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***Battery + Storage Podcast: Duke Develops Flexible Energy Storage Options to Enhance Reliability and Maximize Value With Laurel Meeks, Duke Energy***

**Hosts: Bill Derasmo and Josh Combs**

**Guest: Laurel Meeks**

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**Bill Derasmo:**

Hello, and welcome back to the Troutman Pepper *Battery + Storage Podcast*. I am your host, Bill Derasmo. But today, we have stepping in as a guest host, my colleague in our Atlanta office, Josh Combs. Josh will be interviewing our guest. We're very pleased to have Laurel Meeks from Duke Energy. Laurel is the Director of Energy Storage Development at Duke, and I will now hand the baton to Josh. Josh, take it away.

**Josh Combs:**

Thank you, Bill, and good morning, Laurel. I'm really excited to do the podcast and to chat all things energy storage development with you. Good to see you.

**Laurel Meeks:**

Thanks so much for having me.

**Josh Combs:**

I'd like to first talk a little bit about, let the audience know your background and your path that you took to arrive at Duke Energy, I guess, and to the energy storage space. If you could talk a little bit about that.

**Laurel Meeks:**

Absolutely. I am currently in a director role leading the Storage Development team. I've been with Duke for five years, working on storage development. I've seen the program grow from its infancy. Prior to working at Duke, I did an energy MBA at Kenan-Flagler. Before that, I worked in energy efficiency. I've had a long history of a passion for the clean energy industry, and I got an undergraduate degree from Carolina as well. Double Tar Heel, I could not stay away from Chapel Hill.

**Josh Combs:**

Fortunately, or unfortunately, somewhere along that path, we had the chance to meet each other and work together. I'm definitely happy to have you here, and want to dig into some of the development and projects that Duke is doing across the country. If you could just talk a little bit about the overall strategy and focus of the storage development team and your role and as it relates to Duke Energy future.

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**Laurel Meeks:**

Sure. Our team of project developers is focused on the development and deployment of standalone storage across our regulated jurisdictions. Duke Energy operates its electric utility business in six states. We have the opportunity to deploy standalone storage as a capacity and energy resource and a reliability resource in all of those jurisdictions. What we do well is strategically site storage to maximize the grid value and lower the end cost to customers.

On a day-to-day basis, what that looks like for us is originating projects, negotiating procurement contracts, land contracts, interconnection agreements, and generally, making sure that projects are buttoned up, so that we can turn them over to our construction execution partners.

**Josh Combs:**

As with that focus and strategy in the regulated utility space, talk a little bit about when it, as it relates to planning and operations that are regulated utility, how does the storage development team and your work fit into that process?

**Laurel Meeks:**

Duke Energy has made a corporate commitment to transition its electric generation fleet to net zero carbon by 2050. Doing so, means we're going to have to change the electric generation resources that are currently on the grid. We'll see a varied fleet, a very diverse generation fleet, including low-cost, intermittent renewables. Those are necessarily going to be balanced by energy storage and multiple forms. That's where we fit into the puzzle piece of the net zero transition and also, supporting our grid reliability and customers' energy needs.

**Josh Combs:**

I think that you said there were several jurisdictions. What are the regulated jurisdictions in which your team works on developing these projects?

**Laurel Meeks:**

We operate all across the Eastern Seaboard. We have operations in the Midwest, in Indiana, Ohio, and Kentucky, in the Carolinas and North and South Carolina, and also in Florida.

**Josh Combs:**

Okay. I'm sure that in each of those states and service territories, there are probably different considerations and different ways in which storage is being developed. I'd like to talk a little bit about the specific aspects of development within each of those states that you mentioned. Starting with North Carolina, what are some of the drivers of storage development in North Carolina, and what is the company's early experience developing in North Carolina?

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**Laurel Meeks:**

This is a great question, because each jurisdiction has different legislation, policy, and economics. We are all balancing the same Duke Energy Corporate Commitment of net zero by 2050. In North Carolina, we've been a leader in storage development. You can see that through legislative frameworks, including House Bill 951, that directly aligns with the Duke Energy Corporate goal of reliably, cost-effectively serving customers, while also providing direct line of sight to carbon intensity goals for the electric generation fleet.

