

## **Summary: The National Energy Efficiency Action Plan of Jordan**

Jordan is one of the Arab countries that import more than 95% of its energy needs. In 2010, the primary energy intensity was 0.23 ktoe/GDP compared to 0.28 ktoe/GDP in 2000. In this context, EE comes as one of the means to curb electricity consumption and face the increasing demand. Accordingly, the Jordanian Council of Ministers approved the National Energy Action Plan (NEEAP) of Jordan in June 2013 for the period 2013-2015. The Jordanian NEEAP comes as a response to the Arab Electrical Energy Efficiency Guideline approved by the Arab Ministerial Council of Electricity in November 2010.

The NEEAP depends on the key indicators of the Jordanian electricity consumption to set its targets. NEPCO\* stated that the electricity intensity in Jordan was 1.13 GWh/GDP in 2010 and is forecasted to reach 1.28 GWh/GDP in 2020. The national end-use electricity consumption is estimated to increase from 14562 GWh/yr in 2010 to 29059 GWh/yr in 2020; equivalent to a 7.6% increase per year.

Electricity represents a big portion of the aggregate energy consumption and its share is projected to increase from 22.7% in 2010 to 30.5% in 2020. The electricity consumption in Jordan is divided among 5 main sectors: residential (41%), industrial (25%), commercial (17%), Water pumping (15%), and street lighting (2%) according to 2010 statistics.

The NEEAP is planned to save more than 502 GWh in the first two years (2013-2015). To achieve the 20% targeted decrease in electricity consumption, around 8 sectors are tackled through 25 different measures. The plan will cost in total \$ 114 million with a projected pay-back period of about 2.3 years.

### **The National Indicative Target**

Based on baseline consumption of 11291 GWh/5 yrs on average, the 2020 National Indicative Energy Efficiency Target is to save 2258 GWh of the electricity consumption (20%). Accordingly, the first NEEAP targets a 4.4% saving in the two years 2013-2014 that is 502 GWh. The NEEAP includes 6 main Sectorial Targets with their corresponding measures, and some Additional Measures as follows.

#### **1- The Sectorial Targets**

##### *a. The Residential Sector*

It is the most consuming sector with a baseline consumption of 4447 GWh/5 yrs average. Its share of electricity consumption is projected to increase from 41% in 2010 to 34% in 2020. Thus, the target is to achieve a 25% saving by 2020 (1112GWh) which corresponds to a targeted minimum saving of 5.6 % in 2014(247 GWh). The government put a 4-measure program that can exceed the targeted saving to reach around 509 GWh (rather than 247 GWh) by 2013 with total budget of around \$43 million. These measures include replacing 1.5 million incandescent lamps with energy efficient lamps (CFL\*), adopting Energy Label Program for four home appliances and installing 30,000 Solar Water Heaters in

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\* National Electric Power Company

\* Compact Fluorescent lamps

addition to 5,162 SWHs in cooperation with Jordan River Foundation. An additional supporting measure is to convey a survey of energy consumption in the sector by the end of 2012.

#### *b. The Industrial Sector*

It comes as the second electricity-consuming sector with a projected steady share of 25% from 2010-2020. The baseline consumption for this sector equals 3013 GWh/5 yrs average. The national indicative target is to save 452 GWh by 2020 (15%) that is to save 100 GWh in 2014 (3.3%). Thus, the government is adopting a mobile energy and environment clinic projected to save 191 GWh by 2015.

#### *c. The Commercial Sector*

The baseline consumption for this sector equals 1875 GWh/5 yrs average. Its electricity consumption share is estimated to increase from 17% in 2010 to 25% in 2020. The target is to curb the electricity consumption by 2.7% in 2014 (50 GWh) to reach the 2020 national target of 12% saving (225 GWh). Replacing the conventional ballasts by electronic ballasts for fluorescent lamps will save around 31 GWh by 2013.

