



Economic and Social Commission for Western Asia (ESCWA)**Report****Regional Capacity Building Workshop on “Water - Energy Nexus
Operational Toolkit: Technology Transfer”
Amman, Jordan, 30-31 October 2017****Summary**

The Regional capacity building Workshop on the Water-Energy Nexus Technology Transfer operational toolkit was convened by the United Nations Economic and Social Commission for Western Asia (ESCWA) in Amman, Jordan on 30 - 31 October 2017 to strengthen the capacity of ESCWA Member Countries to pursue the integrated and sustainable management of water and energy resources. The workshop was conducted within the framework of the United Nations Development Account project on Developing the Capacity of ESCWA Member Countries to Address the Water and Energy Nexus for Achieving Sustainable Development Goals.

The workshop was based on the water-energy nexus operational toolkit on Technology Transfer that aims at improving the technical capacity of government officials who manage or oversee the provision of water or energy services in ESCWA Member Countries and provide them with appropriate technological strategies in terms of efficiency and renewable energy that can be used to integrate water-energy nexus considerations into their operations, activities and projects.

The workshop focused on the principals of technology transfer (TT) and its legal and financial frameworks along with the gaps and challenges in the Arab region and ways to overcome them. TT was addressed through concrete case studies on resource efficiency and renewable energy which allowed participants to discuss the strengths, challenges and opportunities available in the region. Participants then broke out into three discussion groups that focused on promoting technology transfer in the Arab region, technology pathways and the financial barriers to technology transfer. The key conclusions from the discussion includes the need to formulate a comprehensive approach that targets the economic, social, commercial and technological aspects of technology transfer specific to each country by bringing together different stakeholders such as the public, private, academic and financial institutions and regulatory bodies.

Note: This document has been reproduced in the form in which it was received, without formal editing.

CONTENTS

<i>Chapter</i>	<i>Page</i>
I. INTRODUCTION.....	3
II. MAIN TOPICS OF DISCUSSION.....	3
A. Overview of Technology Transfer Principals and Mechanisms.....	3
B. Technology Transfer for Resource Efficiency.....	4
C. Technology Transfer for Renewable Energy	5
D. Technology Transfer in the Arab region – Challenges and Opportunities	6
 III ORGANIZATION OF WORK.....	 7
A. Venue and Date.....	7
B. Opening.....	7
C. Participants.....	7
D. Agenda.....	8
E. Evaluation.....	8
 Annex: List of Participants	 9

INTRODUCTION

The United Nations Economic and Social Commission for Western Asia (ESCWA) is implementing the United Nations Development Account (UNDA) project on Developing the Capacity of ESCWA Member Countries to Address the Water and Energy Nexus for Achieving Sustainable Development Goals. The Regional Capacity building workshop on the Water-Energy Operational Toolkit: Technology Transfer” is the third technical workshop organized within the framework of this project and was convened on 30-31 October 2017 in Amman, Jordan. The Final Regional Policy Workshop on the Water-Energy Nexus will be convened at the end of 2017 following the completion of country-level pilot projects, to present the outcomes of these projects.

This regional capacity workshop aimed to strengthen the capacity of government officials who manage or oversee the provision of water or energy services in ESCWA Member Countries to pursue the integrated and sustainable management of water and energy resources in the Arab Region in support of efforts to achieve sustainable development goals. The workshop set forth the following objectives:

- Present and discuss the water-energy nexus: Technology Transfer operational toolkit;
- Provide technology transfer insights, challenges and opportunities in the energy efficiency and renewable energy that can be beneficial to the water-energy nexus considerations;
- Address the possibility to use commercialized technologies available today, to improve water and energy security;
- Share the different TT experiences in different countries in order to help the Arab region move forward to meet its demand for water and energy needs, and implementing sustainable development plans,

Participants to the workshop were invited to participate in three different group sessions to discuss promoting technology transfer in the Arab region, technology pathways and financial barriers to technology transfer in the region. To have a more in depth look of the topics and materials covered during the workshop it is advised to check the website:

https://www.unescwa.org/sites/www.unescwa.org/files/publications/files/water-energy-nexus-technology-transfer-module-english_0.pdf

II. MAIN TOPICS OF DISCUSSIONS

Presentations and discussions are summarized in the following sections and are organized in accordance with the meeting agenda.