And North and South Carolina, one of the first drivers of investment in energy storage was the Western North Carolina's modernization plan. This was a first example of a public and private partnership to deploy clean technology. For the Western North Carolina's modernization plan, Duke found significant community support to defer a planned transmission line run through upstate South Carolina by using new energy solutions, including retrofit and reconfiguration of a planned combined cycle and the addition of battery and solar.

Today, we have 13 megawatts of battery energy storage and service in the Carolinas, with an additional 60 megawatts of energy storage planned, along with 9 megawatts of solar. Solar and storage is actually planned to be cited adjacent to that now constructed and operating combined cycle in Nashville. More is to come in the Carolinas. That is for sure.

**Josh Combs:**

For that first initial wave through the Western Carolinas modernization plan, my understanding is that there was a microgrid project that was a part of that policy process. Laurel, could you talk a little bit about the Hot Springs project that came out of the Western modernization plan?

**Laurel Meeks:**

Absolutely. Hot Springs microgrid is a show piece project, certainly, because it is an inverter-only microgrid in a rural and remote community in North Carolina. Of course, that did support the Western North Carolina's modernization plan that had benefits for both North and South Carolina customers. Interestingly, this was a way for us to use battery energy storage technology to support a local reliability need, while also using this system to dispatch for the benefit of all Duke Energy customers across our balancing authority.

What Hot Springs microgrid did was actually defer needed investment in a new transmission line, running to a rural, or on the grid isolated town of Hot Springs in North Carolina that was experiencing a high amount of loss of normal utility service. Today, that microgrid dispatches every day for the benefit of all Duke Energy customers as a production asset. If that town of Hot Springs, that community experiences a loss of normal utility service, the microgrid kicks in and islands that community and provides backup power, so that businesses can continue to operate, homeowners can still use their power.

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**Josh Combs:**

Yes, that's very good information. I think that the inverter only aspect of that is something that was definitely unique about that project. You mentioned, I think, 13 megawatts are currently in service in North Carolina. I've heard you and other folks in the industry talk about storage as serving as a Swiss army knife for utilities. You've talked about some of those potential benefits that storage can provide for customers. Can you just dig into that a little bit more about how some of these initial projects have validated some of the benefits and use cases for storage and for regulated utility?

**Laurel Meeks:**

We love that acronym. Storage is a Swiss army knife. That's because storage can provide so many different grid services. It can dispatch as a capacity resource. It can do energy arbitrage, which buys down the cost of operating the fleet charging, when power is low cost and widely available and then discharging, when energy demand is at the highest. Storage can also serve as a cost-effective way to defer investment in distribution solutions and transmission solutions.

A great example of that is our continued investment in battery energy storage at the distribution scale within a microgrid configuration to increase local reliability, where other traditional solutions really aren't applicable, or feasible for customers. We have experience dispatching, as I previously mentioned, these batteries to the benefit of the bulk electric grid as a capacity resource and doing energy arbitrage. We're testing that. We're getting better and better at dispatching operations every day. I think some of these early investments and use cases really are validating that those grid services are able to be served by batteries.

**Josh Combs:**

This is obviously, particularly important as the entire industry is undergoing a transition, a declarative transition. Definitely using storage as a complementary resource during this time, I'm sure provides great benefits to the utility and the customers.

**Laurel Meeks:**

Yes. Storage can be complementary to many different grid resources. I did mention the necessity of balancing low-cost intermittent renewables with energy storage, but let's not forget that energy storage can be a way to smooth the operation and lower the cost of dispatching and operating fuel resources, like natural gas plants and even nuclear. For example, we have a really amazing resource in our fleet today, our Bad Creek Pumped Hydro facility that was actually built to complement our nuclear fleet, and was dispatched at some point in the past to charge when nuclear was overly abundant and then discharged when the power grid needed it the most.

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**Josh Combs:**

Similar to the way we talked about North Carolina, could you talk a little bit about Florida to the extent that there are particular nuances, or differences in the way that the company is developing and deploying storage in Florida?

