

Enguri HPP and Energy Supply to Abkhazia -Energy and National Security Challenge

Introduction

The growing unpaid consumption of electricity in Abkhazia is becoming a major energy security problem for Georgia. It results in increasing outflow of energy and finances, worsens the technical condition of the Enguri-Vardnili cascade and aggravates the situation in Georgian power system. It also increases the energy dependence on Russia and Azerbaijan and creates additional economic and political risks. This escalating problem can be considered as a form of creeping occupation in energy sector. This is also similar to Russia's energy support to otherwise unsustainable breakaway regions in Moldova and Ukraine.

The situation is not very beneficial for Russia, who partly covers the winter power deficit for Abkhazia, as well as for the population of Abkhazia; who although benefits from almost free electricity, but increasingly suffers from the poor quality and reliability of supply. In addition, the current unsustainable practice of energy extortion threatens the main source of their energy supply Enguri-Vardnili cascade. The situation is not sustainable and may lead growing tensions over Enguri cascade output. The ghost of cryptocurrency mining is already raising the stake by growing the demand on electricity on both sides of a dividing line.

On the other hand, there may be interesting opportunities of cooperation that could bring sizeable benefit to all parties and normalize the situation around Enguri-Vardnili cascade. However seizing this opportunity requires political will and recognizing the fact, that the Current *Status Quo* is unsustainable, leads to further aggravation, more damage to all parties and eventually - to increased tensions in the region.

Herewith we would like to initiate an internal discussion to draw more attention to this complex and sensitive problem. At the same time, we acknowledge that our assessment and conclusions are based on a limited available information to us and are open to alternative opinions, supported by more arguments and/or facts.

Background

After the war in Abkhazia in 1993, the facilities of Enguri Hydroelectric ended up to be on both sides of the dividing line. Power house and substation of Enguri HPP and Vardnili 1 HPP are on the Russian-Abkhazian controlled territory, while the dam, reservoir and part of the diversion tunnel

are on Georgian-controlled side (see Figure 1). It should be noted that the whole staff of the station are Georgian engineers (living in Gali region) and the plant operates as an integral part of the Georgian power system.

Initially there was an informal agreement to divide the output of the Enguri-Vardnili cascade in proportion 40:60 between Abkhazia and the rest of Georgia. This represented an estimate of plant fixed assets by both sides of dividing line for that period.

