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SOUTH CAUCASUS ENERGY INTEGRATION:

MARKET SNAPSHOTS

OCCASIONAL PAPER

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South Caucasus Energy Integration: Market Snapshots

Occasional Paper

Energy Charter Secretariat Knowledge Centre

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Abstract

Given the ongoing work of the Energy Charter Secretariat on the South Caucasus region, this article gives a snapshot view of the energy markets of the three involved countries. This overview is a starting point for further investigation into the energy policies of Azerbaijan, Armenia, and Georgia, and particularly of the potential role of the Energy Charter in harmonising policy among the three countries and/or with Europe.

Armenia:

High potential threatened by aging infrastructure and conflict

In Armenia, the energy sector is a mix of strength and potential threatened by a multitude of hazards. The country has long been powered by, in roughly a third each, nuclear (NPP), gas-fired thermal (TPP), and hydro plants (HPPs). This robust mix meant that Armenia was usually a net electricity exporter in the Soviet era, despite lacking the natural resources of Azerbaijan or other nearby states. Things changed rapidly between 1988 and 1994, as the country was first hammered by a devastating earthquake that took the Metzamor NPP offline, and then by the Nagorno-Karabakh War, which cut off oil and gas imports from Russia and therefore shut down the TPPs. Since this dark time, the energy sector has rebounded and has 3,914 Mega Watts of installed capacity, of which 73% is currently running. Some of this is exported to Georgia, and some is traded with Iran in a electricity-for-natural-gas deal.

Armenian authorities can be pleased with the excess capacity and a number of other factors. The country is actually quite efficient, ranking as one of the best out of the former Soviet states. This ranking has been driven out of necessity, since the country imports almost all its hydrocarbons and cannot cover inefficiency with domestic surplus resources. As of 2008, the country ranks near the middle of the pack even when compared to EU states. Armenians can point to a growing sector of small hydropower installations, which in total are estimated to grow from about 100 MW to 215 MW capacity between 2010 and 2020. Hydropower has also attracted some exciting investment recently, as U.S. power company ContourGlobal recently finalised purchase of the Vorotan Hydro plants for for \$180 million, and plans to invest an additional \$70 million in refurbishment and modernisation.

However, there are a number of issues the country must overcome in order to increase, or even sustain, the strength of its energy industry. The largest is the age of nearly all its facilities. 70% of their HPPs are more than 35 years old, and 50% are more than 50. The main equipment at the two primary TPPs, Hrazdan and Yerevan, is past the 200,000 work-hour design life and no longer meets international standards. The NPP, Metzamor, was built in the 1970s and is one of the few remaining NPPs in the world that operates without a primary containment structure. The plant was most recently intended to be decommissioned in 2016, but this has recently been extended to 2026. This move prompted a large amount of safety outcry, considering the location of the plant 19 miles west of Yerevan in a major earthquake zone. Even the transmission infrastructure needs repair or replacement, with the average age being more than 45 years old, and 33% (520km.) of power lines needing urgent repair. Finally, the pipelines that carry vital gas from Russia, through Georgia, also need replacement and are frequently taken offline for repairs.

In addition to these problems, the security situation has been an obvious issue since 1994. The conflict over Nagorno-Karabakh has cooled, but the borders of Azerbaijan and Turkey remain closed. These blockades dramatically interfered with the original Soviet infrastructure, and drastically limit Armenia's opportunities for export and trade to this day. A pipeline to Iran was only completed in 2009, and trade with Georgia remains difficult due to an asynchronous system connection. Finally, the difficult economic conditions have, over the years, led to a number of selloffs of utilities to foreign buyers. The purchase by ContourGlobal is one example, but these have been primarily Russian deals. For instance, in 2004 the Hrazdan TPP complex was traded to the Russian Federation in an agreement to resolve some state debts, and recently Gazprom acquired the last 20% (they already controlled 80%) of the state gas transport company in exchange for a reduction in gas prices through 2018. The newly renamed Gazprom Armenia controls all natural gas infrastructure in the country, including the pipeline to Iran, and gives Russia a monopoly on purchases and sales. Unfortunately, these selloffs mean that, even if Armenia navigates all the challenges facing their energy industry, they may not reap all the hoped-for profits.

Azerbaijan:

Full steam ahead with local energy dominance

Azerbaijan has long been famous for its energy industry. The country was the site of the world's first paraffin factory, first drilled oil field, first offshore oil platform, and provided the majority of the oil supply to the Soviet Union in World War II. Today, Azerbaijan is facing potential issues in oil production but will remain a key energy player due to increasing production of natural gas. The country is heavily involved in continuing to develop the energy sector, both with exploration and development of new fields and also with attempts to diversify its export avenues in oil, natural gas, and electricity.

