Navigating the Energy Crisis: A Middle East Viewpoint

Presentation at the Global Investment Management Summit

Dr. Nasser Saidi

28 March 2023

Agenda

Global Energy Crisis & its Consequences

Weaning Away from Fossil Fuels & Investing in Renewable Energy

Geopolitics & Emergence of a New Global Energy Map

View from the Middle East:

- **Economic Recovery, Recent Oil Windfall & Climate Crisis**
- **Energy Transition to Combat Climate Change**

GCC at the Centre of a Transformed, New, Global Energy Map

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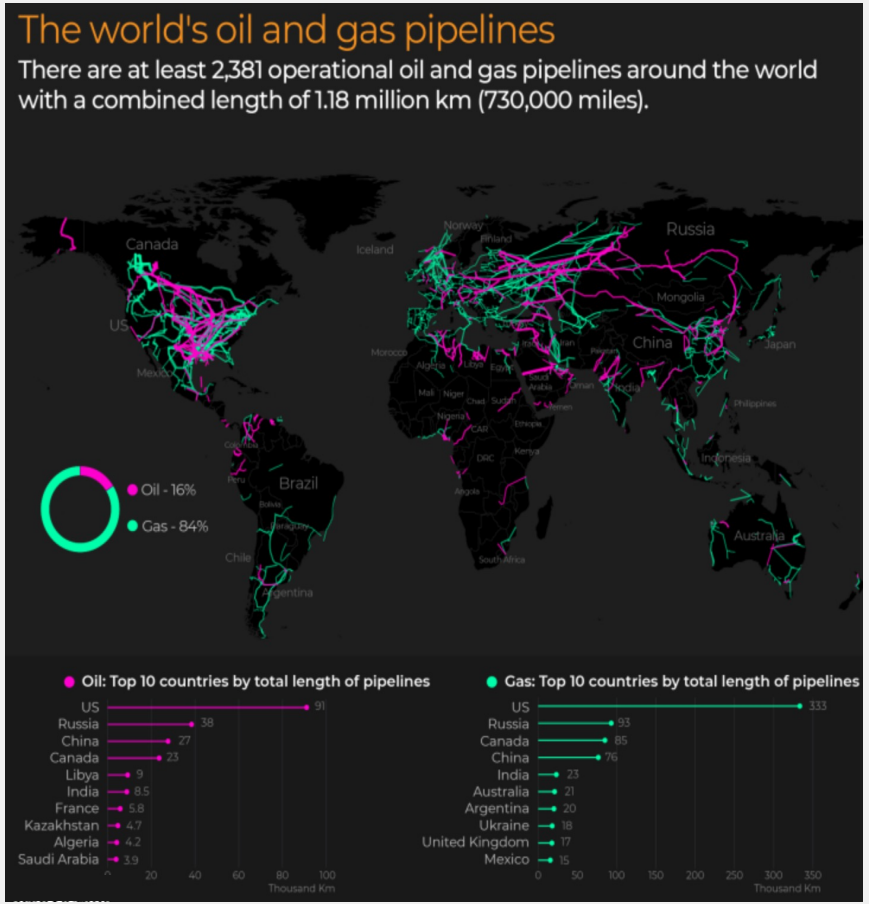
Global Energy Crisis: Sources & Consequences

Sources

- Post-Covid19 recovery (supply shortages, policy stimulus)
- Russia-Ukraine War disruptions; sanctions
- Non-diversification of supply sources: over-dependence on Russia
- Infrastructure inflexibility
- Underinvestment in new production capacity and pipelines following GFC

Consequences

- Energy security & new energy trade patterns (Russia- China & India)
- Higher energy prices -> inflation, recession
- Increased Renewables Investments & accelerate energy transition
- Decarbonization / NZEs
- O&G industry adapts (clean energy & hydrogen strategies)

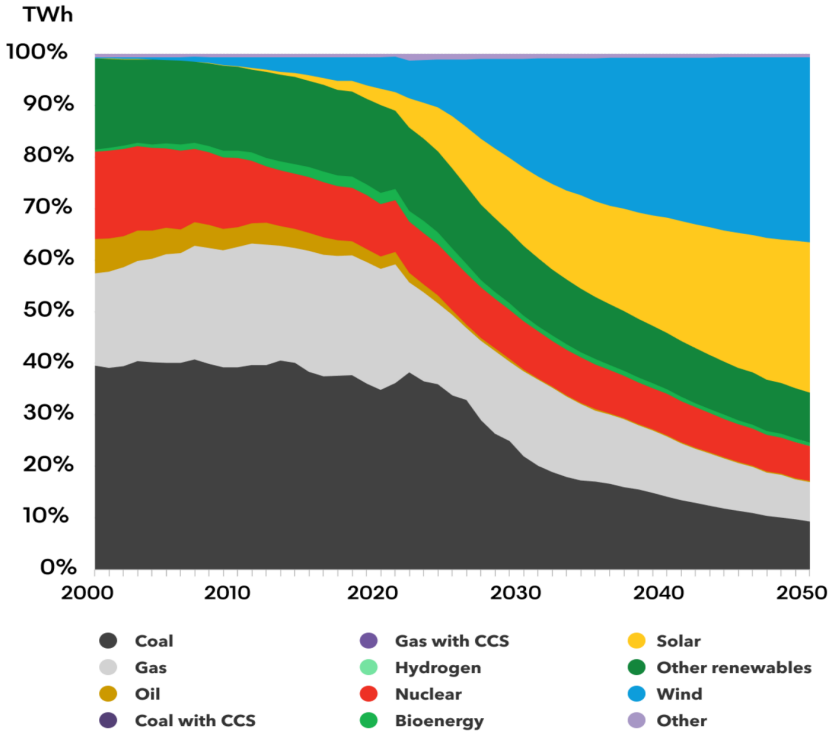


Source: Global Energy Monitor via Al Jazeera Dec 2021

Global Energy Crisis + Investments in Renewable Energy & Climate Risk-Resilient Infrastructure = A New Global Energy Map

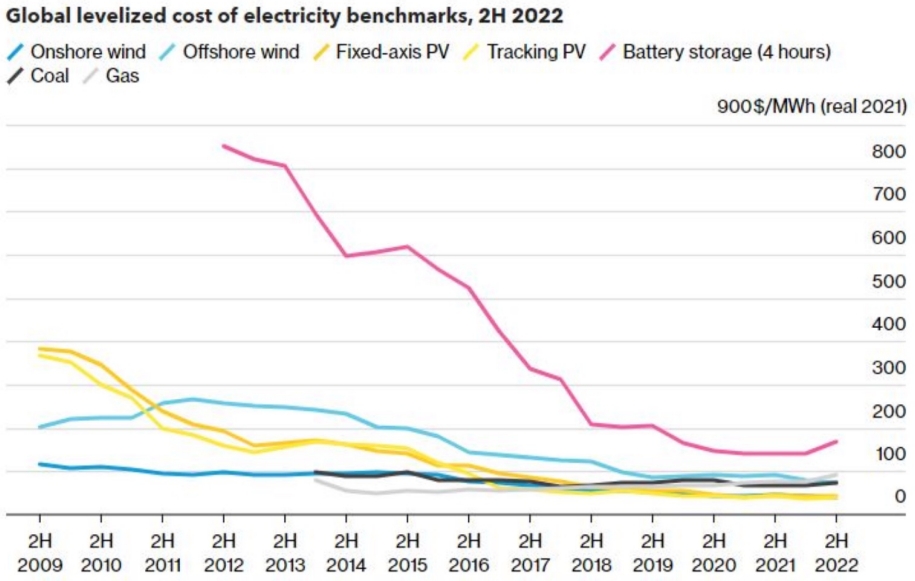
Increase of renewables' share in the global energy mix:

