MARTY ROSENBERG
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VIVIAN BOUET INTERVIEW

Q: Hi, and welcome to Grid Talk. It's our pleasure today to have Vivian Bouet who is CPS Energy Chief Information Officer. Hi, Vivian.

A: Hi, how are you doing, Marty?

Q: Great. A word about CPS; it's the largest public power and natural gas and electric company with 840,000 electric customers and over 350 natural gas customers and has the unique distinction of having bills and rates that are among the lowest of 20 largest U.S. cities for San Antonio. Vivian, we're going to be talking about artificial intelligence and we are particularly pleased to have you with us because of your diverse background before diving into CPS two years ago. For four years, you were Executive Senior Director of Business Transformation Walgreen's, and prior to that for seven years, you were Director of Strategic Healthcare Solutions for Anthem, the large insurance company. So, give us a broad view of what you know and feel about the thrust of artificial intelligence across the U.S. economy right now in the industries you've worked in and then we'll zero in on utilities.

A: So, Marty, you know one of the things that's very apparent with those industries both with healthcare and the detail and in

particular for Walgreen's pharmacy as well, which is part of healthcare. These hats you go through transformation; you have to go through digital transformation, you have to get to know their customers, and a big staple and enabler of doing so was using artificial intelligence, using these technologies that we are seeing moving into other industries as well so that experience working very closely with those both technical teams and strategic teams, insight teams, it's knowledge I hope to bring here and apply here to propel what we're doing as to energy forward in terms of the value that we bring to our customers, but also overall for the utility industry to the extent that I can make a small difference.

A: So, there is an intense interest across the utility space of artificial intelligence. NREL tapped into it back in October almost a year ago with a workshop that lead to a study that had over 60 people and 40 utilities. Utilities are particularly capital-intensive. Do you think that means the impact of artificial intelligence will be quite sweeping as it rolls out?

A: I can certainly see that as you take a look at utilities; you're right. They are very much so capital-intensive, but you want to look at the value-chain overall and how it can impact the value-chain so I talk from generation to generation to distribution at an integrated utility like ours, to retail to

trading to even our support services; when you think of cross-setting ties spectrum-related to improve decision-making across it, to improve performance across that value-chain, is where AI can be a significant enabling vehicle in order for us to do that, so yes, I do believe that the changes and the impact can be quite sweeping across even a capital-intensive industry such as the utilities.

Q: So, the study that NREL produced which can be accessed directly at the SmartGrid.gov site under *Voices of Experience* has a breakout, a table of Use Cases; there were 15 of them. I would like to ask you to apply out about four of them, particularly electric vehicles. How will AI help deployment and integration of EVs across San Antonio and other markets as well?

A: Well, I mean there's many ways it can apply. You can use AI there. When you take a look at; just imagine a world in which EVs become with very heavily use within the community, the growing market for it. But the full implementation of that is not fully there yet. That said, though, when that happens (it's going to be a when, not an if), when that eventually does happen as the models are beginning to project in what others are saying, you're going to want to really talk about how you will manage your energy differently, how you manage your load and so getting to re-understanding how you optimize the grid, how you

forecast performance and look at the trends that are happening to best understand how to deliver, I think that is one place where you can certainly use AI. The other piece of vehicle is transformation there is really around digital core bedding. This is the space on how you bring services to your customers; you know you want to get close to your customers, understand what they want. You can use AI to better deliver the kinds of services that they're using. The question, you know is, who are the players who deliver those services from that utility or others or partnerships across the supply-chain for that. But that's certainly one way to where you can get to micro-segmentation and targeting for those electric vehicle customers to best understand their needs and to optimize how you bring those services to them using some predictive, some artificial intelligence into that space.

Q: Another area of intense interest is Use Cases of AI for optimizing DER. One of the major transformations of utilities is, as you know, moving from a model where there is large central generating stations with largely a one-way directional flow of energy to distributed energy going out with solar, wind, a variety of micro-grids. With this distributive environment, how will AI play an important role?

