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Energy Transition Dialogues

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OPEDS TOP 10 NEWS DIGEST HYDROGEN INSIGHTS THIS WEEK'S EVENTS

Carbon Markets in Development Across the Gulf

Edward Bell - Senior Director, Market Economics, Emirates NBD

Carbon markets are in the early stages of development across the major GCC economies of the UAE and Saudi Arabia. Both countries have made commitments to achieve net-zero carbon emissions by 2050 and 2060 respectively and making use of carbon markets, along with other emissions reductions strategies, will help the journey toward those targets.

Carbon credits are financial instruments that permit emissions from a company's operations under a set national limit, usually reducing on an annual basis. A carbon offset is a certificate generated by a project that draws carbon out of the atmosphere, through development of a natural resource like a forest, or a project that doesn't add carbon - a renewable energy facility for instance. Carbon trading can take place under mandatory rules, such as the EU's Emissions Trading System (ETS), in which credits are auctioned or allocated to participating companies who then make use of the credits to cover their emissions and then buy or sell more if needed or they have too many. Voluntary carbon trading markets exist as well in which companies buy offsets from qualifying projects to offset their carbon emissions. Etihad in the UAE has made use of voluntary offsets to help reduce some of its carbon emissions.

The 2021 UN Climate Change Conference, COP 26 held in Glasgow last year, achieved a global breakthrough on carbon market operations to avoid double counting any reduction in emissions. It also allowed for voluntary carbon trading to be counted toward a nation's Nationally Determined Contribution (NDC), the carbon reduction plans submitted to the UN as part of the Paris Agreement on climate change. That should help to empower the development of domestic or regional carbon markets and channel investment toward more offsetting projects.

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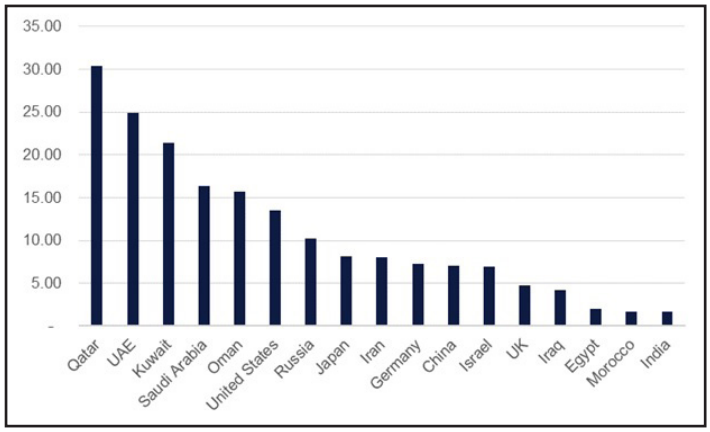
There is a compelling need for economies in the Middle East, and in particular the GCC, to lower their carbon emissions. Compared against peer economies, carbon emissions on a per capita basis are substantially higher. The UAE's carbon emissions per capita was nearly 25 metric tonnes CO2 in 2020 compared with around 14 metric tonnes in the US or 7 metric tonnes in Germany.

Carbon emissions per capita (metric tonnes)



Source: BP Statistical Review of World Energy 2021, World Bank, Emirates NBD Research

Apart from helping the GCC economies meet their nationally determined contributions by offsetting the impact of domestic emissions, the development of carbon markets in the GCC economies could also help to cycle investment domestically toward carbon abatement projects themselves. Carbon capture and storage (CCUS) are major parts of the climate change mitigation plans in both the UAE and Saudi Arabia and a market for the carbon offsetting capacity of CCUS projects could help to ensure their economic viability. A deep market for carbon could also help to offset the impact of Scope 3 emissions from regionally sourced oil and gas exports.

