“MENA + Pakistan region faces $420–$510bn climate adaptation funding gap”, Interview with Zawya Projects, 7 Nov 2025

Dr. Nasser Saidi’s interview with Zawya Projects titled “MENA + Pakistan region faces $420–$510bn climate adaptation funding gap: CEBC Chief” was published on 7th Nov 2025.

MENA + Pakistan region faces $420–$510bln climate adaptation funding gap: CEBC Chief

In an exclusive interview with Zawya Projects, Dr. Nasser H. Saidi, Chairman and Founder of the Clean Energy Business Council (CEBC) MENA, explained why the MENA + Pakistan region must more than quadruple climate adaptation investment across infrastructure, and highlighted the GCC’s potential to become a global hub for renewable energy.

The Middle East, North Africa, and Pakistan (MENA+Pakistan) region must significantly increase investments in climate adaptation, particularly for retrofitting infrastructure, to an estimated $420 to $510 billion, the chief of UAE-based Clean Energy Business Council (CEBC) MENA told Zawya Projects.

Dr. Nasser H. Saidi, Chairman and Founder of the ADGM-based non-profit, which represents the clean energy sector pointed

out that so far, the MENA+Pakistan region is discussing investments of around $100 to $120 billion in climate adaptation, which involves retrofitting current infrastructure, factories, and housing to be future-ready across the region.

“However, my estimate is that you need around four times that figure—to $420 to $510 billion—because Mother Earth has a mind of her own,” he said.

“Human actions have created climate challenges, and the earth responds. While we are not in charge of that, we must integrate climate models with our economic and planning models to design effective policies.”

And while numbers are still being assessed, the dynamics of climate change can be severe, he noted.

“We have to be preventive and preemptive when addressing climate risks; it concerns all our lives,” he said.

Dismal scenario

Saidi cited the disastrous floods in Libya in September 2023, where two dams collapsed in Derna after Storm Daniel, releasing 30 million cubic metres of water.

“The floods swept entire buildings, with thousands of people still inside them, into the Mediterranean Sea,” he explained. “This is a classic example of why the region needs to raise its investments in climate adaptation across its infrastructure and housing.”

“Climate change is a priority as we are very challenged by desertification, Medicanes, water scarcity, rising temperatures, and growing urbanisation and populations. So far, there have been many commitments and bright promises for net zero at the global level, but many of those pledges have not come through, and there has been dismal performance.”

Key challenges include securing enough financial resources from governments and attracting the private sector. Referencing the success of US railroads and post-war infrastructure development in Europe driven by private investment, Saidi emphasised that “whether we talk about energy, AI, data, or the digital economy, the bottom line is that the private sector will need incentives.”

He stressed the need to account for climate risk and pricing, making room for new, radically different technologies from the private sector.

“Much of the technologies that we inherited from industries like electricity, water, and transport have so far been managed by the public sector. It will have to be a combination of both because we have to plan at the national, regional, and global levels,” said Saidi, who is also the Founder and Head of Nasser Saidi & Associates, a consulting firm.

“All future planning should include the private sector, but with the framework and financing coming from the government and international institutions.”

He noted that the CEBC, which focuses on bringing together governments, regulators, and the private sector around climate finance, e-mobility, and energy efficiency, would be open to developing a climate fund, though its core mission remains as a not-for-profit platform to drive clean energy policy and dialogue.

“I would be open to anyone who says, let us develop a climate fund together,” he said.

Carbon pricing imperative

Regarding innovative funding instruments, Saidi suggested a gradual build-up. “In the end, we have to adopt carbon pricing, which means central banks, regulators, and governments have to introduce carbon pricing in everything—be

it energy, water, the way companies perform, the balance sheets of banks, and central banks."

Following the Great Financial Crisis, international banking regulations introduced measures such as the establishment of capital buffers.

It also saw the implementation of Basel III—a set of enhancements developed in response to the 2008 crisis—and subsequently Basel IV (the finalisation of Basel III), which overhauls global banking capital requirements, which is expected to significantly impact the lending landscape, particularly across Europe and the Nordic region.

"We need something equivalent to that in this area," said Saidi, a former Lebanese Minister of Economy and Industry and former Vice Governor of the Lebanese Central Bank.

"It is only when you start pricing that people respond—not just good wishes," he said, stressing that carbon pricing must eventually be integrated into the banking and financial system structure.

"Once you do that, you create opportunities for financing. But then again, you have to think long-term. Then the next question is, how do you control risks for infrastructure projects spread over a period of 15-20 years?"

"This is why pricing is so important. I am a strong believer in markets, so we need to create renewable funds and create markets where you can trade risks, particularly through financial markets," he added.

The UAE's Federal Decree on climate change, coming into force this year, mandates monitoring and control of GHG emissions across sectors while encouraging companies to participate in emission trading schemes and carbon credit markets. The country is also introducing carbon compliance regulations for eventual compliance markets.

Following the Great Financial Crisis, the world has also seen the rise of non-banking financial intermediaries, now providing almost 50 percent of the credit. “That creates its own risks. Hence, we have to involve the non-banking private sector, which consists of private credit and private funds, with the organised, regulated banking and finance sector—we have to look at the whole spectrum.”

Global hub for renewable energy

While regional commercial banks do not always have the teams to assess such projects, the MENA region benefits from being awash with sovereign wealth funds and national funds.

“Hence, it would be ideal if they become involved because green and renewable energy is where the GCC, in particular, has a comparative advantage,” he said, arguing that deploying public money makes sound economic sense as part of economic diversification.

“We have accumulated enormous wealth due to high energy prices, and hence, we can deploy that wealth in green, digital, and renewable initiatives, and it can create jobs. So you diversify and develop your economy, and, at the same time, it is critical for the GCC and the region to create jobs. So this is the perfect opportunity for us.”

“This region is already the global hub for oil and gas,” Saidi concluded. “This region also has the potential to be the global hub for renewable energy. No other country or region has that combination.”

“AI, geopolitics and the Mena opportunity”, Op-ed in Arabian Gulf Business Insight (AGBI), 27 Feb 2025

The opinion piece titled “AI, geopolitics and the Mena opportunity” was published in Arabian Gulf Business Insight (AGBI) on 27th February 2025.

AI, geopolitics and the Mena opportunity

DeepSeek’s emergence has spotlighted the GCC’s role in hosting green AI infrastructure

The surprise arrival of Chinese LLM startup DeepSeek roiled global markets, wiping billions from US chipmaker Nvidia’s market cap and slashing global tech stocks.

DeepSeek’s breakthrough highlights China’s rapid innovation capabilities, as well as Washington’s struggle to contain Beijing’s rise, particularly in AI and quantum computing.

The Chinese tech firm’s emergence is attributable to its open source, cost-effective AI models, which operate with significantly lower costs and data requirements than existing models. Since DeepSeek entered into the market, global tech firms have announced even higher spending on AI infrastructure and accelerated deployment.

However, financial sustainability remains a question. There is also a long way to go to reach human-level intelligence levels or Artificial General Intelligence (AGI).

DeepSeek has challenged the belief that advanced chip hardware is necessary for better AI. This raises hope for less advanced countries to catch up in the AI race, particularly against the backdrop of greater geopolitical fragmentation and increased protectionism.

As it becomes easier and cheaper to adopt new technology this will increase the ubiquitousness of AI-based applications and services.

AI is a general-purpose technology that promises to be transformational. Its wide applicability will increase economic efficiency and reshape innovation and R&D processes, while complementing other innovations – such as in quantum computing, generative biology and robotics – leading to an upward shift in total factor productivity.

In the early 2020s, initial expectations assumed that AI tools would primarily benefit lower-skilled workers by enhancing efficiency (for example, assisting new customer support employees). However, research has since warned that AI could exacerbate socio-economic disparities.

The International Labour Organisation estimates that 75 million jobs worldwide (or 2.3 percent of global employment) are at risk of automation due to high exposure to generative AI (GenAI) technology, with the risk rising to 5.1 percent in high-income countries.

Nobel Laureates Daron Acemoglu and Simon Johnson caution that decisions regarding powerful automation tools should not be left solely to a small group of entrepreneurs and engineers, as this could deepen income and wealth inequality.

They advocate for AI policies that prioritise worker interests

to prevent widespread job displacement and unemployment.

Where does the Middle East stand?

As GenAI technology becomes more mainstream, its growing adoption calls for more data centres, increased electricity consumption and higher carbon emissions.

AI is highly carbon-intensive, with ChatGPT alone generating over 260 tonnes of CO_2 emissions per month. This presents a significant sustainability challenge for tech firms and governments.

However, the GCC offers a solution: renewable energy powered data centres.

Moro Hub, a subsidiary of Digital Dewa, operates a data centre entirely powered by renewable energy (in partnership with Masdar and Acwa Power). With abundant and cost-effective renewable energy, the GCC has a strategic advantage in becoming a global hub for sustainable data centres.

Within the next five years, renewables could account for 30 percent of the region’s total energy capacity, supporting the expansion of “green” data centres.

The GCC had $3.1 billion worth of data centre projects in progress, as of November 2024, with the UAE and Saudi Arabia leading investments in this sector.

Recent partnerships with Europe, China, and the US to develop AI capacity have cemented the ambition of the region to become a prominent player in the sector.

For example the UAE plans to invest EUR 30-50 billion in building a mammoth AI data centre in France. The project is backed by a consortium of French and Emirati investors, including MGX, a major Abu Dhabi government-backed investor.

MGX is also a core stakeholder in OpenAI’s Stargate project,

which aims to invest $500 billion in AI infrastructure over the next four years.

The successful adoption of AI and digital technologies requires both hard and soft infrastructure.

This includes electrification, digitalisation infrastructure, supportive policies, R&D investments, STEM education, workforce reskilling, an enabling regulatory environment, and adaptable legal frameworks.

There remains a wide technology divide between the GCC and other Mena countries, which face challenges such as a shortage of AI talent, digital illiteracy, underdeveloped infrastructure, and limited R&D investment.

While AI has the potential to be transformative, it also risks deepening inequalities due to the region's disparities in digitalisation and AI preparedness.

As the GCC emerges as a leader in AI, it should prioritise technology sharing and capacity building across the region through investment, digital infrastructure integration, and inclusion in foreign aid programmes.

Dr Nasser Saidi is the president of Nasser Saidi and Associates. He was formerly chief economist and head of external relations at the DIFC Authority, Lebanon's economy minister and a vice governor of the Central Bank of Lebanon

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Dr. Nasser Saidi's interview

“Ahead of The Curve” with The Buzz Business on CEBC’s pioneering role in MENA’s clean energy transition, Nov 2024

The interview with Dr. Nasser Saidi, in his capacity as the Chairman of the Clean Energy Business Council (CEBC), appeared as a Buzz Business article in Nov 2024. The focus was on CEBC’s pioneering role in MENA’s clean energy transition. The article titled “Ahead of the Curve” is copied below:

Ahead of the Curve

CEBC’s pioneering role in MENA’s clean energy transition

As climate change increasingly impacts economies and lives across the globe, the Middle East and North Africa (MENA) region finds itself at a crossroads. Here, in a land rich with fossil fuels but increasingly exposed to climate challenges, the need for a shift towards clean energy and sustainable practices is critical. Leading this charge is Dr. Nasser H. Saidi, founder and chair of the Clean Energy Business Council (CEBC), an organization fostering collaboration between the public and private sectors to catalyze the region’s transition to a cleaner future.

Dr. Nasser’s journey to the helm of CEBC has been as varied as it is impressive. With a career that spans academia, government, central banking, and senior positions in finance, he is no stranger to the complexities of building something from scratch. “I’ve always valued freedom and the ability to think independently,” he says, reflecting on his time contributing to establishing the Dubai International Financial

Center, which started with just a few companies and grew into a global hub. This drive to create and innovate independently has become the backbone of his leadership at CEBC—a vision not only for clean energy but also for MENA's potential to become a global leader in climate solutions.

CEBC was born from an urgent need for more than dialogue; it was a call to action for the region's leaders to reimagine MENA's place in the global energy landscape. Dr. Nasser understood that while the region has long been defined by its fossil fuel wealth, it also possesses vast untapped potential for renewable energy, particularly solar. "This part of the world is blessed with some of the highest solar irradiation on Earth," he explains. "With partners like ACWA Power, ENOC, ENGIE, and ABB at the forefront, we're already seeing impressive advancements in solar capacity and innovative projects that could one day redefine energy systems globally."

CEBC's initiatives are built to tackle a diverse range of challenges, from energy efficiency to hydrogen innovation, e-mobility, and climate finance. Yet, Dr. Nasser emphasizes that the real breakthrough lies in fostering strong, lasting partnerships with both public and private sectors. This commitment to collaboration is evident in CEBC's Annual Summit, now in its 12th year, which brings together policymakers, industry leaders, and technology innovators to align on regional sustainability goals. This year's summit, themed "Strategic Levers for Decarbonizing MENA," will be held at Expo City Dubai, reflecting the growing regional commitment to decarbonization and sustainability. "By bringing government and regulatory bodies to the table, we're creating the conditions for action," Dr. Nasser says. "CEBC is not just an organization; it's a platform for real change in MENA's energy future."

The MENA region, he points out, is uniquely positioned in the global fight against climate change, with opportunities that extend beyond renewable energy into areas such as water

desalination, desert agriculture, and district cooling. These technologies are critical in a region where temperatures are rising, and water scarcity is a daily reality. “Cooling alone accounts for up to 70% of peak energy demand in the Gulf,” Dr. Nasser notes. “We’ve pioneered district cooling systems that are not only more energy-efficient but can be powered by renewable sources. This technology could become a model for the world.”

As climate disasters continue to reshape economies, MENA countries face both an urgent challenge and a significant opportunity. CEBC is working to help the region balance its reliance on traditional fossil fuels with the need for renewable energy development. According to Dr. Nasser, this transformation will require considerable investment and policy reforms, especially in terms of reducing fossil fuel subsidies and attracting private financing to fill funding gaps. The International Monetary Fund estimates that MENA will need to invest up to 4% of GDP annually to build climate resilience and meet emissions targets—a staggering number, but one Dr. Nasser sees as achievable with the right public-private partnerships. “For every dollar invested in climate adaptation, we see a return of ten in economic benefits,” he says, highlighting how companies across the region can drive these returns by investing in clean energy solutions.

The private sector, he believes, will play a pivotal role, especially with national initiatives like Saudi Arabia’s Vision 2030 laying the groundwork. “The goals set forth in Vision 2030 offer a roadmap for the private sector to contribute to decarbonization through investments in clean energy technologies and sustainable practices. Companies like ACWA Power, ABB, Totalenergies, BEEAH, and other CEBC partners are proving what’s possible with large-scale solar and wind projects that have the power to reshape our entire region.” CEBC, he adds, has been instrumental in creating platforms for private sector leaders to engage directly with policymakers,

facilitating cross-border clean energy projects that address regional needs while also setting an example for the world.

