

# Energy Transition Dialogues

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## INTELLIGENCE BRIEFING

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**HYDROGEN'S PUSH** **PETROLEUM VIEWS** **IN FOCUS: INDIA** **INSIGHTS: CHINA** **THIS WEEK'S EVENTS**

## Middle East's Prep for COP27?

Daniel Carter, Vice President of Decarbonization and New Energies, WoodPlc

In the lead up to the COPs in Egypt and the UAE, look for the reaffirmation and perhaps governments' increased net zero ambitions. But, more importantly, I hope to see the establishment of foundational work to implement a carbon pricing scheme.

In the next two years, if we can demonstrate that we are working towards setting carbon pricing, we will accelerate the pace of technology adoption and projects. COP27 and COP28 provide an opportunity for huge national oil companies (NOCs) like Saudi Aramco and ADNOC to demonstrate they have the skills and ambition required to take a leadership position in the energy transition. We describe these organizations as NOCs, but let's face it, they are international operators. They are huge in scale and have a global reach.

### UAE's competitive edge

The UAE has always been very proactive when it comes to diversification and embracing new technologies. We are starting to see ADNOC moving away from its traditional model of developing domestic projects to developing projects like TA'ZIZ, where they are working with several external stakeholders to diversify the downstream portfolio, for example. The UAE has all the tools it needs to deliver on its net zero ambitions. This includes the infrastructure and the human capital to manage, deliver, operate, and enable these projects. The UAE is in a tremendously good position to lead the pace in the Middle East.



### 2024

should see the Middle East make significant progress in crafting an architecture for a carbon pricing scheme – an integral part of achieving the region's decarbonization goals.

## Urgent: Carbon pricing

A topic that must be addressed is a mechanism for carbon pricing. Until emitting CO<sub>2</sub> emissions has a real cost penalty associated with it globally, investors will likely be skeptical about making substantial investments [in net zero]. Standards that underpin a carbon price or tax will enable investors to see a genuine route to success: it will undoubtedly be critical in delivering net zero ambitions in the Middle East. Plus, the region has many advantages that other parts of the globe do not. For example, renewable power through solar and, in some cases, wind will be very cheap to deliver in the Middle East. Additionally, there is a lot of existing infrastructure that can be repurposed either through CO<sub>2</sub> or hydrogen pipelines. And many oil wells could potentially be repurposed for carbon capture and sequestration (CCS).

**FULL INTERVIEW HERE**

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# Hydrogen: Plugging the Policy Gaps?



**Widya Wahyuni**  
Senior Consultant and Lead Engineer  
ERM Dolphyn Development Project

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**P**olicy is a major driver of change – and it is an issue for the energy transition. For green hydrogen, for example, there are many plans for projects, but costs are quite high compared to gray hydrogen projects. So, looking at a contract for difference for hydrogen is one move which would support the growth of a hydrogen economy. The same applies to instilling quality assurances, design standards, and plugging regulatory gaps, especially for new hydrogen projects. Onshore projects are a little clearer in terms of policy, but there are many question marks when you go offshore.

## Public-private balancing act

We have good government support for hydrogen projects in the UK, with a few hundred million pounds dedicated to the market. But that is not adequate. We do not see a lot of investment from the private sector. To allow more in, we are doing government funding at the beginning of a project and the visibility study. Then, the private sector comes in once they have confidence the project can succeed. There has also been a lot of talk about the EU's taxonomy, but the details are still not clear.

**20%+**

of global carbon abatement by 2050 will be achieved by hydrogen – if strong public-private collaboration can make it a reality.<sup>1</sup>

**\$500bn**

is being invested in hydrogen projects and along the whole value chain worldwide up to 2030.<sup>2</sup>

**359**

large-scale projects were announced globally up to July 2021 – up 131 in first half of 2021 alone.<sup>3</sup>

**10**

nations lead the Hydrogen Investability Index: Germany, Spain, US, Australia, France, Netherlands, Italy, UK, Canada, and China.<sup>4</sup>

Sources: <sup>1</sup>Hydrogen Council; <sup>2</sup>Hydrogen Council; <sup>3</sup>Hydrogen Council; <sup>4</sup>Cranmore Partners, Energy Estate

**Charley Rattan**

**Charley Rattan Associates**



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**S**ometimes policy and planning do not align with reality in the UK. In terms of hydrogen, it is slightly farcical. Hydrogen is not even allowed in the gas grid, as it was banned in 1974 when there was a big push for natural gas. Obviously, that needs addressing sooner rather than later, especially as the UK aspires to be one of the world's hydrogen leaders. Clearly there are anomalies on the policy side. The good news is that some trade organizations are addressing them. Watch this space – hopefully there will be some positive changes soon.