A. OVERVIEW OF TECHNOLOGY TRANSFER PRINCIPALS AND MECHANISMS

1. The first session introduced the water-energy nexus Technology Transfer (TT) operational toolkit and highlighted the important role of TT principles and mechanisms in providing a means through which the SDGs can be achieved.
2. The session also highlighted the different forms by which TT can take place, either vertically or horizontally, and through several pathways such as international trade, joint ventures, foreign direct investment and licensing of foreign technology. While actual options chosen must be unique for each country, collaboration is a must between entities in different countries and within the same country.
3. The currently observed TT trends in the Arab countries were presented during the session. For example, there is greater funding for Renewable Energy (RE) and resource efficiency related projects, increased research performed in local institutions on related RE technologies and resource efficiency topics and greater funding available to researchers abroad.

4. Technology Transfer via Joint Industry Projects (JIP) was also presented. JIP provides opportunities for sharing knowledge and technology transfer locally or across borders, especially for complex or costly projects such as offshore projects. The JIP setup process was elaborated on with an example on the oil companies partnering with renewable energy companies to power offshore oil and gas production.
5. Discussion addressed various issues including the role of formal and informal TT with informal in many cases being the seed for more formal TT. The need for clear selection criteria, indicators and standards for TT in the region were highlighted with the need to respect specificities of countries.

B. TECHNOLOGY TRANSFER FOR RESOURCE EFFICIENCY

6. In this session, the role of W-E nexus and resource efficiency was highlighted. Being a key driver for sustainable energy transition in the region, energy efficiency is the ability to successfully conserve water in energy production and vice versa. This can be implemented in a number of ways such as through the integration of water and energy efficient technologies during the planning stage.
7. Several case studies were presented. For example, the Turbine Modernization program between Germany and China that was implemented in 2004 with little R&D but which involved a wider dissemination of already proven technologies. China had many power plants using coal fired turbines, but most were older generation and needed significant improvement to enhance their efficiency. The technology transferred from Germany to several coal-fired power stations in China involved the modernization of the turbines which optimized the combustion process and led to increased efficiency in the use of coal and water. The change in the design of the power plants was minor and did not greatly affect its cost.
8. The regional MED-ENEC Project which aims to increase the use of energy efficiency measures and renewable energy technologies in the building sector was also presented. The project was funded by the European Union and implemented by ADEME and ECOFYS and lead by GIZ. The project was implemented in two phases. Phase 1 included a pilot of 10 low-energy-buildings to demonstrate technology transfer, best practices and an integrative approach for the efficient use of energy and the use of renewable energies in the building sector in the MENA region . The second phase included the know-how transfer (policy development, financing, business development, energy efficiency building codes...)
9. The case studies presented highlight how various entities can collaborate to facilitate the successful transfer of technology. However, local authorities must rely on due diligence to ensure the appropriate technological options are being chosen for their respective countries. Enhancing energy efficiency in the region requires the establishment of a clear energy efficiency policy with government support to push and pull the market; obtain adequate financial support, awareness and capacity increase for all stakeholders and participants, along with public-private partnerships and collaboration on the global and regional levels.
10. TT in nuclear energy throughout the Arab region was also discussed. The countries in the region are interested in developing nuclear power for their energy security, water desalination and the diversification of their energy mix in order to free up oil and gas volumes for export. So far, the UAE is the only Arab country which has proceeded with the construction of a Nuclear power plant. The UAE's fast leap in advancing its nuclear program was through its willingness to forgo the front end in cycle (mining – milling – conversion – enrichment – fuel fabrication) since its main focus was electricity generation. As a result, the UAE built the plant and then sought international help while building up its human capital.

