Formal Case No. 1050

In the Matter of the Investigation of the Implementation of Interconnection Standards in the District of Columbia

and

Case No. RM40-2022-01

In the Matter of the 15 DCMR Chapter 40 - District of Columbia Small Generator Interconnection Rules

Moderated by Dilip Kommineni

Thursday, April 10, 2025

10:00 a.m.

Public Service Commission of the District of Columbia

1325 G Street N.W., Suite 800

Washington, DC 20005

(202) 626-5100

Reported by: Olivia Thompson

JOB NO: 7282592

CONTENTS

A P P E A R A N C E S

List of Attendees:

Vasheena Butler, Regulatory Docu-Manager PSC

Harry Warren, Center for Renewables Integration

Linda Gray, GDS 7 Associates

Abraham Kebede, PSC

Nina Dodge, D.C. Climate Action

Dilip Kommineni, PSC

Knia Tanner, OPC

Taylor W. Beckham, Pepco

John Gorman

Maria Brown, PSC

Jason Cumberbatch, OPC

George Aleksandra, OPC

Albert LaFrance, Solar Solution

Nicole Rentz, New Columbia Solar

Kunle Adeyemo, Pepco

Roger Fujihara, PSC

Alex Woodward, PSC

Hunter Davis, PSC

Kevin Mara, GDS 7 Associates

Dollie Banks, PSC

A P P E A R A N C E S (Cont'd)

List of Attendees:

John Budd, Pepco

Thomas Bartholomew, DOEE

Hussain Karim, DOEE

Julianny Tate, Pepco

Laura Ward, DOEE

Brian Lydic, IREC

Adam Carlesco, OPC

Pamela Nelson, OPC

Lonko Tuma, Pepco

Tasha Kaewnukultorn, Pepco

Jack Bertuzzi, Ecogy Solar

Yohannes Mariam, OPC

Ashok Sundaram, Pepco contractor

Kimberly A. Curry, Pepco

Thomas Olmstead, PSC

Jason Turner, PSC contractor

Olivia Thompson, Veritext reporter

14344662188, Unverified

12022564327, Unverified

P R O C E E D I N G S

MR. KOMMINENI: Okay, group. I am Dilip Kommineni, Chief of Climate Action at PSE. I will be hosting today's call in the absence of Brian Edmonds. Today's session will be recorded, and also, we have a stenographer on the call who will provide the transcript. So I would like to request folks who are speaking up to state their name, and spell out their last name, so that the name can be captured.

With that said, I'm also looking for a volunteer to take the minutes. I know -- is there any volunteer who wants to take the minutes for today's call? All right. I'm going to call out someone here. I know in the past, DOE and Pepco had taken the minutes, so I'm just wondering if OPC or IREC could help us take the minutes this time.

MS. TANNER: Good morning. This is Knia Tanner from OPC. I'll take the minutes. I don't mind.

MR. KOMMINENI: Thank you, Knia.

With that said, we will go through the agenda. Let me bring it up. You guys can see my screen. I think a couple of major topics for today's meeting is Pepco is going to present about the inverter default setting, and then followed by DOE presenting their advanced inverter roadmap.

With that said, I'm going to ask folks to stand by as they present. Once the presentation is completed, we'll open up for questions so we can move forward.

With that said, I am going to hand this over to Pepco to present the default setting. I'm going to stop sharing, and give the control to Pepco so that they could present their information.

MS. BECKHAM: Hi, folks. This is Taylor Beckham, assistant general counsel for Potomac Electric Power Company. I'll go ahead and share my screen with our presentation in just a moment. And John Budd is going to give us a presentation.

So John, if you're ready to go, I will turn it over to you.

MR. BUDD: All right. Thank you.

Good morning. My name is John Budd, J-O-H-N B-U-D-D. I'm going to be presenting on

Pepco's default inverter settings today.

The default settings at Pepco Holdings are uniform across all four of its jurisdictions, all three of its opcos. So everything that you see here today is also the same in Maryland, Jersey, and Delaware. With that, we can get started. If we can go to the next slide, please.

So the high-level goals of our default inverter setting profile, which I'll go through in a little bit more detail in the next ten slides, are to minimize energy curtailment, increase hosting capacity, and ultimately keep our grid safe, stable, and reliable, with an emphasis on trying to interconnect DERs to our system.

