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**DAVID OWENS INTERVIEW**

Q: Hi, and welcome to Grid Talk. Today we have with us, David Owens, who happens to be the chair of the Puerto Rico Electric Power Authority TAC or the Transformation Advisory Council, and as we're going to find out, he's overseeing and aware of everything that's happening to bring the grid back to where it needs to be in Puerto Rico. David also has been executive vice president of the Edison Electric Institute, now retired. He served there 36 years. It's been my honor over at least the last 20 of those years to have interacted with David. I heard him speak at conferences; invited him to speak at conferences I ran and in private discussions we have had with electric executives. David, welcome.

A: Well, thank you, Marty. I certainly do appreciate this opportunity.

Q: So, the world knows that three years ago, Puerto Rico was devastated by Hurricane Maria. It caused estimates of \$94 billion dollars of infrastructure damage including knocking out 25% of the transmission towers. Most of the people were without power for a considerable period of time; some up to a year. Now, there's in place a plan to upgrade the grid and I'm going to go

over some of the high points that I have gleaned from news accounts. Tell me where I'm wrong and if I'm wrong. But, about a year ago, PREPA announced a \$20.3 billion dollar grid plan that would include 1,400 megawatts of solar, 920 megawatts of battery storage, \$6.5 billion dollar for transmission, \$5.7 billion for distribution, \$3.9 billion for generation, \$1.8 billion for automation and computer system upgrade, and \$1.8 billion dollars for microgrids. How am I doing; is that about right?

A: Well, let me if I could just update the numbers a bit. So, what you just cited from essentially was a plan that PREPA, which is the Puerto Rico Electric Power Authority, where currently I am the vice-chair of that board. I moved from the chair of the Transformation Advisory Council to now being on the board of PREPA. And PREB (Puerto Rico Energy Bureau) which is the regulator in Puerto Rico, required PREPA to file an Integrated Resource Plan (IRP) to describe how it will improve the electric system reliability to meet the electricity needs of Puerto Rico. The last Plan that we filed was back in 2015 and we updated it in 2019. Several months ago, the PREB issued its direction to PREPA, and in that direction, as to the 1,400 megawatts of solar - they doubled it. They said by 2025, you need to have 3,600 megawatts of solar energy on the system; 1,300 megawatts of battery backup for resiliency and

reliability. Our plan focuses on building 8 microgrids with renewables being their primary source of supply. It's a phased plan which revolves around solar energy. I must stress, a grid for renewable technologies is a grid very distinctly different in many respects from a grid that's been built around central station facilities, which is traditionally how the Puerto Rican grid has evolved. The existing grid centers around baseload oil-fired facilities, baseload coal plants and so it's a different type of a grid that has to be built to provide the high level for resiliency, reliability and visibility to serve the customer. It is a grid that is more digitized, relying on new advanced technologies.

Q: So, David, people are talking about the concept to build back better, which is something that our President-elect Biden is talking about. Do we have in Puerto Rico, a testbed that will enable you to deploy technologies that the entire industry has been talking about in the United States for years to take us to a place that nobody's been to before?

A: I think, you know the matter that's got me all excited is really a coalescence of a lot of my experience over the years. All the things that I've done in the mainland under the Energy Policy Acts of 1992, 2005, and the Energy Security Act of 2007. Those pieces of legislation opened up the electricity grid for

increasing competition and recognized the need for grid enhancement and greater transparency. Recent decisions by FERC has stimulated the integration of both wholesale and retail markets by providing for the aggregation of distributed resources. We need a grid that can accommodate similar changes in Puerto Rico. In Puerto Rico, one of the major pieces of Law Act 17 (Energy Public Policy Law Act) underscores the need to privatize the T&D system by creating a Concessionaire, a third party, to build the grid back better, much like what was done in LIPA (Long Island Power Authority). The goal is to rebuild the grid so it's more resilient and more reliable to withstand a Category 4 storm.

Q: Will this third party be independent of PREPA?

A: Yes, the third party is independent. In fact, I can tell you who it is. Through a competitive process, which took over a year to complete, proposals by several companies were reviewed to rebuild back the grid better, to operate it and do the customer interfaces for storm restoration. It was decided after a lengthy process involving many detailed discussions that three companies would form a partnership called LUMA and named Concessionaire. This partnership includes ATCO Energy, LTD.; we all know is a global corporation and has tremendous expertise in electric transmission and distribution and natural gas T&D.

Quanta Services, Inc.; which is a superb infrastructure provider. They operate and maintain systems throughout the world and have over \$12 million dollars in revenues. And the last one, Innovative Energy Management, Inc., which has tremendous expertise in emergency management and disaster recovery. LUMA is proceeding similar to how the LIPA electric system has been enhanced. The Concessionaire is now involved in the front-end transition. This requires carefully evaluating the electric system and the expertise needed to rebuild the electric system under the 15 year Operating and Maintenance Agreement (OMA). LUMA will now be the T&D provider in Puerto Rico. The PREPA, which I'm a part of, will transition many of its responsibilities to LUMA. The numbers that you sight - \$20.3 billion dollars is an awful lot of money as a result of the devastation to infrastructure caused by hurricanes Irma and Maria. For the last two years, we have been working hard to respond to requests from FEMA to get disaster recovery funding. Again our goal is to build the system back much better.

