Transcript of *Knowledge@Wharton* interview with Felix Mormann

Announcer: From the campus of the University of Pennsylvania Wharton School, this is *Knowledge@Wharton* on Business Radio. Here's your host, Dan Loney.

Dan Loney: Hi, everybody, and welcome to *Knowledge@Wharton* here on SiriusXM 111-- business radio powered by the Wharton School. Thanks for spending part of your day with us on this May the 15th, coming to you from warm and steamy Philadelphia today, as the weather continues to shift-- about every 24 hours-- significantly here in Philadelphia. Great to have you with us.

Coming up on today's show at the top-- the country of Costa Rica is setting out to make itself the first country on the planet to be free of fossil fuels. It's already a country that is 99% using renewable energy. So can they reach his goal and become the first zero-carbon country? We'll take a look at that coming up in just a minute.

Then in about 30 minutes, we look at "The Future of Work." That is the title of a new book from Darrell West of the Brookings Institution. We'll talk with him about what we should expect from the impact of AI and robotics, and what this means for humans' work and more.

Then in hour number two-- President Trump is flipping the position of the United States, seemingly, on Chinese telecom ZTE. It had been sanctioned for work that it had been doing in Iran amongst other violations. We'll discuss why President Trump is making this call right now.

And in our final 30, we'll discuss the decision by the Supreme Court to let states decide whether they should or not have sports betting. Plus, what various sports leagues think they can gain from it. That comes your way at 11:30 Eastern time.

All of that over the next two hours. Your comments and questions are welcome throughout. The way for you to join in as either by phone at 844-WHARTON, 844-942-7866. Or if you'd like, send us a comment via Twitter either @BizRadio111 or my Twitter account, which is @DanLoney21.

[MUSIC PLAYING]

Costa Rica is preparing for what many believe is an amazing move-- a country that already generates 99% of its energy from renewables is getting ready to go without fossil fuels in the South American country. The hope is that within the next couple of years, fossil fuels will no longer be used on transport. Wharton's Eric Wertz will be joining us in the studio in just a little bit. Also with us right now is Felix Mormann, who is an associate professor of law at Texas A&M University. He's also a faculty fellow at the Center for Energy Policy and Finance at Stanford University. Felix, welcome. Great to have you with us.

Felix Mormann: Thank you, Dan. Pleasure to be here.

Loney: Thank you. And this is a story that I think to a degree has gone not recognized as much as it probably should. Why do you think that is the case up until now?

Mormann: I think a lot of it is the sheer size or lack thereof with the country Costa Rica. When we talk about renewable energy these days, we tend to think of the United States. We tend to think of China-- Denmark maybe, Germany. But these countries, admittedly, are deploying much greater numbers in sheer capacity. But relatively speaking, they have a long ways to go to get to where Costa Rica is today.

Loney: So the process of going through this, obviously, has to have been several years to be able to get to this point, correct?

Mormann: It's a matter of years. To be fair, I think Costa Rica was also blessed in a number of ways. They started off in a much better situation than many of the countries I just mentioned, simply by virtue of the fact that hydroelectric has always been a huge component of the local electricity mix. In other words, using the local topography, the abundance of rain that the Caribbean portion of the country receives every year. And I think that's really given them a bit of a head start.

Loney: So how have some of these elements Costa Rica out in recent years? And I guess, moving forward, the expectation of how this country will continue to grow?

Mormann: So first, it's a country that already had vital technology experience in this space. If you start from scratch, you don't have the engineering know-how, you don't have the deal structures in place. You just don't know the first thing about how to even get steel on the ground. So I think there, Costa Rica was aided again by its rich history in hydroelectric power.

But the country doesn't only use hydroelectric power. I think it's 78% of the mix. But there's over 10% of geothermal-- again, being smart. Making use of local resources, which is the volcanic activity that's in parts of the country, and wind, of course. It's nestled between two major oceans.

Loney: Yeah.

Mormann: Easy to use.

Loney: We are joined on the phone by Felix Mormann of Texas A&M University. He's an associate professor of law there. He's also a faculty fellow at the Center for Energy Policy and Finance. You're listening to Knowledge at Wharton here on SiriusXM 111 Business Radio powered by the Wharton School.

So the first piece that is being reported-- they want to focus on transport. What does that specifically consist of in terms of getting rid of fossil fuels in that sector?

Mormann: Well, I think it's going to require a major revamp and rethinking, really, of the transport sector. So Costa Rica, as it stands right now, has above average numbers when it comes

to how many cars per capita are on the road. The roads themselves are congested. Traffic in the capital of San Jose is really bad. So all of those will need to be rethought.

