



ST ANTONY'S COLLEGE  
UNIVERSITY OF OXFORD

# Climate Policy Perspectives and Energy Transitions in the Middle East and North Africa (MENA) Region: Setting the Scene

UNFCCC-ILO Event; MENA Climate Week- Dubai

## Dr. Manal Shehabi

Academic Visitor, St. Antony's College, University of Oxford  
Founding Director, SHEER Research & Advisory  
Senior Research Fellow, Oxford Institute for Energy Studies  
Research Associate, Economic Research Forum

**March 28, 2028**



# Citation & Disclaimer

## Suggested Citation:

Shehabi, M. (2022, March). *Climate Policy Perspectives and Energy Transitions in the Middle East and North Africa (MENA) Region: Setting the Scene*. UNFCCC-ILO Event; MENA Climate Week- Dubai, the UAE.

## Disclaimer:

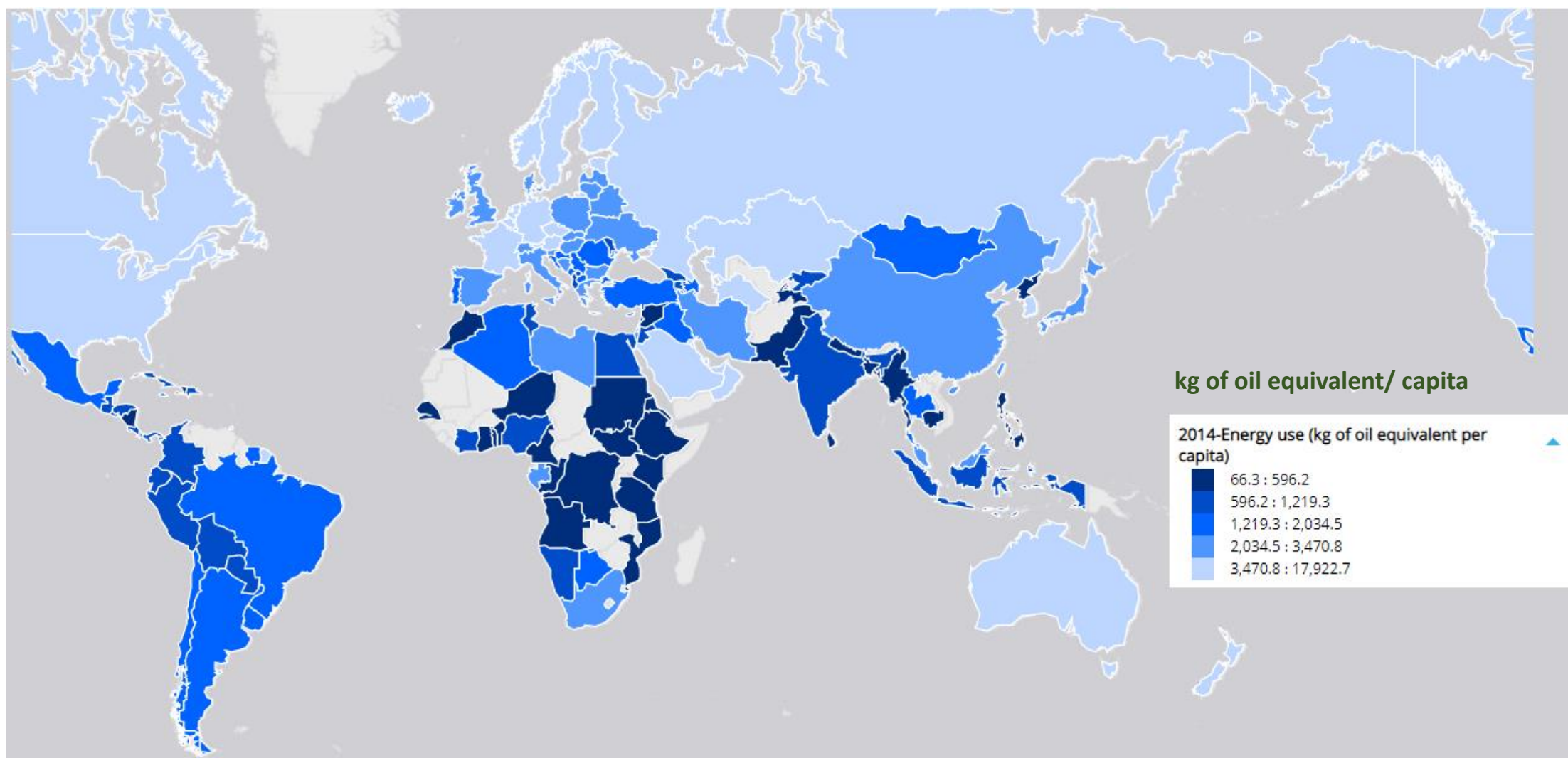
This contents of this presentation are the author's sole responsibility.



