



USAID
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ARMENIA

GLOBAL CLIMATE CHANGE

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USAID's energy programs in Armenia have helped to diversify energy sources, improve energy efficiency, and reduce carbon dioxide emissions, all of which have greatly helped in efforts to mitigate the effects of climate change. Maintaining energy projects in Armenia will further support USAID's objectives, especially with the assistance of the private sector and other interested parties.

BACKGROUND

Energy supply became a critical issue for Armenia in 1991, when Azerbaijan shut down the main pipeline transporting Russian gas to Armenia. This action meant that a smaller pipeline through Georgia, which was subject to disruption, remained the only source of natural gas supplies used for electricity generation and heating. The ensuing energy crisis was the major motivation for the Armenian government's controversial 1995 reopening of the Armenian nuclear power plant, which had been shut down after the devastating 1988 earthquake. This action alleviated the immediate energy shortfall, but this Soviet-designed facility is considered inherently unsafe and inefficient by international nuclear regulatory agencies, despite extensive safety improvements made in recent years. While Armenia has significant hydroelectric power potential, increased output in this sector has resulted in reduced water levels in the country's largest lake (Sevan) to ecologically dangerous levels. Lastly, Armenia's energy sector is characterized by inefficient energy use patterns, significant energy losses, and degraded infrastructure, all of which contribute to a system that, in its current form, is unsustainable in economic and environmental terms.

SECTOR-SPECIFIC CLIMATE CHANGE ACTIVITIES

USAID's program has evolved in recent years to focus on developing an efficient, reliable, and cost-effective energy sector that is appropriate for the emerging Armenian market economy. Such an energy sector is critical for sustainable economic growth, environmental protection, and social welfare.

USAID's energy/climate change activities in Armenia have progressed to focus on developing private sector participation, promoting economic growth and environmental sustainability, and diversifying energy sources. All three were addressed in USAID/Armenia's energy portfolio, particularly through the Energy Reform Program implemented by PA Government Services, Inc. and the Energy Efficiency/Demand Side Management/Renewable Energy Program, implemented through Advanced Engineering Associates International.

Supporting energy reforms, USAID assisted in the restructuring of the power sector in a stable functioning field and the recommencement of the gas sector. Reforms promote the development of renewable energy and energy efficiency. In the context of those projects, the structural and institutional reforms have been implemented, the Public Services Regulatory Commission was established and the respective regulatory framework was developed. The tariff reforms resulted in the establishment of reasonable tariffs at the cost recovery and attracting investments to the

PROJECT HIGHLIGHT**Reducing Carbon Emissions while Helping First Responders**

Armenian fire fighters have a heavy workload, especially in the Winter when the population consumes more gas and wood for heating. However, Fire stations and the equipment in them have deteriorated over the last decade. Under the Energy Efficiency, Demand-Side Management and Renewable Energy Program, 48 fire stations around Armenia received new energy efficient equipment. Implementing projects such as these in the residential and public sectors, USAID has reduced carbon emissions and enjoyed a high level of public acceptance.

sector, particularly for the development of renewable energy. The reliable gas supply resulted in fuel switching from electricity to natural gas for heating and hot water purposes. The application of commercial working principles in gas and electric sectors substantially decreased losses, theft and the level of emissions. Reforms have an irreversible effect and their positive influence on a decrease of emissions has an ongoing nature.

The development of a legal and regulatory framework, combined with trainings and awareness raising programs on global climate change, has had a positive effect on investments in renewable energy projects. As a result of policies that encourage investments in small hydropower plant (SHPP) development and increased political will to maximize the use of hydro potential for the needs of the energy sector, 53 small hydropower plants are operating and a considerable number of hydro plants are under construction. These investments have been further solidified by the establishment of a small hydropower generators union, a renewable revolving fund, tariffs and regulations instituted by the Public Services Regulatory Commission to encourage investment in SHPP. Annual generation of 210.7 MWh by Small HPPs results in avoiding 47 tons of CO₂.

