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Transparent Energy Trading in Secessionist Regions

Electricity Supply to Abkhazia and Emerging Energy Security Risks for Georgia



World Experience for Georgia



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Introduction

Georgian Breakaway region of Abkhazia has been Russia's instrument against Georgia's independence since 1990-ies. The war in early 1990-ies and Russian occupation completed in 2008 have resulted in big number of IDPs and subsequent isolation of the region causing various humanitarian and economic problems, including a major issue in energy security.

Energy remains a strong connecting link between secessionist region and the rest of Georgia. The major energy asset of Georgian power system and the main source of energy in Abkhazia is electricity – Enguri/Vardnili hydropower (HPP) cascade ended up between Georgian and Russian/Abkhazian controlled territories; Enguri HPP reservoir and dam are on Georgian side while its powerhouse, Vardnili1 HPP and currently submerged Vardnili 2,3 and 4 HPPs are on Abkhazian territory.

Abkhazia is supplied for free from Georgian grid and Enguri/Vardnili HPP cascade. The unpaid consumption from Abkhazia was tolerated for decades as it allowed to have a working relation with the region and maintain relative peace. However, the growing unpaid consumption on Enguri/Vardnili HPP cascade output is becoming a major energy security problem for Georgia as this increases the energy and financial losses, aggravates the technical condition of the Enguri/Vardnili cascade and the power grid. This status quo is partly supported by Russia, who controls the situation in Abkhazia and there have been cases where Georgia had to import power from Russia and supply Russian occupational forces for free. This escalating problem can be considered as a form of creeping occupation in energy sector, and is similar to Russia's energy support to otherwise unsustainable breakaway regions in Moldova and Ukraine.

Though, consumers in Abkhazia may benefit short term from almost free electricity, they increasingly suffer from poor quality of supply and accumulation of problems in the network. Inadequate tariffs, poor metering, billing and collection practices and related corruption in electricity distribution network, result in a waste of expensive energy resource, underinvestment in the network, and prevent the development of hydropower as well as economy in general. Extortion energy for free from Abkhazia's main source of energy - the Enguri/Vardnili Cascade affects its technical condition, shortens the lifetime and undermines the security of supply to the same Abkhazia in long term.

Russia's traditional attitude of extending its influence through the control of energy assets in other countries plays also in case of the Enguri/Vardnili HPP cascade which is the critical energy asset for Georgia and can provide a strategic leverage over its energy supply and potentially policies. The same may be implied with regards to Abkhazian side and its power network. Having the patronage over the occupied region, Russia demonstrates the responsibility and partly subsidizes or otherwise assures the electricity supply to Abkhazia in winter periods. Until recently Russia itself had electricity deficit in southern regions due to the necessity of supplying occupied Crimea. With commissioning of the 4th unit in Rostovskaya nuclear power plant the power deficit has been resolved. However, providing even limited amount of electricity to Abkhazia without payment is still an economic burden for Russia as well.

The situation is locked in a stalemate and the weak process of Geneva Talks or diplomatic consultations of Abashidze-Karasin on Abkhazia have not demonstrated much progress. Although the Georgian government shows its willingness for reconciliation (e.g. providing the free healthcare to the population of Abkhazia) the Russian military and propagandistic grip over Abkhazia does not allow to achieve any sizeable progress in this direction. Neither there has been any improvement on energy related issues. Spending the money on Enguri HPP is like trying to fill the bucket with a hole. The unsettled relations around its output do not allow to operate the plant in a safe manner.

The current *Status Quo* is not sustainable; Absence of enforceable agreement leads to further growth of unpaid consumption, which may eventually lead to increased tension and its escalation over the power output from Enguri cascade. It paves the way to Russia's control of critical energy infrastructure on both sides of administrative border and its use in hybrid warfare against Georgia's independence and Euro-Atlantic aspirations

At the same time, there are interesting opportunities for cooperation and achieving the mutual benefit in energy sphere. Seizing these opportunities first of all requires realization from stakeholders that, current practice leads to increase of damage and cannot continue for long. It also requires some political will and readiness for improvements, which is not obvious for now.

