

**UNITED NATIONS**

**Economic and Social Commission for Western Asia**



## **AFED Annual Conference**

# **“Sustainable Energy in Arab Countries”**

28 - 29 October 2013

**Sharjah, UAE**

**“Sustainable Energy: Examples of the GCC Countries,  
Is Energy Intensity a useful tool for GCC countries?”**

**UN-ESCWA Sustainable Development and Productivity Division  
Energy Section**



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### **“Up-scaling Energy Efficiency in the residential and tertiary sectors in the Arab Region”**

**UN-ESCWA Sustainable Development and Productivity Division  
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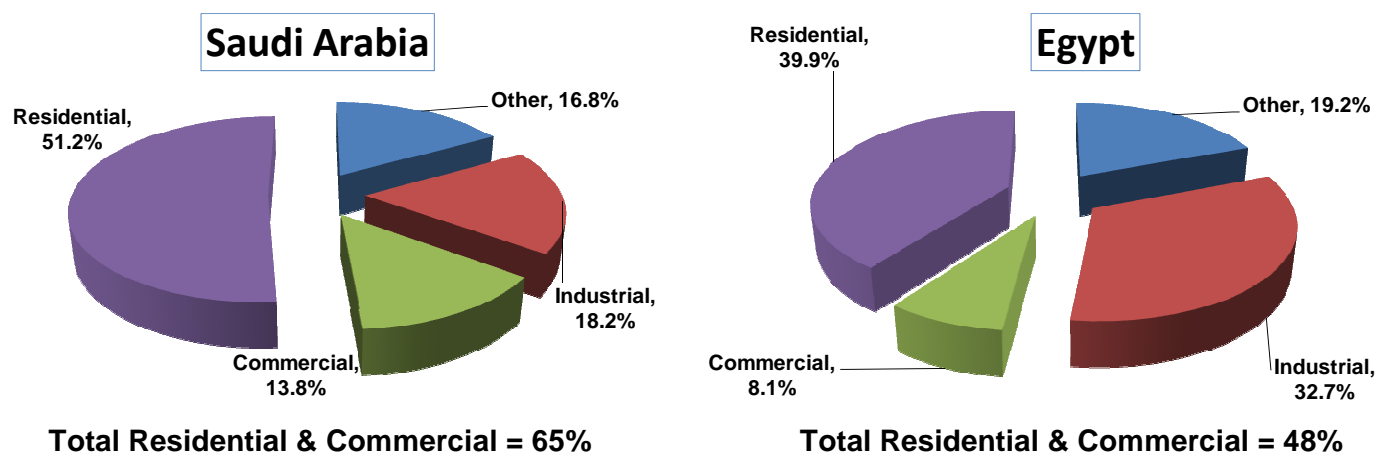


# Background / Energy Consumption in the building sector (Case of Electricity)



## Share of the Residential & Commercial Sectors in Electrical Consumption (2010) and Increase of Peak Electrical Demand (2009-2010) in Arab Countries [%]

(Source: Arab Union for Electricity Statistical Bulletin for 2010)



	Commercial	Residential	Residential & Commercial	Increase of Peak Elect. Demand
<b>Average:</b>	<b>15.0%</b>	<b>44.1%</b>	<b>59.1%</b>	<b>9.2%</b>
<b>Maximum:</b>	38.9% Bahrain	66.6% Yemen	88.0% Bahrain	15.1% Jordan
<b>Minimum:</b>	6.9% Iraq	27.9% Tunisia	34.9% Tunisia	3.5% Lebanon <sup>(2)</sup>

<sup>(1)</sup> Peak electrical Demand occurred during the hot season in all countries except for Palestine & Syria

<sup>(2)</sup> Lebanon has an installed electrical capacity deficit (Customers are not supplied from public grid fulltime)



# The ESCWA Regional Initiative to Up-scale Energy Efficiency in the Existing Building Stock



## ❑ Project Objective:

Substantially improve energy efficiency in ESCWA member countries' residential and services sectors (17 Arab countries), in the immediate and short term, through up-scaling energy efficiency programmes in the existing residential and non-residential building stock

