

Clean Energy in MENA and Ireland

Shared Experiences on a Journey to a Net-Zero Future

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Enterprise Ireland MENA and the Clean Energy Business Council Middle East & North Africa are delighted to host a joint seminar and networking event on the “Shared Experiences on a Journey to a Net-Zero Future”. Keynote speaker includes Minister Robert Troy TD.

Tuesday 5th October 2021, 18:30 - 21:00 (GST)
Venue: Capital Club, Dubai



Robert Troy TD

Minister for Trade Promotion, Digital
& Company Regulation

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Dr. Nasser Saidi

Chairman

Clean Energy Business Council MENA

Clean Energy Market in MENA

Finance, Mobility, Hydrogen, Energy Efficiency



CEBC: a Regional NPO & NGO promoting Clean Energy & Technology

A NPO, NGO membership organisation

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

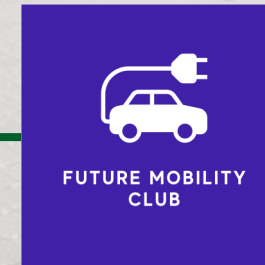
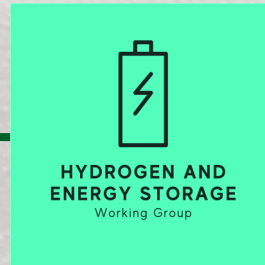
Establish a **dialogue between the public and private sectors**



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

Clean Energy Ecosystem in the MENA region

Building blocks of the Clean Energy Ecosystem



Megatrends: 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.

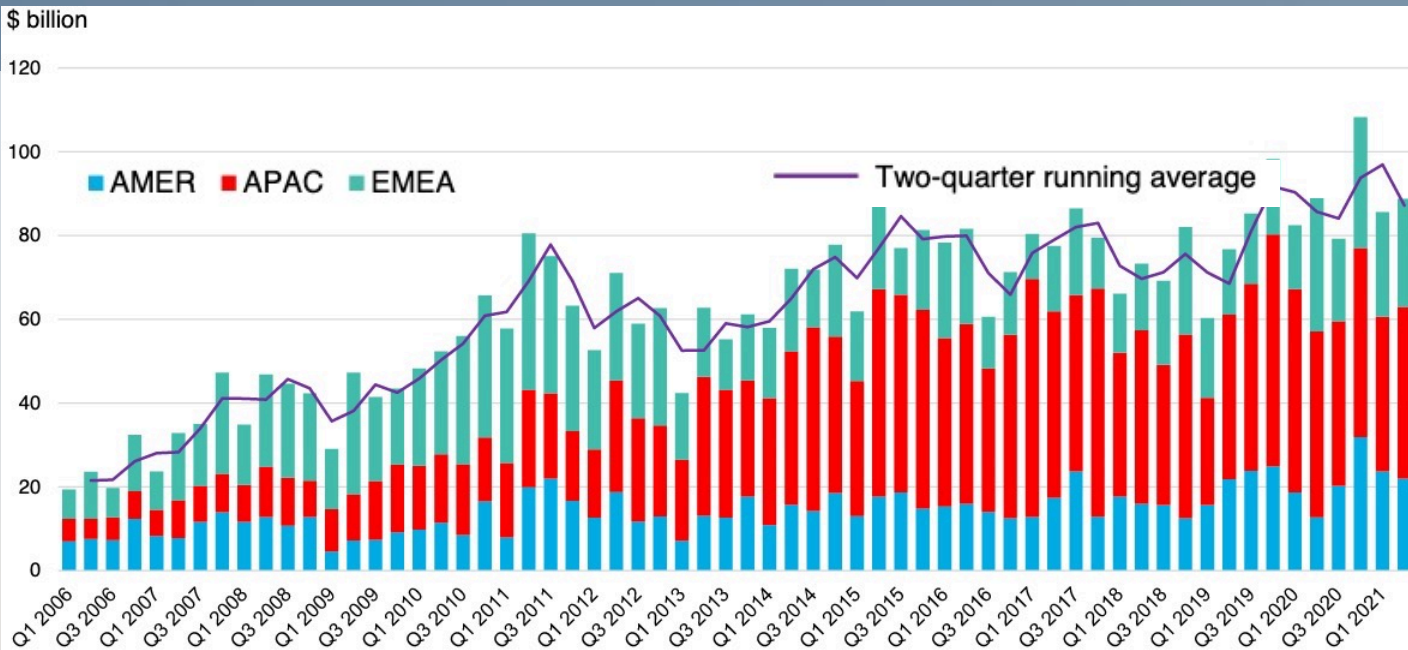


Health, happiness and well-being: With improving living conditions, health and happiness are becoming a priority for the population.

