BofA Hydrogen Conference – Linde Transcript
David Burns
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STEVE BYRNE: Welcome back to our next session at our Green Hydrogen Conference. My name is Steve Byrne, I cover US chemicals, and it's a real pleasure for me to host Linde on this next session. Our speaker from Linde is David Burns. I have a brother named David, but it is not the speaker today. But David was our speaker in our last conference. He is head of Linde's clean hydrogen initiative, and he's been involved in the hydrogen and syngas business for quite some time. He started out at Dow Chemical, went over to Praxair I believe in 2005.

So he's been involved in hydrogen and HyCO for a long time, and is now leading the company's effort on the clean hydrogen front. And he's in Munich, and Juan Pelaez is also with us, and he's up in Danbury. If you need any follow up questions, Juan is certainly available, and he's going to give me a jolt if I ask something inappropriate. So he's on with us too. But listen fellows, it's a pleasure to have you both with us. And welcome, and look forward to the dialogue here.

DAVID BURNS: Thank you, Steve. Glad to be here, and good morning, everybody.

STEVE BYRNE: So for those of you that are on this session, feel free to send me questions as we go through this discussion. You can send them to me on the Veracast portal. I have that app. You can send me Bloomberg chats, send me an email, whatever works for you. But we have plenty here to talk about. So perhaps just kind of big picture question for you to start off, David. I mean, Linde is a big company. You got almost $30 billion in revenue, and market cap $150 billion. And how meaningful is this clean hydrogen initiative for Linde? Is this-- what's the level of commitment would you say the company has in clean hydrogen, and what would you highlight is your primary advantages? Why would you characterize Linde as a way to play this green hydrogen theme?

DAVID BURNS: Yeah. No, we see clean hydrogen, clean energy as a real growth story for us going forward, a lot of opportunity for us. And then if you caught the earnings call with Sanjeev last month, I think it was but he really emphasized heavily where he saw this going, and how it's going to be a big part of our growth story going forward. So we put a lot of emphasis, putting a lot of resources into it.
And really, we think that we can really leverage the advantages we have. As you said, we've been in hydrogen a long time. We've got the best technology across the value chain, the clean hydrogen chain, as well as the conventional hydrogen chain. We got that infrastructure we developed over many years to support our old hydrogen business. It's a $2 billion plus business today. All that infrastructure, all those networks, we can kind of leverage that for the blue and green clean hydrogen going forward.

We're also very heavily focused on developing partnerships around the world, local partnerships though, that we're going to create local advantages, such as we did recently with Hyosung in Korea. It was a good

example of that, for instance. I think we have a very strong enviable balance sheet, which we could use to invest heavily in this sector as well.

And I think just the experience we've had, some 100 plus years in the hydrogen business is something that others can't match. Others are just coming into the business. We've been in a long time, we've got a lot of expertise, a lot of infrastructure, a lot of capabilities that we can really leverage here and really make us-- set us up for success in the clean hydrogen business just as we've had in the gray hydrogen business, I guess you'd call it over the years.

STEVE BYRNE: So I think it was two weeks ago today that you along with your some several of your colleagues in Linde engineering hosted a green hydrogen event. I'm not always up at 4:00 in the morning, but I was that day. And I found it actually extremely useful, but I don't believe that event was really meant for analysts like me or certainly not US customers. Perhaps describe that event. It was a couple hours long, it was very technology-focused, but who would you say really was the target audience for that? And how was the response from it?

DAVID BURNS: Yeah, it was tremendous response. Thank you for getting up so early to join us, pleasure to have you on the call there, on the event. But we had something like 2,700 people register for it, which was phenomenal. The majority of those, I think of those maybe 100 were from Linde, but the rest were really external, particularly customers, those who are interested in what green hydrogen is about, how could they participate in the green hydrogen area, what does Linde do, et cetera.

