

Transcript for #94. A Whole Blue World: The Future of Methanol Fuel Cells
Guest: Anders Korsgaard, CEO and Co-founder at Blue World Technologies
June 5, 2023

Tammy Klein (00:01):

Welcome to the show everyone. I'm really pleased to have with me today. Anders is CEO and co-founder of Blue World Technologies. Anders, welcome to the show.

Anders Korsgaard (00:30):

Thank you so much. Thank you for having me.

Tammy Klein (00:32):

Great to have you. So for the listeners, let's get right into it. I am super excited to have Anders on the show today because methanol to me is like the Visa commercial. It's everywhere you want to be. Methanol is, you know, I don't know if I'd say it's enjoying a resurgence, but I think methanol is sort of being rediscovered and its various applications are exciting. So we're talking everything from shipping to fuel cells and e-fuels and points beyond. So I really want to explore with producers and technology producers, what's happening, how did they get involved in the space, just to give everyone listening, a little bit of background. And that's why I'm excited to have Anders with us today. So for the listeners who may not be familiar, can you talk to us about Blue World Technologies? What it does? You are co-founder of this company, you've had a lot of experience working in new energy technologies. So tell us about the company, why methanol?

Anders Korsgaard (01:53):

Yeah, thank you for the introduction. Yes, methanol is a great fuel. I've been working with that for the last, 15, 20 years. it's my second company I've found within this space. The reason why we work with methanol is of course, that it's the simplest alcohol available, also simplest hydrocarbon, if you will. So it only can contain one carbon to put it physically, and that means that it's quite efficient, the most efficient actually to produce synthetically and also to convert back into electricity with the fuel cell or with the combustion engine or whatever. And, that's really the core of why. The second reason is of course that it's liquid and that's the fundamental part. So unlike gaseous e-fuels, it's super easy to set up infrastructure.

(02:53):

So, the market barriers are far lower, and it actually has the advances that it can be used in combustion engines, which is basically our competitor, how competing technologies compare like combustion engines. But in this case, they're actually our enabler as well. Because without methanol being able to be used in existing energy conversion devices such as convert combustion engines, it's very difficult to get the end result. And that's the beauty of methanol. So you can transport it like you do with oil or diesel gasoline. You can use it in combustion engines as you do with diesel and gasoline. New plug. You can also get it from a renewable source that could either be bio or from electricity which is the future, of course. And you can also use it in fuel cells, of course, being far more efficient than a combustion engine to use it with a fuel cell.

(03:48):

And that's the reason why we are here. Previously I also explained this as the bridge between our past and the future. So our fossil past to our renewable future where methanol enables sort of an evolution instead of a revolution. And revolutions always take a lot of bets commercial bets

in the trillions of a Euro if you go the wrong direction. But, with methanol, you can take it step by step and convert the world to CO2 usually in a step-by-step manner.

Tammy Klein (04:33):

So what's been the company's progress since you founded the company in 2018? Especially, Talk to us about the Blue Aalborg factory and also where do you see the company going in the next 10 years?

Anders Korsgaard (04:48):

Yeah, so in Blue World, as I said before, many of us have been working in this space for a couple of decades. We are an acquired, experienced team and also founders. Some actually not the only founders who we are three but basically what has been lacking in terms of leveraging this kind of fuel cell technology that is so efficient to work with methanol, by the way, has been proper industrialization. So we actually founded Blue World in the second or third or fourth gear, so to speak, because we really knew that in order for all the visions to materialize, we needed to industrialize the technology. So that was sort of the first four years actually acquiring technology. We actually acquired a technology company that, has been working with this technology for one or two years.

(05:36):

We did some innovations ourselves within the manufacturing policy and also efficiency improvements. And then we built our factory in just four years from the outset and raised a larger two, two-digit million euro amount to be able to execute that. So we have been very fast off the ground, at least as to European standards, we moved fairly quickly and I was sort of ready with our base. And that is the factory, so the cell factory where we make the raw, how should I say, components for the future stack. So that's a good stepping stone. Next will basically be to scale it into different application areas and sort of that this technology into different verticals.

Tammy Klein (06:32):

So what do you see...that leads me into questions about the applications. What do you see as the most promising markets for methanol fuel cells? I mean, does one market stand out to you as particularly promising over another? And then how do you see these markets evolving over the next 10 years, especially for e-fuels? E-fuels, there's a lot of activity that's heated up seemingly quickly in the e-fuel space.

