

GEORGIA'S HYDROPOWER DILEMMA

A CASPIAN POLICY CENTER POLICY BRIEF

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I. EXECUTIVE SUMMARY

Despite nation-wide protests against proposed large hydropower projects over the past decade, the Government of Georgia remains focused on rapidly developing new installed hydro capacity to address increasing demand for electricity. Georgia's government seeks to develop self-sufficient electricity production to diversify and mitigate potential risks of dependency on foreign imports, be they from Russia or Azerbaijan. By choosing to focus on large hydropower projects as the primary avenue for this expansion, however, Tbilisi has failed to recognize adequately – and address appropriately – domestic sentiment against these projects, negative feelings that have also fostered distrust towards government entities and foreign investors.

While national authorities bear the bulk of this responsibility, outside actors, including the United States and European governments, private sector investors, and the international financial institutions, can also play helpful roles. Bearing this in mind, the authors propose two sets of recommendations.

To mitigate social and environmental ramifications of large hydropower development and strengthen overall energy security, the Government of Georgia should:

- Conduct a comprehensive assessment of Georgia's national energy security strategy;
- Consider diverting resources into run-of-river hydropower and other renewable energy systems as an alternative to large reservoir facilities;
- Strengthen Georgia's national grid to increase its capacity to accommodate greater wind and solar power integration.

The United States is in a position to facilitate Georgian efforts to strengthen energy security and tap its renewable energy potential by:

1. Encouraging and providing technical assistance to Georgian entities conducting a comprehensive assessment of the country's national energy security strategy;
2. Demonstrating and helping build effective communication methods between the central government and local communities; and
3. Working with Georgia's government and pertinent Georgian entities to attract renewable energy financing from international financial institutions' environmental funds.

II. NEED FOR INCREASED GENERATIONAL CAPACITY

As of the end of 2020, Georgia's overall installed electricity generation capacity consisted of 94 hydropower plants (2381 MW of regulating/reservoir and 941.5 MW of run-of-river "ROR" plants), seven thermal stations fired predominantly by natural gas imported from Azerbaijan (1189 MW), and one wind power plant (20.7 MW).¹ Three of the largest power plants (Enguri HPP, which is shared with the break-away Abkhazia, as well as Gardabani TPP and Vartsikhe HPP) account for over half the country's electricity generation. With hydropower plants accounting for over 73 percent of its total electricity production (3323 MW out of the total 4533 MW), Georgia stands well below the world average of about 60 percent of fossil fuel share in global electricity generation mix.² While this is a welcome position to be in as the world moves to decarbonize, the heavy use of large-scale hydro has led to a number of problems domestically.