Q: So, my understanding based on our previous conversation is that they've allocated \$10.5 billion dollars. That represents the largest disaster recovery relief plan by the federal government ever.

A: That's correct.

Q: How did you get this and let me just contextualize it a bit. Our listeners may know or may not know that the poverty rate in Puerto Rico is fairly high. Estimates are as many as 43% of the residents on the island live in poverty compared to 13% in the United States. So, your customers in Puerto Rico can't shoulder the majority of the costs of this, is that correct, and how much will FEMA help address this?

A: Yes, you're absolutely right and it gets even more complicated because Puerto Rico is bankrupt. There is a Restructuring Support Agreement (RSA) which is in process; it's in the courts to pay the bondholders a certain percentage of their investment. And so, one of the things that could prove to be a challenge for the OMA with LUMA is the resolution of the RSA arrangement. That's very important so there's clear daylight because right now obviously we can't get access to capital in competitive markets. There must be certainty to bondholders and you also want certainty to PREPA and getting the money from FEMA is essential. In order to start the process for the receipt of money from FEMA, we are required to file a Ten-Year Plan with FEMA by December 19. And that Ten-Year Plan just doesn't deal with the T&D. It deals with some power supply; dams that we have; other infrastructure. Obviously, a lot of our attention will be focused on the T&D system. And, that's very important

because we need to bring jobs back to Puerto Rico. Puerto Rico has a very robust pharmaceutical industry but it could be even stronger if there were greater resilience and proven reliability.

Q: So, take a minute and tell us with the solar that you outlined and that's going to be deployed, and the microgrids that are going to be deployed, how will that work? Will that be urbans, will it be rural, and will you be training the workforce to deal with this?

A: Yes, it's going to be a mixture. Currently, we have some rooftop (private) solar. My numbers may not be accurate but I believe it is in the range of 150 megawatts. We have some existing hydro facilities and some wind facilities that were severely damaged with the hurricanes. If you aggregate all of our renewable resources it is roughly 400 megawatts, I would say. Now, you recall that PREB requires 3,600 megawatts of renewable energy by 2025 with a substantial reliance on solar energy.

Q: How's that compare with the total load?

A: Our current peak load is approximately 2,600 megawatts. However, 3,600 megawatts of solar is an intermitted source, which means it may not be available to meet our highest demand. It's more relevant to consider the total amount of energy

provided by solar energy and to diversify the types and locations of solar facilities. We still need our baseload plans in addition to transition facilities such as energy storage and natural gas-fired facilities.

Q: So, will the bulk of this be rooftop or will you have solar farms out in the countryside?

A: Excellent question. No, the bulk will not be rooftop it will be a combination of rooftop and community based solar. I am a strong believer community based solar would provide greater resiliency reliability and result in a lower cost for the customer. While we are encouraging customers to install rooftop solar, the reality is that many of the people of Puerto Rico will not be able to afford rooftop solar facilities. Moreover, if microgrids are being required it makes more sense to build them primarily around community-based solar. The integration of both rooftop and community solar requires a better grid which has advanced distribution management system and streamlined interconnection rules. But you also need to have some level of coordination and visibility so the utility can see what customers' sources are feeding into the grid. Coordination, cooperation, and visibility are very important.

Q: So, will the bulk of the microgrids be in San Juan? Will they be in installations---

A: They are going to be located all across the island. This is based upon our experiences from hurricanes Irma and Maria which knocked out San Juan, Puerto Rico for many months. Two major 230 kv ties that were severely damaged underscored the vulnerabilities of the electric grid. That is why microgrids will be located throughout the entire island in order to enhance resiliency and reliability.

Q: So, let me press that a little bit. You know we're looking in the era of climate change and Maria is believed to be a harbinger of more frequent, more violent storms that will be going to be coming through for years to come. As you build out this \$20 billion dollars, \$2 billion dollars a year; let's say, in a decade, it's fully deployed and up and running, Maria comes through. What's your vision of what happens in Puerto Rico? Will it be a few days outage? How robust will it actually be at the end of the day?

