SUPPORTING SUSTAINABLE DEVELOPMENT GOAL 7, “BY 2030 ENSURE UNIVERSAL ACCESS TO AFFORDABLE, RELIABLE AND MODERN ENERGY SERVICES”

A NEXUS APPROACH TO ENERGY ACCESS, LESSONS LEARNED, AND MOVING FORWARD

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Accelerating Progress toward SDG 7: UN System Contribution
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From MDGs to SDGs: Lessons Learned

**MDGs**
- UN led
- Silos Approach
- AMR framework
- Indicators not reflecting reality

**SDGs**
- Voluntary, universal, state-led, participatory, multi-tiered approach
- UN-Water and UN-Energy played a leading role
- Integration of the 3 pillars
- SDGs are universal and indivisible
- FUR framework
- Countries lack capacity to collect needed data
Elaborating a WEF security nexus within the context of sustainable development

The SDGs regional challenges: an ESCWA perspective

2. ZERO HUNGER
Scarcity of freshwater and land degradation.
Reliance on international trade and foreign land agreements.

6. CLEAN WATER AND SANITATION
Most water scarce region in the world.
High dependency on transboundary water.
Accessibility constraints due to occupation and conflict.

7. AFFORDABLE AND CLEAN ENERGY
Rich in fossil fuels and renewable energy.
Low rural electrification.
Arab countries seek optimal energy mix that includes renewable options and maximized efficiency.
Energy for Water

Desalination
Varies depending on technology, from 1.5-5 kWh/m³ and 00-300 MJ/m³

Abstraction
0.36 kWh is needed to lift 1m³ of groundwater a vertical distance of 100m

Water Treatment
Varies depending on water quality, up to 0.3 kWh/m³

Wastewater Treatment
• Primary treatment 0.1 to 0.3 kWh/m³
• Secondary Treatment 0.27 to 0.59 kWh/m³

Transmission
0.04 kWh is needed to pump 1m³ of surface water a horizontal distance of 100km
Energy for Water: Treated Wastewater Reuse

Energy Demand of Water in the Arab Region

- Jordanian water sector accounts for ~15% of total annual electricity generated
- Saudi Arabia: Groundwater pumping accounts for 10% of total fuel consumption
- Libya: Groundwater pumping accounts for 14% of total fuel consumption
- Bahrain: 30% of total energy use is for desalination
Water for Energy: Hydropower

- On the Euphrates River Basin, 8,580MW installed capacity
- On the Nile River Basin, hydropower potential is ~20GW, only 26% is currently used.
Water for Energy (oil sector)

Extraction/Processing of fuels
- 16.7 to 46 litres of water per barrel of extracted oil
- 2.6 to 4 barrels of water to produce one barrel of oil from oil shale
- Processing requires 200 to 800 litres of water per ton of crude oil

Produced water
- Oman has highest water-oil ratio of between 6:1 and 10:1
- UAE has the lowest water-oil ratio of 0.35:1
Water and Energy for Food

Direct
- Irrigation (W+E)
- 80% of water withdrawal in Arab region used for irrigation with 50-60% efficiency in irrigation systems
- Harvesting (E)
- Processing (W+E)
- Transportation (E)
- Storage (E)
- Retailing (E)

Indirect
- Fertilizers (W+E)
- Pesticides (W)
- Energy embedded in global annual food loses can reach up to 38% of the total energy used in the entire food value chain.

Food for Water

Water quality
- Siltation
- Contamination
  - Pesticides
  - Fertilizers

Cover Crops

Mulching

Landscape management (runoff capture)
Climate change and the WEF security nexus

- ESCWA is coordinating the **Regional Initiative for the Assessment of the Impact of Climate Change on Water Resources and Socio-Economic Vulnerability in the Arab Region (RICCAR)** which is being implemented in partnership with the League of Arab States and 11 regional and international organization and three climate research institutes.

The effects of climate change do not hit a particular sector and country, but much rather **resonate across a wide spectrum.**

- Consistent warming trend with a general increase in the frequency of warms days and longer summer periods across the Arab region

- The WEF security nexus approach has the potential to effectively **harmonize** these interactions **across sectors and countries.**
Sustainable Energy in the Sustainable Development Agenda 2030
ESCWA Activities in Relevance to the SDG 7 & SE4All

**Implementation Approach**
- Intergovernmental Com. on Energy & WP 2016 - 2017
- Publications, reports, fact sheets, EGMs, ...
  - DA Projects (promoting RE investment in the Arab region,
  - building capacities in developing green technologies in rural areas...
  - Capacity building & knowledge sharing

**Energy Access & Energy Security**
- Policies, cleaner technologies, Market, for Conventional & Non-conventional energy resources
- Regional Interconnections
- Electricity Grids/Natural Gas Supply
- Water-Energy-Food Nexus

**Energy Efficiency (EE)**
- EE in key Sectors: Power, Transportation, Industry
- EE Standards & Specifications and indicators
- Regional Initiatives to Upscale EE in Arab Member Countries

**Renewable Energy (RE)**
- Support RE Development
- Technology/Policies/implementation Schemes, R&D
- Access to Energy Services in Rural Areas (improving living conditions)
- Regional cooperation/integration: Local Manufacturing, Market, R&D

**Climate Change Mitigation**

Program Mandated by ESCWA Committee on Energy & LAS Arab Ministerial Council for Electricity
THANK YOU