But more than anything, it's an infrastructure problem. I mean, we're seeing this here right now, even with the support of a giant like Tesla and Elon Musk. We have trouble putting into place the charging infrastructure that you need to make electric transport work.

Not to mention the costs involved. Because to this date, you can't sell an electric car that is competitively priced for now, compared to the fossil fuel technology that's been around for decades.

Loney: And to be able to try and do that in Costa Rica would obviously be an incredible investment, and a time investment, as well.

Mormann: Yes. So part of the question here is also, who is willing to undertake that major investment?

Loney: Right.

Mormann: I think part of what helped on the electricity side is that there's a monopoly-protected supplier. There's no competition in the Costa Rican electricity market as of right now. So if the local incumbent utility chooses to make an investment, they're virtually guaranteed a return on that investment.

I mean, this is why they were able to build the most recent hydroelectric dam, Reventazón. Because if you can tell your investors, hey, I can guarantee you X% return on your investment, who's not going to say, “Yes I’m in,”?

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So the changes that Costa Rica has made up until now have meant what for the economy of that country?

Mormann: So it's obviously created a lot of jobs because this is about construction. This is an industry that -- the renewable energy industry in general -- that per kilowatt hour of electricity produced generates more jobs than oil, coal, and natural gas. So in that sense, that's good news.

There's a flip side to it, though. Costa Rica is among the most expensive countries-- not just in Central America, but really in the world, when it comes to electricity prices. And that may also -- because you asked me about what helped bring about these fantastic numbers. That may have helped.

The value proposition of emerging technologies, like solar, like wind, is of course, much greater if you're not competing with very competitively, very low-priced electricity, as we see it here in the United States.

Loney: How much you have the-- I mean, I'm guessing at some point, there had been a level of public-private partnerships to be able to get some of these things done in Costa Rica.

Mormann: There have, yes. So naturally, even though the incumbent utility is essentially publicly regulated, they're not going to undertake and execute all of these projects by themselves. So a lot of private players have benefited. Some of these from outside the country. Some of them domestic players.

Loney: And some of this would obviously have to end up being a key component if you're going to be able to do some of the things you want moving forward, like the potential of wiring out the country so that you can move forward with some of these initiatives, correct?

Mormann: Absolutely. There's another aspect to the electrification of transport that I think is going to raise some iffy questions for the Costa Rican government. And that's the role of what here in the U.S. we call distributed energy resources. In other words, the solar panels that you have on your home's rooftop, or in fact, just the electric vehicle charger that you might have in your garage.

These are all resources that can help the grid, in fact. They can put a strain on the grid, but they can also be used to help balance and strengthen the grid. The trouble in Costa Rica is that the incumbent utility doesn't want to give up its monopoly on generation.

And so they have been fighting the move toward rooftop solar in people's homes because that puts it a little bit beyond their control. And if Costa Rica is serious about the electrification of the transport sector, I think they're going to have to rein in the utility and make sure that they become more open-minded when it comes to that.

Loney: So that utility doesn't see it as an investment to be able to give these options to the people that live there. They see it as a hindrance that could hurt their bottom line.

Mormann: It could, indeed. And let's be fair. I don't blame them. If I was them, and if I was looking out for my shareholders, my investors -- I would do the exact same thing. Because all you'd have to do is look at the United States and other countries where we speak of a utility death spiral, where potentially utilities, which were once very highly-rated enterprises as far as credit rating was concerned, are facing a very difficult future because their monopolies are gone.

They're increasingly being pushed out of the generation market, which used to be their bread and butter. They're becoming what we call wires companies -- companies that are in charge of transmission and distribution of electricity, but those are not necessarily the most profitable aspects of the market.

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In some cases, and here in the United States, Felix, we would see instances where the government wouldn't be bringing forward some of these initiatives because of the impact that lobbying would have to preserve the financial goals that they would have of the company. It sounds like to be able to get some of these things done, that is not necessarily happening in Costa Rica.

Mormann: To be honest, I'm not sufficiently privy to the inner workings of Costa Rican politics to speak to this. But my guess is, if the U.S. experience and other national experiences are any indication, these incumbent utilities are extremely well-connected. They have high-powered, well-connected lobbyists, lawyers-- and I don't want to just put the blame on anybody. Because again, the numbers are staggering. They're very impressive.

Loney: Right.

Mormann: The main question we all have is, could this be achieved, potentially, at a lower cost? Could this be achieved in a more effective way if we had greater competition? Economic theory suggests "of course." But there was a time when monopoly protection made sense because, originally, the major investment that is necessary to even put in place the kind of grid that we all rely on today. And the economies of scale involved required and suggested that monopolies were good, at the time.