## ❑ Project Targeted Beneficiaries:

Public and private sector stakeholders and main actors involved in EE programmes related to the residential and services sectors in ESCWA Member Countries (Ministries and public institutions, relevant national, professional, and trade associations, consumer protection associations, and other relevant private sector and civil society actors)

## ❑ Project Duration:

4 years

# The ESCWA Regional Initiative to Up-scale Energy Efficiency in the Existing Building Stock



## □ Project Main Goals:

**Assist member countries, through a regional approach, in:**

- **setting up institutional and policy frameworks to promote EE in the residential and services sector**
- **mapping the current situation and setting up monitoring programmes of energy performance in these two sectors**
- **enabling labelling and MEPS programmes for household equipment**
- **developing comprehensive large scale dissemination schemes to accelerate the implementation of EE measures in existing buildings**
- **setting up awareness raising programmes**

# The ESCWA Regional Initiative to Up-scale Energy Efficiency in the Existing Building Stock



## ☐ Project Status:

- **Concept note prepared and passed ESCWA internal approval procedures**
- **Concept note reviewed by many international experts with mostly very positive feedback**
- **Currently exploring possible partnerships and funding opportunities to operationalize the initiative**
- **Expected launching date: First half of 2014**



# **AFED Annual Conference**

## **“Sustainable Energy in Arab Countries”**

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**“Sustainable Energy: Examples of the GCC Countries**

**Energy Efficiency On-Going Program List in GCC countries**

**UN-ESCWA Sustainable Development and Productivity Division**  
**Energy Section**





# Energy Efficiency On-going Program in GCC



## □ BAHREIN:

- **Energy Efficiency building- 81 multi-story buildings in 2012 and thermal insulation regulations.**
- **A public tender in 2013 to replace 2.1 million of incandescent lamps in the residential sector**

(Reference: [www.afedonline.org/afedreport09/english/Char2.pdf](http://www.afedonline.org/afedreport09/english/Char2.pdf))

- **Bahrain and WB agree Energy Efficiency Program- providing technical support and advisory services to address the challenge of curbing energy demand in the country over the next 3 years. The agreement was signed by Bahrain's Minister of Finance, Sheikh Ahmed Bin Mohamed Al Khalifa, and WB Director for GCC Countries Farrukh Iqbal.**

(Reference: [www.thejakartapost.com/news/2013/09/23/bahrain-wb-agree-energy-efficiency-program.html](http://www.thejakartapost.com/news/2013/09/23/bahrain-wb-agree-energy-efficiency-program.html))

# Energy Efficiency On-going Program in GCC



## □ UAE:

- Proper motor sizing- to meet demand and using high efficiency motors
- Variable speed drives (VSDs) on applications of variable loads, in addition to leaks reduction from compressed air systems & high pressure steam system (Reference: [www.afedonline.org/afedreport09/english/Char2.pdf](http://www.afedonline.org/afedreport09/english/Char2.pdf))
- EE & Standards Labeling Program (EESL Program) for UAE- This introduced specific efficiency and labeling requirements for non-ducted room air-conditions in 2011. These measures were donned in 2012 by requirements under the same program for many other household electrical goods including lamps, washing machines and refrigerating appliances. The labeling requirements under this program will become mandatory by 2013 and it will be extended in 2013 to include ducted air-conditioners and chillers.
- UAE EE Regulation-ensuring that all non-ducted air conditioners (room air-conditioners) may be placed on the market or put into service only if it does not endanger the safety of persons or domestic animals when properly installed. (Reference: [www.ecomena.org/tag/energy-efficiency-in-uae/](http://www.ecomena.org/tag/energy-efficiency-in-uae/))
- Becoming home to the largest single energy management project- energy consumption monitoring of over 200,000 commercial & residential properties across the emirate with collaboration between Hara and Abu Dhabi Water & Electricity Authority. Hara will provide environmental and energy management software.

(Reference: [www.theguardian.com/sustainable-business/uae-largest-energy-](http://www.theguardian.com/sustainable-business/uae-largest-energy-)



# On-going EE programmes in GCC countries



## □ SAUDI ARABIA:

- National energy Efficiency Program (NEEP)- UN/DESA (Division for Sustainable Development) is executing agency. The aim of this programme is to assist the energy sector in Saudi Arabia to meet the rapidly growing power and energy demand through efficient and rational consumption patterns. NEEP involves supporting energy auditing in the industrial and commercial sectors, utility load management, setting policies and regulations for residential buildings and energy-consuming and private sector investments and utilization of efficient technologies. It will enhance and encourage outreach and awareness building initiatives on EE through campaigns, workshops and capacity building. Saudi Arabia will have implemented a national program to improve EE both in production and in end-use.