Electricity generated by technology, based on how energy transition might evolve from today as a result of cost-based technology changes



Source: BloombergNEF World Energy Outlook 2022

Cost of renewable power generation continues to fall



Technological innovation is accelerating adoption & integration of clean energy systems

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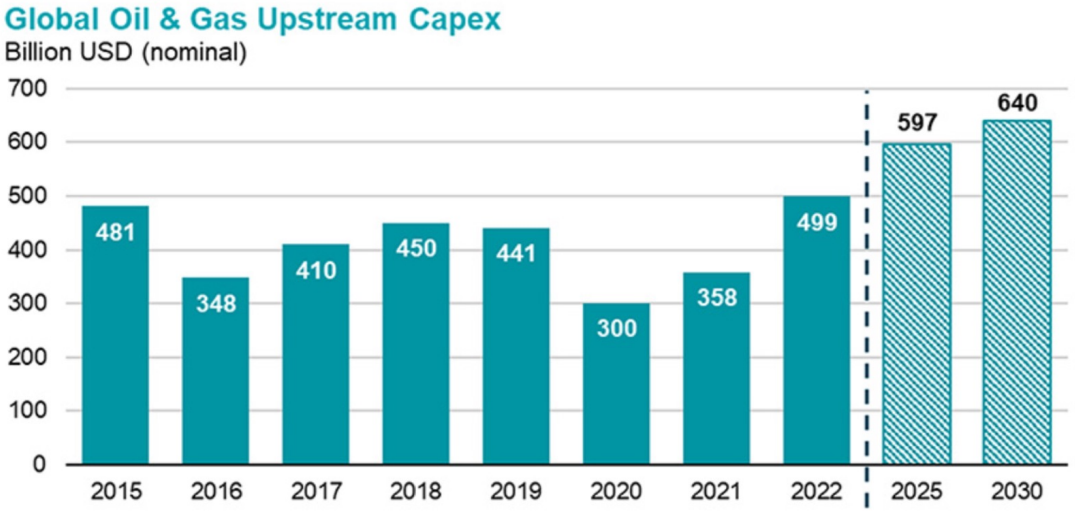
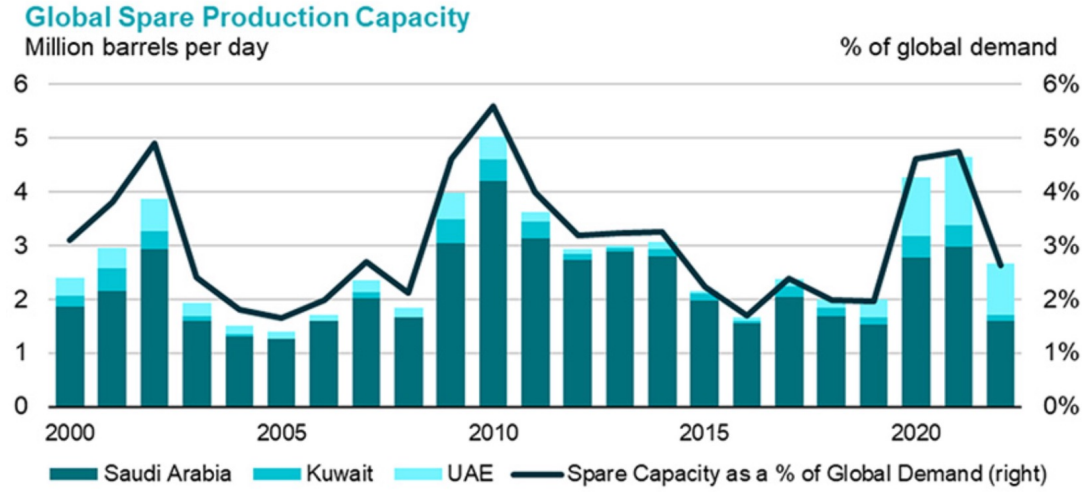


Need additional investments in O&G production capacity & pipelines

Cumulative investment of $4.9trn needed globally b/n 2023-30 to meet market needs, prevent supply shortfall



Current global spare production capacity is only 2-2.5mn barrels per day and nearly all of it is held by Saudi Arabia and the UAE

Source: International Energy Forum, Feb 2023
https://www.ief.org/focus/ief-reports/upstream-investment-report-2023#figures

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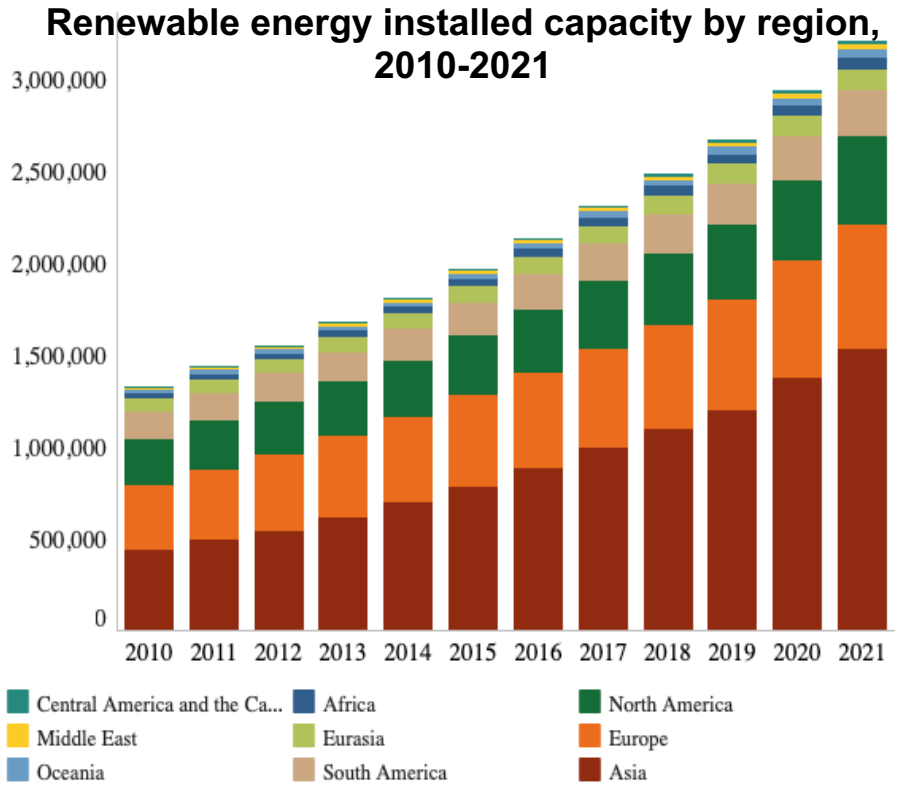
Renewable Energy Capacity has been rising, but more action is required…



