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Energy Transition

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GREEN HYDROGEN INSIGHTS Q&A SOUNDBITES

"Green Hydrogen Needs Industrial Policy Support to Succeed"

Emanuele Bianco
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How advanced is Green Hydrogen policy making?

Green hydrogen is still not very well understood. It is an infant industry that needs to be sheltered and protected from competition from fossil fuels. Since 2008's financial crisis and the growth of the renewable energy industry, industrial policy connected with societal and sustainability issues has become more supported. However, this is still to be fully embraced by policymakers who take decisions.

Is it a chicken-and-egg situation between stakeholders and policymakers?

There are national strategies addressing this issue and an intention to make supply and demand meet. However, sometimes for example, the strategy focuses on export and so does not create local demand. This can become an issue. The first batches of hydrogen are likely to be consumed locally, and if there is no local demand, there is a risk that the supply will not happen because the offtake risk is just too big. These must be planned together, which comes under industrial policy.

What policy changes do you expect this year for hydrogen in the Middle East?

It is a big question. IRENA and the World Economic Forum have written a list of 50 policies together to enable green hydrogen trading. We focused on Europe and Japan as a start. This region differs from the rest of the world because the weighted average cost of capital is so low. This has allowed some projects to kickoff fast, such as ACWA Power's in Saudi Arabia, which can already produce a large amount of green hydrogen. However, without an off taker of that green hydrogen, it would be a risk. We don't yet have standardization, regulation, and certification of green hydrogen. All these aspects need to be addressed in collaboration with importing countries.

CONTINUED ON PAGE 2

How do you see that list of policies progressing?

One of the main bottlenecks is whether electrolyzers can be replicated at scale. We have around 300 megawatts of electrolysis in the world that produces green hydrogen. We need around five Terawatts but presently don't have the manufacturing capacity to reach those targets. What is needed to kick start the green hydrogen market in this region is also to answer where it wants to be in the next 10, 20 or 30 years? It's currently split between two markets: Asia – with blue hydrogen products for Japan, South Korea, and possibly for China, and then Europe, which is setting higher technology standards for green hydrogen definitions. If the region does not decide to invest heavily in this very specific technology for green, it risks losing an important market. Another point to consider is that investing in blue hydrogen might mean stranded assets in the future. I do not see investment in CCS (carbon capture and storage) for the next 10 to 15 years if there's a risk of no demand for blue hydrogen well beyond that.

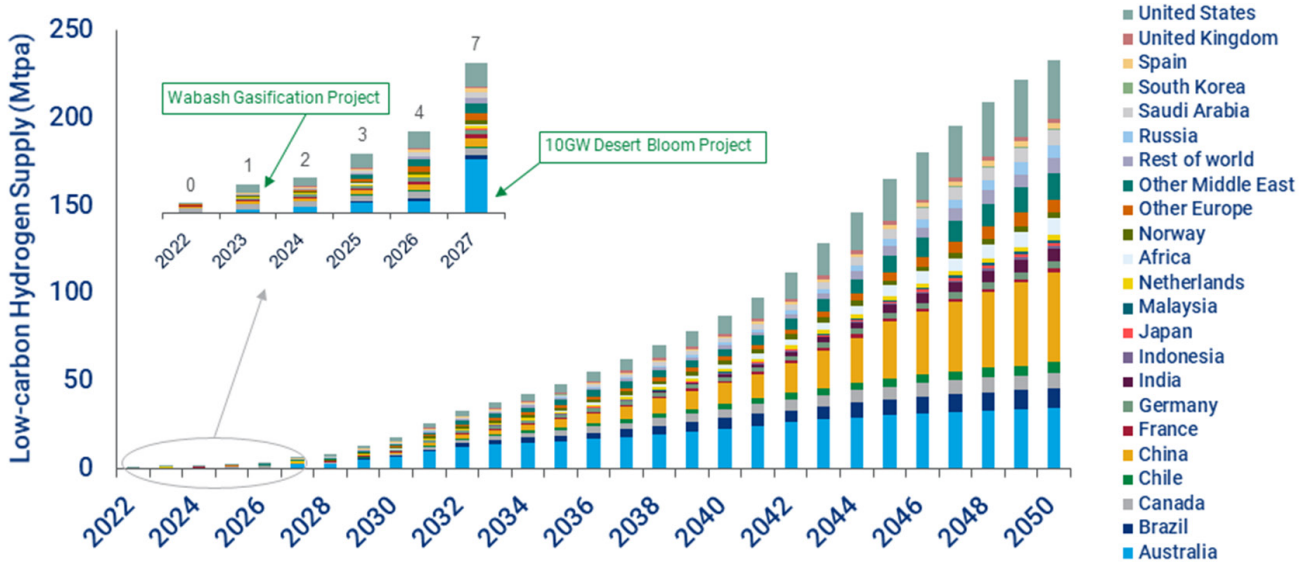
Can hydrogen really take off without an established carbon pricing mechanism?