#### *d. Water Pumping*

It forms around 15% of the electricity consumption in 2010 with no projected increase by 2020. The baseline consumption equals 1668 GWh/5 yrs average. It is targeted to save 384 GWh (23%) by 2020 which requires decreasing consumption by 85 GWh (5.1%) in 2014. The government is implementing a two-phase program with a total cost of \$43 million and a 60 GWh/yr projected saving. The first phase is improving the energy efficiency of the Water Authority of the Jordan (IEE\*) then the EEP\*.

#### *e. Street Lighting*

It is the least consuming sector with an estimated steady share of 2% till 2020 and a baseline consumption of 288 GWh/5 yrs average. The 2014 target is reducing consumption by 6.6% (19 GWh) in order to save 86 GWh (30%) in 2020. Replacing the mercury lamps by efficient lamps and using automatic street lighting controls and voltage regulators can save around 60 GWh by 2015 and cost \$9.15 million.

#### *f. Development and Free Zones (DFZC)*

DFZCs include 61 public and private zones that host more than 8000 enterprises operating in different fields: tourism, trade, industry and others. Through their unique structure, they can provide platforms to pilot EE targets and reforms. The EU and USAID along with the Jordanian government will fund a 9-measure program to be implemented in 2013-2014. Among these measures are strengthening the Energy Management dimension in the planning and operation of the DFZC, the development of a Dead Sea DFZC and assisting in the execution of its Energy guidelines and action plan, assisting Ma'an Development Area in implementing EE recommendations, supporting Green investment and Clean Tech

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\* Improvement of Energy Efficiency Project

\* Energy Efficiency Plan

Cluster, establishing an energy baseline and developing RE and EE projects at the JIEC industrial estates and land assets (Abdullah II Industrial Estate Sewage Treatment Plant, Mowaqr Industrial Estate, and Zarka Industrial Estate).

## **2- Additional Measures**

Four additional measures were set to cover designated sectors: the public sector, the utilities responsibilities, the power sector, and some horizontal and cross-sectional measures.

The first two measures target the public sector and are projected to save more than 40 GWh by 2013. These are to reduce the consumption of public buildings by 10% and replace 50,000 incandescent lamps with compact fluorescent lamps; this would cost more than \$235,000. The coming measure entails eight activities to be implemented in 2012-2013 as part of the ERC\* Media Plan on energy conservation. This plan targets utility responsibilities with total budget of around \$120,000.

Other measures target the power sector and include an implemented PV project at RSS-288 KWp which cost around \$5.6 million. The other measure is adopting capacity-building in Wind Energy and Concentrating on Solar Power (WECSP Project) at NERC\* during the period 2011-2013. This would cost around \$13.4 million. Finally, it is planned to implement a number of horizontal and cross-sectional measures by the end of 2014.

### **Progress**

The implementation progress will be assessed by a number of criteria that cover institutional, regulatory, and financial aspects. Law no. 73 (approved in Nov.2012) announced the EE policy and it regulates the procedures and means of conserving energy and improving its efficiency (Article 10 of the bylaw No. 73 (2012) obliges mandatory installation of Solar Water Heaters effective from 1 April, 2013 for new apartments exceeding 150 m<sup>2</sup>, as well as for offices in commercial buildings exceeding 100 m<sup>2</sup>, and for residential buildings exceeding 250 m<sup>2</sup>). A technical committee was formed representing different entities and was responsible of drafting an EE policy. The drafted paper is part of the EE law and was backed up by an action plan (NEEAP).The government is to provide a full or partial public or PPP\* to finance the action plan. Energy Efficiency is regarded by the government as a source of energy where it tenders the business plan as they would tender a new power plant.

### **Recommendations:**

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\* Electricity Regulatory Commission

\* Energy Research Program

\*Public-Private Partnerships

The Jordanian NEEAP comprises several promising measures that tackle both the demand and supply sides in the various sectors. The following elements should be considered to further improve the NEEAP:

- To strengthen the focus on the industrial sector and add other measures beside the set one.
- To clarify the role of utilities and determine whether they are part of the national plan or not.
- To detail the funding of some measures and provide other alternatives in case no funding source is given.
- In some cases, the cost per KWh saved could be indicated to provide a basis for prioritizing measures.
- To further detail the enforcement of some measures.

