

Energy Security Georgian Perspective

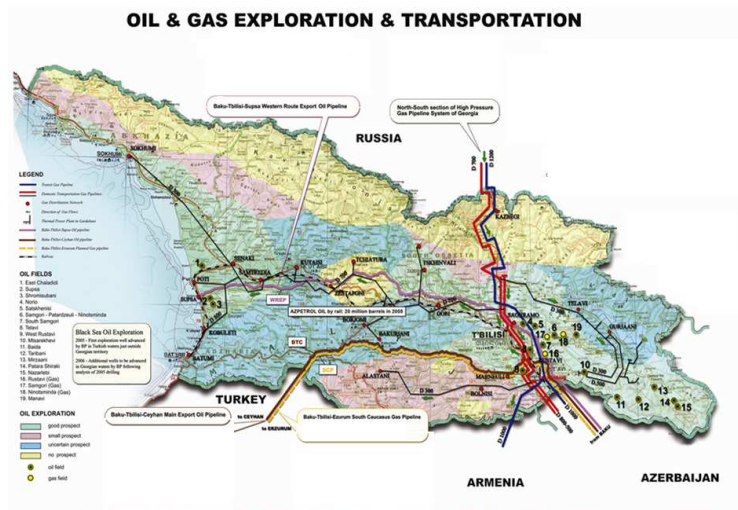
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Energy Security means reliable and sustainable provision of energy at affordable price and acceptable quality. In short term energy security is defined by the probability of sudden changes in supply or demand and the ability of energy system to react efficiently. Long-term energy security is linked to timely investments to supply more of own energy, and other supporting measures to reduce the probability and adverse effects of external supply disruptions. The requirements of sustainable economic and social development and environment protection limit the scope of security measures. Here we briefly review the current and prospective factors of Georgia's energy security.

Georgia's Energy Mix.

Georgia does not have significant oil & gas reserves. As a result, about 65% of country's primary energy supply is from external sources. Imported natural gas constitutes about 45% of total energy supply while imported oil products constitute about 25% of energy mix. Own hydro generation is sufficient for internal demand and constitutes 20-25% of total energy supply and the rest is fuel wood.

Georgia is situated on important geopolitical crossroads of the continent, major energy transmission lines and pipelines go through the country. South Caucasus Pipeline (SCP) connects Caspian Shah Deniz gas field to Turkey. The Baku Tbilisi Ceyhan (BTC) oil pipeline connects the offshore oil fields in the Caspian to the Turkish coast and further European markets. Western Route Export Pipeline Baku-Supsa (WREP) also serves for supply of Azeri oil by tankers to global markets. Georgian railway provides a corridor for transporting petroleum products and crude from Azerbaijan, as well as Kazakhstani and Turkmenistan to the Black Sea. North-South main gas pipeline serves for export of Russian gas to Armenia.



These transport routes involve many international stakeholders and provide to Georgia relative political security as well as transit revenue and own energy. Currently about 60% of Georgia's current domestic gas demand is provided from in-kind gas transit fees from SCP and North-South gas pipelines.

Current state of Energy Security

Sabotage on Russian territory of the natural gas transmission pipeline and the main electricity transmission line, serving for energy export to Georgia, in severe winter of 2006, resulted in energy crisis for almost two weeks. Russian-Georgian war in 2008 didn't create much of energy disruption and major energy infrastructure was damaged, however the risks were extremely high. This was preceded by almost quadruple increase in the price of imported gas over previous three years. These developments have indicated a serious need for strengthening Georgia's energy security and urged the actions for diversifying energy supply sources.

There has been a significant improvement in Georgia's energy security standing over the last several years. In difference with the situation of 2006, Together with development of Shahdeniz field in Azerbaijan more gas became available to Georgia both as in-kind fee for the transit over SCP, and also for direct purchase from Azerbaijan. Georgia has reoriented its gas purchases and has concluded a long term agreement with SOCAR to supply the gas at fixed price as well as to supply gas in emergencies. The portion of Russian gas in energy balance is now limited to in-kind fee for transit to Armenia.