11. On the other hand, Jordan and Egypt have advanced agreements with Russia to build Russian technology nuclear power plants through the Water-Water Energetic Reactor (VVER) technology while Saudi Arabia is in agreement with South Korea– though still at very early stages – to jointly develop a small nuclear reactor which can also be used for water desalination.
12. TT in nuclear is desirable but continues to face several challenges. The limitations of nuclear power’s technology transfer lies in its expensive costs, inadequate human, industrial and institution capacities, politics and suppliers’ policies. Export control remains a major barrier in nuclear TT. There are two required elements for effective TT in nuclear: the project should be large and the bilateral relations between the co-operating countries should be strong. The nuclear sector remains slow and is mature with little room for innovation and has stringent regulations.
13. A discussion took place to address nuclear energy in the region where it can provide un-interrupted energy supply vs. various sources of renewable energy which witness various and unexcepted intermittencies and require an alternative source of energy during these disruptions. However, some countries do not have the possibility to choose between the alternative sources of renewable and nuclear and would have to go with what’s available in their locations. Furthermore, the case of UAE’s nuclear energy was discussed. The UAE had signed the 123 agreements with the US which prohibits them from enriching uranium in return for using the technology so they chose not to embark in uranium enrichment or any of the fuel cycle as a trade-off to importing the South Korean technology. This highlights the UAE’s priority for generating electricity.

C. TECHNOLOGY TRANSFER FOR RENEWABLE ENERGY

14. In this session, the role of W-E nexus and renewable energy (RE) was highlighted with several case studies. RE can reduce water-intensity of the power sector, improve access to water, enhance reliability of the water supply, bridge the water gap in arid regions and replace traditional water heating.
15. The Masdar RE Desalination Pilot Program is a successful example of TT. The goal of the project is to develop seawater desalination technologies that are more energy efficient, can be powered by renewable energy sources, are cost competitive with non-renewable energy powered seawater desalination and are resilient in challenging seawater and environmental conditions. The project was implemented in collaboration with the Abu Dhabi governmental agencies in the water sector through four pilot plants – each having a different international partner – which will demonstrate different advanced and innovative desalination technologies. The promising results of the pilot projects have proven to be an important step in advancing desalination technology. A discussion also took place about the evaluation process for the proposals of the project. The proposals were evaluated by an in-house team of Masdar employees along with an external consultant and were based on two tracks (innovative technology and advanced technology) where the criteria under each was the same but had different weights.
16. The As-Samra waste water treatment plant was presented as a successful water-energy TT case study. The As-Samra plant is 80% self-sufficient relying on renewable energy from the biogas generated as part of the wastewater treatment process. TT has been assured through capacity building of local staff with these staff becoming experts that are called upon in the region. An important key to success has been the well-balanced relationship between the private and public sector which was based on a BOT framework. Another successful case study – Oman’s Solar EOR Pilot – was also presented concerning solar technology in enhanced oil recovery (EOR) in Oman’s oil and gas sector. The selection of the right technology allowed the pilot project to save almost 1 million m³ of natural gas within the first year.
17. The renewable energy potential in the MENA, along with its benefits in final energy consumption, and the opportunities for local RE manufacturing were also presented. The Arab’s RE market has

been growing with installed capacity expected to reach 107 GW by 2030. Since some of the parts of RE technology are not specific to a certain type of RE technology, then Arab countries could benefit from the local manufacturing of the less complex and more versatile components. There are already some components that are being manufactured locally in Algeria, Egypt, Lebanon and Tunisia. However, it is important to take into consideration the comparative advantages Arab countries have in locally developing these technologies in terms of financing, labour market, policies, incentives (such as market restructuring) and how these technologies are integrated into the whole economy. Moreover, there is a legal framework with several agreements and treaties that can facilitate the trade within the Arab region, yet trading activities are still limited.