Source: IRENA

NZE commitments

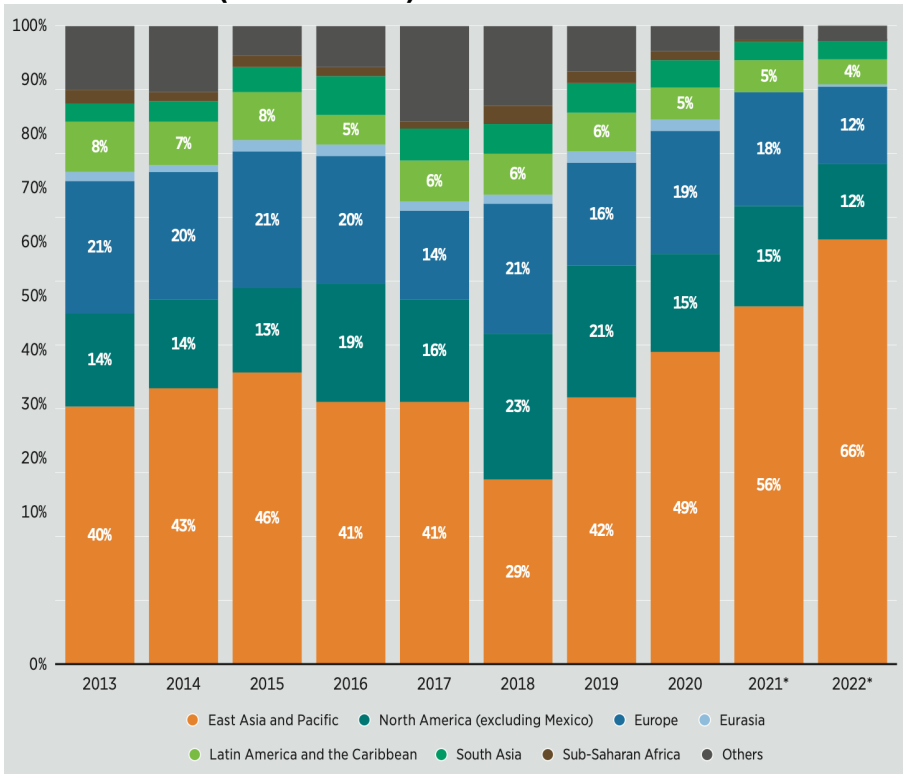
- Long-term commitments through laws/ constitutional amendments
- Multi-year budget commitments
- Develop standards for green projects
- Transparency & disclosure

Climate Finance opportunities

- Solar PV
- Building retrofits
- Energy efficiency investments
- Global initiatives like electricity storage, green hydrogen and biomethane

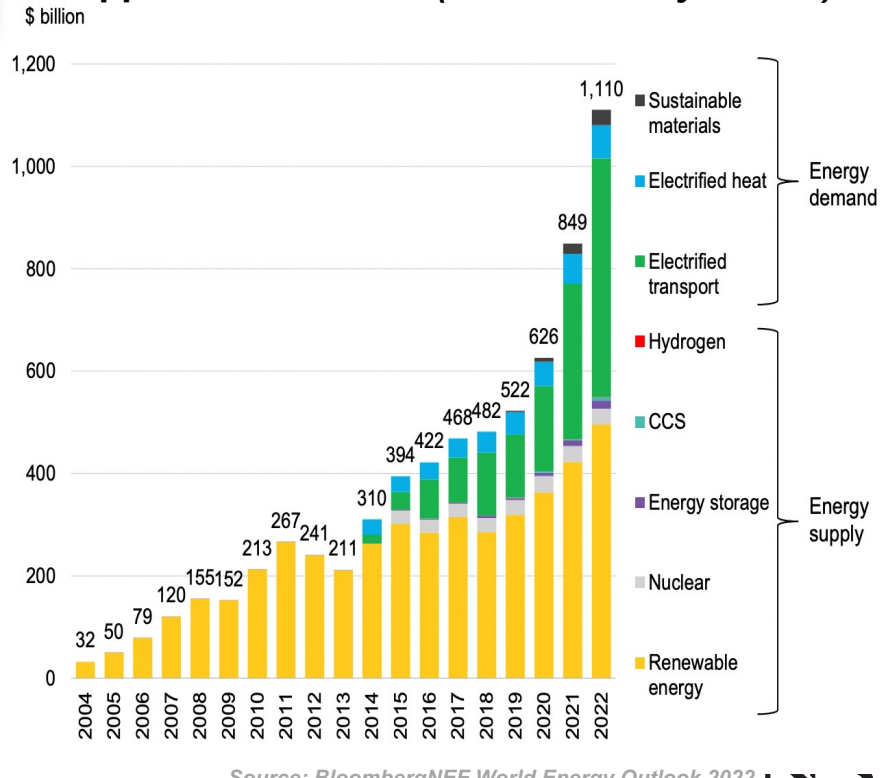
New Global Energy Map has seen rapid growth in Renewable Energy investments... but they are insufficient given NZE commitments.

Investment in Renewable Energy by region of destination (2013-2022)



Source: "Global landscape of renewable energy finance 2023", IRENA, Feb 2023; MENA is included in Others. Investments for 2021 and 2022 represent preliminary estimates based on data from BNEF (2023).

Global investment in Energy Transition topped $1trn in 2022 *(investment by Sector)*