**Laurel Meeks:**

Florida is a state that's currently delivering low-cost reliable power, but that has a diversifying fleet, including clean tech. We have solar on the grid today in Florida and the 10-year site plan, which is the integrated resource plan, or capacity model for Florida has selected more solar and intermittent renewables as a part of the ideal capacity fleet. That's going to need to be balanced again by storage. This year, we saw that that 10-year site plan did select several battery energy storage systems, including a standalone storage asset and storage that's paired with solar.

**Josh Combs:**

How does the company, as you're approaching, so if there's a need identified for storage, how does the company then determine whether it's going to be solar paired with storage, or just a company, or just standalone storage without another resource?

**Laurel Meeks:**

Well, that's a great question for an integrated resource plan modeling expert. We have really amazing analytical experts at our company, who determine what the appropriate inputs are for our capacity expansion models, or our integrated resource plans. They run these models over and over again to determine how we need to cost effectively serve our growing energy demand with a variety of potential capacity resource types, whether that be storage, solar, natural gas, wind, etc.

One of the distinctions that I'd like to call out with storage is that it does have the ability to create, or make – it does have the ability to complement solar and make solar a dispatchable resource and therefore, could be a capacity resource. There is a place and a capacity expansion plan for both solar paired with storage and standalone storage. Ultimately, those modeling experts, these analytical experts will determine the right ratio.

**Josh Combs:**

Great. Moving to the Midwest, to Kentucky or Indiana, which interestingly enough, I'm originally from Kentucky, so there's part of Kentucky that considers itself to be the southeast, but I realize that it's a part of your Midwest service territory. Could you just talk a little bit about the storage development in those areas and what you're seeing in those service territories?

**Laurel Meeks:**

Well, Josh, we love Kentucky. We operate in Indiana, Ohio, and Kentucky. It's important to note that we only own electric generation in Indiana and Kentucky. As a part of a capacity expansion

model, storage would be a part of a solution within those two states. We are seeing the Midwest determining how storage can be a part of that cost-effective portfolio. They're contemplating how to do that within the context of the energy transition.

We do have three operational battery energy storage systems today online in Indiana. I'm very proud of that fleet. There are three approximately 5 megawatt, one-hour duration assets that are currently dispatching into the MISO market, and that have the opportunity and ability to microgrid, or island critical loads.

**Josh Combs:**

When you say critical loads, for those in the audience who may not know what that means, could you elaborate on that a little bit more?

**Laurel Meeks:**

Of course. An example of that would be our Camp Atterbury Battery Energy Storage System, which again, is operating and dispatching for the benefit of all Indiana customers into the MISO market, but has that opportunity to isolate itself from the electric grid in the event of that loss of normal utility service and backup Camp Atterbury, which is an army national guard base. Really critical. We're maintaining the reliability of the grid for customers and we're maintaining and enhancing national security. Who doesn't want that?

**Josh Combs:**

Absolutely. When you think about the future, so in the battery chemistry and what we're seeing going forward, and that first, you ask, are all of the batteries that we talked about here, or the storage projects been lithium ion that's been the battery chemistry?

**Laurel Meeks:**

This is such an important question. I did refer to our existing pumped hydro resources earlier on our chat. It's an important point to make, because we have decades-long experience operating energy storage. In the short-term Duke Energy plans to invest in short-duration lithium-ion battery energy storage. That's what my team is working on today. There's technical reasons, there's commercial reasons why that short-term investment will be in lithium-ion. Looking beyond the 2020s into that commitment for net zero energy by 2050, we will need to invest in other types of energy storage technologies, including long duration storage technologies.

**Josh Combs:**

One of the quotes that I had read that you had said previously that I feel like, I would like for you to elaborate on, because it perfectly speaks to the future. You said that it's really exciting to not only reimagine the grid of the future, but reimagine sites that have been traditionally used for power plants as a part of that transition. I think that that has implications, both in terms of federal legislation that we've seen in just the overall future of the industry. Could you talk a little bit about that and as it relates to the future of Duke Energy's storage program?

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**Laurel Meeks:**

We have the opportunity to be really creative and really smart and how we plan for the transition of our electric fleet into the future, to be able to provide customers the energy that they need at a low cost and with increasingly low carbon intensity. As an example of what I talked about in that particular quote, let's talk about the Asheville plant. Asheville, North Carolina is its own balancing authority. It's a very small balancing authority that was previously served by one legacy coal plant. That coal plant has retired and was replaced by a combined cycle, a very highly efficient combined cycle.