Loney: From what I also read, Costa Rica is trying to take a leading role in terms of getting rid of plastics in their country, as well, correct?

Mormann: That's what I've heard, yes. There's a larger environmental initiative ongoing. And that, I think, is really what the country deserves a lot of credit for. Because we often hear that developing countries like Costa Rica are too busy with, you know, putting food on the table, with trying to get to where the United States and many other developed nations are today. And along the way, they might -- these aspects might fall by the wayside. But not so in Costa Rica. And I think for that, again, the country and its government deserve a lot of credit.

Loney: But as you mentioned earlier, there are other countries that are trying to follow a pattern similar to what Costa Rica is doing right now. When you look at this in general, the idea of being able to tackle some of these things -- you're talking about not having fossil fuels is a component, zero carbon. Obviously, they are pretty much at all of their energy coming from renewables right now. How possible is that in Costa Rica, do you think, over the long term? And can it be a model that other countries follow?

Mormann: I think it's quite plausible in the long run for Costa Rica. And that's, I think, in large part thanks to the abundance of geothermal resources and hydroelectric. I say this because those two, in some sense, are outliers when it comes to renewables because they're not what we call intermittent.

They don't depend on the sun to shine, the wind to blow. They can, assuming you don't have a drought year, perform 24/7. They're suitable for what we call baseload generation. In other words, those plants that are online 100% of the time. And then you can use solar and wind to address certain peaks, et cetera. But I think Costa Rica is very well-positioned to actually achieve this feat.

Now, the flip side of this is that many other countries are going to have a harder time. Because unless we figure out an economic way to store electricity, one that doesn't break the bank -- we're hard pushed to make full use of the many hours of sunshine we get, or the hours of wind that we get. I mean, we're already seeing this in states like California that have a very high penetration of solar -- where during the day, there are times when solar takes plenty of other plants offline because of its dispatch priority. In other words, it gets dibs on generating electricity, if you will.

But then, what do we do with all that solar energy? We might want it at night. Or what do we do if it's a cloudy day?

So I think Costa Rica, again, because of its particular mix and its topography, is in a great position to do so.

Now is the Costa Rican example going to serve as a blueprint for every country in Central and South America? I don't think so. There's a lot we can learn from it, but we also need to understand that every country is different. Every electricity market is different. Every resource endowment when it comes to renewables is different.

Loney: What has been the reaction that you have read or heard from the public to all of these shifts over the last several years?

Mormann: I think there's a very bullish feeling, in the sense that renewables are entering the mainstream. For the longest time, this seems like some policymakers' pet peeve. You and I might still remember the days when solar-powered pocket calculators were so bad that we had to put them right under the neon lamp for anything to work.

Loney: Yeah.

Mormann: And so if you think of how far we've come -- not just in terms of how well this technology functions, but also how much prices have come down -- I agree with all those who are very bullish. And especially when we look to countries in Latin America, the value proposition is outstanding. Because, again, these are countries where many communities aren't electrified yet. They don't have electricity.

Their comparison isn't the same as ours here in Texas, where it's like, well, I'm paying $0.10 per kilowatt hour. Can you beat that? Their question is, “Can you give me electricity?”. And if the answer is yes, how much that costs is secondary at the moment for them. And many regions aren't well-connected, even here in the United States.

Hawaii is my favorite example. When you have electricity rates of 30-plus cents per kilowatt hour, going solar is a no-brainer, and has been for years. It's no coincidence that Hawaii is the most aggressive state in the union when it comes to renewable energy, aiming also for 100%.

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I guess there is a segment here in the United States that's reporting this as a ban on fossil fuels. But it really isn't that, correct?

Mormann: It's an interesting view. Part of it is, how do you frame it? Is it an active ban? We've actually seen some policymakers here in the United States at the state level try to implement literal bans on, say, fossil fuel imports. Minnesota is one such case.

But in the Costa Rican case, it wasn't that. It was really just about, let's promote renewables. And yes, we are aware of the fact that they will eventually displace, they will crowd out fossil fuels. But that seems like a good idea, especially if you have to rely on imports for fossil fuels.

So part of what I like about the Costa Rican story is, it is about environmental benefit, but not solely. It's also about basic economics. And that's the beauty of it. There was a time not long ago where you had to be an idealist to promote, to deploy, renewables. That time is long gone. Right now, if you look at where the smart money is trying to invest, it's much less fossil fuels than it is these new and cleaner technologies.