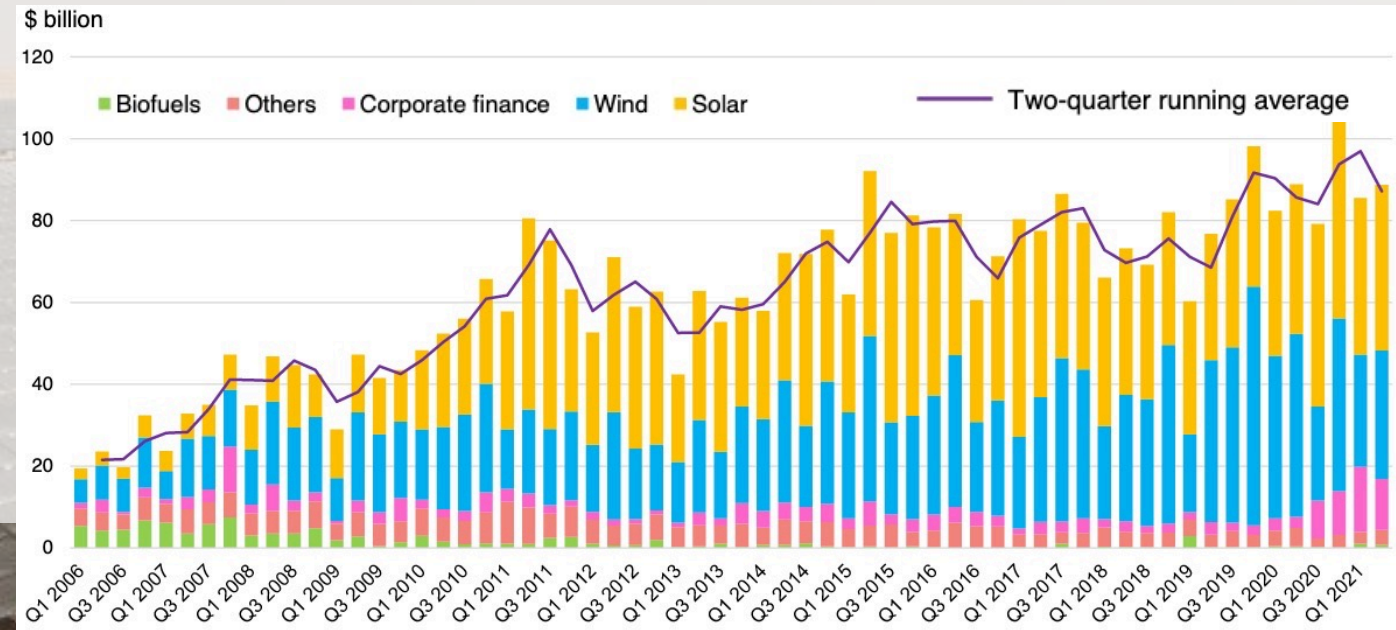


Artificial intelligence, robotics and automation increasingly integrated into daily activities & processes. How does this impact the energy transition? What is the impact on labour markets?

New investment in renewable energy, by region & sector

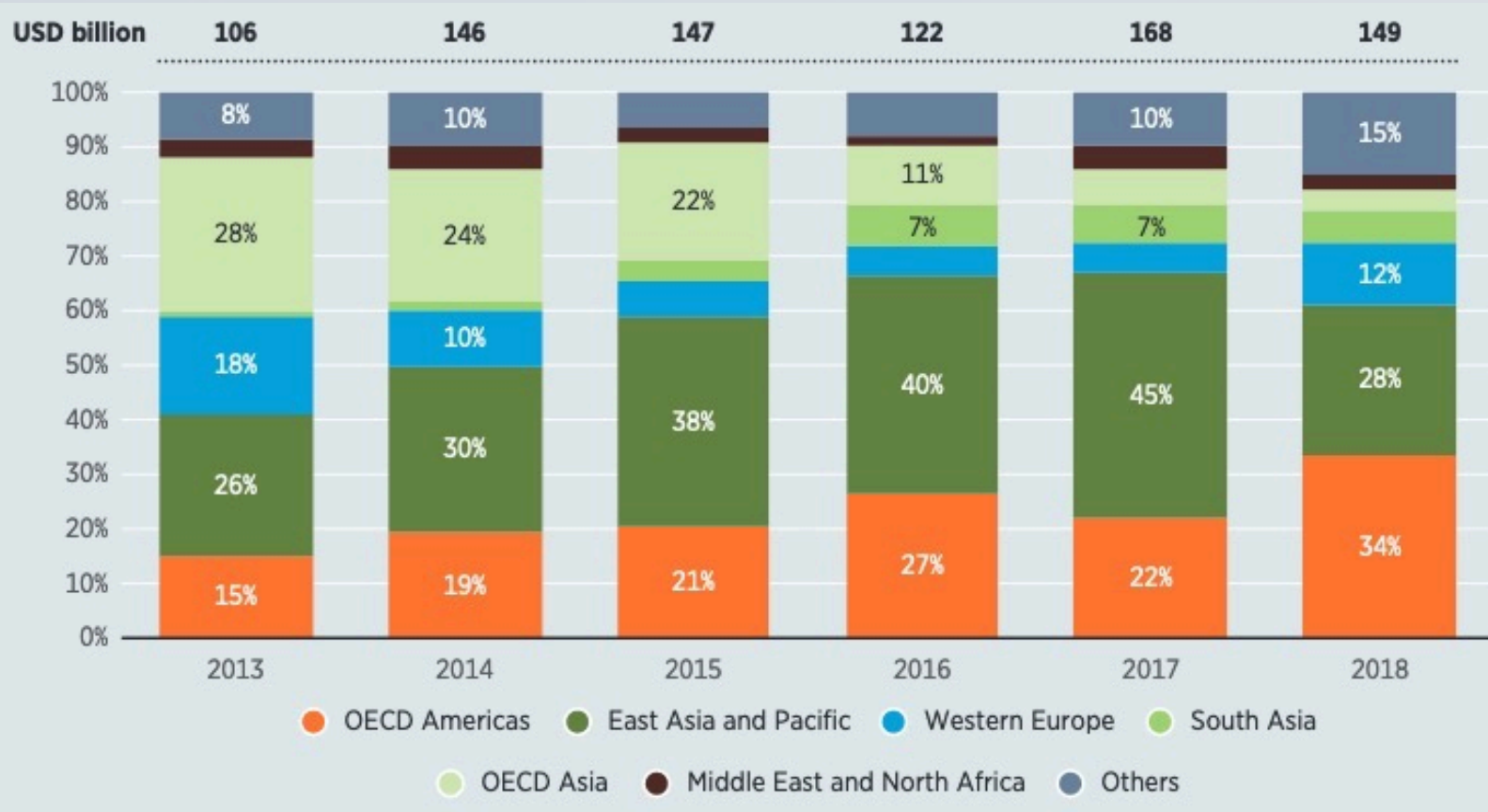


Source: Renewable Energy Investment Tracker, 1H 2021, BNEF



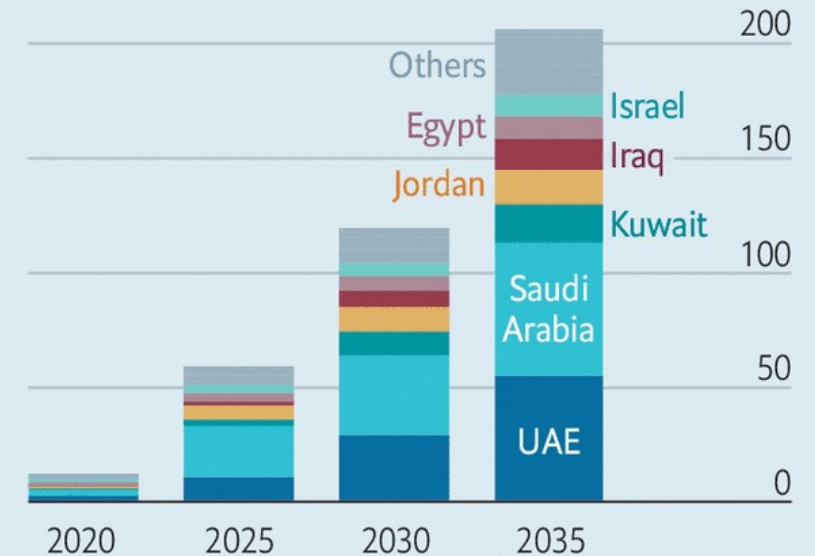
Investments in solar & projected solar capacity