A: You know, as you mentioned, you know electricity flows to and from a customer and that in itself can inform artificial intelligence algorithms within to better understand how to epitomize if you may, and manage excess generation. Sell it to the grid, participate and demand response programs. When you think about solar, a complement to that is some firming capacity and how you think of something such as perhaps, a battery store-up and coming; when to charge and discharge batteries. When you think about demand energy response management platforms, you know you can really inform the market operators both consumption and production and even alert potential customers of when and how much power to use at that time. So, there's so many applications there; I can go on and on, but I mentioned a few.

Q: Yeah, and we'll largely by function of this podcast, be dipping our toe into vast oceans of potential. Two other areas of Use Cases I'd like to look at: predictive maintenance and outage management. Of course, major hurricane season is upon us now and with threats to the Southeast. You have disruption in the West from fires in California right now. How will AI be part of the solution of utilities getting their arms around these issues?

A: Well, you know, I'll use an example for one in which we've deployed already. For instance, we use weather-related data for

outage management to determine and to predict where we might see, based on looking at weather patterns, a lot of the variables that come in from a weather perspective. Looking at our systems as well and we're looking at how we can best incorporate that information as well as for as how our systems have performed. But the model that we put out there ultimately better informs when you see a weather pattern come in and those weather patterns may look different. Where can you potentially expect an outage to happen that gets our crews ready; it gets our customer success team ready. We understand how to put models in place; how many crews do we need; whether they're responding to customers; whether they are proactively trying to prevent the outage from happening and going out there to make changes. That's one way where we can see an application of AI in place. Predictably, to better perform around that.

Q: So.

A: Marty, you were going to say something?

Q: Go ahead. I'm sorry.

A: Well, actually your second Use Case; remind me what your second Use Case is?

Q: DER Predictive maintenance.

A: Predictive maintenance. So, wow, the amount of opportunity here can be pretty large, right? So, you've got a proliferation

of sensors that are out in the ecosystem of assets that we're managing. One thing you want to be able to go to is to begin to understand the patterns of performance and when an asset could be more vulnerable for breakage; gets to it before it breaks, then clearly mitigate that before you see any kind of a disruption that is not anticipated. So, the intent is allowed getting to better reliability, getting to better resiliency overall, too, and that's a lot of opportunity there and one in which we are just really beginning to scratch the surface.

Q: And what about cost savings? Are there?

A: Absolutely, I mean you hit the nail on the head there, Marty, because by doing that then, of course, there's a cost that comes to unanticipated breakages and you don't have and you aren't anticipating. And, of course, that can certainly get you ahead of the curve in terms of reducing operational costs overall around those assets and how you manage those assets, overall it allows you to predict more reliably what your operational costs might look like as you think about your budgeting cycles so the intent is to manage the costs also, hopefully, better inform what your spending could be. But these are all areas that are under exploration and we've just beginning to scratch the surface there.

Q: So, it's been said that AI for the decade of 2000 to 2010 has been about a larger intelligent automation and now we're moving more to deploying grid intelligence. Overseeing the technology roadmap and innovation functions at CPS, where you say CPS is in terms of the continuum of AI deployment? How would you describe it? What have you accomplished and what challenges are directly ahead of you?

A: That's a big question so in terms of AI what we've accomplished is there's many, many applications here. One of them certainly is the one that I just spoke about which is the predictive side of outage management and we have been leveraging AI there. Another part, which is a large part of our budget which we are exploring and we have some very promising results, is vegetation management. And this is where you, rather than having crews and teams go out there surveying the landscape, this gets them to better, as you look at vegetation management, of course, that impacts your reliability. Trees and plants, etc., they begin to get closer to your assets, your vertical assets, your power lines, your distribution lines. Having a control of by---of a very large and expanse like CPS Energy in our service territory, you're talking about a very large area to manage and what we're doing is we look at the vegetation that is using LiDAR data for instance, to predict where we should

prioritize focus for vegetation management. We're just starting that and we have some beginning models which are very good there. The other place is certainly, you know we deployed our Smart Meter technologies and we have been in it for several years now. And, we're beginning to take that data to better manage the grid overall and turned it around in terms of operational efficiency gained for the grid or to better inform us how the grid is performing. I would say though that this is one area where again, still exploratory and we have a lot more to do there and a lot of Use Cases that will explain but those are a few where we've already started to leverage the data. There are other examples. I can certainly talk about them but you let me know how much deeper you want me to go there.