Anders Korsgaard (07:13):

So when we look long term definitely there's a lot of electrification that's going on that has to go on. So that means that battery technology is the thing. We are not trying to argue that the batteries will be just an intermediate step. It is definitely direct electrification is the most efficient utilization of renewable energy wind, solar, solar, whatever. But, there's certain areas where it's not the most efficient how should say use it as an energy carrier. And in particular, if you start in one end where it's definitely not fuel cells, you'll take something like a scooter, of course. that has to be directly electrified. There, no need for fuel cells here. And then the other end of the space is probably marine or aviation.

(08:08):

those will be completely impossible to decarbonize the ocean-going vessels where with the <inaudible> container ship you know, battery-based container. So, we know for a fact that e-fuels has to dominate the ocean-going traffic essentially. and this is responsible for three or three and a half percent of the global greenhouse gas emissions. So this is definitely where we

see methanol now also taking a leading role. We see many of the big container ship operators and also <inaudible> carriers and so forth, starting to work with methanol as a primary candidate. There are other candidates as well, but it's probably going to the battle is between ammonia and methanol. I think hydrogen is not much on the radar these days because it's far too bulky and too difficult to, and so forth.

(09:08):

So, it's between the two and basically methanol stands out as the issues candidate to work with because it's liquid. It could be more or less the same infrastructure on the ship. It can be the same engines bunkering facilities, et cetera. The biggest issue for methanol is essentially the question that we often get, is there enough biogenic q2? So that is if, is there decomp? There's plenty. Of course there's about 400 ppm and beyond in there at the moment. It's quite expensive to capture it at the moment. that price will come down over time. But what we are looking into today is more concentrated resources. So that will be the first stepping stone bead from biogas bead from municipal waste forest residues, so forth.

(10:02):

That's where the biogenic CO2 will start. That's the cheapest source looking a little bit ahead. and I said before, direct air capture is on the development where that price will end. we are talking many hundreds of <inaudible>, a dollars baton that will come down where it'll end. I think there's a lot of guessing going on. but, but definitely if you go below a hundred <inaudible> then we are looking at something where you can make e-fuel or methanol that is probably going to be a little bit price premium compared to diesel, for instance, from marine, marine gas oil. and if you come significantly below a hundred <inaudible>, then it's a much bigger, how shall say, penetration. Now, what we can do with fuel sources.

(10:55):

And unlike combustion engines, is that we don't need to dilute the CO2 that comes out of the fuel cell with air. and that's really a new thing. So essentially what comes out of our fuel cell systems for the < space is pure CO2. You don't need to wash it with Amin or something like that. There's no complicated process. So we can actually recycle that CO2 and send back support, and that will be highly valuable in the future. So CO2, at the moment, biogenic CO2 or green CO2 is sitting at a price level of about 100 to 150 <inaudible> at the moment. Maybe it'll come down a bit, but that's sort of the word of magnitude. If we can produce a Q2 out of the fuel that it already has a bionic origin and ship it back to port, it will be highly valuable in the future seen from a business case protection. So that is one of the things that, and, and, and so if you really think fuels those into the big picture, and I'm talking propulsion of ships here

Tammy Klein (12:00):

Yeah.

Anders Korsgaard (12:01):

Then that biogenic CO2 issue will actually not be a problem because we are recycling shield true continuously even we may be able to make carbon a negative because we can pump the CO2 underground. So we are actually purifying the air forced CO2 as you are sailing, so to speak. So, that's really one of the things exciting when you're looking into other segments, sort of more like heavy <inaudible>. So that could construction process you could envision something similar, at least for the bigger applications, if you are down to small vehicles and so forth, it would be difficult to envision that you recycle the CO2, but then you simply just have to pay the price. so, you don't leave the benefit of getting that CO2 recycling. But I think that's the way, at least I see the future, is that CO2 is a commodity that will be traded, and biogenic CO2

will be more expensive than fossil CO2. Fossil CO2 just needs to be pumped underground anyhow. So yeah.

Tammy Klein (13:08):

Do you see I mean, like what would a timeframe be like? Do you see the coming of a biogenic CO2 traded market in be beginning to form and coalesce, not being fully created, but beginning to coalesce within five years, 10 years, 15 years?

Anders Korsgaard (13:36):

It's already here. So essentially if you have a green CO2, so if you are a producer of, let's say ethanol today you have CO2 as a byproduct that can actually be sold and pumped underground, and it's already been done. So actually you make a negative footprint and US corporations are actually paying to get those CO2 credits essentially already. So it's already a business case. And that business case is sitting at about a hundred, 250 Euro ton. so that will just increase and increase in size that market basically to offsets CO2 in other markets. And so I think, and you already have the CO2 credits that are sort of being traded more, not physically, but sort of more politically, how should I say on the market today. So it is a thing. And it'll definitely be a much bigger market in the next five, 10 years, that's for sure.