Looking to the future, Dr. Nasser sees energy efficiency as a vital component in achieving MENA's net-zero ambitions, especially in high-energy sectors like construction, transport, and infrastructure. CEBC has recently partnered with the Advancing Net Zero Volunteering Team to launch a white paper focused on retrofitting existing buildings—a crucial step in reducing energy consumption across the region. He believes this focus on efficiency, combined with technological advances like AI-driven energy management and smart grids, will be key to MENA's sustainable development. But Dr. Nasser stresses that the most critical driver will be awareness, both public and governmental. "We're at a tipping point where climate adaptation isn't a choice; it's a necessity," he says, echoing the urgent tone that has defined his work and vision.

What are CEBC's key achievements to date?

"I'd say the most critical achievement is public awareness. Climate and clean energy are now part of our regional discussions, which is something we couldn't have imagined a decade ago. Today, we have ministers in charge of climate portfolios, notably in the UAE, and I hope other countries follow. Our partnerships are creating regulatory frameworks that involve both government and the private sector in the transition to clean energy."

How optimistic are you about the region's clean energy transition?

"I am cautiously optimistic. The region's leadership has a clear vision of what's needed, and we're seeing an unprecedented level of commitment to clean energy and climate adaptation. Yet, challenges remain—subsidies for fossil fuels need to be removed, and people's perceptions around the 'cost'

of energy must shift. Still, I am inspired by the strides we've made and confident that with ongoing collaboration, we can achieve real, lasting change."

What advice would you give to companies in the private sector?

"Start with energy efficiency—look at your own operations, from building temperatures to energy sources, and be ready to invest in clean technologies. Long-term success will depend on this. I also advise companies to get involved with CEBC or similar platforms to stay aligned with national goals and regulatory developments. The future will belong to companies who adapt early and invest in sustainable practices."

Looking ahead, Dr. Nasser's vision for CEBC reflects both urgency and optimism. As the region grapples with the realities of climate change, CEBC stands as a catalyst, turning MENA's unique challenges into opportunities. With the right partnerships and a clear focus, CEBC is not just imagining a cleaner future—it's building one.

“CEBC isn’t just an organization; it’s a platform for real change in MENA’s energy future.”
Dr. Nasser H. Saidi, founder & chair, Clean Energy Business Council (CEBC)

Comments on the GCC diversification strategies in Arab News, 9 Mar 2024

Dr. Nasser Saidi’s comments appeared in an Arab News article titled “Diversification strategies paying off for GCC economies” published on 9th March 2024.

The comments are posted below.

Speaking before the latest PMI report, Nasser Saidi, former Lebanese economy and trade minister and founder of Nasser Saidi & Associates told Arab News: "The Gulf is benefiting from investments that have been made over time."

He said: "I think one of the critical sectors is transport and logistics," further stating how "many countries don't have the airports, transport and facilities that the Gulf has developed, particularly the UAE, Qatar, and increasingly now Saudi Arabia and to a lesser extent Oman."

Saidi continued: "As a result of it, tourism has developed very rapidly, and when you also open up the economy to tourist visas, facilities to establish businesses, and particularly you deal with COVID-19 very effectively, and you open up when the rest of the world was closed — the combination of these factors delivers the growth that we are witnessing now."

The economist believes that one of the undervalued aspects that contributed to non-oil growth is the fact that GCC health systems performed very well during COVID-19.

Saidi believes that the other big story for non-oil sector growth is the investment in renewable energy in the region.

"Despite the odds, these are the countries that are investing the most and the fastest in renewable energy because they have the advantage of solar power," he told Arab News, adding: "They're looking at this as a new opportunity of being able to go green and particularly (with) renewable energy, things like district cooling, things like a whole number of climate tech industries."

The economist said: "Desalination is a perfect one. The combination of these factors in addition to the further

opening of the economies with free trade agreements are fostering growth.”

Interview with Al Arabiya (Arabic) on renewable energy investments & COP28, 3 Dec 2023

In this interview with Al Arabiya aired on 3rd December 2023, Dr. Nasser Saidi discusses the topic of rising renewable energy investments and the potential role for GCC nations in the backdrop of COP28.

Watch the TV interview at this link as part of the related news article:

السعيدي: استثمارات الطاقة المتجددة وصلت إلى تريليوني دولار

قال رئيس شركة ناصر السعيدي وشركاه، ناصر السعيدي، في مقابلة مع Business“ العربية“، إن استثمارات الطاقة المتجددة وصلت إلى نحو تريليوني دولار وهذا أمر جيد.

وأضاف السعيدي أن دول الخليج تمتلك قدرة كبيرة على التمويل والاستثمار.

وأشار إلى أن التمويل سيأتي من القطاع الخاص لتجاوزه قدرة الدول على القيام بالدور وحدها.

Comments on the proposed India-Middle East-Europe trade corridor in The National, Sep 11 2023

Dr. Nasser Saidi's comments appeared in an article in The National titled "Why new trade link between India, Middle East and Europe is a win for all" published on 11th September 2023.

The comments are posted below.

"The India-Middle-East-Europe corridor will be a win-win for all countries involved in the project," president of Nasser Saidi and Associates, Nasser Saidi, and its director of macroeconomics, Aathira Prasad, said.

"The move will support the UAE's diversification efforts, as it can expand its trade with other markets in the corridor, underscoring its current efforts to deepen trade relations with emerging market nations."

"Deep trade agreements need to be signed to reap the full benefits from the corridor," Mr Saidi said.

"The region should take this opportunity to improve trade facilitation measures", including easing the movement of goods

at the border and focusing on reducing overall trade costs, he said.

"In the medium term, integrating trade infrastructure (ports, airports, logistics) in the wider Mena region would lower costs and facilitate intraregional trade, leading to greater regional integration," said Mr Saidi.

"Given ongoing renewable energy projects and net-zero emissions ambitions of the UAE and wider GCC, one could even envisage a GCC renewable-energy-powered, integrated electricity grid could extend all the way to Europe and India," Mr Saidi said.

A potential land-based alternative to the Suez Canal will reduce the risk of it being a chokepoint, as it currently handles about 10 per cent of global maritime trade, Mr Saidi said.

"Instead of viewing the corridor as a threat to revenue, this should be seen as an opportunity to integrate the various modes of transportation … creating an air-sea-land custom-free corridor to support the movement of goods," he said.

"GCC can take centre stage in global energy transition", Op-ed in Arabian Gulf Business Insight (AGBI), 26

Jul 2023

The opinion piece titled "GCC can take centre stage in global energy transition" appeared in theArabian Gulf Business Insight (AGBI) on 26th July 2023.

An extended version of the article is posted below.

GCC will be at the Centre of a Transformed Global Energy Map

Nasser Saidi and Aathira Prasad

As nations navigate a post-Covid recovery path amid Russia-Ukraine war disruptions and sanctions, a New Global Energy map is emerging.

On the demand side, climate change and global warming -witness extreme temperatures- is forcing nations to accelerate their low-carbon energy transition plans, resulting in policy and consumer behavioural shifts away from fossil fuels. Global investment in low-carbon energy transition topped USD 1trn for the first time in 2022, up 31% year-on-year, and on par with fossil fuels investments[1]. The investments also spanned a vast spectrum: from renewable energy, the largest sector by investment (+17% yoy to USD 495bn) to hydrogen which received the least investment but was the fastest growing (USD 1.1bn, more than triple vs 2021). On the supply side, rapid technical change and innovation has resulted in a massive decline in the costs and thereby increasing the competitiveness of Renewable Energy, with the costs of solar, wind and battery declining by 90% over the past decade. Already, solar power is the cheapest form of electricity production.

Geopolitics is also driving a transformation of the global

energy map. The Russia-Ukraine war along with US and the EU policies to decouple or “de-risk” from China are leading to energy supply chain disruptions and market fragmentation. Sanctions on Russia have heightened national energy security concerns, resulting in a restructuring of energy trade patterns: India and China accounted for almost 80% of Russian crude oil exports in May 2023, while nations shifting away from Russian Oil & Gas were looking towards alternative sources, including from the GCC.

Global energy consumption remains skewed towards fossil fuels, but with a rapidly rising share of renewables. The new economic and geopolitical energy market realities are accelerating the quest for long-term competitive, sustainable, clean, and secure energy. While dependence on oil and gas will persist into 2050, the GCC has a comparative advantage to reap the benefits of the paradigm shift to renewable energy.

Faced with the challenges of the global energy transition, the GCC are committing to massively increase the share of renewables in their energy supplies, the KSA to 50% by 2030 and Net Zero by 2060, the UAE to 30% by 2031 and Net Zero by 2050. The GCC is leading the Middle East’s massive investments in renewable energy which recorded its largest-ever increase in renewable energy capacity in 2022, commissioning 3.2 gigawatts of new capacity (+12.8% yoy)[2]. The UAE’s planned investments to the tune of US$165bn in clean and renewable energy initiatives over the next 30 years as part of its NZE goal underscores its commitment to furthering its clean energy agenda.

With these renewable energy investments and use of modern technologies, the GCC are achieving the lowest global cost of solar power. Masdar submitted (June 2023) the lowest bid for the 1,800MW Phase 6 of the Mohammed bin Rashid Al Maktoum Solar Park in Dubai: USD1.62154 cents per kilowatt hour (kWh) for the solar PV power project. Similarly, Hydrogen which

could potentially reduce global emissions by 20% by 2050, at a price between $0.70 – $1.60 per kg- a price competitive with natural gas, has led to new alliances forming to develop megawatt projects, with some 31 projects in the region, including the world's largest in NEOM Green Hydrogen Project and the DEWA & Siemens' Green Hydrogen project using solar power.

The GCC, given its location at the heart of the global sunbelt, will become the lowest cost producer of solar power. Solar based, Green electric power can be exported from the GCC and North Africa to the rest of the Middle East, into Europe, East Africa, India, and Pakistan, through integrated power grids. This requires the development of an integrated electricity market allowing trading in energy.

The GCC's experience with developing and using climate tech - including desalination, district cooling and desert agriculture- can result in these being export technologies. Take the example of desalination, where the GCC has 45% of global desalination capacity, with Saudi Arabia's Saline Water Conversion Corp being the world's largest producer of desalinated water. Renewable energy powered desalination plants can be used as a solution to global water supply problems, where the UN estimates that about 1 in 10 persons lack access to clean water and 1 in 4 do not have access to safe drinking water. Similarly, district cooling is 5-10 times more energy efficient than conventional cooling, with the GCC being a pioneer in the development and deployment of district cooling, addressing the fastest growing source of demand for power from accelerating global urbanisation.

Being at the centre of the global energy map, with 30.5% of global oil reserves and 29.5% of exports (20.7% and 25.2% respectively for gas), the GCC have a long experience with energy finance. The GCC can become hubs for climate and renewable energy finance. The region's financial centres - DIFC, ADGM, KAFD, QFC- have the resources and expertise to

become the regional/ global centres for climate, green & blue finance, accelerate issuance of green & blue bonds and Sukuk, attract VC investment into climate tech in the region and support listings of clean energy firms. Already, the GCC are using their massive financial firepower to serve their climate agendas. GCC sovereign wealth funds are among the largest investors in renewable energy – Mubadala last year invested USD 20.2bn (about 27% of total investment globally) via its subsidiary Masdar (which has a mandate to double renewable capacity in 2-3 years) while ADIA and QIA invested USD 2.2bn and USD 1bn respectively. Clean energy finance is not only integral to fuel climate change policies, but also has the added advantage of generating jobs and attracting FDI into the renewable energy and climate tech sectors, thereby accelerating the region's energy transition and economic diversification plans.

The four building blocks of massive investment in renewable energy, comparative advantage in producing and exporting hydrogen and solar power through integrated grids, experience in using climate tech, supported by vast financial resources being used for climate & renewable energy finance, result in the GCC being able to provide highly diversified energy supply ranging from solar power to hydrogen complementing its oil and gas to climate tech. The GCC will be at the centre of the emerging New Global Energy Map.

[1] https://about.bnef.com/energy-transition-investment/

[2] IRENA.

“Navigating the Energy Crisis: A Middle East Viewpoint”, Presentation at the Global Investment Management Summit, 28 Mar 2023

Dr. Nasser Saidi was invited to join as a guest speaker at the Global Investment Management Summit held in London on 28th March 2023.

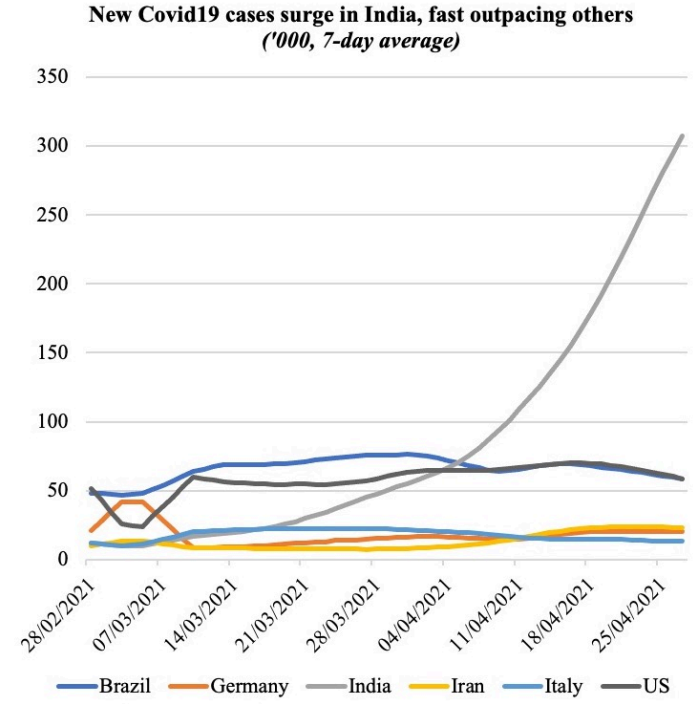
Dr. Saidi’s presentation, titled “Navigating the Energy Crisis: A Middle East Viewpoint”, covered among other points the sources and consequences of the ongoing global energy crisis in the backdrop of weaning away from fossil fuels and investing in Renewable Energy. The geopolitics and emergence of a new global energy map formed another key point in the discussion which advocated for GCC to become the centre of a transformed, new, global energy map.

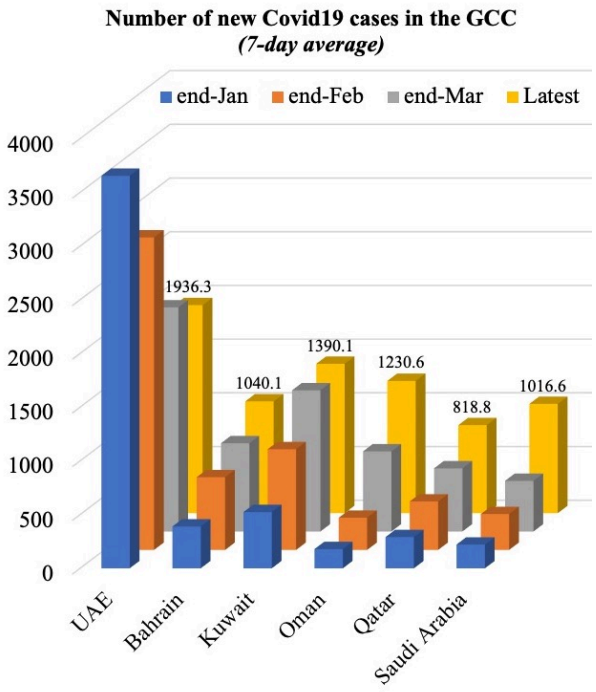
Weekly Insights 29 Apr 2021: India’s exponential rise in

Covid19 cases – spillovers into the UAE?

