

**MARTY ROSENBERG**  
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**Grid Talk #313**

**ANTONIO CAMMISECRA INTERVIEW**

Welcome to Grid Talk. Today we have a special guest with us all the way from Rome, Antonio Cammisecra, who's the head of the Enel Grids within the Enel Group in Italy. Enel Grids operates 1.5 million miles predominately distribution lines. They have 33,000 workers in eight countries and they serve 75 million end-users with electricity. They're also the world's leading private electric distribution provider and the world's largest renewable developer.

Q: Antonio, thank you for joining with us today.

A: Good morning to everybody and thank you for hosting me in this conversation.

Q: So, where you sit in Rome today as we chat, talk about where you think your company is as being such a dominant player and according to your LinkedIn post, focused on openness towards innovation. Usually, large organizations can't be innovative so why don't you take a crack right off the opening, how you manage to be innovative and so large?

A: Well, I think we understood a number of years ago now, that is what's crucial because we anticipated in the strategic energy world group that the transition, what you today call the energy transition, was approaching. We started viewing this from the generation's side. It was quite evident to us that let's say, the technology revolution of renewables was let's say, hitting unprecedented levels; that was there to completely transform the sector and from that point of view, we also started understanding actually, because it took some time, that revolution was not just about the way we produced electricity but also in the way we like to transport, distribute, and use it as the key solutions, probably the only solutions for the climate change. So, we understood there was a new era approaching to the industry and you cannot, let's say, survive or prosper or lead the industry without deep profound change in the way you wanted to stay in that industry, which, of course, conceives a different approach to innovation and to sustainability. So, being large sometimes represents an obstacle to be fast and dynamic but at the same time, provides you with the resources, the view, the magnitude to embrace large projects to get the vision and to try also bring with you, the industry as a whole because I mean, there's no point in just transforming yourself if the rest of the industry stays where it was, so I think we were able to open us, actually

typically utility, we're not very open. Our sector was traditionally considered one of the closest one, each one thinking its own empire and...

Q: Very conservative, too; usually slight change.

A: Right, very conservative. Let's say, passing the use of technology so technology was pushing not by the user, which is us, but by the manufacturer, the OEM, so we understood there was a better point, better let's say, equilibrium in cooperating with the technology provider, understanding the needs of the customers and try to speed up on the technological evolution, it's not about...please, go ahead.

Q: I was going to ask you, at one point, 1.4 million miles of power lines in your group. Describe what it's like. Is it predominately Europe with some in other countries or...?

A: Currently, we have 2.2 million kilometers. The distribution grids are along the widest, largest infrastructure ever built by humans collectively. This is a very important factor when you program innovation, when you program evolution of this infrastructure. It's very wide, goes in every house of a territory that you serve so 50% of this is in Italy; it's our largest grid. It's about 50% of the consistency of our infrastructure and then we have a very large grid in Spain. We have a fairly big grid in Brazil because we serve the City of São

Paulo, which is one of the biggest metropolitan areas all over the world. And then we have a number of capital cities in Latin America like Santiago, Lima, Bogota, etc., so we have 13 grids in Europe and in Latin America and we would like one day to expand in other geographies including into the U.S.

Q: So, this 1.4 million miles and I'll stick with miles, please forgive me. What percentage of it is digitized and represents the very latest technology? What percentage is legacy technology from 20, 30, 40 years ago?

A: Well, Italy as I said, is about 50% and the Italian grid is massively digitized so I would say that roughly we are now in our, let's say, in the year of complete digitalizing the grid, they're both 50%. Of course, there are ones that are not at the same speed, at the same level everywhere homogenously because it goes with the waves of innovation and the wave of, let's say, transformation that we are bringing on in the several districts that we serve so by and large I would say we are both at 50%.

Q: So, with that degree of digitization in the Italian grid, to what extent do you think you are the most digitized grid?

A: Without a doubt we are the most digitized distribution companies in the world. We are the absolute leader in this field.

Q: So, paint for us a picture here in America back here in the back wood colonies what the future is going to look like. What

are you achieving now with Smart Meters, sustainability, greening the grid that is just maybe a dream in the minds of your counterparts here in North America?

A: Well, first of all before talking about greening the grids which is a very important topic, what we have achieved in 20 years; it took us 20 years to completely digitalize the Italian grid for which we are very well advanced. And we had several waves of digitalization so, now we are at the third generation of digital meter. We have achieved basically two things: the capability to open up a much more modern electricity market because the digitization of the metering itself is the beginning of a much more modern market so you can have hourly pricing for example. You can sophisticate much the pricing of the electricity so...

