

Energy Transition

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ENERGY TRANSITION REPORT INSIGHTS EXCLUSIVE SOUNDINGS HYDROGEN

Demand Security Key to Hydrogen

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Australia plans to be one of the biggest producers and exporters of hydrogen to countries in Europe looking to reduce their reliance on fossil fuels, and to also supplying its established trading partners in Asia such as South Korea, China, and Japan. Green hydrogen has been gaining attention, while as a massive natural gas producer, Australia also has the potential to produce blue hydrogen.

Do you see demand for hydrogen from domestic industries?

The strategy has tended to focus on exports, as has been done with the gas industry. The opportunities for hydrogen domestically are limited to particular applications such as long-haul transportation. It is not easy to connect locations across Australia for the transport of hydrogen considering its geography and that would require huge investments in infrastructure.



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Are investors interested in scaling hydrogen?

One of the main issues with hydrogen is scale. It is currently a massive undertaking to package, transport, dispense, and store it as a product. The precondition for investment is that producers have the confidence in security of demand for their product. If you talk to some of the companies investing in hydrogen in Australia, they are moving forward under intense pressure to reduce emissions and improve their environmental performance. They are investing in clean technologies like CCS and hydrogen yet are doing so without the assurance of security of demand. The government is engaging in high-level talks on this aspect to develop long-term agreements, but they are just intentions at this stage.

Should any types of hydrogen take priority?

All colors should be considered, depending on a region or country's natural resource. Canada could be producing hydrogen using hydropower or countries that are strong in nuclear energy may consider that option. Australia's large coal industry can be combined effectively with CCS. However, natural gas has the greatest potential to scale up the industry in the intermediary period and create demand for hydrogen until the green variety is ready to come in. In the end, economics will play a major role in determining the winner.

Are we seeing progress in the hydrogen taxonomy?

In addition to technology and costs, the continuity of policy support is extremely important to develop a hydrogen industry. The point of hydrogen is to reduce emissions, and this is where climate policy comes in. It can be achieved either through strong regulations, by introducing carbon taxes on competing fuels such as oil, or by supporting hydrogen through subsidies and grants, similar to what we saw in the scaling of solar and wind. However, in the longer term, it is important for hydrogen to become independently profitable as an industry.

Has the current energy crisis curtailed hydrogen investment and interest?

Consumers want their energy services to be available when needed, but they also do not want to pay excessively high prices. Companies will continue to invest in hydrogen, but it will not be the sole energy provider in the long term, rather just one in a group of sustainable resources.

[FULL INTERVIEW HERE](#)

HYDROGEN: “If you talk to some of the companies investing in hydrogen in Australia, they are moving forward under intense pressure to reduce emissions and improve their environmental performance. They are investing in clean technologies like CCS and hydrogen, yet are doing so without the assurance of security of demand.”

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INSIGHTS

What Belongs on a Tea Plantation...



Bill Spindle
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Nearly every tea plantation in India has adopted at least some organic farming methods to build resilience of their crops, in part against the growing ravages of climate change.

At Nuxalbari Tea Estate in the Dooars region of West Bengal, Sonia Jabbar views organic farming methods as just one part of a wider effort to reintroduce elements of nature, wilderness, to the estate. That means everything from reviving microbial life in the soil to welcoming some considerably larger visitors (see above tweet). Sonia, as you'll hear, is something of a force of nature herself, the only woman who both owns and runs — hands-on, day-to-day — a tea estate in India.



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Professor Tadhg O'Donovan
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Potential of Biofuels in Advancing Energy Transition in the Middle East

As governments around the world push to meet their carbon neutrality targets, shifting attention towards biofuels will greatly push global net-zero efforts. Currently, a few countries within the Middle East have forged biofuels partnerships. However, more countries will need to join in these efforts, especially considering the role biofuels can play in circular economies, and consequently economic growth. It is still a long way to go in the MENA region and around the world to take full advantage of biofuel potential. The UAE has shown concerted efforts to further the development and use of biofuels. In 2021, the country announced the commissioning of a biodiesel refinery in the Jebel-Ali Free Zone to become home to the largest biodiesel refinery in the Middle East. The refinery uses second generation bio-refining technology, where FAME (Fatty Acid Methyl Ester) Biodiesel can be produced based on waste and residues. The net-zero pathway demands that nearly half of biofuels (45%) consumed in 2030 must be produced from waste, according to the International Energy

Agency. Biofuels can be very beneficial specifically for aviation, which has difficulty in finding an alternative to liquid fuels, as it provides a clean fuel alternative that could significantly help with decarbonisation efforts.

