UN-DA Project: “Developing the Capacities of ESCWA Member Countries to Address the Water and Energy Nexus for Achieving Sustainable Developing Goals”

Regional capacity building workshop on “Water- Energy Nexus Operational Toolkit: Technology Transfer
30th – 31st October 2017, Amman, Jordan

Project Background and Workshop Agenda

Ms. Radia Sedaoui
Chief Energy Section
Sustainable Development Policies Division
Countries in the Arab region exhibit different energy consumption levels, but they share their reliance on fossil fuels for energy sufficiency.
Setting the Context
Energy consumption more than doubled in the Arab region since 1990

Historical energy consumption in the Arab region by country (TJ), 1990-2014
Setting the Context

The top 33 water-stressed countries in the world by 2040

<table>
<thead>
<tr>
<th>Rank</th>
<th>Name</th>
<th>Score (all sectors)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bahrain</td>
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<tr>
<td>1</td>
<td>Kuwait</td>
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<td>1</td>
<td>Qatar</td>
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<tr>
<td>1</td>
<td>United Arab Emirates</td>
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<td>1</td>
<td>Palestine</td>
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<tr>
<td>9</td>
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<td>4.99</td>
</tr>
<tr>
<td>10</td>
<td>Oman</td>
<td>4.97</td>
</tr>
<tr>
<td>11</td>
<td>Lebanon</td>
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<tr>
<td>14</td>
<td>Jordan</td>
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<td>15</td>
<td>Libya</td>
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<tr>
<td>16</td>
<td>Yemen</td>
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<td>Morocco</td>
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<td>Iraq</td>
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<td>25</td>
<td>Syrian Arab Republic</td>
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<tr>
<td>30</td>
<td>Algeria</td>
<td>4.17</td>
</tr>
<tr>
<td>33</td>
<td>Tunisia</td>
<td>4.06</td>
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Arab region includes some of the most water scarce countries in the world.

At least 13 of these countries suffer ‘absolute’ water scarcity.
How inclusive is progress in sustainable energy development in the Arab region?

1. Universal access to modern energy
   Significant progress in modern energy access, with important remaining sub-regional gaps in the Arab LDCs

2. Energy efficiency
   The Arab region is the only world region where energy intensity has been increasing, not declining since 1990

3. Renewable energy
   The Arab region’s potential for renewable energy remains largely under-exploited

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Sustainable Energy in the Sustainable Development Agenda 2030

SDGs will stimulate actions over the next 15 years in 5 areas of importance

1. No Poverty
2. Zero Hunger
3. Good Health and Well-being
4. Quality Education
5. Gender Equality
6. Clean Water and Sanitation
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation and Infrastructure
10. Reduced Inequalities
11. Sustainable Cities and Communities
12. Responsible Consumption and Production
13. Climate Action
14. Life Below Water
15. Life on Land
16. Peace, Justice and Strong Institutions
17. Partnerships for the Goals

17 SDGs, 169 Targets, 240 Indicators
Inclusive national development: pursuing policies that embrace the principles of universality and inclusivity
Overview of the UN-DA Project: “Developing the Capacities of ESCWA Member Countries to Address the Water and Energy Nexus for Achieving Sustainable Developing Goals”

In 2012, ESCWA organized an intergovernmental consultative meeting to initiate *intersectoral and intergovernmental dialogue* on the nexus in the *Arab region*

The representatives of both Committees on *Energy & Water Resources* identified 7 *priority areas*:

- Knowledge and awareness raising on the nexus
- Policy coherence
- Examining the W-E security nexus
- Improving efficiency
- Informing technology choices
- Promoting RE
- Addressing climate change & natural disasters
Overview of the UN Development Account Project

**Duration**

**Objectives**
- Build the capacity of ministries and public service providers who are responsible for water and energy in the region, so that they adopt the nexus approach and address water and energy issues in an integrated manner.
- Assist ESCWA ‘MCs in bringing the nexus approach to the SDGs in the 2030 Agenda development framework.

**Beneficiaries**
- ESCWA Member Countries (MCS)
Overview of the UN Development Account Project: Main activities

**Capacity Building**

- High level officials in Ministries
- Development of Regional policy toolkit
- Development of 3 technical toolkits

**3 pilot activities**

- Regional Policy workshop (Amman, Oct. 2016)
- Regional knowledge exchange workshop
- Resource efficiency
- Renewable Energy
- Technology transfer

- Training workshop: (Bahrain Feb. 21-22, 2017)
- Training workshop, (Beirut, July 2017)
- Training workshop (Amman, October, 2017)
<table>
<thead>
<tr>
<th>Module</th>
<th>Title</th>
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<tbody>
<tr>
<td>Module 1</td>
<td>Knowledge and awareness raising on the nexus</td>
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<td>Module 2</td>
<td>Policy coherence</td>
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<tr>
<td>Module 3</td>
<td>Examining the water-energy security nexus</td>
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<tr>
<td>Module 4</td>
<td>Improving efficiency</td>
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<td>Module 5</td>
<td>Informing technology choices</td>
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<td>Module 6</td>
<td>Promoting renewable energy</td>
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<tr>
<td>Module 7</td>
<td>Addressing climate change and natural disasters</td>
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Regional Policy Workshop- Amman (October, 2016):
Main outcomes