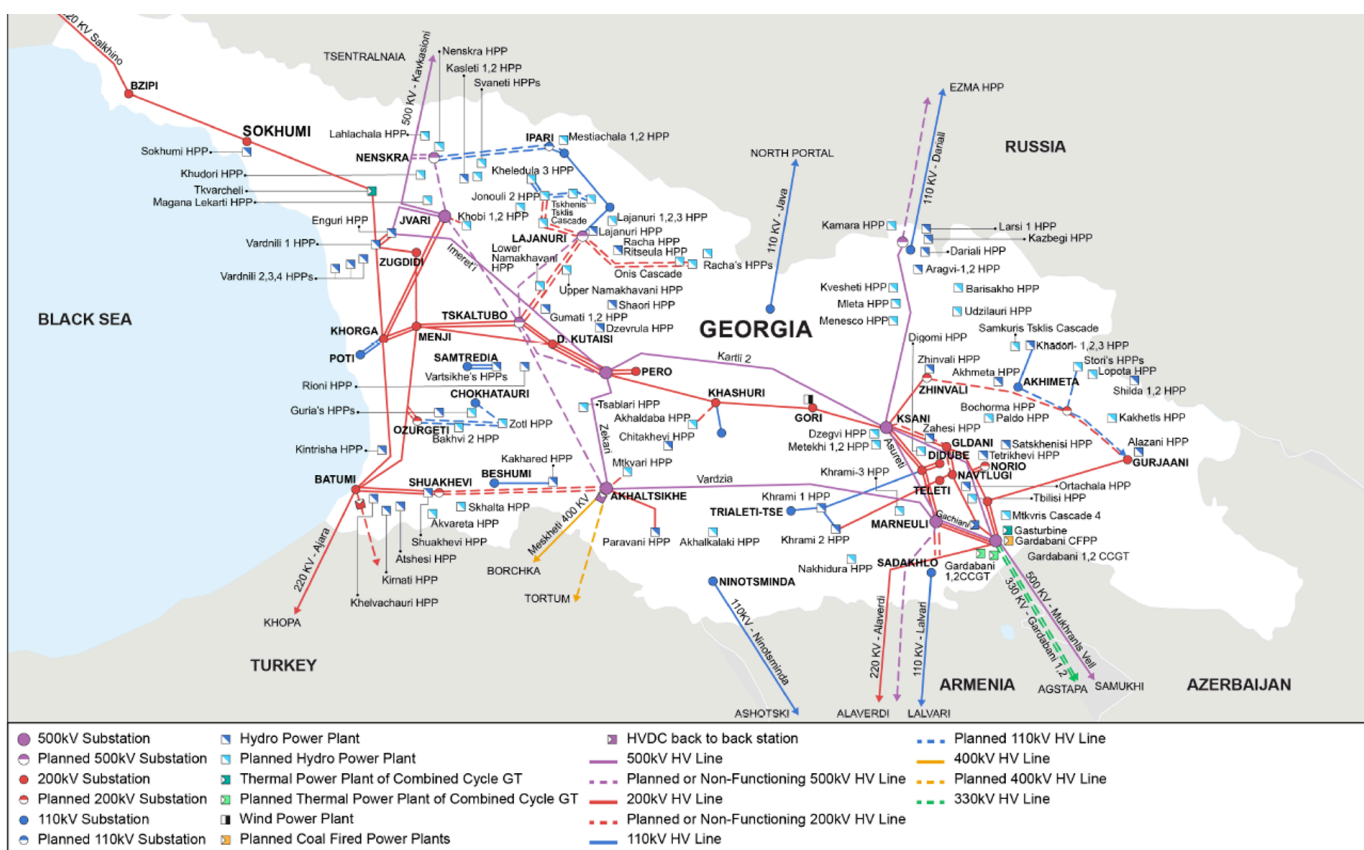
Georgia's domestic electricity consumption has been on the rise in the past several years, recently approaching 12 TWh annually. With the exception of the COVID-19-related stagnation in 2020, the country's annual electricity consumption growth has typically exceeded 5 percent; by 2019, consumption was up over 30 percent from 2013 levels. Growth is expected to continue, particularly as unregulated cryptocurrency mining becomes a larger burden on the national grid. According to the World Bank 2018 report,³ cryptocurrency mining is estimated to account for up to 15 percent of Georgia's electricity consumption.

An additional complication and unknown variable comes from Abkhazia's consumption of electricity, which Georgia supplies at no cost as part of an agreement to maintain access to Enguri HPP generation facilities. Located across the administrative border line, the Enguri power plant is the single largest component of the country's supply and accounts for 33.4 percent of total electricity production. The agreement stipulates that Enguri's production is to be shared with Abkhazia free of charge. Today, by some estimates, the break-away region consumes up to 18 percent of Georgia's total electricity supply.⁴ Reports suggest cryptocurrency mining is a factor behind this number.

Georgia has become a net importer of electricity, counter to the Georgian government's initial objective of attaining energy self-sufficiency, and forecasts show further continued growth in electricity demand. Georgia trades electricity through its grid connections with Turkey, Russia, Azerbaijan, and Armenia. In 2018, it imported 1.5 TWh (mostly from Azerbaijan) and exported 0.6 TWh (mostly to Turkey), amounting to net imports of 0.9 TWh. Electricity imports have continued to rise, reaching a four-year high in first quarter of 2021, and accounting for half of Georgia's total imports.⁵

The production deficit – a result of hydropower’s seasonality that leads to low supply of electricity in winter months – is further exacerbated by the structure of Georgia’s national electricity grid. Originally constructed during the Soviet period, the grid is geared towards integrating the western parts of Georgia to the North Caucasus system while connecting the eastern regions to Armenia’s and Azerbaijan’s systems. As such, the grid’s east-west integration is weak as historically the energy flow was meant to move electricity from hydro-heavy Western Georgia to Russia, while Eastern Georgia relied on imports from Azerbaijan to fuel its thermal power plants.