# I. Introduction: Energy in the MENA Region



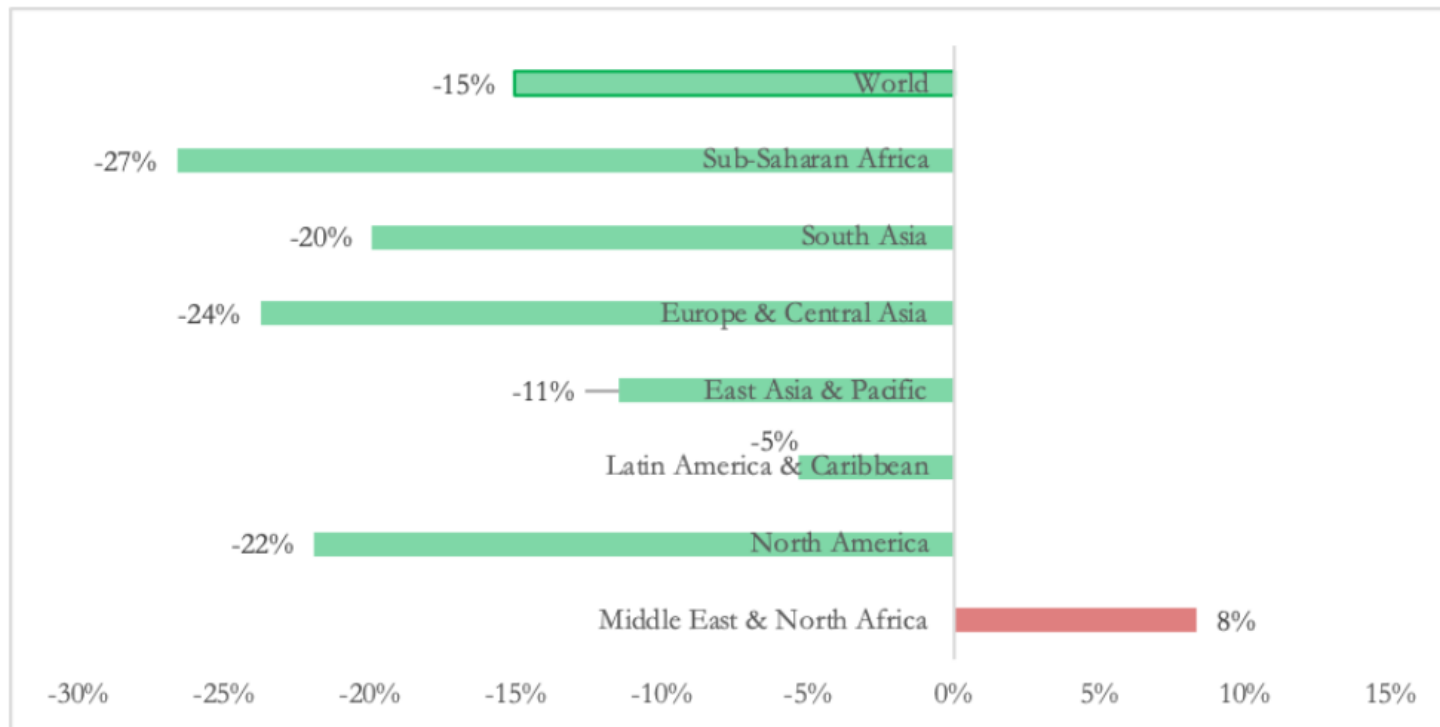
# High & Rising Domestic Consumption/Capita, Population Growth, & Energy Poverty



Source: World Bank data.



# Historic Change Domestic Consumption/\$1000 of GDP (2001-2018) and Rising with Population Growth



Source: Middle East Institute (2021); World Bank's World Development Indicators data.