- Support building an understanding of the W-E-Nexus as a conceptual framework for advancing sustainable development.
- Discuss benefits, opportunities and challenges of adopting a nexus approach for strengthening integrated natural resource management in the Arab region.
- Provide training on integrated strategies and policies on the water-energy nexus.
- Exchange information on regional initiatives, projects and partnerships supporting Arab countries on the water-energy nexus.
- Identify policy tool/instrument to support mainstreaming W-E-Nexus at national level.
- Initiate discussion on proposals of Pilot Projects which would receive technical support and advisory assistance from UN-ESCWA to assist in piloting the tool or instrument at the national level. Egypt, Syria, Tunisia have already submitted their proposals.
Water-Energy Nexus Operational Toolkit
Resource Efficiency Module

Technologies to improve Water Efficiency

Key performance indicators for the water-energy nexus

Technologies to improve Energy Efficiency

Financial Perspective: Efficiency improving technologies

### Technologies to improve water efficiency

- There is no ideal efficiency solution for all ESCWA member countries. Strategies must be assessed with reference to the respective situation.
- Recycling of wastewater is a strategy that can be implemented by various sectors.
- Water consumption can be reduced in electricity generation processes by addressing various parameters (Cooling types, Combined cycle arrangements).
- Several technological options for more water, efficient water distribution (e.g., IM systems), particularly in the agricultural sector, are becoming more popular.

### Technologies to improve EE

- Variation in energy savings and payback period for different strategies for the water sector, which shows the potential complexities due to the many parameters to be considered.
- Cost sharing between energy and water utilities must be facilitated in support of efficiency measures.
- By regulating tariffs more effectively, investment required for the adoption of more energy- and water-efficient technologies can be facilitated and End-use consumption can be better influenced.

### Financial Perspective, KPI & SDGs indicators

- The most energy-consuming parts of a process must be targeted.
- Intelligent systems have the potential to increase efficiencies.
- The level of coordination and collaboration between the water and energy sectors in all stages of planning and implementation must be increased to achieve targets.
- Water and energy efficiency indicators are vital to measure progress with respect to the water-energy nexus and data required is not always available.
Water-Energy Nexus Operational Toolkit
Renewable Energy Module

- Renewable energy technologies: financial perspective
- Renewable energy technologies assessment for water and wastewater applications
- Renewable energy technologies assessment for electricity production
- Key performance indicators for RE technologies


### RE technologies assessment for electricity production
- Share of RE in the electricity generation sector increasing worldwide and in the Arab countries.
- RE technologies consume less water than conventional sources when being used to produce electricity.
- There are many potential RE-desalination combinations but only a select few are viable.
- Solar energy is the most popular type of RE for powering desalination.

### RE technologies assessment for water and wastewater applications
- There are many opportunities for the use of RE technology to strengthen the security of the water-energy nexus.
- Water pumps can be powered by solar, wind, or biofuel energy.
- Solar water heating has been implemented in the residential sector successfully in various Arab countries.
- The Oil & Gas sector is already using RE sources for certain operational activities.

### Financial Perspective, KPI & SDGs indicators
- The costs associated with RE technologies have decreased over the past few years and become comparable with those of fossil fuels.
- Indicators related to RE technology as well for the water-energy nexus, are still being developed.
- The data required for these indicators can be difficult to obtain depending on the complexity of the indicator.
Water-Energy Nexus Operational Toolkit
Technology Transfer Module
**Regional Capacity Building Workshop on: “Water - Energy Nexus Operational Toolkit: Technology Transfer”**

**Agenda**

**DAY 1: Monday, 30th October 2017**

09:35 – 10:30  **SESSION 1: OVERVIEW OF TECHNOLOGY TRANSFER PRINCIPALS AND MECHANISMS**

10:30 – 11:00 **Coffee Break and Group Photo**

11:00 – 11:40  **SESSION 2.1: TECHNOLOGY TRANSFER FOR RESOURCE EFFICIENCY**

11:40 - 14:30  **SESSION 2.2: TECHNOLOGY TRANSFER FOR RESOURCE EFFICIENCY CASE STUDIES**

13:00 – 14:00 **Rich Coffee Break**

14:30 – 15:00 First Day Wrap-up

**DAY 2: Tuesday, 31st October 2017**

09:00 – 11:05  **SESSION 3: TECHNOLOGY TRANSFER FOR RENEWABLE ENERGY**

11:05 – 11:20 **Coffee Break**


BRAINSTORMING DISCUSSION: BREAKOUT WORKGROUP SESSIONS

13:20 – 14:20 **Rich Coffee Break**

15:15 – 15:30 **Wrap-up of the Workshop and Wrap-up and Closing Statement**
Thank YOU