Q: Well, just give us a 30,000-foot assessment of how deeply you are into capitalizing on AI; would you way you're at the beginning, you're at the middle, or have a fairly mature effort underway.

A: I would say that we're somewhere between the beginning and the middle because when you start getting into impacting core operational areas and finding value through your AI modeling and capabilities, I think you're beyond it nascent but there's more to do there in terms of the expanse of that. We're not mature yet and that's ahead us and we see that as an opportunity to

continue to mature in this area. We not talking about operational. Examples would be renewable energy curtailment as an example; city-wide load forecasting; and even for safety, motor vehicle accident frequency pattern identification to better to increase safety for employees and so on and so forth. So, I would say that nascent to closer to middle.

Q: Ok, so the NREL *Voices of Experience* report on AI has some advice for getting started and they're several bullet points, and I'd just like to read them and have you offer up your thoughts.

A: Sure.

Q: Build simple examples to attain buy-in.

A: Well, I would say that, you know, folks think about AI or digital transformation; they seem like very lofty, aspirational goals. To obtain buy-in is to start doing the things that are maybe even the low-hanging fruit. They may not be the most flashiest but start to build some real value for the business to hold onto, and that may not be actually AI but just unlocking the value within the data itself through basic business intelligence and the way through AI; when folks get better handle of their data. That's an example of where I would say we start to get business folks that become your voices and

supporters for what value they can get out of data and moving towards AI.

Q: Take an enterprise-wide approach to evaluating metrics and value.

A: Well, when you take a look at that, you know if you focus in on the one area only, I like the idea of taking an enterprise-wide view and this is one in which we talked about recently in the workshop you had back in February. In the enterprise---when you have an enterprise and people can see the bigger picture of what you're trying to envision, you may not be fully there yet but you want to talk about the enterprise as a whole in order to understand the full value that you may be able to unlock. And, by doing so with some real examples of what that looks like, you can start talking about what metrics that have value to the enterprise that can be impacted positively by doing an AI initiative. So, think wider; think about the full value chain, not just one area of the value chain. You may begin to look for value on areas of, start with the bigger picture across the value chain, so that allows you to think about the enterprise as a whole and get the enterprise involved in what you're trying to do.

Q: Consider the customer.

A: Well, you know that's one thing that I you probably want to lead with is what the impacts are to your customers where, as you mentioned, we are a municipally-owned utility which means we serve the community, which means that what we do for our customers needs to be at the forefront in all of our thinking. Because, ultimately, what we're doing is to service them. So, we want to think about the impact of AI and how it brings value to them. And that may take multiple shapes and that's perfectly all right. But you want to be able to demonstrate the impact to the customer and have their voices reflected in what you're doing, whether it's through services or better in reducing the amount of outages that they see or proactively prevent outages. Take that view because it gets people (1) gets people excited, (2) the community excited, (3) you're delivering better services overall.

Q: Why don't stay on for just one more question and that is, San Antonio is fairly unique demographic, I would think. It also has some tech going on. To what extent to different customer bases dictate a different approach to AI by a utility?

A: Well, you know, it's a very good question. One of the areas, and we're just exploring this. So, our Chief Engagement Officer and I and his group, we work very closely together to understand the profiles of customers that we have and what is

most important to them. Whether that's the small business customer, whether that's the residential customer, or maybe it's a customer that is troubling within the residential segments of sub-segments. You want to understand what they're trying to accomplish, and what needs you to meet. How do they dictate? You need to find a balance because they're all important. You need to find what you prioritize and do so equitably across this spectrum of profiles. Now, what they prioritize may look different but you certainly want to strike a balance to meet all of their needs and that's what we're working towards and what we're doing. We certainly do that already in our services that we do day-to-day but as we think about the application of AI, I would certainly say that's the work that's ahead of us as we look at segmenting the customers and their needs and striking a balance across all of them to service their highest priority needs.

