

# Clean Energy Market in MENA

*Finance, Mobility, Hydrogen, Energy Efficiency*

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**Dr. Nasser Saidi**  
**Chair, CEBC**  
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# CEBC: a Regional NPO & NGO promoting Clean Energy & Technology.

## Active Working Groups: Climate Finance, Hydrogen & Energy Storage, Energy Efficiency, Future Mobility & Women in Clean Energy

A NPO, NGO membership organisation

Work on behalf of members to promote investment & adoption of renewable and clean technologies through public-partnerships

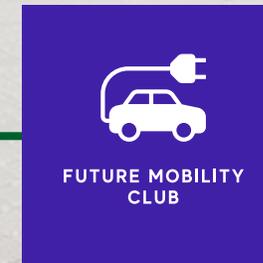
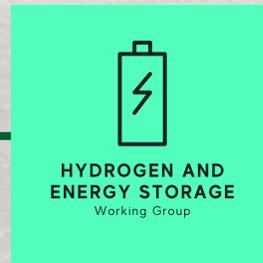
Establish a dialogue between the public and private sectors



Represents the private sector involvement in Clean Energy & Technology across the MENA region

Supports the development of regulations and policy to promote the clean energy sector in MENA

Undertakes research, develops and presents policy solutions



[www.cebcmena.com](http://www.cebcmena.com)

# MENA region is facing two major challenges: it is a climate hotspot & needs to prepare for its post-oil future. Investments in Renewable Energy & Clean Tech are imperative

## Building blocks of the Clean Energy Ecosystem



## MENA Clean Energy drivers and challenges



**Climate change:** Region is highly vulnerable to warmer temperatures and water scarcity and the global energy transition.



**Urbanisation and demographic changes:** The region is moving towards denser cities and urbanised settlements.



**Post-oil economies and demand for energy:** Clean energy sources are abundant in the region and good progress is being made in their deployment.



**Cybersecurity, IoT, connectivity and analytics:** Energy & critical infrastructure more vulnerable to cyber attacks.

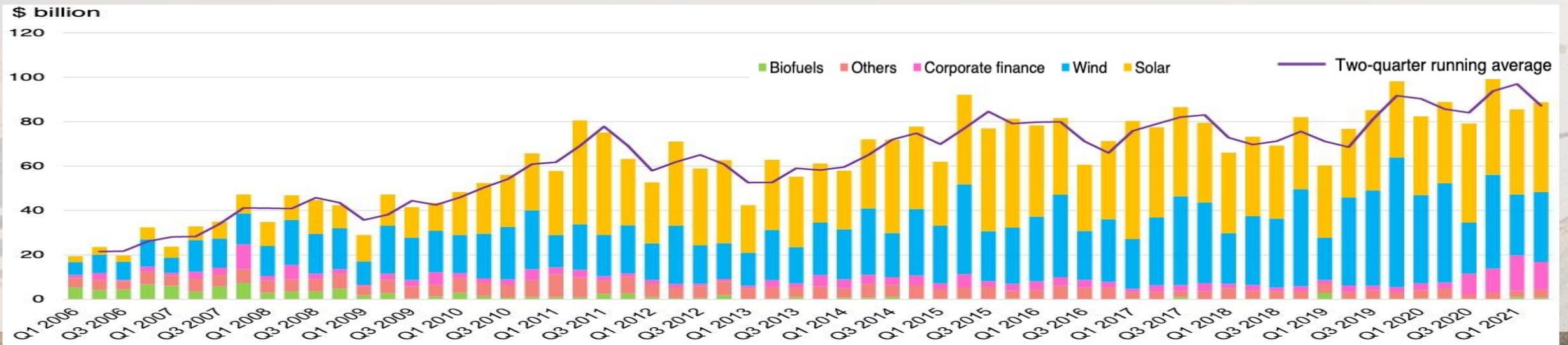
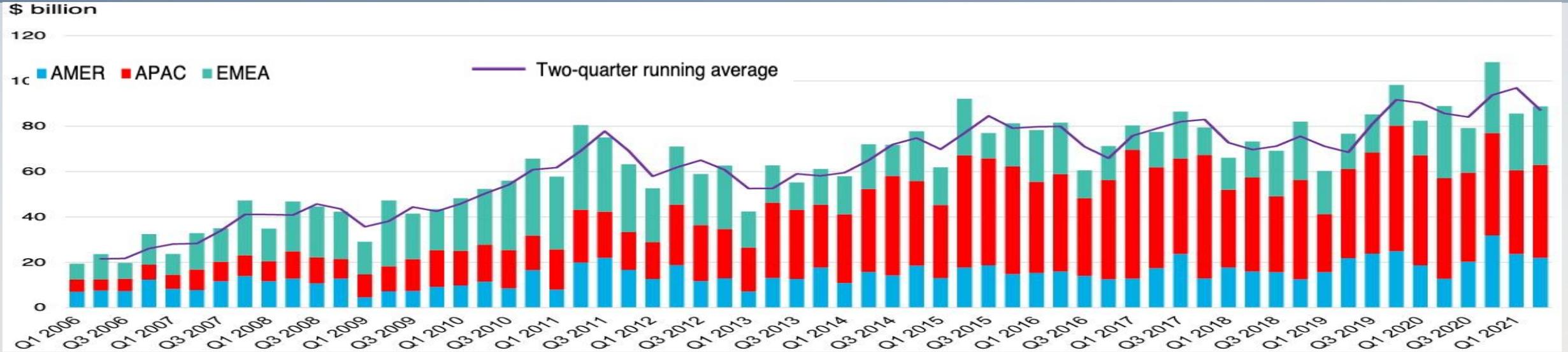


**Health, happiness and well-being:** With improving living conditions, health and happiness are becoming a priority for the population.



**Artificial intelligence, robotics and automation** increasingly integrated into daily activities & processes. How does this impact the energy transition? What is the impact on labour markets?

