

Energy Transition



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SCROLL DOWN

GREEN HYDROGEN INSIGHTS CHINA NOCs EXCLUSIVE SOUNDINGS

The Big Future for Green Hydrogen has Started!

Dr. Christoph Noeres, Head of Green Hydrogen, Thyssenkrupp Nucera

Hydrogen has moved from very small-scale R&D projects in the last ten years to industrial scale in the last three years. We are seeing big projects with NEOM in Saudi Arabia and the Shell project in Rotterdam. All these are multi-hundreds megawatt, and even gigawatt scale projects and they are moving towards becoming more competitive. It has become more and more important day by day to invest in green hydrogen because it is not only key for decarbonization, but also for energy-dependent regions to become more resilient in their energy system.

How capable are the regions competing to become hydrogen producers?

Looking into the different regions, Australia is one which has strong capability, given its vast areas of lands, ideal for solar and wind energy production which are excellent conditions to invest and implement renewable power and thereby green hydrogen projects. In addition, the country has a very safe political condition. Another region would be the Middle East and North Africa which also have excellent conditions for wind and sun-based renewable energy as we see as the basis for the NEOM Hydrogen Project in Saudi Arabia. The MENA region is also close to typical energy importers like Europe. Regulations coming up from MENA will also further push projects forward. For Europe, one of the key areas is the harbor of Rotterdam, which will be an important pillar of the European hydrogen backbone. It can serve those industrial processes located in the harbor area which needs green hydrogen for electrification. It will become a hub for hydrogen distribution across Europe.



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Dr. Christoph Noeres, Head of Green Hydrogen, Thyssenkrupp Nucera

How do you deal with the demand for electrolysis and the supply chain disruption?

There are a lot of companies working on electrolysis technology. We have already one gigawatt supply chain to manufacture electrolysis technology and we will spend some significant time and investment in the coming months and years to further optimize the technology and the supply chain. We will further expand that supply chain to around 5GW by 2026. This is key to driving the investment cost for green hydrogen projects further down. The key for the future will be to further optimize the electrolyzers to reduce the use of precious materials inside, as well as other materials to cut costs and dependency on a disruptive market situation. What we have seen over the last year is an unusual situation of the supply markets. We see raw materials and precious metals reaching peaks we have never seen before.

Partnership challenges?

As we are going into a completely new era - we need tight collaboration between industrial partners, operating companies, technology providers, and regulatory bodies in specific countries to make sure there are proper business cases. We need transport system, hydrogen hubs, and pipelines – and those collaboration would be needed to make those significant investments. But the first phase of hydrogen will be investments in existing installations that would change from gray towards green hydrogen.

Which would weigh more within region: hubs or pipelines?

We will see both. We will see perhaps as far as installation around the regions and demand as well for procuring hydrogen in the form of ammonia. However, companies in all the industries are investigating how they will decarbonize the industrial footprint and all of them will move towards further decarbonization. That means there will be a massive demand for industrial hubs. So around that, there will be further installation of renewable power and then the additional installation of green hydrogen production.

How important is green hydrogen in the energy mix of the future?

It's very difficult to give an exact number and where we see what kind of percentage green hydrogen will provide in the energy mix. But we will see a significant growth of assets. Those small projects that we have seen have risen in the last two years from five to ten megawatt projects to now multi-hundred-megawatt projects, even giga projects. It takes typically three to four years depending on where you start from the financing up to the final startup date of the plant. In the next five years, we will see a significant growth of that kind of projects and that will come online in 2024 to 2026 and will further rise. It will be a year by year, as it becomes more and more important part of the overall energy mix around the world.

[FULL INTERVIEW HERE](#)

