

MARTY ROSENBERG
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SIMON MÜLLER INTERVIEW

Hi, and welcome to GridTalk. Here we are in the summertime when people like to travel and stretch their imaginations and get re-energized, and I thought it appropriate to link up with one of the foremost thinkers on the future of energy and sustainability in Europe. Simon Müller is the director of the Agora Energiewende in Berlin.

Q: Hi, Simon. How are you?

A: Hi, Marty. I'm doing great. How are you?

Q: Good, so I'm very excited about our conversation on what's going on in Europe and the United States and with a particular focus on Germany where you sit in Berlin today. There's a lot going on in changing our grid infrastructure, our energy systems to achieve sustainability and what I like about the Agora and its many activities since you were founded about a dozen years ago is your objectives as recited on your website is to find scientifically sound and politically feasible strategies to achieve climate neutrality. Talk a little bit about that overarching goal that you have and how far off is it? Are we

close to it? Is it in our grasp? Or is it going to take a lot harder work first in Europe and then as you see it in the United States?

A: So, the short answer is, I think we've come a very long way. When Agora Energiewende was founded in 2012, Germany was just beginning to get serious about ramping up renewables, not just to replace fossil fuels but of course in 2011, there had been the decision to also exit from nuclear power. So, it was a very different time then; climate neutrality as a goal hadn't really been set yet and the whole question of the energy transition was very much focused on the power sector, and there was a lot of debate around whether it's even possible to run an electricity system with heavy double-digit figures of wind and solar. Now fast-forward to 2024 and we have an organization, Agora Energiewende, that now really looks at climate neutrality across all sectors so not just looking at how you can decarbonize the power sector based on the most cost-effective way of doing it and that of course, means a rapid scaleup of renewables but also how you can use this electricity to decarbonize the end-use sectors to how we heat our homes, how we drive our cars, all the way to how we produce steel, chemicals, and cement. And over time, Agora Energiewende grew from an organization of just about a dozen people to about 200 people

now because we're tackling this question not just for Germany and Europe but increasingly with an international perspective where we also have offices in Beijing and in Bangkok, and we have several brands where altogether that we do cover all the different sectors that you need for climate neutrality.

Q: So, let's just set the table here for a minute on a comparison because I see statistics that cut different ways. Germany was early to embrace wind power and solar and pushed it fairly aggressively. According to one statistics and by the way, a lot of these figures come from the International Energy Agency where you worked, Simon, for nearly nine years, so you're probably way more familiar with this data than I am, but in Germany there have been close to 260 terawatt hours of renewables in one recent year. Maybe 57% shared the load and in comparison to the United States according to our Energy Information Administration, utility-scale generation, maybe 21% gets up to renewables so it shows that Germany and Europe have been more aggressive in deployments, but if you look at another statistics from the IEA, Germany has about 2,822 kilowatt hours per person of renewables compared with 2,159 in the United States. That's fairly close. How would you compare Germany and the United States in terms of its success in converting to renewables as the moment we stand at now?

A: So, it's somewhat of a mixed picture. First of all, if you look at the starting point the amount of legacy hydropower that you have in North America and because of that in some parts of the United States is relatively more important in the mix when it comes to renewable energies. Now, if you look at the scaleup of hydropower, that's not possible to really go much further in Germany. We have about a 4% contribution from hydropower in the overall electricity mix and also, the resource space compared to what you have in the United States is mostly moderate, in particular for solar PV. For wind, there are of course, good offshore wind potentials. But all things taken together with Germany now having about 50% of its electricity consumption coming from renewables; that's a number for 2023, I would say that the deployment is somewhat more advanced than we have in the United States across the board. But of course, there are states in the US if you look at the Midwest with a lot of onshore wind potential where the contribution from onshore wind is somewhat larger than it is in Germany, so it's a mixed picture. Overall, I would say from the total grid perspective, Germany is a little bit ahead and one important factor there, it's actually been picking up speed again. If you look at the energy transition in Germany, I mean the very start was around the year 2000 with the adoption of the Renewable Energy Law but

then solar PV peaked in the early 2010s; there was a spike in deployment which came with a lot of cost and that led to government to really slash subsidies which led to a very strong reduction in the solar PV deployment, where only now in the past two years we're been reaching the levels again that had about 10 years ago and similarly for onshore wind, there really was a boom in 2017 for a number of reason but then deployment also collapsed and for about three years, the new government that was then assuming power in 2021, has been working to also ramp-up the onshore wind deployment, but this is still lagging behind somewhat compared to solar PV.