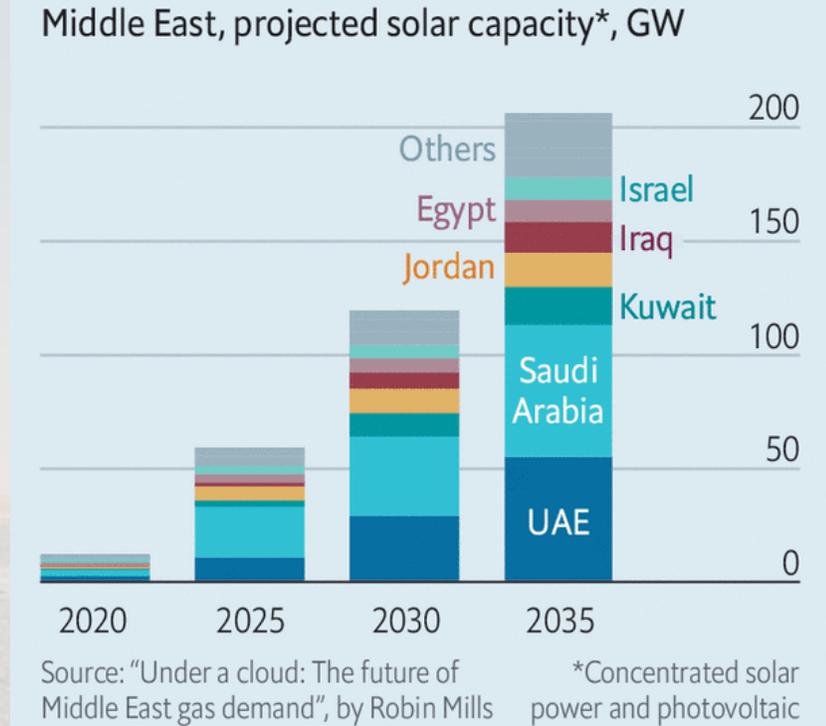
# Renewable Energy Investment, by region & sector: APAC/China & Solar dominant. MENA is catching up. Corporate finance rapidly growing



Source: Renewable Energy Investment Tracker, 1H 2021, BNEF

# Investments in solar & projected solar capacity: Saudi & UAE dominate the MENA market. Exponential growth in solar capacity by 2030, 2035

## Investment in solar PV, by region of destination, 2013-2018



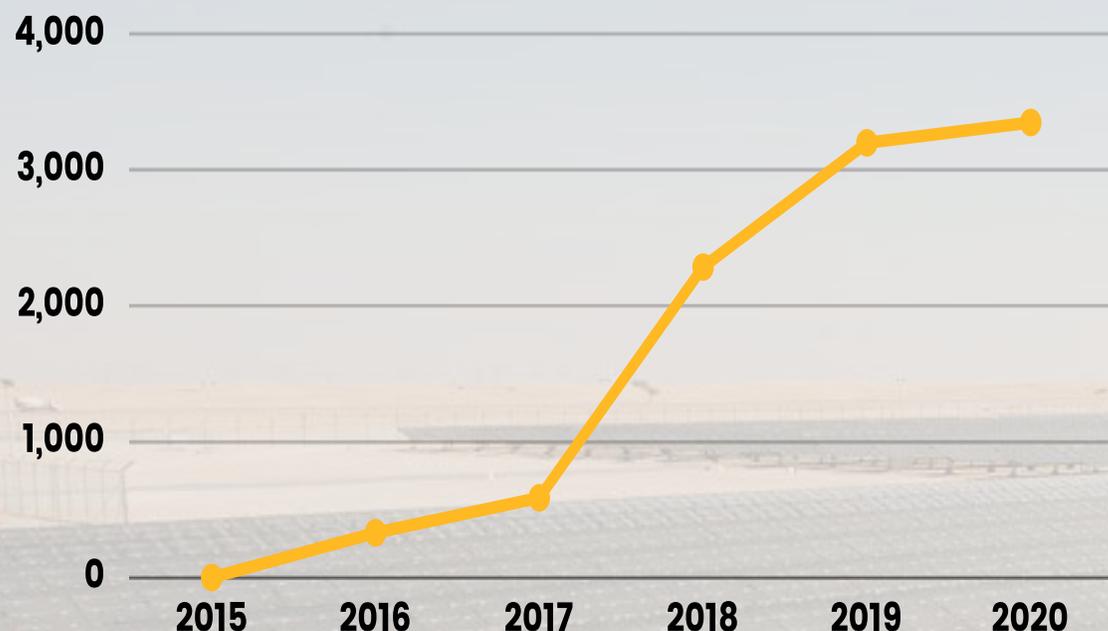
Source: Global Landscape of Renewable Energy Finance, 2020, IRENA

# Climate Finance in MENA is in its infancy: a major opportunity for conventional & Islamic finance

## Green Debt Market in the MENA region

Figure 1. Evolution of green debt issuances in the MENA region

in millions USD



Source: CEBC analysis on various sources

## Sustainable Investing in the MENA region

Figure. Assets under management related to sustainability

Market	Total AUMs Related to Sustainability	% of Total AUM
EU	\$3,700 trillion	16.97%
Brazil	\$70 billion	12.00%
USA	\$2,700 trillion	11.02%
<b>MENA</b>	<b>\$54.25 billion</b>	<b>2.13%</b>
China	\$4,12 billion	1.00%
<b>MENA without Shari'ah compliant investments</b>	<b>\$17.1 billion</b>	<b>0.67%</b>
India	\$1.1 billion	0.67%

Source: [IFC report](#) on Sustainable Investment in the Middle East and North Africa

# Climate Finance in MENA faces typical challenges of developing countries, despite availability of enormous financial resources

*“It is important to communicate the viability of renewable energy as a worthwhile investment, by reducing the information barrier and perceived risks to potential investors, whether in fragile or more stable Arab States.”*

Table 1: Funds supporting MENA region (2003-2018)

Fund	Amount approved (USD millions)	Projects approved
Clean Technology Fund (CTF)	864.8	10
Green Climate Fund (GCF)	287.8	6
Global Environment Facility (GEF4, 5, 6)	108.6	47
Adaptation Fund	48.7	10
Special Climate Change Fund (SCCF)	43.6	8
Least Developed Countries Fund (LDCF)	35.1	8
Adaptation for Smallholder Agriculture Programme (ASAP)	23.0	4
Global Energy Efficiency and Renewable Energy Fund (GEEREF)	16.6	1
Partnership for Market Readiness	11.0	6
MDG Achievement Fund	7.6	2
Global Climate Change Alliance (GCCA)	3.4	1