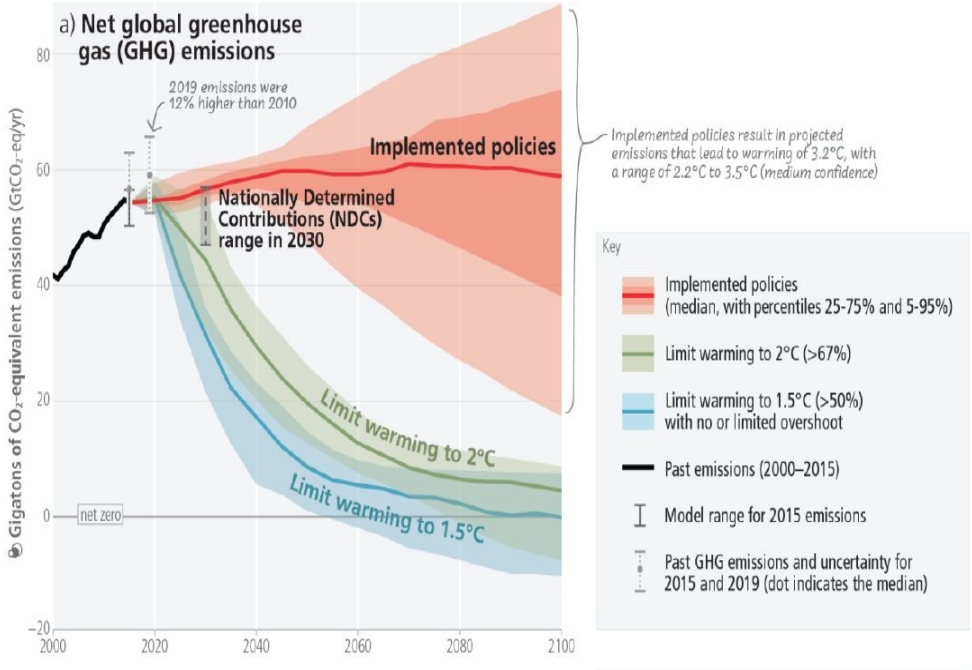


Source: BloombergNEF World Energy Outlook 2022

Massive Financing is Needed to Contain Emissions

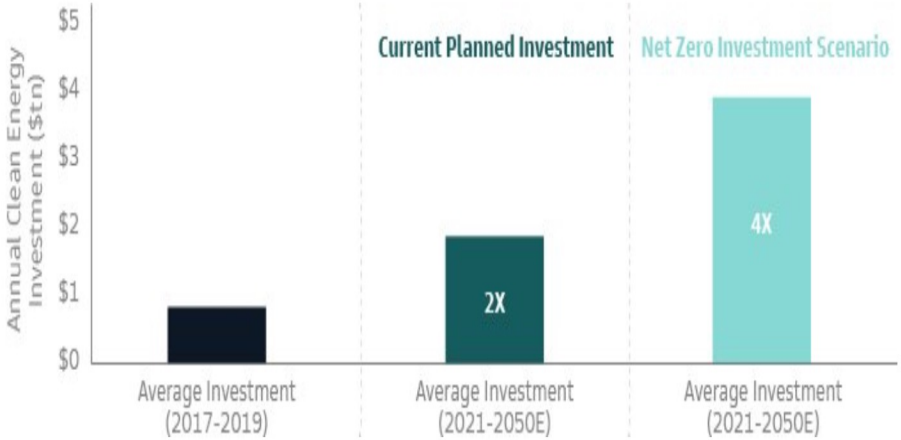
By 2030, the **global economy needs to emit 25% less GHG than in 2022** to have a fighting chance to reach goals set in Paris 2015 & avert likely catastrophic climate disruptions. **Requires a step change in investment & deployment of CE, CT**

Limiting warming to 1.5°C and 2°C requires rapid, deep & in most scenarios immediate GHG emission reductions



Source: IPCC's AR6 Synthesis Report: Climate Change 2023

Around $4T of Clean Energy Investment Is Needed Globally Per Year to achieve NZE goals



Traditional energy companies will likely continue to play a major role (decades of experience in R&D & managing capital intensive projects + benefit from improving balance sheets with rising levels of free cash flow available to invest
Need ~$4tn per year on power generation, energy efficiency, renewable fuel switching and carbon capture

Source: Goldman Sachs Asset Management and IRENA (Aug 2022)

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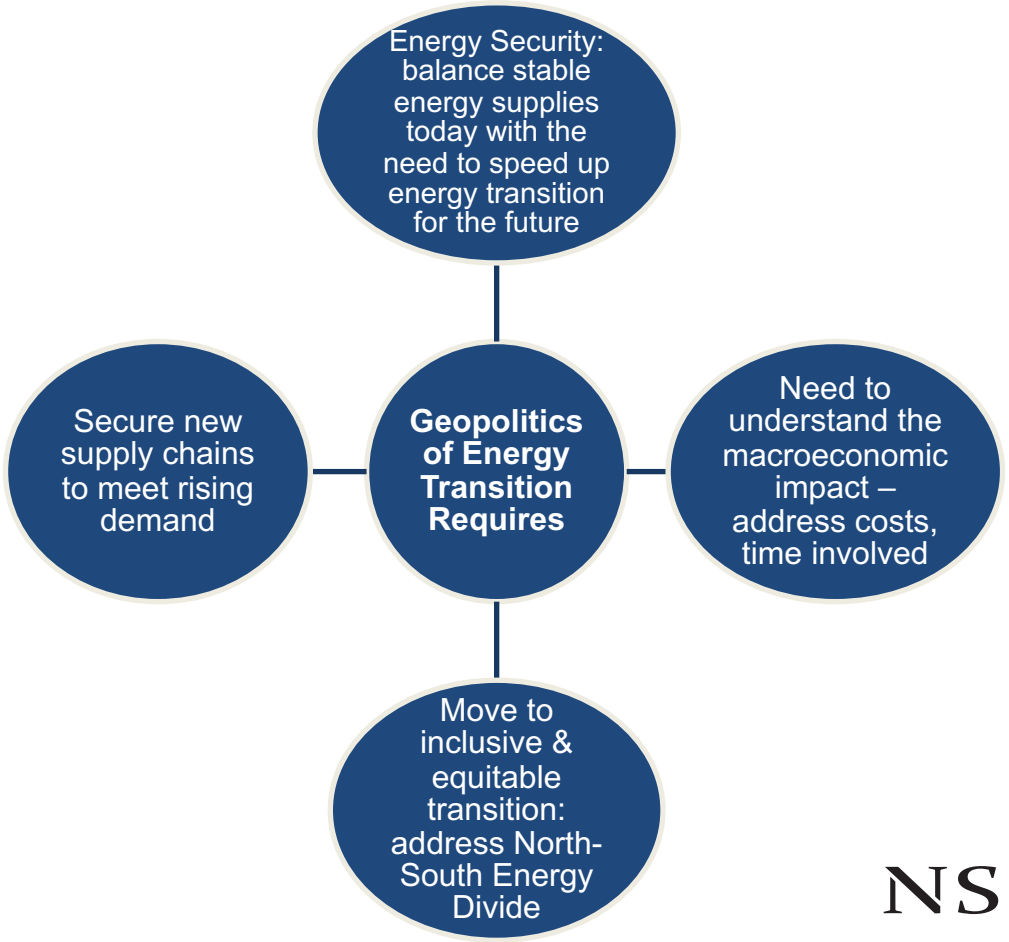
Geopolitics could delay emergence of a New Global Energy Map

Global Energy Crisis => **focus on national energy security & energy transition**

- US-China confrontation + Russia-Ukraine war is leading to increased **global fragmentation** and energy supply chain disruptions
- **Lack of global consensus on how fast the transition can and should take place**, in part because of its potential economic disruptions
- **Widening divide between advanced and developing countries**: investment is concentrated in advanced economies and China. Except in China, clean energy spending in emerging market & developing economies is stuck at 2015 levels: **growing risk of two speeds and widening gaps**



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The State of the Energy Transition

Demographics, urbanization, energy efficiency & economic growth drive energy consumption patterns.

Global energy consumption remains skewed towards non-renewable resources, though the share of renewables is rising.

Energy requirements: massive investments required in clean energy & tech, as well as O&G.