This Soviet legacy has caused Georgia to struggle to deliver electricity from its primary production sources in the west to its largest consumption markets and population in the East. Georgian State Electrosystem (GSE), the country’s main transmission and dispatch operator, which owns the system and substations, has been working to strengthen the grid, but the system remains relatively unstable when called upon during peak demand periods.⁶ Therefore it is cross-border trade that allows Georgia to address these shortcomings and stabilize the regional, as well as seasonal imbalances. However, reliance on imports also means that Georgia is susceptible to fluctuating gas prices for its thermal power plants, a reality that poses risks to the country’s energy supply security.

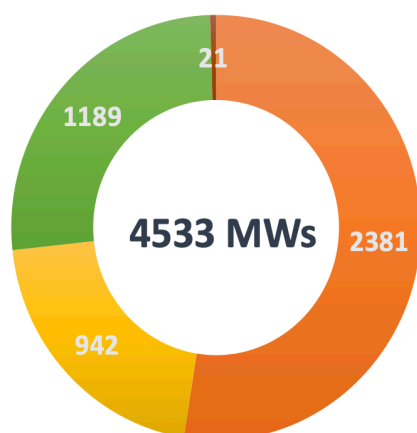


Map of the current transmission network. Source: International Energy Agency

III. FOCUS ON HYDROPOWER DEVELOPMENT

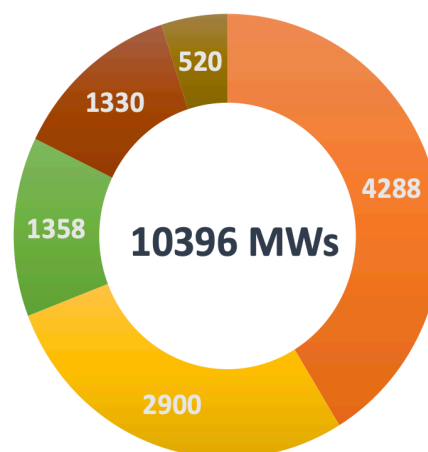
Over the past several years, the Georgian government's primary solution for addressing the ever-increasing demand for electricity and at least partially alleviating its dependence on imports has been to develop significant new installed capacity, primarily in hydro production. The Georgian State Electrosystem's Ten Year Network Development Plan for 2021-2031 projects that Georgia will more than double its installed capacity from 4,533 to 10,396 MWs by 2031. As seen on Graphs 1.1 and 1.2, this new generation mix is expected to nearly double the capacity of reservoir HPPs used for seasonal regulation to 4,288 MW, as well as nearly triple the capacity of run-of-river (ROR) hydropower plants, which are still susceptible to seasonal variability, to 2,900 MW. In addition to hydro, which will account for 69 percent of total capacity, the projection includes increasing the share of other renewable energy sources to 18 percent of total production. Such an increase would consist of 1,330 MW generated from wind and 520 MW generated from solar power by 2031.

Regulating HPPs Seasonal HPPs Thermal Wind



Graph 1.1 Current Installed Capacity

Regulating HPPs Seasonal HPPs Thermal Wind Solar



Graph 1.2 Expected Installed Capacity by 2031

By increasing the installed capacity of regulating (reservoir) HPPs to close to 41 percent of the country's total electricity mix, Georgia hopes to counter the current seasonality of hydropower production and to lessen its dependency on electricity and fuel imports. However, while securing sources of supply through self-sufficiency remains an alluring goal, the changing public sentiment towards large-scale hydro infrastructure projects challenges the successful realization of these aspirations.

When cross-referencing a Ministry of Energy 2017 licensing document of large hydropower plants expected to commence operation by 2021 with the list of facilities now operating, one sees that only five such facilities with installed capacity above 40 MW have come

online: Paravani, 87 MWs; Khelvachauri, 48 MWs; Shuakhevi, 185 MWs; Kirnati, 52 MWs; Dariali, 108 MWs. None of these are large reservoir power plants that can be used for seasonal regulation, but as run-of-river facilities they do have some flexibility to regulate for daily electricity demand fluctuations.