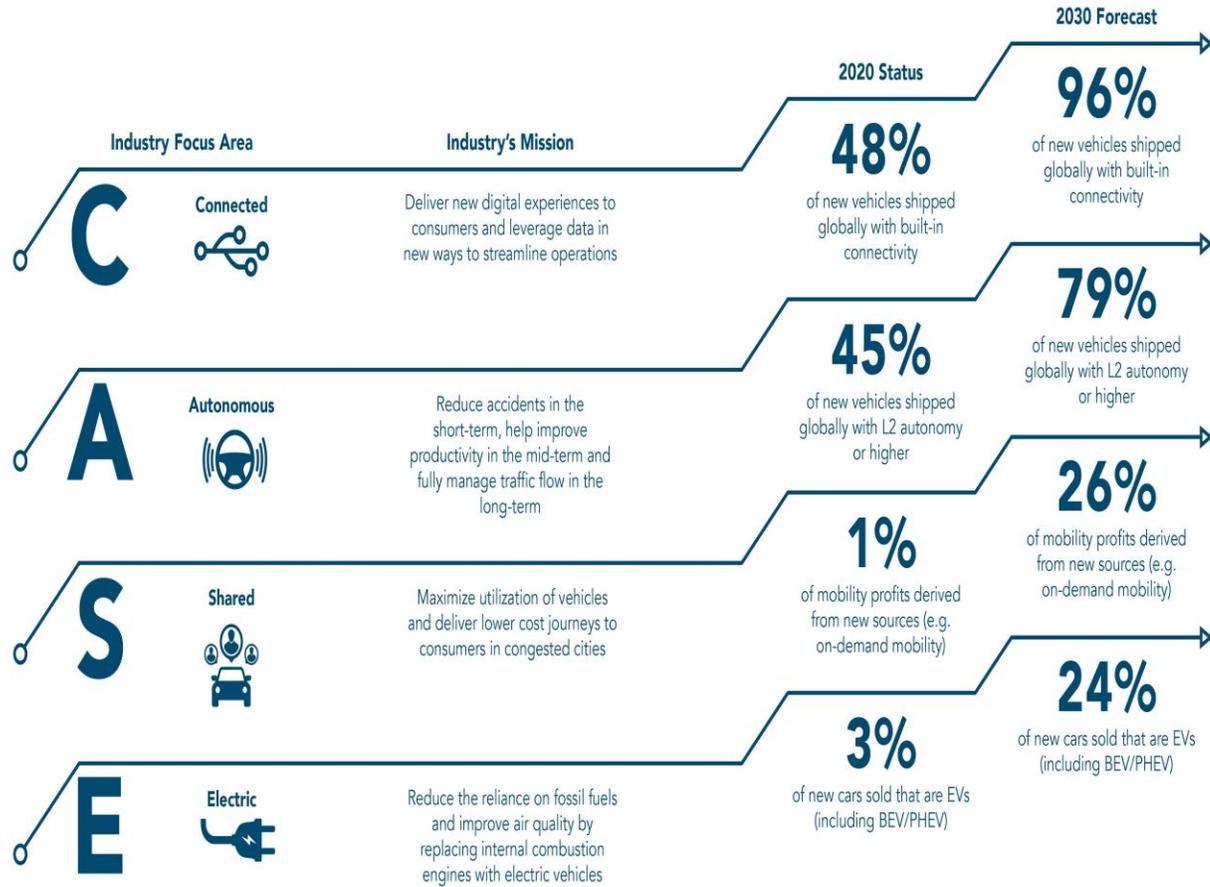
Only \$14 billion of the \$546 billion of climate finance in 2018 flowed in the MENA region, despite the region including some of the most potent areas for solar PV, along with being highly vulnerable when it comes to climate impacts.

## Barriers to scaling up finance

- High cost of capital due to perceived or actual risks of investing in developing countries
- Difficulty in transferring technologies and solutions to fragile contexts
- Political economy of transitioning from an extractive industry to renewables
- Difficulties connecting renewable energy solutions to existing grids
- Low awareness among investors about suitable renewable energy solutions
- Lack of access to finance for SMEs that offer tailored renewable energy solutions
- Lack of industrial or commercial storage to meet consumption patterns
- Access to primary resources from outside the region – reliance on international trade

# Future Mobility

## Change Personified in Four Letters: C-A-S-E



## The Future of Mobility

<i>C</i>	<i>A</i>	<i>S</i>	<i>E</i>
Connectivity	Autonomous	Shared	Electric

# E-mobility in MENA: lacking infrastructure. Saudi, Egypt, Morocco plan EV production

## Morocco

- Acting towards being the center for **EV production**.
- Begin EV production in Morocco. Government plans to promote & create EV awareness locally.
- Charging stations installed between Marrakesh and Casablanca.
- STMicroelectronics to inaugurate a new electronic chips production line in Morocco for Tesla.

## Tunisia

- According to Paris climate agreement, Tunisia will be reducing 41% carbon intensity by 2030.
- 10 AGIL service stations will be installed in the pilot phase of the project.

## UAE

- Dubai plans 18% Electrification by 2030
- +300 Charging stations installed by DEWA
- 350 kW Superfast charger installed by ION in Abu Dhabi.
- Dubai Green Charging Initiative launched in 2014.
- Incentives for EV owners across the UAE.

## Oman

- Lack of EV models and charging stations
- Low maintenance cost requires government incentives around EV.
- Government plans to promote EV and create policies.

## Saudi Arabia

- Aims to manufacture EV by 2030 and reduce quarter of their energy consumption.
- Planning policies and incentives to compete with low fuel costs.
- Focus on investment and local manufacturing.

## Algeria

- CDER seek investors for locally prototyped EV and start large scale production.

## Egypt

- Egypt established a manufacturing plan for a local EV brand E70. First production vehicle was launched in mid 2021.
- 100 cars to be manufactured by 2022
- Targeting +3000 charging stations to charge 6000 EVs simultaneously by end of 2022.