We stated that we plan investment and solar and storage on site. The intention is to construct that and put that in service to the benefit of customers in 2026. How neat is it to see a site with a retired coal plant revitalized to not only continue reliably serving the region, but with less carbon density? I'm very excited about those projects, and I think the community is as well. A bonus there is that now, we have the opportunity to buy down the cost of that clean energy investment at that site with the investment tax credit rules that were recently passed by the federal government, where if you cite clean energy technology projects on the location of a retiring coal facility, you get an ITC bonus adder. You're buying down essentially 10% more cost of the project for customers using that federal ITC tax incentive.

**Josh Combs:**

It's interesting that you mentioned that. We talked about, me being from Kentucky, I know that in a lot of these areas, my market was from Eastern Kentucky, those communities have been built around and dependent upon coal plants. To be able to go back and still provide and invest into those communities, I feel like, it's important and an added benefit to your work.

**Laurel Meeks:**

Absolutely. We have to be very sensitive about our communities and stakeholders, while we're embarking on the clean energy transition. One of the ways that we can be sensitive is retraining, retooling the workforce, right? Reinvesting in the communities that have legacy energy infrastructure and making sure that we maintain a tax base for those communities. There is a local benefit to investing in new combined cycles, new solar, new storage at these sites and making sure that community has the opportunity to work at those facilities and has access to that tax-based contribution as well.

**Josh Combs:**

I know that, I think, one of the – some of the work in Florida may be citing projects in those communities. You talked about that helping with the cost effectiveness. Leveraging those federal opportunities, or other opportunities, how are you using those incentives as a way to continue expanding energy storage across the service territories?

**Laurel Meeks:**

You're asking a little bit more about strategic citing, which is so important to touch on. There's two ways to think about strategic citing. One is to maximize grid value at a particular project location. That may mean stacking grid values. Let's take the example of Hot Springs, where we're going to serve as a capacity and energy resource for the bulk electric system and a local reliability resource. It's a project that does two things at once. The other way to look at strategic citing is where can we cite a project to minimize cost to the customer? That means, looking at these brownfield sites within energy communities that are applicable for that ITC bonus adder, advise down the cost of that investment.

Additionally, if we're looking at existing sites, we already own the land. We don't need to buy more land. We already may own interconnection facilities, substations and transmission lines. If we can get a lower cost interconnection there, that's also a way to save money for our customers.

**Josh Combs:**

Absolutely. Just to wrap things out, you said, I think that you've been in the storage development space and on this team for five years. As you look five years ahead, or 10 years ahead, what do you hope is the future for storage at Duke Energy, and what do you see on the horizon?

**Laurel Meeks:**

Well, let's talk about the workforce of the future, because it's always on my mind. My team is always in need of talent. This industry is always in the need of talent. When I look to the future, what gets me excited is building a new workforce. That is really within many functional roles. I support a business development function, but we need smart minds, strategic thinkers working in finance and engineering and project management, technology development within the storage industry. I don't want to leave this subject without hitting on the importance of diversity within that workforce for the storage industry. It's really critical. That a diverse workforce can provide the best, creative solutions for where we need to get as a electric utility and as an industry.

**Josh Combs:**

That's great to hear. I know I've been fortunate to work with you and your team and to see some of the development and the execution of these projects and really appreciate you taking the time to chat with us today. I don't know if our expert Bill wants to hop in and say a final word about anything that we've talked about, but I know that we certainly enjoy you being here and appreciate your time, Laurel.

**Laurel Meeks:**

I really appreciate you hosting me, Josh. It's been a pleasure to work with you. I see you as a rising star in the legal energy industry. I hope we get to chat again soon.



**Josh Combs:**

Yeah, thanks so much, Laurel.

**Bill Derasmo:**

Thank you for joining us today. Josh, great job. I would echo Laurel's assessment that you are a rising star here. We appreciate you stepping in as a guest host. Of course, Laurel, very nice to have you on our program. We appreciate you sharing as much as you did about Duke's plans and your team's plans and a lot of interesting development within Duke on this issue. In a lot of themes, I think that you hit on that, or echoed in a lot of other episodes. We really appreciate the time today.

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