Q: So, you raise an interesting point. There have been elections in Europe for the EU as well as in Germany. We're in election season in the United States now. To what extent do you believe these trends we're talking about are insulated from politics and will go forward on their own momentum, and to what extent are they dependent on the political winds?

A: When it comes to the buildout of renewable energies actually what we see in jurisdictions across the world is that now that you really have very competitive costs that it doesn't take that much political will any more to go for quite large amount of renewables. Also, if you look at the data from the International Energy Agency for the second year now, we're in a

situation in 2024 where the aggregate investment numbers into solar PV add up to a larger number than the combined investment in all other energy electricity generation technologies combined so it's clear that a lot of renewables are locked in in the trajectory going forward irrespective of policy preferences, but there is a big but. There are very many things that we need to do in order to contain dangerous climate change and actually get to net zero. In Germany, climate neutrality 2045 that won't happen just letting market forces play out but rather you really need a consistent set of policies in the different sectors from electricity to industry to transport to buildings to all the way to agriculture to actually get emissions to zero and there we see strong differences between different political parties and different government setups, and I would say looking at the current government in Germany, there has been a very big push for ramping up renewables in the power sector. There has been quite a push but with a lot of also pushback in the building sector. We see some first positive movements when it comes to the decarbonization of industry but we have a big lack of consistent policies in the transport sector so I think it varies but to really be consistent and doing what it takes to reach climate neutrality on time I think it remains something that politicians across the board find somewhat challenging. Of

course, the focus of our work is how you design policy instruments to actually make it feasible to move ahead more quickly.

Q: So, while you're focused on policy and given the context you said that Europe and Germany have gone further consistently than the United States on renewable fronts, what's your view and what's the European view of the effort of the federal government in the United States under the Inflation Reduction Act and the infusion of massive tens of billions, hundreds of billions of dollars into the grid and reforming energy infrastructure in the United States? Will it make a difference and are you somewhat envious of this push?

A: I think the answer is a clear yes. When you look at policymakers in Germany but also in Europe, they've been looking to the United States and the Inflation Reduction Act with a certain degree of envy. Why? Because it's been perceived as being very successful at attracting investments in technologies that are very promising for the future and that are very strategic to the position that the United States strategically on the front of a clean energy technologies and Europe has been struggling somewhat to emulate the success. Now, if you look at the Inflation Reduction Act, the way in which you can access support payments is relatively straightforward if you fulfill

the criteria, you can be certain that based on the activity you're doing, you will get support. Of course, there's all's the uncertainties of how long for new projects this support will remain in place and so forth, but it's pretty straightforward. There's not a lot of red tape involved to really access the support. Now, this is very, very different when you look at the European context. Why? The entire European Union was built as a project to create an internal market and to prevent individual member states from subsidizing their particular industry in their country at the expense of other European countries so any form of state aid needs to be notified with the European Commission and even if there are European-wide projects of common interest, there's a lengthy process of prequalification where basically it's pretty cumbersome and difficult to access support payments. And also, especially Germany has been extremely reluctant to put money on the table to handout support payments at scale to really replicate what is seen as a strong success of the IRA. At the same time, I think the mere presence is very important for the political discussion in places like Germany and Europe more widely because it's very clear, okay, we want to also play a role as a manufacturing hub going forward, we have to get our act together to find a response to that act in the US.

Q: Okay, there's another story to be told here that I'm very anxious for you to share with our policymakers, our utility executives who are listening in and our folks in the regulatory community. I think you know where I'm heading on this. Germany starting in the spring of 2022 exacted certain reforms of permitting to help speed projects due to red tape. That's a big issue in the United States when it comes to building out transmission assets and other assets. Somehow Germany has managed to slash the time of projects that previously took upwards of 10 years to 4 years. Tell us how that's been achieved and what you see the outcome of this being?