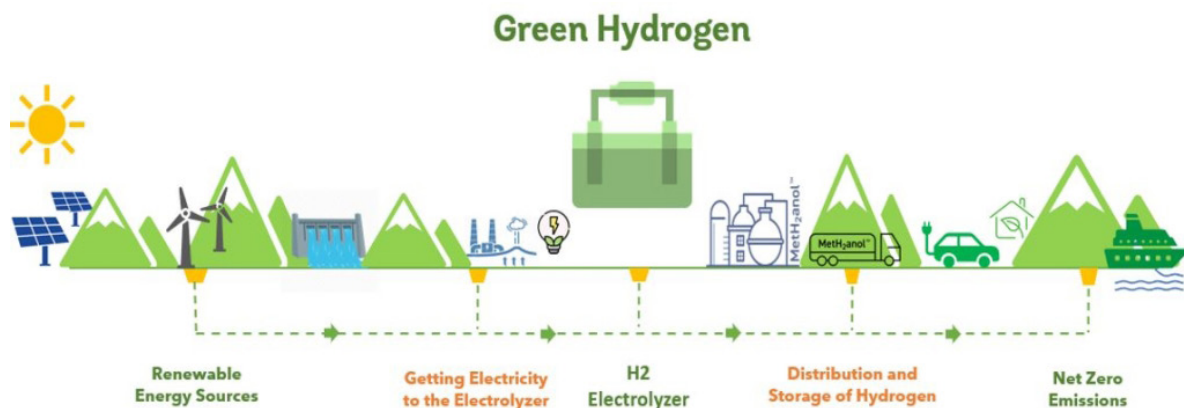


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INSIGHTS

India's Renewables Heartland



Bill Spindle
Climate & Energy Editor
SEMAFOR

Two states in the country's northwest are powering rapid growth of clean energy

Much of India's northwest is a scorching, windswept expanse of desert — precisely what the country's renewable energy companies love about it.

In the state of Rajasthan, I visited the Bhadla solar park, among the largest in the world. ACME Group, one of India's largest renewable energy companies, brought me out to visit the section of the expanse of arrays the company operates.

Beneath an unrelenting sun, solar panels covered the scrubby plain for as far as I could see. It was May, and afternoon temperatures already topped 120 degrees Fahrenheit. It was easy to understand why Rajasthan has installed more solar capacity than any other Indian state. The state racked up almost half of all the renewable energy built in India through August, according to statistics compiled by Ember.

Just days later and a few hundred miles away in the state of Gujarat, I stared up at wind towers operated by another of India's biggest renewable energy companies, ReNew Power. Gujarat, the other powerhost of India's renewable energy boom, hosted almost two-thirds of the 1.1 gigawatts of new wind generation built in the country through August.

India has few crude oil deposits and little natural gas. Coal is plentiful, and at the moment the government is scrambling to mine and even import more of it. But burning coal contributes to global warming and has helped leave India with some of the most polluted air on the planet. Global prices for oil, natural gas and coal are soaring as the war in Ukraine scrambles supplies and the global economic bounce back from Covid has boosted demand. Yet despite the desperate



scramble for fossil fuels — or, more accurately, because of it — their long-term appeal is waning rapidly. India would like nothing better than an alternative to dependence on volatile global energy markets.

"This is going to open up a whole lot of room for renewable energy," says Sumant Sinha, the chairman and chief executive of ReNew Power, one of India's leading renewable energy developers.

India has already expanded renewable energy faster than any other large country in the past decade. Solar power capacity has grown 60-fold in a decade, stunning industry insiders and skeptical observers alike. India has already installed almost 20% more renewable capacity so far this year than it did all of last year, bringing the total to more than 120 gigawatts. The government aims to install much, much more. India has publicly committed to producing half its power from renewable sources by 2030. That's likely to mean adding at least three times more capacity, requiring the country to move two-and-a-half times faster in installing renewables in the time remaining.

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H.E. Sharif Al Olama

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Energy Transition Journey Won't be an Easy Ride

The pace and commitment to the energy transition will vary from country to country, as each country has its own priorities when it comes to economy and growth. No matter how important the climate factor is, each country will work at its own pace and strengths when it comes to transitioning to clean energy. Therefore, you are going to see a variety of progress as countries begin to develop policies and regulations. In terms of hydrogen, there are still many hurdles that are yet to be overcome so that it can compete with the conventional sources of energy or fuel. The first is the elevated cost of production when it comes to hydrogen; second, the lack of an existing supply value chain; and third the urgent need for regulations, policies, and international standards.

UAE Moves to Develop Regulatory Framework

The UAE has started the work in the development of a hydrogen policy and regulatory framework with the Abu Dhabi Department of Energy taking that first step. It is in the process of aligning all the major

stakeholders in Abu Dhabi and the final report for that should be available towards the end of this year. It will define the policies, regulation, standards, and certification requirements which will eventually be taken up by the Ministry to pave the way forward on what is required on a federal level.