So we had the whole range of engineering companies, to renewable power companies, to end users, to mobility. So quite across the range with about 2,700 registered. We had afterwards-- in the first few days, I haven't seen the most recent numbers-- we had something like 1,600 people visit our website. Right afterwards, about 500 requests the presentations and close to about 100 requesting follow up to talk about investment opportunities. So from our point of view, it's tremendous.

We've done these kinds of events in the past physically, and you can get maybe a couple of people. Maybe it's one of the benefits of COVID. You can have these virtual events, you can get thousands, in this case 2,700. So from our point of view, it was very successful.

And, of course, we had Andreas Rupieper, head of-- managing director of ITM Linde Electrolysis talking, Markus Weikl and Volker Goeke as well. So Michael Schaffer kind of introduced it. He was head of our hydrogen platform here at Linde Engineering. So excellent, excellent participation from outside. And it followed on a couple of months before that, we had one of blue hydrogen. A similar kind of event that focused on blue, this one was on green. We thought we'd separate them, and we really got a lot of attention, and it was very successful, successful event.

STEVE BYRNE: One of your colleagues described your projects in development as containerized versus modular versus train based. And each of those is a different sized project. I don't know whether it was like a couple of megawatts for the container, or maybe less than 10 in the 50 for modular, and then train

based the larger ones. How would you assess the 1600 interested parties that participate in this then? Where would you place them in those three buckets?

DAVID BURNS: Yeah. I mean, some of them were in the mobility sector, so they were looking at small applications maybe single digit, tens a day, tons of hydrogen. That's in the kind of containerized scale, the 2 to 10 megawatt scale if you like. Simple kind of plug-and-play is ideal for small applications, small needs for hydrogen.

Next one up was kind of the modular, and there we're looking at maybe 10 to 50, maybe even up to 100 megawatt kind of scale. So from 1,500 tons a day to 15,000 tons a day, getting into the bottom end of the large applications in refining and steel and chemicals. On the low end of that, you're looking at commercial vehicles, trucks, buses, trains kind of scale. Again, containerized, making use of all the capabilities around modularization to really drive down costs there.

And then on the bigger end, of course, in the larger end it's the scale you're getting to when you're looking to put it into a pipeline network or to completely decarbonizing the ammonia train, et cetera, in the much, much larger scale. And there you're looking at taking advantage of some new technology we have around, what we call the gigawatt stack which is a 5 megawatt stack. And they'll be kind of then replicated and built up into the train size. So cover the whole gamut of from 2 megawatt to 100,000 megawatt kind of scale.

Obviously, we're not at the 1,000 megawatts. Nobody's pulling that in yet, but there is talk of that. And we are working on projects in the 250, 500 range. So we have utilities and large chemical companies refining at the far end and small utility, smaller maybe fueling station, city municipalities, things like that at the low end. So that's kind of the range we covered there.

STEVE BYRNE: And so you say you're working on some projects that are in the 250 to 500 megawatt. Would those be projects that would have the ability to ramp up even larger into gigawatt scale?
DAVID BURNS: Yeah. I mean, you could. I mean, once you get to a certain scale, it's just a case of replication. You're putting in 100 megawatt kind of trains, and so you get to 250, you can then-- you can go to 350, 450, and so on, right. But part of it-- it depends, what's the downstream.

If you're feeding an ammonia train with a 250 megawatt electrolyzer, you'd have to then replicate the ammonia train as well. So there's certain-- I mean, if you're doing derivatives, it really depends what are you going to do downstream of it as well. But once you are at that kind of scale, it's just a case of replicating and getting advantages from the costs of scale really driving down the cost there. But—

STEVE BYRNE: So you mentioned this giga stack with five megawatt electrolyzer. How far away is that from being commercial? And is there even a larger unit in development? I mean, if you're talking about 500 megawatt trains, you're still looking at a hundred of these giga stacks. So—

DAVID BURNS: Yeah, well with—

STEVE BYRNE: --is there something bigger in development?