In the UAE, Abu Dhabi Global Market (ADGM) announced this week that it would establish a regulated carbon exchange and clearing house to allow for trade in carbon credits and offsets and eventually develop a derivatives market for carbon assets. ADGM will host the exchange though the carbon trading could relate to projects and companies operating outside of the UAE. In the terms of the UAE's second NDC, submitted in December 2020, the country supported the "development and operationalization of market mechanisms aimed at emissions reduction" which would likely entail the development of a domestic carbon market.

In Saudi Arabia, sovereign wealth fund PIF has announced it will establish a carbon credit trading platform with cooperation from Saudi Aramco, ACWA Power, Saudi Arabian Airlines, Maaden and Enowa. The first auction of carbon credits is meant to begin in Q4 this year. Like the UAE, Saudi Arabia is committed to the development of carbon markets as part of its NDC that was revised in October 2021.

(Source: Emirates NBD Research)

TOP 10 STORIES

1. **The allure of Middle East hydrogen**
2. **Energy Transition Will Transform Geopolitics**
3. **Time to accelerate transition to clean, renewable energy**
4. **EU renewables push to quit Russian energy**
5. **IFM Investors delivers infrastructure outlook**
6. **Global energy spending to reach over $2Trn in 2022**
7. **Hydrogen twice as powerful a greenhouse gas**
8. **China Development Bank bolsters support for clean energy**
9. **CFM: Hydrogen Is The True Zero Carbon Solution**
10. **Italy's Draghi set to sign deal in Algeria to ease Russia gas fix**

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Prof. Tadhg O'Donovan
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COP27/28 to Bolster Egypt & UAE's Commitment to Energy Transition

The Middle East and North Africa is currently faced with the challenge of diversifying energy sources away from oil and gas, reducing CO2 emissions, while at the same time meeting the needs of growing populations and expanding economies. As such, hosting COP27 and COP28, the largest and most important international conference dedicated to climate change, is of great significance to the Arab world as it presents a unique opportunity to find solutions to the region's most pressing challenges.

During COP26, the powerful potential of renewable transformation in the MENA region was acknowledged. The energy transition and the shift away from fossil fuels is shaping policy and investment in the Middle East. With about 28GW of renewable energy production capacity installed across the region, renewables represent only 7% of the region's power generation capacity (MEED report 2021). However, with declining technology costs, most countries are planning solar and wind projects, with Saudi Arabia and UAE leading the way. In addition, Egypt is planning to increase its supply of electricity generated from renewable sources to 20 percent by 2022 and up to 42 percent by 2035
There are reasons specific to both the UAE and Egypt that make hosting the COP events significant. For Egypt, as the largest oil producer in Africa outside of OPEC (Organization of the Petroleum Exporting Countries), has been making ambitious goals in recent years, including the Egyptian Solar Plan that will add 3.5 GW of solar energy by 2027. Most importantly, Egypt hosting COP 27 this year is a significant milestone as it will help future innovative solutions to drive environmental sustainability in Africa, one of the most vulnerable regions to the consequences of climate change.

While for the UAE was the first Gulf country to sign and ratify the Paris agreement and the first Arab country to set voluntary clean energy targets. The country has taken significant steps to accelerate the transition to clean energy including rolling out the Dubai Integrated Energy Strategy 2030 to drive energy decarbonisation and ensure efficient use of energy. The UAE hosting COP28 is essential for laying the groundwork for the UAE's "Net Zero by 2050."

**Paraphrased Comments*

Amir Sharifi
Chief Investment Officer, Hy24
Energy Transition Lead, Ardian

Viability of Hydrogen Investment

Today, natural gas represents 24% of total energy consumption in Europe and 40% of that comes from Russia. Hydrogen and renewables can replace about 20% of that gas supply. This means various initiatives need to accelerate to drive local energy production towards renewables, including Hydrogen, which can be stored, transported over long distances, and can be utilized in many applications in the same way as oil and gas, but with zero carbon emissions.