Loney: Well, if you're talking about trying-- and you mentioned before-- about trying to tackle transport and some of the issues there, that almost becomes an issue that is probably a continuing area to try and change while you're working on other areas, as well, correct?

Mormann: Yes, absolutely. I think this is not the kind of question that you should tackle in isolation. I think because of the infrastructure needed -- also because of the kinds of resources you may want to put online for generation -- you should have a holistic concept here. And I would add to that, because of Costa Rica's roads with the traffic congestion situation, that you should think about a public transport concept that helps alleviate some of that congestion. And it would, of course, mean that the volume of electrification becomes lower. If you have fewer vehicle miles traveled, then your task becomes, obviously, easier.

Loney: Then what other areas do they have to look at to try and tackle to move these initiatives forward?

Mormann: So I think a lot of it is about financing. I mentioned earlier how the cost of most of these technologies continues to plummet. And it's really impressive. It's been very encouraging. And what that means is that the more salient cost to us may be the solar panels, the charger, et cetera. They make up an ever-smaller portion of the overall project cost.

Right now, what we call in the industry the “soft costs” -- financing, permitting, et cetera — those, just to give you an idea for a solar system in the United States -- more than half the overall system cost is that. It's not what we see on people's rooftops. And so how do you deal with those costs, how do you try to keep them down? Some of it has been, in other countries, government loan underwriting. Some of it has been tax incentives. Some of it has been streamlined permitting.

I think, in a way, this is the low-hanging fruit. If you can make the process of getting a permit easy yet comprehensive -- if you can, in fact, not even reinvent the wheel. You could just look to other countries who've already spearheaded this effort, Germany among them. Some states in the U.S., too. Again, California has sought to streamline permitting. That, I think, is a very easy way to immediately have a positive impact on the project costs and also project pace.

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No matter what happens, I think from this point on, Felix, the story is an incredible one. Up until this point, to be able to get to the levels that they have already-- and obviously having the want to improve it even more -- it's an incredible story to move forward.

Mormann: There's no doubt about it. And I actually love the way the numbers often are presented in the media. When you hear percentages, it is one thing. But when you read that, I think, as of November last year, Costa Rica had covered 300 days worth of demand only with renewable energy, that's incredible. Because as an industry insider, if you have to cover half a percentage point every day with some fossil plant that has to go online and offline, that's hugely inefficient.

The numbers wouldn't change, if you see what I mean, in terms of 99-plus percent renewables.

Loney: Right.

Mormann: But that wasn't necessary. They were able to essentially keep all of that generation infrastructure offline, which might not make the owners very happy, but it's certainly the more efficient way and the more ecological way to run things.

Loney: Yeah, they had a stretch, I guess, last year where they had 100 consecutive days where they were able to generate electricity without having to use fossil fuels. Which again, as you said, it will not make some people happy, but in the overall perspective, that's an incredible achievement at this point.

Mormann: Absolutely.

Loney: We're joined by Felix Mormann of Texas A&M University.

And as you mentioned, wind and hydro power are obviously two big components here for Costa Rica moving forward. Partly because of their ability that they already have, but partly because of their location, correct?

Mormann: Absolutely. So now, I think every country in the world has some form of renewable resource endowment. It's just about identifying what your local strengths are. This is what makes this area so fun to work in -- that every country is different. If you just go from Costa Rica, to Nicaragua, to Guatemala, every country has different resources to work with. It's just about trying to harness them.

And to be fair, sometimes there is a policy choice involved. So hydroelectric is great, as I mentioned, in many ways, for baseload power, et cetera. But it does engender its own environmental costs. There's a reason why in the United States, we haven't really commissioned any major dams or other hydroelectric facilities for decades.

Because they tend to involve displacement of people who live wherever you're about to create a reservoir. And they have an impact on the local ecosystem. I mean, they change everything. So if there are endangered species, threatened species, in the area, that's something to be considered.

The Reventazón project -- the most recent hydroelectric project in Costa Rica -- was controversial for that very reason, because it required a number of people to be displaced. Their homes are now flooded.

Loney: Right. Felix, thank you very much for giving us your time today. We appreciate it. Thank you, and we will talk to you again soon.

Mormann: Thank you for having me, Dan.

Loney: Thank you. Felix Mormann of Texas A&M University. He's an associate professor of law there. He's also a faculty fellow at the Center for Energy Policy and Finance at Stanford University.

We will take our first break of the show. When we come back, we look at “The Future of Work.” That is the title of the new book by Darrell West of the Brookings Institution. He will be joining us to discuss that book, and talk about things like robotics and AI, and how they are going to impact our jobs, both here in the United States and around the planet in the months and years to come. We'll talk with him in just a minute.

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