Q: So, let me stop you right there because you're going to be dangling a lot of goodies in front of us. To what extent does the average homeowner in Rome, your neighbor, take advantage of hourly price shifts?

A: Yeah, yeah, first of all, unfortunately Rome is not a city served by us but we wish it that way, whole Italy, but not Rome. But yeah, the market operator today can offer hourly prices; can offer you, let's say, can offer hourly prices. Can offer you,

let's say, weekend tariffs and working day's tariffs and all the flavor that you want to have built up on around..

Q: So, my question is, has that proven popular? Are people flocking to...?

A: Yeah, yeah, they are, especially in this moment with the energy crisis going on. The people are becoming more and more energy and price aware so there are...

Q: So, to what extent is that helping speed deployment of electric vehicles for example? And to what extent is it helping you shift peak and better control demand by price signals?

A: Absolutely. Without a digital meter you cannot conceive a... this kind of the management of consumptions and let's say, a moderating of electricity without a digital meter; it's just not possible. So, it's let's say, a prerequisite for approaching the market the way you are describing. So, without the digital meter, you cannot have, for example, specific type of calculations for the immobility, so, that's the beginning of everything so it would be very difficult if not impossible to consider a significant new electrification without the digital meter in place.

Q: So, for Americans that might not be following it closely, briefly describe the EV market. Is Fiat coming out and other

Italian automakers with major lines of EVs and what is consumer uptake of those new electric vehicles?

A: This is basically, Europe decided by 2035 combustion engines will be no longer, let's say, possible; cannot be manufactured any more so from now to 2035 all the European manufacturers are investing billions, billions of euros in newer platforms so all of them are releasing here, month after month I would say, new models so it's Fiat, it's Audi, it's Volkswagen, it's all of them. And of course, it's just starting so changing a car, it's not an easy task, so it's for a family, for keeping a family...it's an investment so it will take time but it is absolutely happening as we speak and in parallel, the recharging, the public recharging infrastructure is being deployed in hundreds of thousands points per year...are booming somewhat so we have adopted basically the number we had last year in terms of the request for new connections for charging points and on top of that, we have the private charging stations, so keeping it every new house that is built today typically comes with a EV panel and a charging point included.

Q: Antonio, talk a little bit about how digitization of the Italian grid has enabled new open-source provision of equipment and changed the landscape of how you procure equipment for your grid?

A: Well, actually it's not the way that you're saying. It's the consequence...the second is the consequence of the first but it's also the first that, let's say, the consequence of the second things you said, so, collaborating and opening in terms of specification procurement, technological trends, stuff like that, helps a lot in terms of standardization and keeping the costs down because you have to consider one thing that because if you want to green and we come back to the point you were raising at the beginning, if you want to green the grid, we need to really to make a paramount endeavor, a paramount effort of changing materials, changing technologies in an environment that's been very conservative for decades, so doing this alone, it's quite stupid I would say because you wish to do that alone, the French would do the same; the Spanish, the Americans, everybody should do the same, coming to the same solution, probably. So, we say, why don't we do it together so we speed up a lot in the transition, we speed up a lot in the research of a new material, in the things of new solutions that can be greener, that can be lighter, can be more cost effective, so that we find the final benefits of things, paying less for more and get it about lighter infrastructure that is in tune with the energy transition so because it would be very strange that we transport clean power be not clean, this would be absolutely not acceptable so the idea of



working together so being open to offering what we're doing let's say, to the industry for comments, for critics, and getting back the way they're doing stuff and put together in order to evolve fast, quicker, we thought was...we believed from the beginning was a much clever way to go ahead. We have a very specific set of characteristics. In our service territory, we are the king; we don't have competition so this is one of the feelings it's much better to collaborate rather than to compete because there is no point in competing with my neighbor distribution companies. Think about Oregon and California; I mean, the two operators could collaborate wonderfully together to come up with a better unified solutions that can cost less and be faster to implemented into the market. So, but strangely enough in this sector, everyone is speaking...is working in isolation so what we're trying to do is to break this isolation and say, "Guys, we have an immense challenge in front of us. Let's work together because if we work together, maybe we have a chance to win it, this challenge."

Q: So, maybe before we go further tell me what it is about Italian business, Italian culture, Italian personality that brings you to the forefront of this? What do you put your finger on and what do you attribute it to?