(Reference: <http://esa.un.org/techcoop/flagship.asp?Code=SAU01002>)

- In NEEP, UNDP supports energy auditing in the industrial and commercial sectors, utility load management, setting policies and regulations for residential buildings and energy-consuming appliances efficiency, improving EE information exchange, promoting energy services and private sector investments and utilization of efficient technologies.

(Reference: <http://web.undp.org/comtoolkit/success-stories/ARAB-SaudiArabia-energyenviron2.shtml>)

- Standards for the Use of Advanced insulating materials in the construction of new commercial building- to reduce energy demand
- Restructuring of electricity tariff- Saudi Electric Company
- Saudi EE Center was set up in 2010- Coordinating and complementing national energy efficiency activities to achieve world energy intensity standards by 2020

# Energy Efficiency On-going Program in GCC



## □ OMAN:

- **Oman Invests \$2.9bn in 13 New Power, Water and Energy Projects-** To face the increasing demand, Oman is investing in strengthening power and desalination water generation capacity and in maximizing the network efficiency to improve costs and energy saving benefits and to optimise the rational use of electricity and water resources. EE strategies as well as the ongoing and planned power and water projects will be among the key topics to be discussed at the Oman Power & Water Summit 2012 developed in cooperation with the Public Authority for Electricity and Water and with the official support of the Ministry of Regional Municipalities and Water Resources, Oman Power and Water Procurement Company, Authority for Electricity Regulation, Electricity Holding Company & Rural Areas Electricity Co.

(Reference: [www.turkishweekly.net/news/131539/oman-invests-2-9bn-in-13-new-power-water-and-energy-projects-.html](http://www.turkishweekly.net/news/131539/oman-invests-2-9bn-in-13-new-power-water-and-energy-projects-.html))



## □ KUWAIT (1):

- **Building Energy Code of Practice in Kuwait- Basic energy conservation requirements: limits A/C peak power (Watt) per unit area (m<sup>2</sup>) for air- and water-cooled A/C systems as well as lighting for: Residential buildings and Commercial buildings (including office, shops, mosques, schools ... etc.). The 1983 code was developed by MEW, MPW and KISR: Applicable to all new and retrofitted buildings of all types. The code covers electrical installations: Regulations including their operations energy and conservation measures in buildings.**

**(Reference: <http://css.escwa.org.lb/sdspd/1939/16.pdf>)**

- **Aims to 1) Improve the energy efficiency of Kuwait's power stations by 5%, 2) Reduce energy consumption by 10% in existing buildings and industries, 3) Reduce energy consumption by 30% in new buildings from the current level. There are 23 projects under the programme, as follows:**

# Energy Efficiency On-going Program in GCC



## □ KUWAIT (2):

- There are 23 projects under the programme, as follows:

S. No.	Title
1	Develop and Update Building energy code and design guidelines
2	Performance Verification of Fenestration Products
3	Cool Roofs and Urban Heat Islands Mitigation
4	Development of National Code for Lighting Systems in Buildings
5	Updating of MEW Electrical Codes
6	Optimum thermal resistance for walls, roof and floor of buildings
7	Minimum energy efficiency for different air-conditioning systems
8	Effect of Alternative Refrigerants on the Performance of Air-Conditioning Units in High Ambient
9	Minimum energy efficiency for domestic and office appliances
10	Guidelines and recommendations for installation and maintenance of air-conditioning systems.
11	Guidelines for Verification of Building Energy Code Compliance and Energy Labelling
12	Design of a Sustainable Traditional Kuwaiti Villa
13	Construction and Performance Evaluation of a Sustainable Traditional Kuwaiti Villa
14	Establishment and Performance Assessment of A Sustainable Model Building in Kuwait
15	Performance Assessment of Encapsulated Latent Ice Storage System
16	Assessment of Geo-thermal Heat Pump Application
17	Assessment of the Electromagnetic Field around the electrical Secondary transformers in schools And residential area
18	Development of Design Guidelines of District Cooling System for Al-Khairan New Residential City
19	Indoor Environmental Quality (IEQ) Assessment and Development of codes
20	Integrated Demand Side Management and Photovoltaic Systems for Schools in Kuwait
21	Green Building Certification for the oil Sector Complex Building
22	Implementation of Energy Efficient Retrofits for Five Existing Private Office Building and Shopping Malls
23	The Potential of Energy Conservation and Peak Power Reduction in the Residential Sector