## Who's leading the race?

Several countries make the early ruling when we talk about budding global hydrogen superpowers. China is on the list, plus there are significant signs of activity in Australia. The UK is also on the list, benefitting from our East Coast cluster and others. So is the US, with its Earthshot proposal, plus elsewhere in Asia-Pacific and Latin America. The same applies to India, as there seems to be more joined up thinking now, after a few false dawns.

***“There is an elephant in the room in the UK, asking: Who pays for all of this? It is not going to be cheap, so will it be disguised carbon tax, for example? It's not all about waiting for policy – the private sector can drive progress, especially clusters.”***

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**Dr. Steve Griffiths**  
**Senior Vice President for Research and Development  
and Professor of Practice, Khalifa University of  
Science and Technology**

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**W**ith blue hydrogen, I am concerned about making sure that the natural gas supply chain is verifiably clean – and not leaking. We have seen papers published from our colleagues in the US where they talk about a 2-3% methane leak rate. That is not what we are seeing in Europe and that is definitely not what we hope to see in the UAE; we are talking about something less than 1%. If you can ensure no leaks, then the low carbon equivalent intensity of blue hydrogen can be verifiable and it becomes a future fuel. That said, not everyone can utilize the CO<sub>2</sub> they capture. For example,

*“The most important thing right now is having hydrogen clusters in the Middle East.”*

we cannot always geologically store it. So, we are working on ways to utilize it in products. One route is using carbon for concrete production – very high strength, sustainable concrete would be great for the UAE, as it has such a high construction rate. This highlights the importance of finding interconnectivity between industries.

**50%**

of the UK's industrial CO<sub>2</sub> emissions can be removed by the country's East Coast Cluster.<sup>1</sup>

**#1**

The Earthshot Prize is the most ambitious and prestigious of its kind – designed to incentivise change and help to repair our planet over the next ten years.<sup>2</sup>

Sources: <sup>1</sup> East Coast Cluster; <sup>2</sup> Earthshot Prize

## Becoming a H2 Superpower?

Getting hydrogen from one place to another can be very expensive – moving across oceans is not cheap – so locality is key. You must leverage local and regional industries that need a supply of hydrogen or derivatives, say ammonia, and you must establish clusters. Otherwise, it will be very hard to become a hydrogen superpower. Plus, there are areas you can leverage to capture great advantages now. For one, the Middle East has a very low-cost supply of natural gas, which can support a blue hydrogen market, including local products, such as ammonia for fertilizer or transport. Consequently, I think we will see more blue hydrogen in this region in the near-term, as the cost of green hydrogen comes down in other places in the world. But up to 2030, we will end up seeing a trade-off between blue and green hydrogen.



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**YEAR AHEAD – ENERGY OUTLOOK**

Whitepaper

Q1 – 2022

**How can the Oil & Gas Industry  
Earn its Seat at the Climate Solution Table  
while Sustaining its Market Share in Net Zero Era?**

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## INSIGHTS

# Petroleum Industry's Perspective

These highlights provide a snapshot of how leaders in the world's most influential commodity market view the energy transition. Extracted from the recent International Petroleum Technology Conference, exclusively hosted by Saudi Aramco, one point is clear: security trumps all.

"We need to have better engagement to work together with the support of policy makers around the world. Demonizing the industry is not going to solve anything, and this is what is happening today. This industry is being demonized, and now we have a crisis, and they are looking back at this industry and saying we need the solution. We can have a solution, but we need to work together. We need to ensure there is adequate investment, there is decarbonization with support of regulators. You cannot look only at alternatives; you need to work in parallel and look at existing energy sources and new energy sources. And unless you have a plan B fully done and completed and ready, you cannot ditch plan A."

*Amin H. Nasser, President and CEO, Saudi Aramco*



"I think there is a lot of focus now in terms of cleaning our industry, a lot of focus on decarbonization, putting investment into technologies that will allow us to decarbonize. I reckon that oil and gas, especially gas, can be a lot more competitive when compared to other green energy and with that, we should be able to attract enough funds and capital to continue to invest and bring capacity up."

*Adif Zulkifli, Executive Vice President and CEO, Upstream, PETRONAS*

"What the last couple of years has taught us is that you have got to be very agile and nimble and quick to react – and resilience is very important. We've adopted a global and local approach, and that means don't be dependent on sole source suppliers, don't be dependent on engineering that's so specific and detailed that it can't be scaled."

