

**Meeting of SREP Pilot Countries
October 30, 2012 - Istanbul, Turkey**

SREP Progress Updates - New Pilots and Reserve List Countries

Country: Armenia

Scoping/joint mission date: July 2-12, 2012

What is the status of renewable energy in your country, and what are the challenges for scaling up?

Armenia has significant renewable energy resources. Estimated technically feasible potential for different technologies is as follows:

Solar PV - > 1000 MW

Wind – 300-500 MW

Hydro – 250-350 MW

Geothermal – 80 MW

Solar heating - >1000 MW

Heat pumps - >1000 MW

BioFuel - 100,000 t/year

However only hydro resources are realised largely. The main challenges in scaling up renewable energy in Armenia are:

- 1) Not sufficient tariff level to attract private investors: Fixed tariff is set up for most RETs, however impact of more attractive tariff on end users may affect poverty situation in country;
- 2) Lack of long term loans and affordable financing in local market;
- 3) State budget constrains to support RETs;
- 4) Limited scope of external borrowing;
- 5) Low absolute tariffs that render most renewable sources uncompetitive.

Although the legal and institutional framework is developed, however, institutional capacity building may be further required in establishing an enabling policy and regulatory framework to support renewable energy, particularly tariff setting, and governance issues such as coordination and information sharing. Updated, enhanced, and published supply and demand forecast with corresponding analyses on costs and benefits, carbon emissions, investment requirements, and tariff requirements, is needed.

What are your country's main achievements and opportunities in the areas of renewable energy?

Overall, the existing energy strategy, legal and regulatory framework in Armenia support renewable energy development. The Energy Law and the Law on Renewable Energy and Energy Efficiency clearly articulated the importance of renewable resources and provided a framework for facilitating their development. Among others, the legal framework guarantees 15 years off-take of electricity produced for all renewable power plants at the tariffs set by the regulator, Public Services Regulatory Commission (PSRC) and provides payment assurance. The National Plan on Renewable Energy and Energy Efficiency was adopted in 2007. In 2011 the Renewable Energy Development Roadmap was prepared under the WB/GEF Project.

There is also institutional and administrative set up to facilitate investments in renewable energy.

Armenia has significant achievement in realization of hydro potential. In 2005-2011, around US\$85 million was invested in SHPP, which added around 158 MW of new SHPP capacity. All generation facilities are owned and operated by private companies. The renewable energy based annual electricity generation increased from 137 GWh in 2005 (0.5 percent of total generation) to 520 GWh in 2011 (around 7 percent of total generation). The donor community played an important role in promoting development of renewable energy in Armenia through a number of projects, including resource assessments and mapping, which also provided both investment and technical assistance to improve the legal and regulatory framework for renewable energy.

Research and technical capacity as well as studies, policies and plans for renewable energy development already exist in Armenia.

What are the preliminary outlines of your SREP investment plan, in terms of technologies, financing sources and instruments, enabling environment activities (policies, regulatory framework, etc), and/or capacity building?

As a country possessing no fossil fuel resources, Armenia could realize different sources of renewable energy available in the country. Small hydro power plants and solar hot water heaters are the most economical, followed by grid connected wind farms and the use of heat pumps. Photovoltaics, geothermal power, waste and bio-fuels are ranked as more costly and commercially not viable in current conditions.

However all the mentioned technologies become feasible if sufficient affordable funding is accessible and appropriate policy is implemented.

Taking into account success story of SHPPs it is evident that with the attractive tariff policy the private sector, including banks will be ready to invest.

In order to prepare Investment Plan following activities are envisaged and implemented under the preparation grant:

- Critically review all available information regarding RE in Armenia and assess the level of penetration and potential for each of the following technologies: Hydro, Wind, Solar (PV, CSP, solar thermal), Geothermal, Biomass (including Biogas), underground water heat pumps, Pump Storage;

- Identify the key barriers (technical, regulatory, financial) hindering the development of RE technologies reviewed and propose measures to overcome them;
- Review the ongoing and planned activities in Armenia in the field of Renewable Energy and Energy Efficiency of other bilateral and multilateral donors;
- Calculate the Levelized Energy Cost (LEC) for each RE technology, based on actual technology prices in Armenia and forecast its development in the coming 15 years;
- Compare the LEC with current energy prices (real and subsidized);
- Develop a demand/supply model based on different development scenarios;
- Develop at least four development scenarios based on prioritizing criteria (e.g. maximizing labor utilization, maximizing carbon reduction, minimizing environmental impact, etc.)