# On-going EE programmes in GCC countries



## □ QATAR (1):

- Standard for air conditioner's EE set by Kahramaa (Electricity & Water Corporation) through Conservation & EE Department. The new standards are approved by World Trade Organization (WTO) under QS SASO 2663/2013, will be effective soon. The minimum EE star rating for air conditioners in Qatar is three, which is equal to an EE Ratio (EER) of 8.5. Once the EE labeling is activated, non-compliant appliances will not be allowed to enter the Qatari market. The rule will be enforced in co-ordination with concerned authorities who will issue pre-approval for shipping such items into the country.

(Reference: [www.gulf-times.com/qatar/178/details/361733/qatar-sets-new-energy-saving-standards-for-air-conditioners](http://www.gulf-times.com/qatar/178/details/361733/qatar-sets-new-energy-saving-standards-for-air-conditioners))

- Chevron Launches EE Center at QSTP- to improve EE and develop region-specific solar technologies-The center was inaugurated under the auspices of HE Dr. Mohammed Bin Saleh Al-Sada, Minister of Energy & Industry, at a ceremony at the science park, accompanied by John Gass, Chevron's President of Global Gas, and Dr. Tidu Maini, QSTP's Executive Chairman. Also present were Saad Al-Kaabi, Director of Oil & Gas Ventures at Qatar Petroleum, and Carl Atallah, President of Chevron Qatar. The Chevron CSEE was established to support Qatar's strategy for sustainable development. It has a visitor center with training and demonstration of EE lighting and photovoltaic technologies. Later in the year the Chevron CSEE expects to link with a solar research facility at QSTP studying solar power and solar air-conditioning. Through its subsidiary Chevron Qatar Energy Technology Ltd, Chevron is investing \$20 million in its QSTP activities over five years.

(Reference: [www.chevron.com/documents/pdf/CSEEpresseRelease032011.pdf](http://www.chevron.com/documents/pdf/CSEEpresseRelease032011.pdf))



## ❑ QATAR (2): EE Programme in the Qatari Electricity Sector

In Feb 2006, ESCWA and Qatar General Electricity & Water Corporation (KAHRAMAA/KM) signed an agreement aimed at developing a cooperation programme on EE in the Qatari electricity sector. The programme span was 20 months, implemented in full coordination between ESCWA & KAHRAMAA and included the following key activities: Evaluation of the current and future supply and demand of the electricity sector in Qatar - Assessing the load profiles and analyzing the electrical energy consumption patterns by sector - Performing preliminary energy surveys/audits at selected sites - Identifying possible EE Measures (technologies and practices) and conducting preliminary evaluations for their potential applications in Qatar - Providing guidelines and recommendations for an adequate and appropriate tariff structure and pricing for the electrical energy supply in the various sectors - Identifying the requirements to develop an EE program at national level and related preliminary action plan - Organizing a Seminar on the outcomes of the cooperation programme

- The agreement is supposed to be implemented over 2009-2020 and is expected to provide several benefits, among these: 1) Reducing the peak load by 550 MW, which could save \$325M required for installing power plants in addition to \$92 M needed for transfer and distribution electricity networks, 2) Reducing electricity consumption by 2.3 TWh annually “about 19% of total consumption”, which would in turn save \$574M annually in fuel consumption, 3) Reducing CO<sub>2</sub> emission by 1.3 Mt/y and nitrogen oxides by 5400 tons/yr 4) Creating a new jobs related EE activities.
- In responding to the requirements of the EE programme, KM established a department for Energy Conservation & Efficiency and proposed a national action plan for energy conservation. In this regard, KM set detailed implementation plans for several EE projects.