18. A discussion also included Oman's blueprint on oil and gas which is being implemented by Petroleum Development Oman (PDO) and which not only focuses on local manufacturing but also on services, transfer of knowledge and upscaling across the whole value chain. This blueprint is being expanded to the energy and water sector as well and is a successful example of not only technology transfer but also transfer of services and components of the whole value chain. The possibility of re-using the treated waste water for potable use in Jordan was also discussed. However, the treated waste water cannot be considered for potable use, but instead can be used in the industrial, irrigation and possibly for cooling use in the planned nuclear power plant. As for trade within the Arab region, mutual trust is very important especially in technology transfer in the renewable energy.

D. TECHNOLOGY TRANSFER IN THE ARAB REGION – CHALLENGES AND OPPORTUNITIES

19. ESCWA's Technology Center in Jordan has been working on technology transfer in the Arab region for the past 7 years. The center's project for establishing a national innovation system for TT and development in Egypt, Lebanon, Mauritania, Morocco, Oman and Tunisia was also presented. The project's main goal is to enhance the potential of the respective countries to help them create an enabling environment for R&D and innovation based on the appropriate policies and establish a network of interlinkages between the different stakeholders. The national innovation system is created when the government, educational institutions, research centres, financial institutions and private sector interact together towards achieving a common goal. The outcome of this project is establishing an operational framework for the national innovation system and a local office in each of the respective countries for technology transfer.
20. However, challenges remain and are summarized in the following: uncompetitive economy and the consequent loss of potential human capital due to lack of job opportunities. One of the key reasons behind this phenomenon is the gap between the education system and the economic structure and labour markets and a deficiency in research and development promotional policies.
21. A discussion pursued on the important role the private sector can play in R&D and the challenges it still faces. The academic sector is doing a great job in R&D but the private companies in the Arab region still lag behind as it lacks sustainable incentives. The need to improve linkages between the private sector and the academia was raised as an important missing link in the region.
22. The workshop participants were separated into three working groups based on interest, sectorial and regional distribution to discuss various aspects of TT and provide recommendations for the way forward for TT in the region.
23. Group 1: Promoting Technology Transfer (TT) in the Arab Countries- Main outcomes: There should be an established centralized, credible and powerful entity that can drive and promote TT in the Arab region. This entity should be responsible for legislations, regulations, governance, planning and studying the value chain across the whole technology and its competitive advantage, strategic goals and well-established targets. However, several challenges still persist and lie in the current bureaucratic system, the lack of political stability, unclear or unfavourable terms of

references for some tenders and the lack of integration, funds, incentives, links between institutions and clear designated focal points within the different entities. To overcome these challenges, there should be a national strategy with a clear-cut sense of direction on technology creation. The strategy should highlight the different roles, responsibilities and incentives of the government, the industries and technical research pool. There should also be continuous and sustainable funding. The government should also change its current behaviour as a regulator to become a more active partner and integrator in TT. Key Performance Indicators (KPIs) should also be adopted as a way to measure and evaluate the success of TT.

24. Group 2: Financial Barriers to Technology Transfer (TT) in the Arab Countries-Main Outcomes: There should be a collaborative effort between the public and private sectors to finance TT in the Arab region. The public sector lacks the necessary technical expertise and flexibility in decision making that the private sector has. Collaboration between the two sectors is the ideal way to promote TT projects; however, due to the different nature of each – where the private sector’s priority is profit seeking while that of the public is providing services to its citizens – there should be a designated framework that guides this collaboration. This collaboration will create better quality services to the public and more job and TT opportunities to the public and private entities. Build-operate-transfer has been the norm of joint public and private collaboration in most of the Arab countries for both the energy and water sectors; this method safeguards each of the sectors’ interests but still requires the appropriate legislations that regulate this partnership.
25. Group 3: Pathways for Technology Transfer- Main outcomes: Different case studies were observed in TT in water desalination projects in Egypt, Tunisia, Jordan and Mauritania. As a result, the following points were deduced for effective TT: 1) there should be partnerships between the international investing companies and the research centres; 2) there should be incentives for using TT in renewable energy for water pumping in the region; 3) international investing firms should provide training for the local employees to enhance local capacity building and the sustainable use of the technology; 4) there should be legislations and regulations that facilitate the TT in neighbouring countries, at lower costs, that have successfully implemented TT in water-energy nexus projects; 5) small and large enterprises should also partner with the universities to develop in-country value and identify the gaps in technology needs in the energy sector.