USAID co-sponsored over 30 pilot projects in Armenia, most of which focused on improving energy efficiency and promoting renewable energy in the following areas:

- Fuel switching from electricity to natural gas for industrial and small commercial operations, as well as for government/municipal buildings;
- Efficient municipal street lighting and solar heating for hot water production;
- Industrial waste heat recovery and insulation and micro-hydro power generation (under 100 kW); and
- Introduction of a biogas system.

Conversion from electricity to natural gas heating was coupled with additional energy efficiency measures (such as weatherization and/or replacement of windows and doors, and installation of regulating valves on radiators). All of these initiatives contributed greatly to increased gas savings. Energy conversion is a particularly effective intervention, as the usage of natural gas by end-use customers for heating purposes is three times more efficient than the usage of natural gas at power plants for electric energy production. The total amount of GHG emissions avoided due to the implementation of these projects in 2007 has been estimated to be over 4,000 tons of carbon dioxide (CO₂).

USAID/Armenia provided significant support to the Armenian Government in developing the Energy Efficiency Standards and the General Requirements for Electric Installation Settings (GREIS). The new standards cover all aspects related to energy efficiency measures, use of renewable energy technologies, and issues related to environmental protection. GREIS promotes energy efficiency and ensures reduction of hazardous

PARTNERS

USAID's partners in climate change activities in Armenia include:

- Advanced Engineering Associates International (AEAI)
- Armenian State Standardization Committee
- Ministry of Environment of Armenia
- PA Government Services Inc.
- Research Institute of Energy
- United States Energy Association (USEA)

Because partners change as new activities arise, this list of partners is not comprehensive.

For more information, visit <http://armenia.usaid.gov>

accidents related to the use of electric power. Another set of new standards, requirements, rules and procedures related to renewable energy developed in 2007 include: standards for wind energy installations, standards for the methodologies of determination of power intensity for product manufacturing processes and services in technology-based energy systems, and technical requirements for connection of small hydropower plants to the national grid. These standards support the development of renewable energy facilities in Armenia by ensuring that the quality and efficiency standards are met.

These advances build upon work that USAID has funded in the past. For example, USAID helped develop Armenia's National Energy Strategy, which places a strong emphasis on energy efficiency and renewable energy, and performed a number of services to help mitigate climate change. In 2004, it successfully eliminated the role of Armenergo (the state electricity utility) as a single buyer in the power market, creating the possibility of a more transparent market, providing better economic signals for more efficient use of natural resources and allowing better competition between energy sources. Additionally, USAID supported the development and adoption of the Law of the Republic of Armenia on Energy Conservation and Renewable Energy, which is defining the principles for state policy and mechanisms for its implementation in the areas of energy conservation, energy efficiency and the development of renewable energy.

USAID/Armenia's energy portfolio also included a series of trainings on the subject of renewable energy and renewable energy technologies to NGOs, private and public institutions and research/educational institutions. Topics included: "Public Involvement in the Regulatory Process," "Electricity Tariff Methodologies," and "The Energy Sector for Non-Energy Stakeholders." Other capacity building initiatives included a stakeholders' conference on the subject of advancing and simplifying development of micro-hydro power in Armenia, training in monitoring and verifying greenhouse gas emissions and installation of energy efficient technologies, and training on improved demand-side management or integrated resource planning and improved efficiencies in industrial processes.

Currently, USAID through PA Government Services, Inc. provides technical assistance to the Government of Armenia in preparation of the Initial Planning Studies concerning the replacement of the nuclear power plant unit in Armenia in addition to an Environmental Background Information Document.

Closure of the existing Metsamor nuclear unit in Armenia is a major U.S. Government objective, as the plant is considered unsafe. Results of the studies will assist the Government of Armenia in its ability to make future decisions about the best technical solutions, project logistics and negotiations with potential suppliers and international financing institutions aiming at replacing the 440 MW of existing capacity with a new 1000 MW unit.

The new unit will include enhanced safety features compared to the existing unit, and will avoid more than 900,000 tons of CO₂ annually, than what would have otherwise been generated at the thermal power plant.