

PPIAF Assistance in Jordan

Technical Assistance for Jordan's Energy Sector

PPIAF has provided funding support for two activities in the energy sector in Jordan. The General Electricity Law No. 64, adopted by the government in August 2002, outlined Jordan's new electricity tariff policy. In addition, the power sector was unbundled into a competitive market structure comprised of a generation company, a transmission company, and three distribution companies.

The government requested PPIAF support in 2003 for a small activity to translate the recently determined tariff policy into rules, and to design the applicable tariffs to meet the government's objectives of sector efficiency and financial viability, while taking in account social and equity considerations. PPIAF funding also provided training for regulatory staff of the Electricity Regulatory Commission (ERC) in tariff design and application, including approaches to dissemination to consumers and stakeholders, in accordance with the provisions of the General Electricity Law.

As a result, the staff of the ERC was trained to better understand tariff design and application, and as part of this activity, ERC staff used the PPIAF tariff models to determine average selling prices at each service level for the 2004–2011 period. Importantly, the PPIAF-funded analysis emphasized that ERC should ensure that rates increase over time to reflect rising operating (and capital costs), allow for a reasonable return on investment, and promote sensible electricity usage, and that Jordan's system of cross-subsidization should diminish over time. However, the ERC has not implemented the recommendations contained in the PPIAF report. Bulk supply and retail tariffs remained constant from 2002 until 2008. In March 2008 the ERC did approve an increase in bulk supply tariffs, from 2.4 JD/KW/Month to 2.98 JD/KW/Month. This increase did lead to retail tariff rises that were mainly passed on to commercial users rather than households, maintaining the ERC's cross-subsidization model.

In late 2005 the government requested a second PPIAF activity for the energy sector. Similar to many other developing countries, in 1999 Jordan adopted a transitory single-buyer model as part of its restructuring of the energy industry through the General Electricity Law No.13. The single-buyer model was designed to provide a stable, uniform, and effective counter-party to both the generation and distribution licensees in the country. However, the government recognized the need to move to a multi-buyer multi-seller wholesale market in due course to improve operational efficiency and to ensure the sector benefits from competition. Article 48 of the General Electricity Law No. 13 accordingly provides for a transition to a competitive electricity market, at such time as the Council of Ministers is satisfied of the sector having sufficiently developed and prepared for the shift to the multi-buyer model.

As part of its broad reform policy, the government of Jordan took a number of decisions in the energy sector aimed at encouraging competition and private sector participation, particularly in the generation and distribution of electricity. Under this policy change, the vertically-integrated state-owned utility, the National Electricity Power Company (NEPCO), was unbundled in 1999 into three separate public shareholding companies: NEPCO, the Central Electricity Generating Company, and the Electricity Distribution Company, to operate in addition to the two already existing distribution companies (Jordanian Electric Power Company and Irbid District Electricity Company). An Electricity Regulatory Commission was also established to oversee the electricity sector.

It was in this context that the government of Jordan requested PPIAF support to provide options and recommendations to assist the government and NEPCO decide on the possible transition steps to a wholesale and competitive multi-buyer electricity market, including defining the new power market structure, legal framework, regulatory and pricing issues, Power Purchase Agreements and their evolving role, benchmarking principles, and new arrangements for the regional electricity trade.

PPIAF's support was carried out in two phases. The Phase I report focused on recommending areas in the electricity industry in Jordan where efficiencies could be improved further through competitive mechanisms. The report recommended a transition from a single-buyer model to a regulated multi-buyer

sector structure wherein NEPCO would be the owner and operator of the transmission system and the bulk electricity supplier function of NEPCO would be passed on to distribution companies, who would contract directly with generating companies for the purchase of electricity. In effect, under this system NEPCO would no longer be involved in bulk electricity supply, but would retain its role as owner and provider of the transmission infrastructure, including operations and maintenance responsibilities.