Download a PDF copy of this week's insight piece here.

1. As cases continue to surge in India, pace of global recovery comes into question





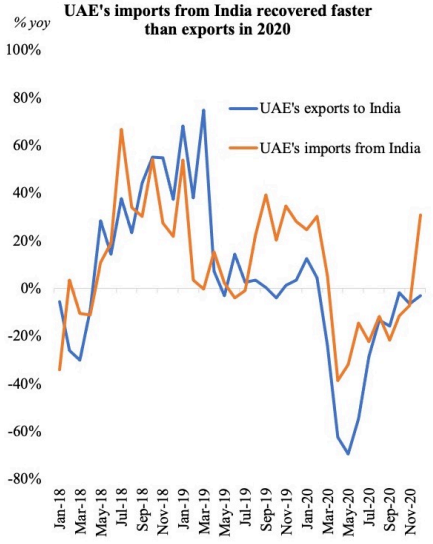
Source: Our World in Data. Chart created by Nasser Saidi & Associates

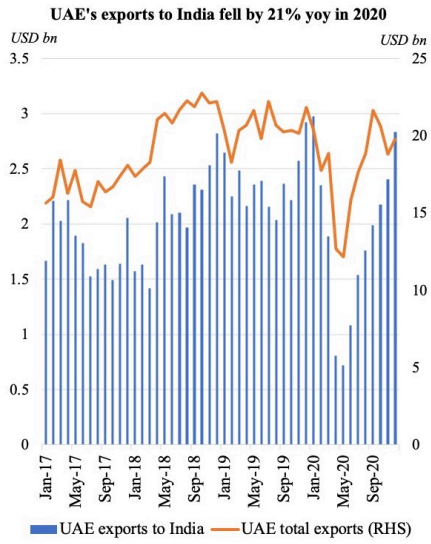
- **India reported the highest-ever single day cases on Wednesday, at 379,257 & continues to account for almost half the rise in global Covid19 cases.** Concerns about the accuracy of these statistics notwithstanding, it is worrisome that more than 20% of tests are coming positive and that the crumbling healthcare infrastructure (in many states) is leading to around 3k deaths per day!
- **Given India's linkages with the global economy** (trade, labour & investment flows), **it is not surprising that emergency supplies are coming in from across the globe to contain the spread**; US relaxed its previous ban on exports of raw materials for vaccines.
- Meanwhile, **GCC nations (except the UAE) have seen a**

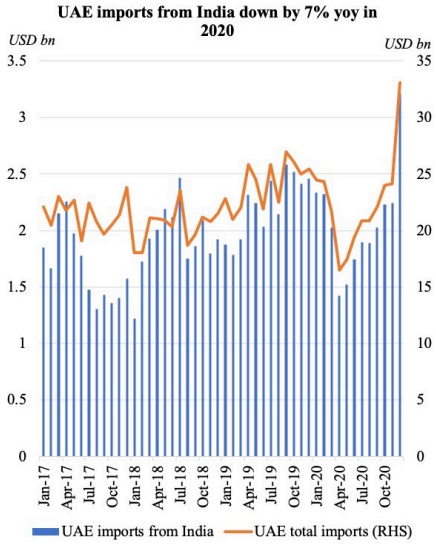
steady uptick in cases from the beginning of this year; UAE's numbers though are still the highest among the lot. In terms of **new cases per million, Bahrain stands the highest (611) and Saudi Arabia the least (29**), with Kuwait (326), Qatar (284), Oman (241) and the UAE (196) in between.

2. India-UAE links: Trade & Investment

- **UAE has developed strong links with Asia, and especially India**, over time. A prolonged slowdown in the Indian economy is likely to spillover into UAE's growth.
- First off, trade links: **bilateral trade was around USD 60bn in 2019**, though the Covid19 pandemic saw a decline in trade to USD 41.9bn (-30% yoy). Imports from India recovered much faster than exports into the country after the slump during lockdowns last year. India was the UAE's second-largest trading partner (after China) during pre-Covid times.
- While **oil is a key traded commodity** – about 8% of India's oil imports are from the UAE – exports of precious metals, stones and jewelry remain significant. Indian food imports also have a significant part to play in UAE's food consumption.
- **A slowdown in India would hence affect trade significantly**: **oil demand** will decline with lower mobility; **higher cases would lead to lower economic activity** – i.e. negative impact on industrial production lowers exports of textiles, machinery products, lower levels of agricultural production implies less food imports from the country.
- Official figures for **Indian investment in UAE** are not available: the Indian Embassy estimates it at around USD 85bn.

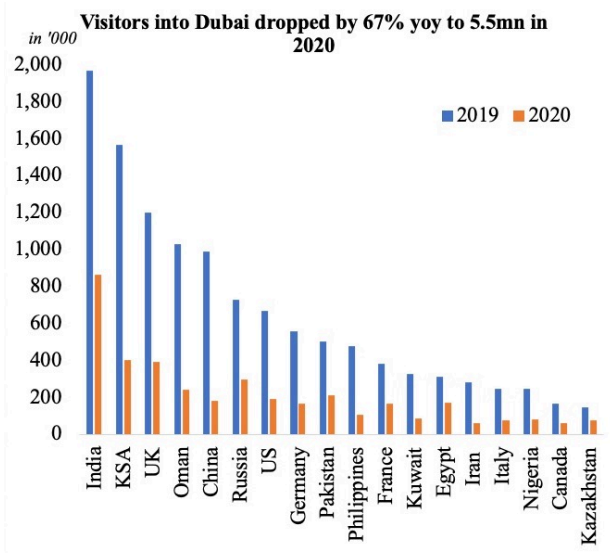


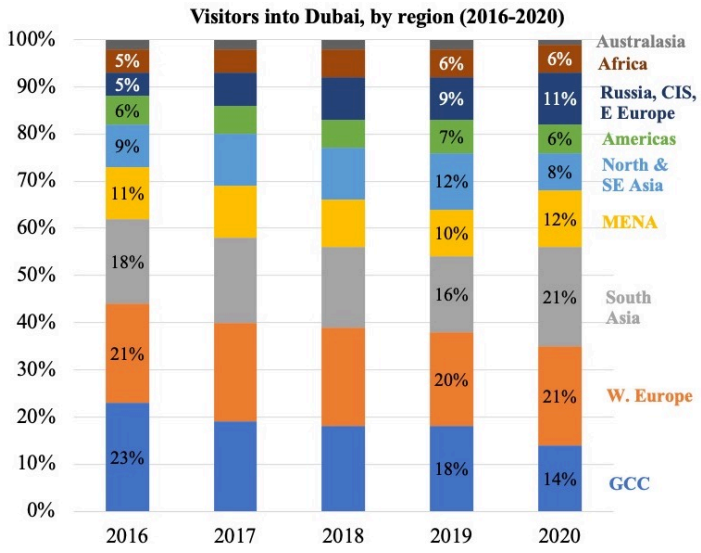




Source: IMF Direction of Trade Statistics. Charts created by Nasser Saidi & Associates

3. India-UAE links: Tourism



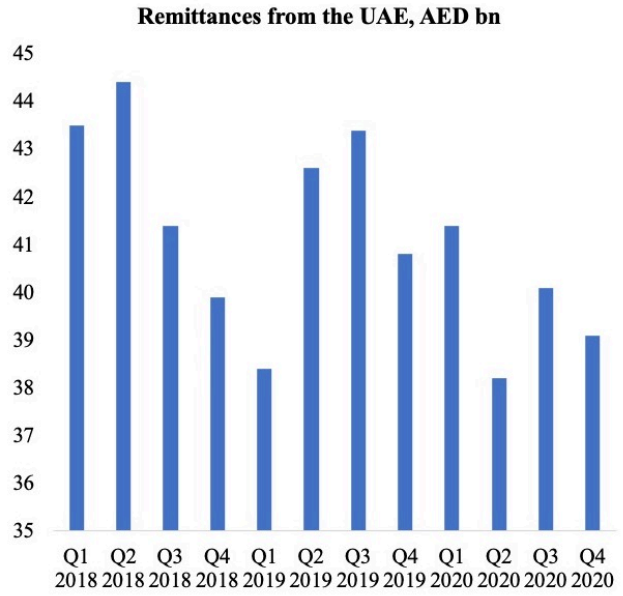


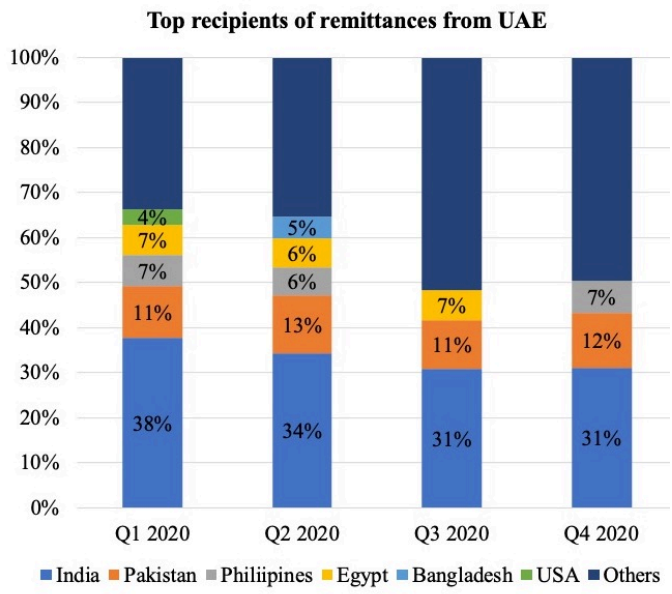
Source: Department of Tourism & Commerce Marketing. Charts by Nasser Saidi & Associates

- Prior to the Covid19 epidemic, **India was the largest source market for visitors into Dubai, attracting 1.97mn visitors out of a total 16.73mn.**
- Covid19 cut short most tourist travel for a significantly large part of the year, resulting in a 67% decline in tourists into Dubai. **India was still the largest source market for Dubai in 2020** – attracting 865k persons (-56% yoy) and South Asia retained its top spot as the largest source of visitors (21% of total).
- **Flights to the Indian sub-continent have been suspended since Apr 25 for 10 days**, and given the exponential rise in cases in India, an extension seems likely – about **300**

commercial flights operated weekly in what is one of the busiest international travel corridors. Newspaper reports suggest an uptick in enquiries for private jets to ferry stranded residents (similar to the lockdowns last year). Cargo operations are carrying on uninterrupted.

4. India-UAE links: Remittances

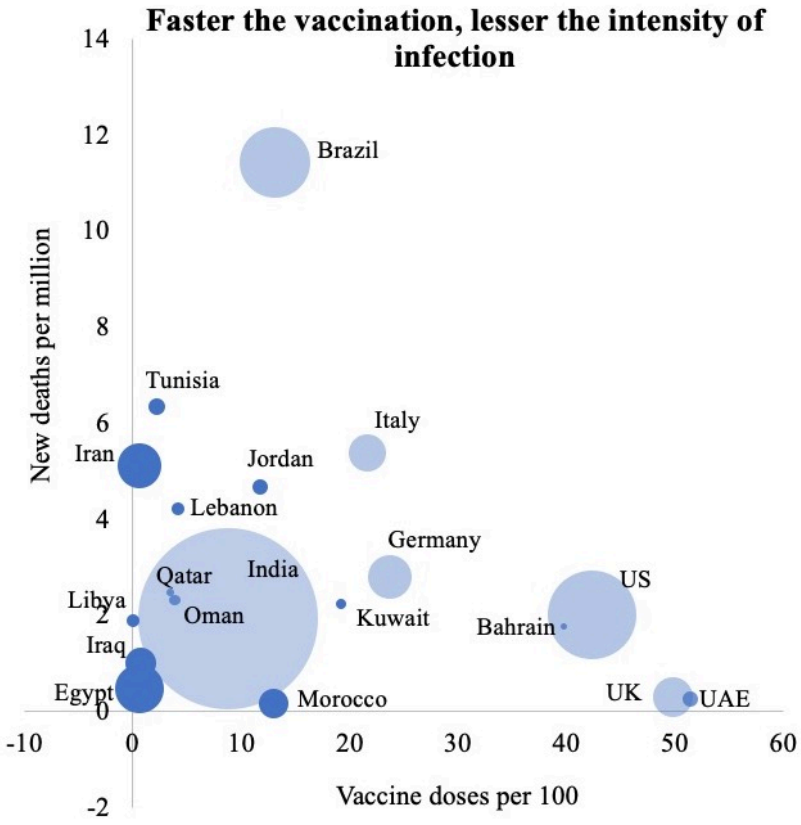




Source: UAE Central Bank. Charts by Nasser Saidi & Associates

- The **UAE-India migration corridor is one of the largest in Asia**: it stood at close to 3.5mn migrants in 2019. (Source: UN World Migration Report 2020). Indians account for around one-third of UAE's total population.
- **In 2020, total remittances from the UAE touched a total of USD 43.2bn** (-4% yoy). While Q1 saw a 7.8% uptick in remittances, Q2 saw the sharpest drop of 10.3%.
- **Remittances to India accounted for 33.5% of its total remittances last year** – maintaining its spot as the largest recipient of remittances from the UAE.
- As India goes into lockdown, it is possible that **UAE will see an increase in remittances to the country** as financial support for families in need. **A weaker Indian rupee would further suport this pattern.**

5. The economic case for vaccination



Source: Our World in Data. Chart created by Nasser Saidi & Associates
Bubble size denotes size of the population

- The discovery of vaccines for Covid19 had brought a sense of consumer and business optimism. However, **with vaccine distributions underway, its pace is less than heartening in many nations.**
- **Israel and UAE have topped the lists in terms of vaccination rates.** There is confirming evidence from Israel of reduced transmissions as a result of the inoculations.
- As the chart on the right (focusing on MENA nations) shows, there is a **negative correlation between vaccination and infection rates.** Anecdotal evidence also suggests that an infection after the first dose of vaccine is much less likely to require hospitalization.
- **Unfortunately for India, the pace of vaccination has been very slow.** Less than 10% of the nation's residents received the vaccine, in spite of it being home to the world's largest vaccine manufacturer (the Serum Institute).

- **The rapid pace of India's infections also calls into question its vaccine production and distribution channels**: the Serum Institute has not fulfilled its commitment to supply the AstraZeneca vaccine globally (to UK, EU and Covax), but is also planning to sell the vaccine to state governments and private hospitals in the country (at higher rates).
- In the MENA region, new deaths per million are low in the UAE (the leader in vaccine doses per 100 persons) while Iran has a long way to go. If Israel's results are to be emulated, **a coordinated effort should be underway to accelerate the pace of vaccination, resulting in faster return to higher economic activity**.