ORGANIZATION OF WORK

A. VENUE AND DATE

26. The Regional Capacity Building Workshop on “Water - Energy Nexus Operational Toolkit: Technology Transfer was organized on 30-31 October 2017 in Amman, Jordan.

B. OPENING

27. The meeting was formally opened by Ms. Radia Sedaoui, Chief of the Energy Section, Sustainable Development Policies Division, ESCWA. The project background was presented including its two policy and operational tracks. Then the workshop objective and agenda were outlined.

C. PARTICIPANTS

28. The workshop was attended by 48 participants and gathered members of the representatives. Stakeholders representing water and energy ministries as well as experts from the water and energy sectors representing different private, governmental, research and academic institutions also contributed to the deliberations and enriched discussion and exchange of ideas.

D. AGENDA

29. Presentations and discussions were made over Four sessions. The agenda of the meeting is summarized below:

- Opening session and introduction
- Overview of Technology Transfer Principals and Mechanisms
- Technology Transfer for Resource Efficiency
- Technology Transfer for Resource Efficiency: Case Studies
- Technology Transfer for Renewable Energy
- Technology Transfer in the Arab region – Challenges and Opportunities
- Brainstorming Discussion: Breakout Workgroup Sessions
- Closing session

E. EVALUATION

30. An evaluation questionnaire was distributed to participants to assess the relevance, effectiveness and impact of the meeting. The feedback received from 45 participants was positive with most of the participants rating the overall quality of the meeting as excellent (53.3%) and good (44.4%); only 2% rated the quality as fair. Most of the participants found that the meeting achieved its objectives (36.4% rated it as excellent and 56.8% as good) while 6.8% thought it had fairly met them. The majority thought that the objectives of the workshop were clear with 51.1% rating it as excellent and 44.4% as good with only 4.4% as fair.
31. Almost 75% of the participants agreed on the necessity of having follow up actions that included the following: evaluating the local status of each country to see what is applicable specifically for each one; organizing follow up workshops in the future; providing information exchange with the specialized countries in the nexus field (specially the GCC); providing legal framework for workshops for TT to improve the countries' capacity in water-energy nexus and learning from other countries' success stories in TT and looking into establishing partnerships.
32. When asked about the quality of the presentations, almost 49% rated them as excellent while 42% rated them as good and 9% as fair. Also, 36% rated the panel contributions as excellent, 45% as good and 18% as fair. More than half of the participants found that the workshop did contribute to building relations with stakeholders from outside their respective countries with 40% rating as excellent and 47% as good while 13% as fair.
33. Members of the workshop also suggested organizing future workshops to enhance the connection between the ESCWA member states to follow up on this matter and other topics; developing joint ventures between the ESCWA member countries; allowing the participants to build relations and talk to each other during the meeting by providing more time between sessions and during breakout sessions; asking each country participant to give key points on national experiences and relying more on international statistics and information to provide more precise and sophisticated studies and results. There was also a request from Sudan's representative to develop such workshops in their country to provide support., since they have many initiative projects in RE.