The view in the past was that without carbon pricing, solar photovoltaic and wind would not be developed, yet that happened. It's good to see the proposal of the European Commission for a Carbon Border Adjustment Mechanism - an import tax based on carbon content. The fact that the US and Europe signed a trade agreement to exchange steel and aluminum based on carbon content and opened the opportunity for other countries to sign, means that it's going to be the new normal and that the market for their green products is growing. These kinds of policies are going to revolutionize the industry. Since Germany and other countries in Europe published their green hydrogen demand strategies, investors around the world started developing concepts and projects that will fit to build that supply.

FULL INTERVIEW HERE

By 2050, China, Australia and the US become world's largest hydrogen producers

Global low-carbon hydrogen production by country: 2022 to 2050 (Mtpa)



Source: Wood Mackenzie

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INSIGHTS

The World Has No Choice but to Care About India's Heat Wave

Bill Spindle
Council on Foreign Relations
International Affairs Fellow, India

How the country meets an escalating demand for energy is a problem the whole world must reckon with.

Soon after I arrived in the eastern megacity of Kolkata in February, temperatures began climbing. They always do when India's short winter turns into an early spring. But then they kept rising.

After the hottest March in 122 years of record keeping, the scorching temperatures continued through April, with the nationwide high averaging more than 95 degrees Fahrenheit. During my recent stop in New Delhi, the mercury topped 110 degrees for two consecutive days, overwhelming the air conditioner in my rental apartment. The maximum temperature last month in the capital, home to more than 30 million people across the metro area, averaged more than 104 degrees. Even higher temperatures have been reported elsewhere: 111 in other regions of India, and to the west, in parts of Pakistan, above 120.

I was fortunate to have any air-conditioning at all. Most of India's 1.4 billion people would consider themselves lucky to have a fan and the electricity to run one. A ride in a three-wheel tuk-tuk feels like having a blow-dryer directed straight at your face. The inside of a slum dweller's windowless room, often housing an entire family, can become a lethal hotbox. Health authorities have reported hundreds of deaths across the country from heatstroke, but the actual number is likely to be far higher.

The only saving grace, as I write now from the northern state of Punjab, is that the unseasonable spring heat has come before the monsoon rains. Although that's led to drought

conditions in some places, it has also kept humidity levels low enough for India to largely avoid a national spike in deaths from heatstroke. For the country's health and climate experts trying to plan for global warming, the "wet bulb" temperature is the danger they fear most. This deadly combination of heat and humidity, which prevents a human body from cooling itself by sweating, is a huge looming threat for South Asia's wet season, experts say. Although climate scientists are still puzzling out the precise details of global warming's role in India's current heat wave, the correlation is clear enough: Spells of blistering heat such as this are becoming a regular feature of South Asia's weather, rather than a once-in-a-decade-or-more crisis.

The heat wave has been severe enough to make international headlines, but it is far from the only impact of climate change I've witnessed in the first half of my six-month journey through the country to research and report on climate change and the energy transition India is undertaking in an attempt to mitigate it. India is at the sharp end of this predicament. A recent report by Standard & Poor's concluded that South Asia's economies are the world's most vulnerable—10 times more exposed to global-warming threats over the coming decades, the consultants estimated, than the least vulnerable countries, mostly in Europe.

During a visit to the sprawling Sundarbans mangrove swamp, part of the world's largest tidal estuary, where several great rivers meet the Bay of Bengal, I saw for myself how rising sea levels and more frequent and intense cyclones are helping destroy what is not only a complex and sensitive ecosystem but also a major carbon sink. One island in the estuary, Ghoramara—pounded by four major cyclones from 2019 to 2021—has lost about half its landmass and more than half its population in recent decades. A tropical storm last year submerged the entire island under several feet of churning water. Thousands of residents were forced to take refuge in a school shelter. Though inches above the floodwaters, they escaped with their lives but lost practically everything else, including personal effects and the school's textbooks.

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Boyana Achovski
Secretary General
Gas Infrastructure Europe

How would you describe the momentum today in Europe for clean hydrogen?

This year has demonstrated a ramping up of the hydrogen economy. It is very timely and must happen very fast. The war in Ukraine has accentuated the need for energy source diversification – for more natural gas import routes and speeding up the processes which are related to renewable low carbon gases, especially hydrogen. The European Commission has doubled its 2030 hydrogen targets from 10 million tons to 20 million tons, emphasizing the importance of security of supply. The whole scope of the European Green Deal should be accelerated. There is a need to be more focused on investments and a better and flexible regulatory framework.

Does Europe's existing network capacity support a hydrogen market?