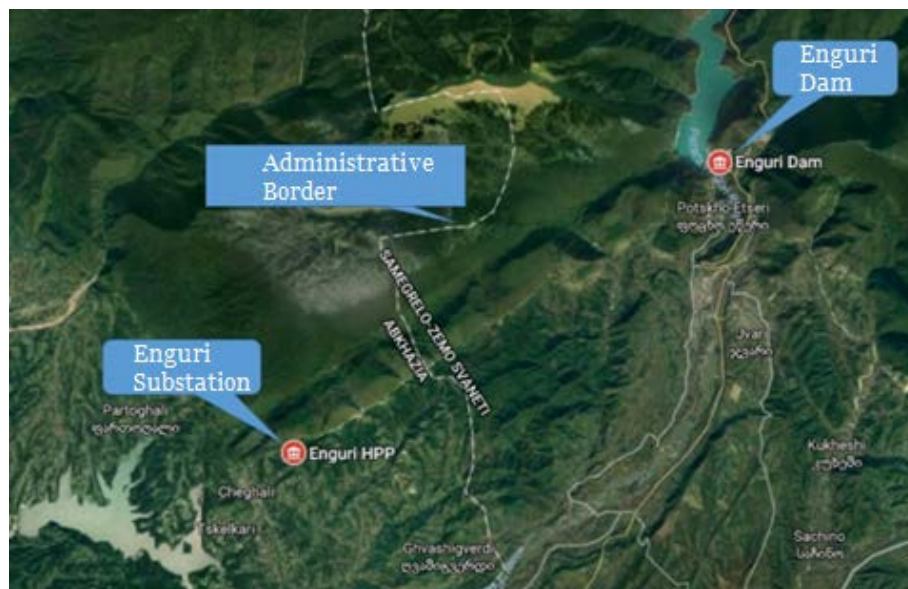


Figure 1: Enguri HPP Dam and Substation

Ever since, Abkhazia uses electricity generated by Enguri cascade without any limitation and any financial reimbursement, while the rest of the Georgian consumers and the country budget pay for the operation and capital repairs of the station. The state of Georgia is subsidizing the consumption of electricity in Abkhazia, not only by covering the plant expenses but also through electricity imports in winter. Formally, according to the Enguri tariff, the cost of electricity delivered to Abkhazia is around 36 million GELs annually. However, considering the need of compensating the growing winter consumption by imports and thermal generation, the real cost to Georgia is at least twice as much. This also does not include the major costs of capital works on the tunnel and reservoir. Even if initial assessment of asset distribution was correct, the later investments in plant rehabilitation¹ and operation, should have significantly changed it in favor of the Georgian side. Therefore, using the same principle, the Abkhazian side should be receiving less electricity, and in any case not free of charge.

On the contrary, the scale of the problem is constantly growing together with Abkhazia's unpaid consumption. In 2010-2016 the increase in consumption in Abkhazia was 550 GWh (More than total output of the new Shuakhevi HPP – 450GWh). Only in the first 5 months of 2017, the consumption increased by 100 GWh². Compared to 2016 the annual consumption will grow at least by 200GWh-s. In winter the consumption of Abkhazia already exceeds the output of Enguri / Vardnili cascade,

¹ Financed by EBRD and EIB

² This is more than annual output of the new wind farm (88GWh)

which requires more imported electricity, including from Russia, whose military facilities are likely to be consuming this energy.

Despite commissioning of new power plants, the country's energy security worsens and growing unpaid consumption in Abkhazia is a major contributor in it. In 2017 the annual import of electricity is expected to be around 1.3 TWh. **This increases energy dependence on Russia, which can bring significant negative political consequences.** At the same time, the Enguri HPP is accumulating **technical problems** (damaged facing of the 15 km pressure tunnel, siltation of reservoir, etc.) requiring more expensive measures.

Thus, due to the growing unpaid consumption in Abkhazia and related technical, financial and security problems, the benefit of Enguri cascade to the rest of Georgia gradually diminishes, while costs increase. The Georgian government has to reconsider its attitude to the problem and find rational ways of changing the current *Status quo*.

The situation has a negative impacts for Russia, and in the long term, to Abkhazian region itself:

According to Russian-Abkhaz sources, Russia also partly subsidizes energy consumption in Abkhazia by supplying electricity at below market price. According to the Russian Energy Ministry's estimates, the unrecognized income of Inter-Rao amounted to 750 million rubles in 2016-2017 for energy supply of Abkhazia. These Inter-Rao expenses are partly reimbursed by the Ministry of foreign affairs of Russia.

Electricity supply in Abkhazia becomes unreliable especially in winter due to shortage of energy but also conditions of distribution network. The rolling blackouts over last two winters have not achieved the result of significantly limiting the consumption. Electricity system managers are concerned about future winter prospects, fearing that because of the Crimea supply Russia may not be able to supply sufficient electricity to Abkhazia³. Although Russia is now commissioning the new unit in Rostov Nuclear Power Plant, the prospects of Abkhazia supply are not clear yet.

Along with the comfort of free electricity, the basic cause of the problem is technical and organizational disorder in electricity distribution system in Abkhazia resulting in electricity theft and unrestricted consumption. It seems that the acting government in Abkhazia has not gained enough political maturity to resolve the problem of electricity distribution even in favor of own economic and social and security interests.

Electricity consumption in Abkhazia

In 2016, electricity consumption in Abkhazia reached 1926 GWh, which translates into 8000 kWh per capita, if one uses Abkhazia 2011 census data (240 thousand inhabitants). This is 3.3 times higher than per capita consumption in the rest of Georgia, and exceeds the same for Belgium or Japan. Using a more modest expert assessment of real population (180 thousand inhabitants), one arrives at 10.7

³ <https://eadaily.com/ru/news/2017/10/26/energopotreblenie-abhazii-rastet-ezhegodno-na-9-prognoziruyutsya-pereboi>

thousand kWh per person, which exceeds 4.4 times the per capita consumption for the rest of Georgia. This is more than figures for Singapore, Saudi Arabia and high-income OECD countries, and is almost double of EU average (5.5 thousand kWh / per person). Such a level of consumption is unusual for nonindustrial, underdeveloped region and is equivalent to every resident of Abkhazia having a 1.2 kW electric heater turned on 24 hours for the whole year. This can be partly explained by wasteful electricity consumption, but has also raised yet unconfirmed suspicions on illegal outflow of electricity to Russia.