DAVID BURNS: Yeah. What you're looking at-- we started-- this is a 0.7 megawatt was the original stack size ITM had, then it became two megawatt. That's what we're installing at Leuna, for instance, is a two megawatt. Next, we have the five gigawatt stack, and that's going to be the basis of all the large projects we have going forward. And we're already bidding projects based on that. So that is a technology which is part of our platform going forward.

And what you do, is you get two five megawatts come together to make a 10, you get to a hundred and so on. So we're looking at this kind of replication. And as you get up in scale, both in the size of the stack, you get better efficiencies, you get manufacturing efficiencies from automation as well. So the overall benefit of bigger stacks is also help reduce the cost of the balance of plan that comes with it.

And obviously that's where Linde engineering, whether it's capabilities around process design and modularization, et cetera, and putting together full EPC packages really comes into its own in terms of driving that to a very economic train, if you like, of meeting large scale requirements for electrolysis, which ultimately is going to be the goal if we really are going to transition from hydrocarbon to renewables. And hydrogen is going to be a key part of that. And we need to be able to do this on this kind of scale. But obviously, we're not there yet, but you obviously you've seen and heard the projects at that scale which were being talked about. And which have been-- government funding being made available for. But right now with at 24 megawatts going in, we're looking at 100 megawatt projects, and doing field studies on 250. So as you can see, the scale is gradually increasing here.

STEVE BYRNE: So ITM is your electrolyzer partner. And—

DAVID BURNS: Yeah.

STEVE BYRNE: --I got to tell you, over these last two days, we've had a lot of various electrolyzer companies representing-- some are new entrants and work representing the whole spectrum, from various versions of alkaline, to PEM, to solid oxide. And I'd like to hear your view. Where would-- how would you characterize the range of technologies out there from-- one, have you picked the horse that you want to race with? Could you consider others as you move down the line? And why PEM versus the others?

DAVID BURNS: Yeah, I guess looking at-- from a high level, alkaline is the old technology. I guess it's been around since the '20s. So it's certainly got a history and a track record. To some extent, we feel that it may have run its course in terms of its ability to get-- squeeze further cost advantage or efficiencies out of it. But it's a viable technology. And it's been around for a long time.

When we were looking at which electrolysis technology we wanted to invest in, partner with, we looked at-- did quite a lot of due diligence. And pretty soon, ITM and PEM came to the top. Looking at PEM, our

view of PEM is that you're looking at a few years, and that's going to be the technology, really, that's going to lead the charge. It gets a lot of synergies with fuel cell technology. It's very nice for following renewable power. The variability of renewable power, PEM follows that very nicely.
It's, we feel, the easier and simpler. And PEM is safer to operate and maintain. And it has a smaller footprint. So we see a lot of benefits from PEM. Earlier in its development cycle, we see opportunities for driving cost out as well. So PEM, I think, going forward, is going to be at parity and maybe improve over alkaline going forward in a lot of projects. It's certainly well-suited to the small mobility projects, and the power to gas, refining, those kinds of projects.

When you look at solid oxide, that's an interesting technology. Running at a high temperature, you get very good efficiency. It brings some problems with it as well. But if you can take advantage of the high temperature, do some heat integration, find applications where heat integration is important, you can really get good efficiency. But I guess also, we see it as kind of still at the development stage in many respects. So obviously, keep an eye on that. But that's a technology of the future, perhaps, as well in certain applications. And you certainly get very good efficiencies out of it as well.

But yeah, that's kind of a summary of the three technologies, the alkaline, PEM, and SOEC as we see them.

STEVE BYRNE: OK. And so there's a range of efficiencies in those. And as you mentioned, PEM has the-- has that ability to be dynamic and responsive to changes in current. But do you have a view that Linde also has an advantage with respect to your ability to contract for renewable power at competitive rates? Is that-- and do you agree with that? Do you think that's a sustainable advantage? Or do you think that renewable power pricing is going to become attractive to all of the green hydrogen producers that are in development?

DAVID BURNS: Yeah, I mean, obviously, you hit on a point there, which is over half the-- more than-- the majority of the cost for green hydrogen is related to the power. So we can do what we can on the equipment side. But ultimately, the cost of renewable energy is critical.