Stakeholder map

For better understanding of the situation, below we list the main stakeholders and their alleged interests in relation to Enguri HPP & Abkhazia consumption problem, as revealed from available sources and expert consultations:

Georgian government needs to address the Enguri HPP/Abkhazia Consumption problem in a wider context of occupation by Russia and secessionist sentiments as well as own willingness of reconciliation with Abkhazian population. Up to now Georgia has taken a visibly passive position in resolving the Enguri power problem and has continued to supply the power to Abkhazian side without any payment or declared demand for payment. There were periods (2014-2017) when Georgia was importing electricity from Russia and supplying to Abkhazia, including Russia's military bases on the territory. Georgia has also shown its willingness for expanded energy cooperation by seriously putting on the agenda the possibility of rehabilitation of Vardnili 2,3 and 4. However Georgian government does not recognize the de facto Abkhazian government as a legitimate counterpart and cannot negotiate with it for obvious reasons. Inability of addressing the issue was presented as a good will for supplying with electricity of Georgian citizens beyond occupation border (even for free).

Russia has traditionally sought the expansion of its presence in strategic energy infrastructure which would give it additional leverage over Georgia's independence (HV transmission lines, transit gas pipelines etc.). It has shown the interest of controlling Enguri/Vardnili cascade and during the 2008 invasion in Georgia, even forced the Georgian government to concede to Russia's management of Enguri/Vardnili cascade (The latter didn't materialize due to opposition from Abkhazians). Russian troops and military bases are significant consumers of electricity. There are conflicting stories about their readiness to pay for electricity consumed. Russia as a "patron" of occupied Abkhazia also bears some responsibility in supplying electricity and has partly sponsored the import in the times of deficit (2017) in Georgia's power system.

Abkhazian De-Facto government is concerned with energy supply and is interested in improving the quality of energy supply to consumers. It is taking the measures for curtailing the consumption and recently even issued a ban on crypto currency mining resulting in a shutdown of about 9MW of mining capacity. However, this may be a result of inefficiency of mining with poor quality of electricity in Abkhazia or some internal clash of interests. Establishing of realistic tariffs, proper metering and payment discipline

requires substantial network investments political will and maturity. This is unlikely to happen any time soon, especially close to presidential elections expected in August of 2019.

Abkhazians are also keen to preserve the control of energy infrastructure and one can note that it was Abkhazian opposition that didn't allow the alleged agreement between Georgian government and Russia on transfer of the management of Enguri/Vardnili cascade to Russian utility company to materialize.

Electric power utilities on both sides of occupation line - **Georgian State Electro system (GSE)**¹ Georgian transmission system operator and **Chernomorenergo**² – transmission and distribution network operator in Abkhazia, continue to cooperate and coordinate on technical issues and issues of energy supply to Abkhazia, with Enguri and Vardnili HPP. Georgian management is an important part of discussions. Recently there has been a closed meeting to address the power supply issues in winter of 2019, but the results are not disclosed. Energy cooperation at technical level remains as a lonely example of working connection

International community including Swiss Government, European Union, Japanese Government, KfW, EIB and primarily EBRD have provided financing for various phases of Enguri HPP rehabilitation starting from 1990ies. Most recently EBRD has allocated 33mln EUR for the fourth phase of Enguri rehabilitation³. Otherwise, the international community including EU, US and international organizations do not have significant presence or influence in the breakaway region. Incident Prevention and Response Mechanism and presence of EU monitoring mission at the border only contributing to maintaining the security situation⁴. USAID has sent the missions to assess the technical conditions of Enguri HPP and options of implementing energy efficiency measures in Abkhazia. However, no follow-up actions or plans are known.

Non-government actors including experts, journalists and civil society representatives on both sides of administrative border seem to recognize the existence of the problem and the need for addressing it. There have been several meetings facilitated by international mediators, where the possible solutions to curbing the excessive unpaid consumption were discussed, including energy efficiency measures and the potential for development of renewable energy sources. However, the radical improvements needed in distribution system in Abkhazia are beyond the reach of this community. Nevertheless, these actors can have an important role in awareness raising and preparation of public opinion for necessary changes.