Figure 2 shows that the agreed (although unpaid) consumption limit was maintained until the last period⁴; However since 2014, the share of Enguri electricity consumed in Abkhazia has been sharply rising and in 2016 reached 46% of the cascade’s annual output. The expectation for 2017 is 48%.

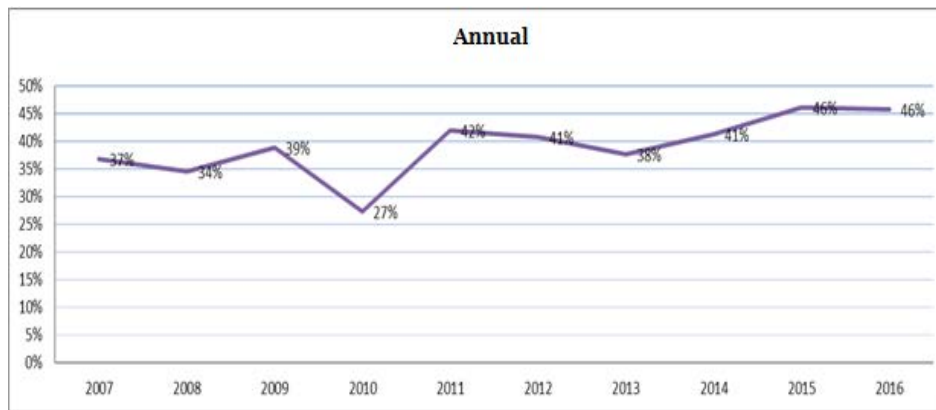


Figure 2. The share of the consumption of Abkhazia in the part of the Enguri-Vardnili cascade
Note: Consumption in 2010 is reduced not by absolute indicator, but because of the increased output of the Enguri / Vardenal cascade due to the share and waste.

The situation is much more alarming in winter. Over the last ten years the summer consumption has increased by 77% (probably due to tourist load), while winter consumption increased by 48%. However this latter falls on the most difficult low water/high consumption period in the system and is more disturbing. In winter, Abkhazia consumes more than Enguri generates, and Georgia's energy system has to import expensive electricity to compensate this growth. Fig 3. shows the dynamics of Abkhazia as a share of Enguri/Vardnili, output in winter and summer months.

⁴ This was partly due to compensation of increased consumption in Abkhazia by increased production of Enguri/Vardnili after rehabilitation.

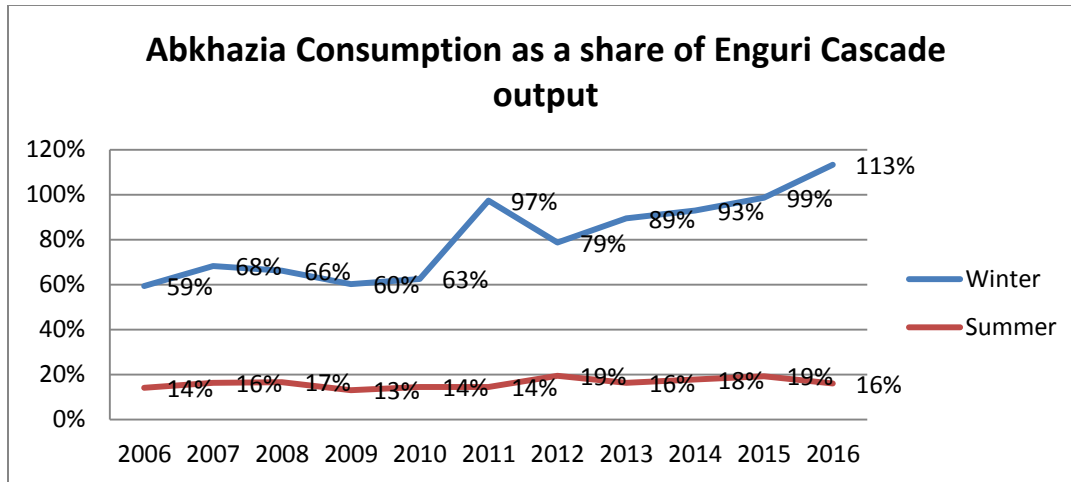


Figure 3. The share of consumption of Abkhazia to the Enguri cascade

As shown in the graph, in winter months, Abkhazia uses 13% more electricity than Enguri produces and this is growing. During January 25 - February 16 of 2016, the rolling blackouts were introduced due to low level of water in the reservoir, however, the winter consumption still was the highest over last years and continues to grow.