**In MENA, over the past 4 decades:**

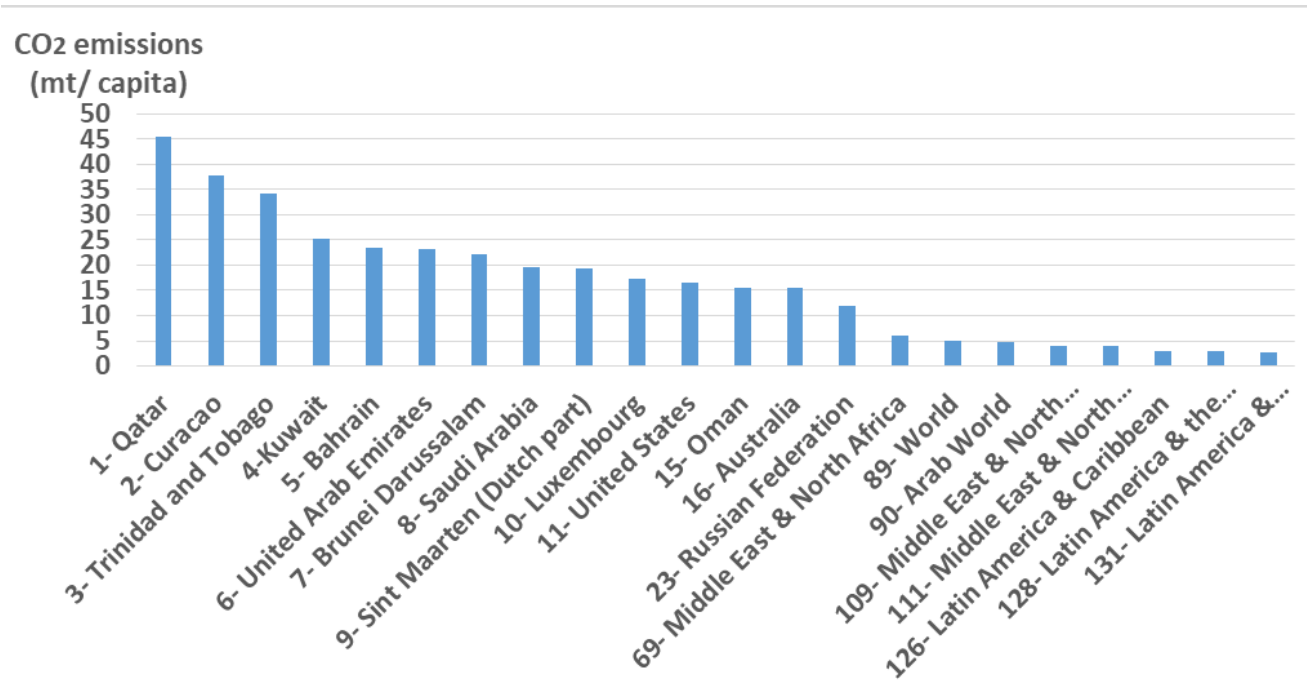
**Population grew by 150%**

**GDP grew by 220%**

**Electricity production grew by 600%**



# High & Rising Domestic Emissions/Capita & the Energy Mix



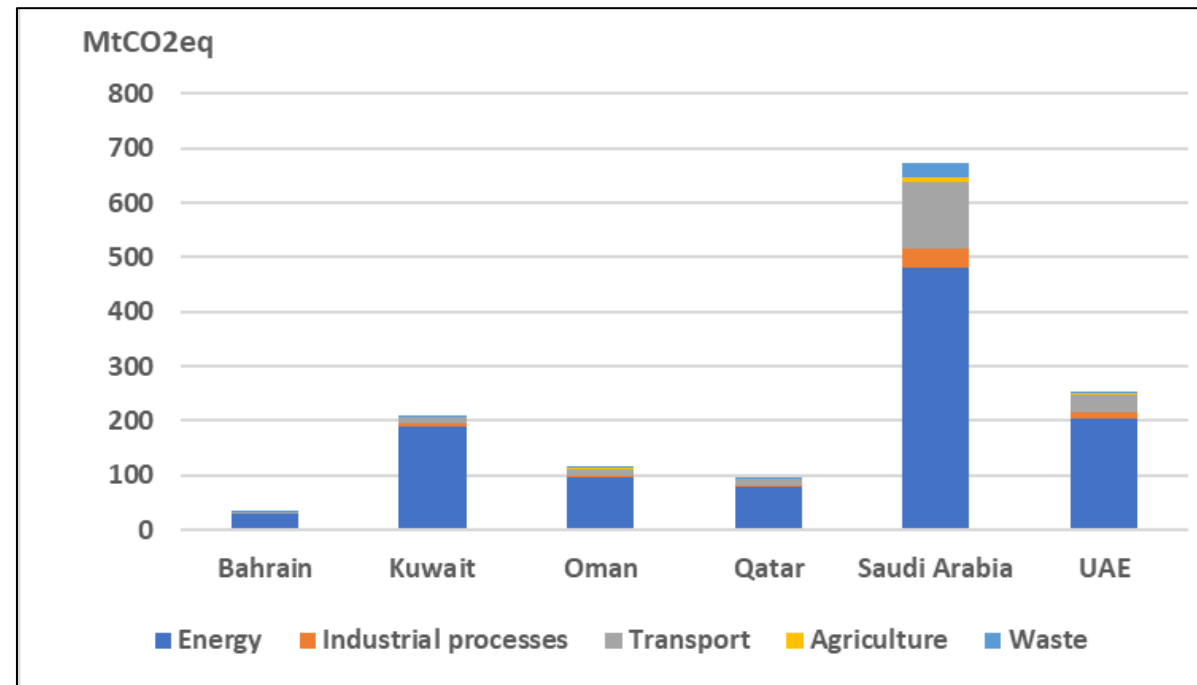
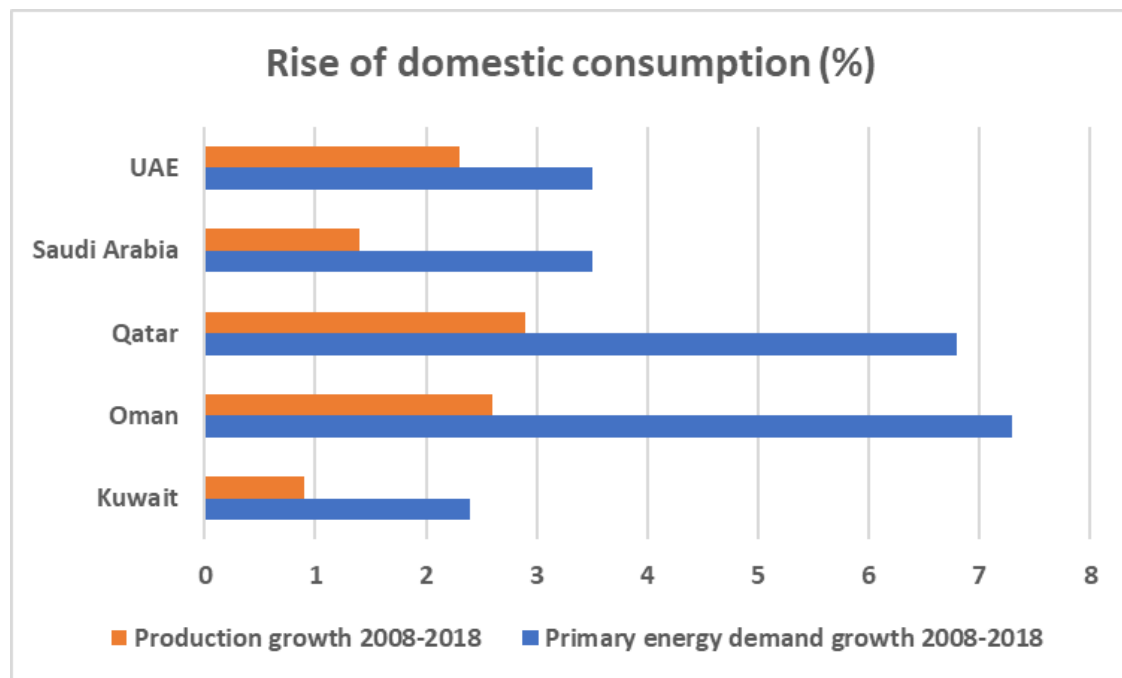
Source: Shehabi (2021) based on World Bank (2014), World Development Indicators.

- Over 90% of the region's energy mix is from Fossil Fuels
- Exceptions include:
  - Egypt
  - Jordan
  - Morocco
  - UAE
- MENA exports ~45% of oil globally & and ~25% of gas exports
- **Challenges of ensuring sufficient energy production that is economically and environmentally sustainable**



# Zoom in on Hydrocarbon Producing GCC States

With some of the highest economic dependence on oil and gas exports



Source: Shehabi (2021)

