

Research @ Citi Podcast, Episode 88: Energy in the Age of AI

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Transcript:

Erica Poon Werkun (0:00)

Welcome to the Research @ Citi podcast. I'm Erica Poon Werkun, JANA and Asia South Head of Research at Citi.

Joining me today is Tony Yuen, Managing Director and Head of Energy Strategy at Citi. Tony, welcome, and thank you for joining us today.

Tony Yuen (00:19)

Thanks for having me.

Erica Poon Werkun (00:20)

Our topic today is about energy in geopolitics and AI. As we know, energy is at the heart of two major developments globally: geopolitics and AI. First, geopolitics in the Middle East and between Russia and Ukraine affect the supply of oil and gas, which in turn affect inflation, interest-rate decisions, and currencies. Second, AI uses a lot of power. Getting power supply and having power infrastructure are two constraints that affect how quickly AI data centers develop.

So, Tony, let's set the scene. How much oil and gas supply is being affected, and are they fairly priced?

Tony Yuen (01:01)

So on the surface, supply losses look sizable at around maybe 6% of global oil supply and just less than 20% of global LNG supply. And that's why oil prices are high, diesel prices are high, and European gas and global LNG prices are very high. But that actually nuances these numbers.

On the oil side, out of around maybe 6 million barrels, they have losses based on ship tracking data. The majority is lower oil exports from the Middle East, but also some lower exports from Russia because of the Russia-Ukraine conflict. Now, counterbalancing that, China has reduced its oil purchases by roughly about 1.5 million barrels a day. So the net loss is roughly about 4.5 million barrels a day. And that's why prices were around \$90 per barrel oil before the pumping station of Saudi Arabia's east-west pipeline just got hit recently. And this assumes that in a balanced market, oil prices should be in the high \$60s to around \$70 per barrel of oil.

Then the market reacted to the hit on Saudi Arabia's oil pipeline and sent prices of ICE Brent oil to an intraday high of almost \$110 per barrel of oil. And that's essentially pricing in the loss of all exports coming from the east-west pipeline. As of now, oil prices have fallen to roughly about \$100 per barrel of oil. And that's because Saudi Arabia said half the capacity of the east-west

pipeline can come back within days. And there also looks to be some trend towards de-escalation. So that's the oil side, and a lot of nuances in there.

Then on the LNG side, a loss of 20% seems very large, but there are many offsetting factors. In fact, the loss of the Middle Eastern supply on paper looks like the same magnitude on a daily basis as when Russia cut off natural-gas supply — pipeline natural-gas supply — to Europe. So that's when people worry about prices rising to 2022 levels in Europe and Asia on natural gas. But there are these offsetting factors right now, including lower European demand, weak LNG demand in Asia because of fuel switching away from natural gas to other energy sources, and rising LNG supply from other places globally.

Specifically, on the one hand, Europe has been quite worried about storage, and people say that this winter could be cold because of El Niño. But European demand since the start of the Russia-Ukraine war is down by roughly 20% on an annual basis, and down by roughly about 15% during winter. Partly because industries have gotten more efficient, some industries have left, and renewables have really gradually displaced natural gas in power generation. And El Niño winters, based on historical data, tend to be mild. Now, winter U.S. natural-gas prices, which are also subject to El Niño impacts of mild winter but without exposure to the Middle East war, have also plunged. Japan's Meteorological Agency's latest outlook expects a 50% chance of mild winter as well, a 40% chance of normal winter, and a 10% chance of cold winter. So, the whole thing about El Niño leading to a cold winter doesn't jibe with the data.

Now, Asian LNG demand structurally is also weak this year. East Asian demand has fallen and more than offsets gains in South Asia. In a lot of places, coal and renewables have really substituted natural gas. In Japan, we're starting to have additional nuclear reactors to help. And China has plenty of wind, solar, hydro, and coal-fired generation. And then, of course, global LNG supply outside the Middle East has also been rising. So that's why, when the Strait of Hormuz starts shutting to transit, you're supposedly losing roughly about 10 billion cubic meters per month of LNG from the Middle East. And people attribute that and move all that to affecting European storage. It turns out only a quarter of that affects European storage. So that's why Europe hasn't really been affected as much.

But these are some of the things that we are talking about in terms of oil and gas supply disruption because of geopolitics so far.

Erica Poon Werkun (04:45)

Tony, you've given us a lot in terms of the overall picture for both oil and LNG. Certainly, geopolitical developments are hard to predict. What are some potential scenarios we should think about?

Tony Yuen (04:49)

So there's the de-escalation vs. escalation, right? And we think that there looks to be some natural constraint to escalation. Now, there are certainly military aspects that experts have more to say about. But from the commodities or economic constraints, we can think about U.S. retail gasoline and diesel prices, certainly affect headline inflation. And these prices also somewhat correlate with inflation break-even rates.