As, you know, we learn more about this, as we evolve and get more field experience, we do anticipate that, over time, these settings are not set in stone. They could change. A lot of utilities across the nation are learning from these types of default settings, so it is an evolving process, is what I'm getting at. Go to the next slide.

So the first part of default settings

are the performance categories, and IEEE 1547 divides these into two performance categories. One is abnormal operation.

So when we talk about "abnormal operation," we're talking more about the inverter's capability to support the bulk electric system reliability needs. This is to avoid widespread tripping of DERs, and that has happened in places like Australia and California. And so standards were adopted to try and head this off before it becomes a problem in other areas, and that's to basically give the inverters something called "ride through" capability, and this allows the inverter to stay connected during wide grid disturbances.

At PHI, our default setting that we chose for this was Category 3, which is considered the higher penetration of DER ride-through performance. So you choose the higher category if you expect to have higher penetrations of DER. Go to the next slide.

The second category, or operating performance requirement, is around normal operating performance, and it's split into Categories A and B. PHI's default setting is Category B, and effectively, this just stipulates certain capabilities that the inverter must have.

In general, Category B is a little bit more rigorous. It requires the inverter to have more of an extended set of voltage regulation capabilities that Category A might not have, and this allows for the DER and the utility to use the inverter in ways that maybe you could not have in the past. Next slide, please.

So the second set of settings are the protective trip settings, and we'll go over this in table form. I won't go into detail here, but effectively, these are the settings at which DERs must protect themselves and disconnect from the grid.

Guidance was taken from PGM, so we made sure that our under-voltage set points for this align with PGM's recommendations and guidance. Ultimately, these are aligned with the IEEE 2018 and 2020-A Amendment recommendations, and ranges of settings for DERs to trip off. And the PHI default requirements are circled, or squared off in red. Next slide.

The frequency trip settings, as well, follow the IEEE guidance. And we use the IEEE defaults here, and the PHI defaults follow those defaults shown below in red. Next slide.

We require anti-islanding protection to be turned on. This is a pretty simple one. This just ensures that the inverter will disconnect from our electric grid in two seconds or less. And we do require, for larger DERs, the customer, at our request, to disclose that method of islanding. Different OEMs for inverters have different islanding detection methods. An island is really just the ability of an inverter to back-feed into our system. Go to the next slide.

The next default setting is called the "enter service setting." The enter service setting is how a DER turns on, or enters service into the PHI electric grid. So there are certain criteria that need to be met for a DER to turn on. In other words, it will not connect unless these minimum ranges are met.

So for example, the PHI default settings follow the IEEE defaults. So for example, it will not connect if frequency is out of bounds. So if frequency is below some certain amount, if you see there 59.5 hertz, or above some maximum amount, it will not enter service, or connect to the PHI distribution grid. And there's similar requirements for voltage, as well. If voltage is above 105 PU per unit, it will not connect, right? So we follow these ranges from 1547.

All right. The default voltage regulation settings for PHI, these are probably the meat. So PHI's default voltage regulation requirement is to use Volt-Var. There are five main ones that you can select from. So the simplest one is constant power factor, and that's what we had used in the past. That's just basically all real power, or let's say power that is sold back to utility.

There are other functionalities, though, that provide ways for the DER to mitigate some of the problems that it might cause. So the default setting that we selected at PHI was Volt-Var, and in

Volt-Var mode, the DER basically has the ability to regulate its local voltage by injecting or absorbing reactive power. Go to the next slide.

For that particular setting that we chose as our default, there are more technical settings. And I won't go into detail here, but effectively, there is a default curve that PHI has, and that's shown on the right there in that little graphical plot. But that sort of depicts how the inverter is set to regulate voltage at its local terminal, where it's connected to the electric distribution system grid. PHI's defaults are shown in red.

Frequency regulation. So this is more of a bulk system support functionality, as well. But in some cases, the DER, if there is not enough generation in the, say, local bulk electric system grid, the frequency might start to dip, or it might start to rise if there's too much. And so the smart inverters have this particular setting built in, and PHI has selected the Category 3 IEEE 1547 defaults. Basically, this setting is here because it will try and either increase or decrease DER output if the frequency starts to get too low or too high in a given region. Go to the next slide.

