The Water-Energy- Food (WEF) Nexus in the GCC and EU regions Challenges and Opportunities

Summary Report

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Webinar: The Water-Energy- Food (WEF) Nexus in the GCC and EU regions Challenges and opportunities

8 December 2020

Background

The Gulf countries are facing a rapid increase in the energy and water consumption due to the harsh climate conditions, high population growth and increase in industrial and agriculture activities.

In Europe, water availability is among the key constraints affecting the energy sector, which currently requires 74 billion m3/year of freshwater, like the water needs of agriculture. The decarbonisation of the energy system could reduce its water needs by 38 % by 2050, yet water availability will play an essential role on the way to climate neutrality by 2050.

Indeed, significant amounts of water are used for extracting and transforming energy as well as in agriculture for food production. Similarly, energy is used for extracting, collecting, pumping, transporting, treating and desalinating water. Moreover, the lack of coordination at national and regional levels and the required local skills on the WEF nexus framework threatens the sustainable development of national agendas.

This close interdependence between the water, energy and food sectors implies that their management should be addressed simultaneously, to increase energy efficiency in the water and agriculture sectors and reduce the water footprint in the energy and agriculture sectors. Equally important, the WEF nexus could help to create opportunities for entrepreneurship development, gender empowerment social inclusion based on Human right approach.

In this context, the EU-GCC Clean Energy Technology Network (EU GCC CETN) and the Gulf Cooperation Council Secretariat General (GCC SG) have organised an online event entitled "**The Water-Energy- Food (WEF) Nexus in the GCC and EU regions; Challenges and opportunities**" which took place on **8 December 2020** at 3:00 pm GST, 12:00 pm CET.

The online workshop aimed to achieve the following main objectives:

- Build a common understanding of the WEF nexus as a key driver for sustainable development and economic diversification.
- Exchange information on the initiatives that have been developed in the GCC and EU and inform about the lessons learnt and business models.
- Discuss opportunities for strengthening EU-GCC collaboration between national and regional initiatives in supporting the concrete implementation of the WEF nexus concept including capacity building, R&D and knowledge management initiatives as well as awareness raising.

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During the opening session, addresses were made by:

- **Mr. Frank Wouters**, Director, EU GCC Clean Energy Technology Network
- **Dr. Mohammed Al Rashidi**, Director of Electricity & Water Department and Acting Director of Energy at The Gulf Cooperation Council – Secretariat General
- **Patrick Illing**, Head of Trade and Economic Affairs, EU Delegation in Saudi Arabia.

During this session all acknowledged the importance and value of the Network in bringing together the two regions actors and highlighting collaboration opportunities in the field of the Water-Energy- Food Nexus which became a priority for the GCC region as well as for Europe and MENA region.

The opening session was followed by a panel discussion moderated **Dr. Mustapha Taoumi**, Key Expert, Clean Energy, EU GCC CETN.

The following speakers have contributed to the discussion with short introductory presentations as follows:

- **Prof. Waleed Khalil Al-Zubari**, Arabian Gulf University, Bahrain
  "The WEF Nexus Approach in the GCC Countries: Dynamics, Risks and Opportunities"
- **Dr. Faycal Bouraoui**, Scientific Officer, Joint Research Center of the European Commission, ISPRA, Italy
  "The Mediterranean Nexus: a regional assessment of water-energy-food-ecosystem interdependencies"
- **Prof. Mushtaque Ahmed**, Professor of the Department of Soils, Water and Agricultural Engineering of Sultan Qaboos University (SQU), Oman
  "Going Green on Desalination"
- **Dr. Nikos Dimitriou**, Senior Research Associate, Institute of Informatics and Telecommunications National Center for Scientific Research "Demokritos", Greece (10-12 min)
  "Internet of Things for Water-Energy-Food (WEF) sustainability"
- **Omar Saif**, Regional Advisor on Water-Energy-Food Nexus (Gulf Region), Embassy of the Kingdom of the Netherlands, Abu Dhabi, UAE (10-12 min)
  "**Designing a Sustainable Greenhouse for the Gulf Region using a WEF Nexus Approach"**

After the presentations' session, a Q&A session has been organised with the aim to answer the following questions:

- What are the barriers hampering the adoption of a cross-sectoral perspective for energy management?
- Which public policies (incentives, mechanisms such as taxes or subsidies and, administrative tools) could, and should be promoted to remove such barriers?
- What are the economic benefits for stakeholders and companies to adopt a cross-sectoral perspective to ensure energy security in the Arab region/GCC?
- Which issues should be addressed to improve energy governance and collaboration among stakeholders and between stakeholders and governments, to fully tap into the economic growth potentials of the MENA/GCC region?
- What is required Institutionally, Legislatively, Technically, Economically to implement the WEF Nexus in the MENA/GCC?