ANNEX

LIST OF PARTICIPANTS

UN MEMBER STATES

Republic of Egypt

Mr. Mostafa Hasaneen

Senior Engineer
Energy Efficiency and Climate Change
Department
Ministry of Electricity and Renewable Energy
Cairo, Egypt
Tel: +2 02 22616523
Mob: +2 01007427646
E-mail: mostafahasaneen@live.com

Mr. Amr Fawzy Mahmoud Ali

Director
Minister's Office for Nile Water
Ministry of Water Resources and Irrigation
Cairo, Egypt
Tel: +202 35449505
Mob: +2010 05645423
E-mail: amrfma@hotmail.com;
amrfawzy@mwi.gov.eg

Ms. Rabab Gaber Abbas

Deputy Director
Water Uses Department
Ministry of Water Resources and Irrigation
Cairo, Egypt
Tel: +202 35449492
Mob: +201 141574018 - 201 005076783
E-mail: rabab1403@hotmail.com

Mr. Ahmed Awaise

Sector Head
Studies and Development of the Stations
Nuclear Power Plants Authority
Cairo, Egypt
Mob: +202 27627149
E-mail: awaisennpp@yahoo.com

Republic of Iraq

Mr. Laith Shakir

Senior Chief Engineer
Iraqi Ministry of Electricity
Baghdad, Iraq
Tel: +964 7901707637
Mob: +964 7901707637
E-mail: 32_regulatory@moelc.gov.iq

Hashemite Kingdom of Jordan

Mr. Ali Subah

Secretary General Assistant
Strategic Planning
Ministry of Water and Irrigation
Amman, Jordan
Mob: +962 775690020
E-mail: ali_subah@mwi.gov.jo

Mr. Khaleel Alkhateeb

Head
Natural Gas Studies
Ministry of Energy and Mineral Resources
Amman, Jordan
Tel: +962 65803060
Mob: +962 780300957
E-mail: khaleelk@memr.gov.jo

Mr. Raed Saleh

Mechanical Engineer
Ministry of Energy and Mineral Resources
Amman, Jordan
Tel: +962 65865715
Mob: +962 7625406
E-mail: raid.daoud@memr.gov.jo

Mr. Wael Elayyan

Head- Financing and International Cooperation
Directorate
Ministry of Water and Irrigation
Irbid, Jordan
Tel: +962 798060574
Mob: +962 798060574
E-mail: wael_elayyan@mwi.gov.jo

Mr. Mohd Aldwairi
Project Management Engineer
Head
Investment Department
Ministry of Water and Irrigation
Irbid, Jordan
Mob: +962 775744046
E-mail: mohammad_aldwairi@mwi.gov.jo

Republic of Lebanon

Ms. Mona Fakih
Director of Water
Ministry of Energy and Water
Beirut, Lebanon
Tel: +961 1 565097
Mob: +961 3 763936
E-mail: monafakih@hotmail.com

Mr. Fadi Bou Khzam
Manager
Hydropower Plant
Electricity of Lebanon (EDL)
Beirut, Lebanon
Tel: +961 1 448993
Mob: +961 3 220872
E-mail: fadi_b_k@hotmail.com

Libya

Mr. Abdulrahman Daw
Director
Office of Thermal Conversions
Executive Board of Renewable Energies
Tripoli, Libya
Tel: +218 213408602
Mob: +218 925030841
E-mail: altliss41@gmail.com

Mr. Mohamed Sidon
Director
Chairman's Office
Renewable Energy Authority of Libya (REAOL)
Tripoli, Libya
Tel: +218 923800220
Mob: +218 923800220
E-mail: mohamed_sidon@hotmail.com

Islamic Republic of Mauritania
Mr. Weddady Ahmed
Director
Sanitation
Ministry of Hydraulics and Sanitation
Nouakchott, Mauritania
Tel: +222 46533030
Mob: +222 26533030
E-mail: ahmedwd62@gmail.com

Mr. Mohamed Bâ
Deputy Director
Exploration and Production of Hydrocarbons
Ministry of Petroleum, Energy and Mines
Nouakchott, Mauritania
Mob: +222 36 31 29 16
E-mail: seyidiba@yahoo.fr

Mr. El Moustapha Hamoudy Hdaya
Chief of Service
Rural Hydrology
Ministry of Hydraulics and Sanitation
Nouakchott, Mauritania
Tel: +222 22139220
Mob: +222 33492226
E-mail: moustaphahamoudy@yahoo.fr