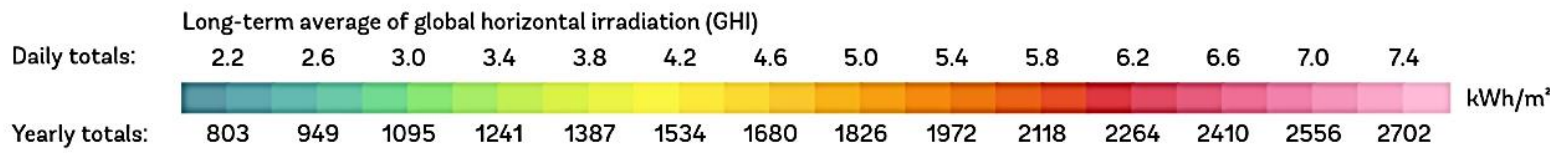
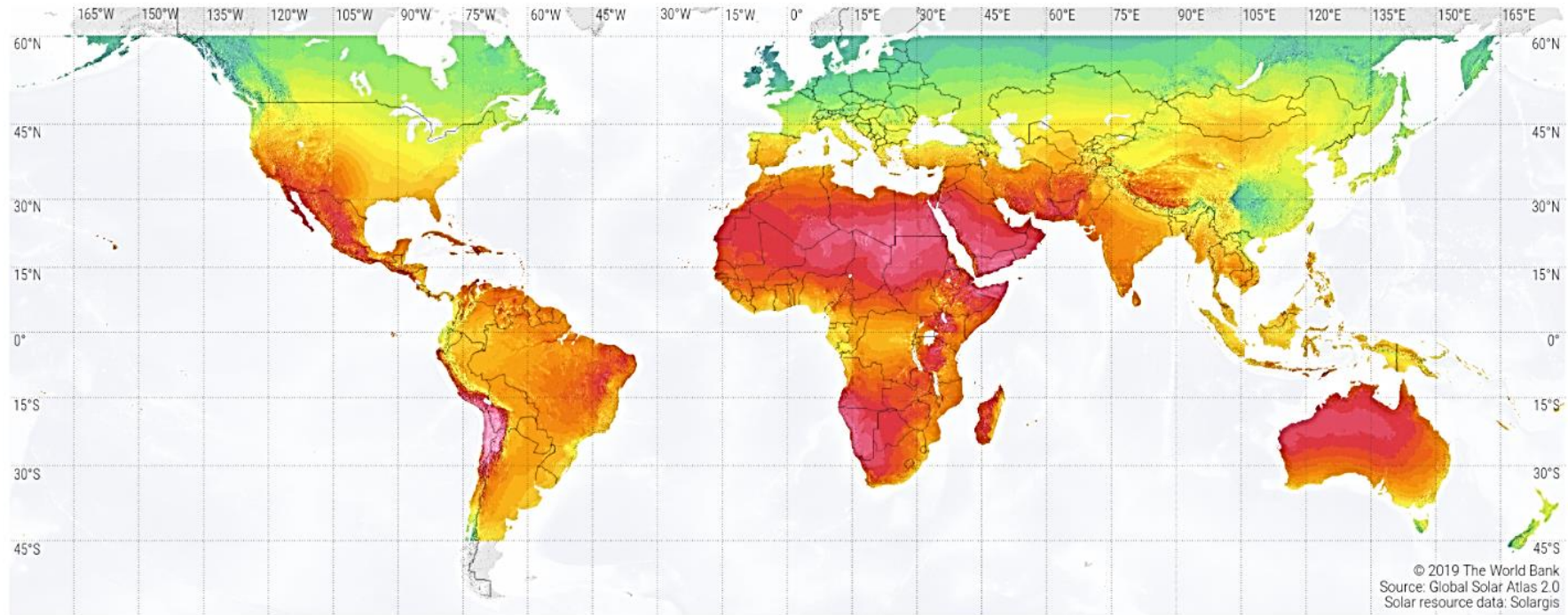
Note: MtCO2eq= Million tonnes of carbon dioxide equivalent.  
Source: Shehabi (2021). Author's representation based on data from the UNFCCC (2018).





# MENA Region at the Heart of the Global Energy Transitions with The World's Lowest Levelized Costs of Renewable Electricity

## Global normal irradiation map



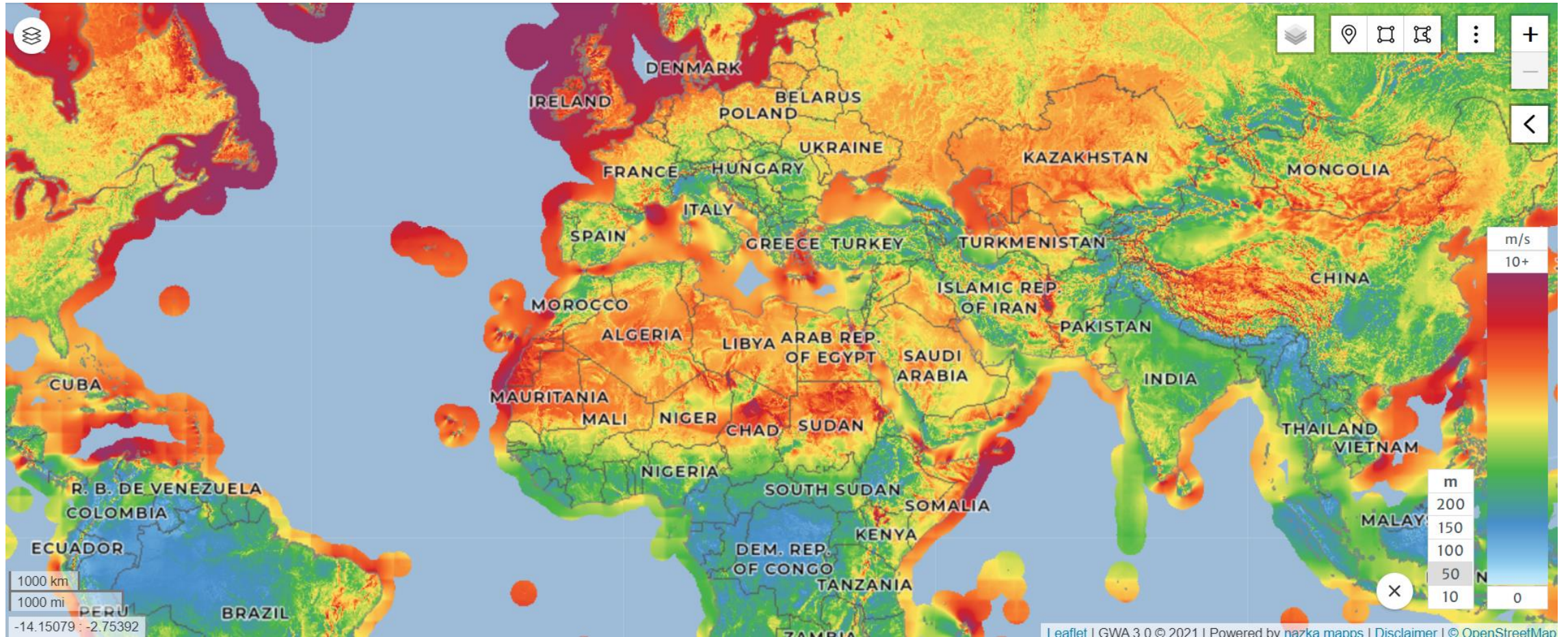
Source: World Bank (2019), Global Solar Atlas (n.d.).





