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## ECONOMIC AND SOCIAL COMMISSION FOR WESTERN ASIA

A workshop on “*Deployment of Carbon Capture, Use and Storage in the Arab region, Challenges and Opportunities*”, on the 19<sup>th</sup> February 2017, Manama, Bahrain

### INFORMATION NOTE

#### (1) Introduction

Efforts to limit rising atmospheric CO<sub>2</sub> concentrations while meeting increasing global energy demand can only be achieved by deploying a comprehensive portfolio of technologies that include alternative energy sources, energy efficient systems, and carbon capture, utilization and storage (CCUS) measures. In the Arab region, several challenges and opportunities still exist for deployment of the CCUS technologies. Therefore, various scientific, economic water energy nexus and societal aspects need to be addressed to ensure a successful utilization of these technologies.

In light of the above, and within the context of its work program, the United Nations Economic and Social Commission for Western Asia (ESCWA), in cooperation with the National Oil and Gas Authority in Bahrain under the patronage of HE the Minister of Oil, will organize a Workshop on “Deployment of Carbon Capture, Use and Storage in the Arab region, challenges and opportunities”, to be held on the 19<sup>th</sup> February 2017, Manama, Bahrain.

#### (2) Background

Global climate change is arguably the most challenging environmental issue the world will be facing in the future. Despite the adoption of alternative energy sources and energy efficient systems to reduce the rate of CO<sub>2</sub> emissions, the cumulative amount of CO<sub>2</sub> in the atmosphere needs to be reduced to limit the detrimental impacts of climate change.

To address this issue, Carbon capture, utilization and storage (CCUS), also referred to as carbon capture, utilization and sequestration is an important part of decarbonizing the global energy systems. It could account for 13% of the required reduction in greenhouse gas emissions by 2050 according to the International Energy agency (IEA)’s 2°C scenario and substantially more if this

goal is reduced to 1.5°C. Therefore, regardless of the deployment of clean and efficient energy solutions, CCUS technologies need to be implemented. CCS projects are already underway worldwide, but large-scale deployment will require us to reduce costs, develop viable market mechanisms and improve our understanding of geological storage capacity.

### **(3) Main Objectives**

The event targets to explore the challenges and the opportunities for wide-scale deployment of CCUS and examine the side effects of this technology for the Arab region in the context of international and regional environmental law and from the perspective of water-energy nexus.

### **(4) Scope**

Carbon capture, utilization and storage (CCUS), is a process that captures carbon dioxide emissions and either reuses or stores it so it will not enter the atmosphere. Carbon dioxide storage in geologic formations includes oil and gas reservoirs, unmineable coal seams and deep saline reservoirs - structures that have stored crude oil, natural gas, brine and carbon dioxide over millions of years. CCUS involves multiple aspects that need to be in sync for the successful removal or capture of CO<sub>2</sub> from the flue gas or the atmosphere, followed by utilization and storage.

To date, CCUS has been deployed by injecting CO<sub>2</sub> into petroleum reservoirs for enhanced oil recovery (CO<sub>2</sub>-EOR). While CCUS/CO<sub>2</sub>-EOR can make early contributions to reducing CO<sub>2</sub> emissions and raising revenue for first mover CCS demonstrations, the total scope is limited. For example, in the U.S., in the year 2013 alone, emissions were 6.7 billion tons of CO<sub>2</sub>. For comparison, total storage capacity using “next generation” CO<sub>2</sub>-EOR in the U.S. was estimated to be 45 billion tons of CO<sub>2</sub>, with less than half (20 billion) considered to be economic at an oil price of \$85/bbl, which would address the equivalent of three years of CO<sub>2</sub> emissions.

Furthermore, CCUS technology called enhanced water recovery (EWR) can be deployed in saline aquifers that are well distributed and close to CO<sub>2</sub> sources (e.g., power plants). EWR can be synergistically integrated with other emerging CCUS technologies that generate geothermal energy as well as provide grid-scale energy storage. By removing brine from a saline CO<sub>2</sub> storage reservoir, EWR can augment the development, operation, and performance of CCS, while producing large quantities of water. The EWR will also be discussed at the workshop to discuss how it can be used to help manage environmental and financial risks during the stages of CCS development

Creating value from Carbon Dioxide (CO<sub>2</sub>) and contributing to international efforts to reduce CO<sub>2</sub> emissions are the main reasons for undertaking CCS investment. High capital and operating costs, the lack of stable policy support or a clear business model, uncertainty around world storage capacity, in addition to absence of regulatory systems are the main challenges that should be considered today around the world. The event will highlight the most important issues, in terms of technology and knowledge, economic cost and benefits, national capacity, awareness, etc.

However, the nature and role of public acceptance in the development of legislations and regulations in the Gulf Cooperation Council (GCC) countries (GCC) is different, when compared to the European countries. For example, in the GCC, levels of public awareness and positivity towards key CCS processes such as pipeline transportation of high CO<sub>2</sub> pressure, injection and storage, may be assumed more favorable than those in the European region. This is mainly attributable to public confidence in the safety and robustness of existing similar practices in the oil and gas industry, such as high-pressure natural gas transportation and acid gas injection. Hence, we see that the drive for the GCC countries towards developing CCS projects has been largely attributed to the viable business case that can arise from implementing CO<sub>2</sub>-Enhanced Oil Recovery (CO<sub>2</sub>-EOR) and the ability of sustaining oil production by use of otherwise wasted CO<sub>2</sub>. Based on the above, CO<sub>2</sub> obtained from industrial sources is utilized as a useful commodity and this supports CO<sub>2</sub> emission reduction to the atmosphere.

This workshop will discuss the challenges and opportunities as well policy options and incentives for the large use of the CCUS within the Arab countries, In addition, capturing relevant insights into CCS development in the Arab countries, regional and international experiences will be included in order to contribute to create a regional platform for knowledge.

#### **(5) Participants**

The Event will bring together experts/executives/practitioners/Academia and policy makers' representatives from Arab and international entities to contribute to foster interactive discussion and interventions.

#### **(6) Date, Time and Venue**

The Event on “Accelerating the Deployment of Carbon Capture, Use and Storage” will take place on 19<sup>th</sup> February 2017, from 9:00 am to 17:00 (registration will be from 8:00 – 9:00 am), Manama, Bahrain. The relevant Agenda will be provided soon.

An Arabia / English interpretation will be available, meanwhile the relevant agenda will be sent to the participants soon.

#### **(7) Logistics**

Each participant shall undertake the preparation related to her/his participation, in terms of: (i) securing hotel reservation in the venue location, (ii) visa, and (iii) any other requirements for travelling to Bahrain.

Participants can obtain their visas to Bahrain from the Bahraini embassy in their respective countries. In case of needing an assistance to obtain the entry visa, ESCWA can provide the participant with a supporting letter, upon his request.

## **(8) Correspondences**

Correspondences and inquiries should be addressed to:

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