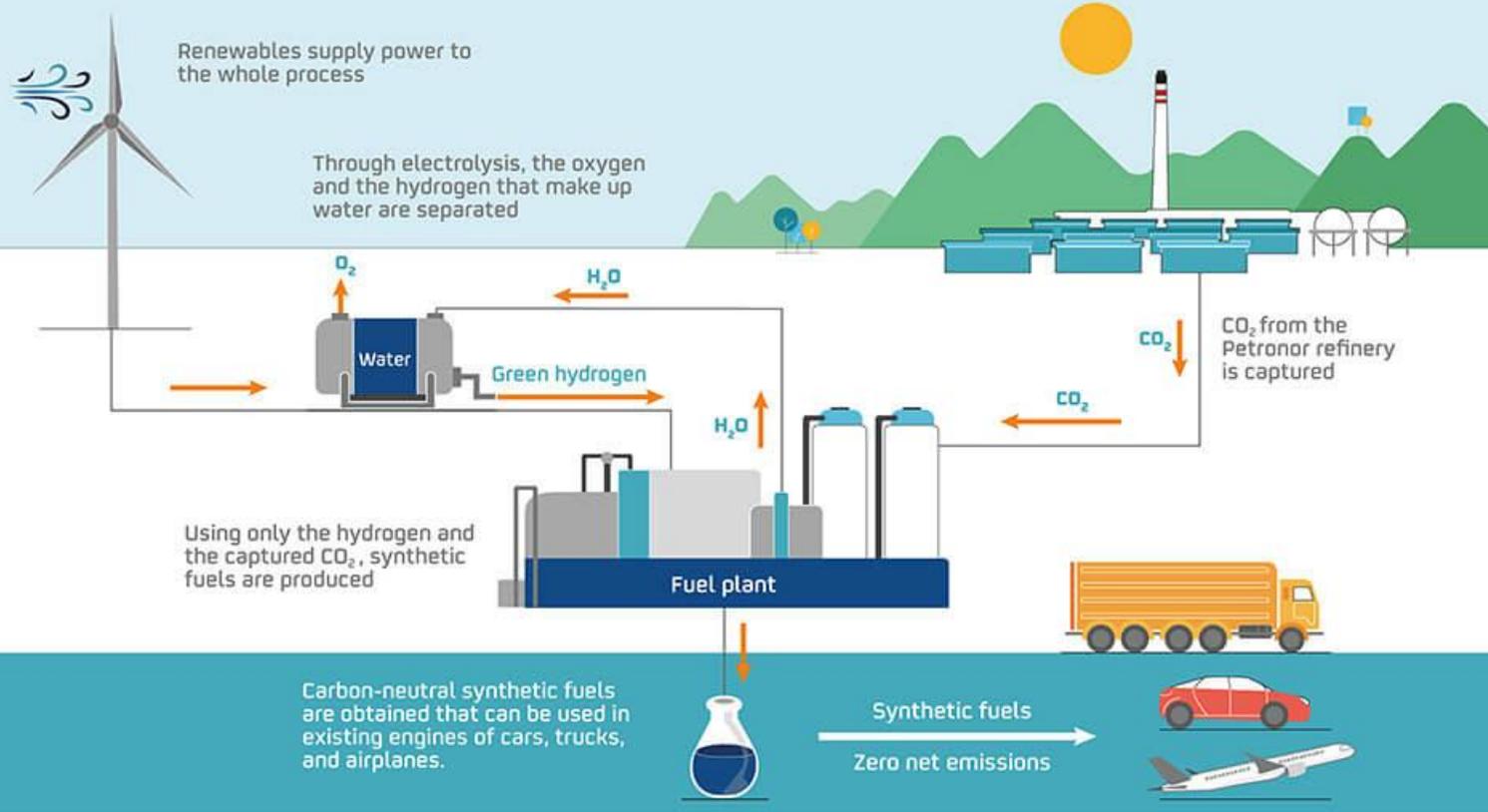
## Jordan

- Highest number of EVs in the region.
- By 2025, low EV taxes and 3000 charging stations will be implemented.
- High gasoline prices helping transition to EVs faster.
- Government will and support to the transition to EVs.

## Qatar

- By 2022, Kahramaa will install 200-500 chargers.
- Charging stations will charge 2 cars in 15-20mins.

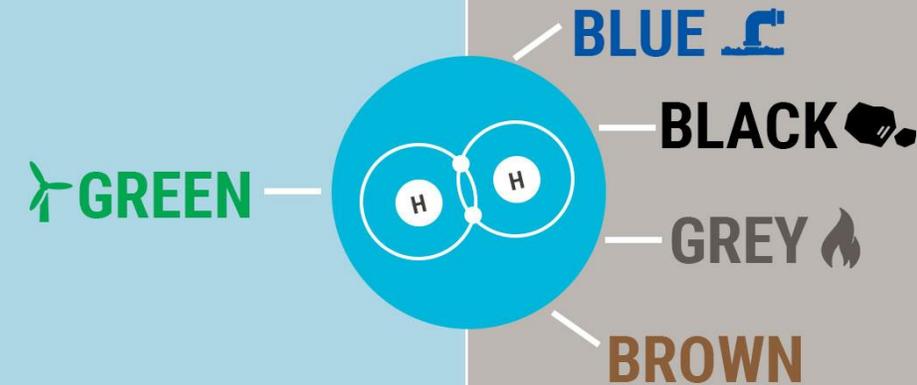
# Hydrogen in MENA



## THE HYDROGEN RAINBOW

Renewable Hydrogen

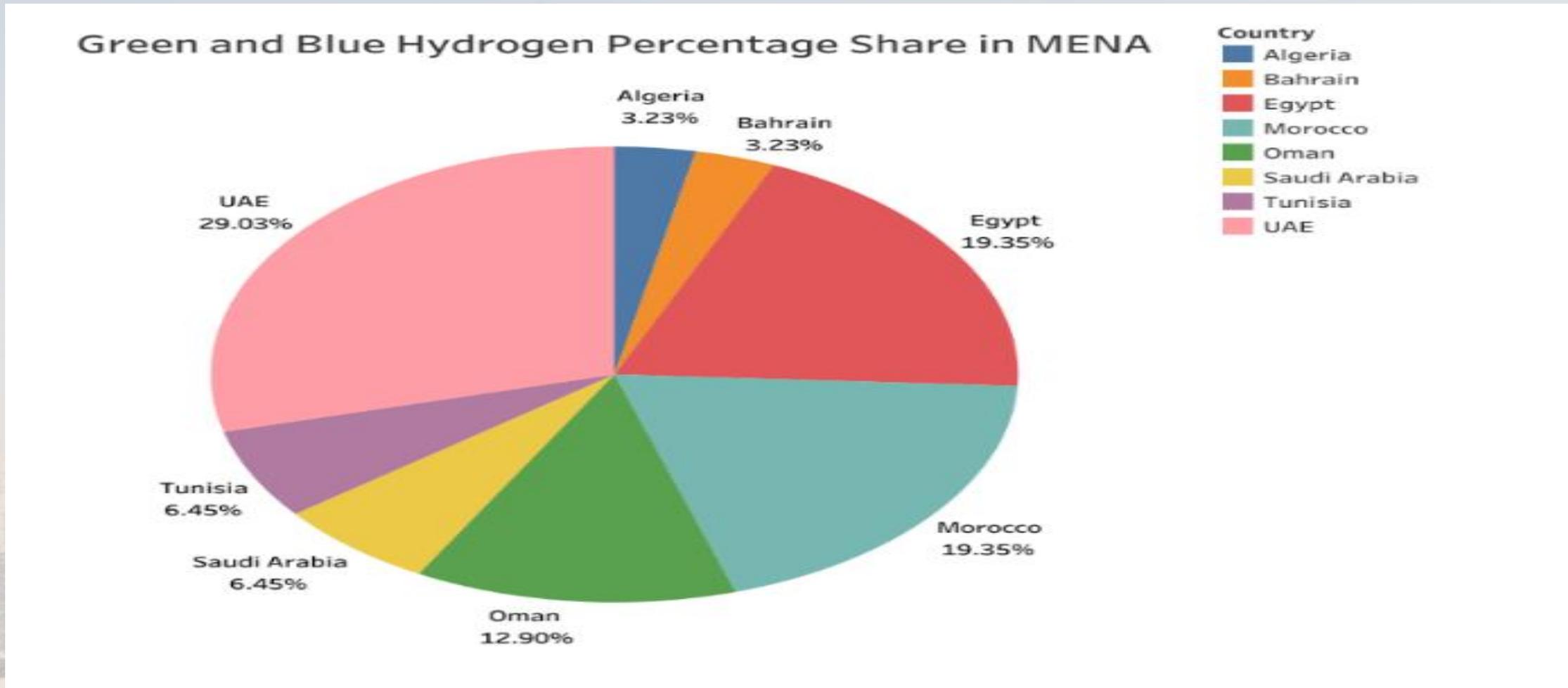
Fossil Fuel Hydrogen



- Wind, solar and hydro
- Any fossil fuel with partial carbon capture
- Gas
- Brown coal
- Black coal



# Hydrogen in MENA: an infant, but rapidly developing market.



Investments of \$55bn, 5.3 mn tonnes

# Hydrogen in MENA: GCC can become a major global exporter

No. of hydrogen projects



**Total Investment in US\$: 55 billion approx.**  
**Total Volume of Green Ammonia in Tons: 5.3 million approx.**

7 July 2021 - Eni and Sonatrach outlined a roadmap for the joint assesment of a green hydrogen pilot project.

- 34.7 million USD
- Key Players: TuNur Ltd.
- Hydrogen Strategy was Announced.