# MENA Region at the Heart of the Global Energy Transitions with The World's Lowest Levelized Costs of Renewable Electricity

Mean wind speeds at heights of 50 meters



Source: Global Wind Atlas (2022)



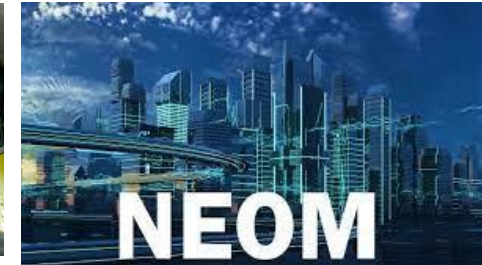
## II. State of Energy Transitions in MENA





# Energy Transitions in MENA Post COP26 & Preparing for COP27 Egypt and COP28 UAE

- Existing trends of development of large utility-scale renewable projects, with reducing costs and technology advancements
- **Net-Zero Producers Forum April 2021**, with Saudi Arabia & Qatar
- **Net zero pledges, October-November 2021**
  - UAE 2050
  - Turkey 2035
  - Saudi Arabia 2060; Green Deal
  - Bahrain 2060
- Intended Nationally Determined Contribution (INDC) submissions
  - Basis for cutting GHGs is the **diversification of the domestic economy** and **enhancing carbon capture mechanisms**, whilst continuing or increasing current levels of oil exports.
- Climate finance & \$100billion pledge- uncertain
- **Trajectory in MENA post COP26:** Ongoing impacts from global climate change, adaptation and response measures
- **Both domestic and external dynamics**





# Historically Slow but Accelerating Renewable Energy in MENA: Variations Across Hydrocarbon Exporters & Importers

## Installed renewable energy capacity compared with national targets in hydrocarbon exporters

Update to graph: UAE at 7% by 2021;

Country	PV (MW)	CSP (MW)	Wind (MW)	biomass and waste (MW)	Total RE (MW)	share of RE in total electricity capacity (%)	National RE targets
Bahrain	5	0	1	0	6	0.1%	5% by 2025 and 10% by 2035 of electricity generation
Kuwait	19	50	10	0	79	0.4%	15% by 2030 of electricity generation
Qatar	8	0	0	0	8	0.1%	200-500 MW of solar by 2020
Oman	5	0	0	38	43	0.4%	10% by 2025 of electricity generation
Saudi Arabia	89	50	3	0	142	0.2%	3.45GW by 2020; 9.56GW by 2023 (10% of cap), and 30% of electricity generation from renewables, nuclear, and others
UAE	487	100	1	1	589	2.0%	Abu Dhabi 7% of capacity by 202; Dubai 7% of electricity generation by 2020; Ras al-Khaimah 20-30% clean energy by 2040; total UAE 27% clean energy by 2021, 44% of capacity by 2050.

Notes: 2018 data for Kuwait and the UAE; 2017 data for the remaining countries. RE= Renewable Energy; PV= photo voltaic; CSP= concentrated solar power; MW = megawatt.

Source: Author from IRENA (2018, 2019), and national official documents of Visions and development plans in each GCC country.