A: Yeah, so, looking at what was really slowing down the progress of renewables energies, ahead of this legislative term, so about 2020-2021, it was very clear that the planning and permitting procedures were really holding back progress, and Germany is a federal state so you have some jurisdiction on the federal level, some jurisdiction on the state level, and also, when you look at the planning horizons, now let's focus on the grid infrastructure. In the past, the planning was very much incremental so there was only a lookout period over the next 10 years and so there wasn't really a clear vision of where we had to go as a country with our infrastructure. So, the first thing that was changed was actually going from this incremental view

on infrastructure to a more target-oriented view of the infrastructure so to say, okay, what's the infrastructure we need for a climate-neutral economy by 2045 because there is a very clear constitutionally-backed, legally binding climate neutrality for the entire country of 2045 so this integrated planning framework is a very, very important component in this. Why? Well, because it shows at once how much infrastructure you need and then avoids the situation where you plan one line and then two years later you realize oh, we actually need a second one right next to it which could delay things so having this target picture in mind. The second very important component was that in the previous setup there were a number of planning procedures that were actually duplicated so that you had several legal instruments that planners have to comply with and essentially this ended up in doing work twice so there was a streamlining of these mechanisms so that now you really only have to go through the planning framework once rather than doing it several times. And then actually, there wasn't a single huge element that kind of did this all at once but rather it was going through individual procedures and seeing where can you cut time. A very, very important development in this context came about through the energy crisis. There was an emergency regulation passed by on the European level that showed that for

certain sites where you had already done a strategic environmental impact assessment, you didn't have to replicate this assessment for individual projects so that was something where also kind of a shortening of these procedures was possible. So, these are some of the elements and the last one that I'd like to mention because it really goes across the board; in all the relevant laws the Renewable Energy Act and then also the Energy Industry Act, there was language inserted that said that the buildup of a climate-neutral energy system is in the overwhelming public interest and a matter of national security and what that does is that if you have a court case where judges need to weigh different interests for example having heritage sites, having other possibly competing uses, it's now much easier for grid buildout, for renewables buildout to prevail in these court cases and also to shorten these court cases and that's another very important element of acceleration, and all thing taken together, it's been possible to really slash these planning and permitting times significantly.

Q: Do you know of any studies or if they're been any conferences or meetings to look at regulatory red tape in Europe versus the United States and see what common themes emerge and possible strategies for the solution? I think of regional transmission organizations in the United States with their

backlogs of projects they just can't address primarily because of lack of transmission. Is there any low-hanging fruit where you think regulators or policymakers in Europe and the United States can get together and come up with common goals and objectives?

A: So, this is something that I haven't been following too closely for the past years because my work has been focused very much just looking at the German context so there might be such exchange for going on that I'm not directly aware of. Now, looking back a little bit in my career when working at the International Energy Agency, what I found is it's almost never possible that you have kind of a copy/paste replication of legal approaches that work in one jurisdiction and you can simply take them and replicate them in a different jurisdiction; however, such exchange can be extremely useful to enrich the thinking of policymakers, of regulators in their own jurisdiction with new ideas and then actually transfer the knowledge and make it applicable in one's home jurisdiction, so there's definitely tremendous value in this and I do think that at this point there's a lot to share what Germany, what other European countries have achieved in order to accelerate things. I mean, if I look at onshore wind, that's also something that the US is currently grappling with, the acceleration of the planning, of

the permitting but also the supply chain issues linked to onshore wind, I'm very sure that there's a lot that a place like Germany could tell how its gone about doing this faster, doing this more efficiently, and of course, vice versa from various jurisdictions in the US.

Q: To what extent would lack of transmission assets be a factor in Germany on deployment of onshore wind?

A: It's a huge factor.

Q: Just like the United States?

