مؤسسة نفط الشارقة الوطنية
SNOC

EXECUTIVE INSIGHTS

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How can the energy sector leverage technology and innovations to accelerate decarbonization by COP28?

Today's technologies in the collective toolkit for the energy transition will not enable us to achieve Net Zero in time; they help significantly, but they will not get the energy industry past that finish line. Therein lies the urgent rallying cry for a dual approach in the lead up to COP28, the world's biggest annual climate gathering, in Dubai in November 2023. This means both focusing on transformational ideas that move the needle and dramatically enhancing the efficiency and deployment of technologies we already have.

These exclusive insights reflect the opinions and outlooks shared by senior delegates during a roundtable event for SNOC during the renowned ADIPEC conference in Abu Dhabi in November. The event was hosted by Gulf Intelligence under the Chatham House Rule. Any further use of this content must cite SNOC and this report.

Technological innovation is a cornerstone of the energy industry's rapid growth and positive worldwide influence, which provides a strong bedrock for more advancements in the energy transition. However, even with this robust starting point, the energy industry needs far more clear policies, regulations, and incentives to post significant and measurable progress for when the doors to COP28 open in just a year.

The concept of a greener future collapses if we do not invest in the rapid advancement of technology, especially digital tools of the 4th Industrial Revolution (4IR) – pivotal to making Net Zero a reality in just 28 years. In that vein, the steps taken within the next twelve months to enhance the technological package are instrumental in helping the energy sector set a more trackable and tangible path up to 2050, delegates agreed.

"The UAE and other countries in the Gulf Cooperation Council (GCC) must start charting an emissions reduction story underpinned by technology that works for the economy – including oil and gas exporters and producers – and for the region," a delegate said, adding that one template cannot suit all regions. Integrating climate thinking into all decisions is equally vital, other delegates flagged, just as the fossil fuel industry has very successfully achieved with health and safety.

We need a set of rules for Net Zero that everyone can follow and then engineer solutions backwards, from 2050 to today – for engineers, environmentalists, banks, and so on. Then, more entities can absorb more risk, accelerating the maturity of the market…even when we don't know entirely what that market looks like yet.

TICK TOCK

Many other industries have found ways to innovate and execute technology solutions far quicker than energy companies, which means the energy sector must work harder at "thinking outside the box", delegates urged. One aspect of today's challenge is the long development cycle of an energy project, which can deter shareholders and others in charge of the finances.

"The economics must add up and investors must make money, which is usually easier in tried and tested routes in the sphere of technology. The energy transition, meanwhile, brings many exploratory technologies and this sometimes means more risk and more time – a less attractive blend, but perhaps even more valuable to the energy transition," a delegate said.

Ramping up buy-in requires more collective efforts between the energy industry, technology providers, government bodies, academia, and others. This has long been underway in the UAE, but efforts must keep increasing; key to the nation's Net Zero goal and as an example to other countries, especially as the energy industry prepares to take the global stage at COP28. This includes increasing partnerships and knowledge-sharing along the supply chain, so the conversation about the energy transition on an executive level evolves. This is critical to measuring and mitigating Scope 1, 2, and especially Scope 3 emissions.

"We cannot change nearly a century of energy companies' focus on profit, let alone in three decades. So instead, we must work with them – utilize their expertise in rapid, worldwide market growth alongside newer, tailored technology companies," a delegate explained. Essentially, big oil and big tech must merge their strengths – and soon.

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The UAE is increasingly renowned for its development of climate-related technologies, resulting in some of the world's largest and most competitively priced solar power generation projects, for example. But ongoing hurdles in creating sizeable and commercially viable energy storage amid rising energy demand means all forms of energy – not just renewables – must be supported to meet the needs of the country's 10mn residents, every second of every day of the year. Accordingly, delegates called for more funding and human capital to be funneled into this critical space, "digging deep" into solutions like leveraging hydrogen storage technologies.

"A mistake we continue to see is that companies are seeking technological perfection, when we actually need to get moving with good and great technologies," a delegate shared. For example, a country only needs advanced energy storage techniques (which are not yet commercially available) once they have a very high percentage of renewable energy, i.e., 50%+. "We're really very, very far away in most of the world from the 50% point, including the UAE, so let's also focus on the multitude of other technology solutions we need for other challenges. We must still work hard on energy storage solutions for this is instrumental to Net Zero, but it is not the only pressing challenge right now," a delegate said.

Whenever we speak to anybody about a clean hydrogen project, they immediately ask: Can you give us a 15-year offtake? We know we can't, because the market structure and technology are not there yet. Regulators can be powerful engines to drive this development and in turn, the UAE's competitiveness.