**Iraq 33% by 2030; Iran 10% by 2025; Libya 22% by 2030**

## Renewable electricity generated in hydrocarbon importers

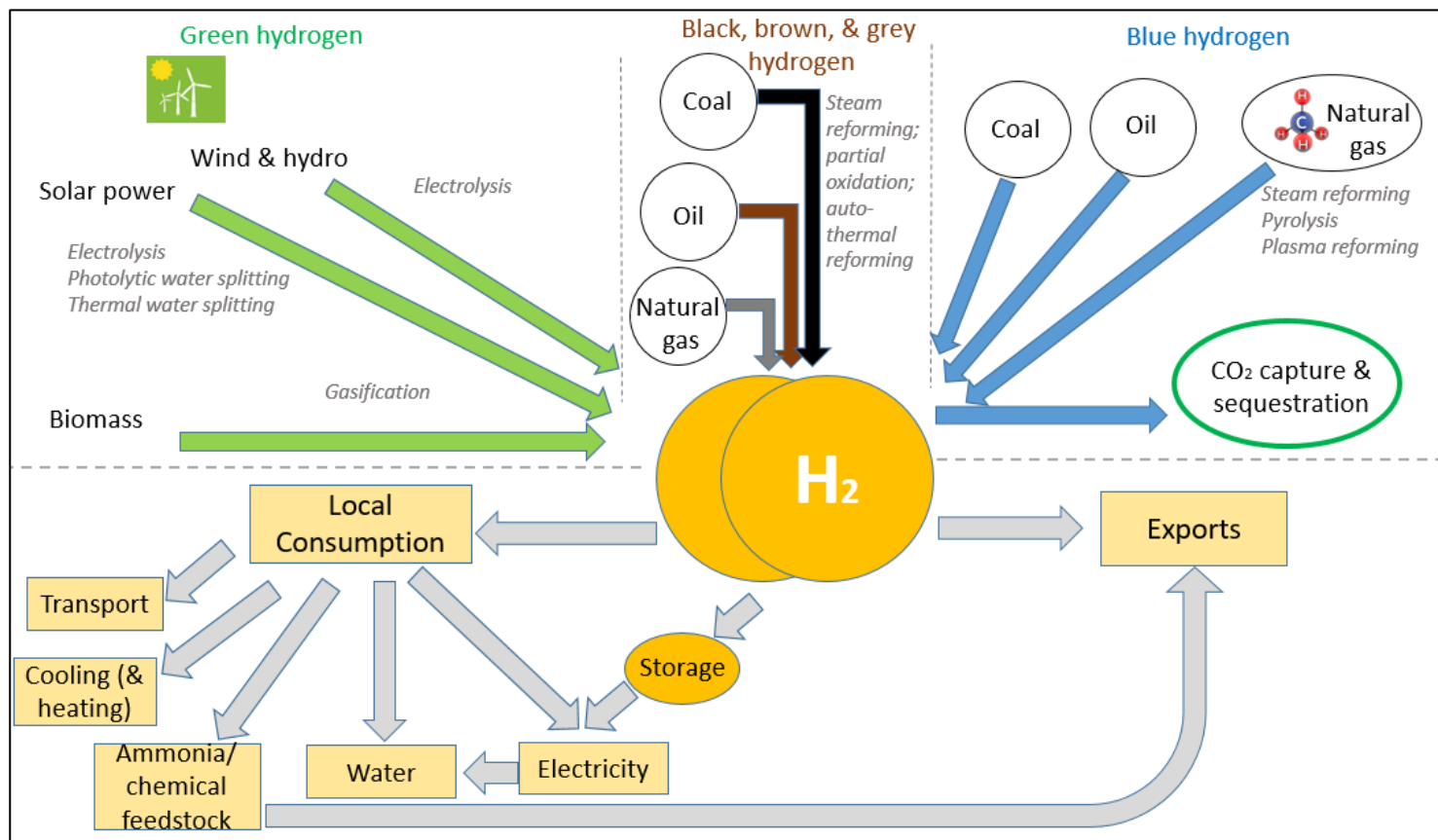
- **Egypt**
  - 20% of power generation by 2022, target of 42% by 2035
- **Jordan**
  - Close to 15%, target of 35% by 2030
- **Morocco**
  - Installed 34% of renewable energy, targets of 42% by 2020, 52% by 2050
- **Tunisia**
  - 8% in 2019, target of 30% by 2030



# Energy Transition Initiatives & Opportunities

## Initiatives

- Renewable energy (mostly solar PV, but also CSP & wind)
- Nuclear power
- Carbon markets
- Carbon Capture, Utilization and Storage (CCUS)
- Circular carbon economy
- Hydrogen



Source: Shehabi (2021)