On the fundamentals, Hydrogen is a great solution! If you no longer depend on the electricity grid and can generate renewable energy with an infrastructure built for Green Hydrogen production, effectively the cost of that Hydrogen, which is now based on current natural gas prices and with a CO2 price, is much more efficient. This can be a game changer for investors because even without public support, that's parity. We expect this to happen in a few years.

How has the Current Threat to Energy Security Dampened Investors' Appetite?

I am pleased to say that we are doing quite well. We targeted to raise $1.5 billion in our new fund, and we are close to reaching our goal. There is a huge appetite to invest into this fund, which has also attracted industrial corporate groups. We are keen to create an initiative that allows industrial and financial investors come together under a common platform. We also found that our value proposition is interesting for target companies which look at a dedicated Hydrogen infrastructure as a valuable solution.

The steelmaking industry is the one that everyone has on their radar because it is an energy intensive industry, and hydrogen offers obvious solutions in that industry. The other one is Ammonia, as the CO2 penalties being imposed on Fertilizer companies mean that they need to switch to options such as Hydrogen derivatives.

**Paraphrased Comments*

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HYDROGEN

China's 2021-2035 Blueprint Focuses on Capacity Building and Demonstrative Applications

In our earlier report of "Hydrogen in China: Hope or Hype?", we reviewed over 50 local hydrogen development plans and concluded that they were "over-enthusiastic zealots" on the part of regional governments. We observed that in contrast to the frenzy of the local authorities, the central government, represented by the NDRC/NEA, has shown more calmness and cautiousness. "They are weighing out, in their forthcoming hydrogen strategy or plan, how to encourage technology development while not adding 'fuels' to the fire that is already burning a lot of money across the country."

Now the much-awaited plan is out. Released by the NDRC/NDRC on March 23rd, the "Mid-to-Long-Term (2021-2035) Hydrogen Development Plan" (the Plan) clarifies China's hydrogen development priorities and focal areas. With this Plan, China joined other major economies (US, European Commission and Individual EU Countries such as Germany, UK and France, Japan, Australia, Korea, Canada, etc.) in having a national hydrogen strategy.

What are the differences between the Chinese plan and those of other countries? Well, this Report does not intend to answer this question, but tries to help you make your own judgement by proving the following key elements of the Plan.

A much watered-down ambition

The Plan acknowledges the importance of hydrogen as a clean energy carrier with potentially big contributions to the netting-zero goals, but putting a strong emphasis on the fact that conditions are not yet mature for large-scale deployment. The highlighted inadequacies China faces include innovation capabilities, sophisticated equipment manufacturing, critical core technologies, key components, and high cost. For instance, the end-user cost of hydrogen today in China is between RMB 50-80/kg (US$7.8-12.6/kg), much higher than oil-derived fuels.

Taking into consideration all those constraints and with an attempt to cool down the overheated local enthusiasm, the Plan sets rather qualitative and aspirational targets for 2025, 2030 and 2035:

- By 2025: build a complete industrial value chain with both "grey hydrogen" (industrial byproducts) and "green hydrogen" (from renewables). Emphasis is given to technology innovation aimed to master the core technologies and acquire manufacturing processes, and improve hydrogen's competitiveness through demonstrative applications. The target is to have 50,000 hydrogen fuel cell vehicles on road, matched with adequate number of refueling stations, and 100,000-200,000 tons of green hydrogen produced.
- By 2030: construe an integrated innovation system and industrial value chain, where green hydrogen is embedded in broad areas of applications.
- By 2035: form a hydrogen application ecosystem covering mobility, energy storage and industrial applications, with the share of green hydrogen in total energy use significantly increased to play its due supporting role in energy transition.

As shown above, specific numerical targets are only set for 2025. As of July 2021, China had only 1,500 hydrogen vehicles on road. Growing the fleet to 50,000 represents a growth of 240% per year over 4 years, but it remains negligible given China's 395 million vehicles fleet in total. 100,000-200,000 tons of green hydrogen production will require an installed electrolysis capacity of 1-2GW, much less than the EU target of 6 GW by 2024. It represents a much-watered down ambition, given China's solar and wind manufacturing capabilities, and particularly in comparison with all the local governments' hydrogen plans.

