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*Zackes Brustik (Interviewer):* Welcome, Peter.

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*Peter Vermaat (Interviewee):* Yes, thank you, Zack, and ready to start.

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*Zackes Brustik:* Well, Peter, you worked for Enexis in your last position, I think which has more or less 5000 people. Now you moved on to DSO Entity. Did you have to move to Brussels? I think suddenly you have a team of maybe 2 or 3 people. Is that right? Any adjustments you had to take to be comfortable in your new role?

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*Peter Vermaat:* Oh yeah, feel very comfortable. But indeed, it is quite a change. I work most of the time from Brussels and indeed running a startup company is quite different from managing a well-established large company, but it gives a lot of positive energy since it gives us the challenge and the opportunity to serve all DSOs throughout Europe to facilitate the energy transition. It's a big step, but a very nice step.

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*Zackes Brustik:* You know what's interesting to say, because you said it feels like a startup, yet you're in Brussels working with regulatory issues, which usually is very much anything but agile. So how well can you balance both, like being a very small team, being able to work very agile, but in the regulatory space where things usually take a lot of time and a lot of cycles, and everybody needs to be involved?

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*Peter Vermaat:* Yes, that's a very nice question and obviously the pace of development can differ, but I think from the urgency of energy transition, you see things move much faster than before. So that is also our challenge to try to move it faster and to pick the right priorities, right? We do not need to work on everything at the same time. But if we pick the right priorities, we make a good acceleration towards the right direction for a sustainable energy system.

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*Zackes Brustik:* Well, talking about priorities, if we look at the European power grids for the energy transitions, in which areas is there a need for action? So, what are the top priorities you need to focus on?

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*Peter Vermaat:* Yes, that is a very good choice to be made on what priorities to select. And before I go there, perhaps a very brief introduction on what the distribution system operators, DSOs are doing for their business. Because if you look at the energy system, together with the transmission system operators, we form the system to distribute electricity but also to facilitate the market. DSOs are the last mile to the consumer. Through our 900 members, we serve 250 million consumers throughout Europe to get their energy safely, reliably, and efficiently. And if you look for the developments for the future that are determining the direction for priorities, I think we can all easily see that electrification gives a lot of pressure on the electric grid and also that the variability of the renewable resources gives certain priorities that are different

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from history and to illustrate that a little bit more to make the grid future proof, it is important that we expand the grid simply because we have more traffic on the grid through electrification. But also, we need to change the system from a one-way grid into a two-way grid because most of the renewable resources will be injected into the grid at the distribution level up to 70 percent. We need to anticipate a two-way system, including the facilitation of flexibility mechanisms. Therefore, we do not only need to expand the grid, but also to smarten it. So, to enable consumers to play their part from the position in the grid.

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*Zackes Brustik:* So that very much sounds like a technical issue in the first place.

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*Peter Vermaat:* Yes, I think there is a lot of technical issues involved about expanding, about technology and all things. But like I said, we are not only distributing energy, but we are also facilitating the market. Also, from the regulation and the market signals and market development, it's important that we find new priorities and take good direction. How, for instance, to facilitate flexibility to serve as a real market so that we do not arrange everything through the grid technically, but also that the market and the consumers that are prosumers, can play their part and enable the integration of renewable sources in the future.

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*Zackes Brustik:* So, if I paraphrase it, I heard four priorities already. That's expansion, that's integrating the two-way thinking, that's digitalization and flexibility. So, if we focus on digitalization, why is that so crucial?

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*Peter Vermaat:* Yes, I think digitalization comes together with the smartening of the grid. Like I already said, we need to expand the capacity by just growing the grid, but we also need to make more efficient use of the grid capacity. And there are two reasons for that. It is the more intense energy use, and it is the variability of the renewable sources. I think we are all aware that wind and solar vary over the day, over the seasons. That is what we need to accommodate. Now to accommodate that, it's important that we have better visibility on the grid and a better means to predict and operate the grid, anticipating the variability both in use and in supply. So that is why digitalization is important.