## Projects & ambitious

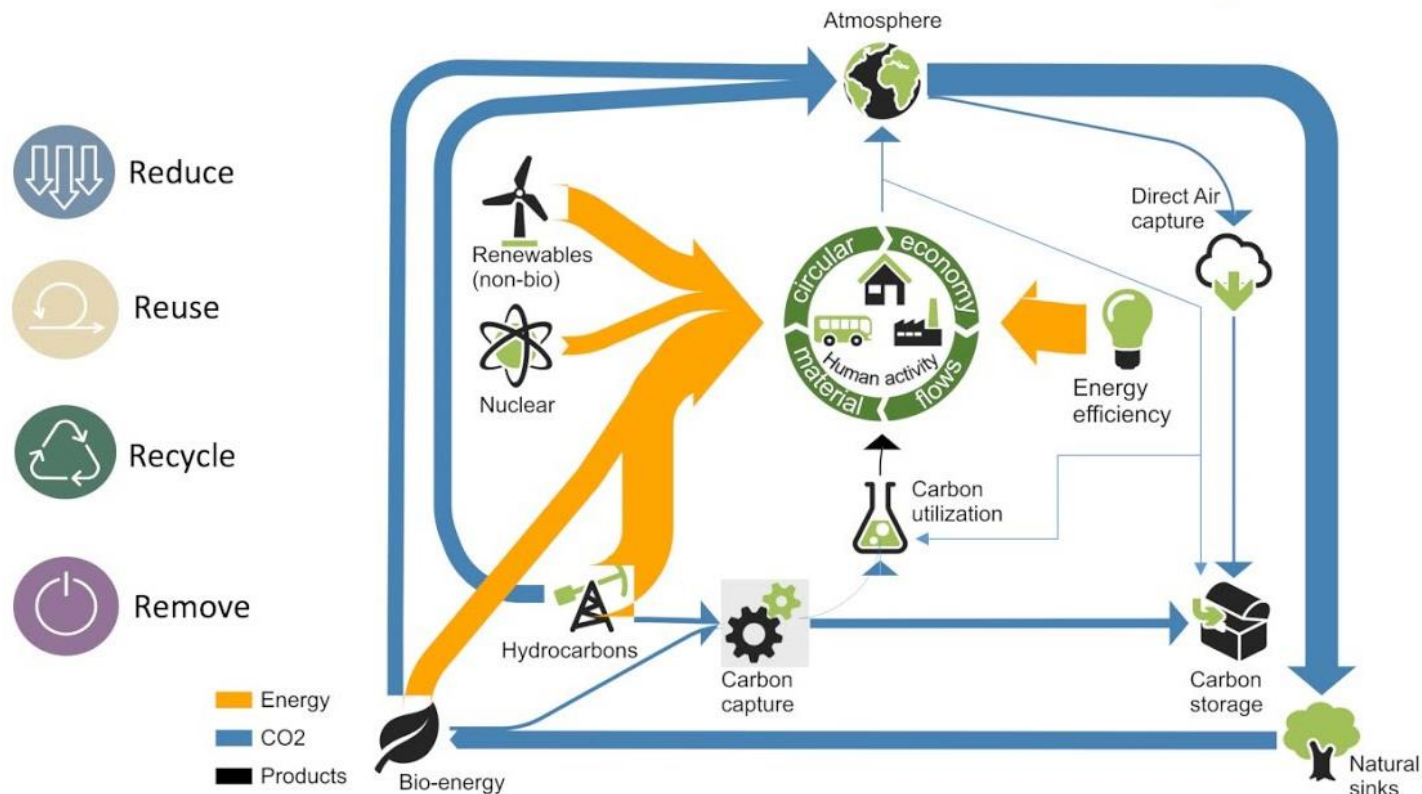




# The Circular Carbon Economy

- The CCE is an **integrated** and **inclusive** approach to transitioning toward more **comprehensive, resilient, sustainable, and climate-friendly** energy systems that support and enable sustainable development. CCE enables countries to take advantage of **all technologies, forms of energy, and mitigation opportunities** according to resource availability, economics, and national circumstances.
- The G20 (2020) endorsed **CCE be incorporated in various decarbonization pathways during the energy transition.**

## Circular Carbon Economy



Source: Circular Carbon Economy Guide (2020).





### III. Just Transition, or Just Energy Transition?

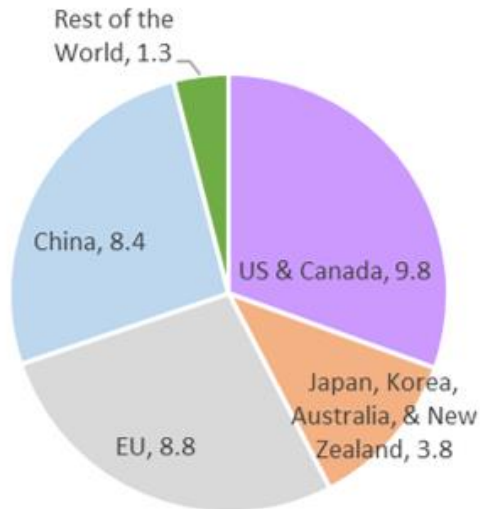


# Are Targets Achievable? Challenges...

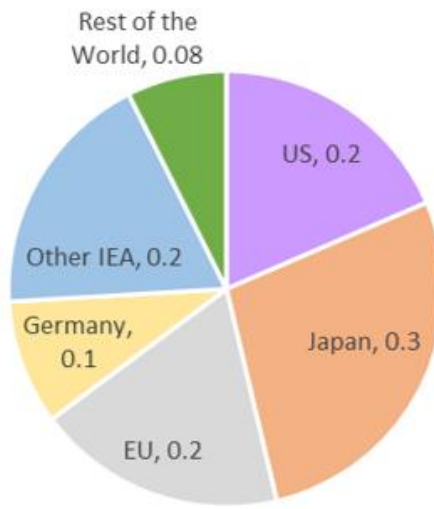
- 1: Limited environmental focus in economic diversification plans**
- 2: Slow renewables when energy transition is export-motivated**
- 3: Limited CCUS & technology**

Budgets on hydrogen & low-carbon energy R&D (2020)  
(USD billion)

Hydrogen technologies R&D



General low-carbon energy R&D



- 4: Commercial and economic profitability, including for carbon**
- 5: Weak regulatory environment**
- 6: Limited water resources challenges**
- 7: Affordability for consumers**

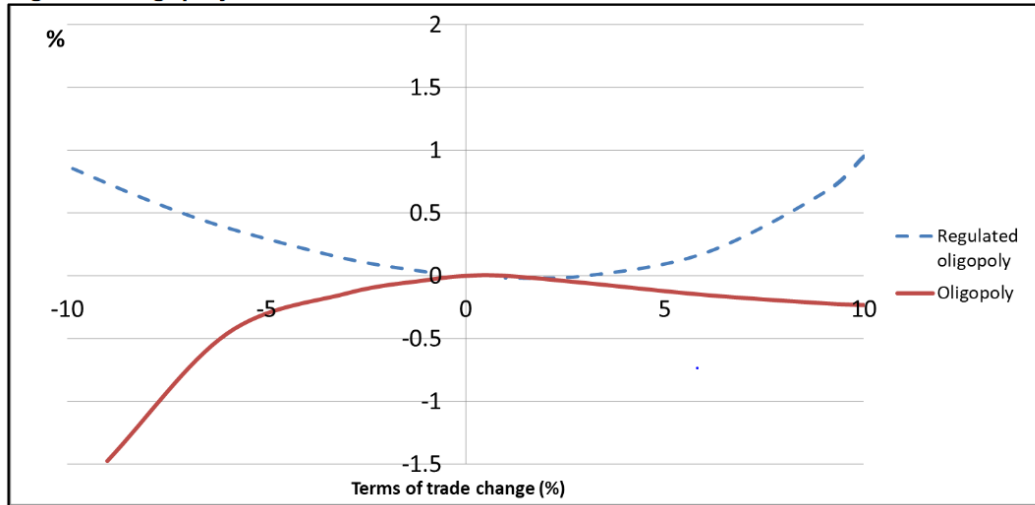
Source: Author's representation based on aggregated data from the IEA (2021a).  
Shehabi (2021).