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



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

Middle East, projected solar capacity*, GW



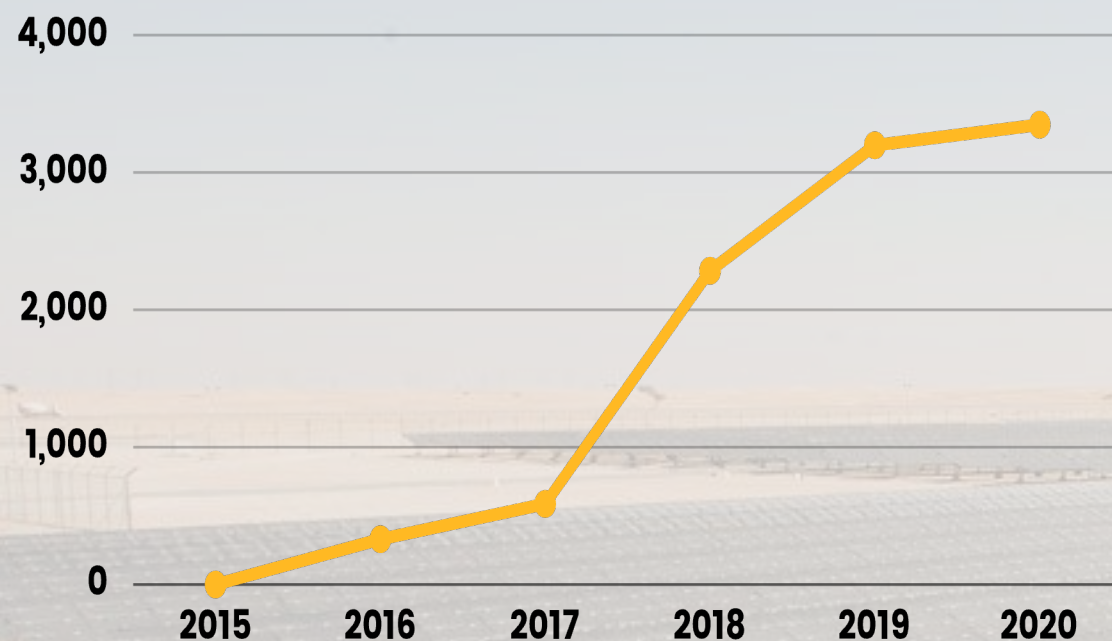
Source: "Under a cloud: The future of Middle East gas demand", by Robin Mills

Climate Finance in MENA: in its infancy

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%
MENA	\$54.25 billion	2.13%
China	\$4,12 billion	1.00%
MENA without Shari'ah compliant investments	\$17.1 billion	0.67%
India	\$1.1 billion	0.67%

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

Climate Finance in MENA: Status and Challenges

“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**

E-mobility in MENA

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 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

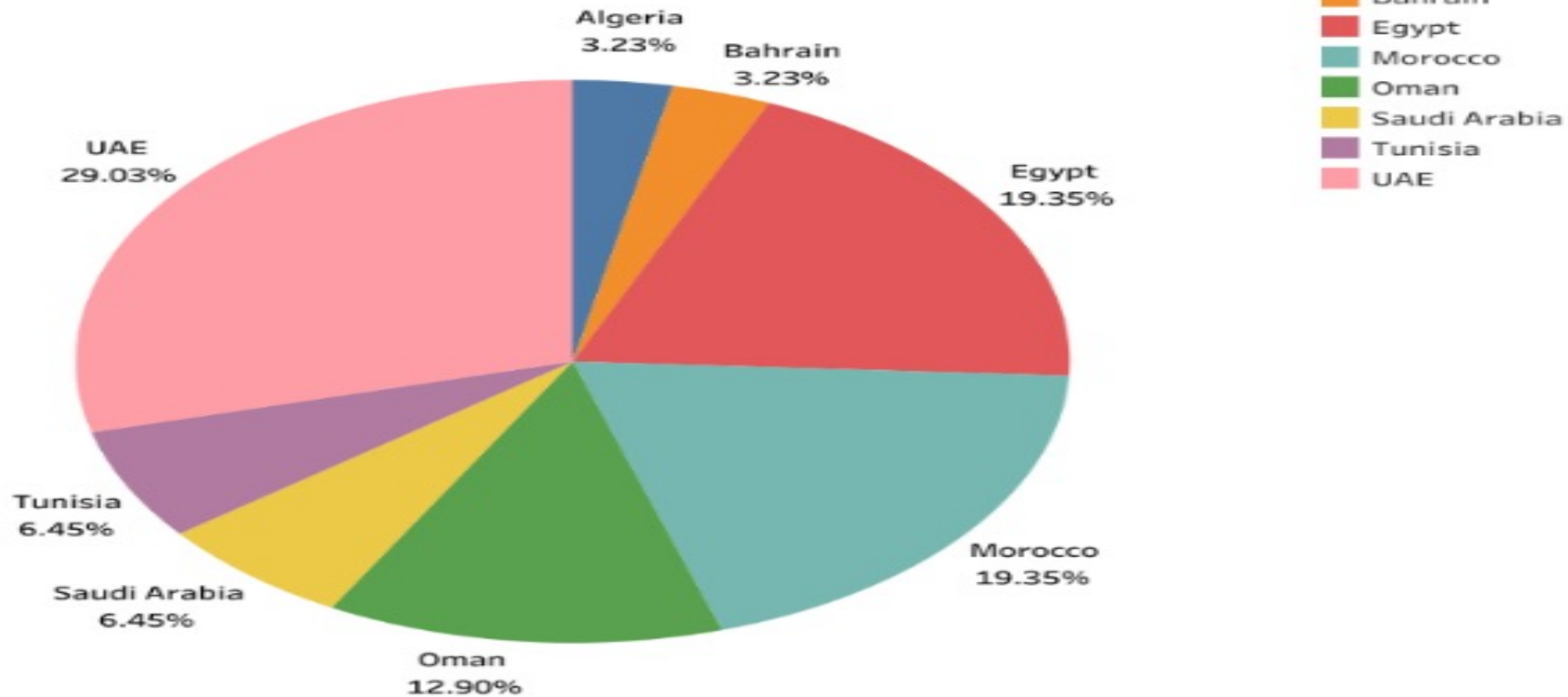
- Highest number of EVs in the region.
- By 2025, low EV taxes and 3000 charging stations will be implemented.
- High gasoline prices helping transition to EVs faster.
- Government will and support to the transition to EVs.