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*Zackes Brustik:* Now, you mentioned that, actually, it's important that DSO and the Transmission System Operators (TSO) are working together. That means on an association or organization level, DSO entity works together with ENTSO-E, the European Network of Transmission System Operators for Electricity, to jointly develop a Digital Twin of the European power grid. Can you explain to us why we need a Digital Twin and what it is? And maybe just before is the ENTSO-E sort of like the equivalent to the DSO Entity just for transmission system operators?

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*Peter Vermaat:* Yes, thank you. That is a good observation indeed. DSO Entity and

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ENTSO-E are two of a kind. So, in fact we are partners together developing the regulation of the future, obviously, closely interacting with other institutions like the European Commission and ACER, the agency of regulators. But indeed, we operate a lot together and we always try to take an integrated view for the system.

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*Zackes Brustik:* Coming back to the Digital Twin, what exactly do you mean by that?

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*Peter Vermaat:* Yeah, the Digital Twin, I think, has been used very often as an example to illustrate the digitalization and especially the further operation of the grid in the future. The objective of Digital Twin, I would say, is to improve the modeling of the grid, so as to make better decisions on investments and better decisions on operation. And in fact, what it is, is simply a virtual representation of the grid. You can say a virtual model and it can have various levels of development like functionality levels or visibility levels or scope levels. And I think it's very important that in the project that we are now developing that we take a close look into the required functionality so that we design the Digital Twin, such that it can really serve the purposes that we try to serve with it and achieve the objectives defined by the European Commission.

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*Zackes Brustik:* So, you're still in the early stages of planning. So once completed, which areas will the Digital Twin cover? Just the transmission grid? Also, the entire distribution grid?

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*Peter Vermaat:* Yes, that will also depend on the dimensions that we look at. In essence, it could cover all grid levels from TSO and DSO. However, I think we also need to take a close look, like I said before, on the required functionality and I can imagine that for TSOs having a cross-border European wide grid, it's very important that you model all cross-border lines and the main land lines in one model. For DSOs, that have a more regional structure, it might be helpful to look for the right granularity. So perhaps it's not necessary to design a model for 250 million connections, but perhaps we can already serve the purposes that we have identified by having it on a more regional level, or to have a sort of modeling approach that allows for a stepwise development over time. I think for now we have a vision, but it needs to be further elaborated before we can give a clear definition of the final product.

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*Zackes Brustik:* Now to be honest, I probably could imagine it to be easy to set it up for the transmission part. But if I imagine over 900 DSOs coming together and a lot of them coming from Germany, where, let's be honest, we're very far behind when it comes, for example, to smart meters. How realistic is it really to get together this huge patchwork all over Europe and to get the data and the insights and the visibility?

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*Peter Vermaat:* Let's go back again also to the definition of the Digital Twin on that, because Digital Twin can focus on modeling the grid. Another definition would be that you also look at the layer of data exchange. It's not a model only. I think it's also much

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related to the data exchange between TSO and DSO and between DSOs as such, also including the consumer and the market. It's not necessary perhaps to have a fully covering model, like I said, to cover all DSOs throughout Europe for 250 million consumers. But I think that looking at relevant market areas or looking at relevant regional zones, you can already start with exchanging the relevant data and then perhaps through a stepwise development, can look for the next levels or next layers in the model. A modular approach might be more appropriate for the DSOs there.

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*Zackes Brustik:* So, if I also repeat it in my own words, and I guess that's the misconception I had here, is it's not necessarily a real time data insight, but it's a model using comparative data, etcetera, where no real time data is available.

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*Peter Vermaat:* Yes, I think to make it a bit complicated, I think both visions are right. The initial first step could be that it's not exactly real time, but that is a modelling exercise that helps to take better decisions. A next level could be that it is real time so that you can take your operational decisions based on real time data and then another next level could be to make it predictive, right? You can even use it to analyze scenarios. And that is in fact what I mean with a modular approach, you can go various steps, grow the functionality of the model, and also expand the scope of the model.

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*Zackes Brustik:* Now you mentioned three different levels. For example, what sort of timeline would you attach to each of these levels or the project in general?