A: We've had at least 4 hurricanes and many earthquakes since Irma and Maria, which were not as severe, thus we were able to restore service more quickly. This resulted from careful planning, vegetation management and improved maintenance of existing facilities. In fact, most of our recent outages have resulted in services being restored in less than 30 days. But not only have we improved our service restoration time following

outages, we also have improved our call center response time. In addition to that, we have different ways where we reach out to the customers in advance and give them an indication of when we're able to restore service. It's not perfect. We still have tremendous call-waiting times and we're reducing those significantly, but to your major question, the system is not as resilient as I would like to see it because we need to improve the T&D system. We are also working with industrial and commercial customers, many of which have their own power supply in order to minimize interruption of their critical services. We are meeting with them about synchronizing sources so service restoration time is not as significant as it was in the past. The money that we receive from FEMA will help us to do what we call system remediation. LUMA has looked at the entire system and found and identified vulnerabilities. They are putting a priority around addressing these vulnerabilities and that's incorporated in the Ten-Year Plan that I spoke about earlier. The Ten-Year Plan has got to be consistent with the Integrated Resource Plan approved by PREB.

Q: As you do this decade program and you're calling on vendors to submit bids for providing battery storage, and solar units, and generation T&D, computer systems and microgrids, are you working with EPRI and some cutting-edge companies to develop new

technologies to try to advance the ball from what's available right now?

A: LUMA will be using state of the art technologies and as such may be working close with EPRI, DOE and other entities familiar with all the emerging technologies. They will be working with the industry, with respect to storm recovery and may become an active participant in the Electric Systems Coordination Committee. It includes some of the public utilities as well as the large Public Power Council and government agencies. They may also be involved in exercises and pilots for testing the electric system under different types of events. But more importantly, they will be guided by the Department of Energy and its prospective teams. The DoE has been very thoughtful and its build that better study, has identified some very sophisticated ideas for improving the electric system in Puerto Rico. Moreover, DOE has a working team which includes other agencies, such as HUD and DOE labs who will also be examining our Ten-Year Plan.

Q: So, David, what do---how aware is the U.S. utility industry today of what's being attempted in Puerto Rico and what do you want your hundreds of friends across the industry to know? Can you think of a few of the most important take-aways?

A: Well, I think there's several important take-aways. Before the Ten-Year Plan is filed, we're going to do outreach, so I would estimate that the draft of the Ten-Year Plan will be completed the week of December 7. So, that gives us roughly two weeks to do outreach. That outreach will be with U.S. mainland utilities; will be with the various government agencies; will be with the oversight committees in Congress so that they are not surprised by what we file. And we'll reach out to the municipalities in Puerto Rico to get buy-in. Part of the challenge we have is we just had a gubernatorial election and you really want to work with the new governor and transition team. The governors must feel comfortable with what we are proposing because this is really about the future of Puerto Rico. This is about bringing jobs back to Puerto Rico, enhancing economic development, re-establishing businesses in Puerto Rico, getting Puerto Rican employed once the RSA is addressed; getting it back to the point where it can procure capital in a competitive market. Attracting citizens who left the island, because of better opportunities in the main land, to come back to Puerto Rico. So, the bottom line I would say is, wait for the Ten-Year Plan, then you'll see a lot of press, then you'll see a lot of outreach coming from Puerto Rico so that we can demonstrate that the \$10.5 million dollars that have been firmly

committed to us is well-spent. Obviously, we will work with U.S. mainland utilities. I know the industry extremely well because I was at EEI for many years and so I will be one of those ambassadors to testify, to talk to companies. I know that many companies are modernizing their grids so there will be efforts to reach out to them to benefit from their experiences. They are good test cases for us to learn from.

Q: David, we know you're a young man and but you've stepped down, what was it, in 2017 from EEI after 36 years?

A: That's correct.

Q: What do you feel about this project you're undertaking? Is this a capstone of your career? How do you feel about this and---

A: You know, that's a very interesting question. So, I've always been guided by my faith and my commitment to give back because I think I've been very blessed in my career. The opportunities I've been given not many African-American males have such experiences. When I pray, I ask the Lord, "Why do you have me in Puerto Rico?" I frequently get the answer back, "You will find out." Many people ask me, "why are you in Puerto Rico?" You should be vacationing. You should be having fun. You're in Puerto Rico working, man. What's wrong with you? I always respond, I am making a positive difference in people's

lives. Puerto Rico is a culmination of many things I've done in my career. The new regulatory rules that have to evolve, I have experience in that area. It's an electric system that's got to be redesigned and it's got to be rebuilt. There's a tremendous need for outreach. There are cyber security issues, which are very significant. There are storm restoration recovery issues which have to be addressed. I did a significant amount of work under Super Storm Sandy. There are new technologies to support solar energy such as energy storage, which could be a renaissance technology to bring clean energy. I'm a strong advocate of clean energy and renewables. It's a culmination of everything I've done in my career. It utilizes my expertise, many of the things that I've learned throughout my career, it augments important relationships that I've developed, but most importantly, I'm giving back and making a difference in people's lives.

Q: Thank you, David.

A: Thank you.

A: Thanks for listening to Grid Talk. Thanks to David Owens for sharing his insights about these important developments in Puerto Rico and change is coming there and to the electric industry. Please send us feedback or questions at [GridTalk@NREL.gov](mailto:GridTalk@NREL.gov). We encourage you to give the podcast a rating

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