So in the U.S., to solve really high gasoline and particularly diesel prices, the U.S. can try a few routes. One is to tell Ukraine not to hit Russian refineries, which President Trump did say publicly. We'll see whether that will happen. Or the U.S. could restrict exports of diesel,

gasoline, or even crude oil. Logistically, it is really not easy. In fact, one can think about the U.S. as having three different oil markets — the East Coast, the West Coast, and the midsection of the country — because of constraints on oil infrastructure. So that's why people talk about an export ban, but it is difficult.

Then the third option for the U.S. would be to do a deal — however temporary — with Iran, which we've seen with the MOU several months ago. Now, 2018 is actually an interesting parallel. You had the same U.S. president, the same midterm-election season, and the same two parties of the U.S. and Iran against each other. So at the time, President Trump said that he would implement harsh restrictions on Iran oil exports in November 2018. But then by early October 2018, lots of waivers got issued. So oil prices then reached an intraday high, before all these announcements, of roughly about \$87 per barrel of oil. But by the end of the quarter, prices fell to \$50 per barrel of oil. And so that's an interesting parallel given the setting.

Now, at this point, when we look at what's happening these days, President Trump said that he could talk to Iran's president during this U.N. week. And of course, retail diesel prices had just rose to about \$6.50 per gallon, setting another all-time high. And the Fed just raised rates because of strong inflation. And the inflation break-evens are decently correlated with gasoline and diesel prices.

So what's also interesting is that when the MOU was first signed in June, a series of meetings took place in May. Now, at the time, the Iranian foreign minister first went to Beijing. Then President Trump went to Beijing several days later. Then several days later, President Putin went to Beijing. And then the Pakistani prime minister also went to Beijing. So lots of geopolitical discussions went on back then and are, of course, going on right now too. So it'll be interesting to watch from that point of view.

Erica Poon Werkun (07:39)

Wow, certainly a lot of moving pieces. So stay tuned to see which scenario will pan out. In the past, Tony, we keep on talking about OPEC driving the oil market, but China has emerged to be very influential. In what ways is China affecting the energy markets?

Tony Yuen (07:58)

This is a great question. So China is very interesting these days. Let's look at China's market positions in various sectors. It is the single largest oil-importing country in the world. It is among the largest LNG-importing countries in the world. It produces and consumes the most coal globally. It also makes and installs the most solar and wind generation and batteries. It also makes and sells the most electric vehicles globally. So that's the market position.

Then, if you dive deeper into specific areas: on the oil side, China's ability to sharply cut back oil imports this time, over the last few months, has really limited the upside of oil prices. And China is able to do that because it's been building and been buying oil — roughly about 1.5 million barrels a day of oil — for stock-building purposes, because they have a very low inventory at the price. So when prices are high and supplies are tight on the oil side, China just stops building inventory. So that's why they can cut back on oil imports. China also has so many electric vehicles that people switch from using gas and diesel-powered cars to EVs or LNG-powered trucks and so on and so forth, right? So that's why China can pull back on oil demand, and therefore oil imports. When you are the biggest customer, certainly sellers and producers treat

you somewhat differently as well. But now look at the magnitude of those numbers — that's why China can influence the oil market quite a bit.

Then on the LNG side, China also has other sources of gas, not only domestic production, but also pipeline gas from Central Asia and Russia as well. China also has lots of renewables that the country has been switching to. And there's also a reason why we have for a long time thought that the global LNG industry will head towards a massive oversupply, because China simply doesn't need that much LNG.

Then you also talk about on the industrial side: China produces a lot of EVs, and exporting them would dramatically change the oil market in the future. Now, in the past, a lot of EVs were sold in China, so the rest of the world didn't really see the impact of weaker oil demand. But now as China exports a lot more EVs to the rest of the world, then oil demand could take a more visible hit in the future.

Then China, outside of EVs on the industrial side, produces lots of solar panels and batteries, which also fit with the current geopolitical landscape because a lot of countries and corporates want to source their energy more domestically. Now, certainly some would say that you're still importing equipment from just a single country. But to many energy-consuming countries, rather than buying more oil and gas — which entails constant buying, like literally every day, every week, every month — installing renewables and batteries makes sense to have your energy become much more domestic. So that's why China — from just the oil, LNG, EVs, industrial, solar panels, renewables and batteries — is just dominant throughout.

Erica Poon Werkun (10:48)

Understood. Well, let's zoom back out of China and focus on some of the other macro dynamics. Why are oil and gas prices important to inflation and rates?

Tony Yuen (11:00)

As we talked about before, in the U.S., gasoline and diesel prices matter to headline inflation a lot. And that's why, if you look at U.S. politics — not only because consumers look at their gas station, every single day they look at the numbers — but it feeds into a lot of transportation and intermediate goods transport. So that's why gas and diesel prices matter a lot. And these prices happen to have, if you look at it more statistically, a decent correlation with the two-year and 10-year inflation break-even rates, for example.