Qatar

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

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

Green and Blue Hydrogen Percentage Share in MENA



Investments of \$55bn, 5.3 mn tonnes

Energy Efficiency in MENA

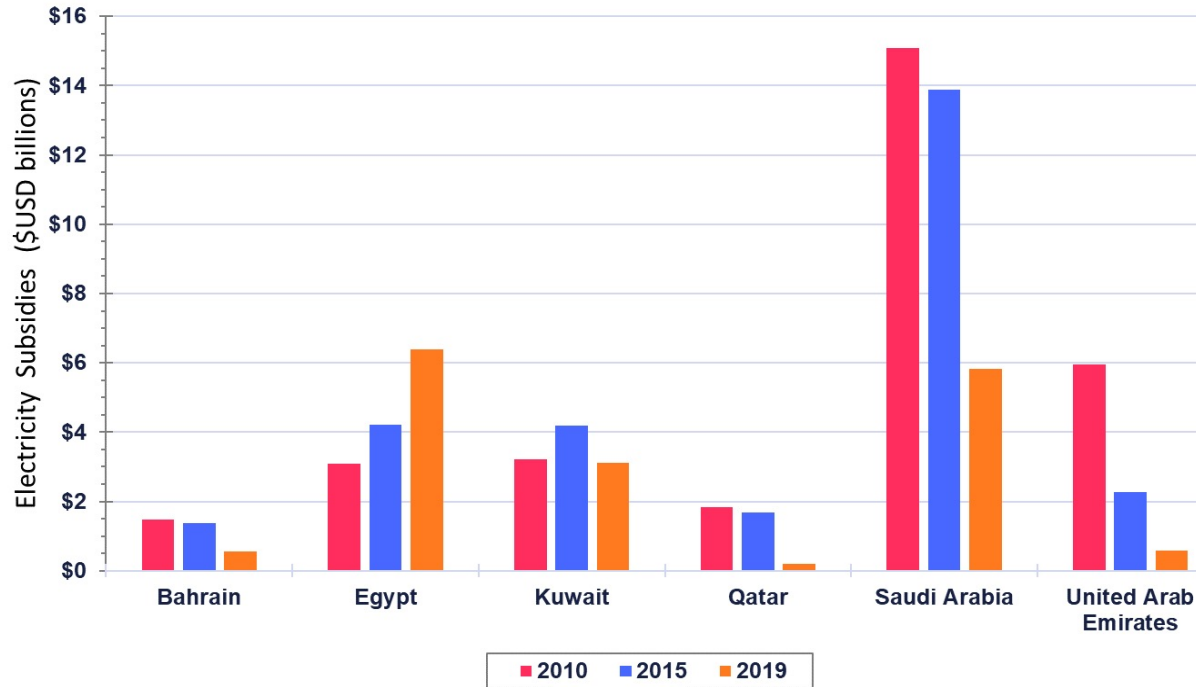


Figure. Electricity Subsidies from 2010 to 2019

(Source: International Energy Agency Data and Statistics webpage)

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

Energy Efficiency in MENA: ESCOs emerging, but fragmented market



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

Fossil fuel subsidies hit USD 5.9trn in 2020

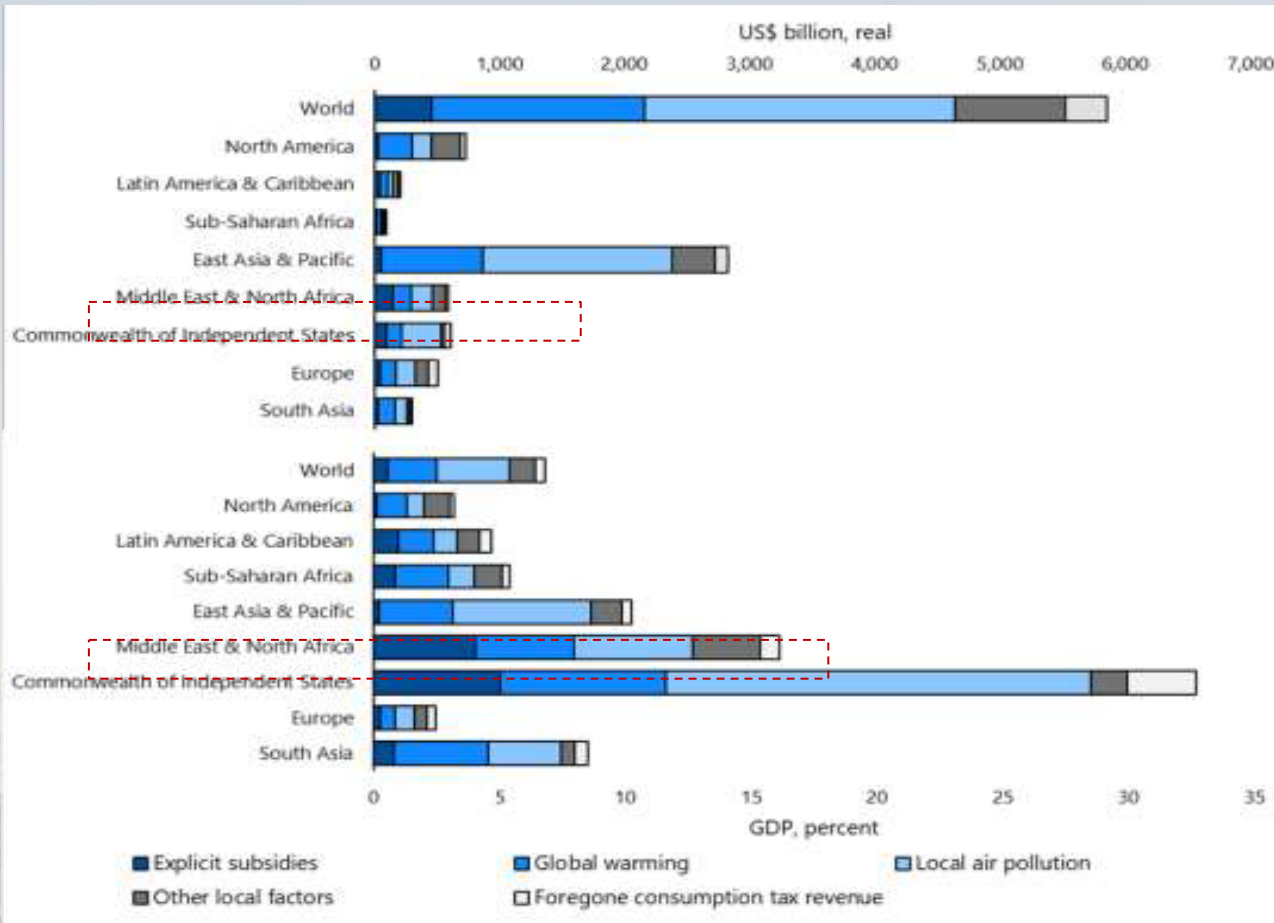


Figure. Global Fossil Fuel Subsidies by Component, 2020

(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.