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*Peter Vermaat:* I think that will also depend on the way we go forward with, for instance, the interaction with other European programs. You might be aware of the Horizon Europe Project schemes and for instance, now there is an interesting call for various market parties to make further designs for the virtual grid model. The Digital Twin. Another important steppingstone, I think the work is done already. I'm aware, for instance, in Germany that there is the Comenius project and I think we could make use of that. Apart from that, for the timeline, I think it's also important to distinguish between the two tracks of the program. Perhaps I may elaborate on that because we have discussed the Digital Twin, but there is another track that is the development of smart grid indicators, and they are focused to design indicators that help DSOs and TSOs to take decisions to invest in the smartening of the grid. That's important because you can only build the fully functional Digital Twin if the grid itself is also smart. It needs to go in parallel with the development of Digital Twin and the smartening of the grid.

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*Zackes Brustik:* So, it's also an approach to see where investments are needed and to send it into the right direction.

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*Peter Vermaat:* Yes, exactly. For that, especially, the smart grid indicators are relevant. They will consist of a limited set, and they will cover both input and output indicators. The input indicators will help to direct investments in the right direction and the output

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indicators will show the benefits of the smartening of the grid and therefore also deliver new input for the Digital Twin to be further developed.

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*Zackes Brustik:* Now you already mentioned benefits. What kind of benefits could we expect from the Digital Twin?

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*Peter Vermaat:* Yes, I think if you look to the benefits for the longer term, in fact there are five areas to cover. Let me try to briefly elaborate on it without making it too long. But a very important area to cover is the observability of the grid. We also call it visibility. What is going on in the grid and do we need to take any measure to compensate for that? And another important area to cover, is the better decision making on investments, not only when to invest in smartening of the grid, but also where because from the capacity utilization, we can better analyze the necessity of investments in certain regions. I think it's also helpful (the third point) to be more resilient because we if we have better grid modeling, we can also better monitor and fight, for instance, cyber security attacks or if an attack occurs, restore quickly. The fourth area would be that at the next level we can be active systems managers. So, if we have better visibility of the grid, we can operate the grid more efficiently. And lastly, not to forget, TSOs and DSOs need to interact very intensively on the data exchange to make sure that the grid, both at transmission level and distribution level, is stable, reliable and safe.

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*Zackes Brustik:* Now earlier already mentioned the smart grid indicators, and you mentioned it as a tool also to divert investment or not divert investment, but to channel investment in the right direction. How could the grid operators themselves profit from smart grid indicators?

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*Peter Vermaat:* I think that the smart grid indicators are a helpful guide for investment decisions. But I think also that there is another area of interaction needed. That is the interaction with the regulator. Developing smart grid indicators is also very interactive with the regulator who needs to judge the efficiency of investments. I think having a European wide limited set of indicators could help both DSOs and regulators to take control of their investments for the future.

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*Zackes Brustik:* Well, Peter, we already really went deep down the rabbit hole in explaining the whole concept of the Digital Twin all across the European grid landscape. Now, to close, we started with you saying that it feels like running a startup. Startups have themselves very short timelines until they reach their next objective. What's the next objective for you that DSO entity wants to reach? What's your next milestone?

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*Peter Vermaat:* Yes, we have milestones soon and in the further future. Let me start with our mission, because really, we think that DSOs are at the heart of the energy

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transition, and it is our mission to enable DSOs throughout Europe to facilitate that. But our more nearby goals are to develop those tools and conditions that are necessary to guide decisions and to guide developments. One of them is the Digital Twin, but I think closely related to the developments in the future is also the Network code for Flexibility, and that is the network code we are actively working on and that I think a lot of people are aware of. The year 2023 really is the year to develop the network code for flexibility as a basic fundament, a foundation for the future grid.

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*Zackes Brustik:* Thanks a lot, Peter. It's been exciting having you in the podcast. Thanks a lot for these great explanations and all the best for the next goals in 2023.

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*Peter Vermaat:* Thank you very much and at your service. See you soon.