And of course, if you want to see these default settings and default, you can look at our website. If you go to the next slide, I have the links here. There's two links. So the base link is the acceptable inverters link, and we showed that at the last, maybe few meetings ago, for this working group. And then within that link, if you dig down into it, there's going to be another link, which I have shown below it, but there'll be some writing, as well, that actually has the default setting addendum, which sort of outlines it in a more English-friendly format. It's not like a computer program format. It describes some of these different default settings, if you wish to dive further into it and see a little bit more detailed view of what these default settings are. But you can look at those two links on our website to get more information on the PHI default inverter settings.

And that's it. Are there any questions

about default settings at PHI? All right. Well, thank you for your time.

MR. KOMMINENI: Thank you, John. I think I see a question. Kevin has a question.

MR. MARA: Yes. This is Kevin Mara, last name's M-A-R-A, representing OPC. Are you using the same default settings on your spot network?

MR. BUDD: Yes. So the default settings apply across all voltage levels, so to speak.

MR. MARA: So it doesn't matter if it's on spot network or radial line; it's the same? Or on a network, not a spot network.

MR. BUDD: Yes. Of course, depending on the application, if a site-specific setting is recommended, that will obviously change it. But if we're talking about defaults, it is the same.

MR. MARA: Okay. And I had a follow-up question. So on your overvoltage setting on slide 7, at 110 percent, you had a two-second clearing time; is that right?

MR. BUDD: Yes. Clearing time is two seconds. Yes.

MR. MARA: Okay. And where is that over-voltage measured? Is that measured at the point of common coupling, or at the inverter itself?

MR. BUDD: It is measured at the -- so for your smaller sites, in all practicality, the point of common coupling is going to be effectively at the inverter, because the impedance is super small, and there's no transformer. For larger sites, where the point of interconnection is at the point of common coupling, these trip settings will be applicable at that point of common coupling for the customer interconnecting.

MR. MARA: Okay. Thank you.

MR. KOMMINENI: Kevin, if you're all set, I'm going on to Mr. Warren.

MR. WARREN: Yeah. Hi. Say, thanks very much, Dilip.

Hey, John. Just a follow-up on the question that was just asked, for clarity. So you use the same inverter settings across all the different voltage configurations on your system. However, if you're on a networked service, you're also going to have some additional controls that don't allow export, or require minimum export from a building; right?

MR. BUDD: Yeah. So in those cases, where the active power curtailment function would be activated, that would be more of a, what you might call a "site-specific;" right? Because that level of curtailment is going to be different, potentially, in every single case.

MR. WARREN: Right. But it's related to -- just so I'm clear, it's related to building output. I mean, it's not really so much worried about -- like, on a radial circuit, I think of an inverter; when it gets to the point where it's exporting power into the distribution line, that's where it's looking to use its Volt-Var, or volt watt settings to control voltage; whereas, if you're on a network service -- are you allowing a custom volt watt setting to be the mechanism that that reads line voltage and controls the inverter that way? Or do you ask for some additional controls that affirmatively makes sure there's no export or minimum import?

MR. BUDD: So on a network service,

volt watt would not be the correct setting. It would actually be the real -- let's say the the active power curtailment setting would have to be enabled. And generally, what would happen is our engineers would do some kind of analysis to figure out what that minimum import is, and --

MR. WARREN: Yep. Okay.

MR. BUDD: Okay.

MR. WARREN: And the inverters, then you allow the inverter itself to be configured to achieve that objective? You don't require necessarily additional controls?

MR. BUDD: Well, okay. So additional controls are required, but you can't do that sort of thing without programming the inverter; right? Because --

MR. WARREN: Yeah. Okay. I hear you.

MR. BUDD: -- the reality is you can put a relay, and we do require that in many cases. But if you just put a relay, you don't want the customer tripping, so the inverter also has to be configured to curtail that output.

MR. WARREN: Okay. Got it. Okay. Thanks. And I do have a couple other questions for you, John. So I think I saw on your cover slide that the presentation package was dated, like, was it dated as January 24? Which I think is when all these went into place; right?

MR. BUDD: Yeah. So that's all I was trying to communicate there, was that this all sort of has been in effect since, you know, January 1 of last year.