A: Oh, that is so hard. I don't have the answer. I have very international experience. Our group is now a multi-national

sector. Maybe the passion that we put in our daily activities and let's say, the pragmatist but also the vision that more than 10 years ago, that something big was going to happen into the sector...

Q: To what extent does policy makers and political leadership buy into this, or is this totally driven by private sector?

A: I would say there is a good share of political let's say, policy interference in the high levels. I mean, Europeans and the national politics are driving renewables and the energy shift. But then there is also a lot of driving from the private forces so it's a good collaboration between the two.

Q: So, given how markets function in Italy which our listeners may not be totally aware of, to what extent can you influence and speed the development of green power and or are you simply building the network to enable it once it arrives?

A: On my side on the distribution, I'm building the network to speed-up, as you said, to create the awesome capacity, connectability and the dispatch ability of the green energy flows coming up from the plants. Of course, we also have a renewable arm which is green power. I was the CEO of Enel Green Power until a few years ago. So, we're also investing not only in Italy but globally in renewables. And we're investing billions of Euros in

new plants; also, a lot in U.S., so we're one of the biggest operators in grid power in the United States.

Q: So, talk about when you expect to be carbon-neutral. What's the national goal? What do you have as a corporate goal, and how are you making it happen?

A: Yeah, we have a...they declared our goal to be carbon-neutral by 2040; we'll be net zero by 2040 and we're stressing a lot the word zero more than the word net because we want to be zero, real zero and of course there will be some parts of our businesses very difficult to decarbonize and for the remaining part, we will try to compensate, so we will be net zero by 2040.

Q: So, the other thing I want to ask you about is the new sensitivity in the United States for what are being called equity issues of making sure all this technology which comes with a huge price tag, does not wind us really squeezing people who are least able to pay. I think I'm not an expert on the Rome economy but you have some significant pockets of poverty and the standard of living may be a challenge for a large part of your population. How do you address equity questions? Are there new approaches that you think those of us in America that have similar responsibilities that should be considering?

A: Yes. You have to consider one thing, I mean, typically an electrified family meaning a family that we use electricity for

basically all their energy needs will of course, pay more in electricity bills, I mean typically three times. But of course, they will cease to pay for gas, for gasoline, diesel, for things like that, so all in all, including the cost of technologies, a typical household, a typical family will spend less in energy bills so the energy transition is bringing...I mean, this is, of course, without the spikes or living in this moment, of course, I mean, in a stable situation, is bringing efficiency often times for the families. Now, there will be the needs for investment we said already but if you spread these new investments across the multiple giga towers over the electricity, will be consumed by the people this impact is really very marginal and by far, lower than the savings we will achieve by not using more gas and gasoline to drive to hit the houses and stuff like that, so. Of course, this is very important. This revision will be helping a lot at this point maybe because one of the lessons learned in the 20 years of experience we had in Italy, in other countries, is that the transition is not only modernization but also doing more with less. To make an example, to be very clear. It's like installing ABS brakes on your old car. When you have ABS brakes on your old car, you can use your car, the same car, in a much safer way for longer, so you have the same car but you put ABS so that the digital brakes and you can drive your car safely for

longer for more mileage. These revisions are exactly the same stuff so it's bringing a number of features and capabilities for the modern grids but it's also helping the grid operators to defer investments in time so to maintain an equilibrium between the benefits and the tariff daily for the final users and that's the equilibrium game we're playing in many countries where as in the U.S., the customers are becoming more and more sensitive to the final bill they're paying.

Q: So, your 75 million end-users right now and you explained the markets you're in all the way from Latin America across Italy, to what extent are they receiving...if you look across that entire massive network, to what extent are they getting green power now? To what extent are they still burning fossil fuels, and how fast do you see that changing?

A: Knowing the fact at the very level household level, the number of families requesting pure green power supplies are increasing very much, very, very much. Of course, it changes very radically from country to country, which think about the damage to go to Brazil is largely hydro, solar, and wind. I mean, they are the customers who get these benefits in any energy proposal. But in countries like Italy and Spain, they are a growing number of families requesting specifically green or proposal, greener supplies for the energy use so this use is growing very quickly.

Q: Let me rephrase it, from a very high-level perspective, your markets include industrial countries and more underdeveloped countries. What's your sense overall the uptake of green power and how rapidly is the entire grid changing? Is it very rapidly? Is it some pockets more than elsewhere?

A: Yes.

Q: How do you describe today...paint a picture of today's situation globally because you operate globally?