After the economically disastrous breakup of the USSR and subsequent Armenia-Azerbaijan war, the energy industry accelerated in the late 1990s and early 2000s. Oil production ramped up quickly, from 315,000 bbl/d in 2002 to 1 million bbl/d in 2010, but since then has plateaued and slowly dropped. 2014 production is estimated to be around 850,000 bbl/d, and the decrease has prompted scathing criticism from the government towards BP, who manages the Azeri-Chirag-Gunashli field. Geology might not be in the government's favour, however, since the country's oil reserves are estimated at around 7 billion barrels, or 20 years of supply at current extraction rates.

Luckily for Baku, natural gas can fill the void. The vast Shah Deniz field in the Caspian was discovered in 1999, and the country became gas independent by 2007. Today, there is an oversupply of 2 billion m³ of gas, which is estimated to go up to 10 billion extra m³ by 2017. This supply has been a focus of news cycles and political bluster for a few years now, as European politicians strive to diversify their supply with a southern (non-Russian) corridor. In 2013 agreements were made to develop stage 2 of the Shah Deniz, and ship it via a newly constructed pipeline called the TANAP across Georgia and Turkey to the EU.

Meanwhile, Baku is diversifying with electricity as well, constructing new power lines that allow increased exports to Georgia (during the winter) and Turkey. The country has issues with line losses due to outdated infrastructure, so these new projects are welcome both for export capacity and general efficiency. Currently the country powers itself primarily with thermal plants. Hydropower is a small contributor, satisfying about 18% of the country's needs. In the Nakhchivan province, which is separated from the mainland by the disputed Nagorno-Karabakh area and Armenia, there has been heavy investment in hydro which has turned the province into a net electricity exporter as well. As for the province's fossil fuels, Azerbaijan has a small gas exchange programme with Iran to keep it supplying Nakhchivan.

While this security situation illustrates an important challenge, overall Azerbaijan has ridden its energy wealth to impressive growth over the past decade. This success might actually be the country's largest threat: analysts estimate that energy makes up 50% of GDP and over 90% of all exports. Such a one-dimensional focus is worrisome for long-term economy stability. The country has had issues with corruption, and foreign investment in areas other than energy has been difficult to find. The problem of slowing oil production illustrates a need to turn the magnificent energy profits into growth in other areas of the economy.

Georgia:

Political and security situations are primary obstacles to impressive energy sector

Georgia has turned its electricity sector into an impressive strength, helping to fuel robust 6.1% annual economic growth for the period 2003-2012. This is the result of two major factors. Georgia's hydro power potential is among the best in the world, having the third most undeveloped potential in (geographic) Europe, behind Russia and Turkey. In per-capita water resources, it is in the top five in the entire world. Secondly, Georgia has embarked on an ambitious programme to exploit these resources, which includes a focus on infrastructure, drives to reform and streamline their business regulations, and a desire to be internally 100% self-sufficient with hydro in the near future (currently above 90%).

Large projects have been started or completed in the last few years to improve power line connections with surrounding countries, with a major transmission line with Turkey recently coming into service. On the business front, the World Bank's 'Doing Business 2014' report lists them as the overall 8th best country

on the globe in ease of doing business, and the second best at recent improvement. The government advertises perks to investors in hydropower including market freedom to choose customers, cheap state land use, no fees for grid connection, and ever-increasing connections and opportunity with the Turkish market. As a result, the government boasts of currently 45 on-going projects, with a total installed capacity of 2506 MW and annual generation up to 10.2 TWH.

As for fossil fuels, almost all of Georgia's oil and gas must be imported. Here the country functions primarily as an important transit hub, both on the north-south and east-west axes. Due to border closures, for instance, it carries almost all the resources from Russia to Armenia. Recently, there has been a high focus on the east-west axis, with the Baku-Tbilisi-Ceyhan crude pipeline going into service in 2006. An even larger project is the TANAP pipeline, which, if successful, will inaugurate the long-awaited Southern Corridor of EU gas supply by bringing Azerbaijani gas from the Caspian to the EU. Georgia, as a critical transit member due to political issues with Armenia and Iran, reaps the benefits of tariffs or fuel supply.

Of course, the country faces challenges as well. 2008 highlighted a huge one, as the South Ossetia War over the independence-minded province resulted in a quick Georgian defeat by Russian and South Ossetian forces. A flare-up of conflict over South Ossetia, Abkhazia, or even involving Georgia's southern neighbour Armenia and its Nagorno-Karabakh conflict could drastically harm Georgia's energy fortunes. The Enguri HPP complex, for instance, is right on the internal border with Abkhazia and supplies 34-40% of Georgia's electricity. The security situation also hurts the confidence of foreign investors, and the country has had difficulty with firms backing out of projects like the massive Rioni river proposal. Georgia has attempted to address this issue in part by getting cosy with the EU, and has just recently started negotiations to join the Energy Community. Finally, the energy sector itself needs more refinement, particularly in fossil fuel efficiency and HPP reservoir capacity. The country currently only has about 10% of annual generation in reservoir capacity, compared to countries like Norway, Sweden, or Finland, which average around 49%. The net result is that while Georgia has strong electricity exports overall, the system is unbalanced and they have to import from their neighbours in the winter months while wasting capacity in the summer.



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