MR. WARREN: Right. Question, then. I think in the Maryland Interconnection work group, there were some comments made. I seem to recall, and maybe there's someone from IREC on the phone, that IREC made some recommendations about kind of tweaking some of the inverter settings that you had; I think some of the Volt-Var curves. Have you guys -- do I recall that correctly? And if so, has PHI been considering, or is it in the process of considering any adjustments to the fine details of these settings in response to the comments over the last year or so?

MR. BUDD: So on slide 2, I put in

there, right, like, this is a learning experience. And I think, yes. Part of what we're doing is, you know, as we get more field experience, and things evolve and change, these settings could evolve and change over the years; right?

I don't recall an IREC-specific recommendation from the Maryland working group. It was a while back. But we do take feedback from all different types of stakeholders, and try and balance that against some of those objectives there that we show what we're trying to do when we set a default profile. And it's hard, because everyone has their own needs and wants, so we're trying to balance those among the different objectives and needs.

MR. WARREN: Okay. But at this point, there's no sort of active -- there's not a -- we wouldn't anticipate some change in the near future. At this moment, we're still gathering data, and see where that goes.

MR. BUDD: Yes. Yes. Definitely.

MR. WARREN: Okay. And then one third question -- I'm "Question Man" here -- at the inverter workshop that my group co-sponsored back in December, you had raised a question for the group about whether some consideration of, you know, volt watt settings as an additional way to control things, to allow, you know, to possibly improve hosting capacity further; whether that was something people might want to talk about. Where is PHI at this point, in trying to invite, or, you know, consider how to approach that?

MR. BUDD: Yeah. So in Maryland, we have a pilot that we're trying to push out there. And really the concern, right, that we've heard about that setting is this first point; right -- minimize energy curtailment.

MR. WARREN: Yeah. Yep.

MR. BUDD: And you know, we're considering it; right? And the question is how much are we going to push against that curtailment of energy? Because -- and that's sort of what we're trying to evaluate with that pilot. Is it going to be so much to where it's not going to be worth it? Or is it something, on average, that it will be so small that, hey, we can push our system?

We can put this -- we can maybe explore considering this setting that you mentioned to try and push more on the second objective there.

MR. WARREN: Right. Right. Okay. And that pilot, you say you're trying to push that out. So am I right, I mean, the results of that pilot, you know, if that gets moving quickly, would be a couple of years out of kind of running that pilot? Is that the timeframe?

MR. BUDD: Yeah. I believe it is a few years, we presented recently, in one of our Maryland working groups around that pilot.

I'm not on the project management side of it, so I'd have to defer to them. But I know they're in the process of trying to get approval, I think, for that. Final approval to go forward.

MR. WARREN: Right. But going back to the earlier question, volt watt is still something that's on the menu of possible custom settings for any particular installation if it might appear that that's a beneficial approach, right, in D.C.?

MR. BUDD: You're talking about site-

specific settings.
MR. WARREN: Yeah, site-specific. That was the term I was looking for, yeah.
MR. BUDD: Yeah. So when we go through -- yeah. So if you look at the IEEE standard, they list out all the different capabilities that are available if an inverter meets that certification. So within that standard and what's certified by it, all those different capabilities are potential tools that you could use for a site-specific setting, so to speak.
MR. WARREN: Right. Okay.
MS. BECKHAM: And I'll just add, Harry, I think in our technical interconnection requirements, site-specific settings are -- we use our default settings for those systems that are below 250 KVA; we utilize site-specific settings for those systems that are above 250 KVA. And that's in that technical interconnection.
MR. WARREN: Yeah. Which actually, that raises an interesting issue that, you know, maybe should be discussed at some time, as to whether, you

know, if that 250 KVA cutoff, you know -- are there ever opportunities to use those site-specific settings on smaller systems that would be beneficial, you know, to them.

I also, actually, have always wondered, I think you brought this up in a prior meeting, this 250 KVA cutoff, maybe, when we were looking at TIRs. And when I flip that around, I also wonder if some of -- if the goal of these advanced inverter settings in part, right, is to increase hosting capacity. What is it about the Pepco system in D.C., where you would not want to employ site-specific settings, like, for smaller systems; you know what I mean?