Around $4trn of Clean Energy Investment is needed globally p.a. to comply with NZE commitments

Energy Crisis & Security: dependence on O&G, especially imported, is unlikely to disappear quickly

Energy trade: profound reshuffling of global trade patterns (e.g. Russian O&G to China & India; Iran)

Energy supply: cost of production is an important determinant of future oil & gas production. **Brent breakeven price for Middle East producers is the lowest globally.**

Bottom line: New geopolitical & energy market realities accelerate the quest for long-term affordable, sustainable, clean and secure energy. Dependence on the Middle East will grow.

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Middle East highly exposed to Climate Change Risk; COP28 will witness major new commitments.

Rising temperatures: over past three decades, temperatures in the Middle East have already risen by 1.5°C, **twice the global increase of 0.7°C.** By 2050, average summertime temperatures could exceed 30°C in half the region's countries!

Global warming is exacerbating desertification, water stress & rising sea levels. 20% reduction in water supply in the Middle East could decrease GDP by up to 10%.

Negative impact on GDP: a temperature increase of 1°C in 5 of the hottest countries (Bahrain, Djibouti, Mauritania, Qatar & UAE) results in an immediate decline in per capita economic growth of ~2 percentage points.

Climate migration: 22.3 million people worldwide were internally displaced globally due to extreme weather events in 2021 & accelerating with climate change.

Growing risk of Stranded Fossil Fuel assets. Global losses range between USD 21.5 -30.6trn

Climate Risk Mitigation & Adaptation are urgent priorities

- Develop & implement **Climate Change strategies, not just NZEs**
- Massive investment in Renewables & Climate Tech
- Increase **role of the private sector**
- Measures to **contain & reduce emissions:** carbon taxes, reduce subsidies & strengthen regulation
- Boost public **investment in climate resilient infrastructure**
- **De-risk fossil fuel assets: privatisation**
- Build **financial & institutional resilience** to natural disasters/climate risk

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3 Stages of GCC's Economic Transformation

Initial Phase: Oil discovery & modernisation

- Moving from nomadic lifestyle to creating urban spaces
- Use of oil wealth to build the economies: GDP growth + fiscal, current & BoP surpluses
- Massive spending on infrastructure, health, and education => raise standards of living
- Creation of Sovereign Wealth Funds to manage oil wealth
- Peg to the USD for monetary stability

Economic Diversification 1.0

- Population surges: young demographics + immigration
- Melting Pot of nationalities, cultures, races, religions, ethnicities drives innovation
- Build up of world standard hard & soft infrastructure, transport & logistics
- SEZs as a means of clustering, diversification & private sector development
- Liberalisation of rights of establishment, trade, FDI
- International Financial Centres (ADGM, DIFC, QFC) to manage & deploy region's Wealth and Assets

Future: Soaring Falcons

- **Digitalisation & New Tech** sectors (Space, AI, transversal tech)
- Emerging **Global Energy Map** & energy transition/ NZEs
- Attracting specialised **human capital** + more labour mobility
- **New economic partners** (via FTAs)
- **Regionalised Globalisation**: Driving & supporting Regional Economic Integration
- **Role of SWFs** – reorienting to new investment sectors/ domestic development…

Common factors: political stability, absence of burden of legacy systems (tech, regulations/ legal), sound & liberal macroeconomic policies, low taxation, peg to the $, no financial crises

MENA: Divergent Recoveries; GCC Recovery Driven by both Oil & Non-Oil Sectors

	GDP ($bn)	Real GDP growth (% yoy)		Inflation (% yoy)		Fiscal balance (% GDP)		Current account bal (% GDP)	
	2022	2022	2023	2022	2023	2022	2023	2022	2023
Bahrain	43.5	3.4	3.0	3.5	3.4	-4.7	-6.0	8.6	5.0
Kuwait	183.6	8.7	2.6	4.3	2.4	14.1	14.1	29.1	23.0
Oman	109.0	4.4	4.1	3.1	1.9	5.5	2.3	6.2	3.6
Qatar	221.4	3.4	2.4	4.5	3.3	12.5	16.0	21.2	22.1
Saudi Arabia	**1010.6**	**8.7**	**2.6**	**2.7**	**2.2**	**5.5**	**3.9**	**16.0**	**12.3**
UAE	**503.9**	**5.1**	**4.2**	**5.2**	**3.6**	**7.7**	**4.9**	**14.7**	**12.5**
Algeria	187.2	4.7	2.6	9.7	8.7	-12.3	-11.3	6.2	0.6
Iraq	282.9	9.3	4.0	6.5	4.5	11.1	9.2	16.3	13.0
Libya	40.8	-18.5	17.9	5.5	4.0	15.8	22.1	16.6	24.5
Egypt	**469.1**	**6.6**	**4.4**	**8.5**	**12.0**	**-6.2**	**-7.4**	**-3.6**	**-3.4**
Jordan	48.1	2.4	2.7	3.8	3.0	-5.9	-6.6	-6.7	-4.8
Morocco	142.9	0.8	3.1	6.2	4.1	-5.3	-5.1	-4.3	-4.1
Tunisia	46.3	2.2	1.6			-6.6	-5.3	-9.1	-8.0

Source: IMF World Economic Outlook (Jan 2023), Regional Economic Outlook (Oct 2022)

UAE:

- GDP growth supported by oil & non-oil sectors
- New trade & investment linkages
- Privatisation & PPP, Capital market development, Structural reforms

SAUDI ARABIA:

- Ambitious Mega/ Giga projects support diversification efforts + jobs
- SWF investing in regional and domestic projects
- Capital market reforms & FDI, privatisation
- Ambitious plans to attract HQs, localization policies

EGYPT:

- IMF program & move to a flexible exchange rate
- Devaluation, double-digit inflation, dwindling reserves, high debt-to-GDP
- Financing gap of USD 17bn over the next 4 years: IMF

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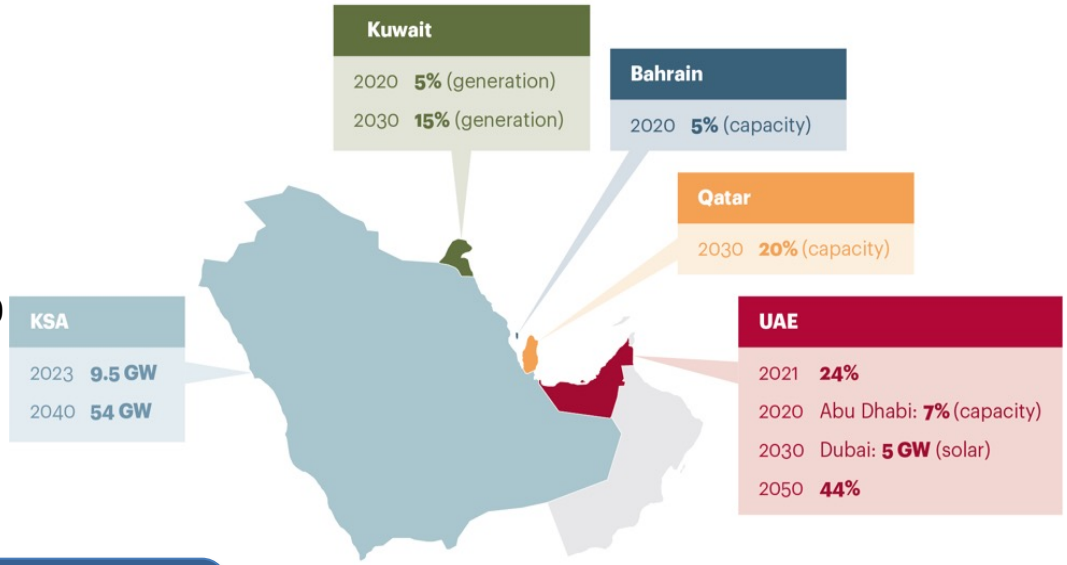
Energy Transition in the GCC & Combating Climate Change