You have to remember, also, Linde is a very large purchaser of power as well for its base business, its ASU business. So we're already very well familiar with the industry. We have some leverage there as well. But the key is to get good pricing on renewables. And I think that's maybe something a lot of people are struggling with in how do you get good pricing on renewables in the central Germany or something like that.

It may be easier in the Middle East where there are specific projects being built specifically for renewable green energy, for green hydrogen. You can get good pricing there. But it's a bit more difficult when you have to use the grid in any way, and you can't get behind a meter. So I think it's a problem we're all facing is how do you get good pricing on renewables where the demand is developing most rapidly, which is Europe today.

STEVE BYRNE: And can you comment on what kind of pricing you can get for renewable power in Europe? I don't think it's quite as good as you can get in Texas right now. But what's kind of an order of magnitude? Are we in-- can you get to $0.05 per kilowatt hour in Europe?

DAVID BURNS: That's challenging, yeah. No, I don't think you can do that today. Hopefully-- I mean, obviously, we're looking at some projects in the Middle East where pricing is much lower, the same in Chile, those kind of countries with renewables but no demand, really looking to develop export markets. So there, you're seeing very attractive pricing-- or costs, I should say-- on power. And then certain parts of the US, you can get attractive pricing as well if you're behind the meter again. But still, it doesn't compete with what you can see in the Middle East, or Chile, or in some parts of Australia as well. So I think I wouldn't like to comment on exact pricing. But it certainly is challenging.

STEVE BYRNE: So one of your other colleagues on that event talked about transporting the hydrogen in a pipeline. And if I heard him correctly and I converted it right, we're talking about 1,000 kilometers to move hydrogen for roughly $0.25 a kilogram if I heard him right. Is that the future, the most efficient way to move hydrogen in those regions where you do have pipelines?

DAVID BURNS: Yeah. And certainly, we're a big proponent of pipelines. We operate, I think, over 1,000 kilometers of pure hydrogen pipeline today. And for moving large quantities of hydrogen from centers of production to distributed demand, larger distributed demand, pipelines are key to that. So we're a big proponent of pipelines. And we see that as the future, especially if you couple it with cabin storage, cabins like we have in Texas there.

We have a large pipeline system connected to a 6,000-ton cabin. And that really helps, in that case, provide reliability. But in the future, it really enables you to take advantage of renewable power to make hydrogen. When the power is available and demand is not there, you can really store it. So we think pipelines has a real role as demand gets up. And you're looking at the transition in full swing.
We also see, though, an opportunity for liquid hydrogen in particular for applications developing, such as bus, truck, train fueling, which is maybe in the 5, 10 ton a day kind of range. Doesn't really make sense to put dedicated pipelines in. But you can deliver, with liquid-- a liquid tanker can deliver 5 tons in one shot-- that liquid will have a real role in being able to build out that kind of infrastructure around heavy commercial fueling, vehicle fueling stations. So I think pipelines is very much in large applications, steel, chemicals refining as it is today. In the future though, fueling stations, depending where they are, liquid is going to be the key for that, we believe. And so we feel we have an advantage there too given our history in liquid hydrogen.

STEVE BYRNE: So speaking of that, David, I've seen, in the literature, the energy requirements to liquefy hydrogen to be in the neighborhood of-- 12 kilowatt hours per kilogram is what I've read. But I believe Linde can do it for roughly half that. Is that true? And how is it that you have that technology? What is key to enabling you to liquefy-- so let's just say you can-- your electrolysis requires 50 kilowatt hours per kilogram. You just add on another 6-- so from 50 to 56-- to convert it into liquid hydrogen.

Is that roughly correct? And is that-- do you think that is somewhat misunderstood? Because we've heard it many times in these last two days about the energy requirements to liquefy hydrogen is really prohibitive.

