



المنتدى العربي للبيئة والتنمية  
ARAB FORUM FOR  
ENVIRONMENT AND DEVELOPMENT



ARAB ENVIRONMENT 2013  
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# AFED 2013 Report

## Transition to Sustainable Energy and Climate Change Challenges in Arab Countries

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# Energy: Regional Contexts (1)

- **Fuels the global economy**
- **Hydrocarbons' revenues Play a vital role in Arab's development.**
- **Provides 98 % of the Arab's energy demand leading to high carbon footprint**
- **Meeting water and food needs.**
- **Huge potential of unutilized renewable energy**

## Energy: Regional Contexts (2)

- **Average Energy intensity is 53% higher than the world average**
- **Average Per capita consumption is below the world average**
- **Disparities between different countries (energy rich-energy poor)**
- **Youth group (15-34 years) 46 % of the Arab's Population, potential future demand pressure**
- **Vulnerability of oil producers to potential reduction in global oil demand due to climate response measures.**

## Energy: Regional Contexts (3)

- **Vulnerability of Arab economies to volatility of the global oil market.**
  - **High oil prices generate greater revenues for net exporters**
  - **High prices add additional stress on public budgets of importers.**

# The AFED 2013 report aims at:

- **Presenting the current state of energy in the Arab Region.**
- **Shedding light on major challenges.**
- **Discussing different sustainability options.**
- **Recommending courses of actions to facilitate energy transition**

# The 2013 Report: Facts and Figures

## 3 Editors & 13 Contributors

8  
Chapters

One  
Annex

19 Boxes

4  
Opinions

24  
Tables

21  
Figures

# Ch.1 : Arab Oil in the Global and Domestic Contexts.

- **Current trends of the Arab oil industry**
- **The role of Arab oil in the global market**
- **The role of oil in the socio-economic development of the region**
- **Consequences of shifting the global energy demand.**
- **Challenges facing Arab oil producers**

## Ch. 2: Natural Gas and Arab Energy Transition

- **Economic and environmental benefits of Natural Gas**
- **Policies of fuel switching to natural gas.**
- **The impacts of "shale gas" on Arab oil and gas industries**
- **Potential of regional energy integration through cross-border gas networks.**
- **Role of natural gas in transition to sustainable energy**



## Ch. 3: Renewable energy

- **Potential of renewable energy in the region**
- **Scaling up renewable energy technologies to:**
  - **eradicate energy poverty**
  - **decrease dependence on oil and gas**
  - **improve environmental quality and mitigate climate change.**
- **Challenges of scaling up RE**
- **The current RE Policy landscape**
- **Opportunities to develop RE market.**

## Ch.4: Nuclear Power Option

- **Future of nuclear power industry in the Arab region.**
- **An unbiased view of the pros and cons of NE within the regional contexts.**
- **Critical safety issues ( nuclear accidents, nuclear waste storage and decommissioning, resilience to natural hazards)**
- **Local technical capabilities to build, operate, and maintain nuclear power plants.**
- **Major energy security and dependency concerns (heavy reliance on foreign labor and foreign suppliers of fuel .**

## Ch.5: Energy efficiency

- **The current trends of energy efficiency**
- **Factors contributing to energy Inefficiency**
- **Historical traditions of energy subsidies.**
- **Challenges of improving energy efficiency**
- **Economic, social, and environmental benefits of EE**
- **How to develop the EE market in the region?**