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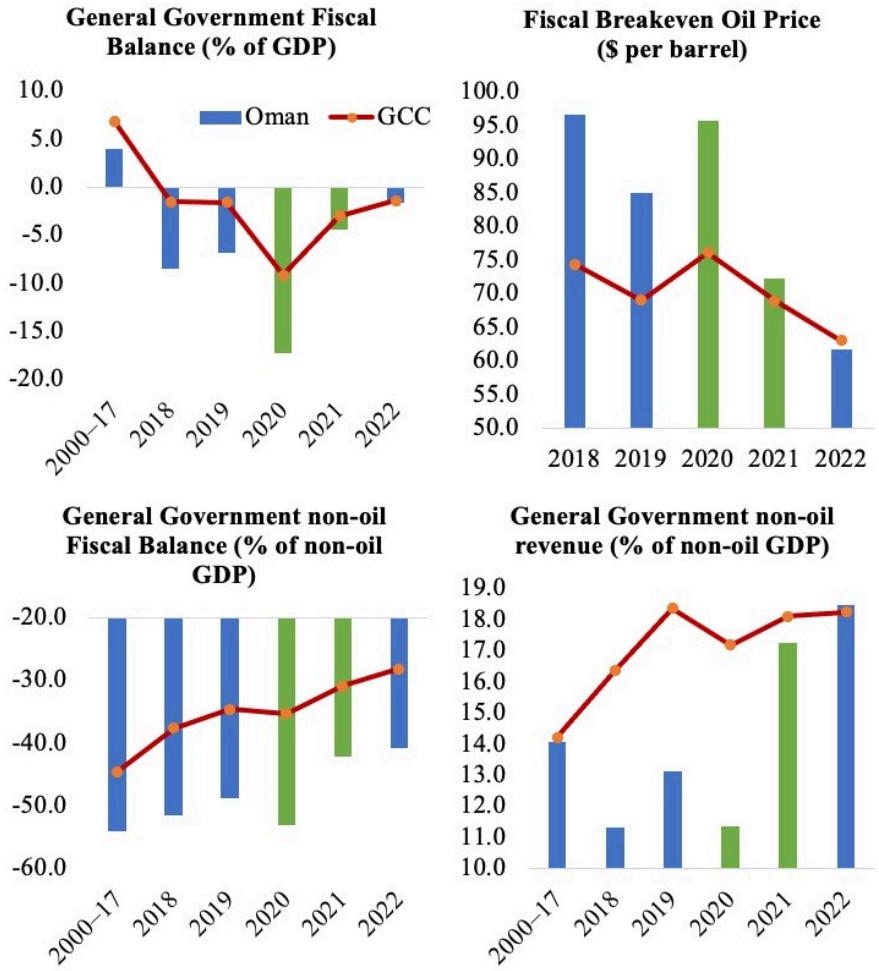
Weekly Insights 22 Apr 2021: GCC: Oil-dependence & Path to Climate Resilience

Download a PDF copy of this week's insight piece here.

1. Oman: 4th GCC nation to implement VAT



Source: IMF Regional Economic Outlook, Apr 2021

- **Oman introduced 5% VAT** on most goods and services, **starting Apr 16**
- UAE and Saudi Arabia rolled out 5% VAT in 2018 & Bahrain in 2019
- According to Ministry of Finance estimates, **Saudi increased non-oil tax revenues to 32% in 2018** (vs just 10% in 2010), 36% in 2019 and estimated to rise to 46% in 2020 (given tripling of VAT)
- **UAE** collected AED 27bn in VAT in 2018 (1st year) & AED 11.6bn in Jan-Aug 2020 (pandemic year); **VAT revenues in Bahrain** touched BHD 260mn in 2019 and BHD 220mn in 2020.
- Oman's VAT is estimated to **generate** ~OMR 400mn (**USD 1bn**) **in revenue** annually, roughly ~1.5% of GDP (if effectively and efficiently implemented)
- As a result, the IMF projects **fiscal deficit to decline** to 4.5% of GDP in 2021 (2020: 17.5%) & **non-oil revenue to rise** to 17.2% of non-oil GDP in 2021 (2020: 11.4%)

- **This move will lead to** an improvement of Oman's sovereign credit rating + lower the cost of credit + attract more FDI & portfolio investment as a result of the ensuing reduction in macroeconomic risks

2. GCC's Diversification Efforts & Renewable Energy policies => Transition to a lower-oil dependent region

- **Unsustainable path of dependence on oil**: current oil demand vs supply, pressure on oil prices + current fiscal & social spending policies => fiscal unsustainability: GCC's aggregate net financial wealth (est. at $2trn) could be depleted by 2034 (IMF)
- **Oil market structure & dynamics are changing**, given global energy transitions: pre-Covid19, shale & renewables were already displacing conventional oil
- Major **challenges** for the oil market *(non-exhaustive list)*:

–**Demand-side factors:**

  - Gov't plans for sustainable recovery, ambitious **goals for net-zero emissions**
  - **Covid19-led collapse in demand**: potential WFH policies & mobility, question marks over recovery of business/ leisure air travel
  - Energy efficiency improvements, EV penetration

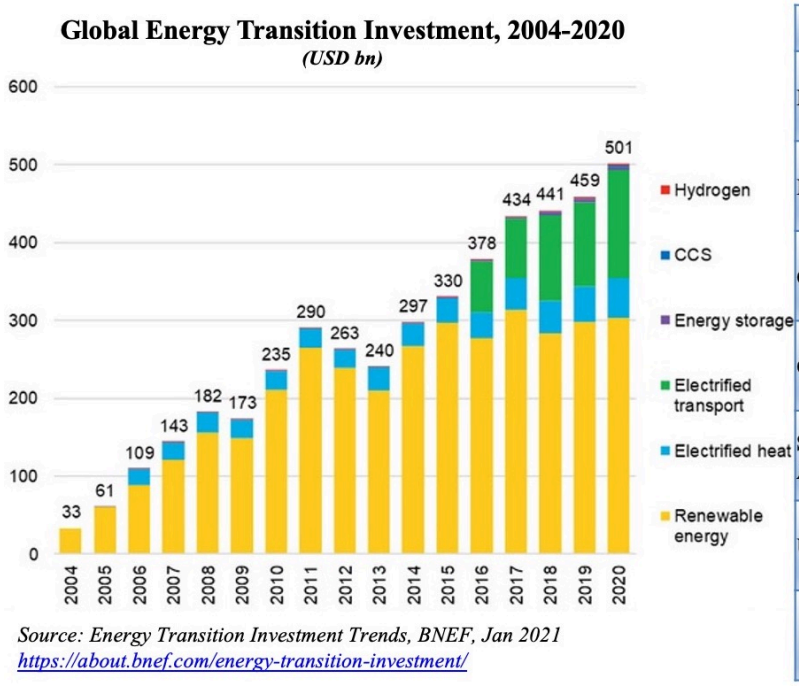
–**Supply-side factors**:

  - Spending cuts and project delays could slow oil supply growth
  - Large cost reductions in renewables + advances in digital technologies

- **Climate Change & Decarbonisation Risks are growing –** could lead to sharp fall in fossil fuel asset prices => stranded assets risk

3. Energy Transitions & GCC's ambitious targets

- The two-day virtual Leaders Summit on Climate (from today), hosted by the US President, brings the US back into play with respect to global action against climate change
- Latest news that banks & financial institutions with USD 70trn+ assets pledged to cut their greenhouse gas emissions & ensure their investment portfolios align with the science on the climate adds to the commitment



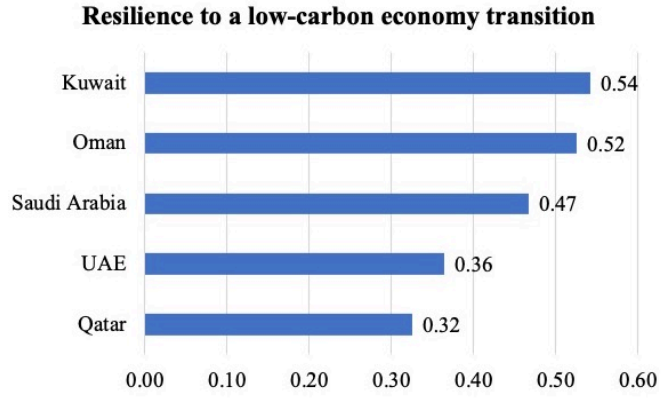
Source: Energy Transition Investment Trends, BNEF, Jan 2021
https://about.bnef.com/energy-transition-investment/

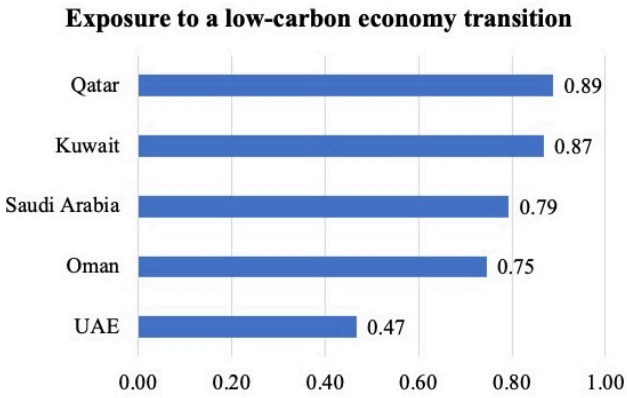
	Renewable energy targets
Bahrain	National renewable energy target of 5% by 2025 & 10% by 2035
Kuwait	Increase the share of renewable generation to 10% by 2030
Oman	Derive at least 30% of electricity from renewables by 2030
Qatar	Attain 20% of its energy from solar power by 2030
Saudi Arabia	Generate 50% of its energy from renewables by 2030
UAE	Reduce GHG emissions to 23.5% vs business-as-usual emissions for 2030
	Increase the share of clean power to 50% of the total energy mix by 2050

4. Are the GCC nations prepared for a low-carbon economy transition?

- The preparedness of countries for a low-carbon transition (LCT) is measured by **exposure and resilience indexes:** highlights turning the risks of an LCT into opportunities for robust growth.
- **GCC nations are signifcantly exposed,** especially given dependence on oil (resource rents, carbon intensity, GHG emissions): Qatar scores highest exposure & UAE the least
- **However, the GCC are relatively well prepared for an LCT** thanks to its resilience, particularly its relatively good macro stability and supportive business environment

alongside high quality of infrastructure, human capital and institutions

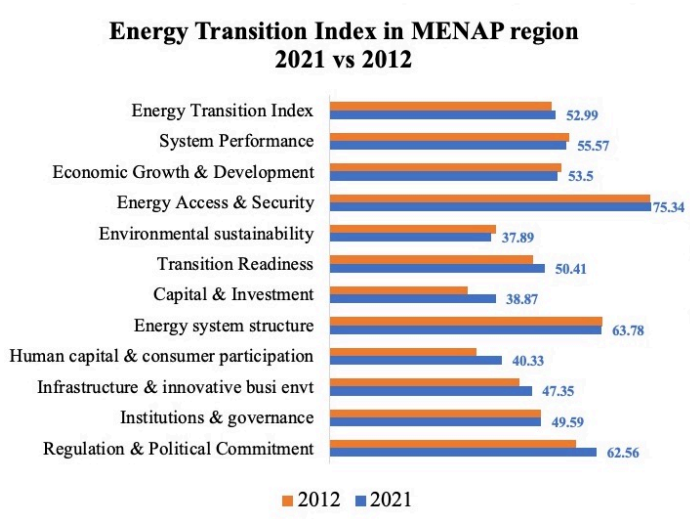


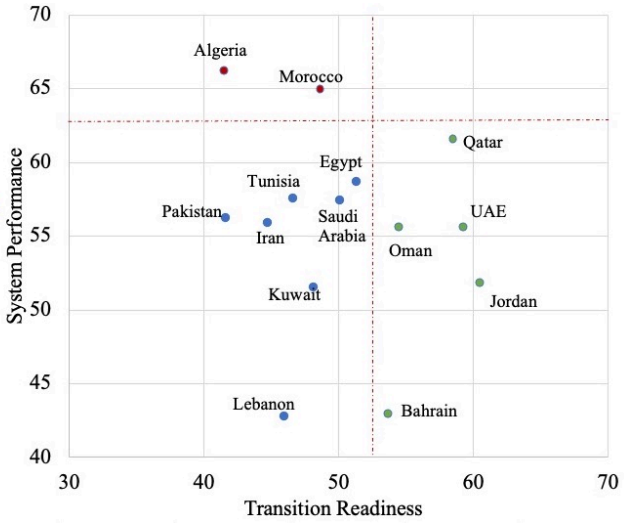


Source: Peszko, G. et. Al (2020) Chapter 5 in "Diversification & Cooperation in a Decarbonizing World", World Bank.

5. WEF's Energy Transition Index ranks UAE just behind Qatar wrt energy systems & pathways to clean energy

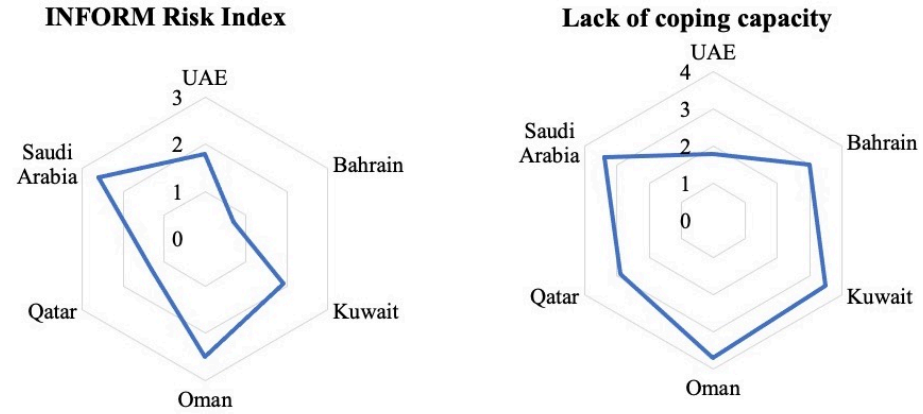
- **UAE ranked 64th globally on WEF's latest Energy Transition Index** (2021) out of a total 115 nations, just **behind Qatar at 53rd position**. Lebanon ranked lowest in the Middle East region at 112th.
- Among the various components of the Index, **MENAP's average falls farthest from the world average in two**: environmental sustainability (37.89 in MENAP vs 61.32 globally) and capital & investment (38.87 vs 55.17). Of the 11 categories, **region is worse-off compared to 2012 (initial year of results) in 4**: system performance, environmental sustainability, energy system structure and economic growth & development
- The **chart on the right** shows no MENAP countries in the top-right quadrant (high transition readiness & well-performing energy systems). **4 of 6 GCC nations are in the "leapfrog" quadrant** (**green dots**, high readiness but system performance below the mean); two countries Algeria and Morocco fall among those with potential challenges (**red dots**, above-average system performance but readiness below the mean).