# Are Targets Achievable? Challenges...

## 8: Loss of efficiency & weakened resilience in private sector structure

Figure 5: Short run effects of terms of trade shocks under current economic policies and regulated oligopoly



Source: Shehabi (2020)

## 9: Ongoing effects of climate change, including coastal & water challenges; ensuing health, fiscal, & economic effects *Gulf; Nile Delta; fresh water*



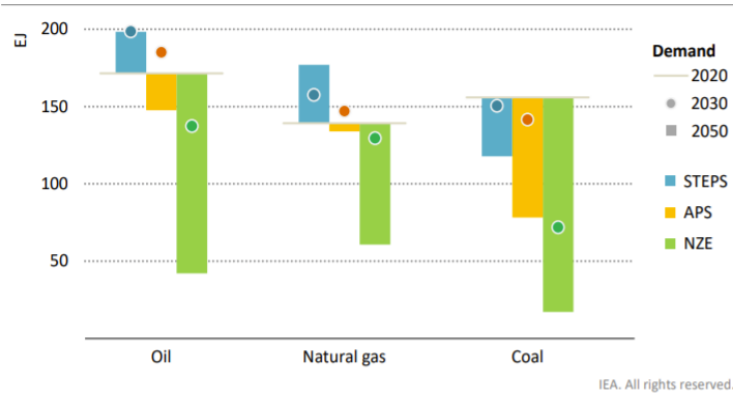
Source: Ibrahim Ramadan/Anadolu Agency/Getty Images

## 10: Fiscal constraints for funding energy transitions along with subsidies and socio-economic development



# Fiscal Constraints and Just Transitions Implications of MENA's Energy Transitions

Figure 1.25 ▶ Fossil fuel use by scenario



Oil demand peaks in each scenario, but the level and timing vary; natural gas increases to 2025 with sharp divergences thereafter; coal falls in all scenarios

Note: 1 EJ is around 0.5 mb/d of oil, 29 bcm of natural gas or 34 Mtce of coal.

- STEPS= Stated Policies Scenario
- APS = Announced Pledges Scenario
- NZE= Net zero emissions

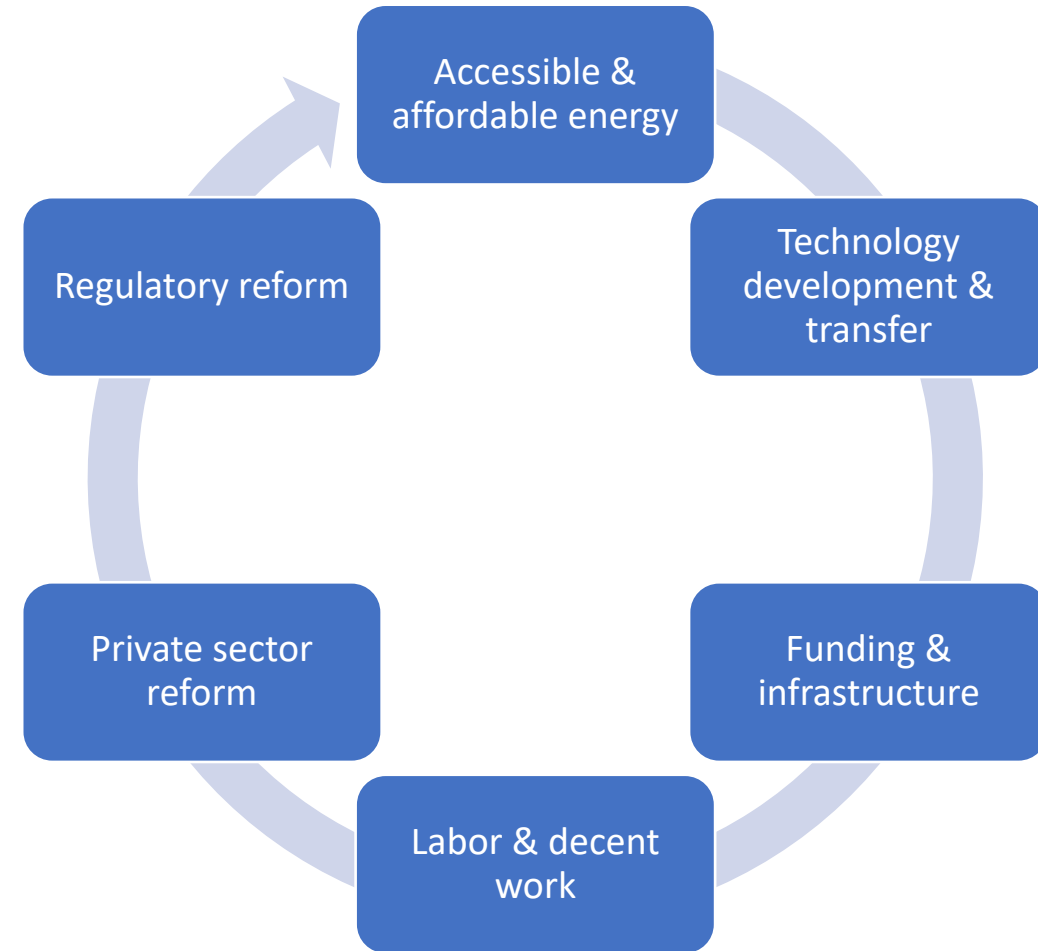
Source: International Energy Agency (IEA)  
World Energy Outlook (2021)

- Expected future decline of hydrocarbon export
- Current environment of high energy costs
  - In hydrocarbon exporters → rising oil and gas upstream investments and capex
  - In hydrocarbon importers → rising energy imports bill and costs
- Fiscal constraints for energy transition & Just Transition
  - Technology
  - Infrastructure
  - Labor:
    - Energy industries are capital intensive, but constraints for funding government budgets for public wage bill, public sector jobs, & non-hydrocarbon sector growth
    - New green industries
- Households: Affordability with subsidies vs. fiscal sustainability



# A Just Energy Transition

- Successful decarbonization depends on technology, governmental regulation, carbon pricing, funding, demand, and costs
- A transition towards a sustainable, low carbon and equitable energy system that is fair for the environment but is also fair and inclusive, creates decent work opportunities, and ensures energy access
- **How can this be applied to the MENA region?**
- **Achieving just transition requires understanding effects of the energy transition on MENA economies and maximizing positives and minimizing negatives of these impacts.**



**Thank you!**  
**Dr. Manal Shehabi**  
 **@ManalShehabi**  
 **manal-shehabi**  
[www.manalshehabi.com](http://www.manalshehabi.com)  
[Manal.shehabi@sheer-ra.com](mailto:Manal.shehabi@sheer-ra.com)  
[Manal.shehabi@sant.ox.ac.uk](mailto:Manal.shehabi@sant.ox.ac.uk)