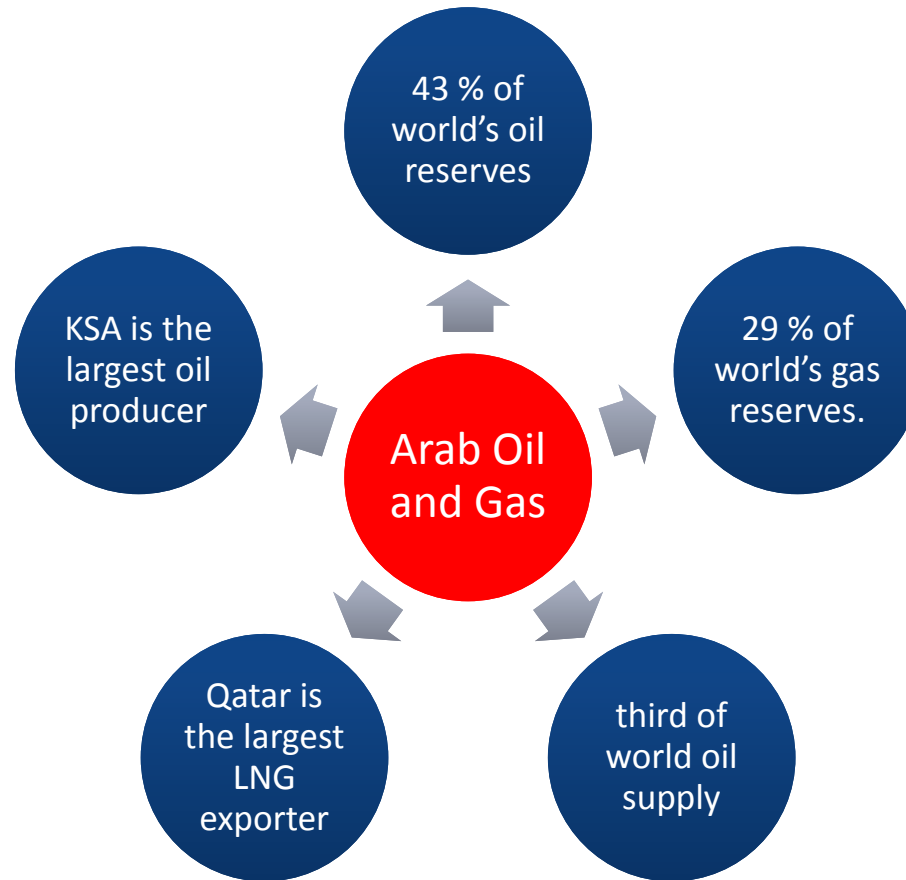
## Ch.6: Energy sector mitigation options of climate change

- **Economic, social, and environmental benefits of mitigation**
- **High potential for**
  - **improving EE**
  - **switching to RE and low carbon fuels and**
  - **reducing carbon emissions.**
- **Opportunities in different economic sectors emphasizing the no-regret options.**
- **Opportunities include fossil fuel power plants, energy intensive industries, and desalination.**
- **Carbon capture and storage offers a high capacity option in GCC**
- **Arab participation in the global carbon market.**

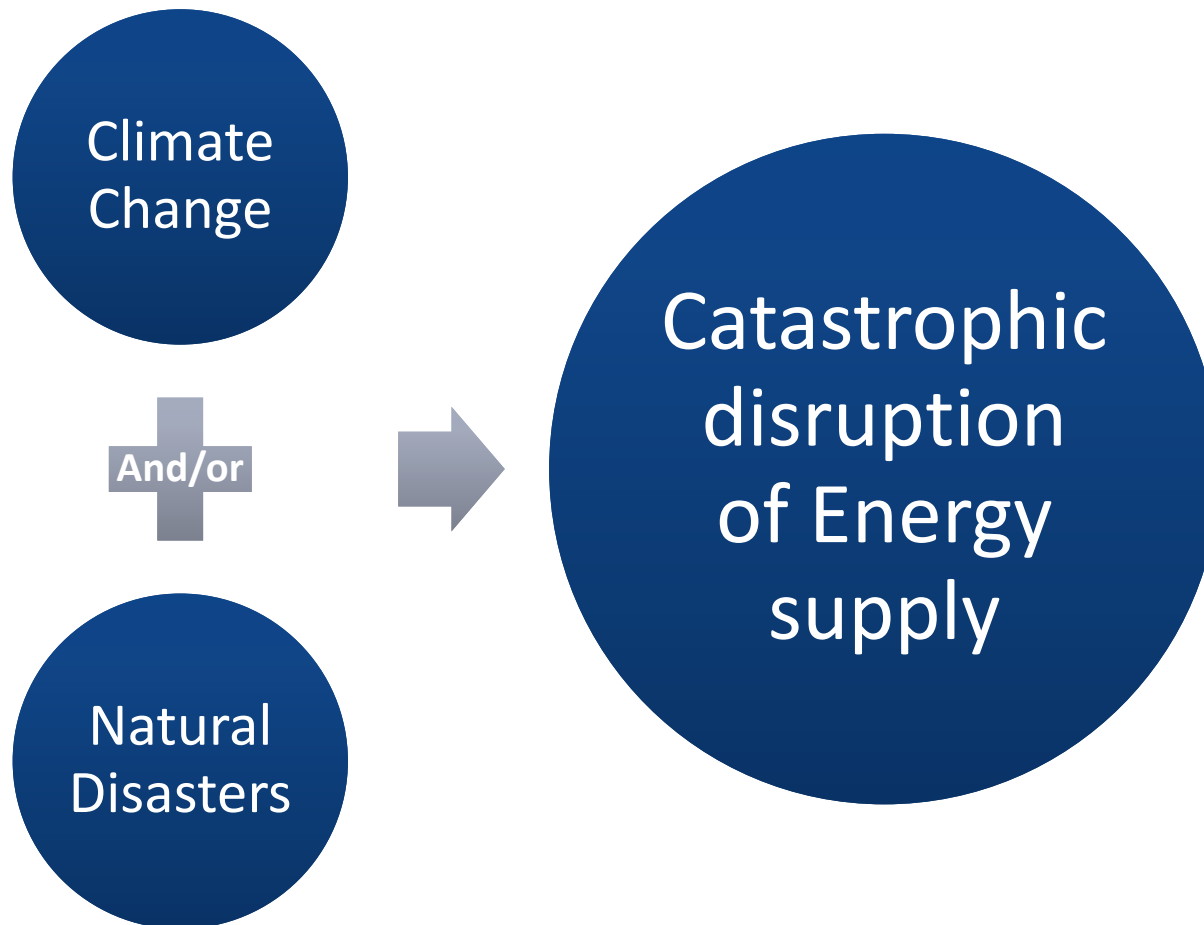
## Ch.7: The Need for Climate Resilient Energy Sector