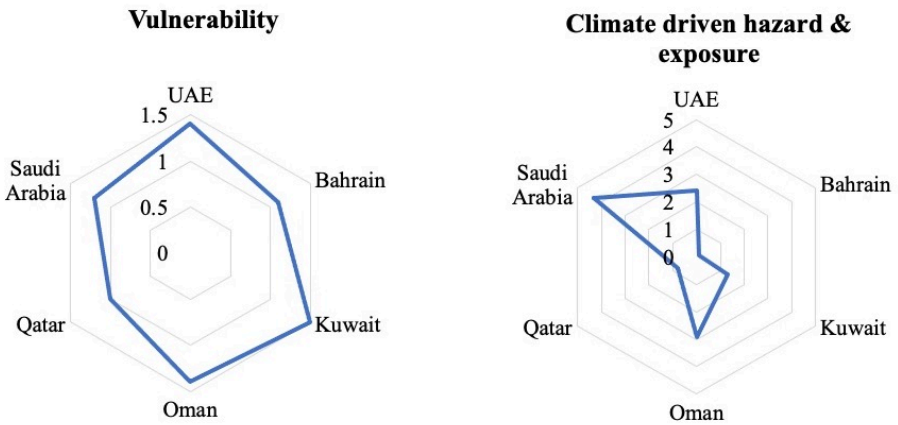




Source: Energy Transition Index 2021, World Economic Forum. https://www.weforum.org/reports/fostering-effective-energy-transition-2021#report-nav

6. GCC risk for climate-driven hazards is much lower than regional counterparts





- The climate-driven **INFORM Risk 2021 Index** is derived from 3 dimensions: climate-driven hazard & exposure,

vulnerability and lack of coping capacity.

- **GCC nations fare relatively better, scoring between 1.3 to 2.6 out of a total 10 (riskiest).** But, two scores are comparatively higher: Saudi Arabia's hazard & exposure score (largely due to conflict risk) and Oman's lack of coping capacity (institutional & governance indicators related to increasing the resilience of the society need improvement).

CountryName	HA	VU	CC	INFORM
Bahrain	0.6	1.1	3	1.3
Kuwait	1.2	1.4	3.6	1.8
Oman	2.9	1.4	3.7	2.5
Qatar	0.8	1	2.9	1.3
Saudi Arabia	4.3	1.2	3.4	2.6
United Arab Emirates	2.4	1.4	1.8	1.8

Source: INFORM Global Risk Index 2021. https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Risk

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"Accelerating decarbonisation and digitisation can build

upon UAE's game-changing reforms", Op-ed in The National, 27 Dec 2020

The op-ed by Dr. Nasser Saidi, titled "*Accelerating decarbonisation and digitisation can build upon UAE's game-changing reforms*", appeared in The National on 27th Dec 2020 and is reposted below.

Accelerating decarbonisation and digitisation can build upon UAE's game-changing reforms

The Emirates' monetary, fiscal and health stimulus packages cushioned the economy from the impact of the Covid-19 pandemic

Adjusting to Covid-19 has defined this year – from partial or full lockdowns to remote working and stalling global trade, investment and tourism, with cleaner air the rare bright spot. Hopes of a V-shaped recovery diminished with the emergence of new Covid strain and subsequent lockdowns. Yet, despite the "Great Lockdown" resulting in a deep recession, markets are exuberant amid expectations that the production and distribution of several vaccines will create a path to normality in 2021.

Unlike the global financial crisis from 2008 to 2009, which began as a housing bubble and a demand shock, the current health crisis began as a supply shock that disrupted global supply chains and caused a spillover to the demand side, where it hit trade, tourism and consumption.

Given the widespread impact of the pandemic and despite concerted monetary and fiscal stimulus equal to 12 per cent of global gross domestic product, not only will the road to

recovery be longer but the cumulative output loss will be much larger than during the 2008 financial crisis, with long-term scarring of labour markets and economies expected.

The UAE's combined monetary, fiscal and health stimulus package – equal to 18 per cent of its GDP – cushioned the economy after a demand-induced oil price shock and the effects of a global lockdown.

After several weeks of movement restrictions and stringent health measures, the UAE's public health system proved effective and resilient, allowing the economy to reopen earlier than regional peers.

While maintaining social distancing and applying Covid-19 protocols to keep the community safe, the UAE reopened offices, businesses, allowed tourists to enter and successfully held events and conferences – both online and on site. This bodes well for the delayed Expo 2020 Dubai and the resumption of tourism.

With the reverberations of Covid-19, the UAE's policy reforms were spot on – from the game-changing 100 per cent foreign ownership of businesses to the remote working initiative to the retirement and 10-year residency visas for skilled professionals – amid the country's intentions to become a knowledge-based, innovative economy.

Liberalisation and market access reforms are set to attract foreign investment, boost capital flows to the property market, enhance workforce skills and support innovation and productivity growth.

With energy market volatility and lingering coronavirus-induced uncertainty, what activities can drive an economic recovery next year and support medium-term growth prospects?

For GCC oil producers, de-risking fossil fuel assets by following a strategy of part-privatisions and public-private partnerships in energy reserves, upstream and downstream operations and related infrastructure such as pipelines is important. This has started with Adnoc and Aramco.

With the oil price required to balance budgets higher than current prices, deficit financing instruments should be

developed by governments. We can expect new government bonds to be issued next year that will encourage more corporate bond issuances and private debt placements.

The UAE is accelerating its decarbonisation efforts, focusing on energy efficiency, transitioning to renewable energy and building on its leadership in renewable energy projects and investment in climate risk mitigation and adaptation.

Greater investment in agriculture technology for food security, which includes sustainable vertical farming and desert agriculture, should take place in tandem with the sustainability and energy efficiency drive.

Decarbonisation and the diversification of the energy mix will support the growth of the UAE's capital markets through the issuance of green bonds and sukuk, as well as the financing of PPP and privatisation deals for renewable energy and clean technology.

Indeed, the UAE can become a regional, if not a global, centre for renewable energy finance.

Covid-19 has led to a strong impetus to digitise as working and learning from home became more popular. The UAE should build on its strong e-commerce and e-services base by massively investing in 5G to support the Internet of Things and building smart cities and infrastructure.

This is critical for the retail sector to move online from brick-and-mortar shops. Liberalising the telecoms sector and lowering the costs of broadband services will help the country become a fully digitised economy and a regional hub for digital services.

The UAE has world-class core infrastructure in transport and logistics, power and telecoms. These assets can serve infrastructure-poor countries in the region, East and Central Africa, India, Pakistan and Central Asia. Electricity from solar power can be exported through cross-country, integrated grids.

Finally, the UAE's normalisation of relations with Israel heralds a new regional economic geography: new trade and investment opportunities, as well as the reduction of

geopolitical tensions.

Dr Nasser H Saidi is a former Lebanese economy minister and founder of the economic advisory and business consultancy Nasser Saidi & Associates

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"A COVID-19-induced macroeconomic overview of the GCC", Keynote presentation at Bonds, Loans & Sukuk Middle East, 8 Dec 2020

Dr. Nasser Saidi, a keynote speaker at the latest Bonds, Loans and Sukuk Middle East event, held virtually on 8-9 Dec 2020, presented a 30-min talk titled "A COVID-19-induced macroeconomic overview of the GCC".
The presentation covered the macroeconomic impact of Covid19 pandemic on the global economy and the Middle East/ GCC region (economic growth, capital flows, trade, investment, labour movements, job losses). Also covered were the policy responses (monetary, fiscal, social and health policies) in addition to thoughts on the Biden Presidency and its regional consequences. The concluding remarks focused on GCC's way forward post Covid19, looking at three pillars: geopolitics, the economy and new sectors of focus.
Download the presentation here.

Weekly Insights 26 Nov 2020: UAE needs to attract FDI into viable, sustainable economic diversification sectors & projects

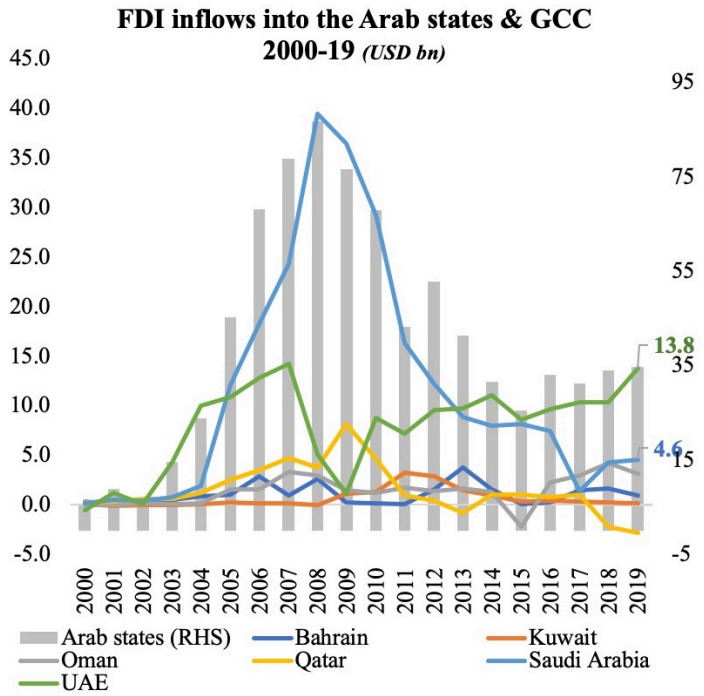
Download a PDF copy of this week's insight piece here.

UAE needs to attract FDI into viable, sustainable economic diversification sectors & projects

The liberalization of foreign ownership laws in the UAE (announced this week) breaks down major barriers to the rights of establishment and will be a game-changer for the country. This reform will help to reduce costs of doing business, lead to a recapitalization of existing jointly owned companies and encourage entrepreneurs to invest in new businesses and new ventures, supporting innovation and the introduction of new technologies while also promoting inflows of foreign direct investment. Foreign companies within UAE's free zones would also be allowed to link up with the domestic economy, supporting local businesses and thereby boosting overall growth. The barriers between free zones and the domestic economy would become blurred, if not absent leading to greater competition and improved competitiveness.

The latest announcement follows a spate of reforms undertaken this year – including labour (long-term residency via a 10-year visa, Dubai's virtual/remote working visa and retirement visa, Abu Dhabi's freelancer permit/ license) and social (removing laws which criminalized alcohol consumption, cohabitation) – aimed to revive the economy attempts from the

negative impact of low oil prices, Covid19 and the Global Lockdown. Importantly, these reforms will encourage the retention of savings in the UAE, reduce remittances and capital outflows, thereby structurally improving the balance of payments. Overall, the result will be an improvement in the Doing Business ranking of the UAE.



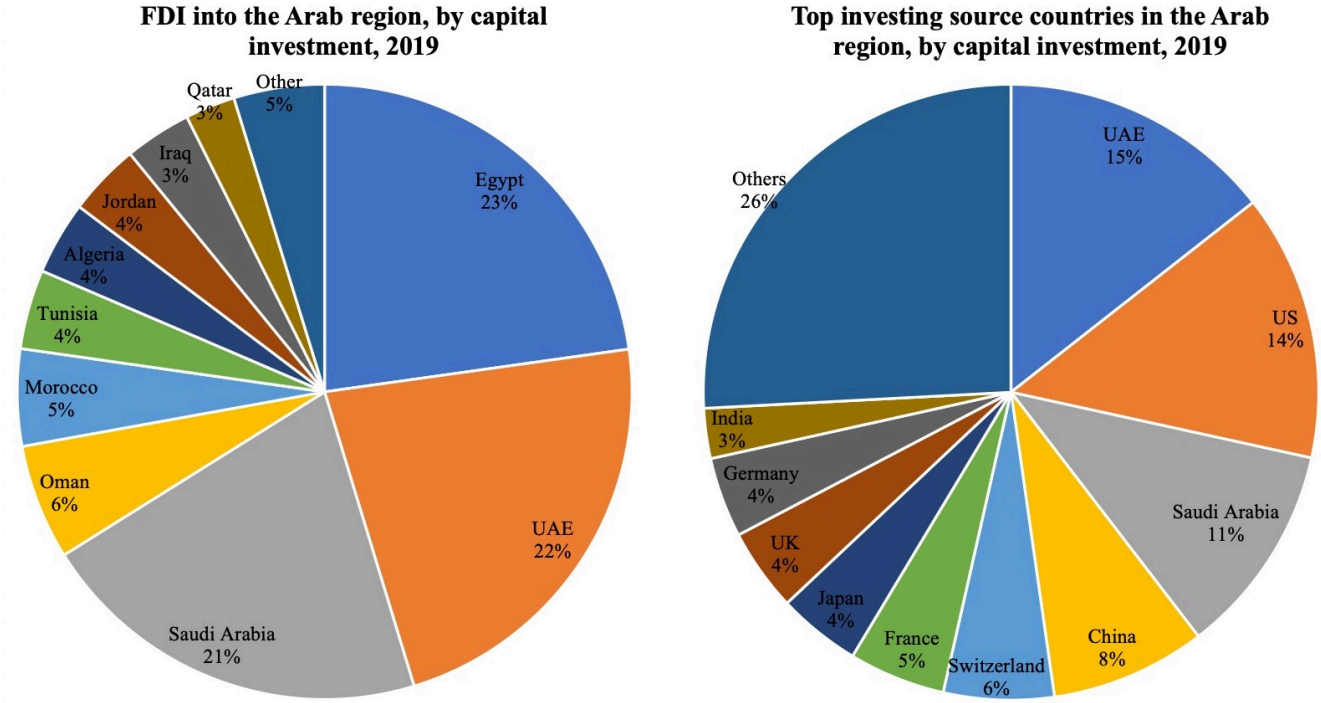
Source: UNCTAD, Nasser Saidi & Associates.

We focus on FDI in this Weekly Insight piece. FDI inflows are essential to the UAE's diversification efforts, as it would not only create jobs, raise productivity and growth, but could also lead to transfer of technology/ technical know-how and promote competition in the market. According to the IMF, closing FDI gaps in the GCC could raise real non-oil GDP per capita growth by as much as 1 percentage point.

While FDI inflows into the Arab region have been slowing in the past decade, the UAE still remains one of the top FDI destinations in the region. Inflows dipped during the time of the financial crisis (to USD 1.1bn un 2009 from an all-time peak of USD 14.2bn in 2007), but rebounded to USD 13.8bn last year, before the Covid crisis. Reforms to improve the investment climate (including allowing 100% ownership at free zones and protecting minority investors), its ease in doing business, good infrastructure as well as macroeconomic and political stability are factors that have aided the increase in FDI.