A workshop was held to assess stakeholder views in relation to the possible transition to a multi-buyer, wholesale model and draw lessons from the experience of other countries in power market development. The workshop built consensus among key stakeholder on the incremental changes required to improve efficiency in the industry particularly in aligning the different elements necessary to form an agreed framework for a phased transition to market operation, including the transitory single-buyer role of NEPCO.

Following the conclusion of Phase I, the PPIAF-funded activity examined the pre-conditions for introducing various stages of market competition into the electricity sector. It outlined the changes required in institutional, legal, regulatory, commercial, and technical aspects to implement this new sector structure, recognizing that the transition would need to be carefully phased and managed to align with the institutional, legal, regulatory, infrastructure, and human resource requirements of each stage.

A second stakeholder workshop was undertaken to receive feedback on the overall strategy and implementation plan for the transition from the single-buyer model to a multi-buyer competitive electricity market in Jordan. Consensus was achieved on the benefits of undertaking this shift to a multi-buyer competitive model.

However, despite achieving consensus, progress on transitioning to a multi-buyer competitive model has yet to be achieved. The government and NEPCO are currently pursuing an enhanced single-buyer model where new power plants are being procured competitively and the prevailing regulated tariffs provide for a cost recovery operation with no return on investment. Since the close of the PPIAF activity, two Independent Power Producers (IPP) have reached financial close, at Al-Manakher and Al-Qatarna, in 2007 and 2009 respectively. These IPPs were structured under the single-buyer model with NEPCO as the off-taker. The government is currently in the process of bidding out three more IPPs in 2011 under the same arrangement.

Results of PPIAF's Activities in Jordan's Energy Sector

Category	Outputs
Enabling environment reform	
<i>Analyses/assessments prepared</i>	<ul style="list-style-type: none"> Capacity Building in Tariff Rule-Making, Tariff Design, and Application, 2004
<i>Plans/strategies prepared</i>	<ul style="list-style-type: none"> NEPCO's Transition Strategy to a Competitive Electricity Market, 2007
Capacity and awareness building	
<i>Workshops/seminars</i>	<ul style="list-style-type: none"> Training on electricity tariff design and application, 2004 Two stakeholder engagement workshops on energy sector market structure in Jordan, 2007

Category	Outcomes
Capacity and awareness building	
<i>Technical capacity enhanced</i>	<ul style="list-style-type: none"> Trained 25 staff members on electricity tariff design and application to enhance the capacity of staff at the Electricity Regulatory Commission, 2004

<i>Consensus achieved</i>	<ul style="list-style-type: none"> • Consensus was achieved on the value of an eventual transition of the Jordanian energy market to a multi-buyer competitive model, 2007
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Technical Assistance for Jordan's Water Sector

Water supply and sanitation in Jordan is characterized by severe water scarcity. Jordan is considered as one of the ten most water scarce countries in the world. High population growth, the depletion of groundwater reserves, and the impacts of climate change are likely to aggravate the situation in the future.

In response to the problem of water scarcity in Jordan and the perceived poor performance of the Amman water utility, the Water Authority of Jordan agreed to a four-year performance-based management contract in 1999 for the Greater Amman Area with the French/Jordanian consortium of Suez Lyonnaise des Eaux/Arabtech Jardaneh and Montgomery Watson, for a total fee of \$8.8 million plus 5% of any profit in excess of anticipated annual profits. The joint venture, Lyonnaise des Eaux–Montgomery Watson–Arabtech Jardaneh (known as LEMA), started operations in August 1999.

In 2000, incoming Prime Minister Ali Abu al-Ragheb and his Cabinet emphasized its commitment across all ministries to increase private sector participation in the provision of infrastructure services. Aside from the Amman water management contract, other early examples of private sector participation in Jordan included the gradual privatization of Royal Jordanian Airlines in 1999, and the privatization of Jordan Telecommunications Company in 2000. In the water sector, the Ministry of Water and Irrigation likewise supported increased private sector participation to improve management, efficiency, and operation of water supply and distribution.