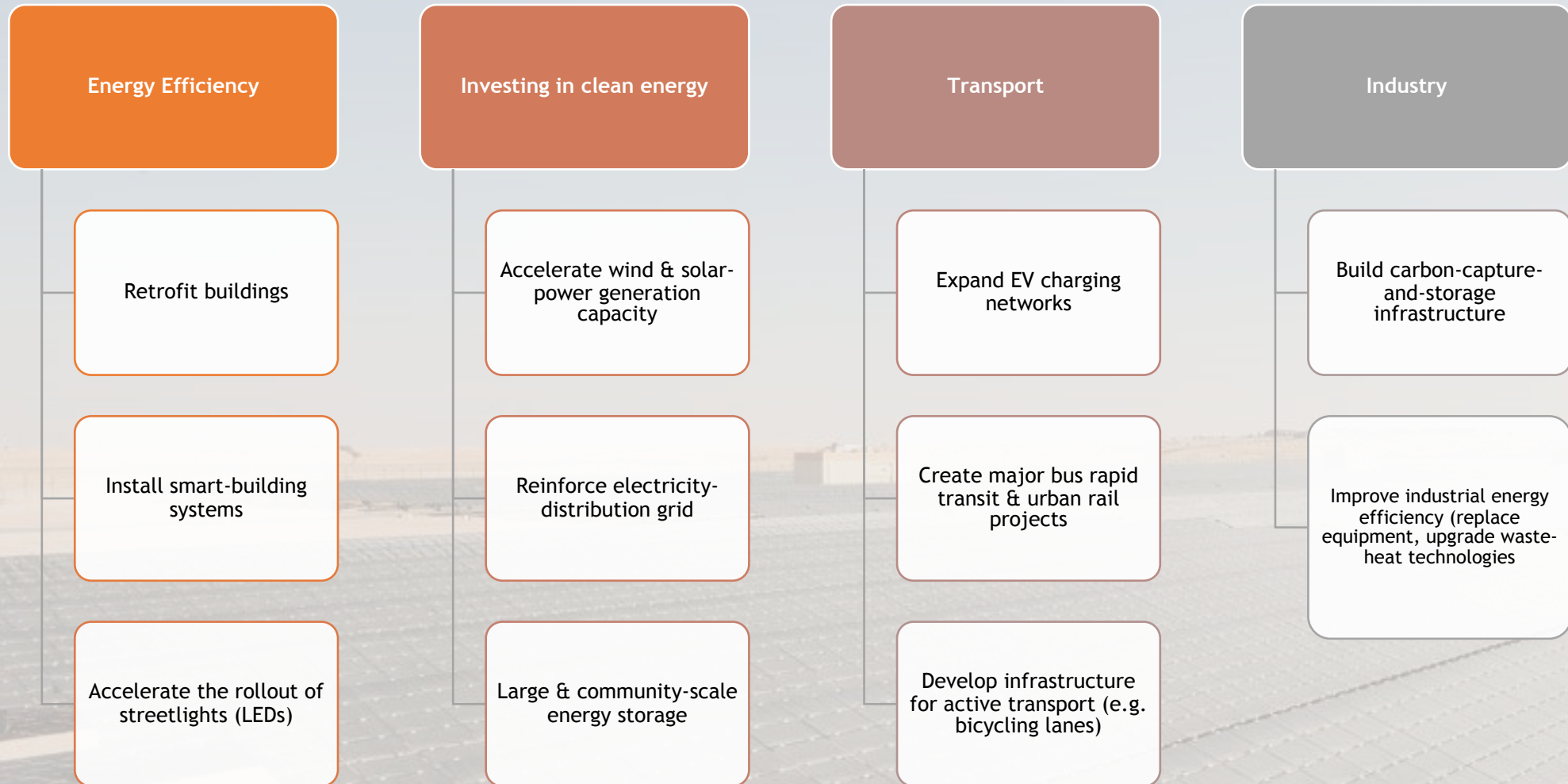
Countries subsidize fossil fuels in 2 ways: undercharge for the product or for other costs (like damage to the planet & people's health)

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 CO₂ 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

Green post-Covid19 transformation presents a major diversification opportunity for MENA

