

Energy Transition



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ISSUE 74, TUESDAY, FEBRUARY 21st

SCROLL DOWN

VIEWES FROM LATIN AMERICA

MIDDLE EAST ENERGY TRANSITION

GREEN HYDROGEN PROSPECTS

Net Zero is the Short Way to Cleaner Energy Systems

Eng. Aisha Al Abdooli

Director Green Development and Climate Change
Ministry of Climate Change and Environment, UAE

The world needs an estimated \$50 to \$60 trillion to decarbonize industrial and energy systems by 2050. No single nation can achieve this on their own. This transition will require new models of government and private sector funding. It is urgent for the world to accelerate the transition to cleaner energy systems. The shortest way to do so is by targeting the net zero. We need to focus on a pragmatic progress to drive the energy transition, which can create new industries, new jobs and generate demand for new skills.



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Eng. Aisha Al Abdooli

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Major outcomes from COP27?

Despite the low expectations initially, COP27 achieved outcomes that will have far reaching implications for the international climate change agenda. Firstly, developed countries agreed to fund the loss and damage compensations to developing countries, something they refused to do for decades. Secondly, the summit managed to negotiate the phasing out of all fossil fuels, which no other COPs had done before. The third outcome was to establish a working program for potential future agreements to scale up supports for a just transition in developing countries. The future of financial deals between developed and developing countries is likely to take place through just transition partnerships.

Paving the way to COP28 in the UAE

The UAE delegation attended COP27 to understand the priorities and concerns of all stakeholders. We want to incorporate these into the program for next year's COP 28 and build upon the outcomes of COP27. Additionally, we are exploring new prospects for public-private partnerships. We are committed to deliver an inclusive and solutions-oriented summit that accelerates the climate finance mobilization, enhances access to clean technologies across communities, and supports the talent development from all sectors of society, including women and youth. As we gear up for next year's climate summit, we will work with the world in the pursuit of actionable pathways to net zero by 2050.

**Paraphrased Comments*

Source: Mashreq Sustainable Finance Dialogues



Masoud Al Hamadi

Exploration & Production Manager
Sharjah National Oil Corporation (SNOC)

Leveraging back-to-back COPs to expand initiatives in the region

We are currently focusing on gas operations to support efforts towards the energy transition. Natural gas is the least carbon intensive of fossil fuel sources and can play its part in achieving a smoother energy transition towards renewable energies. The role of oil and gas companies will be crucial in the coming decades. We have to continue exploring efficiently. Any excess gas we produce today might be turned into hydrogen in the future, for instance. It is necessary to think about other ways to reduce greenhouse gas (GHG) emissions. For instance, we are currently entering the business of carbon capture and storage (CCS). Oil & Gas companies have many depleted reservoirs. We need investments and we need to allow every industry, not just oil and gas, to dispose their CO₂ emissions. Incentives will be fundamental to encourage these types of projects. The UAE has been focused on renewables for two decades. I think it's a very good time for the country to talk about initiatives. We are witnessing many collaborations taking place in the renewable energy space between different countries, as well as the recent commitment from developed countries to fund loss and damages from climate change in developing countries.

Decarbonization will be the way forward for Oil and Gas

Technology providers are essential to improve the decarbonization business. They can help us be more efficient in our operations and reduce the carbon intensity that we produce from fossil fuels through digital transformation and technology applications. The UAE will play a leading role in the decarbonization of the oil and gas industry. We achieved a significant milestone by becoming the country that produces the least carbon-intensive oil barrels. COP28 can be a new opportunity to advance the conversation in this field and continue expanding collaboration among stakeholders.

**Paraphrased Comments*

Source: Mashreq Sustainable Finance Dialogues

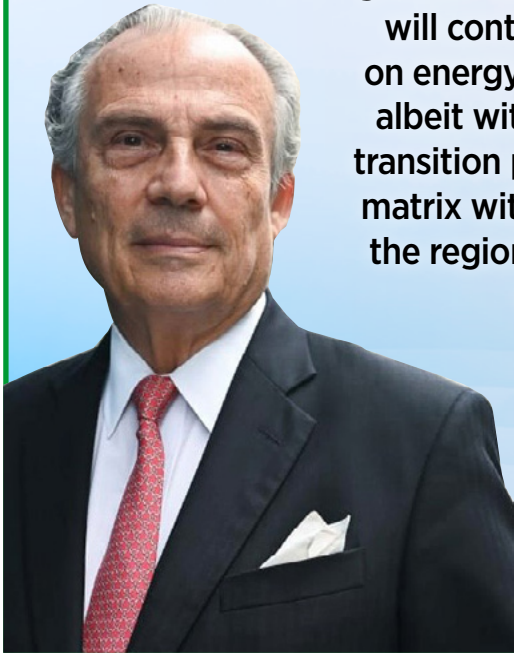
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WEEKLY SOUNDING