*Lorenzo Simonelli, Chairman and CEO, Baker Hughes*



"We have a challenge, but I think we can turn it into an opportunity. We can contribute to accelerate the decarbonisation of oil and gas through technology and it's not only the shift from oil to gas; I believe it's using technology at every step of the upstream, midstream, and downstream to decarbonise operations... ..If we do that well, our industry will not only thrive in the future, but we'll survive and be more resilient than we ever anticipated to be."

*Olivier Le Peuch, CEO, Schlumberger*

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## INDIA IN FOCUS

# It's off to India...and (again) here's why...

No country has more people more exposed to the disruptions of climate change and energy transition, a situation no one on the planet should ignore.



**Bill Spindle**  
Council on Foreign Relations, International Affairs Fellow, India

### We're taking this adventure to India.

We'll explore the country's climate and energy challenges on the ground, looking at everything from the rapid growth of renewables to rising seas, intensifying storms, and climbing temperatures. We'll meet Indians who are working on all these fronts, pushing the country's energy transition forward and trying to adapt and build up their resilience in the face of the realities of climate change. We'll assess what they're up against — and they're up against a lot.

### I'm already in India getting started.

But before zooming down to the ground level, I want, as I say, to return again to why India is the right starting point for a global climate and energy journey. It's not immediately obvious. India isn't the country hardest hit by climate change. Several island nations are already being altogether swallowed by the sea. India didn't cause global warming; the largest historical accumulation of greenhouse gases in the atmosphere by far comes from the US. India isn't spewing the most planet-warming gases right now; China far and away gets that distinction.

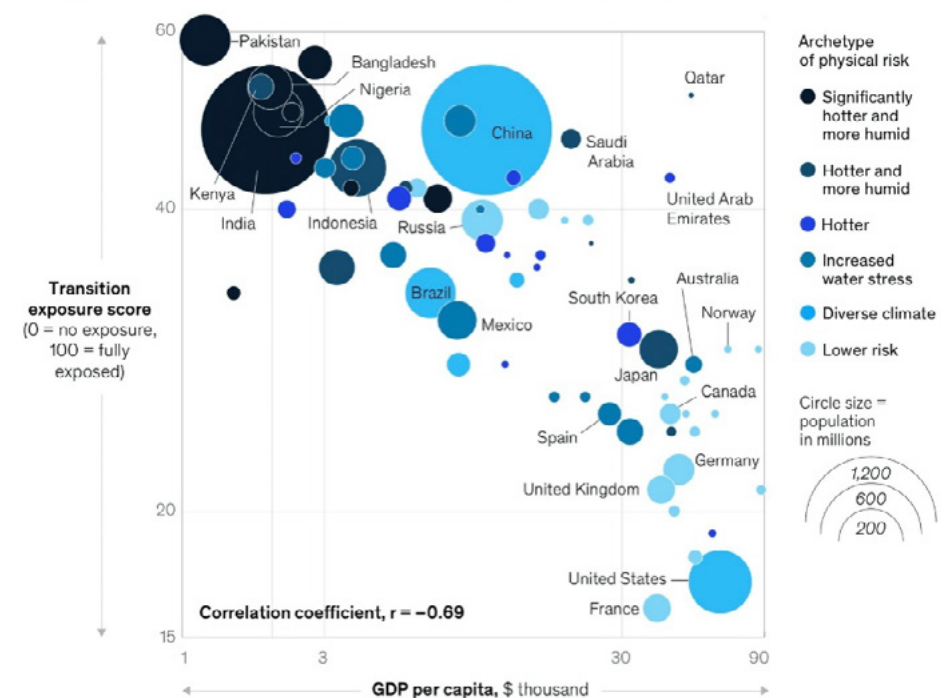
India is, however, the country where more people will be more exposed to more disruptions in the coming decades than any other, from both climate change and the energy transition itself. At the same time, India has the potential not just to successfully navigate these challenges, but also see the means by which it does reverberate around the globe, from the developed to the developing world. That makes India critical for us all. A recent climate and energy deep-dive by the consulting giant McKinsey & Co. underscores India's importance neatly in a graphic.