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- What are the most efficient technologies and methods for reducing energy consumption in the water and agriculture sectors and water consumption in the energy and agriculture sectors?
- What are the ways to promote Clean Energy Investments with a Nexus Approach?
- How can we measure sustainability co-benefits based on different levels of urban integration among water-energy-food systems and services?
- What are the available options towards Integrating Technologies and Infrastructure Systems?
- How IoT & big data could contribute to urban nexus metrics and smart cities?
- Any lessons could be learnt from covid-19 crisis to also associate health dimension to the nexus and evolve towards smart cities?

During the discussion, some key facts and recommendations have been highlighted by the speakers, among them we can cite:

- Bridge the WEF Nexus Knowledge Gap in the GCC countries to enhance science-policy interface
    a. Direct and intensify research on understanding the nexus in the region (quantifying, identifying critical interlinkages, trade-offs, and risks, synergies opportunities
    b. Establish a collaborative research network on characterizing WEF nexus
- Bridge Capacity Gap in WEF Nexus integrated management and planning to support decision making
    a. Establish capacity building programs on integrated WEF approaches for professionals and relevant stakeholders
    b. Development/adoption of dynamic simulation tools for WEF nexus planning and management
- Water quality modelling plays an important role in better understanding the magnitude and the impacts of anthropogenic activities and in providing evidence for policy making for implementing measures to mitigate water pollution.
- Environmental Concerns of Desalination: Focus should not only be on green desalination but reduce the demand through water conservation and reducing the dependence on desalination.
- Water-Energy-Food Sustainability & Smart Cities: The aim of using smart technologies and IoT is to:
    •Minimize waste of resources.
    •Use of ICT to improve quality of life, efficiency of urban operations/ services
    •Address the needs of present and future generations with respect to economic, social, environmental and cultural aspects.
- Evaporative cooling works exceptionally well in Gulf arid climates, producing high yields, however the choice between evaporative and mechanical cooling is a question of prioritizing power or water.
- For Semi-humid climates, a semi-closed system that combines evaporative cooling and mechanical cooling is most suitable
- For humid climates, a closed system that utilizes mechanical cooling is the only option for year-round production and high yields

In addition, some useful suggestions have emerged from the debate:

- Set up an institutional framework/local comity to better coordinate efforts between the multiple actors on the water, energy and food sectors.

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- Fossil fuel and water subsidies imply a host of economic, fiscal, social and environmental costs. Subsidies reduce the incentive to invest in new infrastructure, distort prices, and are encouraging over consummation/exploitation of natural resources. Phasing out these subsidies and aligning incentives across the three dimensions of the nexus is key to getting the appropriate levels of investment, innovation and resources.
- Encourage collaborative and focused applied R&D on the nexus by forming regional research teams & alliances to promote I and T transfer,
- Scale up, replicate and fund on-going projects related to the nexus including integrated seawater energy and agricultural system, renewable energy for wastewater treatment and reuse, and solar desalination,
- Support and provide incentives for strategic partnerships and cooperation between research centres and the private sector,
- Build capacity for policy makers and institutionalize regional knowledge management systems to share best practices on the water-energy-food nexus,
- Development of in-depth case studies focusing on nexus in local level and also regional and international level (exchange of experiences between the GCC and EU could be very useful),
- Strengthen scientific research to develop science-based models to evaluate and analyze policy settings scenarios for informing decision making,
- Intensive training programmes should be planned and executed to improve the skills of local engineers and technicians so they can design, build, operate and maintain smart and efficient water and energy projects. This would also help in localizing the technology which is much needed in that region in the field of renewable energies, desalination technologies, etc.
- Develop integrated models for scenario planning and decision making that can be used to inform national, environmental and industrial policies.

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