Technical problems

The increasing uncontrolled consumption of Abkhazia creates more technical issues:

- Although the Enguri HPP is operated from Tbilisi dispatch center, due to drain of resource, in winter months, it cannot perform its major balancing function of a peaking station. This affects power system reliability and limits its ability to accommodate more variable renewable resources of wind and sun. This also compromises the opportunity for Georgian Power System to participate in covering peak loads in neighbor countries and reduces the perspectives for regional cooperation in electricity.
- Filling and draining regimes of the reservoir should be conducted within the strict limitations defined by dam stability requirements. Inappropriate use of the power plant can lead dam and reservoir safety issues.
- Unresolved largescale problems are being accumulated at the plant. Unpaid revenues from Abkhazia affect the plant's ability to conduct major rehabilitations and overhauls. According to some experts, the technical condition of the Enguri HPP is getting worse⁵. Siltation of the reservoir creates operational problems and safety risks for the arched dam, this make it difficult to control the water level in the reservoir. The deterioration of the derivation tunnel is reflected in the increased flow of water filtration along the diversion tunnel.

⁵ <https://eadaily.com/ru/news/2017/10/30/rossii-mozhet-ne-hvatit-elektroenergii-i-dlya-kryma-i-dlya-abhazii-ekspert>

- Due to wasteful consumption, Abkhazia's transmission and distribution network gets overloaded and its reliability has deteriorated⁶. There is need for significant investment in the network.

Experts estimate, that the full rehabilitation of the derivation-pressure tunnel will take about 1.5-2 years and estimated 150-170 million dollars will be needed only to assure alternative electricity supply for Abkhazia. Therefore, from current perspective, the implementation of full rehabilitation does not seem probable in near future.

Due to the above factors, the situation continuously deteriorates and requires fundamental change to make it sustainable. Abkhazia needs to organize proper distribution system and contribute to financial viability and maintaining technical conditions of Enguri HPP.

With the help of international donors, Georgia continues the rehabilitation works on Enguri HPP. For 2018-2021 it is planned to conduct: partial rehabilitation of the diversion tunnel and its access roads, hydro-mechanical and electromechanical works, etc. 35 million Euros for rehabilitation is provided by EBRD. The plant is planned to be shut down for 3 months in February-March of 2018, however the issue of alternative energy supply to Abkhazia is not resolved yet. It is estimated that the rehabilitation will increase the output by 50 GWh-s, however this increase is likely to be eaten up by increase of consumption in Abkhazia. GNERC has recently approved the investment plan of 2018-2020 which includes about 132 mln GEL investment in the plant. There is no evidence of Abkhaz participation in plant rehabilitation expenses although the interviews of the Abkhazian network operator - "Chernomor ENERGO" leadership gives an impression of this happening⁷.

Georgian-Russian-Abkhazian relations on Enguri Hydro Power

Because of scarce of public coverage, we can only mention few cases of relations with Abkhaz and Russian parties over the Enguri-Vardnili cascade;

First of all, one should note, that despite the periods of increased tension in relationships, the Georgian staff of the station has not faced serious threats and/or harassment, which could be considered as indication of possible cooperation with Abkhazs.

The periodic routine meetings were held at operational level between the Abkhazian network operator "Chernomor ENERGO" and the Ministry of Energy to discuss more technical problems of Enguri cascade operation and repairs. As a result of these contacts, the HPP repair works have not

⁶ <https://jam-news.net/?p=9889&lang=ru>

⁷ <https://jam-news.net/?p=9881>

faced security problems or serious obstacles. Supposedly, in the meetings the issues of payment to the plant were also discussed with Abkhazians however without much result.