A recent study has predicted that we will need 28,000 kilometers of pipeline by 2030, and 53,000 kilometers by 2040, covering 28 countries. We need to look at the complete hydrogen infrastructure which includes pipelines, storage and terminals, all of which will provide flexibility of supply, and the ability to import different derivatives such as ammonia and synthetic gas. We must create a complete and interconnected system. Europe cannot afford to lose the possibility to be competitive when it comes to the development of the hydrogen market so it's good that we're seeing discussions between policymakers on criteria around its production and on the pivotal role that it's going to play in the energy system.

What can the Middle East learn from Europe's infrastructure development?

There is a need for interdependence in partnerships, not only with the neighboring countries and regions, but across the world. The existing European gas infrastructure has ensured for many decades how we can be efficient in terms of transportation of LNG and storage. This experience can now be shared for future energy systems. We need proper investment regimes, very stable regulatory frameworks, convergence in energy policies, and scaling up of climate finance. When we talk about partnerships, neighboring regions should be involved in the development process at a very early stage. Infrastructure companies, energy producers and countries which want to play a role for the transit of hydrogen, should all coordinate. All of this will help achieve our common decarbonization goals.

What are your expectations for discussions at COP27?

Recent geopolitical developments will certainly have a big impact on COP27 in terms of energy security of supply. Hydrogen should really be a cornerstone of the discussions. From a European perspective, we're seeing a variety of legislative procedures under development which may be completed by COP 27. We expect an improved regulatory framework for hydrogen that will be based on the Renewable Energy Directive.

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Aligning with Global Standards to Accelerate Decarbonization

Standards, be them technological (involving one particular technology such as 5G), technical (involving one particular product such as cell phone), or practical (involving a particular way of doing things such as CO2 measurement) establish consistent and common protocols for the modern society to get factories built, goods and services developed and exchanged, and manufactured products moved across borders. They are indispensable for measuring, reporting and verifying (MRV) GHG emissions under any national climate scheme or global climate pact.

What will happen, if China, the world's biggest GHG emitter, defines its own technical specifications for decarbonization products, and its own norms in GHG MRV and in green financing that are very different from the rest of the world? Well, it will significantly increase the cost of global decarbonization, and create trade frictions.

Fortunately, this won't be the case. This Insight report reviews Chinese standardization and sheds some light on the challenges in its global alignments.

The target of 85% alignment by 2025

As part of the effort to revamp the old standards system to match up with a new world powered by new technologies, filled with new products and operated by new practices, and to tackle the new challenges such as carbon neutrality, China released its "Outline for National Standardization Development" last October, setting goals for the country to build a standards system that is "structurally optimal, advanced and rational, and internationally compatible" by 2035. It is aimed to support the country's Vision 2035 to build a modernized, high-quality, and globally-leading economy.

The Outline sets an interim target that, by 2025, China will align 85% of its domestic standards with global ones, on all fronts. A very ambitious target, if achieved, will have significant global implications.

Source: © CN Innovation (www.cn-innovation.tech).

VIEW FULL REPORT HERE

Dr. James Henderson
Director of Energy Transition Research Initiative
& Chairman of Gas Research Programme
The Oxford Institute for Energy Studies

Renewable Gases Have a Market in Europe

There are clear signs that green gases have a future in Europe. Plans to double the production of biomethane in 2022 may not be huge, but it is clearly reflecting positive views on increasing gas production. The other is the accelerating positive views on replacing grey hydrogen. There is no doubt that Europe will need to be importing hydrogen as every strategy of most European countries involve this. Whether it is blue or green hydrogen is not the debate right now, but everyone wants to get to a place where we are using renewable hydrogen. The big question, particularly for the Middle East, is how they can export it to Europe.

Effective Hydrogen Infrastructure Key

There are a variety of opportunities in the development of hydrogen infrastructure, and the decision will depend on geography and country preferences. The current areas being explored are transportation of ammonia and other forms of liquified hydrogen. Pipelines also could present opportunities, depending on geography, especially within regions where there is the possibility of using or converting existing pipelines to hydrogen with an element of blending, perhaps at the initial stages. Creating industrial hubs around hydrogen production is vital because there will be times when the economics of hydrogen transport will not make sense. The economics of manufacturing goods like green steel using hydrogen is a good example. It will mean that industrial clusters can be built in areas with large amounts of renewable energy, which can be dedicated to the creation of hydrogen via electrolysis. It is certainly more cost-effective to transport the materials that you have manufactured using hydrogen, than transporting the hydrogen itself. The Middle East and North Africa have the potential for big industrial clusters to be built up around hydrogen.

**Paraphrased Comments*

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SOUNDBITES

Energy Transition Dialogues
60-SECOND SOUNDBITE

Claudia Zuluaga
Founder
The Future is 50/50

"Green tech investment must improve at reaching emerging markets"

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Faris Al Kharusi
Principal Transformation Consultant
Petroleum Development Oman

'GCC Policy makers too focused on flagship projects'

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