Encouraged by donors, the Ministry of Water and Irrigation explored several private sector participation options in the water sector, including build-operate-transfer, leasing, and management contracts. Potential projects included the water and wastewater treatment plants at Al-Samra and Wadi Musa, management contracts for the Northern Governorates and Zarqa, the Disi-Amman water conveyor, and the Hisban desalination plant. However, the institutional structure of the Ministry, as well as the inexperience of Ministry and Water Authority staff in managing contracts with the private sector, was not conducive to efficient management and oversight of the numerous and varied activities.

In light of these constraints, the government of Jordan requested PPIAF funding for technical assistance in late 2000 to provide support for the strengthening of the institutional structure for increased private investment in the water sector, and the design of an appropriate regulatory framework.

PPIAF provided funding for two reports, which formed Phase I of the activity. The first report provided a diagnosis of the water and wastewater sector in Jordan, assessed options for sector reform and recommended an appropriate structure for the sector. The recommended structure was designed to promote greater private sector participation in service provision and reduce the role of the government. The report also looked at corporatization options for the Amman and Aqaba water utilities to improve water provision and service delivery.

Following the first report, the second report provided recommendations on preferred regulatory options for the water and wastewater sector that would promote private sector participation. The report identified major categories of water sector regulation and identified the rationale for each of these forms. Three regulatory framework options were explored in more detail, setting out options for the responsibilities of the proposed new regulatory unit/agency and the Ministry of Water and Irrigation, and discussing the interaction of the regulatory unit/agency with other water sector institutions in Jordan.

Phase II of the activity intended to draft legislation for the development of private sector participation in the sector as well as the creation of a new regulatory agency. However, the government chose not to

pursue the second phase of the activity. As a result, the activity was closed following the completion of the phase one reports.

During the PPIAF activity, the Al-Samra wastewater treatment plant, designed to treat 68,000 cubic meters of waste and structured under a 25-year build-operate-transfer arrangement, reached financial close in December 2003, with investment commitments of \$169 million. In 2009, the 325 kilometer Disi-Amman water conveyer also reached financial close, and was also structured as a 25-year build-operate-transfer arrangement, with investment commitments of \$951 million.

However, progress on increasing private sector participation in the water sector has somewhat stalled. At the conclusion of the Amman water management contract in 2006, the government chose to establish the Jordan Water Company (Miyahuna) in January 2007 as an independent limited liability company fully owned by the Water Authority of Jordan. The Water Authority granted Miyahuna the right to manage water services in Amman with full ownership of operating revenues and the resources generated from a 3% sewage tax. Miyahuna thus became responsible for the complete management of operations, maintenance, and investments related to the provision of water and sewage services in Amman.

Also, a new regulator for the water sector has yet to be established as recommended by the PPIAF activity. The Performance Management Unit (previously known as the Program Management Unit), housed within the Water Authority of Jordan, remains the regulatory entity overseeing private sector participation projects in the water and sanitation sector in Jordan.

Results of PPIAF’s Activities in Jordan’s Water Sector

Category	Outputs
Enabling environment reform	
<i>Analyses/assessments prepared</i>	<ul style="list-style-type: none"> • Water Sector Review and Restructuring Options Report, 2004 • Water Sector Regulatory Framework Report, 2004

Technical Assistance for a Solar Water Heating Program in Amman

The Greater Amman Municipality (GAM) delivers services to the 2.3 million inhabitants of Amman. Amman accounts for about 40% of the population of Jordan and the majority of its GDP. GAM is committed to environmental sustainability, which was a guiding principle of the Amman Plan 2025 (the Amman Masterplan), a spatial planning framework of the city that focuses on energy efficiency and renewable energy that was launched in 2005.

After undertaking a review of its investment program to identify carbon emission reduction generation opportunities, GAM developed the Amman Green Growth Program to promote low-carbon investments that will sustain economic growth in Amman. The Amman Green Growth Program covers municipal waste, urban transport, sustainable energy, and urban forestry.