Abkhaz businesses and population might be considered as beneficiaries of low priced and sometimes free electricity; however, the poor quality of supply affects comfort of residents and prospects for business development. This is especially true in northern part of Abkhazia where collection rates are even lower than in south, populated mostly by ethnic Georgians.

¹ www.gse.com.ge

² www.chernomorenergo.info

³ <https://www.ebrd.com/work-with-us/procurement/p-pn-180813a.html>

⁴ https://www.eumm.eu/en/about_eumm

Development of the scheme and impact analysis

After the war in Abkhazia in 1993, the facilities of Enguri/Vardnili cascade 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). Downstream stations of Vardnili 2, 3 and 4 were flooded during the war and reportedly have been cannibalized. 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 between Abkhazia and the rest of Georgia in proportion to estimated book value of assets on both sides of administrative border - 40/60.



Figure 1: Enguri HPP Dam and Substation

Ever since, Abkhazia uses electricity generated by Enguri/Vardnili cascade without any limitation and any financial reimbursement, while the rest of the Georgian consumers and the country budget pay for the operation, maintenance 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. Taking into account Enguri (1.818 Tetri/0.73 US Cent per kWh) and Vardnili (4.002 Tetri/1.6 US Cent per kWh) HPPs tariffs⁵, the cost (subsidy) of electricity delivered to Abkhazia is around 40 million GEL annually in the last three years.

⁵ Georgian National Energy and Water Supply Regulatory Commission – www.gnerc.org

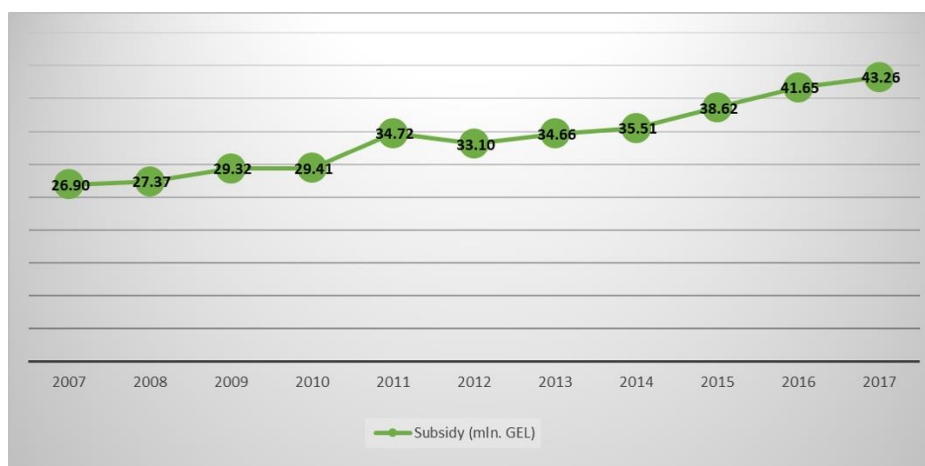


Figure 2: Total cost of electricity supplied to Abkhazia for free during 2007-2017

However, considering the need of compensating the growing winter consumption by imports and thermal generation, the real cost to Georgia is almost twice as much. This also does not include the major costs of capital works on the tunnel and reservoir. More than 180 million USD has been spent on Enguri HPP rehabilitation⁶ during 1998-2016. Current state is an unjust condition forced by conflict and occupation, however Georgian officials emphasize that Abkhazia is the territory of Georgia and despite the conflict and the occupation, we supply electricity to it as any other part of our country⁷. At the same time, they avoid any clear statements about the payment for that supply, which is understandable due to political inability to control the power flows and match them to the payments.