Are there any chances where we're -- are we leaving anything on the table because we're not applying the most sophisticated, you know, set of settings to something smaller than 250? Because I don't know what the distribution of systems is in D.C., but I'd imagine there might be a reasonable number of, like, commercial, or some of the smaller C-segs that might be in that sub-250 range. So you know, just a question as to where that cutoff came from. Is that anything that we should visit at some point, to see if we're getting the most bang for the buck, if you will, out of the inverter settings?

MS. BECKHAM: I will let, if John knows, speak to, like, where the 250 cutoff came from. But I think, you know, from a -- I don't want to say we wouldn't consider it, just as kind of the whole initial goals of the inverter default settings. We said, you know, it's a learning experience, definitely, thinking through how, as technology evolves, times evolve, how those settings can be updated.

I think one of the, just kind of general policies -- and again, from a non-technical aspect, site-specific settings require you to do a specific study. And just generally, with the proliferation of applications that come in, and the regulatory timeframe that the team has to evaluate an application, I think we created, or there is a creation of default settings so that we can, you know, more efficiently, and more -- I'm just trying to think of the right words here -- but, you know, process applications. So I think that's one of the considerations, you know. If you add in this step of doing site-specific settings for smaller systems, that's something that Pepco has to consider. And so I'm not saying that there wouldn't be, obviously, chances for us to rethink that 250 cutoff --

MR. WARREN: Right. No, I hear you. Yeah.

MS. BECKHAM: -- but I think we have to be mindful of that. Just one thought I had.

MR. WARREN: Oh. I apologize. Actually, now I remember back a couple of meetings; there's another little fine point I want to put on my question there. I think he said that below 250 KVA, you use the default settings. But I think I recall a comment where, above 250 KVA, unless you see a need for some kind of site-specific setting, you don't use any default settings at all; you use, not Volt-Var, but power factor 1.

And that was the thing I was confused about, because that's where I thought it sounded like, from a hosting capacity standpoint, like we might be leaving something on the table, because I didn't quite get, why would a larger system not have any Volt-Var correction unless you needed a site-specific setting; right, like, to minimize some interconnection costs?

So I know -- could you clarify that one for me? Because maybe, now that I think of it, that's where I thought we might be leaving, if you will, "hosting capacity" on the table by not applying that voltage correction to larger systems, also.

MR. BUDD: So for larger systems, the site-specific setting that we usually go with is unity power factor. And we do that for a few reasons. The main one is that the larger sites can negatively interact with things like capacitors, regulation equipment on our system.

And if there's no real need to employ that to try and reduce a voltage, right -- say there's no high voltage, because that's typically why we would deploy Volt-Var, or volt watt, right -- then there's really no need to try and cause the customer to lose energy, right? Because there might be a small amount of energy that they lose by deploying that. And so it's done for two reasons. So it's almost like we're focusing more on the third objective and the first objective; right? If there's not really a need to deploy that, then we just use unity power factor.

And once we get to the point where we're starting to see voltage problems, then we will deploy that, you know, our site-specific. We'll go from unity -- maybe we'll go to off-unity power factor. Or maybe it'll be something else entirely. Maybe it will be a limited export. Who knows; right? There's different ways we could go about a site-specific setting.

MR. WARREN: Yeah. Okay. So you're not really worried that -- so I guess -- I appreciate the particular thing you brought up about, you know, negative interactions with some of your electrical equipment. I could see that that would be a problem. But I guess you're not concerned, like -- I don't know. Maybe I'm just thinking about this too simplistically. But I'm just imagining, you know, the first big system that goes on the distribution line, you look at it and you say, "I'm not worried about a voltage problem there. We just leave it at unity power factor." And then the second and third systems that hook up to that line, you say, "Oh. Well, now that we've got this additional power coming onto this line, we are going to need some settings on those."

And I look at that, and I say, "Okay. Well, now everybody downstream of that first decision, they're the ones that have to take the burden of power factor correction." You've sort of lost that opportunity on the first person that hooked up, because, you know, you decided to set that at 1 at the outset.

