

2013 Report of the Arab Forum for Environment and Development

# ARAB ENVIRONMENT•6 SUSTAINABLE ENERGY

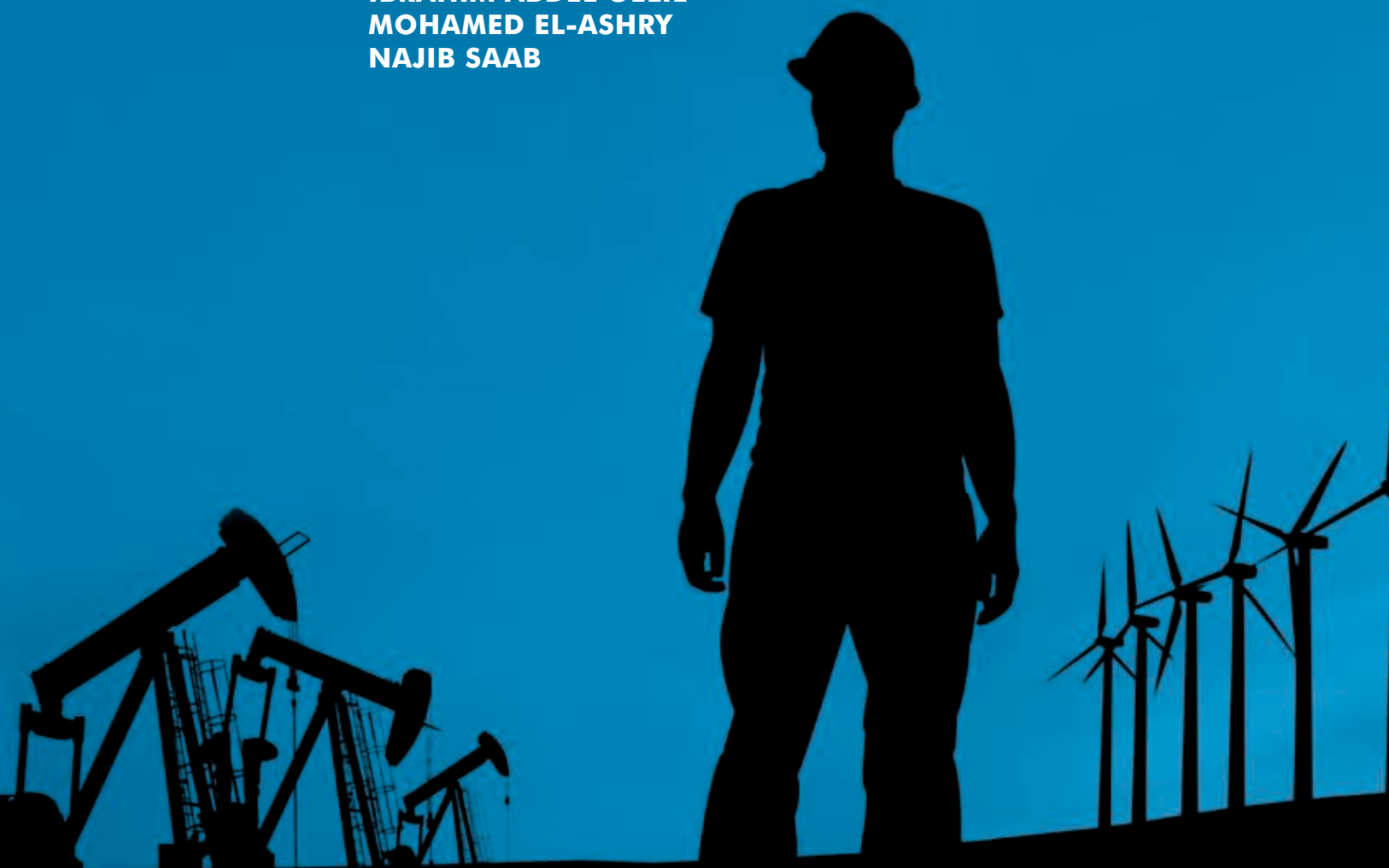
PROSPECTS, CHALLENGES, OPPORTUNITIES

EDITED BY:

**IBRAHIM ABDEL GELIL**

**MOHAMED EL-ASHRY**

**NAJIB SAAB**



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## Preface

*Sustainable Energy* is the sixth in the series of annual reports produced by the Arab Forum for Environment and Development (AFED) on the state of Arab environment. The report highlights the need for more efficient management of the energy sector, in view of enhancing its contribution to sustainable development in the Arab region.

The primary aim of the AFED annual reports is to foster the use of science in environmental policy and decision-making in Arab countries. This is a manifestation of AFED's mission to advocate prudent environmental policies and actions based on science and awareness. Since 2008, AFED has produced five reports in the series: *Arab Environment: Future Challenges* (2008), *Impact of Climate Change on Arab Countries* (2009), *Water: Sustainable Management of a Scarce Resource* (2010), *Green Economy: Sustainable Transition in a Changing Arab World* (2011), and *Survival Options: Ecological Footprint* (2012). AFED reports have gained a reputation as the most credible sources on environment issues in the Arab region, and have triggered policy transformations at the local, national and regional levels. AFED Annual Conference, during which the reports are presented and debated, is equally considered the major environmental gathering in the Arab region, attracting policy makers, business and industry leaders and academics.