While there can be numerous reasons for delay in constructing large reservoir dams, public perceptions and environmental concerns have been major contributing factors stalling the realization of a number of these projects. Construction of four primary HPPs designated as projects of Large Strategic Significance to energy security of Georgia – Khudoni, Nenskra, Namakhvani Cascade, and Oni Cascade – has been indefinitely suspended following significant public backlash.

IV. PUBLIC OPPOSITION TO LARGE HYDROPOWER DEVELOPMENT

The Georgian government's decision to increase Georgia's installed power generation capacity does provide an avenue to mitigate risks stemming from Soviet-legacy infrastructure and to alleviate the growing dependence on imports. However, building large reservoir hydropower plants brings with it a host of environmental and social issues, and the government's decision to pursue such projects while failing to sufficiently address environmental and other concerns voiced by local populations has aggravated communities and exacerbated the political divide between Georgia's center and periphery regions. The criticism of major hydropower projects over the last decade, particularly those with large reservoirs that provide seasonal regulation, can be grouped into three broad categories: environmental issues, including deterioration of flora and fauna caused by construction; insufficient legal protection for vulnerable populations and attention to needs arising from community resettlement resulting from the flooding of villages and farmland; and a lack of transparency in awarded contracts and public apprehension towards foreign companies involved in hydropower projects. These questions warrant acknowledgement, serious examination, and adequate response from the government.

CASES IN POINT: KHUDONI, NENSKRA, AND NAMAKHVANI

Khudoni: The first wave of latest anti-hydro protests in Georgia started in 2013 as a reinvigorated response to construction of the 702 MW Khudoni power plant in the Upper Svaneti region. Originally approved in 1970s, the facility has been a source of longest and continuous civil protest movements in Georgia.⁷

With a dam height of 200 meters and reservoir of 364 million cubic meters, the \$1 billion Khudoni project would require relocation of 2,000 people. The proposed reservoir covers 528 hectares of land in a region where local communities have deep connection to their

ancestral homes and rely on agriculture for their livelihood. Dissatisfaction with Khudoni's construction was exacerbated by an opaque negotiation process, wherein a build-own-operate contract was awarded to Trans Electra Ltd., which never publicly disclosed its beneficial ownership structure nor adequately divulged the sources of the project's financing.

While \$400 million of the project's budget was reportedly appropriated to address social issues, both the Georgian government and Trans Electronica Ltd. were accused of failing to properly communicate plans for compensation and resettlement to local population. An independent analysis of Trans Electra's Environmental and Social Impact Assessment (ESIA) of Khudoni, conducted by the Netherlands Commission for Environmental Assessment⁸ at the Georgian government's request, found that the submitted ESIA did not provide sufficient arguments to justify the project, and advised on the need for increased transparency of public information disclosure and compensation measures. In addition to the report's conclusion that the social, economic, and environmental impact assessments of the project were lacking depth and clarity, it also advised the Georgian government to conduct an extended social cost-benefit analysis to evaluate the project's financial benefits to the country and to local population, rather than the investor itself. In 2020, the government decided to negotiate termination of the investment agreement over Khudoni. The process is ongoing, with Minister of Economy Natia Turnava announcing that one lesson learned is that the Georgian state "needs to have more share in implementing such mega-projects and become at least the partner, if not the sole owner."⁹

Nenskra: Nenskra is a proposed 280 MW HPP in Svaneti with a dam height of 125 meters, and is owned by JSC Nenskra Hydro, a consortium made up by Korea Water Resources Corporation (K-Water) and the Georgian state-owned JSC Partnership Fund. The construction agreement signed in 2015 saw immense backlash from the local population due to, as the EBRD and the European Investment Bank (EIB) would later find, insufficient environmental assessments and risks posed to ancestral lands and religious sites. JSC Nenskra Hydro was forced to redesign significant elements of the project after geological experts pointed to the construction site's high potential for seismic disturbances. Despite considerable questions on its feasibility, the \$1.08 billion project initially secured partial financing loans from the Korean Development Bank (KDB), European Bank for Reconstruction and Development (EBRD), and European Investment Bank, with the Asian Infrastructure Investment Bank (AIIB) and Asian Development Bank (ADB) also considering project financing.