Tammy Klein (14:46):

So I want to bring in the policies here. So from your perspective, are the policies that are expected to be implemented in the EU Fit for 55, for example, or Repower EU and then the US through the Inflation Reduction Act are they enough to really support the growth of this market? I guess, you know, I should ask for biogenic CO2, but also for renewable methanol and its various applications. And if not, what more should be done in your view?

Anders Korsgaard (15:28):

I think the biggest part, like in just not only for methanol, but more in general for the green transition that we are looking into in Europe is actually the permits, you know, how long time does it take to get the permits to put up in mills? And how many permits will be whatever. and that's, I know that just, I think it was yesterday at the or the day before, there was new proposal at least coming out for how to make those approvals faster. This is really the bottom, if the market is able to do a lot right now, for instance, in Denmark, we are discussing how much should the company pay to put up <inaudible> in the North Sea to pay for the area like, just like they paid for the oil bills in the past, then you have to pay a certain fee. So those things need to really materialize so you can get the market going for green electricity, because green electricity is the fundamental part here, right? We need to get more solar, we need to get more wind, we maybe even need to get more nuclear, whatever. but we need to get a lot of resources and the approval processes are happening way too slow at the moment in particular. And I don't know too much about North America, but I know this is a big problem.

Tammy Klein (16:44):

Yeah.

Anders Korsgaard (16:47):

so this is really what the politicians can really change. And then you'll see the market reaction quite fast if you get the approval processes sort of resolved. Second, when we are talking e-fuels in general, I think we should look more on from a more technology-neutral perspective. So really define what does a renewable fuel look like, and not for the government or the policies. It's trying to pick the winners to make the market more active here. And here I could be joking between hydrogen, methanol, ammonia or, you know, the different e-fuels that are out there. not

so much dictated by picking a winner, but sort of just making sure that the incentives are the same even against direct use of electricity.

(17:42):

I think the market can boil out a lot of these issues provided that renewable electricity steep enough, the permissions go fast enough. And then you will see with both the repower EU and basically a lot of incentives going up out there to build up last power to X factor. So hydrogen production or methanol production. But I think that's sort of the second point. And then last not least, that's maybe more like a general comment I say. I think, and I hope that's also why we'll see e-fuels on the rise here that we also are purchasing energy security by having issues. Be it hydrogen, methanol or whatever. But, to be in a situation where we only have intermittent power production and a short-term battery storage for an hour or a couple of days, you know, it's not a way to secure our society against more mature. And I don't think I'd need to point far east from Denmark to illustrate what I'm talking about, you know, taking out power lines, whatever could, in a society that's fully electrified, only direct us and could be a, a huge issue that would paralyze the society if a power line was taken out, for instance, So we need to think that power to X and if e-fuels are also a way of actually making the society more resilient.

Tammy Klein (19:18):

Do you think that there is, I mean, it seems to me from following Europe as an analyst that the Commission, or at least there are people within the Commission that aren't really that jazzed about or excited about e-fuels. I mean, certainly not for transport, maybe for other applications. and do you think that that's, you know, to me it presents a problem because it seems to me that all of these things increasingly are interlinked in this conversation. We're talking about shipping fuel, we're talking about methanol, we're talking about biogenic CO₂, you brought up the connection to ethanol and the connection to heavy-duty trucking. But then when you look at the proposed regulations like, okay, banning the internal combustion engine, which is a potential market source and scale-up area for heavy duty as well, for e-fuels.

(20:22):

And so does that have ancillary effects in terms of not just the energy security concerns, but the ability to grow the market overall. So if you put e-fuels in that market, it sort of grows the overall market. But now you are preparing potentially to ban both cars and trucks on this side. And it's like these technologies are boxed up in these regulations, but in reality, they all kind of intersect and work together in my mind. And I think even in the US I don't think policymakers really grasp what the potential implications could be.

Anders Korsgaard (21:07):

Yeah. I think you're definitely right. That it's looking at it seems like the policymakers to some extent thinks that we have found the holy grail, which is just some batteries in some cars, and then everything will be good and it gives me a little bit, now, back in the early two thousands, I remember the discussion on natural gas and all the scientific society of saying, why are we betting so much on natural gas? We know it's not too neutral and it will only bring us into a reliance on parties that we don't want to be reliant on. And, a lot of people said that, and look where we are today. and I fear that the one-eyed focus on only direct situation could actually bring us in the same situation. So somewhat down the road, remember, if we hadn't had the ability to ship in liquid fuels being liquid as for gas or diesel or whatever, Europe would have been in a disastrous situation right now, we would have really out of luck

Tammy Klein (22:21):

<laugh>. Yeah.