A: No, but there is not a big difference between industrialized countries and converging countries in terms of speed of penetration of renewables. The forces there, let's say, influencing the speed, it's more on the availability of renewables and the cost effectiveness of renewables and the openness of the market rather than the willingness of the customer to get renewable supplies for their uses, so it's depending on...there are other benefits but I would say by and large, this is happening at basically the same speed in the two big, let's say, hemispheres that we serve, the European countries and the Latin American countries.

Q: So, if I were to ask you the dollar value of the 1.4 million miles or the 2.3 million kilometers of grid that you own, it would be in the hundreds of billions if not trillions of dollars, is that correct?

2247

A: Well, it depends by the dollar value you are referring, too. If it's the asset value, it is tens of billions of dollars, tens of billions of dollars.

Q: So, tell me how disruptive or not disruptive the coming emergence of energy storage might be to a company that's in the wires business? Do you see..

A: No, it's not disruptive..

Q: Talk about the edge of the grid a little bit and how you see storage being deployed to complement the grids that you have?

A: No, it's not disruptive. Actually, it's a complementation, it's a technology that is highly required for flexibility management so it's absolutely in synergies what the view that we have of the grid of the future. We're doing whatever we can to, actually to facilitate the installation of batteries and distribution systems to view in our grids, so it's something that is absolutely synergetic with the good management of the grid and is happening. Actually, it's booming more than the EV cycle. We are seeing more distributed generation rather than EV cycle adoption.

Q: Antonio, tell me a little bit about yourself. I noticed on your LinkedIn profile that you're president of an organization

called RES4Africa Foundation. What is it and how did you get involved?

A: I was until one year ago. This is a foundation that we have founded 7 years ago with, let's say, a purpose to, let's say, speed up the penetration of renewables in Africa. You know, less than 2% of the overall investments in renewables were casted in Africa, so basically, Africa is not leading the electricity revolution, the energy transition and about 650 million African people are living today without reliable access to electricity so we thought that we had to work with other players to get the institutions, etc., to try to do something more to speed up the opening of electricity sector to renewables in Africa. And we have collected a number of successes in Morocco, in South Africa, Egypt, Kenya, and many other countries. This started as a very small club of, let's say, visionaries for a better future Africa and now, it's a very big and stable recognized organization that is, let's say, promoting business environment for private investments in renewables and the energy transitions in Africa.

Q: Tell me a little bit more about yourself, and you're sitting where in Rome and what kind of hobbies do you like and how do you unwind?

A: I'm sitting in Rome but I'm not Roman. I was born in Napoli. I think you can see in the back a picture of Adorno, which is my



favorite soccer player. I am a sporty guy. I like to row; I am a rower. I like to ski, to sail. I like to read. I love my job. I'd like to stay in this environment, this industry. I think I am very fortunate to be, let's say, to be witnessing energy transitions from the renewable side and now from the distribution side. I'm 52, married with two sons.

Q: So, my last question to you is as you go about the work that you do, what is the most challenging difficulty that you have to overcome and what brings you the greatest satisfaction?

A: The most difficult by, for sure, is the wideness of our infrastructure. Everything you do, you come up with a solutions and then you have to consider to implement it in hundreds of thousands or even millions of items so execution is key to be then effective in the idea that you come up with. I just make a very quick example. We now have designed a new pole for our lines. The design is fantastic. It's very sustainable. Will stay there forever. But then we have millions and millions and millions of poles to change, which will take years so, size is very important. The second thing is that we impact on the life of people so this is, let's say, when we have hurricanes, we have floods, when we have earthquakes, when we have windstorms or heatwaves, I mean, then it's...we live under stress. But at the same time when we can restore power or provide a good service to

people, they love us, they really love us. They want us to be the operator and that gives us, provides us with a very big wealth of satisfaction.

Q: Okay, and when you're sitting in your favorite restaurant in Napoli, and the sun is setting and you have a glass of great Italian wine in your hands, what gives you the greatest satisfaction in life?

A: Done yes to see that I'm doing something that is in harmony with the prosperity, long-term prosperity. I think I'm working on the right side to live the health in a better condition than the way I have received it from my father and so, I hope to bring...I'm happy if I can leave a little bit of the spirit also in my two children, so that gives my satisfaction. There is hope. There is an opportunity to improve. I see the momentum is positive and I feel that things are going in the right way, I'm happy.

Q: Thank you, Antonio.

A: Welcome. A pleasure.

We've been talking to Antonio Cammisecra, who's head of Enel Grids within the Enel Group which happens to be the world's leading private electric distribution provider and the world's largest renewable developer.

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