- 4 Billion USD
- Key Players: MAN Energy Solutions, Taqa Power, DEMA, Siemens, EEHC.
- Hydrogen Strategy was Announced.

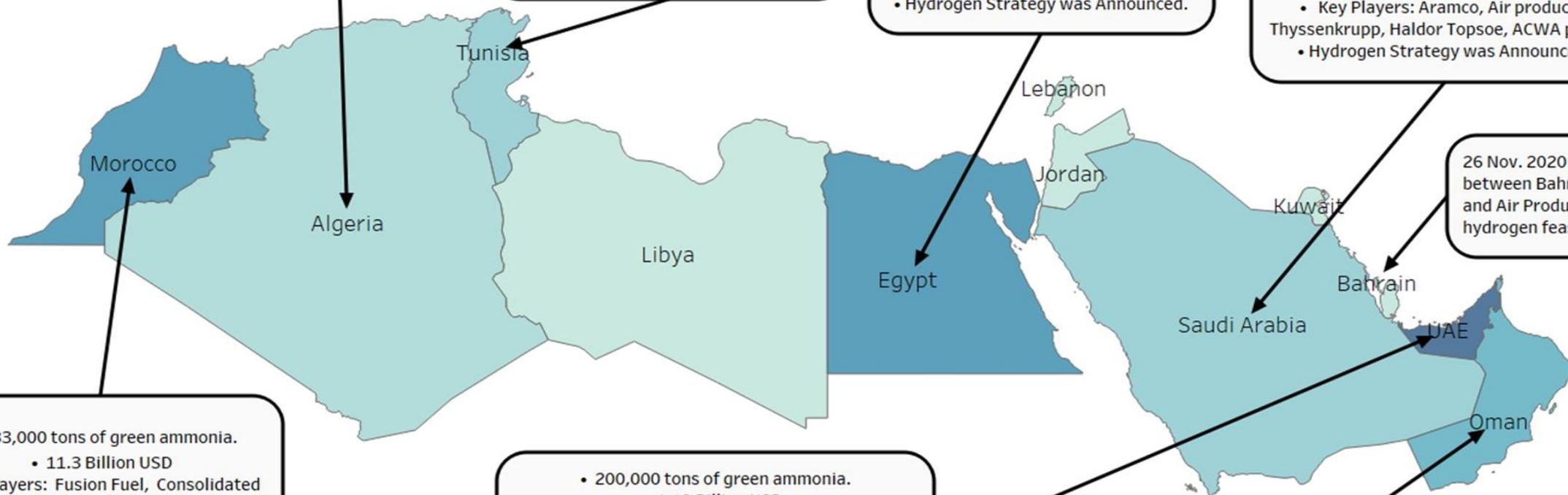
- 1.2 million tons of green ammonia.
- 5 Billion USD
- Key Players: Aramco, Air products, Thyssenkrupp, Haldor Topsoe, ACWA power.
- Hydrogen Strategy was Announced.

26 Nov. 2020 - MoU signed between Bahrain's NOGA and Air Products for green hydrogen feasibility study.

- 183,000 tons of green ammonia.
- 11.3 Billion USD
- Key Players: Fusion Fuel, Consolidated Contractors Group (CCC), MEME, MASEN, IRESEN, Saipem, Alboran Hydrogen, ONEE.
- Hydrogen Strategy was Announced.

- 200,000 tons of green ammonia.
- 1.18 Billion USD:
- Key Players: DEWA, Abu Dhabi National Energy Co., Abu Dhabi Ports, Bee'ah, Chinook Sciences, Masdar, Siemens, Marubeni, Helios Industry, Thyssenkrupp.
- Hydrogen Strategy was Announced.

- 3.7 million tons of green ammonia.
- 33.5 Billion USD
- Key Players: OQ, InterContinental Energy, Enertech, Uniper SE, DEMA, OQ Alternative Energy, Helios Industry, ACME Group.
- Hydrogen Strategy was Announced.



