

# ARMENIA: REGULATORY SUPPORT FOR SMALL HYDROPOWER DEVELOPMENT



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Armenia has one of the older energy regulators in the region, the Armenian Public Services Regulatory Commission (PSRC). Established in 1997, the PSRC has regulatory oversight of the Armenian energy sector, which includes considerable domestically generated hydropower.<sup>1</sup> Renewable energy in the form of hydropower accounts for 30% of the overall electricity generation in Armenia and 100% of the renewable energy generation. Armenia's Ministry of Energy has indicated that hydropower could provide a majority of the country's energy requirements by 2020. Indeed, the number of operating small hydropower plants in Armenia has increased by a factor of four in the last four years. As of 1 October 2010, 95 SHPP's are in operation, totaling 124 MW and generation 387 GWh yearly. Under construction are another 66, which collectively would total 138 MW and generate 517 GWh yearly (of these, many remain un- or under financed, with completion dates unclear). The Government of Armenia, supported by the PSRC, has worked diligently over the last few years to encourage RE production. This case study looks at how the regulatory framework and the regulator have served to further efforts by the Government to incentivize new RE production, and particularly hydropower production, in Armenia.

**The Regulatory Framework Background.** The Energy Law (first adopted in 1996 and amended various times over the years) requires that electricity generation, transmission and distribution companies receive separate licenses, which are issued by the energy regulator. It also requires legal unbundling between transmission and other activities.

Established in 1997, the PSRC is an autonomous regulatory agency, meaning that government entities cannot overrule or alter its decisions. PSRC is responsible for setting tariff methodology and tariff levels; issuing licenses and authorizations (including for the construction and operation of new capacity); establishing and controlling service quality standards; examining consumer complaints; and approving *ex ante* investment plans in the sector under its responsibility. PSRC, in collaboration with the Ministry of Energy, defines basic market rules. It is also able to impose fines for infractions, and may issue orders, suspend or revoke licenses. Regulatory decisions may be appealed to the Administrative Court. No time limit has been set for appealing to the courts, and decisions remain in effect while the appeal is pending. Currently, the PSRC has 107 staff members.

Consistent with the legislative framework (the Energy Law and the related "Procedure of Establishing and Reviewing of Tariffs in the Sector of Energy," June 2007), the PSRC Commission has established the procedure for approving and reviewing tariffs, as well as a list of necessary documents that a licensee must submit. The following categories of tariffs are currently in force in the electricity sector: generation (single price nationwide, which includes a capacity component with monthly payment), transmission, distribution, retail supply (two rates: day and night) and export. In principle, tariffs cover all current and capital costs, and include a fair profit. No subsidies or grants are provided to private or state companies to cover possible financial gaps. Tariffs may be reviewed either on the initiative of a licensee or the Commission.

Once it has begun a tariff review process, the PSRC has a 90-day window to issue its decision. The procedure for approving and reviewing tariffs is the same for all types of licenses.

***The Regulatory Role in Renewable Energy Promotion and Implementation.*** The Armenian government's strategy for the energy sector depends on and encourages private sector participation in the development of the renewable energy sector in general and more specifically in the small hydropower plant industry. On 9 November 2004, the Law "On Energy Saving and Renewable Energy" was passed. Though most secondary legislation to support this Law and most substantial implementation mechanisms are still lacking, some steps have been taken to encourage RE and give the regulator a clear role to achieve this objective.

Licensing offers a good example of how the regulator is integral to the RE development process. To carry out any licensed activity in the energy sector, applicants must submit to the PSRC a business plan that includes an environmental impact assessment and a detailed description of the technical solutions required to meet the environmental impact limits set by law. As a consequence of an amendment passed April 2001, the Energy Law assigns dispatching priority to all electricity produced from small hydropower plants and other renewable energy sources for the 15 years following plant commissioning. As a condition of its own license, the privatized distribution system operator must pay all small hydropower producers before it can book its own revenue, and payments to hydropower plants have been paid fully and on time for the past 10 years. The hydropower plants are paid directly by the privatized distribution operator via a special account administered through an independent Settlement Center and not through any government controlled agency or middleman. The operator is obliged to enter into a 15-year guaranteed power purchase agreement and to take 100% of all (renewable) production during that time period.

The regulator has also worked to bring a feed-in tariff system into place that drives forward hydropower investment, particularly for small plants. These tariffs, like all energy tariffs in Armenia, are set by the PSRC. A feed-in tariff system is now in place and tariff levels have been adjusted a couple of times to reflect market needs. Most recently, on 1 November 2010 the PSRC adopted a new tariff system effective January 2011:<sup>ii</sup>

- Small hydropower plants (constructed on natural water flows) = 19.28 dram/kWh (5.33 cents USD/kWh).
- Small hydropower plants (constructed on irrigation systems) = 12.853 dram/kWh (3.55 cents USD/kWh).
- Small hydropower plants (constructed on drinkable water aqueducts) = 8.57 dram/kWh (2.38 cents USD/kWh).
- Wind power plants = 33.756 dram/kWh (9.32 cents USD/kWh).
- Power plants that use biomass as a primary energy = 36.928 dram/kWh (10.2 cents USD/kWh).