Ms. Vatimetou Sidi Elemine
Head
Rural Electrification Division
Ministry of Petroleum, Energy and Mines
Nouakchott, Mauritania
Mob: +222 22667868
E-mail: houdadah@hotmail.com

Mr. Sidi Aly Sidina
Inspector of Electricity
General Inspectorate
Ministry of Petroleum, Energy and Mines
Nouakchott, Mauritania
Mob: +222 20169696
E-mail: sidyali@yahoo.fr

Sultanate of Oman

Mr. Mahmood Alazri

Director
Water Resources
Dohfar Governorate
Muscat, Oman
Tel: +968 23226065
Mob: +968 99410600
E-mail: mmsalazrii@gmail.com

State of Palestine

Mr. Majdi Yahia

Manager
Distribution and Energy Production Department
Palestinian Energy and Natural Resources
Authority
Ramallah, Palestine
Tel: +972 04 2430042
Mob: +972 05 62002416
E-mail: majdi-sheikh@hotmail.com

Ms. Hanadi Bader

Head of Microbiology Lab
Gender Specialist
Palestinian Water Authority
Ramallah, Palestine
Mob: +970 598645967
E-mail: hanadibader@yahoo.com

Mr. Fadi Abdalgani

Manager
North Area
Palestinian Water Authority
Jerusalem, Palestine
Mob: +972 599358910
E-mail: fadi_abdelghani@yahoo.com

State of Qatar

Ms. Mona Alnaemi

Expert in Economics
Energy Affairs
Doha, Qatar
Mob: +974 33383160
E-mail: mm_alnaemi@qp.com.qa

Republic of Sudan

Ms. Farhien Ghanem

Director
Water Organizations
Ministry of Water Resources, Irrigation and
Electricity
Khartoum, Sudan
Tel: +249 183771951
Mob: +249 918041813
E-mail: farhienghanem@yahoo.com

Mr. Salih Omer

Director
Nile Water Directorate
Ministry of Water Resources, Irrigation and
Electricity
Khartoum, Sudan
Tel: +249 183772409
Mob: +249 912671468
E-mail: shhomer@gmail.com

Mr. Eltayeb Ismail

Manager
Directorate of Electrical Planning
Ministry of Water Resources, Irrigation and
Electricity
Khartoum, Sudan
Tel: +249 123275379
Mob: +249 912845626
E-mail: eltayebdafalla1980@gmail.com

Ms. Muna Ahmed

Manager
Agricultural Technology Transfer Society
Khartoum, Sudan
Tel: +249 183270440
Mob: +249 912149607
E-mail: munamm789@yahoo.com

Republic of Tunisia

Ms. Tiba Haggui

Chief Engineer
Head Office of Water Resources
Ministry of Agriculture, Water Resources and
Fisheries
Tunis, Tunisia
Tel: +216 71560000
Mob: +216 97614397
E-mail: hagguitiba44@gmail.com

Mr. Hassen Marzouki
Head
Energy Efficiency Section
Tunisian Electricity and Gas Company
Tunis, Tunisia
Tel: +216 23 788399
E-mail: hmarzouki@steg.com.tn

United Arab Emirates

Mr. Omar Alblooshi
Deputy Director of Procurement & Contracts
Directorate
Abu Dhabi Water and Electricity Company
Al Ain, United Arab Emirates
Mob: +971 2627996
E-mail: omar@adwec.ae

Mr. Faisal Al Sarkal
Director of Stations
Sharjah Electricity and Water Authority
Sharjah, United Arab Emirates
Tel: +971 506260888
E-mail: faisal.alsarkal@sewa.gov.ae

Mr. Mohamed Yaacoub
Assistant Engineer
Sharjah Electricity and Water Authority
Sharjah, United Arab Emirates
Tel: +971 507979112
E-mail: obaidy.wtr@sewa.gov.ae

EXPERTS

Mr. Hazem Abdalla
General Manager
Samra Wastewater Treatment Plant Co.
Amman, Jordan
Tel: +962 05 3901230
Mob: +962 777427220
E-mail: hazem.abdalla@samra.com.jo