The situation has a negative impact for Russia, and in the long term, to Abkhazian region itself. According to Russian-Abkhaz sources, Russia partly subsidizes energy consumption in Abkhazia by supplying electricity at below market price. With no alternative sources of electricity and no extra money, Abkhazian politicians are holding negotiations with Moscow, the largest contributor to Abkhazia's state budget. In 2016 Abkhazia's entire budget was about 200 million USD. To acquire reliable and uninterrupted supply of electricity in Abkhazia, about 1.1 billion USD of investment is needed according to the head (Aslan Basaria) of the Chernomorenergo⁸.

Technical and organizational disorder in electricity distribution system in Abkhazia, results in electricity theft, unrestricted consumption and allegedly, petty and higher-level corruption. Though the residential tariff is only about 0.6 US cents, the billing and collection rates are very low. According to some estimates only about 15-20% of the households have individual meters. Share of billed electricity paid by customer differs by region, from 30% (Ochamchire) to 58% (Gali)⁹.

⁶ Enguri HPP rehabilitation project, EBRD - <https://www.ebrd.com/documents/comms-and-bis/psd-4304.pdf?blobnocache=true>

⁷ www.accentnews.ge

⁸ Abkhazia, Georgia's Energy Security at Risk - <https://iwpr.net/global-voices/abkhazia-georgias-energy-security-risk>

⁹ www.chernomorenergo.info

Electricity supply becomes unreliable, especially in winter, due to shortage of energy but also due to the condition of distribution network. The rolling blackouts in Abkhazia over the last several winters have not resulted in 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 Abkhazia¹⁰. Russia has commissioned a new Nuclear power unit in Rostov plant in September 2018 which largely addresses the problem of power supply to Crimea and also elevates the situation with power supply to South Russia and eventually to Abkhazia. However, the prospects of Abkhazia supply are not clear. This also does not resolve the problem of payment for the power that can be eventually supplied from Russia¹¹. In 2018 the consumption in Abkhazia has dropped to 2016 levels, but this can be temporary and due to weather conditions.

Current state of Abkhazia Consumption and Enguri HPP Generation

In 2007-2017 the increase in consumption in Abkhazia was 746 GWh. In winter the consumption of Abkhazia already exceeds the output of Enguri/Vardnili cascade, which requires more imported electricity, including from Russia, whose military facilities are likely to be consuming this energy. Besides this, main drivers of electricity consumption growth in Abkhazia are: consumption of households due to the weather conditions, losses in the distribution network¹², crypto currency mining¹³, increasing number of illegal customers, tourism and intense production of Russian companies in Abkhazia due to the low price of electricity.

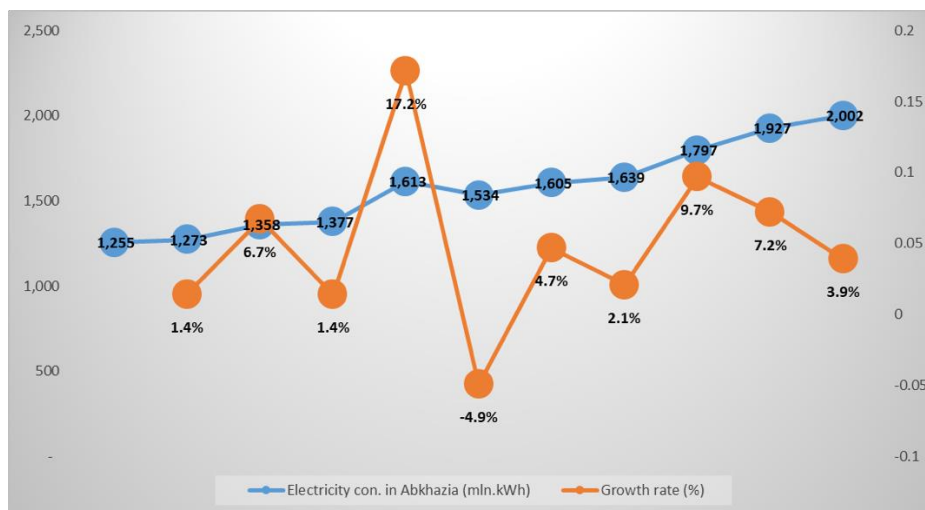


Figure 3: Electricity consumption in Abkhazia and its growth rate during 2007-2017