Green hydrogen:

The Plan has clearly spelled out renewables as the future source of hydrogen supply, although today almost all China's hydrogen production is sourced from coal, gas and industrial processes (see Table 1). The growth rate of green hydrogen from almost zero in 2021 to 100,000 - 200,000 tons within 5 years may appears phenomenal, but not really so when compared to China's existing total hydrogen production volume (33.42 million tons) nor to its total energy consumption of 3,400 million tons of oil equivalent.

Consequently, the essence of the Plan is much more about capacity building rather than any material target on hydrogen development.

FULL REPORT HERE

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INSIGHTS

Two Trains, One Transition

Bill Spindle
Council on Foreign Relations
International Affairs Fellow, India

A ride on Darjeeling's coal-fired train and a visit to India's main electric locomotive factory illustrate the transition. Now it needs to make tracks in a hurry.

The brutal war in Ukraine and its reverberations across Europe are a long way from where my recent travels have taken me: the hills of Darjeeling, their slopes steeped in tea and nostalgia for the long-gone British Empire, and the fertile plain that spreads out between the city of Kolkata and the Himalayan foothills.

Yet my encounters with two trains, one in each place, resonated with the thorny energy dilemmas the world faces in responding to Russian aggression. Namely, how do economies, systems and societies transition from one energy source (say, imported coal and natural gas) to others (like domestically available solar, wind and nuclear power) in a damned hurry?

We've spent three posts looking at the impact of global warming on one of the world's most vulnerable locales, the Sundarbans tidal estuary (read those here, here and here). Future posts will dig deeper into how other places in India are adapting and why adaptation is critical. But in this post I want to return to solutions — how to cut greenhouse gas emissions — echoing an urgent, massive report recently released by the leading global body on climate change.

The first train encounter took me back in time to India's coal-fired, colonial past on a steam locomotive through the storied hills of Darjeeling. The second transported

me forward toward modern India's decarbonized future: riding (even a short stint driving!) an electric locomotive of the sort that increasingly dominates India's rail network.

And what a rail network it is!

This post also serves to introduce the Indian Railways, one of the world's most remarkable institutions. The railway figures prominently in my journey from here on out. It's how I am making my way around the subcontinent, and it occupies an important role in India's transition from coal to clean electricity. It's an institution that touches almost every part of India and virtually every Indian in some way.

Among the oldest railroads in the world — and the first in Asia — Indian Railways transports more people, more places than any railway outside of China. Daily, that's 23 million riders, along with 3 million tons of freight. It's like moving all of Australia every 24 hours. Wholly owned by the government, Indian Railways operates 40,300 miles of tracks, enough to go around the earth and then some. It's one of the world's largest employers, with 1.5 million workers. Its lines reach nearly every corner of the country, piercing jungles, scaling mountains, tracing coastlines, sprawling across dense cities and traversing fertile rural plains. Passengers are from all walks, migrant laborers traveling to and returning home from far away jobs, bureaucrats making their daily commute, farmers toting produce to city bazaars, inspectors bound for rural villages, soldiers commissioned to far-flung posts and the pious on the country's never-ending pilgrimage circuit. Railway freight is the lifeblood of the economy: grains and lentils, kernels and bulbs, clothes and textiles, appliances, cement, chemicals, cars, coal.

FULL ARTICLE HERE

THIS WEEK EVENTS

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TWO MINUTE WARNING
INTERVIEW SERIES

Dr. James Henderson

Director, Energy Transition Research Initiative &
Chairman, Gas Research Programme
The Oxford Institute for Energy Studies

TUESDAY /// APRIL 12th /// 11:00 (UAE)

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Alex Zapantis

General Manager - Commercial
Global CCS Institute

WEDNESDAY /// APRIL 13th /// 11:00AM (UAE)

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