

# **Towards a Robust Grid**

## **Partnering with the Community on Resiliency Planning for Major Disasters**

### **A Conversation with Darren Murtaugh**

#### **Portland General Electric**

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**Interviewee: Marty Rosenberg**

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Q: Welcome to the Voices of Experience: Microgrids for Resiliency podcast. Voices of Experience is a US Department of Energy Advanced Grid Research Division initiative. It captures the experiences, insights, and lessons learned from utilities at the forefront of implementing emerging technologies. Today, we will explore the key points of a virtual discussion recently lead by Darren Murtaugh who is Senior Manager of Grid Edge Solutions at Portland General Electric Company. I am Marty

Rosenberg, an energy journalist and host of this series. The topic of our discussion today is partnering with the community on resiliency planning for major disasters. Hi, Darren.

A: Hi.

Q: Let's jump right in and talk about a 2015 *New Yorker* article about a potential devastating earthquake in the Northwest tied to the Cascadia subduction zone. The *New Yorker* says that, if it hits as is anticipated sometime in the undetermined future, 13,000 people might die and massive destruction would happen in your area. How do you prepare for something like that?

A: Yeah, that's a great question. That *New Yorker* really generated a lot of attention about this. I refer to it as a "sleeping giant" which has always been there but perhaps not always acknowledged as the threat that it actually poses to our area. How do you prepare for it? You know, the way I think about it, we don't know when it's going to hit. There's no way to be able to predict the timing on it nor is there any way to really stop it. There's a fair amount of hardening that we've started to do on the system. What I mean by that is making sure that our critical infrastructure is seismically sound, that our transformers

are bolted to the pads, that they won't shake off the pads and tip over. At the same time, there's going to be destruction. There's only so much hardening that you can do. You're not going to make the system immune to impact. That's where I look to resiliency. Resiliency, in my mind, is less about avoiding the impact and more about rebounding from the impact.

Q: Let's talk about your portfolio with Grid Edge Solutions. Do you think where your utility (and the whole industry really) is headed towards more distributive assets is a good thing when it comes to resiliency? I'm sure you do, so tell us why.

A: Absolutely. It comes down to diversity of your assets and where the energy supply comes from. If we have the traditional model of energy being generated at some remote location and then distributed to our system, taking down the transmission grid would essentially mean loss of power to everybody; whereas, if you have a more distributive model, it's less likely that each and every distributed resource will be taken offline. Therefore, you have a stronger resiliency approach to being able to rebound from a major event.

Q: Now, I've lived in the Northwest, and I know a lot of

Oregonians are off-the-map in terms of the rest of the United States. Your company certainly has some high ambitions. In a press release put out not long ago, a little over a year ago, your company said it "intends to integrate smart grid technology on a scale never before attempted in the United States." Take this down to your level of day-to-day work, and what does that mean?

A: First, I want to say that PGE really prides themselves-- we pride ourselves on being innovative. We're not the largest utility. We're never going to be the largest utility. We are progressive. We are innovative. In fact, the first AC transmission line in the country was here in Oregon operated by PGE. Since then, we've taken on a number of innovative projects. This latest one that you're referencing, it really gets to the smart grid test beds. What those are is a collection of 3 different substations where we've decided these are the communities where we want to pack as much new technology into them and figure out what might the utility of the future look like. It really gets more toward a flexible distribution system where we are using demand response, customer energy resources, providing two-way power flow and actively monitoring the system at that distributive level, just to explore and see

what it would look like.

Q: Tell us a little bit about what you might be doing there that would apply to resiliency.

A: We're starting with demand response and trying to offer a variety of programs to secure as much demand responsive load as possible within those environments. We're also deploying our field area network communication systems, so there's a part of the radio spectrum that we purchased to be able to actively communicate with customer end-use devices. Finally, we have a residential energy storage program that we're making available with special incentives for the test bed environment in trying to get as many residences to adopt energy storage as possible. Through all of it, what we will be doing is we will be controlling and dispatching those energy storage units as well as demand response as needed to respond to system events or to manage the voltage profile on the feeders, to manage distribution congestion relief when needed and to explore the ability of these resources to really influence power flow and power quality on the distribution system. The ideal is to one day get to a point where we could even leverage these resources to effectively island and microgrid parts of the distribution system. If we're able

to do that, I think that really opens up the door to a whole lot of resiliency opportunity.

Q: A little known fact is your company has been ranked as the number 1 voluntary renewable energy program author in the country. Does that mean you think that some of this technology is going to be more readily embraced, perhaps, in other parts of the country?

A: I think it is. We have a pretty progressive rate base. Our customers, they voluntary sign up for green energy. It is a higher cost to them, but it's also important to them-- the social value of renewable energy. I do think that our customers have a readiness and a willingness to adopt some of these more forward-thinking measures which works in our favor. Like I mentioned before, we pride ourselves on being innovative, and we can't do that without a customer base that shares that interest.