¹⁰ Энергопотребление Абхазии растет ежегодно на 9%, прогнозируются перебои / [Abkhazia's energy consumption is growing annually by 9%](#)

¹¹ <http://www.world-nuclear-news.org/Articles/Fourth-Rostov-unit-enters-commercial-operation>

¹² http://chernomorenergo.info/ru/news/news-list/itogi_raboty_rup_chernomorenergo_za_2017_god/

¹³ ABKHAZIA WILL CONTROL THE ENERGY CONSUMPTION FOR MINING - <https://cryptobit.media/en/news/mining/601/>

In 2018, electricity consumption in Abkhazia reached 1.92 TWh, which translates into 8,000 kWh per capita, if one uses Abkhazia 2011 census data (240 thousand inhabitants). This is 2.8 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 10,676 kWh per capita, which exceeds 3.7 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). This can be partly explained by wasteful electricity consumption, but has also raised yet unconfirmed suspicions on illegal outflow of electricity to Russia.

Figure 4 shows that the agreed (although unpaid) consumption limit (40%) was maintained until 2011 and in 2013¹⁴. Share of Abkhazia’s consumption in total generation of Enguri and Vardnili HPPs has been sharply rising in other years and reached 47% in 2017.

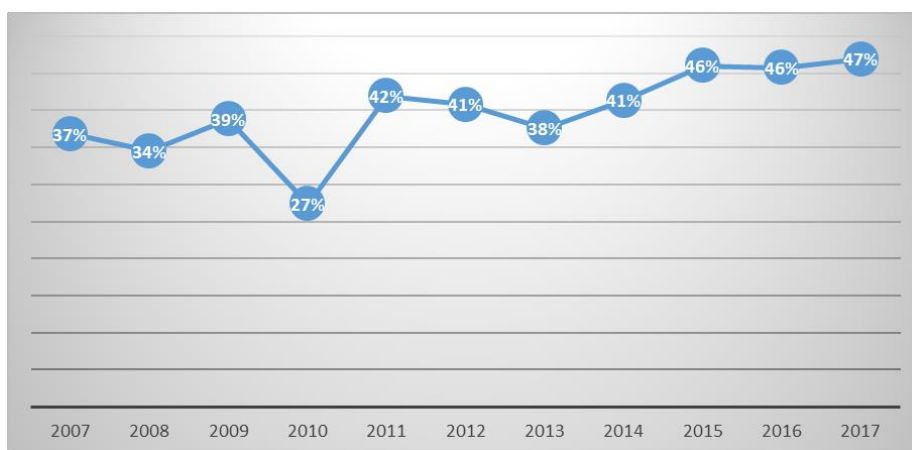


Figure 4. The Annual consumption of Abkhazia as part of the Enguri/Vardnili cascade output Note: Consumption in 2010 is reduced not by absolute indicator, but because of the increased output of the Enguri/Vardnili cascade.

The situation is much more alarming in winter. Over the summer 2007-2017 (June, July, August) the consumption has increased by 81% (probably due to tourist load), while in winter (January, February, December) consumption increased by 58%. However, this latter falls on the most difficult low water/high consumption period in the system and is more disturbing. In winter, Abkhazia consumes most of Enguri and Vardnili generation, and Georgia's energy system has to import expensive electricity to compensate this growth. Figure 5. shows the share of Abkhazia’s consumption from Enguri and Vardnili HPPs in winter (January, February and December) and summer (June, July, August) months.

¹⁴ This was partly due to compensation of increased consumption in Abkhazia by increased production of Enguri/Vardnili after rehabilitation.