The bigger the circle, the larger the population, and moving left to right on

Exhibit E1f

**Countries with lower GDP per capita and fossil fuel resource producers have higher transition exposures.**

Archetype of physical risk' through transition exposure vs GDP per capita by country<sup>2</sup> (logarithmic scale)



Source: McKinsey Institute: The Net Zero Transition

the chart, income per person increases. So, the countries to the left are the poorest. Moving from bottom to top, exposure to social and economic disruptions from the transition to a carbon-free economy rises. The darker the color of the circle, the more vulnerable the country is to the physical and atmospheric ravages of the changing climate itself. Thus, the graphic illustrates the combined potential impact, per-person, of both the problem (climate change) and the solution (decarbonization of the economy) for the countries McKinsey looked at.

India's circle, almost the furthest in the upper left corner, is nearly the largest and just about the darkest. In other words, the world's second-most populous country,

is nearly the poorest on a per-person basis, is nearly the most exposed to both the disruptions of climate change and the tumults of the transition ahead.

What sort of disruptions and tumult? In terms of the energy transition, mostly the immense up-front financial costs and social dislocations that come with winding down a massive coal-based energy system and building a decarbonized alternative, even while energy consumption grows by leaps and bounds. As for climate, you name it — India is vulnerable to, indeed already experiencing, the whole range of climate impacts.

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# Greening Industries: China Gears up Its Clean Reindustrialization

**Industry contributes about 40% of China's GDP, consumes 66% of its total energy but emits more than three quarters of its total GHGs.** It is safe to say that China's duo carbon goals will be untenable without a fundamental shift of its industries. In the "1+N" climate policy

framework, industry-specific targets and roadmaps hold many crucial 'N' keys to the puzzle.

On December 3, 2021, China officially released its 14<sup>th</sup> Five-Year Plan of Green Industrial Development (the Plan), aiming to further elevate its decade-

long endeavor of greening its industries. Built upon progresses made, the Plan specifies new milestones for 2025, not only of carbon emissions reduction, but also of many other "greening" indicators. This Insight China report touches the essence of the Plan.

## Highlights:

Improving energy and resources efficiency is given as an absolute immediate priority. In the meanwhile, the Plan emphasizes such core guiding principles as technology innovation (material science, digitalization, and design), market-orientation, and systemic advancement to nurture the growth engine of industrial green development, strengthen enterprises' role in leading the marketplace, and coordinate the transition across regions and sectors. Quantitative targets are set for 2025 as shown in Table 1.

Table 1. Key Targets of the Greening Industry Plan for 2025

Category	Indicator	2025 Target	Additional Note
carbon emissions reduction	reduction of emission per unit added industrial output over 2020 level	1. - 18%	progresses made in total carbon emissions control in such key sectors as iron and steel, non-ferrous metals and building materials
pollutants reduction	reduction of emissions per unit industrial output of key sectors over 2020 level	2. - 10%	sustained enhancement of management and control capability from sources of hazardous materials, and major improvement in cleaner production
energy efficiency improvement	reduction of energy use per unit added industrial output of industries at scale, over 2020 level	3. - 13.5%	energy consumption per unit of industrial output such as crude steel, cement, ethylene and other key industrial products to reach world leading level
improvement of resources uses	- utilization rate of industrial solid wastes of commodities - total quantity of major recyclates - reduction of water use per unit of added industrial output over 2020 level	4. 57% 5. 480 million tons 6. - 16%	key industries' rates of resource production continue to grow
green manufacturing system	green and environmental protection industry's industrial output	7. RMB 11 trillion yuan (about \$1.7 trillion)	green manufacturing systems of key sectors and regions are basically shaped, with comprehensive industrial green and low carbon standards system, more than 10,000 kinds of green products on the market, and a group of standards and technical public service platforms in place

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# THIS WEEK EVENTS

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### HYDROGEN FULL COURT PRESS

**Dr. Naveed Akhtar**  
Chief Executive Officer  
Hy-Hybrid Energy



WEDNESDAY /// MAR 2<sup>nd</sup> /// 11:00AM (UAE)

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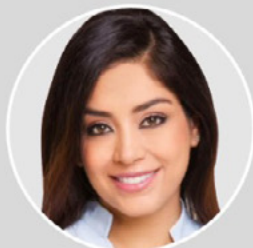


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### PODCAST

WEDNESDAY /// MAR 2<sup>nd</sup> /// 13.00 (UAE)

### *Circular Economy: Top 5 Steps in 2022?*



**Meghna Lakhani Talreja**  
Founder / CEO  
Optas.App / One Modern World



**Aditya Shah**  
Head of Circular Economy  
Creek Capital



**Riad Bestani**  
Founder/GM  
ECO-SQUARE

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