# Fossil fuel subsidies hit USD 5.9trn in 2020; some 16% of MENA GDP

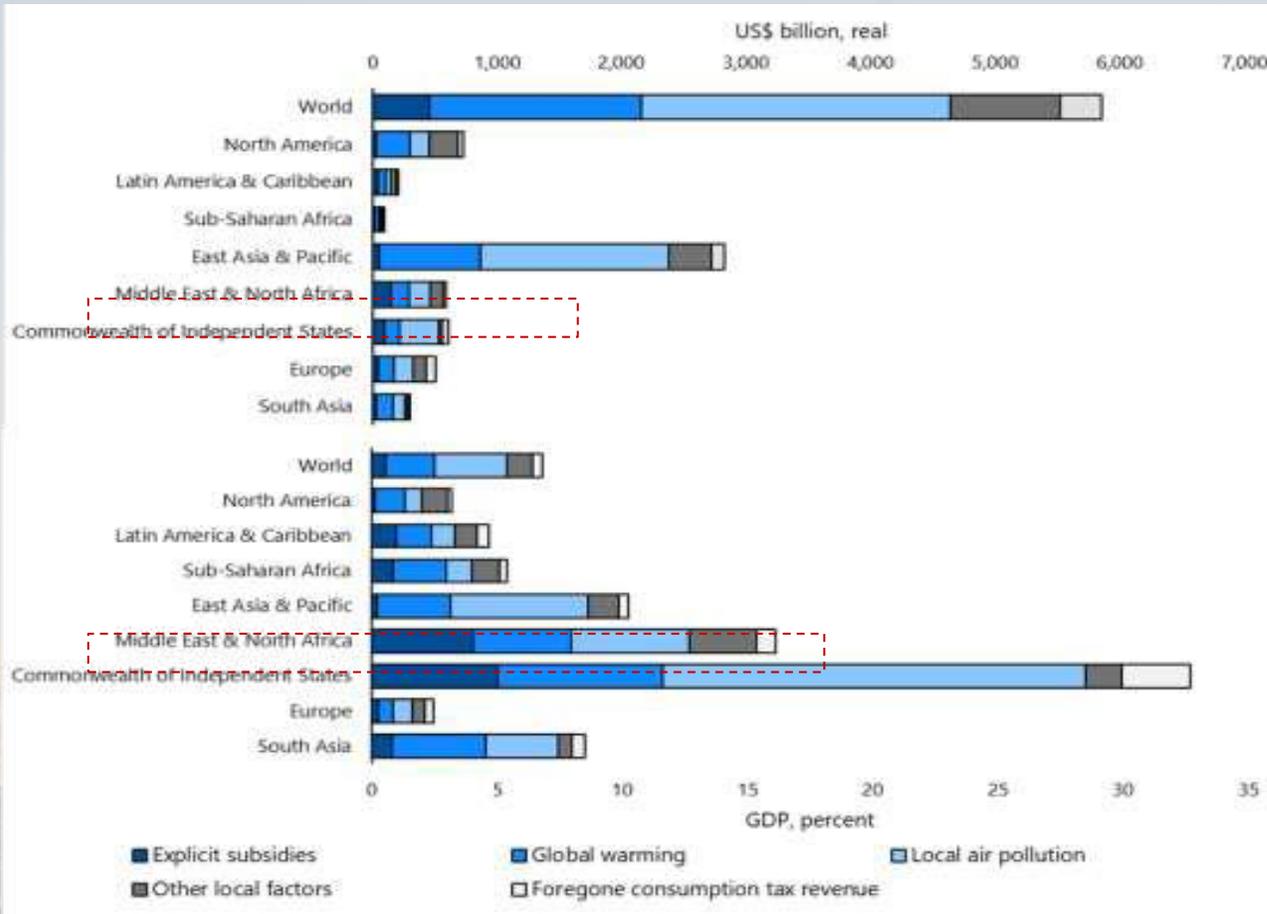


Figure. Global Fossil Fuel Subsidies by Component, 2020

(Source: "Still Not Getting Energy Prices Right: A Global and Country Update of Fossil Fuel Subsidies", IMF Working Paper, Sep 2021)

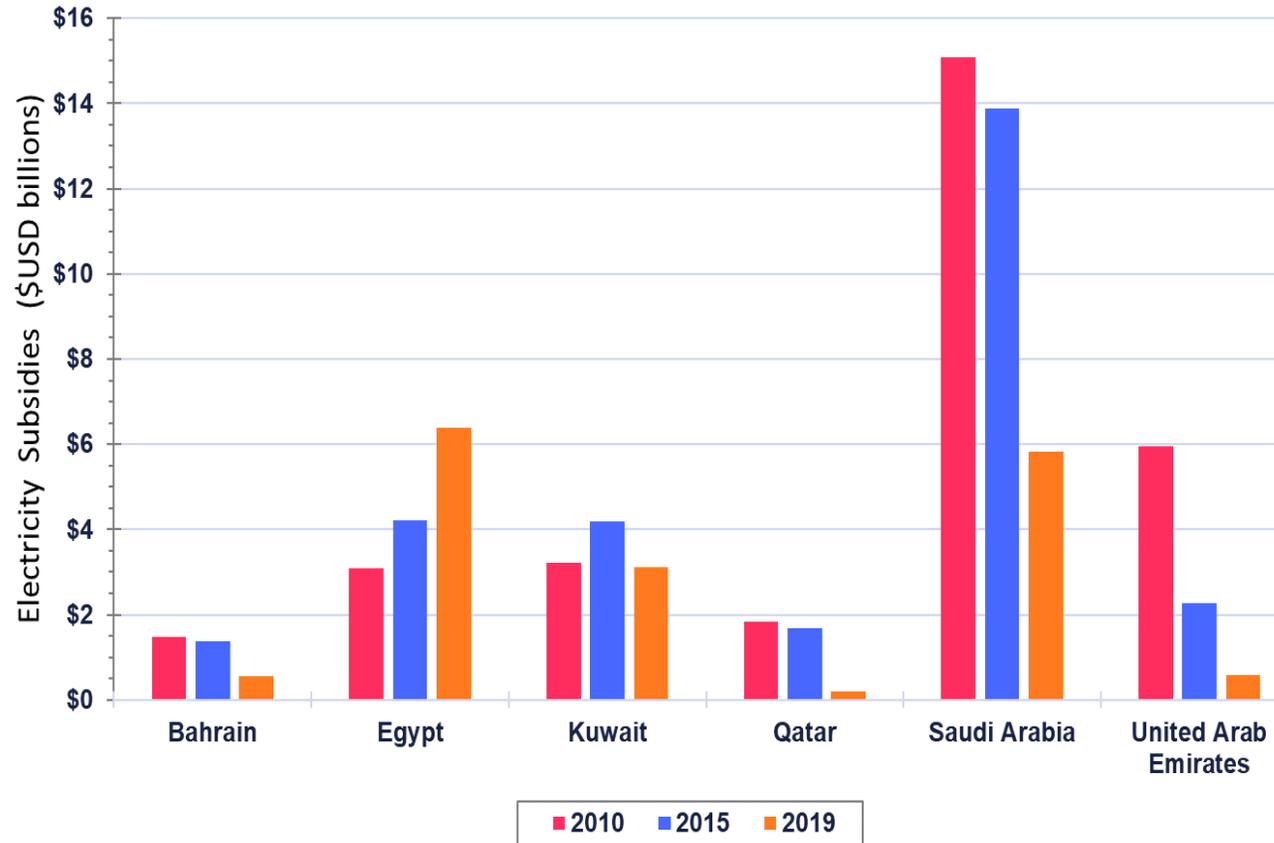
Globally, fossil fuel subsidies were \$5.9 trillion in 2020 or about 6.8% of GDP; expected to rise to 7.4% of GDP in 2025.

**Countries subsidize fossil fuels in 2 ways:** undercharge for the product or for other costs (like damage to the planet & people's health)

**Just 8% of the 2020 subsidy reflects undercharging for supply costs** (explicit subsidies) and 92% for undercharging for environmental costs and foregone consumption taxes (implicit subsidies).

- **Efficient fuel pricing in 2025 would:**
  - **Reduce global CO<sub>2</sub> emissions 36%** below baseline levels (in line with keeping global warming to 1.5 degrees)
  - **Raise revenues worth 3.8%** of global GDP
  - **Prevent 0.9 million local air pollution death**
- Ahead of COP26, **more than 60 carbon pricing schemes have been implemented globally**
  - However, **only about one-fifth of global emissions are covered by pricing programs** and the global average emissions price is only \$3 per ton.
  - An international **carbon price floor can be strikingly effective.** IMF proposes \$75 a ton for advanced economies, \$50 for high-income EMEs such as China, and \$25 for lower-income EMEs such as India => keep warming below 2 deg

# Energy Efficiency in MENA: driven by policy reforms, fossil fuel & electricity subsidies



*Changes in consumption patterns and government subsidies in the local energy markets are taking place in the MENA region. Such changes are impacting the energy efficiency sector across MENA, with reforms being implemented by governments that include electricity and fuel pricing increases and the launch of new energy efficiency programs.*