Georgia has become self sufficient in electricity due to hydro plant rehabilitation, though with one important comment: most of electricity production comes in summer when the demand is low, while in winter the hydro potential is insufficient for covering the demand and gas fired thermal plants or import need to come on line. Major concern is related to Enguri/Vardnili hydro power plant cascade. It is a key contributor to Georgia's electricity generation and therefore major factor of energy security. The power house and switchyard are located on the territory occupied by Russia, while the dam and reservoir are on the territory controlled by Georgian state. This can result in serious energy problem in case of political escalation with Russia who already occupies 20% of Georgian territory.

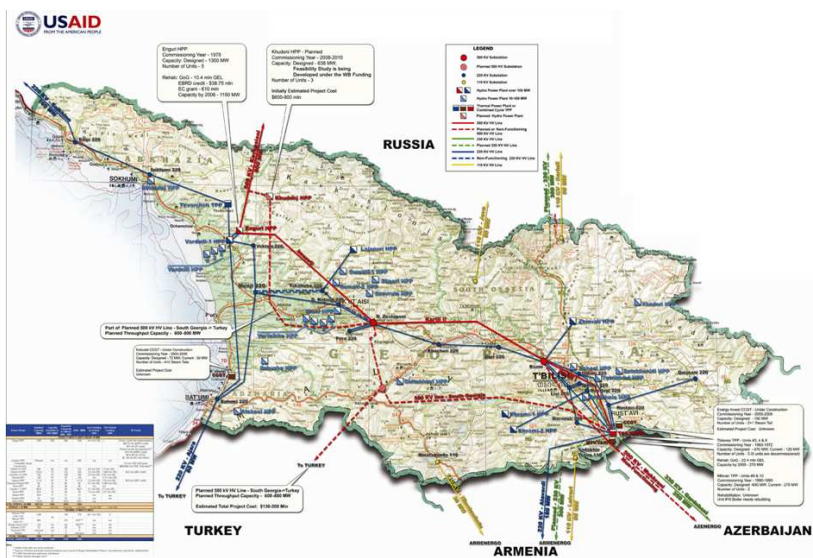
Remaining strong dependence on imported gas, pronounced seasonality of Georgia's vast hydro potential and threat to control of key energy assets are the most important challenges to Georgia's energy security. In order to cope with these challenges Georgia needs to develop internal energy resources, diversify further energy supplies and seek the ways for more political stability in the region.

Internal Resources

By far the hydro electric potential is the main prospective resource of domestic energy. According to various estimates there is a possibility to economically develop about 20-30TWh of annual generation. The Georgian government program “Renewable Energy 2008” has initiated energetic action in this direction and there is a big number of large and medium projects already in development.

In 2010 Georgia has already achieved a level of 1.3TWh of net electricity export, however further development requires reliable external market and possibility of seasonal electricity exchange to compensate for summer excess and winter deficiency of domestic electricity. This urges the development of transmission interconnections with neighboring countries as well as development for long term reliable and transparent arrangements that might start as bilateral contracts but eventually should lead to more stable regional market structures. Turkey is considered as most promising market for Georgian electricity at least in medium term.

Ongoing construction of 500/400kV transmission line with back-to-back DC connection substation in Akhalsikhe, rehabilitation of existing interconnections with Armenia (220kV) and Azerbaijan (330kV) and construction/rehabilitation of additional lines show a strong development in this direction. With this construction of new transmission capacity Georgia



tries to open up the new possibilities for renewable electricity trade and exchange with neighbors. This can become more relevant since recent Fukushima accident and growing concern over climate change caused by Greenhouse Gases.

Georgia has own resource of brown coal which is estimated at 300mln tones. There is already use of brown coal in industry and ongoing construction of small CHP Plant in Tkibuli that signifies the start of coal utilization in power sector for security and economic development reasons.