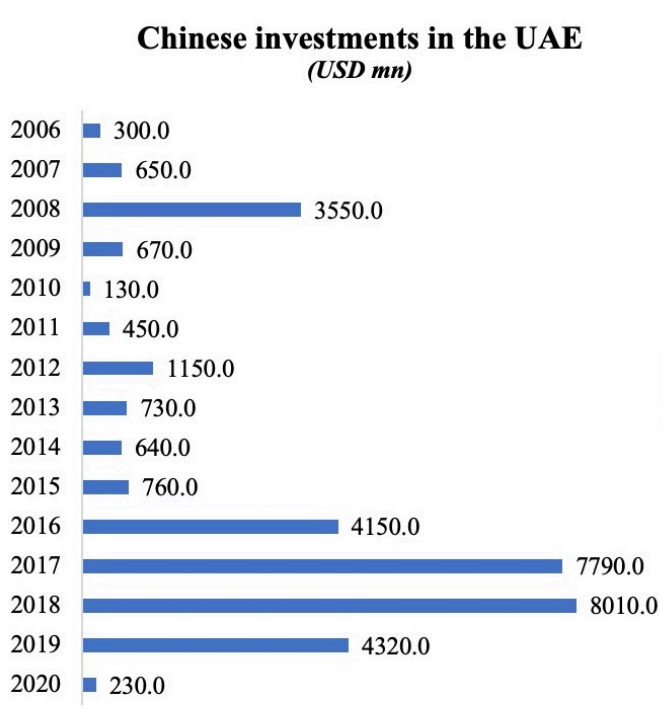
In 2019, UAE was the second largest destination for FDI inflow into the Arab region (USD 13.6bn or 3.4% of GDP, accounting for 21% of total), behind Egypt (USD 13.7bn or 2.8% of GDP, 23% of total) while it dominated FDI by number of projects

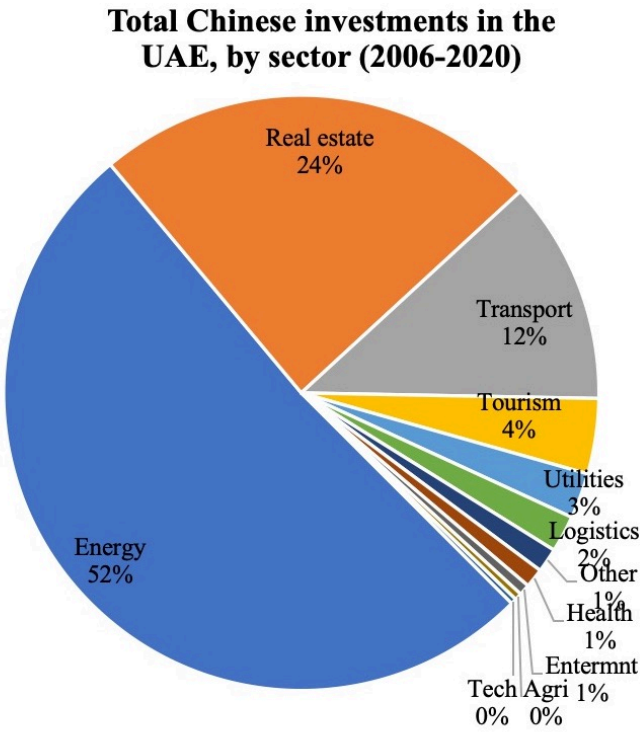
(445). Interestingly, UAE is also a major capital exporter, having invested a total USD 8.7bn into the Arab nations last year (topping the list and accounting for 14.4% of total FDI inflows into the region). In part, this reflects the UAE's hosting of multi-national enterprises investing across the region.



Source: fDI Markets, Arab Investment & Export Credit Guarantee Corporation, Nasser Saidi & Associates.

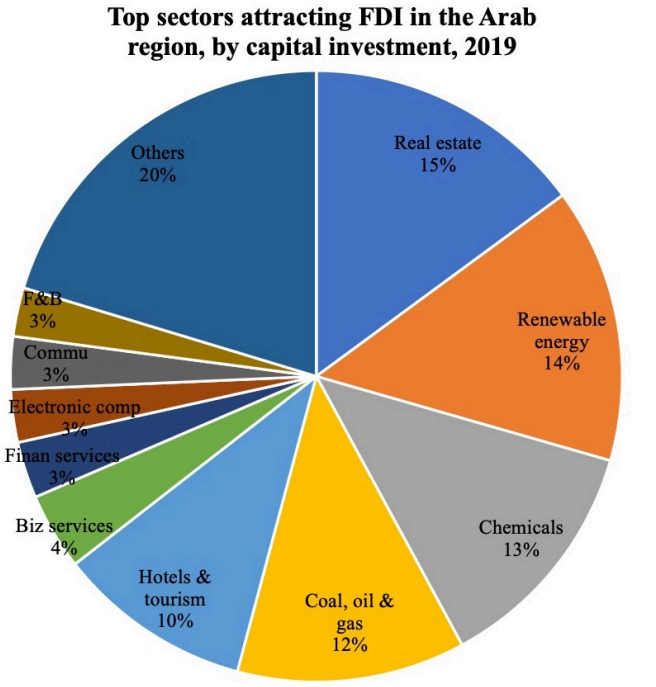
In spite of the Covid19 outbreak negatively affecting FDI inflows[1], Saudi Arabia defied the trend by posting a 12% yoy increase in inflows to USD 2.6bn in H1 2020[2] – in part linked to its mega-projects related to achieving Vision 2030. In Q1 this year, the UAE, along with Saudi Arabia and Egypt accounted for a share of 65.4% of total investment cost of projects in the region, valued at USD 11.2bn. Outflows from the UAE still accounted for 38.2% of GCC's share of foreign investments in Q1 this year[3].





Source: China Global Investment Tracker, AEI, Nasser Saidi & Associates

China's investments in the UAE have been rising, with UAE the top destination country (among Arab nations) accounting for more than one-third of Chinese projects tracked during Jan 2003-Mar 2020 (with the number of projects in double-digits in 2018 and 2019). According to AEI's China Global Investment Tracker, the value of Chinese investments touched a high of USD 8bn in 2018, thanks to a handful of large projects (including with ACWA Power and Abu Dhabi Oil). Sector-wise, investments were concentrated in energy (both oil and gas as well as renewables), real estate and transport – together accounting for 87.8% of total investments during 2016-2020. This is largely in line with FDI inflows into the Arab region as well, with the top 5 sectors (real estate, renewables, chemicals, oil & gas and travel & tourism) accounting for close to two-



Source: fDI Markets, Arab Investment & Export Credit Guarantee Corporation, Nasser Saidi & Associates.

thirds of total inflows in 2019.

For the oil producing & exporting countries of the GCC and the wider MENA, the broader trade and investment landscape was further disrupted (in addition to Covid19) as a result of the profound changes in the structure and dynamics of the energy sector and market. The deep recession and Covid19 lockdown and induced collapse in transport and travel led to a sharp fall in the demand for oil and cratering of oil prices. Fossil fuel prices are unlikely to recover even in the medium term due to the increasing competitiveness of renewable energy (solar, wind and geothermal), persisting competition from shale oil & gas and new fossil fuel discoveries, while climate change mitigation policies and greater energy efficiency are leading to a downward shift in the demand curve for fossil fuels. Accordingly, returns on investment in oil and gas (O&G) will decline. The implication is that FDI into the traditional O&G in the UAE and the GCC will be on a downward trend. The challenge will be to attract FDI into viable, sustainable economic diversification sectors and projects.

The new post-Covid19 FDI landscape for the UAE will likely be boosted if the recently announced deep structural reforms are executed well, alongside a review of existing economic strategies. The next obvious step is greater regional integration – a GCC common market (to start with), allowing for free movement of both labour and capital – as well as formalizing trade and investment treaties with major partners including China.

[1] UNCTAD expects global FDI flows are expected to contract between 30 to 40% during 2020-21.

[2] Source: UNCTAD

[3] Source: Arab Investment & Export Credit Guarantee Corporation

Panel discussion "Managing energy transition in the Middle East" at World Energy Week Live, 7 Oct 2020

The collapse in oil demand and prices due to Covid-19 has had a devastating impact on the resource-dominant countries of the Middle East. Will this delay economic reforms and a transition to lower carbon economies, or can this pose an opportunity for the region to accelerate energy transition and economic diversification?
This panel session, broadcast on 7th Oct 2020, was part of the Middle East and Gulf States session at World Energy Week LIVE on the theme “Managing Energy Transition in the Middle East”

Dr. Nasser Saidi joined an esteemed panel comprising of Adam Sieminski, President, KAPSARC, Adnan Shihab-Eldin, Director General, Kuwait Foundation for the Advancement of Sciences and Robin Mills, CEO, Qamar Energy in a session moderated by Eithne Treanor, Executive Chair, WE Talks, World Energy Council.
The session can be accessed below:

“Tackling the Climate Emergency with Climate

Finance”, Emirates Environmental Group webinar, 28 Jul 2020

Dr. Nasser Saidi participated as a panelist in the webinar organised by the Emirates Environmental Group (EEG) on **28th of July –** under the theme **“Tackling the Climate Emergency with Climate Finance”.** The panel discussion focused on the urgent need for increasing government and private spending on crucial sectors such as health, education, infrastructure, and climate change as well as open up a dialogue about the financial opportunities in the UAE that can be diverted towards combating climate change.
The panel discussion can be viewed below:

"The Economic Consequences of COVID-19 & Impact on Clean Energy", CEBC webinar, 6 May 2020

Dr. Nasser Saidi’s presentation titled “The Economic Consequences of COVID-19 & Impact on Clean Energy” was part of the Clean Energy Business Council’s webinar titled “A Pandemic, Oil Price Collapse, A Recession: Is the Future still Green?” held on May 6th 2020.
A summary of the webinar is available on the CEBC website (https://cebcmena.com/knowledge-centre/reports-and-publication

s/) and can be downloaded directly here.
Watch the webinar below:

Comments on Surviving the Covid-19 economic crisis in MEED, 24 Mar 2020

Dr. Nasser Saidi's comments appeared an article titled "Surviving the Covid-19 economic crisis" that appeared in MEED on 24th Mar 2020.
Comments from the article are posted below. The full article can be accessed here.
"It looks like the oil price war that is now launched is a strategic move by Saudi Arabia to weaken or destroy shale oil," says economist Nasser Saidi, founder and president of Nasser Saidi & Associates.
"It was bound to happen. There are two factors negatively effecting oil – renewables and shale. Shale was eating into the Opec plus share. They either wait and continue to lose market share or they act. They could choose now or later. They chose now."
"I estimate that because of the losses, the GCC needs to raise $160bn-180bn in 2020 to maintain current spending deficits and provide financial support to some industries such as aviation," says Saidi.
No significant announcements have been made about projects being delayed or cancelled in the region, but the projects sector will be significantly affected by cuts to capital spending. *"The likelihood is that many will be delayed or postponed," says Saidi. "And the net result is that structural adjustment, in terms of diversification, will be more*

difficult unless they bite the bullet and open up privatisation and public-private partnerships (PPPs). To me, this is the time to provide incentives."

Comments from the Middle East Energy 2020 conference in Gulf Today, 3 Mar 2020

The below comments were published in Gulf Today, in an article titled "Global energy platform spotlights latest breakthroughs, challenges", on the basis of the discussion at the Middle East Energy 2020 conference, held in Dubai on 3rd March 2020. Dr. Nasser Saidi's comments are posted below.

Nasser Saidi, Chairman, Clean Energy Business Council Mena, said, "Currently, there are seven gigawatts of renewable energy projects in the region and this is very encouraging for the transformation of the energy mix in GCC countries. If you look at prices, we are currently at $0.14 per kilowatt for renewable energy and heading towards $0.01. This means the region is not only at the forefront in adopting renewable sources such as solar power, it means fossil fuel power generation is now being outcompeted by renewables."
He added, "If you're going to invest in the regional energy sector, it has to be in renewables. They are much more efficient, cleaner for the environment and can be achieved at much less cost."
Saidi also added that ending regional energy subsidies, which have historically kept energy prices lower, will benefit both public and private sectors, consumers and the planet, with money previously set aside for subsides instead being utilised

in renewables-based research and development, job creation and a greater understanding of how much energy is being consumed versus how much is actually needed.

The clean energy advocate also stressed the region is primed to take the lead in energy grid integration, stressing his desire for "everyone across the GCC to have their own power plant" is unnecessary.

"Let's integrate the grids across the UAE, across the GCC. Integrated cooperation across the GCC will make for greater efficiency. It means that if there is a surge in energy demand in one location, it can be satisfied by other countries on the grid." Saidi told Middle East Energy delegates that while clean energy targets are a start, they mostly form part of a wider framework centred around climate policy and decarbonising economies for the future, insisting Mena governments and energy companies are already in the driving seat to chart a decarbonised future.

"There is an enormous opportunity for the region to invest in the industry and create jobs. We've long been energy consumers; now we should become exporters of renewable energy. There's no reason why we cannot be at the forefront, as producers of solar technology, to link Europe and North Africa," added Saidi.

"If there's one place where we should be doing research and development in solar it is here, not in Europe. We have approximately 355 days of sunshine. Let's take the lead, build homegrown technology and become exporters of that technology. We can partner with countries such as China who are at the forefront of solar technology. I think this is the answer."

"Climate Change is an Existential Threat for the Middle East & the GCC", Article for Aspenia, Fall 2019

The article titled "Climate Change is an Existential Threat for the Middle East & the GCC" will be published in the Aspenia Issue, Fall edition 2019, and can be downloaded in Italian.

While humans squabble and debate their commitment to combat climate change -despite the clear and present danger warning of the 2018 report by the Intergovernmental Panel on Climate Change (IPCC)- Nature has been relentless and unforgiving. Extreme weather events are growing in intensity and frequency. Examples of which include maximum temperatures being reached in Bahrain this June since records in 1946. The ongoing drought in India and related acute water shortage continues, threatening rural communities and leading to greater poverty. It is expected that sea levels are expected to rise between 10 and 32 inches or higher by the end of the century. Arctic ice loss has tripled since the 1980s [1]and Antarctica lost as much sea ice in four years – four times the size of France [2] as the Arctic lost in 34 years. The Global Climate Risk Index reports that "altogether, more than 526 000 people died as a direct result of more than 11 500 extreme weather events; and losses between 1998 and 2017 amounted to around US$ 3.47 trillion (at PPP rates).[3]

Moving from Climate Crisis to Climate Opportunity

The World Bank estimates the current cost of climate-related

disasters at $520bn a year, forcing some 26mn people into poverty annually.[4]In comparison, the additional cost of building infrastructure that is resistant to the effects of global warming is only $2.7tn in total over the next 20 years. By contrast, the currently known cost of inaction is enormous and expected to reach a staggering USD 23 trillion a year by the end of this century [5], four times greater than the impact of the 2008 financial crisis.