Anders Korsgaard (22:22):

So that's what saves us. So if we are not able to ship in liquid e-fuels in the future, we are putting ourselves at so much risk. We will if somebody manages to take out our power lines for 20 years down the road without, and we don't have any e-fuels available to support, it's simply I don't know how you would resolve it. The society will simply go black. You're not able to survive. You're not able to have any power, and really anything. So I think we need to really to speak out and say green transition is one thing. Energy security is something we need to have energy security. It's not only that we are able to have windmills locally, it's also that we have a resilient infrastructure and energy buffers in the society, and that we are able to trade with the rest of the world when shit hits the fan, so to speak.

(23:30):

so I think that's an important point. We need to get out there and make sure that people really understand. And yes, if you're just banning combustion engines that could actually run on methanol, we as fuel providers, they are our competitors, but they're also our friends, to some extent. So we would love to see methanol, combustion engine trucks going out on the highways. We just need to make sure that we find a good way of trading with CO2. and, I think it's going to come in any case, it's something we need to be good at hunting. and it's not the combustion engine in itself that's the enemy. Here's the use of fossil fuels in it. So if we ban the use of fossil fuels, that could be much more, you know or increase the tax with 5% per year, whatever. So gradually you'll faze it out by means of evolution and not a revolution that sort of sets a political scene, say from this year onwards, it's much rather sort of across Europe, just increase the price of fossil, then the market will resolve it.

Tammy Klein (24:50):

Yeah. So, go for it.

Anders Korsgaard (24:53):

Yeah, yeah, of course. Under the condition that we built enough renewable power, and then we are coming back to the first and I think I'm saying it over and over, every time I get the chance to say it, re-fuels green transition, everything is so reliant on that we put up so much more wind and solar than what we are doing currently. and the biggest threat for not working fast enough here is legislation and permits. So it can be a back to the start.

Tammy Klein (25:25):

I think that that is the star issue of this year because it's a big issue in Europe and it's a big issue in the US And I actually see and have written clients about this recently that if the Europeans, if the EU Commission can really follow through on permitting reform and they can do this fairly quickly and really simplify the process, I think that it could really keep. because the concern is about keeping investments in Europe instead of losing them to the US because of the IRA, I don't think you have a good chance of keeping investment in Europe, because I don't think the permitting structure in the US is going to get fixed anytime soon. I think there's calls for it, I think there's desire for it, but I think the process by which that gets done is very messy with our political situation here. So if Europe, if the Europeans can really move forward on this quickly, I think it could be majorly advantageous for industry and for the competitiveness of Europe. So it's just how...

Anders Korsgaard (26:40):

and the competitiveness in general, the world and growth, because nothing good really came out of just government subsidies to industry, it's not really the way that the world really evolved.

It is to provide a good framework on the best the industry can work. That's, that really makes things scale. But I think the way they implemented the Inflation Reduction Act. So I was participating on a European investment bank conference here a couple of weeks back and must with great envy I can say that, how Swift and so forth, those how should I say, you know, exactly how long time it will take and what your criteria are to be eligible for support from the IRA.

(27:40):

And if you could do something similar on putting on our energy infrastructure, it will, you know, it will move very, very fast. So I think it was a good inspiration also. And it also kicked Europe a little bit under that they need to sort of work against bureaucracy. And, that's really something that could enable us to improve the speed of the green transition, also to compare competitiveness, of course towards the US or any other region. So I think that was good.

Tammy Klein (28:22):

So fun, and last question, what excites you most about this space and why?

Anders Korsgaard (28:30):

I think just looking for the last couple of hundred years we've been relying on the discovery of fossil energy to drive our growth. Now we are changing that. It's the biggest change for the last 200 years, since the early 1800s that we've been replacing both conversion and devices such as combustion intelligence and also sources of energy and all of that. It's sort of a pivotal moment where humankind has the opportunity to continue growth or to do the opposite. But it's really, if you don't change that now, it's we have already peaked. But if we succeed in this transition, then there's infinite sort of growth potential ahead in the future with energy being much, much cheaper in the future than it was in the past.

(29:35):

I see the renewable energy future as being an enabler of much, much lower energy prices than we saw from fossil energy. and I think that's going to be a potential, a new driver of looking into the 2030s once we got this sort of regionalization stuff that's going on. And a lot of other prices we have going on in the 2020s. But I think in the 2030 and beyond, we could really be looking into a new, new growth area, once we figure out how to actually build up our future.

Tammy Klein (30:09):

Well, Anders, thanks so much for coming on the show today. It was a pleasure to have you.

Anders Korsgaard (30:14):

Thank you so much.