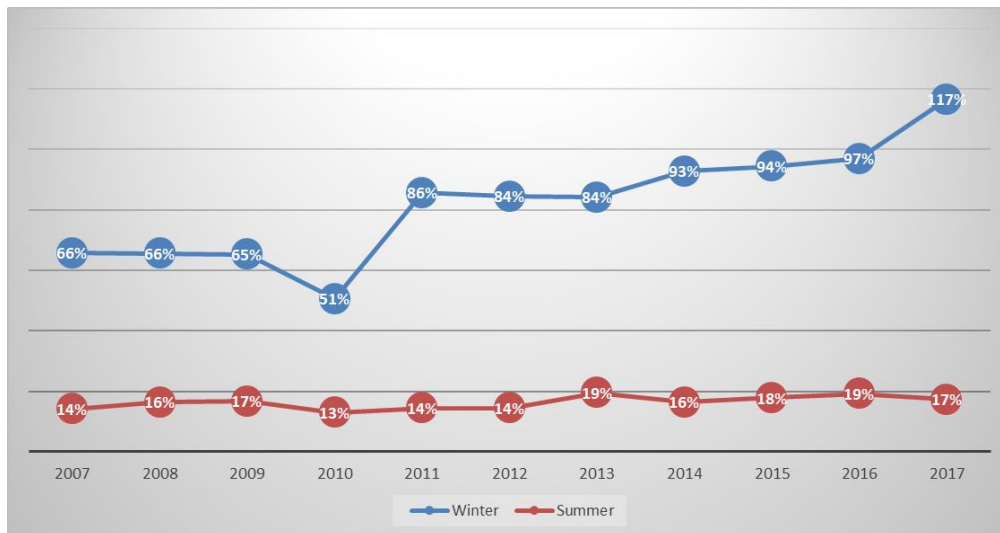


Figure 5. The share of consumption of Abkhazia from Enguri and Vardnili HPPs generation in winter and summer months, 2017

As shown in the graph, Abkhazia uses 17% (2017) more electricity than Enguri and Vardnili produce 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.

In 2017 the net-import of electricity was 0.8 TWh (7% of total consumption) in Georgia. 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.

Technical problems

Enguri HPP is one of the most complex projects of its type and most of remaining items are more than 40 years old. The increasing uncontrolled consumption of Abkhazia creates more technical problems:

- Although the Enguri HPP is operated from Tbilisi dispatch center, it cannot properly perform its major function of a peaking station due to drain of resource in winter months. This affects the power system reliability and ability to accommodate variable renewable resources of wind and sun. It also compromises the ability of Georgian Power System to participate in covering peak loads in the region and reduces the perspectives for regional cooperation in electricity.
- Filling and draining of the reservoir should be conducted within the strict limitations defined by dam stability requirements. Inappropriate use of the power plant can create the dam and reservoir safety problems and shorten their lifetime. Excessive draining of the reservoir may create hydraulic impact on the headrace tunnel and its further deterioration resulting in the increased water filtration.

- Lack of revenues from Abkhazia limits its ability to conduct major rehabilitations and overhauls. According to some assessments, the technical condition of the Enguri HPP is getting worse¹⁵. The main current issue is the repair of 15.5 km long pressure-diversion tunnel, which means putting Enguri out of action for months. Currently, almost about 300GWh of energy is lost annually from the tunnel, due to water leakage and surface imperfection, But to assess and repair even the most damaged 300 meter section, the entire power plant needs to be shut down¹⁶.
- Due to the wasteful consumption, Abkhazia's transmission and distribution network gets overloaded and its reliability has deteriorated¹⁷. There is a need for significant investment in the network.

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 headrace tunnel and its access roads, hydro-mechanical and electromechanical works, etc.

Experts estimate, that the full rehabilitation of the headrace tunnel will require about 1.5-2 years and estimated 150-170 million dollars-worth of alternative electricity supply for Abkhazia will be needed. Therefore, the full rehabilitation does not seem probable in near future. Partial rehabilitation was planned and postponed several times although the funding has been committed. A likely reason for such a delay is the difficulty of agreement on substitute electricity for Abkhazia. Currently the tunnel rehabilitation is scheduled for the spring of 2020, however there is still no committed source of substitute electricity to Abkhazia.