Importance of biofuels for circular economy

Processing waste for biofuels could provide a solid pathway to a circular economy. This is especially important for countries in the Middle East. In recent years, there has been a lot of attention dedicated to addressing waste. As such, both the public and private sectors in several countries have dedicated efforts to recycling and reuse. This can be seen as a top priority in the UAE and KSA, with several initiatives in recent years. Technology that can convert solid waste into liquid fuel is currently in its development stage. As this process becomes more advanced, we could be looking at viable solution for both climate change and creating a circular economy, with its many benefits. ■

Source: Heriot-Watt University Dubai

EXCLUSIVE SOUNDINGS



HYDROGEN: “In a net-zero world, all fossil fuels need to transition to decarbonised energy or zero-carbon fuels. By defining low-carbon hydrogen standards, Europe can shape the nascent global hydrogen market, thereby pushing for increased climate ambition outside of the bloc. It is important for meeting climate goals and for the practical realities of creating a new global fuel market.”

Magnolia Tovar

Global Director, Zero-Carbon Fuels

Source: Clean Air Task Force

CIRCULAR CARBON ECONOMY: “Within the next three to five years, we are going to see much more circular carbon projects. The opportunity space comes from carbon capture and reuse and creating products that you can sell. We are all realizing that carbon capture and storage (CCS) is a cost, however, we are still going to need some of it, and it is still important that we capture and put back carbon into the ground.”



Dr. Jennifer Holmgren

CEO, LanzaTech



DECARBONIZATION: “The urgent need to decarbonise economies without destabilising societies has become crystal clear in the context of new cost-of-living crises and global supply chain risks. Successfully managing energy transitions is best achieved through a combination of energy trilemma solutions at all levels of societies, by redesigning markets and ESG investment frameworks to include energy and environmental justice considerations alongside energy- and climate-security.”

Angela Wilkinson

Secretary General & CEO, World Energy Council

Source: RENEWS.BIZ

REPORT

NEW WAVE OF POWER SHORTAGES LIKELY TO PUSH FOR MORE FOSSIL FIRED POWER

By: *CN Innovation*

Power shortage hits China again. The scorching record high temperatures have brought dramatic spike of power use to stay cool, challenging the power grid which is further exacerbated by the drought induced decrease of hydropower. This seems already a recurring situation. Almost one year ago, China experienced widespread power shortages, which we covered in our Insight China report of October 8, 2021. Factors contributing to the shortages include surge in power demand, decline in coal supply partly due to the Chinese embargo of Australian coal imports, and mismatch between “marketized coal and regulated electricity”. To ease the pressure of that time, the national government adopted measures that increased coal supply and incentivized coal fired power generators. This Insight report focuses on this new round of power shortage and examines its implications for energy transition.

Record high temperatures

Like other parts of the world, China has lived its hottest heat waves this summer. For nearly 70 days all provinces except the northern east Heilongjiang experienced high temperature which is defined as above 35.28 out of the 31 provinces experienced sustained temperatures above 40, and 26 of them broke their respective historical levels. And 277 weather observation stations across the country recorded their historically highest temperatures, with the highest reaching 45. The heat waves, more frequent and

intensive with longest duration since recorded history in 1961, has pushed up by 26.8% the July 2022 residential power demand nation wide, mostly driven by air conditioning. The total power demand grew by 6.3% in July, which has exceeded the planned growth of 4.7% and stressed out the power grid. In Sichuan province, July aircon power demand increased by 25%, accounting for 30% of the total power load of 60GW, 10% above its total installed capacity.

Drought and hydropower output

The heat wave, combined with severe drought, has dried out rivers and reservoirs and dramatically reduced the hydropower output. As the world's largest hydropower station, the Three Gorges project has an installed capacity of 22.5 GW, but now operates at its lowest level in terms of both reservoir water level and water flow rate. Sichuan province, which relies on hydropower for 80% of its power supply and provides 21% of China's total hydropower produced only 60% of the province's hydropower capacity in July and then further down to 50% in August.

Supply rationing

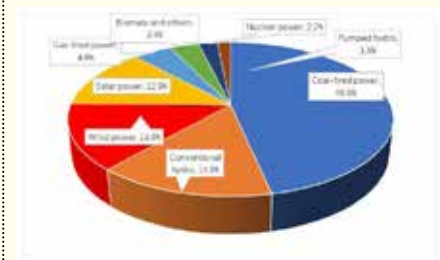
The economically more developed coastal provinces such as Shanghai, Zhejiang, Jiangsu and Guangdong rely heavily on power imports from some western provinces including Sichuan. The drop of hydropower there has significantly reduced their power export. Emergency supply measures were called upon to increase coal fired power generation locally and/ or to import more

power from those less affected northern provinces, but alas, the shortage remains daunting. As a result, power rationing is the only way to avoid large system failure. As the residential sector is given the top supply priority, industry is taking the biggest hit. Factories after factories were ordered to halt operations by the local authorities, severely disrupting global supply chain disruption, again, on top of the long COVID lockdown

Coping with climate induced shortages

According to the weather forecast, the heat wave is expected to die down in September, so this round of power shortage is expected to ease by then. However, at an age of accelerated climate change, extreme weather events, including heat waves, will become the new normal. A serious question requires immediate answers: how should a country build resilience into its power system to prevent and manage climate induced shortages?

Figure 1. Structure of China's Installed Power Capacity (2 380 GW) in 2021



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

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