Brazil

“This leftist and more environmentally focused administration must streamline the complexities – but not ease the requirements – of environmental permitting that stand in the way of sector growth. Notwithstanding focus on oil and gas that continues and will continue, it does not preclude an even stronger emphasis on energy transition. Petrobras’ oil output will continue to grow, albeit with lower emissions, whilst it leads the Brazilian energy transition process and continues to diversify its domestic primary matrix with cleaner and renewable energies. Brazil already leads the region in solar and wind deployments and 76% of its power generation comes from renewable sources.”



Carlos Garibaldi
Executive Secretary
Association of Oil, Gas and Renewable
Energy Companies of
Latin America and the Caribbean

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H₂ HYDROGEN *‘FULL COURT PRESS’*

Hussein Fouad El Ghazzawy
Senior Energy & Industry Consultant
LYNX Strategic Business Advisors

WEDNESDAY /// MARCH 1st /// 11:00AM (UAE)

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Prospects of Green Hydrogen



Ibrahim Al Z'ubi

Chair of the Global Council on SDG13- Climate Action
SVP – Sustainability & Climate Change, ADNOC Group

In the global race against the clock, the energy sectors of the world have been seeking alternatives to the most common source of power, fossil fuels.

While energy transitions and the reality and feasibility of such a transition are constantly discussed and debated amongst experts and governments, and deserve a blog post of their own, there is no argument that these transitions are essential if the world is to stand a fighting chance against climate change and reduce its greenhouse gas emissions in line with the Paris Agreement to promote sustainable living. The most promising drivers of these transitions are solar energy, wind energy, and hydropower energy. However, a rather obscure and uncommon source of power in modern times is re-emerging in the energy markets and is becoming a key player in facilitating these energy transitions in the global sector. Green hydrogen, a low-carbon form of energy, is generated from the electrolysis of water, where the water molecule separates to give hydrogen and oxygen gases.

Before discussing the advantages, it is important to understand the limitations of green hydrogen. Electrolysis is the process of supplying molecules with energy to split them into smaller components. Therefore, to produce this energy source – energy must be consumed. Additionally, electrolysis is an energy intensive process, and



is very expensive as well. Since the goal of green hydrogen is a non-carbon energy source, it would be counterproductive to power its production with fossil fuels. Thus, renewables would be needed to catalyse this process, an energy source that itself is very costly at the scale necessary to produce sufficient amounts of green hydrogen. However, with global goals of reducing carbon footprints, renewable energy sources are becoming more accessible and affordable, meaning that green hydrogen could overcome its main hurdle of cost of production, and the energy sector could utilise its many advantages.

The biggest advantage of green hydrogen is the fact that it is a pure non-carbon source of energy, as when burned, the only by-product of this process is water.

Another significant advantage that could lead to the preference of the use of green hydrogen is that its storable. Many sources of renewable energy such as solar and wind energy have very low storing potential, with batteries allowing up to 4 hours' worth of energy to be stored as the technology and material available are incapable of storing energy for longer. Moreover, green hydrogen is versatile in the sense that if it is not to be used as an energy source, the gas itself could be used in an array of domestic, commercial, industrial, and mobility uses. For instance, hydrogen could be used in steel production, and has historically been used to power hot air

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balloons and fuel cars. Finally, green hydrogen is transportable as well, with initial energy transitions allowing for infrastructure that was previously created for the distribution of natural gas to be used for green hydrogen, given that it was combined with natural gas as well.