- Significant reductions in electricity subsidies from 2010 to 2019 across the GCC:
  - ~90% reduction in the UAE and Qatar.
  - ~61% reduction in Saudi Arabia and Bahrain
- However, not all countries reduced subsidies...
  - Kuwait electricity subsidies stayed mostly flat
  - Egypt's electricity subsidies more than doubled from 2010 to 2019

Figure. Electricity Subsidies from 2010 to 2019  
(Source: International Energy Agency Data and Statistics webpage)

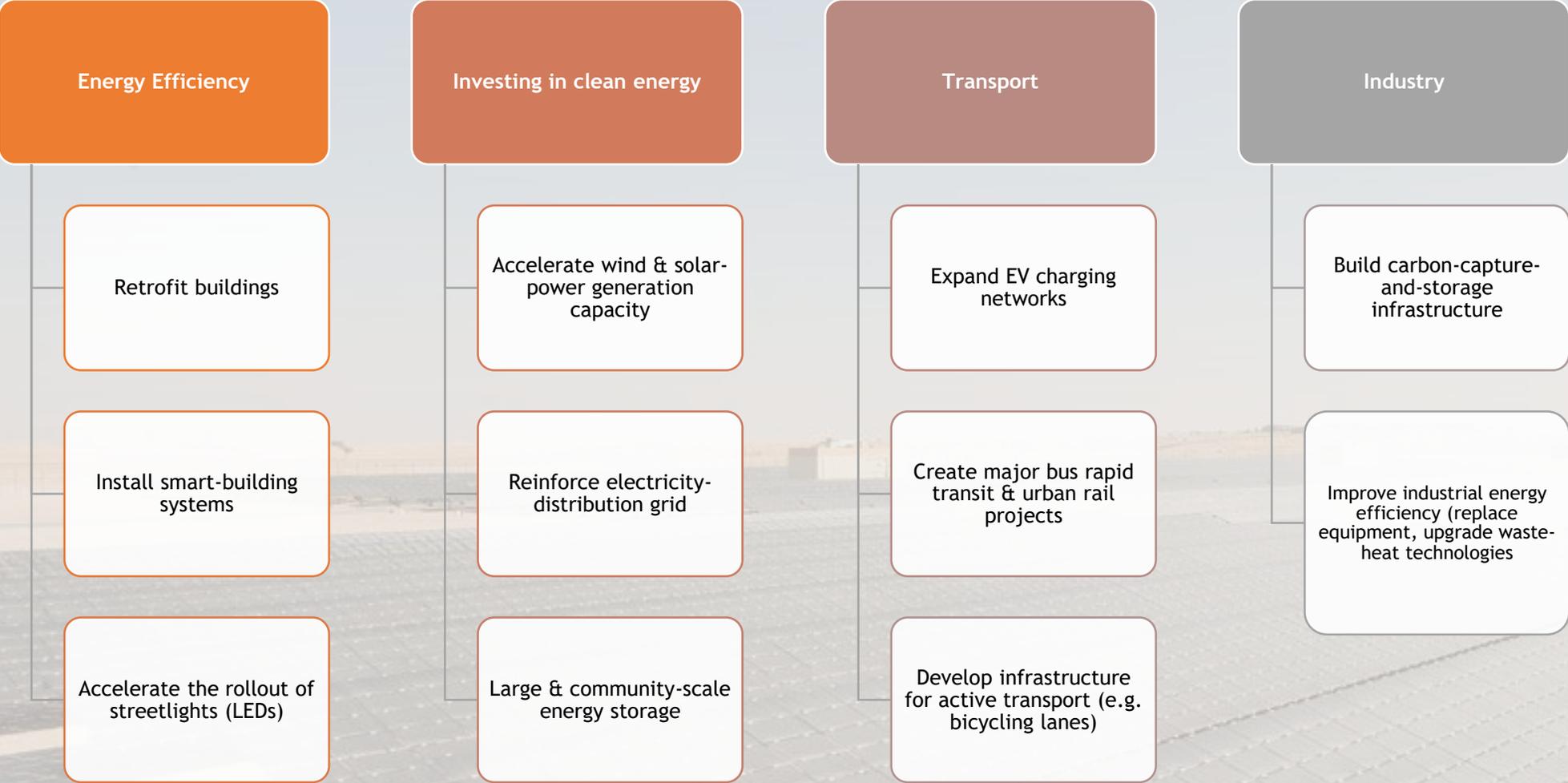
# Super ESCOs emerging in UAE, Saudi, but a fragmented market would benefit from regional grid integration and creation of an electricity market



	ETIHAD	REEM	Tarshid	SEWA	APSR	ADES
<b>Year of Establishment</b>	2013	2017	2017	2018	2019	2020
<b>Region</b>	Emirate of Dubai	Emirate of RAK	KSA	Emirate of Sharjah	Sultanate of Oman	Emirate of Abu Dhabi
<b>Role</b>	Signing entity with ESCO	Facilitator	Signing entity with ESCO	Facilitator	Facilitator	Signing entity with ESCO
<b>Project Financing</b>	Yes	No	Yes	No	No	Yes
<b>On bill</b>	Yes	No	-	-	-	Yes
<b>Target Savings 2030</b>	1.4 TWh, 4.9 BIG	55 GWh, 48 MIG	-	-	-	2.7 TWh, 2.0 BIG
<b># Tenders</b>	100+	18	200+	-	1	1
<b>Value projects awarded</b>	USD 218 million	USD 7 million+	USD 266 million+	-	-	-
<b>Savings from projects</b>	USD 32 million/year	USD 2 million/year	-	-	-	-
<b>Retrofit vs solar</b>	80% retrofit, 20% solar	85% retrofit, 15% solar	100% retrofit	-	-	-
<b>Market segments addressed</b>	91% residential, 5% gov. bld, 4% comm bld	70% comm, 30% gov.	100% gov. bld	-	100% gov. bld	100% gov. bld

# Green deal post-Covid19 transformation presents a major economic diversification & job creation opportunity for MENA

*A few feasible stimulus measures w/ strong socioeconomic benefits (including multiregional job creation) & decarbonization effects*