A: Yes, so, the grid development is really many years delayed for a variety of reasons and the situation that we have now is that about 50% of the cost that users of the transmission grid pay are for a particular form of congestion management and this congestion occurs when you have a lot of wind power in the north and you have very low prices, and Germany has one single price zone for the entire country so that also consumers in the south say, oh, I want to benefit from these low prices, so overall, you get high electricity consumption but the problem is that it's not technically possible to haul all that wind electricity from the north to the south of Germany so the transmission system operators have to do what's called re-dispatch, so you turn down the windfarms in the north and you fire-up gas plants in the south which, of course, are much more expensive but it's

not that these plants are paid from the electricity market; the market prices are still very low. The cost of curtailing the wind and using the gas plants is put on the grid fees and this costs about 3 billion Euros alone in 2023. This was also a result of very high gas prices but it's definitely something where Germany's suffering from a lack of an infrastructure buildout of the past. That's one of the reasons that this acceleration has been prioritized and is one of the reasons that this view to a target grid has also been adopted.

Q: Simon, I'd like to broaden our conversation back to something that you said at the beginning that now Germany has the luxury if you will to look more broadly than just renewables and decarbonization of various sectors. Let's focus on the municipal sector and the role it's playing as you try to try to deal with buildings and decarbonizing heating. How far ahead of other jurisdictions in the United States are you on this and what can we learn from viewing Germany as the laboratory that we might want to emulate and learn from?

A: So, I think Germany has become serious about tackling the decarbonization of buildings and that means decarbonization of heating in particular in a way that is quite advanced but of course, there's other places in Europe; think of the countries in the Nordics that have done this for a longer period of time.

I think what's particular about the German case is that you really have a system where houses are heated predominately by fossil fuels. We don't have that many air conditions in Germany so it's really about the heating component of this and the overwhelming majority is done by via gas, and there's still a sizeable chunk of oil also in the heating of buildings. Now, about a year ago the government proposed quite a stringent regulation that essentially meant that new heating systems and every time a heating system would break in an existing house, you would be essentially obliged to install an almost climate-neutral heating system, in most cases, a heat pump. And this kind of met a public discussion where people weren't really yet aware of the fact that probably the biggest single source of CO₂ emissions that they are kind of personally connected to is their heating system, and there was also a lot misinformation spread the feasibility of installing heat pumps in existing buildings and a very controversial debate. I think this had led to a stronger politization of the whole question of climate neutrality so to some degree, also taking a toll on public acceptance for climate neutrality. At the same time, it went a long way to really make people aware of the importance of heating for overall climate neutrality and also it established planning frameworks which will be extremely important for

actually getting the building stock decarbonized. Why? Heating is a very localized issue, right? It's not something that you can haul around like electricity and as part of the package of laws that was passed last year, all municipalities are now required to do a heat planning so that means looking at okay, how are we actually going to meet heating demands in the various parts of our community? Is this something where we're put in place; district heating? Is it a place where we will actually put in place heat pumps and in some quite exceptional cases, could it even be that we have some persistence of also using molecules in this case, green hydrogen for those applications where you can't really electrify it, but these are really exceptions that prove the rule. And this mandatory heat planning will now provide a framework to really massively increase the contribution from district heating while also decarbonizing the district heating supply and then also putting in place a stringent framework for swapping out individual heating systems so it's really an area where there's been a strong push that will also have consequences in the coming years to also get emissions down in this sector.

Q: How fast will this rollout be? Will there be a significant change you say within a decade?

A: Yes, there will already be significant changes within a decade. There's a legally binding target of about a 40% reduction out to 2030 compared to the 2020 level if my memory serves me correctly. Germany is not on a track to meet this target but it is possible to still come very, very close. The issue with the building stock is the following: you really need to seize the opportunities you get when a heating system breaks down or when people refurbish their building. Use this opportunity to put in place a climate neutral heating system because the capital turnover rate in the building stock and in the heating systems is very, very slow, right? Once you put in heating it will stay in there 20 years, 30 years, and some cases even longer. If you look at a house, the number of times where you really have a big, big overhaul of the building that's several decades and so you have the situation in the building sector; it's similar in industry, where you have to act now and you have to act very quickly, precisely because it's such a slow sector because if you don't do it, you end up in a situation where you actually have to take much harsher measures further down the road and possibly even take out heating systems that would be fine from a technical perspective but incompatible with containing climate change.

Q: Thank you Simon. We could go on forever and I think we should do this again down the road a bit.

A: Thanks, Marty.

We've been talking to Simon Müller who's the director of Agora Energiewende in Berlin.

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