I guess I was thinking that it's when all -- maybe I'm wrong about this. When all systems are operating in a consistent power factor correction mode, like Volt-Var, then, like, everybody benefits in terms of increased hosting capacity. And like, all the systems that are out there that don't do that today, I mean, in a way of speaking, that's like, a foregone opportunity over the years, to -- that now all future systems have to worry about handling the power factor correction, because all those older systems just don't participate.

Or am I, like, is the mechanical engineer in me, like, not appreciating the electrical engineering subtleties here?

MR. BUDD: I understand what you're saying; right? So you're sort of alluding to the cause or pay model --

MR. WARREN: Yeah. In a different way.

MR. BUDD: -- and how that applies to settings, right, in a different way.

MR. WARREN: Yeah. Sort of.

MR. BUDD: But like I said, there is a technical concern where it can interact negatively with our equipment, and we don't want that to happen.

And then furthermore, we actually do have the ability to go back and change settings; right? If the system changes, and as the system changes -- and if we start seeing problems on our system, we could require that customer to adjust that setting; right?

Back when we had only power factor adjustments, constant power factor adjustments, we didn't have things like Volt-Var curves. In fact, we would do that; right? We might have, "Well, you need to change your power factor in the winter to, I don't know, 99 percent, and then in the summer, it's one, and maybe in the spring and fall, it's 92 percent." So we can have schedules of settings where we have to adjust it in time.

MR. WARREN: Okay. All right. Okay. Thanks for letting me digress on that. I appreciate that. Always good to have you on these calls, John. I really appreciate you.

MR. KOMMINENI: Thanks, Harry, for those questions. And moving on to the next person, it looks like Brian Lydic has a question.

MR. LYDIC: Yeah. Brian, B-R-I-A-N, Lydic, L-Y-D-I-C, with Interstate Renewable Energy Council. Yeah, I did have a slightly different question, but just wanted to respond to John and Harry there about that last point, you know.

So Harry, you are right that, you know, in order to have the voltage regulating effect on the grid, you would need, you know, all the systems, or as many as possible, participating in Volt-Var. Just wanted to make that clear, that that is correct. And so, yeah, if you wanted to get the full effect, you'd have to revisit those older systems and change their settings in the future, which I advise against, because that's, you know, not necessarily easy to do, you know. That might require a truck roll to the site every time you change settings, unless we've got communications out to every site, which I don't think is the case, necessarily, today.

So you know, they had this issue in Hawaii where they had tons of old inverters that weren't smart inverters, installed, and got to high penetration before smart inverters started getting installed. And you know, just adding smart inverters with Volt-Var activated doesn't correct the voltage that was, you know, already high because of the existing high penetration of inverters that aren't doing voltage regulation. So definitely a word of caution there in terms of not activating those settings for all systems.

But yeah, my question was just -- and I

apologize if we've discussed this before, either in Maryland or here. But kind of alluding to some of Harry's other questions was just, how -- could you give a kind of rundown of how the Volt-Var settings were selected? You know, there's a slightly wider dead-band than the default settings in 1547, and just, like, a little less severe in general. Was that based on, you know, modeling studies or anything like that? And what kind of different considerations went into that selection, if you could reflect on that. Appreciate it.

MR. BUDD: We worked with EPRI to provide them some models of different feeders on our systems that we felt were characteristic, and I don't remember how many it was. It was a handful. And we had EPRI do some statistical modeling, and power flow, or say electrical modeling, and they sort of gave us some idea of what they called the "best fit" setting could possibly be.

So we took that into consideration, as well as our own concerns with how our regulation equipment is set -- like, regulators and capacitors --

to try and minimize the impact on that, as well.

To elaborate more on that, when EPRI looked at that setting, a "best fit," you know, they were looking at things like hosting capacity, energy loss, you know, the primary and secondary objective in the regs, as well as impacts to the grid, like I mentioned before. Impacts on regulation equipment.

MR. LYDIC: Can you opine a little bit more on what the potential impacts on the regulation equipment would be? And is that something that isn't, or can't be studied when you're connecting a larger system? Or yeah. Like, just in relation to, you know, selecting Volt-Var settings, is it challenging to study that? And again, what are the parameters that you're working around there?

MR. BUDD: Yeah. So in some cases, we have --

MS. DODGE: Excuse me for interrupting, but Brian is fading in and out, and at least I am losing chunks of substance in his questions. John, could you repeat his question just now, and in general? Because it's hard to follow. Thanks.