Building Domestic and Export Markets

The country is keen to address domestic needs as well as export to key markets. At the domestic level, introducing hydrogen into the transportation sector, despite its challenges, is one of the targets. The other aspect is the aluminum and steel industries where hydrogen is of use. Discussions are ongoing with these industries which are present in the UAE on how hydrogen - either blue or green - can be used for their processes. In terms of exports, the country focuses on Germany, India, Japan, and South Korea which have huge demand for hydrogen. ■

**Paraphrased Comments*

HYDROGEN: "Introducing hydrogen into the transportation sector has its challenges, but it is one of the targets that we have in the country. The other aspect is the aluminum and steel industries. We are currently discussing with these industries which we have in the UAE, of how we can utilize either it being blue or green hydrogen for their processes."

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REPORT

CHINESE NOCs NETTING ZERO COMMITMENTS

China has three integrated national oil companies (NOC): CNPC, Sinopec and CNOOC (the “Big Three”). Each has a publicly listed entity, respectively as PetroChina, Sinopec Ltd and CNOOC Ltd, and each of which owns the majority stake of its mother company’s operating assets.

In 2020, those listed entities had a combined Scope 1 and Scope 2 GHG emissions of 347 mt (million tons) of CO₂ equivalent, which is bigger than the entire UK emissions (329 mt CO₂e in 2020).

As state-owned companies, those NOCs are mandated to help ensure the country’s oil and gas supply security, while leading the efforts of decarbonization.

This Insight report aims to shed light on what those companies have committed to advancing carbon neutrality and what challenges they face.

1. Emissions

Before the Paris COP 21, Chinese NOCs were mandated to disclose environmental information and they were reporting energy saving and pollution reduction as part of their CSR (corporate social responsibility) or “sustainability” reports. GHG emissions were added to the scope of reporting after Chinese government officiated its NDCs under the Dec 2015 Paris Agreement.

CNOOC was the 1st Chinese NOC to report its GHG emissions in 2016, followed by Sinopec a year later and CNPC/PetroChina in 2019. Table 1 summarizes their time-bound data of emissions. For comparison, the largest IOC - Exxon’s Scope 1&2 GHG emissions in 2019 was 120 mt, while Shell – the second biggest, was 80 mt, both far below Sinopec or PetroChina.

2. Commitments

In September 2020, President Xi announced China’s goals of peaking emissions before 2030 and achieving carbon neutrality before 2060. Chinese NOCs have successively announced their respective peaking and neutrality timetables (Table 2). Both Sinopec and CNPC published their targets in March 2021, while CNOOC only made its target public in June 2022.

3. Challenges

As shown in Table 2, all three Chinese NOCs have committed to netting out carbon emissions by 2050, up to ten years ahead of the country’s target (before 2060). Each will tell you the activities they do in their respective sustainability reports. However, many challenges have to be addressed. The first is ability and expertise in renewable energy. All the “Big Three” have all announced ambitious targets for renewables, but questions abound about their ability and capability to deliver the targets, as Chinese NOCs are much less experienced than their international peers in developing solar and wind projects.

The second is the mandated and expected multitasking. Unlike oil companies in Western countries, Chinese NOCs bear multiple obligations and expectations of being a state economic and industrial tool, a market player and a listed company. Their multiple responsibilities range from implementing the will of the state and ensuring the security of oil and gas supply to participating in market competition and creating value for shareholders, while holding a unique position in China’s “socialist market economy”. And recent energy crises in Europe have reinforced the Chinese NOCs’ role as energy security provider of the country.

And the third is governance. As the backbone of China’s state-owned economy, the top executives of those NOCs (above the level of deputy general manager) are appointed by the CPC Party. The bosses are treated as officials at vice-ministerial level. Also, Chinese NOCs carry many government functions and their operating model retains the characteristics of national ministries. The biggest pressure on them comes from the government, and the biggest incentive for those at the helm remains political. As a result, Chinese NOCs and their CEOs behave rather distinctly from their international peers. Their netting-zero commitments should be understood within the country’s overall decarbonization plan in which those companies play their due part, rather than independently decided by their boards.

EXCLUSIVE SOUNDINGS



HYDROGEN: “To accelerate the uptake and the development of the hydrogen economy, the key element is to provide confidence to the investor and to the people who are interested to participate to the change in the energy mix. To do that, some assurance of demand is needed. This is something which is happening on a step-by-step process.”

Claude Mourey

Director, Hydrogen and New Energies – EMEA
Wood Mackenzie Consulting

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