MENA/GCC is exposed to severe climate risks but has immense clean energy potential…

- Region must **focus on the 'sustainable' element of the energy trilemma** (reliability, affordability, and sustainability)
- **Expansion** of renewables: **must increase by a factor of 10 to 14** for a consistent energy transition.
- **Total climate finance needed in** MENA region of USD 6.2bn+ annually & USD 62bn up to 2030

To meet increasing demand for electricity, the Gulf countries are investing in renewables



Climate Strategies should supersede NZEs

Phase out fossil fuel-based subsidies

Remove regulatory & other barriers to private sector

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Concerted privatisation drive by GCC govts

To diversify, raise revenue, develop capital markets & mitigate "stranded assets" risk

Company	Sector	Date	Deal size (USD)
Saudi Arabia			
Saudi Aramco	Oil & Gas	Dec 2019 - Jan 2020	29.4bn
Saudi Grain Organisations	Food	Jul 2020, Apr 2021	540mn & 997mn
stc	Telecommunications	Sep 2021	966mn
ACWA Power	Energy	Oct 2021	1.2bn
Elm	Technology	Feb 2022	897mn
Arabian Drilling Company	Oil field services	Nov 2022	712mn
Marafiq	Utility	Nov 2022	897mn
Abu Dhabi			
ADNOC Distribution	Oil & Gas	Sep 2020, May 2021	1bn, 1.64bn
Yahsat	Telecommunications	Jun-Jul 2021	810mn
ADNOC Drilling	Oil & Gas	Oct 2021	1.1bn
Fertiglobe	Fertilisers	Oct 2021	795mn
Abu Dhabi Ports Group	Logistics	Feb 2022	1.1bn
ADC	Holding Company	May 2022	100mn
Borouge	Petrochem	Jun 2022	2bn
Taqa	Energy	Sep 2022	3.6bn
Bayanat	Technology	Oct 2022	171mn
Adnoc gas	Oil & Gas	Mar 2023	2.5bn
Presight AI	Technology	Mar 2023	496mn
Dubai			
DEWA	Utility	Apr 2022	6.1bn
Jebel Ali Port, Free Zone & National Industries Park	Logistics	Jun 2022	5bn
TECOM	Real estate	Jun 2022	463mn
Salik	Infrastructure	Sep 2022	1bn
Empower	Utility	Nov 2022	724mn
Oman			
Abraj Energy Services	Oil & Gas	Mar 2023	244mn

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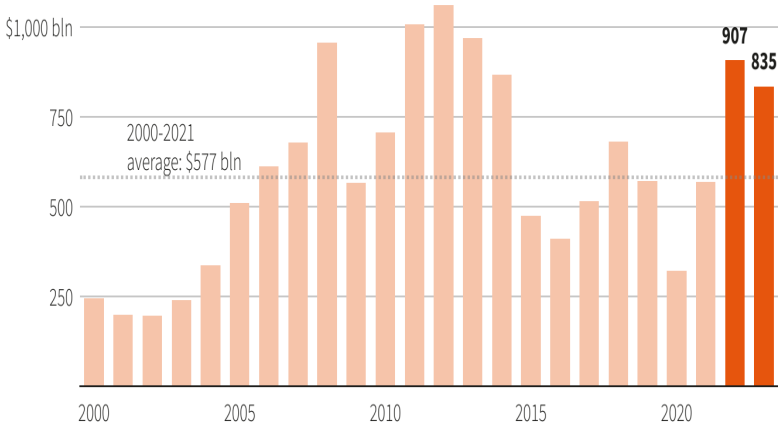
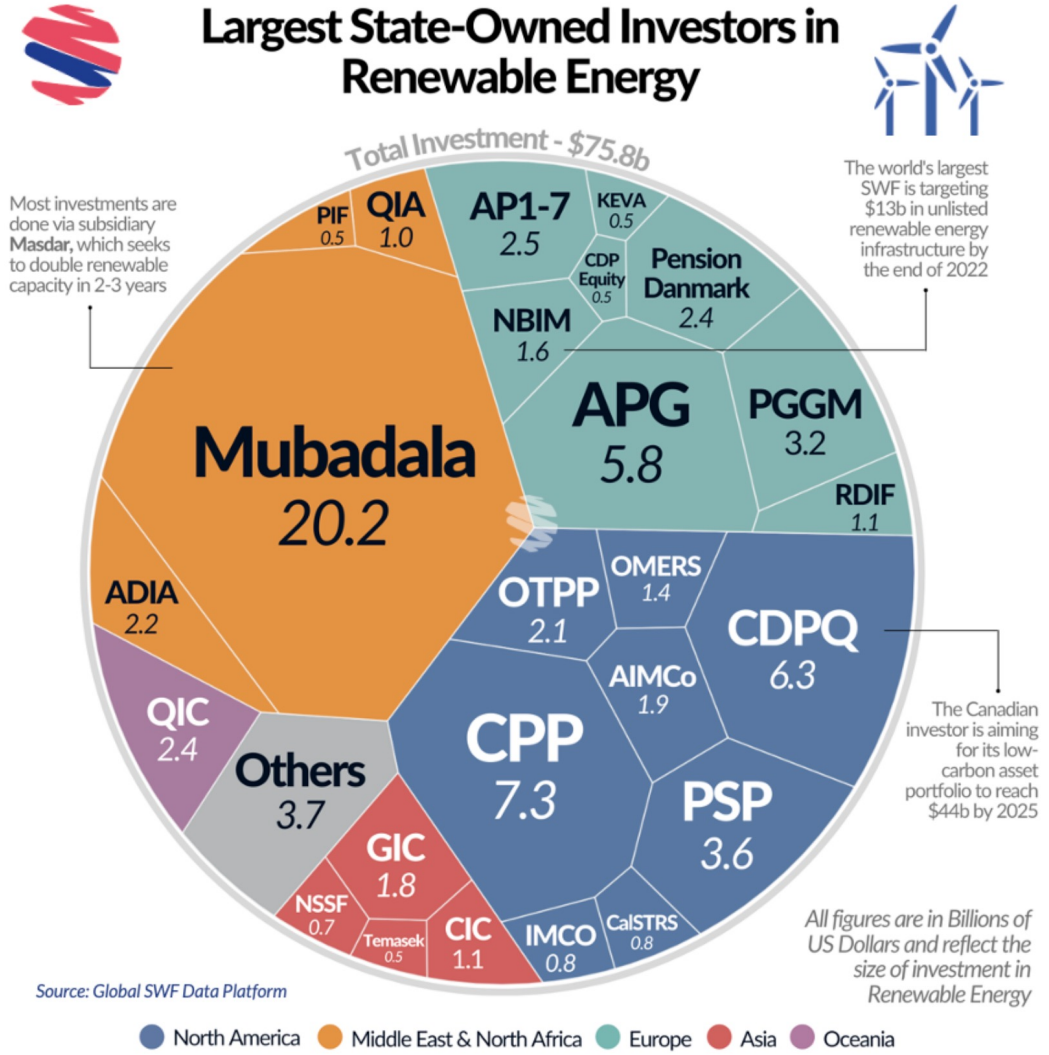
GCC SWFs Increased Reach *(Global, Regional, Domestic Investments)*