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



Clean Energy Jobs in MENA

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

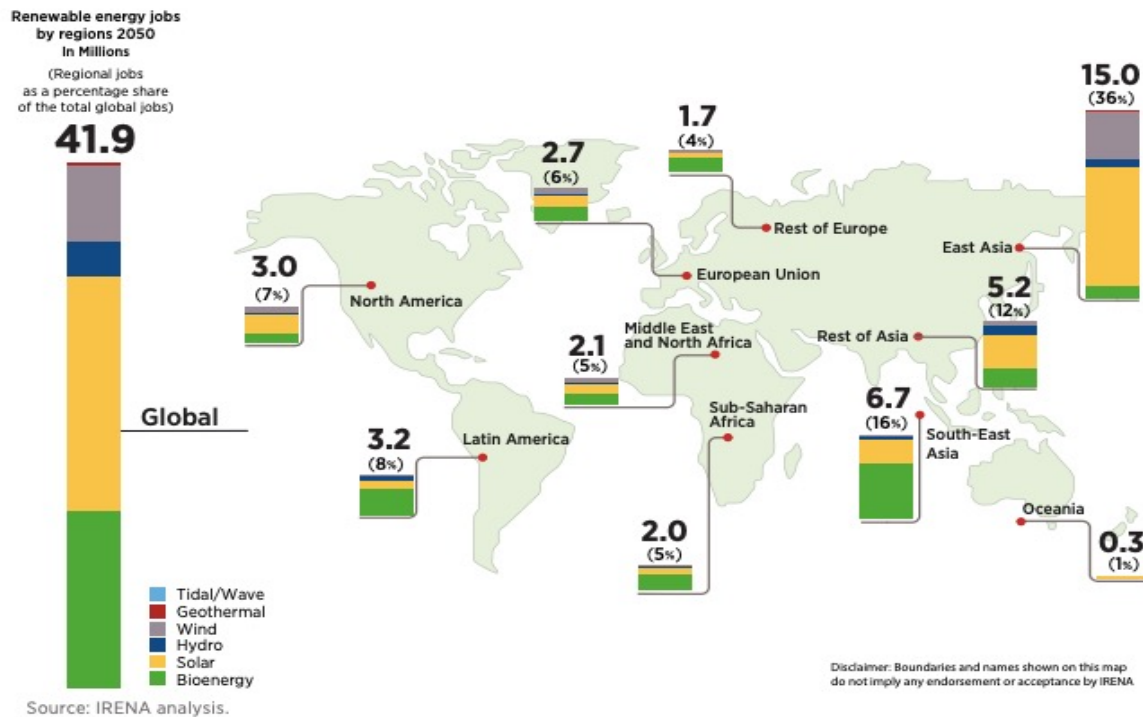


Figure 25: Renewable energy jobs, Middle East OPEC

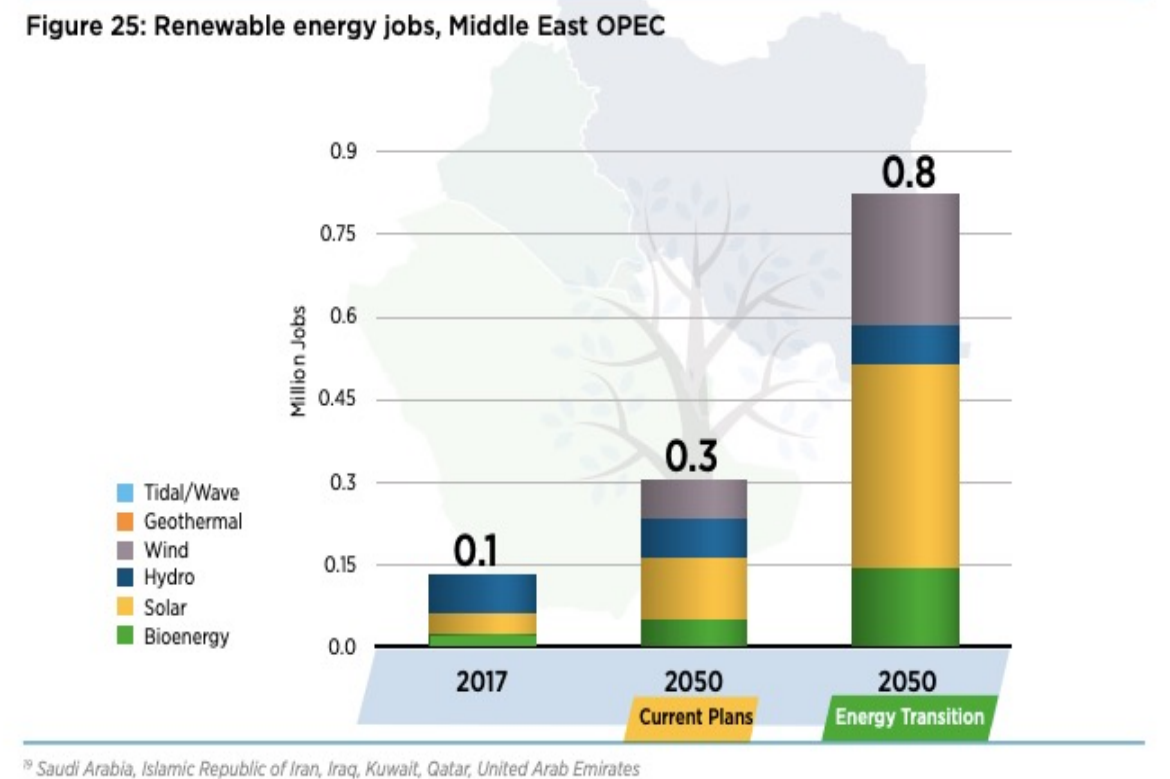


Figure: Renewable Energy jobs in the Middle East by 2050

(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** (sustainable transport infrastructure, ranging from bike lanes to metro systems, energy efficiency for existing buildings)
 - 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

Visit our website at:
www.cebcmena.com

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Irish Innovations

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Jake Bracken

Project Development Manager at
Lumcloon Energy

Lumcloon Energy Limited

An Experienced and Diverse Project Development Company Based in Ireland.

Striving to fill a crucial role in the development of clean energy solutions and to support the transition to a decarbonised power system.



Our Portfolio to Date

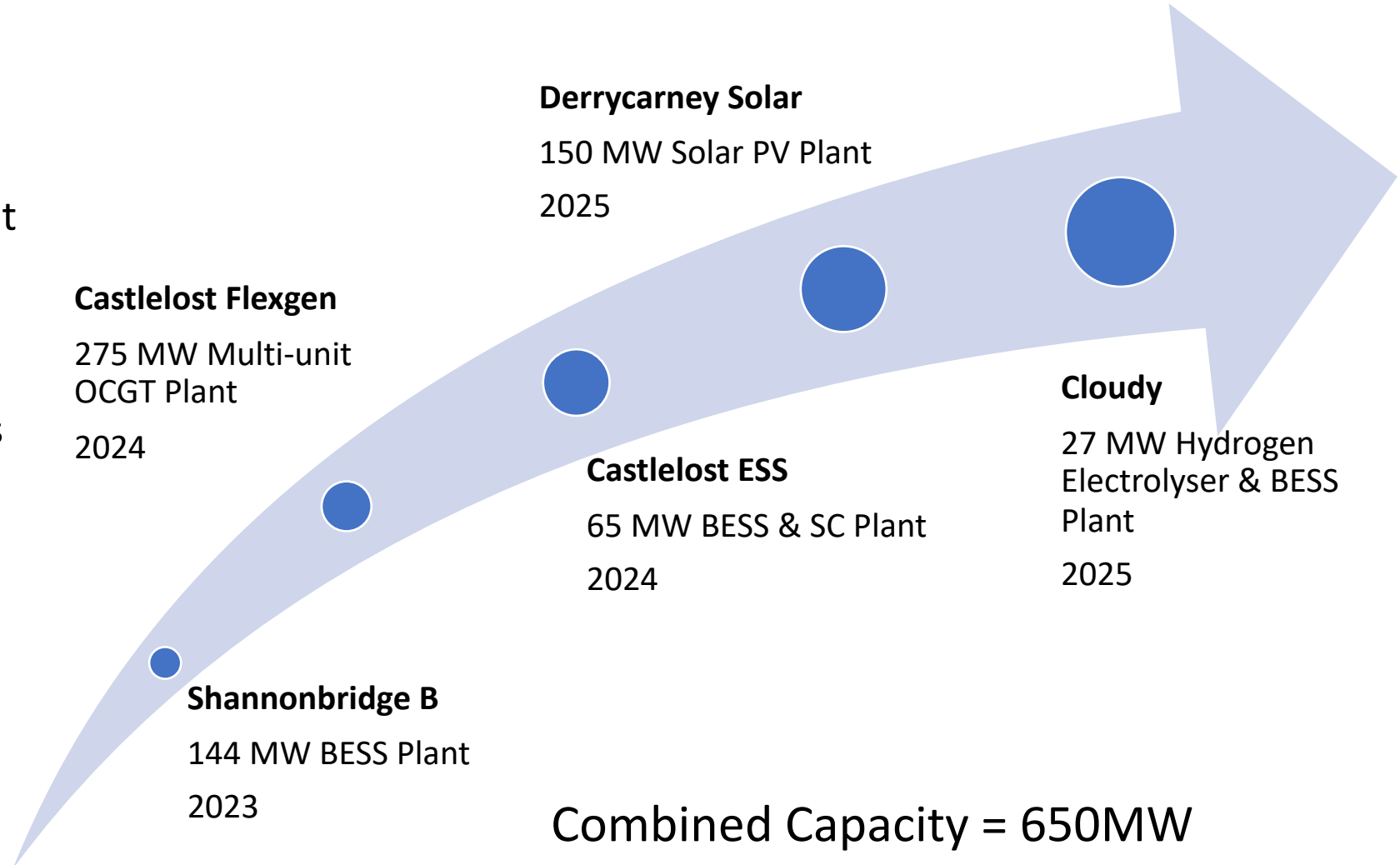
- Founded in 2008.
- In 2013 we began our first pilot demonstration project in Rhode, hybrid fly wheel and battery.
- Two Battery Energy Storage Systems, each supplying 100MW Capacity.
- Landmark projects for Ireland.
- One of the biggest in Europe
- Supply System Services to the Irish power system, enhancing the management of Irelands transmission grid.