DAVID BURNS: Yeah, and I think you have to be careful. What kind of scale are you talking about when you're talking about kilowatt hours per kilogram? What scale? We've had a lot of experience, many years of working in the liquid hydrogen space. I think over half the world's capacity today uses Linde technology to liquefy hydrogen. We operate a lot ourselves. I think the largest units today are like 30 tons a day. We're operating several. We're about to start one up in Texas. And we announced we're going to be building a new one in Korea, a 30 ton a day of capacity in Korea.

So we've got a lot of experience in this space and know how to use that when we look at the next level going to 50, 100, or 400 ton a day kind of scale that we're looking at, which we think will be needed if you're looking to develop a large regional distribution network, or even international distribution network, for liquid hydrogen. And there, obviously, cost is important. So we're using our expertise, our knowledge, et cetera to really look at driving costs down, capital as well as operating costs, efficiencies up-- so looking at advances in refrigeration cycles, the turbo machinery selection, compression, et cetera to really come up with the next generation, which will be much lower in terms of power requirement, and on a unit basis, much lower cost as well.

So we think we've got a real advantage in really leveraging the capability we developed over years when we look back at starting hydrogen production for NASA back in the '60s there. So it's a technology we've had. And we've kind of stuck with it. And I think we're the largest producer of liquid hydrogen today. And we, again, have most technology in the world making liquid hydrogen. So I think it's a good fit with our capabilities there.

STEVE BYRNE: And staying on the theme of liquid hydrogen, you have this Leuna, Germany plant. And you have a contract to supply liquid hydrogen all the way up in Norway. And I got to tell you, when I first read about that project, it surprised me that you would be competitive delivering into Norway, which I think is roughly 800 miles, or something like that, from your plant in Germany versus, potentially, delivery of liquid ammonia into Norway.

But when we started drilling into the math-- and correct me if I'm wrong on this. But roughly speaking, just the truck hauling from Leuna up to Norway, we were coming up with roughly $1 a kilogram for delivery costs and then maybe another $1 a kilogram for liquefaction of that. It doesn't strike-- if those are right, it doesn't strike me as being too prohibitive. Are those roughly correct?

DAVID BURNS: Yeah, I mean, kind of like ballpark. I mean, the key there was this is the first ferry that's going to be using hydrogen, liquid hydrogen. With the first one, it didn't make sense to build hydrogen production and liquefaction in Norway. It makes a lot of sense to have liquid on board the vessel. It makes it a lot more efficient given the scale we're talking about. But hauling it from Leuna to Norway to get this established was the way to do this.

Obviously, we're looking at other opportunities in Norway, other ferries that will be converted and put on liquid hydrogen. And we're looking to build capacity in Norway for producing and liquefying. But at the scale for one ferry, it didn't make sense to do that for that. But what we're looking at is, with a truck-- with a tanker, a liquid tanker, you can get up to 4.5, 5 tons on a tanker. So we're not delivering hydrogen every day. It's maybe every week kind of thing. So it makes it efficient for that particular case and to get things started.

Now you mentioned ammonia. And I guess there was a concern-- well, potentially, is a concern with putting ammonia on a ferry or a passenger vessel, right? I'm not sure you want to use that as the fuel. Potentially, cargo ships, freighters, et cetera, I can see ammonia being used, but not so much on ferries. And if you were looking to say, well, I'm going to import or use green hydrogen and convert that to hydrogen, crack it to hydrogen, liquefy it to put on the ship, I think you look at that for the scale here. When you look at that value chain, I think even delivering liquid out the Leuna is more competitive than taking ammonia, cracking it, liquefying it, and delivering it.

But anyway, so it's first of a kind, first ferry in the world, first of a kind. Getting it started with liquid out of Leuna is a good fit with the project we're doing there. And as I say, we're hopefully doing a lot more projects. And we'll get to-- we'll get to need to build more capacity for liquid and green production in Norway as well.