The economic impact of climate change will be pervasive ranging from major disruption to food chains, the 'creative destruction' of fossil fuel based activities, widespread damage to infrastructure, increased inequality across and within countries unable to counter the effects of climate change, mass forced displacement of human and animal populations, and the destruction of human, animal and plant habitats. The climate change externality is global, long-term, persistent, and potentially irreversible. This has prompted Joe Stiglitz to say that 'the climate crisis is our third world war. It needs a bold response'.[6]

Part of the answer involves deep decarbonisation, shifting our economies from fossil fuels towards green economy solutions, based on renewable energies and technologies. Rapid technological change and innovation has made renewable energies (solar, wind, hydro, geothermal) directly competitive with fossil fuel based technologies and enabling distributed energy resources. More recently, AI and Blockchain are being applied to renewable energies increasing their efficiency and competitiveness. These can be powerful technologies for economic development and for lifting rural communities out of poverty through 'electronification' and digitalisation. We should not, however, delude ourselves: technology is not a panacea absent of political will, commitment and public and private investment. The growing political acceptance of 'green new deals' generates some cautious optimism.

MENA/GCC climate change impact and risks

While climate change will be global, its regional impact will

be varied and unequal, with MENA along with Sub-Saharan countries among the most vulnerable. Growing desertification, widespread drought, high population growth rates (leading to a doubling of population by 2050), rapid urbanisation, extreme heat, compound the effects of water scarcity to magnify the impact of climate change. Last year was the fourth warmest on record, with Algeria recording the hottest temperature (51.3°C) reliably recorded across Africa.

About 17 countries are already below the 'water poverty line' set by the UN. The World Bank estimates that climate-related water scarcity will cost the region 6 to 14% of its GDP by 2050, if not earlier. The MENA region's annual recharge rate of renewable water resources amounts to only 6% of its average annual precipitation versus a world average of 38%. In this context, it should be remembered that Saudi Arabia has exhausted almost 4/5-th of its aquifer water after misguided "food security" policies encouraged water & energy intensive modern farming to transform a largely desert country to become the world's 6thlargest exporter of wheat! This has now stopped but the environmental damage is permanent.

Climate Change and Conflict

Home to 6% of the global population but just 1% of freshwater resources, the MENA region (already in the throes of conflicts over resources, land, ideologies and religion) will very likely be fighting "water wars" by mid-century. Ethiopia is building its Grand Renaissance Dam and Egypt claims that it will cut downstream flows and water supply to Egypt by some 25%. The potential for conflict is growing, with Egyptian President el-Sisi openly declaring that the dam is "a matter of life and death."[7]

A growing body of evidence (for example Burke et al. (2014))[8]and research shows a strong linkage between climate and conflict, with adverse climatic events increasing the risk of violence at both the interpersonal level and the intergroup level, in societies around the world and throughout history.

While climate change was not the main driver of the Arab Firestorm in 2011, the Syrian civil war is linked with an extended drought period between 2006-2011 which caused 75% of Syria's farms to fail and 85% of livestock to die, devastating rural communities, resulting in forced displacement. The Libyan and Yemen wars as well as the Sudan civil unrest have been exacerbated by low rainfall and associated drought leading to rural impoverishment and migration.

Reliance on desalinated water for domestic use is another concern. MENA accounts for nearly half of the world's desalination capacity and the GCC's dependence on desalination is almost 90%. This leaves a large carbon footprint as the region is reliant on energy-intensive thermal desalination plants. Ironically, the region is also at the risk of flooding: the World Bank identified 24 port cities in the Middle East and 19 in North Africa at particular risk of rising waters [9]. For countries like Kuwait and the UAE, the threat of rising sea levels could permanently impact up to 24% and 9% of their GDP respectively. Furthermore, the wide disparity in regional wealth and incomes (about $70k per capita in Qatar to less than $1k in Sudan) implies differences in adapting to and mitigating climate change risks.

Oil Producers Face an Existential Threat

Climate change poses an existential challenge, threatening the economic viability of the MENA oil producing countries. The energy transition to comply with COP21 and related commitments leading to a global shift away from fossil fuels to renewable energy, implies that the main source of wealth and income of the GCC and oil producers could rapidly depreciate in value as a result of the fall in demand and prices. Fossil fuel assets could become "stranded assets" i.e. assets that are not able to meet a viable economic return as a result of unanticipated or premature write-downs. To counter this existential threat, the GCC countries need to accelerate their economic diversification plans and develop and implement decarbonisation strategies. The nations have tentatively and

timidly embarked on this path.

MENA/GCC policies to combat climate change

The GCC nations have initiated a phased removal of fuel, electricity and water subsidies to reduce the high energy intensity of consumption and production induced by distortionary subsidies. The removal of subsidies will reduce energy use and help shift the energy mix away from fossil fuels, and also creates fiscal space allowing funding of renewable energy investments and climate-resilient infrastructure.

The Middle East and GCC are part of the Global Sun Belt: more energy falls on the world's deserts in 6 hours than the whole world consumes in a year! Harnessing solar power is an efficient policy choice, while wind power market is slowly catching up in Jordan and Morocco, though more than 56% of the GCC's surface area has significant potential for wind deployment.

The GCC nations and especially UAE, are taking a lead in MENA in increasing energy efficiency-a low hanging fruit- and investing in renewable energy. There is now a GCC renewable energy project pipeline comprising over 7 GW of new power generation capacity to be realised within the next few years. The surge in projects has been supported by the rising cost competitiveness of renewables (it is now actually cheaper to build new wind and solar PV plants than it is to run existing fossil-fuel ones), as well as the falling costs of energy storage (by 2021, the capital costs of lithium ion battery-based storage are expected to fall by 36% compared to the end of 2017 [10]).

IRENA's 2019 report [11]estimates that by 2030 the region is on track to leverage renewables to save 354 million barrels of oil equivalent (a 23% reduction), create some 220,500 new jobs, reduce the power sector's carbon dioxide emissions by 22%, and cut water withdrawal in the power sector by 17%. Renewable energy related targets range from UAE's ambitious goal of 44% of capacity by 2050 (from 27% clean energy in

2021) to Bahrain's target of 10% of electricity generation in 2035, and Saudi Arabia's 30% of generation from renewables and others (mainly nuclear) by 2030. The other important component of reducing energy consumption is energy efficiency, with a 6% target of reducing electricity consumption in Bahrain (in 2025) to 30% in the UAE (in 2030). Countries are now starting to commit to a net-zero emissions goal – 15 nations have declared the intention of reaching net zero emissions in or before 2050 [12]. The GCC are yet to announce their intentions in this regard.

In addition to the deployment of renewable energy projects, energy efficiency investments are another area for reform. Retrofitting existing buildings will improve energy efficiency and reduce carbon emissions. Green buildings [13]is another policy initiative which has gained traction: the Dubai Municipality has issued the Green Building Regulations and Specifications for all new buildings in the emirate since March 2014. But Dubai is the only city in the MENA region to join the Building Efficiency Accelerator programme, to double the rate of energy efficiency by 2030.

Climate Change Challenges facing MENA and the GCC

Looking ahead, the countries of the region face three broad challenges:

1. Institutional challenges:
2. Policies are in place to move away from fossil fuels to clean energy; however, until subsidies are eliminated, the legacy of building large conventional plants to feed demand is unlikely to end.
3. These policies should ideally be supported by adopting a Zero Net Emissions policy, to serve as a comprehensive, unifying basis for climate change policy. Other GCC nations could follow the UAE's policy direction and establish Ministries of Climate Change & Environment.
4. Unified regional standards are needed to remove barriers to trade and investment, are necessary for regional

power market integration and to benefit from economies of scale.

5. Build capacity to support the creation and development of climate change policy and regulatory experts who can support the government and private sector create policies and strategies to meet a Zero Net Emissions policy.
6. Financing:
7. Introducing Carbon Taxes in MENA would generate substantial revenue, increase energy efficiency and part fund decarbonisation strategies.
8. Support for small-scale players and installations: significant initial capital requirements for big facilities deter the entry of small-scale players. Support for home and business PV installations would improve energy efficiency and creation of distributed energy resources.
9. Facilitate New Energy Financing: global green bond issuances reached a record USD167 billion in 2018. The GCC could become the center for MENA and emerging market green bonds and Sukuk.
10. Develop Green Banks to fund the private sector in decarbonizing, from energy efficiency, to retrofitting, to climate risk mitigation investments.
11. Adopting technological innovations: implement Blockchain (for power/ grid chain management) and AI to increase efficiency, ability to store and share solar power via interconnected grids and smart meters.

Concluding remarks

Climate change poses some daunting challenges and existential risks for the MENA region, the GCC and other MENA oil producers. The bottom line is:

- The MENA countries are highly vulnerable to climate change because of their geographic conditions, demographics, lack of climate resilient infrastructure,

deficient institutional capacity and preparedness to mitigate climate change risk. They also face—mainly in North Africa- the rapidly growing spillover effects of climate-induced mass displacement and migration from Sub-Saharan Africa. They face growing risks of climate related conflicts.

- The global energy transition and decarbonisation policies imply a growing risk that the fossil fuel resource wealth of the oil producers will become stranded assets. Similarly, the region's banking & financial sector faces stranded assets risk, given its heavy exposure to the oil & gas sector. These are existential risks.
- The GCC countries have developed energy sustainability policies. These are modest given their large natural comparative advantage of harnessing solar & wind power and their substantial financial resources allowing accelerated investment in renewable energy assets. A Net Zero Emissions climate policy should be developed and implemented.
- To mitigate climate change risks, the region's oil producers must accelerate their economic diversification away from oil & gas. This implies a rapid phasing out of fossil fuel subsidies. Decarbonisation and economic diversification are complementary strategies and a win-win opportunity. By diversifying into renewable and sustainable energy and climate risk mitigating industries and activities, the GCC can create jobs and a new alternative export base, through a Green New Deal.

[1]https://www.nationalgeographic.com/environment/global-warming/global-warming-effects/
[2]https://www.weforum.org/agenda/2019/07/antarctica-lost-sea-ice-4x-the-size-of-france-in-3-years/
[3]https://www.germanwatch.org/sites/germanwatch.org/files/Global%20Climate%20Risk%20Index%202019_2.pdf

[4]https://www.worldbank.org/en/news/press-release/2016/11/14/natural-disasters-force-26-million-people-into-poverty-and-cost-520bn-in-losses-every-year-new-world-bank-analysis-finds
[5]WEF discussion: https://www.youtube.com/watch?v=su38ondAwkg
[6]https://www.theguardian.com/commentisfree/2019/jun/04/climate-change-world-war-iii-green-new-deal
[7]See "How Climate Change Could Exacerbate Conflict in the Middle East",
[8]Burke, M., Hsiang, S.M., Miguel, E. (2014): "Climate and Conflict", downloadable at: https://www.nber.org/papers/w20598
[9]Egypt's coastal city Alexandria, the second largest city, is at risk of being submerged by rising sea levels.
[10]See Lazard's report https://www.lazard.com/perspective/levelized-cost-of-energy-and-levelized-cost-of-storage-2018/
[11]https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Jan/IRENA_Market_Analysis_GCC_2019.pdf
[12]https://eciu.net/news-and-events/press-releases/2019/one-sixth-of-global-economy-under-net-zero-targets
[13]Green building is the practice of creating structures in a resource efficient way without having any negative impact on the environment.

How should MENA address the existential threat of climate change? Article in The

National, 28 Aug 2019

This is part 2 of a two-part column. The first can be found here.

The article titled "How should MENA address the existential threat of climate change?" appeared in The National's print edition on 28th August, 2019 and is posted below. Click here to access the original article.

How should MENA address the existential threat of climate change?

The starting point for the Middle East and Northern Africa to address the existential threat of climate change is to reduce excessive fossil fuel use by removing subsidies and investing to increase energy efficiency.
The GCC nations – starting with the UAE – have initiated a phased removal of fuel, electricity and water subsidies that have distorted consumption and production choices and encouraged energy waste. The removal of subsidies will discourage energy-intensive activities, provide cost incentives to improve energy efficiency and shift the energy mix away from fossil fuels towards renewables. Eliminating subsidies also provides greater financial resources to fund renewable energy investments and climate-resilient infrastructure.

Given heat levels in the GCC, modernising air conditioning systems and retrofitting existing buildings can radically improve energy efficiency and reduce carbon emissions. Green buildings standards are a policy initiative gaining traction: Dubai Municipality has issued the Green Building Regulations and Specifications for all new buildings in the Emirate since March 2014.
But Dubai is the only city in Mena to join the Building

Efficiency Accelerator programme, aiming to double the rate of energy efficiency by 2030. Overall, effective implementation of energy use targets and standards could lower energy use by some 30 per cent. Increasing energy efficiency is low hanging fruit and should be accelerated given the high returns on investment.

The Middle East and GCC are part of the Global Sun Belt: more energy falls on the world's deserts in six hours than the whole world consumes in a year.

Harnessing solar power is an efficient policy choice. The GCC nations, especially the UAE, are taking a lead in investing in renewable energy in Mena. There is now a GCC renewable energy project pipeline comprising over 7 GW of new power generation capacity to be realised within the next few years. To put it in perspective, one gigawatt is roughly equal to 3.125 million photovoltaic solar panels, 412 utility-scale wind turbines or 110 million LED bulbs. The surge in projects has been supported by the rising cost competitiveness of renewables: it is now cheaper to build new wind and solar PV plants than it is to run existing fossil-fuel ones. The falling costs of energy storage is addressing the intermittency problem of renewables; by 2021, the capital costs of lithium ion battery-based storage are expected to fall by 36 per cent compared to the end of 2017. While the wind power market is slowly catching up in Jordan and Morocco, the GCC has under-invested: more than 56 per cent of the GCC's surface area has significant potential for wind deployment.

The International Renewable Energy Agency's (IRENA) 2019 report estimates that by 2030 the GCC is on track to leverage renewables to save some 354 million barrels of oil equivalent (a 23 per cent reduction). Its efforts will also create some 220,500 new jobs, reduce the power sector's carbon dioxide emissions by 22 per cent and cut water withdrawal in the power sector by 17 per cent.

Renewable energy related targets range from the UAE's ambitious goal of 44 per cent of capacity by 2050 (from 27 per cent clean energy in 2021) to Bahrain's target of 10 per cent

of electricity generation in 2035, and Saudi Arabia's 30 per cent of generation from renewables and others (mainly nuclear) by 2030.

While these targets sound ambitious, they do not meet the threat of climate change. The acceleration and intensity of climate change requires deeper and holistic strategic planning and action. Climate change poses some daunting challenges and existential risks.

To address the stranded assets risk, the GCC needs to share risk on a global basis by privatising or selling participation in their vast energy reserves and related assets (upstream and downstream). Saudi Arabia's announced plan to privatise Aramco is a structural reform that could be a model for other oil producers to emulate. In the same vein, the GCC sovereign wealth funds should divest from fossil fuel assets (as Norway's Government Pension Fund Global is doing) and the banking and financial sector should gradually divest and reduce its exposure to fossil fuel assets.

The GCC countries have developed energy sustainability policies. But these are modest given their natural comparative advantage in harnessing solar & wind power and their substantial financial resources allowing accelerated investment in renewable energy assets. This is the time for the GCC to commit to and implement comprehensive, Net Zero Emissions (NZE) goal climate strategies in or before 2050, along with some 15 other nations.

Decarbonisation and economic diversification are complementary strategies and a win-win opportunity. By diversifying and investing in renewable, sustainable energy and climate risk mitigating industries and activities –through Green Economy strategies – the GCC can create jobs, innovate and develop a new alternative export base.

