tons
Total	4390	12.5	1074 thousand tons

Source: World Experience for Georgia

Along with the development of agriculture and cattle breeding, the amount of the waste from agriculture and cattle breeding increased abruptly. USAID subcontractor Winrock International helps the population to establish small bio-digesters in order to support Georgia's rural development. The bio-digesters enable the population to produce individual free sources of biogas and to participate in the process of cleaning up waste. The UN Development Program also supports the village populations of high mountainous regions of Georgia by supplying bio-digesters and energy efficient ovens.

Bio-fuel

Transport is one of the largest sources of greenhouse gas emissions in the world. For the purpose of reducing transport emissions, many developed countries actively endeavor to increase the production of vegetable fuel and to reduce consumption of fuel produced through hydrocarbons. However, recently, the large increase in food prices has raised many questions concerning the production of bio-fuel. Is it possible that the increased production of bio-fuel will result in more

[12] The mechanism of pure development enables, as a result of the replacement of the hydrocarbons by the renewable energies, to state the amount of sequestrated emissions in tons in the certificate, which is one of the products of international trade and gives significant income. The price of reduction of 1 ton of emission on the international market costs 15-17 euros at spot and amounts to 25 euros futures market.

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price increases on food products and in further aggravating the living standards of socially vulnerable segments of the population in poor and transitional countries?[13]

Moreover, it is well known that the production of bio-fuel in the world is subsidized. Agriculture is also subsidized. The question is what is more necessary to subsidize: agricultural food products or products producing biodiesel? For a mountainous country like Georgia, the prospect of producing bio-fuel should be closely investigated in order to understand how to use land more efficiently and its relation to the competition with food products. Which is better, should the government subsidize agricultural production or biodiesel and bioethanol production?

In its research concerning bio-fuel potential World Experience for Georgia relies on the research of the Center of High Technologies with regard to the potential for producing bioethanol on the basis of topinambur and for biodiesel - rape. According to this research, for the production of 10,000 tons of biodiesel on the basis of rape 12,000 hectares of land area is necessary. After reprocessing fodder and technical glycerin are obtained. For obtaining 10,000 tons of bioethanol from topinambur three hectares of land area is necessary. Sugar, pharmaceutical products, and other additions are produced through reprocessing. According to the research, these bio-fuels can be competitive with traditional hydrocarbon fuels in Georgia.

During the meeting with the team leader of the project it was ascertained that they have not taken the cost of capital and the existing tax regime into account[14] in calculating expenses, since they believe that the state has to encourage the production of bio-fuel in the country through a favorable tax regime and other measures.[15] Therefore they found bio-fuel production competitive with hydrocarbon fuels in Georgia.

Legislative Basis

In the introductory part of this report it was outlined how much attention developed countries pay to the development of renewables. Without a comprehensive state policy, the political will to finance the technologies, and a favorable tax regime, the development of renewable energies would be impossible.

At this stage, the conditions for supporting the development of renewable energies do not exist in Georgia (except for small hydroelectric stations; according to the new laws on oil and gas, the independent commercial operator is obliged to purchase electricity produced by them).

The resolution of parliament of June 2006 called the Main Directions of Georgia's State Energy Policy recognizes the necessity of maximal utilization of renewables (hydro, wind). However, it also points out that the development of renewables should take place in a competitive environment.

[13] For the production of bio-fuel it will be necessary to cut down more forests.
[14] They assumed that a farmer planted topinambur, cultivated and produced bio-fuels, the cost of which would not include the cost of the land, the loan and its interest, or any other capital expenditures. As they explained they included only production costs into the price and assumed that the government created favorable conditions for the production of bio-fuels.
[15] The existing taxes with regard to fuel (value-added tax, taxes on land, income, and imported equipments) have been annulled.

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Nowadays, the development of renewables in a competitive environment is impossible; therefore, this part of the resolution opposes itself and, in fact, rules out the possibility of the development of renewables in Georgia.

In 1998, one year after the adoption of the resolution a state concept on the development of renewable energies was elaborated and subsequently approved by presidential edict. The concept considered subsidization, guaranteed purchase of energy with favorable prices, and tax privileges. The edict has not been followed up with the establishment of an action plan or any type of implementation document.

The tax code operating until January 2005 allowed for the liberation of the production of renewable energies from value-added tax, taxes on land, ownership, and profit, and from tariffs on importing, producing, and utilizing the equipments necessary for the development of renewable energies. The new tax code and rules on tariffs do not consider such privileges. The experts of the Sun House, which use imported solar panels and heaters, pointed out that after the adoption of the new tax code this equipment has risen in price by app. 30-40% (because of value-added and profit taxes).

Currently, work on the legislation concerning renewable energies and energy effectiveness is underway. It will be presented to parliament for discussion on the session of autumn 2008.[16]

Recommendations

- A legislative basis ensuring the development of renewable energies should be established;
- An action plan outlining the stages and mechanisms supporting the development of renewables should be developed;
- Market rules giving renewables access to the market, like those existing with regard to electricity and gas, should be established;
- The country should use all opportunities offered by the pure development mechanism under Kyoto Protocol and take maximum profit from the development of emissions reduction's projects.

Liana Jervalidze
Expert on Energy Issues

[16] Work on the legislation is going on with the support and financial aid of the USAID.

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