- **IMF: ME oil producers set for $1.3tn oil windfall through 2026**
- **SWFs pursuing domestic agenda** to support economic diversification & have become **more active in local** opportunities

OPEC members' annual net oil export revenue is forecast to surge



Source: EIA



New alliances forming to develop Green Hydrogen projects

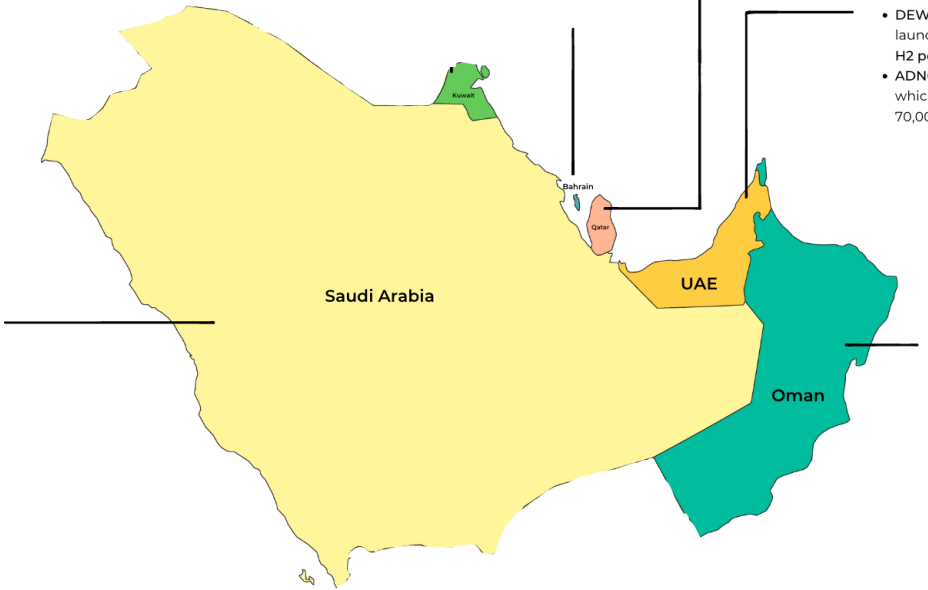
Growing potential of hydrogen in contributing to the energy transition… but market is in its infancy

- Declining renewable energy costs => **greater interest in green H_2 production**
- **Green hydrogen is estimated to be** produced for $0.70 - $1.60 per kg in most parts of the world **by 2050** - a **price competitive with natural gas**!

Qatar's Investment Authority, the country's investment arm, is studying a new investment project in the Suez Canal Economic Zone with investments exceeding $1bn. The project consists of a green ammonia unit

Sustainable Energy Authority (SEA) unveils plan to establish green hydrogen plant in late 2021, which is a 4 MW and will be built in its first phase on a land with **a total area of 20,000 square metres** and an **estimated cost of $150 million.**

- **DEWA and ENOC** sign MoU to develop and operate a joint integrated H2 use pilot project
- **ENGIE & Abu Dhabi's Masdar** partner to explore co-development of a UAE-based green H2 hub. Total investment of **$5bn** and capacity of **2GW by 2030**
- **DEWA and Siemens'** existing Green Hydrogen Project, launched in 2022, aims to produce **up to 1,000 kg of green H2 per day** by 2025
- **ADNOC** announced plans to build blue hydrogen facility which is expected to operate by 2025 and produce up to 70,000 tons of hydrogen per year



- **NEOM Green Hydrogen Project** in Saudi Arabia is the most prominent H2 project. An equal joint venture between **NEOM, Air Products, and ACWA Power.** It is expected to start operations by 2026 and **produce 600 tons per day** of clean H2 electrolysis and **will mitigate the impact of 5 million metric tonnes of carbon emissions per year**. Project cost is **$8.5bn with a capacity of 3.9 GW**
- Recent developments in the project include:
  - NEOM signed finance agreements amounting to $8.5bn to finance its clean energy facility
  - NEOM Green Hydrogen secured Saudi's first industrial operating license for Oxagon

- Hydrom signs six term sheets for six H2 projects worth more than $20bn. Renewable energy capacity of **15GW** required
- **Oman's 'Madayn' joined forces with the US company H2** Industries to establish a **$1.4bn waste-to-hydrogen plant** in Oman
- **Hydrom** marked multiple locations in the country to leverage for the development of planned H2 projects