# Investment in Renewable Energy, mainly solar, can be an important job creation opportunity in MENA

Figure 12: Renewable energy jobs by region for the Energy Transition in 2050

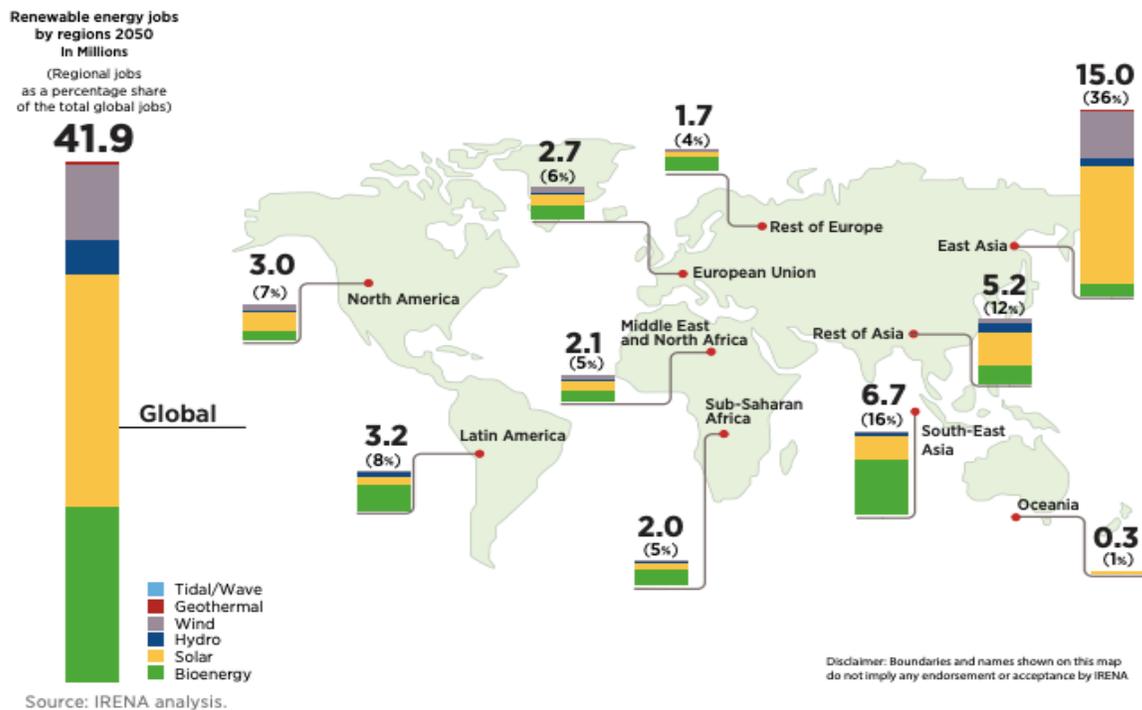


Figure 25: Renewable energy jobs, Middle East OPEC

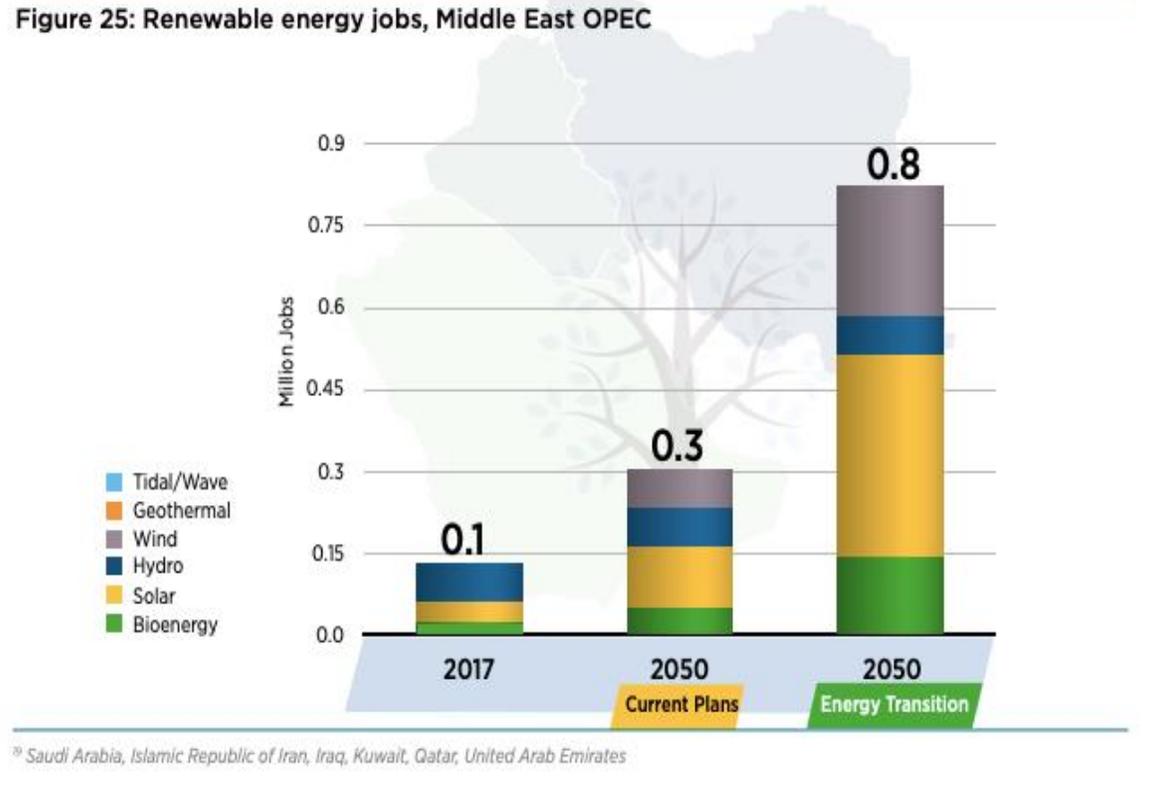


Figure: Renewable Energy jobs in the Middle East by 2050  
(Source: IRENA 2020 report on Measuring the socio-economics of transitions: Focus on Jobs.)

# How can MENA grow & develop its Clean Energy market?

## Policy & Institutional

- Adopt a Zero Net Emissions Policy
- Elimination of fossil fuel subsidies
- Widespread use of clean energy & clean technology
- E-transport systems
- Unified regional standards to remove barriers to trade & investment

## Financing

- Low-carbon transition policies
- Introduce carbon taxes = revenue + raise energy efficiency + fund decarbonization strategies
- Support for small-scale players & installations
- Facilitate New Energy Financing (green and blue bonds & sukuk)
- Develop Green Banks to fund private sector (energy efficiency to retrofitting, to climate risk mitigation investments)

## Adopt innovations

- Energy storage
- Implement Blockchain (for power/ grid chain) & AI to increase efficiency
- Explore new avenues: hydrogen (UAE, Oman, KSA)

# Concluding observations

- Rising sea water levels, high temperatures, particulate pollution, lack of freshwater resources, growing populations & fast urbanisation make **MENA a climate change hotspot. But region also falls within the global sunbelt** => more energy falls on world's deserts in 6 hours than world consumes in a year
- Time to tap the competitive advantage the region **& invest in renewable energy**; will also support the move to **build more diversified, resilient, greener & fairer economies post-Covid19**
- No trade off: investment in renewables are a **source of economic growth, economic diversification and job creation**
- In addition to greater investments in clean energy, the MENA region also needs to:
  - **Remove fossil fuel subsidies and gradually introduce carbon taxes**
  - Support the roll-out **energy efficient policies**
  - Explore and encourage activity in new avenues like **hydrogen market & e-mobility**
  - Focus on **sustainable finance** + increase issuance of green & blue bonds + encourage climate related financial disclosure + introduce carbon taxation and trading

**Thank you**  
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