STEVE BYRNE: Speaking of ammonia, one of your colleagues on that event two weeks ago did talk about green ammonia. Do you see much of a future there? Is that really more of a Linde engineering opportunity to design and build these ammonia plants? Or is this an opportunity that you think Linde would want to get into the business of producing and transporting ammonia rather than just straight engineering?

DAVID BURNS: Yeah, no, certainly, the engineering colleagues certainly have the technology, the capability. And we operate ammonia plants today. We supply Aramco with ammonia in Saudi. And also, we have a customer in Russia taking ammonia from it as well. So certainly, ammonia production is part of our kit bag.

In terms of green ammonia, does it make sense to produce that and ship that around? It certainly solves the problem of being able to ship hydrogen economically today. I mean, the technology for liquid hydrogen at that kind of scale is not available. You couldn't ship liquid hydrogen today from Chile or Australia. It's not there at that kind of scale. Maybe a decade from now it will be. In the meantime, there's obviously a large network of ammonia tankers. And infrastructurally, you can move ammonia around. So it's a way of moving hydrogen as ammonia.

The problem you get into is if you want-- if the end use is hydrogen, you have to take that ammonia, and you have to then crack it back into hydrogen. And then if you need it as liquid, say on board a ferry or on board trucks-- obviously, Daimler's focused on looking at fueling trucks of liquid going forward. If you end

up wanting liquid hydrogen as your final product, then going through ammonia to get there is not the best way of doing it.

Really, ammonia-- if you can find an end use for ammonia such as agriculture where they're willing to pay a premium for green ammonia, or they're looking-- if you're using ammonia as a fuel directly, such as in-- on board ships, as I mentioned, cargo ships, if you can use ammonia as ammonia, as a fuel, great application. And like in Japan, where they're looking to take in green ammonia, or clean ammonia, blue or green, and then use it directly in the power production without converting into hydrogen, there's a lot of opportunities there. But using it as a vector for hydrogen and then converting it to hydrogen, et cetera, it has some challenges. But obviously, it's the only way to do it right now. The liquid hydrogen is not there. But then we also think that we can make use of local production and local distribution as well for hydrogen to compete as well. But we are not saying-- with green ammonia, we certainly have the capabilities. And there may be some projects which look attractive. But I don't think it's a panacea that some people think it is. I think there's key applications, key opportunities where it will fit, but not all of them.

STEVE BYRNE: And going back to the discussion you had earlier, David, about your comments comparing the various technologies, PEM, alkaline, solid oxide, I received an investor question asking me your view on anion exchange membranes.

DAVID BURNS: Yeah, that potentially has opportunities-- some interesting features as well, which is something we're looking at. But again, it's more developmental is our view. So it's not-- it's not-- it's not ready for prime time by any means. But we're looking at-- maybe SOEC would be the one, the next technology to come along. But we haven't-- we're not-- we're looking at anion. But we haven't-- we don't think it is necessarily a big step change compared to, say, SOEC as the next in line. So that would be our perspective on that.

STEVE BYRNE: OK. How about the opportunity that you see for blue, perhaps on one of your pipeline networks where you do-- you own your-- you have SMR’s to generate the hydrogen? At least some of that CO2, you can capture. Are you looking at opportunities for that?

DAVID BURNS: Absolutely. I think where you have access to cheap natural gas, abundant cheap natural gas, and you also have access to pour space to put the CO2, sequester the CO2, it makes it very blue. Blue hydrogen is very competitive. Blue derivatives are very competitive. It'll be hard to compete with green in many cases. So in those circumstances, under those situations, blue hydrogen, blue ammonia certainly has a role to play. And so we are looking at that, and certainly in the Gulf Coast, where we were a major producer of gray hydrogen today.

And it also happens to be well-supplied with natural gas. And it's also well-supplied with the formations to take CO2. So it kind of comes together nicely there. So I think there could be opportunities to develop blue-- blue hydrogen opportunities there, blue ammonia opportunities on the Gulf Coast. But yeah, certainly, that's something we're looking at. And it'll be difficult to compete with green hydrogen on the

Gulf Coast, unless customers are wanting to pay a premium for green versus blue for some reason, and certainly versus gray, of course. But if-- you really need a premium of green over blue to be able to make that work, I think.