Thus, to utilise these multiple advantages of green hydrogen, and to further innovate in technology to plummet its production costs, multiples projects are being developed with the sustainable energy source at centre-stage. Here are a few:

1. Siemens is developing a project that integrates green hydrogen production to individual wind turbines – since wind activity is highest when energy demand is low, the energy it produces will be consumed to produce more green hydrogen
2. The conversion of green hydrogen to produce green ammonia – a carbon free method to fertiliser precursor production – in a planned facility in Duqm, Oman
3. The development of buildings that run exclusively on renewable energy sources, including solar energy that electrolyses water to produce green hydrogen for on-site use – currently being studied by experts in the US and South Korea

4. The development of a 2GW offshore wind and green hydrogen plant in Azerbaijan, supported by Abu Dhabi's Masdar

While green hydrogen is the most environmentally friendly form of hydrogen, there are many other forms of hydrogen that exist as well – including pink hydrogen, where the source of electrolysis is sourced from nuclear energy, blue hydrogen that is produced from natural gas that sequesters any associated carbon dioxide emissions, and the most common form of grey hydrogen, where the electrolysis is powered by natural gas without carbon sequestration, making it the least environmentally friendly. While these options may not necessarily be as viable as green hydrogen, it is important to note that many countries who have accounted for the use of hydrogen in their energy sectors to transition away from fossil fuels may use these forms until they are able to support the production of green hydrogen. For instance, the Abu Dhabi National Oil Company (ADNOC), who is a major player in the blue hydrogen market is producing up to 300,000 tonnes of it annually while it seeks opportunities to start producing green hydrogen – an initiative propelled by its partnership with TAQA in 2021.

Regardless of the colour of hydrogen to be used, it is important that the legislative frameworks in the area of adoption are able to support the production and consumption of hydrogen. This includes:

1. The creation of roadmaps and strategies to introduce green hydrogen that indicate clear targets with tangible impact through quantifiable measures and viable integration schemes
2. Establishing priorities for green hydrogen use through identifying the most effective and efficient uses for it
3. Empowering and aligning public and private objectives to co-ordinate efforts and catalyse technological innovation
4. Promote research and development efforts to further minimise green hydrogen production costs to incentivise its use
5. Financing and supporting projects pertaining to green hydrogen production or retrofitting for consumption

The goal in the end remains the same, to foster and nurture a low-carbon energy sector with diverse sources of energy that could support the needs and demands of consumers without compromising the natural environment.

SOURCE: LINKEDIN PULSE

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INSIGHTS

The Three Layers of Rameshwaram



Bill Spindle

Former Council on Foreign Relations International Affairs
Fellow in India

On a peninsula jutting towards Sri Lanka, one confronts India's climate future.

The spit of land extending from the state of Tamil Nadu towards the teardrop-shaped island of Sri Lanka is a quintessentially Indian amalgam of legend, myth and history.

It is place where, in the epic Ramayana, one of the two great tales in the Sanskrit-Hindu literary tradition, the hero Ram points with his mighty bow. This marks the spot for Hanuman, his monkey god ally, to muster his simian troops and build a bridge across the windswept channel to Lanka. The exiled future king Ram crosses to confront his nemesis, Ravana, in a climactic battle to rescue Sita, his virtuous wife, from her garden prison there.

The tongue of land is also the scene of the tragedy of Dhanushkodi, a real-life village swept away by a huge cyclone in 1964. Accounts of the fateful day invariably feature the determined, if naive, railway engineer who drove his locomotive into the gale. The train was engulfed by the storm surge, leaving him and all of the 115 passengers aboard dead.

And, finally, the city of Rameshwaram — which means “Lord of Ram” in Sanskrit, a reference to the Hindu deity Shiva — is the hometown of one of the most celebrated of India's modern heros (outside of Bollywood and Cricket).

A.P. J. Abdul Kalam was born here in 1931, to a poor Muslim family. He became a scientist known as the “Missile Man of India,” for developing the ballistic missiles that can carry India's most powerful weapons. He was a key figure overseeing the country's historic nuclear tests in



BILL SPINDLE

1998, working closely with the Hindu nationalist Bharatiya Janata Party, which led the government at the time, as it does now. Abdul Kalam ultimately became India's 11th president, with support not only from the BJP but also the opposition Congress Party. He died at age eighty four in the northeast of the country while delivering a lecture titled, “Creating a Liveable Planet Earth.”

The jagged layering in these three distinct stories — real, imagined and mythologized, jostled together by the tremors of time and the human psyche — makes Rameshwaram as good a place as any to contemplate the promise and peril of India's trajectory today. That includes its role contributing to climate change and its response to the devastating impact

changes in the climate will have on the subcontinent itself.