HYDROGEN'S NEXT STEP

Delegates pointed to a "tremendous technology learning curve" in the UAE's fast-growing renewables market. These lessons must now be applied to low-carbon hydrogen – especially as the UAE aims to capture 25% of the global market for low-carbon hydrogen by 2030. This monumental undertaking is complicated by today's very limited low-carbon hydrogen market and the need for more offtake agreements to drive investors' appetites, notably from Europe and Asia.

"In order to create a stronger business case in the next year and convince consumers and partners, the UAE must create more local demonstration units," a delegate said. Another highlighted the second largest economy in the Arab world's track record for moving swiftly in new markets and ideas, when other nations may be more burdened by red tape and less liquidity.

"The UAE puts its cards on the table and says there is no chicken-egg issue: there's a chicken and the chicken gets to work. This analogy must now be applied to developing technology and a regulatory architecture to drive a clean hydrogen market to the scale and cost-effectiveness that the UAE is aiming for," delegates said.

ELEVATING VALUE

The energy sector must work with technology companies over the coming year to propose realistic, measurable,

and scalable strategies to help regulators create a trading ecosystem for CO_2 credits, as well as other emissions. "How do we turn carbon into something? That is where technology can play a major role – changing the economics to give CO_2 emissions far more value and therefore, more investment," a delegate said.

A market with different prices for different types of emissions would give big energy and other companies much-needed transparency, enabling them to make more balanced risk-reward choices. In turn, this will drive greater momentum for established and exploratory projects, enabling a more fluid flow of finance.

"I am a big believer in the value of letting the private sector make its own mind. There is enough capital out there, whether it's private equity, traders, governments, whomever. But they must have something in place that says they can only emit X and the penalty for exceeding that will be Y. This will all need to be facilitated and tracked in real-time. Otherwise, the maturity of carbon trading in the Middle East will continue to move in glacial time," a delegate warned.

Expect a lot of announcements from the UAE up to COP28 – including how to use technology to boost the value assigned to CO_2 emissions.

Another delegate pointed to the need for improved research and forecasting measures amid the acceleration of the energy transition from 2020-2022; a pace of change which is not always accurately reflected in market analysis. This feeds into societal change, as well.

In my experience, the vast majority of the population have no clue about global warming or Net Zero. So, how are we going to achieve the 2050 target if 90% of the global population don't even know what we are doing on the supply side and what they must do on the demand side?", a delegate detailed. We must deploy knowledge far more effectively, for education is part of the Net Zero solution and the energy industry needs to take the reins more proactively.

$4BN
will be raised by the UAE and the US to invest in technologies that will transform agriculture and food production to limit climate change.[1]

30YRS
The UAE is investing $163.5bn in clean and renewable energy projects up to 2052.[2]

$400MN
has been committed by the UAE to enabling developing nations' transition to clean energy.[3]

100MN
The UAE has pledged to help supply green electricity to countries in Africa by 2025 – the equivalent of ten times its own population.[4]

80%
of global energy use is still based on fossil fuels, with a maximum of 5% from renewables.[5] This highlights the need to focus on boosting efficiency in technologies used in the fossil fuel industry; it will take decades for the percentage of renewables to significantly climb.

2050
The UAE, the third biggest producer in OPEC, aims to increase the share of clean energy projects to 50% of its overall energy mix by mid-century.[6]

#1
In 2021, higher carbon prices, revenue from new instruments, and increased auctioning in emissions trading systems resulted in a record high of $84bn of global carbon pricing revenue in 2021 – 60% higher than in 2020.[7]

66%+
In a scenario where the world reaches Net Zero by 2050, capital spending on equipment and infrastructure with relatively low emissions intensity would average $6.5trn/yr – more than two-thirds of the $9.2trn in annual capital spending during that time.[8]

8
The global digital oilfield market size is expected to surpass $54.4bn by 2030, expanding at a compound annual growth rate (CAGR) of 7.08% from 2022-2030.[9]

400X
The global capacity of long-duration energy storage, which supports the use of renewable energy, must increase by a factor of 400 by 2040 to help the power sector achieve Net Zero by that year, according to one study.[10]

20YRS
Methane has more than 80x the warming power of CO_2 over the first two decades after it reaches the atmosphere.[11] Delegates called for the industry to measure and mitigate its methane emissions far more efficiently.

Sources: 1 Zawya; 2 Zawya; 3 Zawya; 4 WSJ; 5 Delegate; 6 Reuters; 7 World Bank; 8 McKinsey; 9 Precedence Research; 10 McKinsey; 11 EDF.


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