In 2020, following a two-year investigation, however, EBRD and EIB independent assessment mechanisms found the project non-compliant with their standards of indigenous people's rights and cultural heritage protection, as well as for information

disclosure and transparent dissemination of information to local communities.¹⁰ While loans from the two IFIs were already approved, the 2020 finding has indefinitely delayed the release of funds, and has served to confirm for the local community that the project was not as benign as initially attested. Nevertheless, the government, much to the local community's dismay, still actively pursues financing for the project. Minister of Economy Turnava has not shied away from publicly expressing the government's displeasure with such significant delays and has advocated for a larger governmental involvement in Nenskra.¹¹

Throughout protests against Nenskra, Georgia's government was accused of systematically attempting to discredit local communities and environmental activists. Tbilisi continues to turn a blind eye to technical, environmental, and social concerns that remain unanswered. Instead, the government has utilized smear campaigns, labeling opposition movements against hydropower as pro-Russian efforts to undermine Georgian security, and focused on stressing the projects' strategic aspects. Meanwhile, the IMF and the World Bank have reported Nenskra's unfavorable affects on Georgia's fiscal stability.¹²

Namakhvani: A culmination of public protests, and the most recent instance of intense demonstrations, came in response to the 433 MW Namakhvani Hydro Cascade in the Racha region, originally slated to break ground in 2021. The project entails construction of two reservoirs with 100 and 59 meter high dams¹³ that would lead to flooding over 600 hectares of arable land. The \$800 million Namakhvani project, which the government describes as critical for Georgian energy security, is 90 percent owned by ENKA (Turkey) and 10 percent owned by Clean Energy (Norway). The latter has a history of hydro construction in Georgia: in 2017, Clean Energy's first hydro project in Georgia – the 185 MW Shuakhevi – had to be pulled out of commission just two months after the grand opening following a collapse of its internal tunnel. Reconstruction took two years, and while the plant started operating again in 2020, villagers around Shuakhevi are now claiming they are experiencing significant freshwater shortages. Due to this experience, Clean Water's partial ownership generated additional distrust towards the Namakhvani project.

Namakhvani's contract, which garnered significant criticism for lack of transparent negotiations, entails a 15-year power purchase agreement allowing the owners to export electricity during May-August periods and obligating them to sell to the government for the remaining eight months.¹⁴ The purchasing price of electricity from Namakhvani will be 6.2 cents for Georgia, and will increase annually by 3 percent for the next 15 years – which is higher than other suppliers on the market. Furthermore, following the 15-year period, the owners will no longer be required to sell to Georgia at all, putting into question the government's claim that Namakhvani is essential to the country's energy security. These details led to large protests from the local villages over environmental concerns, which

soon spread to the rest of the country where citizens questioned the strategic value of such projects. Demonstrations culminated in Tbilisi,¹⁵ with charges that the government put aside national interests in favor of private, foreign companies – an assessment that the recently-leaked 2019 report from the Ministry of Justice of Georgia seems to support. The classified report,¹⁶ which was obtained by a local media organization, is dated prior to the signing of the agreement and finds that the contract places the majority of the obligations – such as compensation for all types of damages and losses – onto the Georgian state while giving maximum protection to the rights of the owners and limiting their liabilities. In September 2021, after months of delays on construction due to the political climate, ENKA evoked the force majeure clause of the contract and officially announced that it is pulling out of the \$800 million project.¹⁷ At the moment, it remains unclear whether the government will seek new investors or attempt to take the construction into its own hands.

While recognizing the need to meet the country's growing electricity needs, the potential for electricity exports, including to enhance the region's energy and overall security, and the necessity of boosting the global production of electricity from renewable resources to cut carbon emissions, the Georgian government should also realize and address the public concerns such projects may provoke. As elsewhere in the world, inadequately engaging interest groups and building support can not only undo, but can spike necessary energy projects, including those governments and experts might see as "green." The government should introduce mechanisms to appropriately and constructively address grievances caused by the development of hydropower and other such facilities. These efforts include increasing transparency as well as identifying the range of environmental and social issues that might accompany hydro projects and clearly showing that adequate measures are being taken to remedy any such issues.