- **Energy infrastructure must be resilient to climate change.**
- **Resiliency of Arab energy system to avoid potential catastrophic disruption of world's energy supply**
- **Assessing vulnerability of the energy system to climate change**
- **Identifying available adaptation options.**
- **The role of energy in community adaptation, particularly for the poor.**

# Arab oil and Gas are vital to Global Economy



# Impacts of Climate Risks



# Impacts of Climate Change on Energy Resources

## Oil and Gas resources

No Impacts

## Hydropower

Variations of water inflow to power plants

## Solar

Change in solar radiations

Change in temperature

Droughts

Sand storms

## Wind

variability of wind speed and direction

Shifts in spatial distribution of wind



# Impacts on Energy Supply Infrastructure

## Oil and Gas Production

Sea Level Rise

Offshore structures

## Oil Refining

Temperature Increase

Increase of cooling water demand

## Thermal Power Plants

Sea Level Rise

Water for cooling

Effects of temperature on efficiency

## Nuclear Power Plants

Natural disasters are unavoidable and generally unforeseeable.

Can cause nuclear disasters

Regional impacts

## Transmission and Distribution

Extreme weather events

T&D lines

Pipelines

Maritime transport

# Impacts on Energy Demand

## Temperature increase

Increase  
demand for  
A/C

Increase  
demand for  
cooling

Increase  
demand for  
desalination

# Adaptation Options

improving  
energy  
efficiency

diversifying  
energy supply

scaling up  
renewable  
energy

promoting  
regional  
energy  
integration to  
share energy  
resources  
during  
emergency  
situations

Mainstream  
adaptation  
assessment in  
EIA and SEA

proper siting  
of energy  
facilities  
away from  
vulnerable  
geographic  
areas

disaster  
preparedness  
planning and  
risk  
management.

## Ch.8: Financing energy supply: Role of the private sector

- **Required investments are much more than the available public funds.**
- **Role of private finance to complement public finance.**
- **Public Private Partnerships (PPPs)**
- **Challenges and barriers to PPPs**
- **The policy framework conducive to private investment in the region.**

## Annex: Water, energy, and food nexus in the Arab region

- **The region is energy rich and water poor.**
- **Energy and water are strongly linked.**
- **Population and economic growth drive pressure on water and energy resources.**
- **Global climate change would exacerbate water scarcity.**
- **interconnections between water, energy, food security and climate change.**
- **The need for policy coherence to address the nexus.**

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**Thank You**