My visit here was a meander through these intermingled realms. In the company of a local guide, a 30-minute drive took us to the easternmost point on the peninsula, where even on a calm day one can easily imagine being consumed by the surrounding turbulent sea. The Bay of Bengal is visible to the left, through the Palk Straits. The Indian Ocean is to the right, via the Gulf of Mannar. We have now crossed from India's west coast (which I wrote about [here](#), [here](#), [here](#) and [here](#)) to its eastern shores. From here our travels will turn back north to where we began.

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The cul de sac at this extreme tip of land is just a few dozen miles from Sri Lanka and used solely by tourists and pilgrims. They walk beach — marked by signs warning of currents too strong for safe swimming — and stare out across a submerged land bridge of limestone shoals that once existed and is now visible only from the sky above. Today Indians park, mill and take selfies in the place where Hanuman and his troops supposedly began their work.

Driving back, we stopped at the ruins of Dhanushkodi. Its derelict buildings — a former post office, an abandoned train station, a crumbling church and dozens of broken down homes along the beach — are inhabited by a few fishermen and roadside sellers of Ramayana merch and snacks for pilgrims.

The town, once home to thousands of families, was abandoned by the state and central government after the 1964 cyclone. It was judged not worth the effort to rebuild the rail line and extend water and electricity services to the village, likely again to be overwhelmed by one of the many cyclones that strike the coast each year.

Driving back along the road, with waves crashing up against both sides of the peninsula, it was indeed easy to imagine the waters rising to swallow the causeway.

We stopped at several sacred sites where devotees believe more events from the Ramayana took place. Each is a kind of touchpoint, a Tirtha or “crossing point” in Sanskrit, where the world we experience in daily life meets a sacred realm overlaid upon it. These exist throughout India, forming a sacred landscape, or map, described brilliantly by the academic Diana Eck in her book, *India: A Sacred Geography*.

For the tens of millions of Hindu devotees who trod paths to these myth-laden locales in pilgrimages throughout the year, the events and the stories they tell are in a way more real than “reality.” This was most apparent in the Rameshwaram



BILL SPINDLE

Temple. I walked among thousands of pilgrims doing the rounds to various fountains and tanks throughout its sprawling grounds, dousing themselves in the holy water or having it thrown upon them.

Later we visited the home where Abdul Kalam was born, as well as the memorial building where he is buried. Both were infused with the hagiography that slowly enshrouded the bright young scientist as he morphed into a silver-haired quasi-guru who, despite being Muslim, has come to embody the Bharatiya Janata Party’s hard-edged Hindu nationalist vision.

Abdul Kalam read Sanskrit and adhered to a vegetarian diet. He stood up for — and his legacy has been further shaped to personify — India’s aspirations to lift itself to a prominent position in the world through scientific and technological prowess. Controversy erupted when his memorial was constructed with a carved copy of the Bhagavad Gita, a seminal Sanskrit work, prominently displayed and members of Abdul Kalam’s family sought also to include a copy of the Koran and Bible to underscore a more eclectic side of Abdul Kalam. Hindu activists were having none of it.

What does all of this have to do with climate and energy? Maybe only this: As the world slides into the grip of conflicts and confrontations — Europe-Ukraine-Russia, China-U.S. — climate concerns are taking a back seat to security.

India has, largely, tried to steer clear of these, essentially trying to keep its head down. But India becomes the most populous country in the world this year, surpassing China’s 1.4 billion people. The nation, and especially its Hindu Nationalist leader Prime Minister Narendra Modi, increasingly seek an appropriate “leading role” on the world stage. One manifestation of that is India’s leadership of the “Group of 20” prominent nation’s this year.

Rameshwaram illuminates two paths the country, with its rich human history and unique yet also universal religious traditions, must choose between. One is a solipsistic vision of Hindu chauvinism that sees the energy transition as one more nationalist project bolstering India’s strength relative to others, pursued to the extent, and only the extent, it accomplishes that. Another is a truer leadership path that blends national pride with the country’s formidable scientific prowess and a truly expansive version of the theme India has chosen for its G20 year — Vasudhaiva Kutumbakam, “One Earth, One Family, One Future. To be genuine, this vision would have to begin at home and extend outward beyond its borders.

But I worry India is veering towards the former vision, mainly because the BJP can’t seem to stomach the family part at home. It’s not too late for a course correction. The fate of the world, like that of the train in Danushkodi, hangs in the balance.

SOURCE: THE ENERGY ADVENTURE (R)

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