Moreover, while national authorities – in this case Georgian – bear the bulk of this responsibility, outside actors, including the United States or European governments, private sector investors, and the international financial institutions, can also play important roles that can address public concerns and help ensure a project's acceptance and success. Bearing this need in mind, the authors propose the following recommendations.

RECOMMENDATIONS TO GOVERNMENT OF GEORGIA

Conduct a comprehensive assessment of Georgia's national energy security strategy. As an integral part of any efforts to develop the country's significant hydropower resources, Georgia's government and relevant institutions should take steps to evaluate its potential environmental effects, ensure its sustainability, and engage with the public on these points. This assessment should include a thorough, transparent evaluation and cost-benefit analysis of renovations to existing infrastructure, implementation of which can

increase efficiency and alleviate losses. Moreover, this work should entail a comprehensive examination of Georgia's river flows and water availability, something which has not been undertaken since the late 1970s and is often voiced as a primary concern by environmental NGOs and independent energy experts.

Consider diverting resources into run-of-river hydropower and other renewable energy systems as an alternative to large reservoir facilities. As large hydropower construction projects encounter strong opposition and delays, wind and solar plants present an increasingly attractive option for Georgia's energy mix.¹⁸ Georgia has favorable conditions for developing all of these. Georgia's annual installed wind power capacity could reach 1500 MW; it also receives 250–280 days of sun per year that could yield 1,300–2,500 KWh of solar radiation per square meter.¹⁹ In comparison to hydropower investments, wind and solar remain low on the Georgian governments' priority list despite their reasonable operational costs and faster construction times. Georgia should factor this broader renewable energy potential into its policy thinking as it reforms to align its energy market with the EU Energy Community, to which it acceded in 2017.

Strengthen Georgia's national grid to increase its capacity to accommodate greater wind and solar generated power. Georgia, like other countries, must modernize its electrical grid if it wishes to maximize utilization of its renewable potential. At the moment, Georgia can integrate no more than 25 percent of its wind and solar potential. To make full integration realistic by 2030, Georgia requires an additional 380 MW operating reserve and significant network and infrastructure reinforcement. By investing in strengthening the transmission and distribution system to accommodate alternative sources of energy,²⁰ incorporating wind, solar, and ROR hydro facilities can be viable options to increase Georgia's total production.

RECOMMENDATIONS TO INTERNATIONAL PARTNERS

In order to assist the Government of Georgia in achieving its goal of a secure electricity supply, the United States, EU, and other international partners can facilitate multiple efforts from the above-outlined recommendations.

Encourage and provide technical assistance to Georgian entities to conduct comprehensive assessment of Georgia's national energy security strategy. This assistance can take the form of capacity-building and technical know-how programs to ensure implementation of vital environmental assessments and energy strategy analyses, implementation of which can provide viable alternatives to large hydropower.

Demonstrate and help build means to communicate effectively the country's long-

term energy security strategy to local communities, especially when it comes to large hydropower development. As evidenced by the experiences of Khudoni, Nenskra, and Namakhvani hydropower projects, the Georgian government often fails to ensure that populations near or otherwise affected by a project's construction are adequately engaged and sufficiently informed of ongoing developments. Working with international partners to formulate a cohesive and fair communications strategy will help Georgia to alleviate some of the strain caused by social backlash to hydropower construction.

Help Georgia with capacity building to attract financing from international financial institutions' dedicated environmental funds, such as the World Bank Climate Change Action Plan. In recent years, IFIs have actively aligned themselves closely to Paris Agreement objectives and have increasingly pivoted to helping decarbonization efforts by establishing dedicated financing mechanisms for cleaner energy sources. For example, the World Bank's Climate Change Action Plan,²¹ announced in June 2021, commits 35 percent of the Bank's total financing for climate change and decarbonization. Priorities for the Action Plan include improving the operational performance and efficiency of energy utilities, as well as providing funding for projects that increase countries' clean energy portfolio. Notably, the World Bank considers hydropower a key to the clean energy transition. Georgia's international partners can help the government take advantage of these initiatives to attract investment into wind, solar, and ROR hydropower generation facilities. In working with IFIs to obtain such funding, Georgian entities can use the application process to identify, address, and allay local concerns about such projects.

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