A: Great. Two more points for getting started. One is do not isolate AI projects.

Q: So this is; I love this one and here's why. So, sometimes you may be tempted because AI is highly technical, can be very highly technical and if you take the AI initiatives and you only focus on maybe value that the organization can get behind. The challenge is that if you don't involve the organization and

they’re not your advocate if you may or they may not be ready, maybe great; but they’re not ready to consume it yet because they have other priorities or challenges of focus area, now you are isolated. Now you’re doing something that requires a push versus a pull. You want the organization to be pulling you in versus you pushing out only to the organization (both push and pull) but if you are completely isolated, it’s a harder---now you’re dealing with a bigger change management, changing the minds and getting people to see what you’re trying to do. You want to be collaborating with them. I think it’s one of the other items I call collaboration across that is very important so that you have the highest priorities that the organization can get behind.

Q: And lastly, do not chase perfection; chase improvement.

A: Yes, so one of the---somebody said this to me so I am going to steal it cause I think it’s a very good thing. When you have a room and on the table there’s piles of let’s just say money and at different heights, right, and you guys want it---I don’t know, 6 inches high and other at two feet high and another at 6 feet high. If you’re only taking the highest pile, you may be missing the lowest hanging fruit. You’re walking in with AI can bring in value, grab (be strategic about what you’re doing, don’t get me wrong), but there’s so much value. Don’t focus on

perfection. Getting better ultimately is how you find value sooner and into the hands of people. It's an additional way of thinking is deliver incremental improvements. Test it out, understand alarms, cycle paths. Go on for the next set of improvements, and from there you, in my mind, bring value faster and sooner, as well as in a valued way, so.

Q: Great. So last set of issues I'd like you to think about and talk to us about. We go through buzzwords and business internet of things and I can go on and on. AI is one of them now. Do you think it has a mystique that needs to be de-mystified and are some people putting too much hope into it? Do we need to debunk some of it and the expectations people have as to what AI can deliver?

A: Well, I would say that is certainly value that AI can deliver but I think about AI you know, some folks may take it maybe too far onto the right. Like, for instance, maybe we make people's jobs obsolete and maybe AI could be bad for humanity and we have, you know the future may look like "The Terminators" and "The Matrix" and so on and so forth, if I can just use those as examples. I would say that AI is what you can use to automate as an example, things that are routine and free human beings to do what they do best, right, to solve problems. So, it is not AI in place of humans, it's AI to enable humans to do better at

what they ultimately do. The intelligence-wise is there, and the problem-solving is there. So, you bring the two together and that's how you get the most value out of it. So, I would de-mystified this idea that artificial intelligence replaces people. It gets you to solve problems differently but it allows also releases humans to do what we do best which is also solving problems. So, that's one thing.

Q: Great. So, is there any over-expectation of what it can deliver?

A: Well, I would say that the over-expectation on what it can deliver is, you know, it really depends on how---on what you're using to ground yourself. And expectation is of AI can be pretty big but you also need to have a pragmatic and realistic approach to it. And so each organization has a different journey that they're on. For some, it may look different. For others their expectations are larger but they've put---they've done the hard work to lay pragmatic foundations in place, such as data governance; such as data quality in order to unleash the data. Those are the foundations that you need so I would say that you can think big with AI but you've got to do the hard work of laying the right foundations in order to unleash the value. You need the organization behind you; you take an enterprise approach and a customer lens and you'll have your realistic

version of what AI can deliver for your organization. And that differs for each, so, that's how I look at it.

Q: Great. Thank you, Vivian.

A: You're very welcome.

Q: Thanks for listening to Grid Talk. We've been talking to Vivian Bouet, who's the Chief Information Officer for CPS Energy in San Antonio, and she's been sharing her insights about artificial intelligence and what that will mean for the utility industry. Please send us feedback or questions at GridTalk@NREL.gov. We encourage you to give the podcast a rating or review on your favorite podcast platform. For more information about the podcast series, to subscribe or to download and to access your artificial intelligence report where you can explore this podcast, go to SmartGrid.gov.

END OF TAPE