Q: I want to ask you about some of the low-hanging fruit that you're able to seize. TriMet which is your local bus authority is converting 2 of their bus depots to all electric facilities, and at one, you're planning to put in battery storage at a site that's fairly close to the state 9-11 center. Can you talk a little about that and the kind of opportunities you're able to seize at that project and

other proctors?

A: Yeah, I would like to clarify that that project is an interest that we jointly have. We want to do energy storage as part of their electrification for that bus depot. We are not yet at a stage where we have identified property to be able to do that. What makes this one particularly interesting, like you mentioned, is it does share, right across the street, there's the 9-11 center and emergency operations center for Multnomah County in the city of Portland. To be able to microgrid that area, I think, could provide a lot of resiliency community benefit. The other thing that is really interesting about having energy storage co-located with a large charging site for TriMet's busses is-- we are expecting, especially when we get to the point where we have fast-charging, DC fast-charging for heavy-duty vehicles. These could be chargers in range of 1 megawatt or perhaps even larger. That's the type of load that, when you're dynamically hitting the distribution system with multiples of these at the same location, turning on and off throughout the day, it has the potential to cause a lot of disruption on the local distribution system. What we're looking to do is deploy these with energy storage and use the energy storage sort

of like a buffer between the charging infrastructure and the distribution system so we can mitigate those impacts on the distribution system thereby enabling us to serve more charging infrastructure, more DC fast-charging load.

Q: Since we're talking about partnering with the community, take a minute to describe how you've been able to partner with the city of Beaverton on their public safety center.

A: How we were able to partner with the city of Beaverton?

Q: Yes.

A: Yeah, so we do maintain a communication with all of our city partners on a pretty regular basis. We the city of Beaverton, we became aware of their plans to develop this resiliency center, the Beaverton Public Safety Center. It's a police station. They had goal; they wanted this to be very forward-thinking. They wanted to use renewables, so they were already intending to put their own PV solar on the building. They had set aside space in their designs for energy storage. It was not something they were intending to purchase and install right at the onset, but they wanted to make sure those provisions were made. When this opportunity came up through the Oregon House Bill 2193 in 2015, you know, this was in the back of our mind. We knew the Beaverton Public Safety Center was one candidate



site that could potentially receive one of these batteries, utility batteries for microgrid. We kept those communication lines open. When we got deeper into the evaluation, we had identified that this would be a strong candidate site. We had a willing customer who had already invested a lot of their own capital in designing a site that would streamline the inclusion of a battery and really facilitate our ability to execute on this in a timely manner.

Q: What's the status of this project?

A: This project is scheduled to open-- I believe the ribbon cutting will be in about 4 weeks. Now, the time line had shifted some because of the COVID impact. Originally, we were hoping to have the ribbon cutting in April, and that's been pushed out a couple of months, but the construction is done. We are going through the process of commissioning the microgrid now, and it should be live here in less than a month.

Q: Okay. You mentioned House Bill 2193. Help clarify for me one of its provisions which says that the energy storage capability should not exceed 1% of your peak system load. Does that give you enough room to grow, and what's the thinking behind that limit?

A: Yeah, it's kind of funny. Internally, we had a lot of discussion about what that means. Because if you look in the house bill, it says the peak is not to exceed 1% of your peak load, referencing summer 2014. For us, that's almost 4000 megawatts of peak load, peak that we'd be allowed to invest in for energy storage. It comes to 39.4 megawatts. The unit is really important. 39.4 megawatts as a peak-- but the minimum that we need to invest is at least 5 megawatt hours. You will notice that those are 2 different units: 5 megawatt hours up to 39.4 megawatts. It really leaves it open for us to interpret what that means. What exists in between those 2 values?

Q: Just as 39.4 megawatts-- is that an aggregate of all the storage that you might deploy?

A: Yes. That's correct.

Q: I mean, do you think you'll hit that in the next 10 years or 2 years? What does that mean in the real world?

A: Well, in our original proposal to the commission, we did purpose 39.4 megawatts of energy storage. We wanted to meet the maximum that's allowed under House Bill 2193. We feel energy storage is a very important part of the future, and we wanted to get as much learning opportunity as possible. Through negotiations with our stakeholders, we

arrived at a place that cut that almost, not quite, in half, but it did pare down the amount of storage that we would be allow to install through this House Bill. Now, that doesn't mean that we're restricting from investing in future energy storage projects outside of the House Bill. What it does mean is that cost recovery would be subject to us proving cost effectiveness of any other projects. The thing that's especially interesting about the House Bill is it gives us some opportunity to invest in energy storage without being handcuffed to the cost effectiveness. There's a recognition that some of these projects, they might not be 100% cost effective right now. We don't know. In fact, we don't know what we don't know. That's the whole point is not to use that as a barrier that keeps us from investing in storage and learning what storage can do for the system.

Q: Great. Thanks for talking to us Darren.

A: Yeah, definitely. It was a good conversation. Thanks for having me.

Q: Thank you for listening to the Voices of Experience: Microgrids for Resiliency podcast. For more information on the Voices of Experience, please visit [SmartGrid.gov](https://www.smartgrid.gov).  
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