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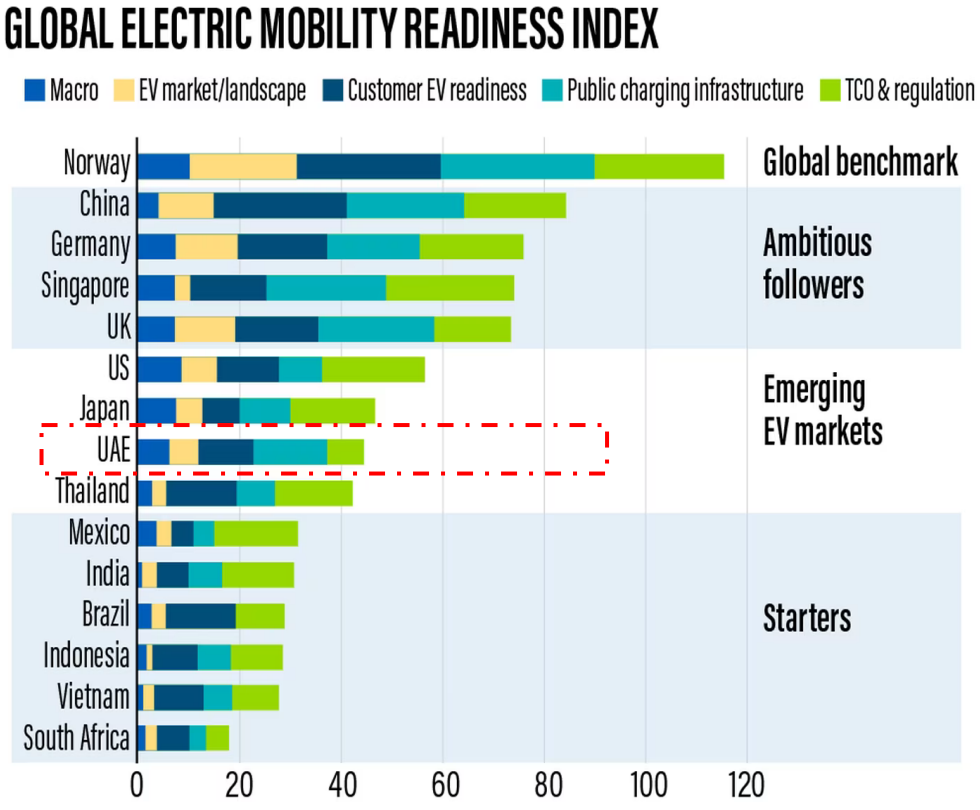
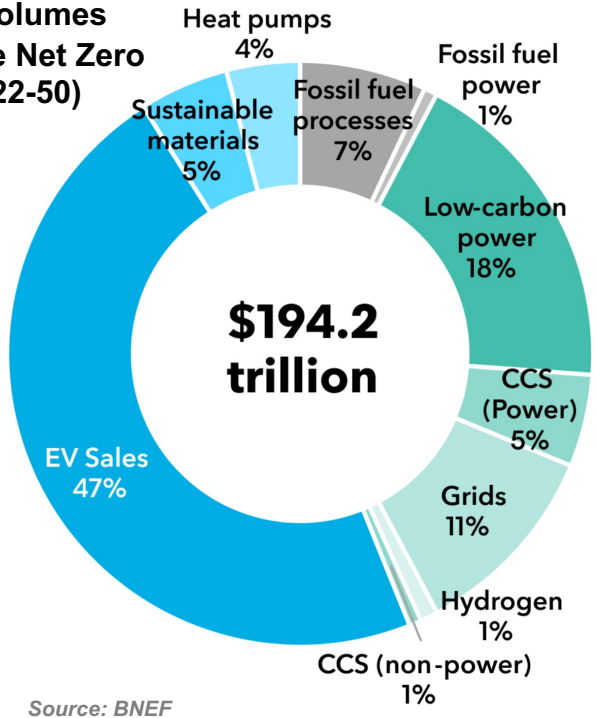
E-mobility Transformation Is Underway: MENA Catching Up!



Source: Arthur D. Little, Sep 2022

Saudi Arabia (with Lucid) & **Egypt** (with China's BAIC) to see first locally assembled EVs this year; **Morocco** aims to double its electric car production by 2024.

Bullish on EV sales:
Breakdown of global investment volumes needed in the Net Zero Scenario (2022-50)



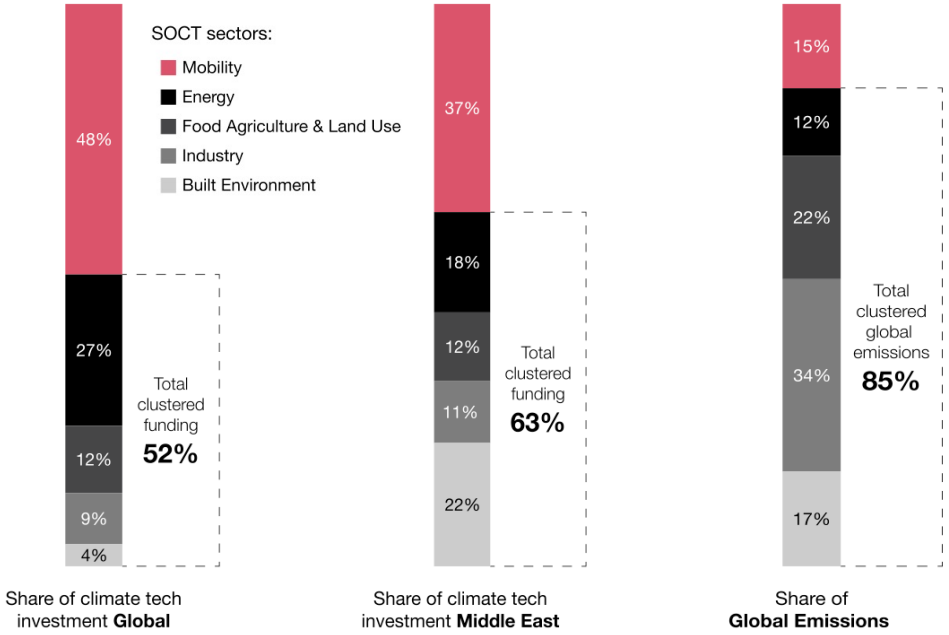
Source: BNEF

Rise of ClimateTech in the MENA Region

Building a climate tech ecosystem in MENA

- **As of H1 2022, 12 Middle East countries invested $1.6 billion in climate tech**
- **PwC**: 98 climate tech start-ups in the region that are currently receiving funding; about **USD 6bn has been invested in climate tech in MENA since 2013**
- Attracting **VC investment in the region into climate tech**: desalination, water reuse, energy and grid, food, adaptation, mobility & transport
- **UAE & Saudi Arabia are leading climate tech** investment in the region despite a decline globally
- **Momentum is strong**: several major investment announcements were made around COP27, including a USD 1.5bn sustainability fund by Saudi Aramco
- **Technologies for which GCC have a competitive advantage**: green fuels, green industries, energy to food, Nature based solutions in arid and semi-arid environments, Desalination, District cooling

Share of climate tech investment Global v share of climate tech investment Middle East v Global Emissions share



Source: PwC State of Climate Tech 2022, PwC analysis of Pitchbook data. This data is based on information available as at 8 November 2022.

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Energy Transition + Climate Risk Mitigation Policies: GCC will be at the Centre of a Transformed Global Energy Map

Diversified Energy supply: solar, hydrogen, nuclear complementing O&G.

Regional integration: create a integrated GCC electricity grid & market.

Diversify into new markets with new products: trade in renewable energy goods & tech (e.g. KSA & EV production); export electricity into MEA, India, Pakistan, Europe…

Market-based policy instruments + Energy efficiency policies: phase out subsidies**,** carbon taxes, electricity markets, compliance and voluntary carbon markets, building codes & standards

De-risk stranded fossil fuel assets: privatisation & PPP

E-Transport system transformation; EV policies & investment in infrastructure

GCC can become global hubs for Climate Finance

Middle East Investment Opportunities: New Geopolitical Map & New Energy Map

Changing Geopolitical Map

- **Disengagement from long-standing regional conflicts**
- **Reconstruction** of **war-torn nations** (Yemen, Syria, Iraq…)
- **New strategic partnerships** (China)
- **Regionalised globalisation** (trade, investment, infrastructure)

Global Energy Map with GCC at the centre

- **Investment opportunities** in "old" O&G + renewable energy, H_2, EVs, ClimateTech, digitalization
- **Energy linkages** with Asia + new links with Europe for gas & H_2
- **Potential GCC electricity grid**, extending all the way to Europe, Pakistan, India
- **Privatisation**, **PPP**, **Capital Market Development**
- **Green & Blue finance**

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Dr. Nasser Saidi
nsaidi@nassersaidi.com