There is a vast untapped potential of Energy Efficiency (EE) and Renewable Energy (RE) in Georgia that have to be incorporated in energy security improvements. The economically

achievable annual potential of renewable energy sources (RES) can be estimated as: small hydro – 5 TWH¹, wind – 5 TWH, biomass – 3-4TWH, solar – 60-120 GWH, geothermal – 0.8 TWH². However, the share of renewable energy, except big hydro, is still only a few percent in Georgia's energy balance. At the same time energy intensity of Georgian economy is high and the amount of specific energy needed to produce goods and services in Georgia is 2-2.5 times higher than in Western countries. It is estimated that Energy efficiency measures can provide up to 20% of energy saving in the country.

Up to now Georgia has been slow in development of EE & RE, but recently especially after the pledges by Georgian president at Cancun 2010 conference and Tbilisi joining the Covenant of Mayors, there is a visible trend towards development of these internal reserves. Adoption of RE & EE legislation would be a strong factor in support of developing these resources. Development of this resource offers the potential for cooperation in this field with neighboring countries who are facing the similar challenges.

Georgia continues to explore its oil & gas reserves. A new development of 21st century Shale Gas can become an additional and even most important source of energy. This potential resource needs to be evaluated and developed over a coming decade, however preliminary rough estimates indicate that in case of success the scale of the resource can be comparable to some most successful shale gas plays in the US.

Another major development is the expected construction of Gas storage facility in Ninotsminda oil field. The gas storage will allow to store more than 300 million cubic meters of gas. The pre-construction design study has been completed last year and the construction preparations are going to start soon.

Energy Transit.

The concept of Southern energy corridor adopted and promoted by European Commission provides major opportunities to increase Georgia's energy security both in terms of additional in-kind transit revenue as well as political support that will strengthen the protection against political risks facing the country.

The near term significant development is expected with further development of Shahdeniz gas production (stage 2) scheduled for 2017. It will tripling overall production from the field and deliver an additional 16 bcm of gas for transit over SCP therefore increasing the transit revenue to Georgia. 5-10 bcm/y additional gas will be available from Turkmenistan off-shore fields developed by Petronas even sooner if TCGP is implemented timely.

¹ <http://www.minenergy.gov.ge/index.php?m=249&lang=eng>

² Renewable Energy Potential in Georgia and the Policy Options for Its Utilization (WEG), 2008

Nabucco - the flagship project of southern corridor is developed to connect the world's richest gas regions - the Caspian region, Middle East and Egypt - to the European consumer markets it will carry about 32bcm of gas annually. The concurrent project -White Stream has been conceived to transport gas from Caspian via Georgia over the bottom of the Black Sea directly to the markets of Eastern Europe. Together with Nabucco, White stream will provide an essential link for Europe to gas resources in the Caspian and will contribute to security of gas supply by providing a complementary export route with diversification benefits for both producers and consumers. The project will be developed in stages with initial throughput of 8 bcm to to 32 bcm per year.

There is an active discussion of Azerbaijan-Georgia-Romania Interconnection Project (AGRI), the project plans to supply 6-8-bcm of liquefied Azeri gas to Europe by Black Sea tankers to Romania annually. The feasibility of the project is still under examination.

All the above projects have the potential to contribute to energy security and political stability of Georgia and relate it closer to energy security of the EU.

Conclusions

Lack of own oil & Gas reserves, excess of hydro potential and tense political relationships with Russia define the current picture of Georgia's energy security.

There are three main directions for Georgia's energy security: 1. Developing internal energy resources, 2. Developing the regional energy exchange and cooperation, 3. Developing country's capacity for international energy transit, especially in the context of Southern Corridor. All three directions are productive grounds for international cooperation and can provide economic, security and environmental benefits to participants. This development shall be supported by creation of transparent legal and regulatory framework of western standards.