Georgian-Russian-Abkhazian Interactions on Enguri HPP

Because of scarce media coverage, only a few cases of relations with Abkhaz and Russian parties over the Enguri/Vardnili cascade are known to public. Despite the periods of increased tension in relationships, the Georgian staff of the station has not faced serious threats and/or harassment while implementing their operational duties.

The periodic routine meetings were held at operational level between the Abkhazian network operator "Chernomorenergo" and the Ministry of Economy and Sustainable Development to discuss technical problems of Enguri cascade operation and repairs. As a result of these contacts, the HPP repair works have not faced security problems or serious obstacles. Supposedly, in the meetings the issues of payment to the plant were also discussed with Abkhazians without much result.

After the August 2008 war, the Georgian government was forced to agree to the transfer of plant management to Russians. According to unofficial information, the agreement that would be strategically damaging for Georgia, failed because of the strong opposition of the Abkhazian *De Facto* government.

¹⁵ USAID Energy Program, HPP Enguri Inspection, Issues and Priorities for Energy Security and Reliability, December, 2018.

¹⁶ Abkhazia, Georgia's Energy Security at Risk - <https://iwpr.net/global-voices/abkhazia-georgias-energy-security-risk>

¹⁷ Энергетика Абхазии в глубоком кризисе - <https://jam-news.net/abkhazias-energy-sector-faces-deep-crisis/?lang=ru>

This could be considered as an example of possible cooperation with Abkhazs on mutually beneficial issues.

There is a weak but still ongoing dialogue between Georgian and Abkhaz civil society representatives supported by various donors, where various issues, including that of energy sector in Abkhazia, are being discussed. Introducing proper tariffs and metering, energy efficiency, renewable energy, plant safety and other issues were discussed. 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. There is a need for new visions, new alternatives and bringing a wider range of stakeholders to table.

Conclusions and Recommendations

The unrestricted unpaid consumption of electricity from Enguri/Vardnili cascade in Abkhazia leads to the waste of valuable energy resource, adversely affects technical conditions of this critical asset, shortens its lifetime and undermines the energy security of Abkhazia and whole Georgia. Inability to bill and collect the price for electricity affects the quality of supply to population and businesses in Abkhazia and limits the development. The current *Status Quo*, protected by Russian occupation, leads to more tensions and increase of Russia's leverage on both sides of occupation line.

Addressing the problem requires maturity of political will and substantial investment on Abkhazian side, as well as taking a more assertive and pragmatic approach on behalf of Georgian government. The issue of Enguri cascade needs to be discussed separately from other political issues and problems caused by occupation. In absence of official relations, contacts between utilities should be used to its best.

Fair and enforceable agreement between Georgian and Abkhazian sides on allocation and payment for Enguri cascade output could open up a wide range of opportunities including development of renewable energy sources (including restoration of Vardnili 2,3,4), energy efficiency, gasification and trade with electricity, normalization of electricity distribution and quality of its supply in Abkhazia.

Abkhazian de facto government has to realize that the current situation is damaging for them, take seriously the future of the region and its energy supply and try to bring order into its electricity network.

Georgian government should do its best to develop the cooperation scenario but also prepare for the case of failure, including development of own power reserves and the means for controlling the water flow to Abkhazia, including development of a pumped storage plant on Georgian territory.

Involvement of international community can strongly facilitate the process as international financial and political support can be a crucial factor for preserving the peace and achieving progress in this sensitive situation.

More concretely the Government of Georgia should:

- Publicize the issue of ongoing energy extortion from Russian controlled Abkhazia and explain to all national and international stakeholders that the current status is dangerous and damaging for the long-term interests of Abkhazia and the rest of Georgia;

- Raise the importance of the problem as a growing security threat to the country and secure an understanding and support of international community on this issue;
- Show a firmer position on free supply of power to Abkhazia, and in the beginning limit the supply to Abkhazia to Enguri cascade output at all times;
- Revise the plans for of Enguri HPP tunnel rehabilitation and conduct it only with the condition of participation of Abkhazian side;
- Develop and suggest at utility level the options for renewable energy and energy efficient technologies, as well as gasification of Abkhazia.