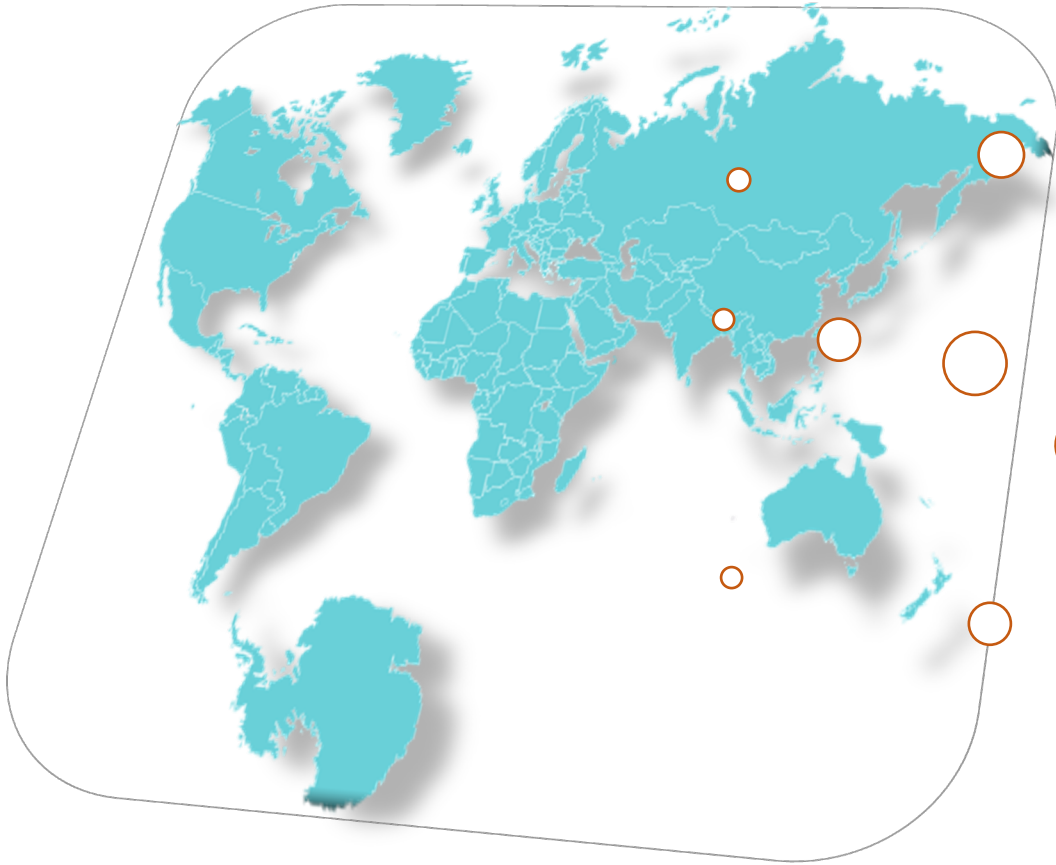
Lumcloon Energy's Project Pipeline

Ireland is the Ideal Testbed

- Ireland's existing generation fleet is stressed.
- Decarbonisation targets are driving a change to new sources of electricity.
- Electricity demand is increasing due to large data centres and the transition into electrical vehicles.



Why We Are Here At The WETEX Exhibition



Learn about International
Markets & Discover New
Projects
Opportunities

Meet New Technology
Providers and Learn about
New Technology
Advancements

Develop New Partnerships
Ranging in Areas From
Technical Expertise to
Financing

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Tony Hennebry

Executive Director - Operations and Finance at
Green Biofuels Ireland

Panel: Energy Efficiency in MENA & Ireland



Catherine Workman

Partner and Head of Middle East a
Pinsent Masons



Dr. John Rafferty

Country Manager - Oman at
ESB International



Jim Healy

CEO of NuLumenTek



Andrea Di Gregorio

Executive Director at the Energy Efficiency
and Renewables Office (Reem) of Ras Al
Khaimah Municipality, UAE.



Graeme Sims

Executive Director
Dubai Regulatory & Supervisory Bureau
for Water & Electricity (RSB)

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Declan O'Connor

Managing Director of BHSL Waste Solutions

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John McGrath

Sales Director, Aquamonitrix Ltd



Real-Time Nitrite & Nitrate Analyser
WETEX 2021, Dubai
October 5 to 7, 2021

Presented by Aquamonitrix ® Directors
Mark Bowkett & John McGrath
E: info@aquamonitrix.com

Why Measure Nitrate and Nitrite in water ?