The AFED 2013 report aims at: presenting a situational analysis of the current state of energy in the Arab region, shedding light on major challenges, discussing different policy options and, ultimately, recommending alternative courses of action to help facilitate the transition to a sustainable energy future.

To achieve its goals, the AFED 2013 report addresses the following issues: oil and beyond, natural gas as a transition fuel to cleaner energy, renewable energy prospects, the nuclear option, energy efficiency, the energy-water-food nexus, mitigation options of climate change, resilience of the energy sector to climate risk, and the role of the private sector in financing sustainable energy.

A group of leading authors has worked on the report. Drafts were discussed with international panels of experts during consultation meetings, held with the Arabian Gulf University (AGU) in Manama, the Environment Public Authority (EPA) in Kuwait and the Oxford Institute for Energy Studies (OIES) in Oxford, UK.

The AFED 2013 report found that although the Arab region's energy intensity and per capita carbon emissions are among the highest in the world, 35 million Arabs remain without access to modern energy services, mainly electricity. Unlike many parts of the world, however, the Arab region is well endowed with clean, renewable sources of energy, primarily sun and wind. Together with enhanced energy efficiency, these renewable sources can help diversify and power a more sustainable energy future.

Accounting for 36 percent of the region's total GDP, oil and gas continue to be the Arab world's most important natural resources, a status that is unlikely to change any time in the near future. However, more economic diversification is needed to reduce the region's heavy reliance on volatile oil revenues. Climate change concerns and expected reductions in emissions of global greenhouse gases would potentially lead to major shifts in global energy markets towards more efficient low carbon clean energy technologies and sources; Arab countries should be prepared to deal with the consequences.

At the domestic level, the surge in energy demand in response to the region's economic growth, population, and change in life style, does not need to lead to a surge in air pollution, including carbon emissions. Demand management and a radical shift to more efficient use of energy, producing more units of output for less units of energy input, are overdue. A recent study indicates that the Arab region can achieve reduction in energy consumption of 56 percent through the right investment in energy efficiency. It is well past time for the region to embrace the shift to cleaner and renewable energy, which would bring low-carbon economic opportunities, energy security, and a cleaner environment.

As the energy sector plays a major role in meeting water and food needs in Arab countries, from desalination to pumping groundwater, the AFED report places major importance on the energy-water-food nexus. Per capita consumption of fresh water in some arid Arab countries is among the highest in the world, and irrigation efficiency is one of the lowest, at an average of 40 percent. Shifting to efficient practices and renewable sources of energy provides viable options for securing sustainable supply of water and food production for decades to come.

The AFED 2013 report concludes that Arab countries can foster the sustainability of their energy sector by making crucial strategic choices, combining high economic potential with secure and balanced resource management. These choices include improving energy efficiency, exploiting the huge potential of untapped renewable energy resources, and harnessing oil and gas reserves in cleaner and more competent ways. Revenues from oil exports need to be utilized to build regional capacity in developing and acquiring clean and renewable energy technologies, including aggressively exploring carbon capture and storage (CCS).

AFED wishes to thank all those who made this report possible, especially our partners at the OPEC Fund for International Development (OFID), the Islamic Bank for Development (IDB), the Kuwait Foundation for the Advancement of Sciences (KFAS), Environment Agency-Abu Dhabi (EAD), and all corporate and media partners who supported this endeavor. Special thanks are due to the authors and experts who contributed to the contents and appraised the drafts.

It is hoped that AFED through this report can help Arab countries adopt long-term commitments and right policies and investments which would allow them to join the global clean energy club, exporting renewable energy in addition to oil and gas.

October 2013

**Najib Saab**  
*Secretary General*  
*Arab Forum for Environment and Development (AFED)*

## EXECUTIVE SUMMARY

# SUSTAINABLE ENERGY IN A CHANGING ARAB WORLD

## 2013 Report of the Arab Forum for Environment and Development (AFED)

Like in many parts of the world, energy systems in the Arab region, which are dominated by fossil fuels, are not sustainable in economic, environmental or social terms. Although energy intensity and per capita carbon emissions are among the highest in the world, 35 million Arab people are without access to modern energy services, mainly electricity. Unlike many parts of the world, however, the Arab region is well endowed with clean, renewable sources of energy, primarily sun and wind. Together with enhanced energy efficiency and cleaner technologies, those renewable sources can help diversify and power a more sustainable energy future. The 2013 annual report of the Arab Forum for Environment and Development (AFED) on Sustainable Energy in the Arab countries concludes that, with a long-term commitment and the right policies and investments, Arab countries could join the global clean energy club, creating high paying jobs and exporting renewable energy in addition to oil and gas.

The energy sector in the Arab countries plays a critical role in the region's socioeconomic development. Oil and gas revenues have been the major source of income in most of the Arab countries, especially in the Gulf region. According to the Arab Monetary Fund, the oil and gas sector makes up about 36 percent of the total Arab GDP. The share of hydrocarbon revenues in most Arab producers' export earnings ranges from 33 percent in the relatively diversified economy of the UAE to 88 percent in highly export-oriented economies such as Saudi Arabia and Qatar, and more than 97 percent in Algeria and Iraq. Over the past three decades the GCC countries, which are the major Arab oil exporters, have witnessed an unprecedented economic and social transformation. Oil proceeds have been used to modernize infrastructure, create employment, and improve human development indicators.

On the other hand, oil revenues have not been able to spur the kind of

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