In short, though not as favorable as in some countries, renewable energy tariffs in Armenia are of a level sufficient to encourage investment, with tariffs for electricity sold from small hydropower (on natural water systems) comparable to that in the EU and US. The tariffs for small hydropower plants are reviewed annually, prior to the 1<sup>st</sup> of December each year, and new tariffs are put into place by the following January. The tariffs include an escalation clause linked to inflation and the US/Armenian currency exchange rate. The estimated increase in tariffs projected for 2011 is about 5%.

**Regulatory Efforts to Address Challenges to Renewable Energy Investment.** The energy regulatory regime, including all licensing and permitting requirements, are well known and transparent. The energy regulator is well established and the renewable energy mandatory purchase requirements are executed reliably and in a manner that minimizes risk. The regulator operates in a transparent manner, and is accessible and responsive. In addition, power purchase agreements of 15 years are in place and there is a record of enforcement. Notwithstanding the existence of this framework minimizing regulatory risk, however, investment projects have encountered stumbling blocks that have delayed realization of full funding and therefore stalled the project. These obstacles are primarily to do with the rigidity of the regulatory framework, which properly exists to guard against corruption and manipulation, but does not offer long term security for investors.

Recent efforts by a Dutch investor have hit some challenges around long-term contract and tariff security, though the regulator has made efforts to assist the investment. In 2008, a Netherlands project developer initiated due diligence of Hydroenergia Limited Liability Company, a registered company of Armenia, with a view to investing in existing small hydropower facilities operating and in various stages of licensing and construction (Yerevan Lake Hydropower Plant and Kotayk Lake Irrigation Canal Hydropower Plant; some background data on the project is offered in the notes of this country profile<sup>iii</sup>). Due diligence is now complete, partial funding secured and the project developer is seeking additional funding sources. Outstanding legal, financial and technical risks have been identified and costs projected, all within the anticipated range. There is significant investor interest, though some concerns have been expressed and the full amount of required funding is not yet secured. In particular, the intended offer to invest in this small hydropower was for a facility that has been operating for 10 years, and has an operating license and power purchase agreement due to expire in five years. Investors expressed concern that only five years remained on the agreement, thus not providing the amount of security they were hoping for. The 15-year license and power purchase agreement was limited to that time period because, when granted, it was anticipated that there would be a free and open market for electricity sales at the end of that period. As with all countries in the region and indeed the vast majority of countries outside of the EU, a free and open market for electricity has not been realized, though remarkable steps are being made in that direction in Armenia.

The current legislation requires that a new application be made 30 days prior to the expiration of the license (tracking the life of the power purchase agreement). The difficulty is that until the application is made, reviewed by the regulator and approved, there is no mechanism to provide guarantees to investors that the agreement will be renewed, the tariff levels at which it will be renewed, and the length of the renewal. Developers will not invest without the

certainty of the renewal. The legal and regulatory framework limited this certainty in the expectation of market reform that has yet to be realized.

The regulator has been responsive in providing explanations and written letters explaining the process and the general expectation that the existing structure will be renewed without complication. The PSRC has made clear efforts to set the tariffs at levels and with incentive mechanisms that balance the risk to investors, the country's RE goals, and the sector and population's energy needs. Because investors require certainty, however, securing the financing has been difficult in the absence of a clear regulatory commitment.

<sup>i</sup> Figures regarding Armenia's share of total primary energy supply can be found at IEA statistics, 2006, <http://www.iea.org/stats/>.

<sup>ii</sup> Taxes are not included; 1 USD=362.09 dram.

<sup>iii</sup> Background on the potential project

**Table 1: Yerevan Lake Information Summary**

|   | Description   |
|---|---|
| Name of Project:  | Yerevan Lake Hydropower Plant   |
| Location of Project:  | City of Yerevan, Armenia  |
| Type of Project:  | Small hydropower plant using the discharge water from Yerevan Lake  |
| Nameplate Capacity of the Generators:                         | 750 kW  |
| Annual energy production since start of commercial operation: | 2003 - 3,339 MWh 2006 – 1,736 MWh<br>2004 - 2,975 MWh 2007 – 1,706 MWh<br>2005 - 2,193 MWh 2008 – 3,145 MWh |
| PSRC approved tariff for 2008                                 | 16.11 AMD/kWh (exclusive of VAT)  |

**Table 2: Kotayk Lake Information Summary**

|   | Description   |
|---|---|
| Name of Project:  | Kotayk Irrigation Canal Hydropower Plant  |
| Location of Project:  | Village of Jraber, in the Kotayk Marz Region, Armenia   |
| Type of Project:  | Small hydropower plant connected to an irrigation pipeline  |
| Capacity of the Generators:                                   | Name Plate -[8x315, 1x200 ] kW<br>Design Capacity – 1800 kW<br>Maximum Operating Capacity – 1350 kW         |
| Annual energy production since start of commercial operation: | 2003 – 2,429 MWh 2006 – 2,926 MWh<br>2004 – 2,489 MWh 2007 – 3,084 MWh<br>2005 – 2,854 MWh 2008 – 3,006 MWh |
| PSRC approved tariff for 2008                                 | 16.41 AMD/kWh (exclusive of VAT)  |