After the August 2008 war, the Georgian government held negotiations on transfer of the plant management to Russian side and preliminary agreements were achieved. According to unofficial information, the agreement failed because of the strong position of the Abkhazian side. However, supposedly, the strategic outcome of such an agreement would not be beneficial for Georgia anyway.

There is an ongoing dialogue between Georgian and Abkhaz civil society representatives supported by the Swiss government, where the issues of reforming the energy sector in Abkhazia are discussed, including introducing proper tariffs and metering, energy efficiency, renewable energy *etc.* Although this dialogue may be a welcome effort for finding constructive solutions, it cannot replace the need of state strategy and tactics from Georgian government.

Presumably, the technical contacts and meetings at operational level still continue, however we do not see the signs of a consistent strategy or tactics for improving the situation. **It seems that closed negotiations cannot solve the problem. There is a need for new visions, new alternatives and bringing a wider range of stakeholders to table.**

Potential remedies

There are several economically profitable opportunities that might be pursued in case of proper willingness to improve the situation:

Organization of proper metering and payments system at a more or less realistic tariffs and eradication of corruption in distribution networks. Experience of Tbilisi and regions of Georgia indicates that, this measure may reduce the consumption by 35-40% and generates revenues for operating the power grid. This can also free up substantial volumes of electricity for better economic use or even export. This measure may require considerable capital expenditures and organizational efforts, however this will be a chance for Abkhazia to create a more stable and predictable environment for investment.

The process can be facilitated by the use of **energy efficiency** and **energy conservation measures** which will partially compensate the costs to the customers. This may lead to deployment of new, efficient technologies and have an effect on job creation.

The use of renewable energy sources can take an important part in resolving energy problems in Abkhazia. It is possible to use solar water heaters or modern biomass technologies in heating system, which can be a source of economic activity and employment.

There may be other alternatives including e.g. bringing natural gas for heating to Abkhazia; developing small and medium hydropower potential, restoration of downstream power stations of Vardnili Cascade, export of electricity to other countries, wide scale development of renewable

sources etc. There may be even high donor interest in financing such activities; however, **two major conditions for progress are in a) achieving and observing a firm agreement on sustainable conditions between the parties, b) bringing an order to Abkhazian electricity grid.**

Conclusion and recommendations

It is becoming more and more obvious that the current unsustainable situation where the electricity is extorted from Enguri HPP and wasted in Abkhazian network, leads to further aggravation and needs to be changed. The unilateral care of the Georgian side in the Enguri-Vardnili HPPs cascade is becoming too expensive and less beneficial and cannot last for long.

There are two **possible scenarios of the development: 1) continued creeping energy occupation and extortion or 2) mutually beneficial cooperation.** Georgian government should do its best to develop the cooperation scenario but also prepare for the case of failure.

Cooperation, can be only possible if:

1. Fair Starting conditions of relationship around Enguri will be agreed, or previous agreement reinstated and given a realistic interpretation;
2. The problems of Enguri power and its reimbursement will be discussed separately from other political issues and problems caused by occupation;
3. The interests of all stakeholders will be assessed and taken into consideration to achieve more fair relationship.

Involvement of international community can strongly facilitate the process as international financial and political support can be a crucial factor for the success.

The Government of Georgia shall:

- Review strategically the current state of Enguri HPP operation and output distribution practices, and assess the benefits of further increased investments in Enguri HPP as well as possible alternatives; **we hope that joining the Ministry of Economy with the Ministry of Energy will not hamper the work for resolving this problem.**
- Intensify the dialogue with Abkhaz and Russian parties on the current situation and alternatives;
- Inform the international community about the "creeping occupation" in energy sector including high international tribunals. Find more mechanisms for the involvement of the international community in this area.
- Inform citizens and involve the civil society to consolidate the public support for resolving the problems
- Strengthen the work on energy security and alternative sources of energy. Including the development of energy strategy and new important generation sources.
- It is necessary to use all internal and external resources to solve the problem of conservation and achievement of fair parity conditions in order to achieve future improvement.

Murman Margvelashvili
World Experience for Georgia

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A TBILISI 0179, PALIASHVILI STR. 5
T (+995 32) 210 24 52
F (+995 32) 222 43 85
E weg@weg.ge