Mr. Ali Ahmad
Director- Program on Energy Policy and
Security in the Middle East
Issam Fares Institute for Public Policy and
International Affairs
American University of Beirut
Beirut, Lebanon
Mob: +961 81 742375
E-mail: aa264@aub.edu.lb

Ms. Yosra Albakkar
Regional Programme Manager
MENA Unit, Sida
Embassy of Sweden
Amman, Jordan
Sweden
Mob: +962 797305159
E-mail: yosra.albakkar@gov.se

Mr. Ahmed Al Busaidi
Director
Renewable Energy Program
The Research Council
Muscat, Oman
Mob: +968 22305406
E-mail: ahmed.albusaidi@trc.gov.om

Mr. Abdullah Sulaiman Al-Abri
Technical Lead
Petroleum Development Oman
Al-Hamra, Oman
Mob: +968 24672356
E-mail: abdullah.s.abri@pdo.co.om

Mr. Mohammed Aljafari
Managing Director
Intellectual Property Commercialization Office
Royal Scientific Society
Amman, Jordan
Tel: +962 7 9640 1245
E-mail: ceo@copiatec.com

Mr. Patrick Bachelery
General Manager
Samra Plant O&M Co.
Amman, Jordan
Mob: +962 77 7641116
E-mail: patrick.bachelery@samra.com.jo

Ms. Syham Bentouati
Managing Director
NAFAS International LLC
Muscat, Oman
Mob: +968 99626621
E-mail: syham@nafasinternational.com

Ms. Fouzia Hannour
Strategy Lead
Energy and Environment
Qatar Foundation for Research and
Development
Doha, Qatar
Tel: +974 4454 5879
Mob: +974 55082928
E-mail: fhannour@qf.org.qa

Mr. Hassan Khrisat
Head
Water Resources and Environment
Water Authority of Jordan
Amman, Jordan
Tel: +962 799813285
Mob: +962 776767202
E-mail: hassankhrisat@yahoo.com

Mr. Taoufik Laâbi
Expert in Energy
Casablanca, Morocco
Tel: +212 661199710
E-mail: laabitaoufik3@gmail.com

Ms. Kaouther Lahidheb
Senior Specialist
Energy Efficiency
Econoler
Tunis, Tunisia
Tel: +1 418 692 2592 (4330)
Mob: +216 98664984
E-mail: klihidheb@gmail.com;
klihidheb@econoler.com

Mr. Sa'd Shannak
Researcher
King Abdullah Petroleum Studies and Research
Center (KAPSARC)
Riyadh, Saudi Arabia
Tel: +966 11 290 3000
Mob: +966 11 290 3000
E-mail: saedshannak2002@gmail.com

ESCWA Consultant

Mr. Hassan Arafat
Professor
Masdar Institute of Science and Technology
Abu Dhabi, United Arab Emirates
Tel: +971 28109119
Mob: +971 50139923
E-mail: harafat@masdar.ac.ae

ESCWA

Ms. Radia Sedaoui
Chief
Energy Section
Sustainable Development Policies Section
Beirut, Lebanon
Tel: +961 1 978527
Fax: +961 1 981510/1/2
E-mail: sedaoui@un.org

Mr. Fouad Mrad
Executive Director
ESCWA Technology Center
Beirut, Lebanon
Tel: +961 1978541
E-mail: mrad@un.org

Mr. Ziad Khayat
First Economic Affairs Officer
Water Resources Section
Sustainable Development Policies Division
Beirut, Lebanon
Tel: +961 1978517
E-mail: khayat@un.org

Ms. Noha Ziade
Administrative Assistant
Energy Section
Sustainable Development Policies Division
Beirut, Lebanon
Tel: +961 1978530
E-mail: ziaden@un.org

Ms. Maya A. Mansour
Research Assistant
Energy Section
Sustainable Development Policies Division
Beirut, Lebanon
Tel: +961 1978529
E-mail: maya-antoine.mansour@un.org