One of the projects identified under the Amman Green Growth Program was a Solar Water Heating (SWH) promotion program. Water heating typically represents 30% or more of households’ energy consumption. SWH systems supplement or replace conventional water heaters and reduce greenhouse gas emissions and other pollutants. Despite its environmental and economic benefits, several barriers still hinder the technology’s broader adoption, such as high up-front system costs, a lack of available financing for SWH businesses and consumers, and a lack of awareness about the favorable lifecycle economics of SWH technology.

In 2010 the penetration rate of SWH in Amman was estimated at 12–15%, very low in comparison to the rate of similar countries in the region. It was in this context that GAM requested PPIAF support in 2009 to determine the feasibility of a SWH promotion program in the city of Amman, and, in view of the failure of

market forces alone to increase SWH penetration rate, establish the preferred mode and structure of a public-private partnership, which would enable GAM to ensure a rapid increase in SWH penetration.

The PPIAF-funded report undertook a market study to establish a baseline review of SWH use in GAM and identified barriers to increased SWH penetration. The analysis found that for low-cost systems, the payback time for users switching from a diesel heating system to an SWH system used to be 17 years, but this has now fallen to four years due to rising diesel prices, but that Amman's low SWH penetration rate is small considering favorable weather conditions and the potential market size. The following key barriers to further development of the SWH market in Amman were identified in the report:

- Competitiveness of SWH (cost versus other forms of water heating);
- Reputation of SWH (as a reliable and cost-efficient form of water heating);
- Policy commitment (to adopt and in particular enforce supporting regulation).

In evaluating the market potential for SWH in Amman, it was found that electric water heaters (with a significantly lower purchase price than SWH but higher operating costs) were by far the most popular technology. The majority of new housing units are equipped with Electric Water Heaters or Gas Water Heaters, meaning that SWH needs to focus on the refurbishment market to gain market share. In this segment, SWH (13.3%) lagged behind Electric Water Heaters (75.3%).

A series of measures were outlined within the report to help increase the penetration of SWH in Amman, broadly divided into two categories: market-based measures and regulatory measures. Market-based incentives to stimulate the demand for and supply of SWH included: tax exemptions, grants or soft loans to lower front-end capital investment costs, income tax deductions, or a fossil fuel/CO₂ tax to raise the cost of competing alternatives. Regulatory measures identified to create a supportive framework for the SWH market included: testing and certification schemes to improve the quality of SWH, building code reforms to encourage SWH in new-build homes, government support to SWH research and development, and capacity building campaigns to promote the use of SWH.

From this analysis, the study performed a detailed analysis of two schemes for promotion of SWH that comply with the Clean Development Mechanism regulation, making the scheme eligible for climate finance support:

- Direct purchase of equipment by end-users
- Purchase of energy services by end-users

In the first scheme, the end-user buys equipment from a SWH equipment supplier and pays a certain share to the SWH equipment supplier while GAM pays the additional share and receives a Certified Emission Reductions, which are sold to the World Bank Carbon Partnership Facility to compensate GAM for (part of) their share of the equipment costs. Any remaining GAM share would be funded through a donor program or from GAM's budget.

The second scheme requires direct involvement of a private partner (i.e., the electricity company) to buy equipment from an SWH equipment supplier and sell energy services (domestic hot water) to the end-user. The company receives sales revenue from the end-user, and the value of the energy saving would be compensated by the Certified Emission Reductions, which GAM sells to the World Bank Carbon Partnership Facility. Any remaining costs of the program would be funded through a donor program or from the GAM budget.

Unfortunately, the events of the Arab Spring have changed the political and financial dynamic in Amman, and it is unlikely that the Amman Green Growth Program investment plans will go ahead. As a result, the SWH program has not yet been launched and is currently on hold.

Results of PPIAF's Activities for Amman's Solar Water Heating Program

Category	Outputs
Enabling environment reform	
<i>Analyses/assessments prepared</i>	<ul style="list-style-type: none">• Feasibility of a Public-Private Solar Water Heater Promotion Program for the Greater Amman Municipality, 2012