The existential threat of climate change is real and becoming a clear and present danger requiring national and regional concerted policies and action, with the promise of new technologies, decarbonised growth and new economic development models. The alternative of inaction is decades of decline,

dismal growth prospects, growing impoverishment, instability and conflicts. The choice is clear.

Jordan: Adjustment & Reform along the Path(s) to Economic Prosperity – Opening keynote at EY's Entrepreneur of the Year 2018 Jordan Forum, 26 Nov 2018

Dr. Nasser Saidi gave the opening keynote presentation "Jordan: Adjustment & Reform along the Path(s) to Economic Prosperity" at EY's Entrepreneur of the Year 2018 Jordan Forum titled "The Path to Economic Prosperity" in Amman on the 26th of November 2018.

The presentation covered the global macroeconomic outlook and risks, and focused on Jordan's economic performance and recent reforms. Dr. Saidi also proposed a list of structural reforms needed for private sector development in Jordan, including increasing female labour force participation and a national digitalisation policy. The talk ended with a slide on focused reforms for "Paths to Prosperity" for Jordan.

Click here to download the presentation.

"Navigating in Turbulence", Presentation to the AlShall Investment Holding Group, 19 Nov 2018

Dr. Nasser Saidi gave a closing keynote presentation titled "Global & GCC Outlook: Navigating in Turbulence" at the AlShall Investment Holding Group strategy session held in Kuwait City on the 19th of November 2018.
The presentation covered the global macroeconomic outlook and risks, and looked in depth at the reform and transition in the GCC given the backdrop of the New Oil Normal. The session also discussed investment opportunities in the region including renewable and clean energy as well as FinTech.
Click here to download the presentation.

Making it Clean: Changing the Global Energy Mix, Article for Aspenia, Jul 2018

The article titled "Making it clean: changing the global energy mix" was published in the latest Aspenia Issue, July 2018, and can be downloaded in English and Italian.
The speed of transition to a new global energy mix has accelerated in the past decade. A changing global economic geography with a shift towards fast growing energy-hungry emerging economies (China specifically) as the main growth engines meant a corresponding increase in energy demand that

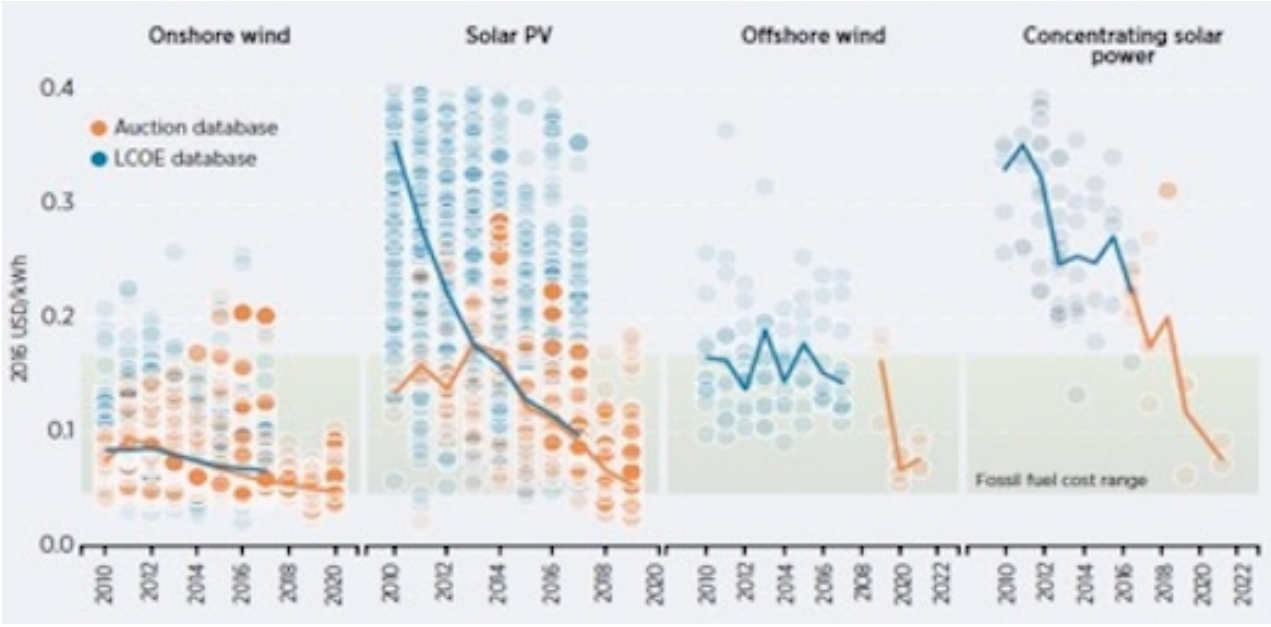
propelled energy prices upwards. Oil prices hit an all-time high of USD 145 in July 2008 before the Global Financial Crisis, and then later in August 2013 to around USD 115. High oil prices provided an incentive for nations (especially emerging ones that ran high oil trade deficits), households and businesses to find substitutes for fossil fuels and lower energy intensity. The EU provided subsidies for renewable energy investments. Concurrently, the OECD countries implemented energy efficiency policies aimed at energy saving, leading to a trend decline in energy used to GDP ratios by some 1%-2% per annum, and breaking the historical link between economic growth and energy demand.

Two additional factors supported the acceleration in energy transition: technological innovation and growing awareness of climate change risks. Innovation in hydraulic fracturing or fracking techniques to extract "tight oil, resulted in the shale revolution and a rapid growth of on-shore oil production in the US. Fracking technology has diffused internationally and its cost has declined: the breakeven oil price for new shale oil wells ranges between USD 46-55, while an oil price between $24 and $38 would cover operating expenses in the US.[1] And the shale oil revolution is spreading internationally: Argentina's Vaca Muerta (Spanish for Dead Cow), is a shale gas and oil formation the size of Belgium, with technically recoverable oil reserves and shale gas of 27 billion barrels and 802 billion cubic feet respectively, the second largest in the world after China's 1.12 trillion cubic feet. Technology is changing the economic geography of energy and its global market!

Similarly, technological innovation and investment have dramatically cut the cost of renewable energy. Since 2009, the global benchmark levelised costs of electricity (LCOE) for solar PV has tumbled by 77%, and that for onshore wind by 38%, while lithium-ion battery price index shows a fall from $1,000 per kWh in 2010 to $209 per kWh in 2017[2]. Declining battery costs means falling energy storage costs, which addresses the problem of intermittency of renewable energy. The decline in

battery storage costs also means a potential revolution of international trade in renewables-based chemicals and fuels. Government policies to curb climate change alongside technological advances and rapidly falling costs for solar and wind power[3] has meant that renewables are becoming increasingly more competitive, resulting in unsubsidized clean energy world records last year. There is no longer a need to subsidise renewable energy system solutions: global renewable energy prices will be competitive with fossil fuels by 2019 or 2020.

Fig 1: Global levelised cost of electricity and auction price trends for solar PV, CSP, onshore and offshore wind from project and auction data, 2010-2022 *(Source: Renewable Power Generation Costs in 2017, IRENA, Jan 2018)*



There has also been a massive shift in public opinion and awareness of the implications of global warming. Addressing the risks of climate change has become a key policy priority embodied in the COP21 commitments. All nations (except the US Trump administration) have committed to reduce emissions by at least 20% compared to business-as-usual by 2030. The subsequent COP 22, 23 commitments have all seen unwavering support from countries across the globe (ex-Trump's US).

A New Oil Normal

The implication of the above trends is that there will be a permanent and persistent secular downward shift in the demand for fossil fuels, putting downward pressure on oil prices. This is the New Oil Normal. For coal producers & coal based utilities and fossil fuel producers and exporters like the GCC countries, the risk is that their vast coal and hydrocarbon reserves will become 'stranded assets': they will no longer be able to earn an economic return.

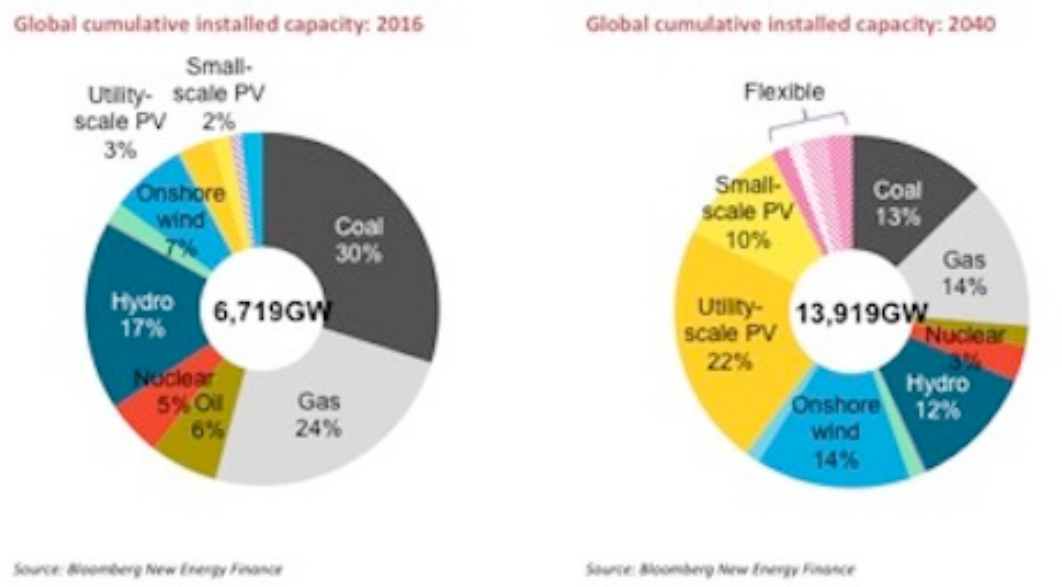
The bottom line is that the increasing prosperity of emerging nations, greater energy efficiency, technological innovation and policy commitments to reduce carbon emissions are resulting in a radical changes of the global energy mix and market. Looking ahead, given their size and demographics China, India and other emerging Asian countries will account for around two-thirds of the growth in energy consumption over the coming decade, to be followed by Africa. Increasingly, these emerging economies are switching to renewable energy sources, given their economic and environmental competitiveness.

A New Energy World is emerging

New investment in clean energy reached USD 333.5bn in 2017, up 3% from the year before but short of 2015's record-high USD 360.3bn, but higher in real terms. A record 157 gigawatts of renewable power were commissioned in 2017, up from 143GW in 2016, and far out-stripping the 70GW of net fossil fuel generating capacity added last year. Solar alone accounted for 98GW, or 38% of the net new power capacity coming on stream during 2017[4]. A regional comparison shows that the balance of investment has shifted from Europe as largest-investing region to Asia. China set a new record for clean energy investment in 2017, and the UAE was among those investing more than USD 1bn in clean energy along with 10 other emerging nations (from a total 20 countries). And Saudi Arabia announced a massive 200 gigawatts solar power development in the Saudi desert with Softbank that would be world's biggest solar project and would be about 100 times larger than the

next biggest proposed development!

Fig. 2, Global cumulative installed capacity, 2016 and projected, 2040 *(Source: Bloomberg New Energy Finance)*



Renewable energy sources are set to represent almost three quarters of the USD 10.2trn the world will invest in new power generating technology until 2040, with solar and wind dominating the future of electricity (Fig 2). The world is also increasing investments in clean technologies. A transport and mobility revolution (electric vehicles) will lead to cleaner, healthier cities for increasingly urbanised populations. Not just ‘smart cities’ but also ‘clean cities’.

Twin Revolutions: Renewables and AI & Blockchain

We are witnessing the birth of twin revolutions which will conflate: AI and Blockchain technologies are fusing with new energy. AI is supporting the 4th industrial revolution: think energy and water digitization, smart grids, smart meters, “deep learning”[5], demand management (i.e. manage demand response of different devices that run in parallel), and digital asset management (i.e. where machine learning algorithms collate, compare, analyze, and highlight risks and opportunities across a utilities infrastructure thereby providing an opportunity for power companies) among others. Blockchain technology has the potential to offer a reliable, low-cost way for financial and/or operational transactions to

be recorded and validated across a distributed network with no central point of authority, leading to a greater decentralization of energy systems.[6] Applications lie across a vast spectrum: digital tokens to reward users for saving energy, adding smart contracts onto a blockchain, asset and inventory tracking, traceability of water, gas & electricity flows & maintenance, data sharing, fraud detection, electric vehicle charging, and so on. Peer to peer energy trading[7] , the ability of neighbouring homes, 'prosumers', to sell solar energy to one another as well as to a shared grid is already being tested.

The challenge to the widespread adoption of blockchain technologies will be to develop an enabling legal and regulatory framework. Country policy frameworks need to be developed to focus on cleantech investments, innovation and commercial conversion, in addition to 'soft' and 'hard' investments to facilitate and integrate the twin revolutions of clean energy and AI and blockchain technologies.

Clean Energy & Economic Development

Energy, water and basic infrastructure are building blocks of economic growth and development. Some 1.1 billion people, of which some 600 million in Sub Saharan Africa, do not have access to electricity. In the absence of electricity they cannot have access to the internet and the digital economy, digital services, let alone participate in the 4th Industrial revolution. The renewable energy revolution offers a new hope to spur and enable economic development of Africa (with its largely untapped hydro and solar potential), India and Asia, using off-grid power systems and decentralisation that do not require expensive, centrally administered national grids. Renewable energy can be local, at village level.

A Renewable Energy Promise?

The IEA has recently warned that the world is headed for irreversible climate change in five years[8]. It is increasingly unlikely that we will be able to keep global warming below 2°C despite COP commitments. Our best hope is to

accelerate the global adoption of intelligent renewable energy systems and clean tech for our cities and transport systems, to rapidly change the global energy mix and mitigate the risks of catastrophic climate change.

[1] See Federal Reserve Bank of Dallas https://www.dallasfed.org/-/media/Documents/research/econdata/energycharts.pdf?la=en
[2] See Bloomberg New Energy Finance (BNEF) https://about.bnef.com/blog/tumbling-costs-wind-solar-batteries-squeezing-fossil-fuels/
[3] IRENA estimates that renewable energy will cost less than fossil-fuel generated electricity by as early as 2020.
[4] http://fs-unep-centre.org/sites/default/files/publications/gtr2018v2.pdf
[5] Google cut its electricity bill with AI: the DeepMind-powered AI coordinated datacenter tasks like cooling, and led to a 15% improvement in power-usage efficiency in 2016. Source: https://www.greentechmedia.com/articles/read/google-employs-artificial-intelligence-to-cut-data-center-energy-use#gs.SuwB65o
[6] See Exploring the Impact of Blockchain in the Energy Industry http://nassersaidi.com/2018/02/15/exploring-the-impact-of-blockchain-in-the-energy-industry-30-jan-2018/
[7] The Brooklyn Microgrid paroject: http://brooklynmicrogrid.com
[8] https://www.theguardian.com/environment/2011/nov/09/fossil-fuel-infrastructure-climate-change