STEVE BYRNE: And are you saying that it would be difficult to compete with green on the Gulf Coast because you can get renewable power that cheap?

DAVID BURNS: No, sorry, I maybe misspoke. I'm saying green is going to be-- it's going to be hard to compete with-- take green hydrogen and compete with blue. Blue is going to be the low-cost source of clean hydrogen just because of natural gas availability versus putting in renewable power. Even though the renewable power is available, you're still going to have a higher cost. Clean hydrogen-- in that case, green is going to be more expensive than blue. Even though renewable is available, natural gas is also available. The infrastructure is already in place. Case of converting gray to blue would be more attractive than putting in new green, I think.

STEVE BYRNE: So this event two weeks ago, you kind of had the closing remarks for that event. And you rattled off a whole bunch of projects. And I think you could talk for another hour about all those projects. And one of them that I was not familiar with was something you're working on with Snam in Italy. Is that a pipeline project where you would be blending hydrogen in with gas?

DAVID BURNS: Yeah, I mean, with Snam, we signed in December in MOU. So we're looking to explore opportunities to work together and develop investment opportunities together with them. So obviously the leading pipeline operator in Italy and elsewhere. So we felt they were a good partner. You've seen they're very active in clean hydrogen, green hydrogen.

As it happens, I think they were an investor in ITM as well now. So they're very much looking at clean green hydrogen opportunities. We feel we've got a good opportunity to work with them with our capabilities, both engineering as well as our expertise around handling hydrogen and using hydrogen. So we're looking at several projects today around trains and buses in particular in Italy, which we think will be of interest. We'll do other projects of larger scale, which are earlier in development. But I think Snam is a great partner and the kind of partner we're looking to work with. When I mentioned earlier we're looking for finding good partners around the world, Snam is kind of the partner we're looking for.

And we're looking for partners, obviously, not just in that space, but also in-- with OEMs, renewables, data centers. So we're looking across the spectrum at who can we partner with where our skills or our capabilities are complementary to what the partner or the customer is in that case. So Snam is a good example of that.

STEVE BYRNE: OK. Another one that you mentioned was the Ontario, California plant where you're converting to blue. I was curious, who are-- who are your customers that are interested in purchasing blue? Are these existing gray customers that want to go blue? Or are these-- are these incremental customers?

DAVID BURNS: Well, you know, California kind of led the way. It was kind of-- under low-carbon fuel standards and its pressure to really clean up emissions around-- from mobility, et cetera. For many years, they've been pushing hydrogen fueling as part of the zero-emission vehicles, et cetera. So there's quite a few fueling stations in California, many of which, or most of which, we've supplied through our FuelTech. We have Linde Hydrogen FuelTech, which provides fueling systems for vehicles, cars, buses, trucks, all the way up to trains, where we can take liquid and put gas on board or take gas and put gas on board, high-pressure gas.

So there's actually quite a developing infrastructure in California for clean hydrogen, blue and green. And so a lot of that hydrogen is going to support that. There are other-- there are some other customers outside of California who also are looking to clean up as well, use clean hydrogen, some big names out there who are taking hydrogen today. So that was part of building the capabilities to support that growth and those kinds of customers. And we're looking to do more of that as the market continues to grow, especially in the US as, under the new administration, we're looking at potentially a lot more investment, a lot more stimulus money coming available to grow clean hydrogen outside of California. And we're looking to participate in that as well.

STEVE BYRNE: Well, David, there's a whole lot more we could talk about. We didn't even get to China yet or Korea. But I think we've run out of time. But anyway, listen, hey, appreciate you joining us today. Thanks for the update. And look forward to catching up with you again on this. But our best to you, OK?

DAVID BURNS: And to you. Thank you very much. Thanks for the opportunity. Thank you, Steve Bye-bye.

STEVE BYRNE: Bye.