Drinking water
standards

Nitrate & nitrite
limits for safe
drinking water



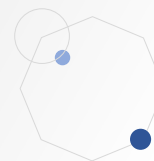
Wastewater
process control

Nitrate and nitrite as
control parameters to
optimize WWTPs



Environmental
protection

Nitrate & nitrite
environmental
impacts on surface &
groundwater



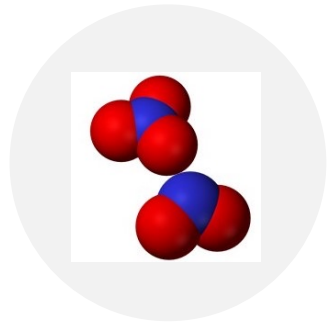
Why Aquamonitrix®?

Limitations of current nitrate & nitrite monitoring



Long wait time
& high costs

Laboratory results can take hours to days. High lab & manual sampling costs



Cannot measure
nitrite & nitrate

Limited options for **simultaneous but selective** detection of nitrate & nitrite



Instrument drift
& low accuracy

ISEs & UV provide low resolution, accuracy, and precision. High instrument drift.



Blockages &
biofouling

Blockages & biofouling are issues in **wastewater** samples



High life-time
costs

Frequent recalibration and/or servicing, high chemical use, need for skilled personnel.



Aquamonitrix® combines rapid ion chromatography & LED detection for



Simultaneous, selective detection of nitrate & nitrite in situ



In fresh or wastewater

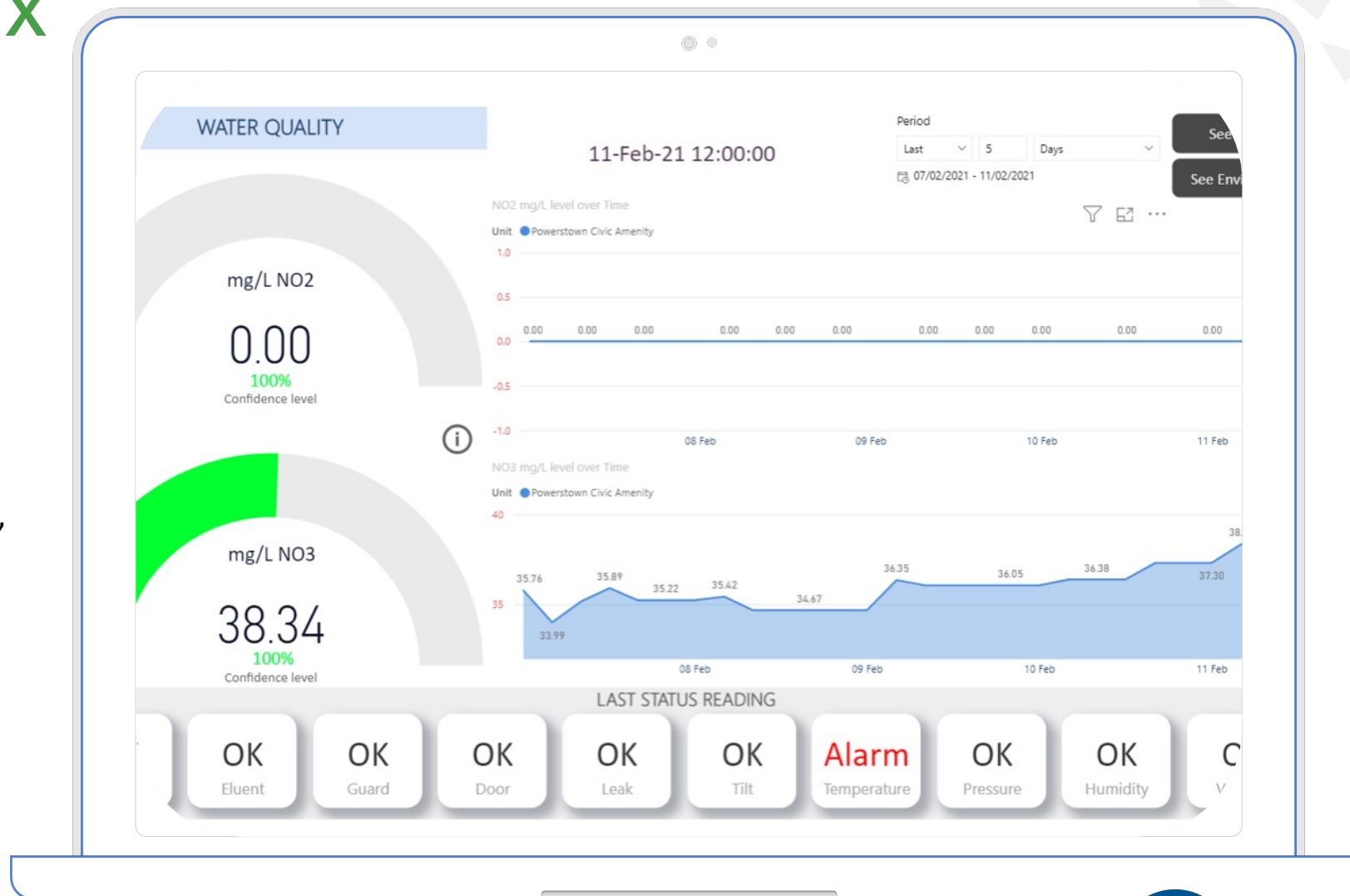


Instant data communication via SCADA or IoT



Optional data management platform

- Store & analyze data
- Set up analyzers on territory, plant and unit basis
- Assign users and email distribution lists
- Set up alerts and alarms
- Get analyser self-diagnosis data



Applications for Aquamonitrix®



Optimizing Wastewater Treatment

Reducing costs, energy use & greenhouse gas emissions
Sewage treatment authorities
Dairy, meat, farm, fertiliser, etc, industries



Environmental Protection

Environmental monitoring & enforcement
Land-use planning
Research & mitigation strategies



Protecting water quality

Safe nitrate & nitrite levels to protect against asphyxiation
Drinking water treatment
Recirculating aquaculture systems

In summary

- Simultaneous & selective nitrate & nitrite measurements
- Lab-quality accuracy & precision
- Portable, fast set-up, no requirements for specialized sampling systems
- Robust operation in wastewater, low blockage & biofouling potential
- Stable calibration, long deployment on site with no accuracy loss
- Simple servicing regime, long intervals between servicing
- Low power & chemicals usage, low intervention needs, low requirements for specialized technical skills
- All adding up to low OPEX / lifetime costs & simple, hassle-free monitoring

Thank you for listening

T: +353 59 9149097

W: <https://aquamonitrix.com>

E: info@aquamonitrix.com



NITRATE & NITRITE SENSOR
Real-Time | Accurate | Simple

Clean Energy in MENA and Ireland

Shared Experiences on a Journey to a Net-Zero Future

Kevin Sherry – Enterprise Ireland