In Europe these days, we get a lot of client inquiries. The surge in natural-gas prices there — the price there is called TTF — caused European inflation back in 2022 to spike and the euro to weaken. And so that's why these days, when people look at TTF prices, natural-gas prices, if there's a spike, then that might be causing inflation. So that's why oil and gas prices matter to inflation and rates so much, both in the U.S. as well as in Europe.

Erica Poon Werkun (11:58)

Tony, let's chat about our second topic, AI. There is the geopolitics of AI because of the competition between the U.S. and China. And the U.S. has the lead in chips, while China has more power supply. We know that energy and power are also crucial to AI data centers. Could you talk about the relative differences in the availability of power developments in the U.S. and China?

Tony Yuen (12:22)

Sure. Thanks for that. It's interesting talking about AI in the U.S. and China. Both countries have lots of data and lots of talent, and advances in different models. And the U.S. has more advanced chips, but it's short on power. In the U.S., building new generation and building new power grids are difficult. And we did [a Must C report](#) on that very aspect several months ago. And that's not only because of regulatory approvals, as well as local consultation — some would say opposition — and now we see the backlash from data centers building, partly around how power prices might be higher because of having more data centers.

But the fastest way supposedly to get power is through the use of natural-gas-fired power generation, including the use of turbines — like combined cycles, single-cycle gas turbines — or engines, like those for literally jet or ship engine types of engine, but then instead of kerosene or jet fuel or fuel oil, using natural gas or using something called fuel cells. But the manufacturing backlog of these turbines and engines lasts years, and there's also a shortage of transformers. And the U.S. also restricts the use of Chinese power equipment. So power is a long-term constraint because of the regulatory process that is structural to the system of governance.

Now, in contrast, if you look at China, it has lots of power generation. It has coal, lots of renewables, it's building the most nuclear reactors, and it has some natural-gas-fired generation. Building transmission lines require different kinds of approvals that tend to be much more accelerated. And the IEA historically did an analysis that it might take China roughly two to four years to build some long-haul transmission lines, but the U.S. may take five to 13 years. And because pre-training of models needs more sophisticated chips, and inference requires different kinds of chips, but inference also uses a lot of power. So it's interesting to see that China also pursues the application of AI more so from that respect.

Erica Poon Werkun (14:23)

So there are the supply dimension and power-equipment dimension. Would you elaborate a little bit more on the relevant bottlenecks and drivers?

Tony Yuen (14:32)

Sure. In the U.S., if you look at the availability of power-generation mixes, it really comes down to natural gas through a process of elimination. So here's how it goes. If you look at coal, it's not really competitive economically with natural gas because of the low cost of shale gas in the U.S. — the shale-gas revolution. A change of U.S. administration can also affect the prospects of coal as well. So building new coal seems to be out of the equation, right?

And then nuclear — historically, big nuclear power plants suffer from cost overruns and delays in terms of constructing new ones. And there's a lot of hope on something called SMRs, which are small modular reactors, but they need to be commercialized first. So it's a hope for now. And renewables would be great, such as solar and wind, but the low-cost solar and wind and batteries are mostly made in China.

So that leaves natural gas, which the U.S. has lots of. But the U.S. needs to build pipelines and needs to have enough turbines and engines to burn gas. And the business of making turbines and engines, as we've talked about, has seen slow growth until the last couple of years. So there's a lot of catching up to do in terms of manufacturing. Plus there's also uncertainty about whether this surge in demand is real, because roughly about 25 years ago, the U.S. also experienced some similar surge in natural-gas-fired generation built. And then after several years, there was a surplus of gas-fired generation. So there's that aspect.

And then the U.S. is also pursuing an interesting angle to add to this — pursuing LNG exports in direct competition with Middle East LNG exporters. So if the Strait of Hormuz reopens fully and sustainably, then the U.S. won't export as much LNG. So, what's driving U.S. natural-gas demand will be more so on the data-center side, and then U.S. natural-gas prices won't be as high. But if the Strait of Hormuz periodically opens and closes, then the U.S. will have to export a lot more LNG. And plus, the demand to power data centers for U.S. natural gas — then U.S. natural-gas prices could be much higher, which means that U.S. natural-gas prices, which are already highly correlated with U.S. power prices, will in the future be affected by geopolitics in the Middle East, unlike the past when U.S. natural-gas and power markets were shielded from these geopolitical developments.

So there are all these things that intertwine. We think that they don't relate to each other, but it turns out they do. So I guess that's the state of the world.

Erica Poon Werkun (16:57)

Wow. It sounds like we're coming full circle. Middle East geopolitics will also affect whether the U.S. and global natural-gas markets will be tight or loose.

Well, with that, Tony, thank you for sharing your thoughts on energy in geopolitics and AI. It's good to have you.

Tony Yuen (17:13)

Thank you.

Erica Poon Werkun (17:15)

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