MR. BUDD: Sure. I think Brian asked me about opining about what some of the impacts are that we see from Var absorption on our system, and maybe generation, as well.

So the main impacts we see are that capacitors, particularly in D.C., are generally triggered by voltage or Var. So if we're consuming a lot of VARs on our systems, we could end up mis-operating those capacitors, and turning them on during light load seasons when they shouldn't, and that could actually defeat the entire purpose of that Volt-Var setting on that inverter. So in that case, it doesn't really work well with our current way of dispatching capacitors, and we don't have a way of easily changing that system right now.

MR. LYDIC: Okay. Thanks for that.

MR. KOMMINENI: Brian is all set there. Then I just have a general question, John.

It looks like those default settings are in place since 2024 January. Is there a particular setting or settings where a large group of customers keep requesting you guys to change? And how do you handle that?

MR. BUDD: I'm sorry; are you saying are there a large group of customers requesting us to change our default settings?

MR. KOMMINENI: Yeah. Is there a particular setting in the, you know, various settings which you've shared with us -- is there a particular setting which, you know, you see customers coming back and asking to change it, or, you know, modify it?

MR. BUDD: For the default?

MR. KOMMINENI: Yeah. For the default.

MR. BUDD: Yeah. I think the one -- and I think Harry touched on this a little. But the most feedback we've heard from developers, or customers -- not really customers, more developers -- is the volt watt setting. That's kind of been the one that I've heard the most feedback to enabling by default.

MR. KOMMINENI: Okay. Thanks for that. I do see another question from Harry.

Harry, please go ahead.

MR. WARREN: Yeah. Sorry. Just

following up on Dilip a little bit there. Again, tell me if this is maybe a question for another day. But when -- if you look at enabling volt watt, is that something that you would enable volt watt along with Volt-Var so that the VAR variation tries to handle the voltage rise, you know, as much as possible, but if it falls outside of that tolerance, then you engage volt watt outside of that? Or when you're using it in D.C. and other places, is it, like, a one-or-the-other sort of approach?

MR. BUDD: I don't think we've really figured that out at this time. That's something we'd probably explore in our pilot, potentially enabling both, maybe one at a time, as well, to see what the effects are, and how it affects hosting capacity; how it affects energy curtailment. I know that's been done in research, in some of our research scripts that we work with, so I know it's possible. It's definitely something we're considering.

MR. WARREN: Okay. Dilip, just to follow up one more thought there. I think that -- tell me if I'm right, John. The only reason that people would ask for volt watt is if, in a site-specific kind of situation, the default Volt-Var curve is engaged; however, there's still a large interconnection cost that's going to be needed for upgrades. And so people will say, well, if we install -- if we use the volt watt setting to more -- I don't know; want of a better term, more aggressively, or more fully manage our export onto the system, can we avoid those upgrade costs if we implement that?

And then I think to John's earlier point, I think one of the things that, as I understand from him, they're trying to get out of the Maryland pilot, is to sort of say, "Okay. The one concern that people have with volt watt is how much curtailment am I going to get?" And that's something, I think, John, you've said earlier, that's not something that's easy for you guys to even, like, estimate on a site-specific basis with your power flow modeling. That's like, so this is where your pilot is going to try to get underneath that, and figure out, you know, what should people expect in terms of curtailment to better inform that kind of decision; right?

MR. BUDD: Yes. Yes.

MR. WARREN: Okay. Thank you.

MR. KOMMINENI: Yeah, that's good to know. Thank you, Harry. Thanks, John.

I don't see any other questions, so probably, we'll move to the next item on the agenda.

Next we have DOEE present on the advanced inverter roadmap. So I would like them to share the screen and the stage here. Let me check if Peter is on the call, or someone from the DOEE.

DR. WARD: Yes.

MR. KOMMINENI: Hi, Laura. Are you going to be presenting today?

DR. WARD: Yeah. That's right.

MR. KOMMINENI: Perfect. Thank you. Laura, I did not get your material. I presume you're going to be sharing your screen. If you're talking, I think it looks like you're muted, too.

DR. WARD: Yeah. So let me share with you my -- can you see my visual?

MR. KOMMINENI: Yes.

DR. WARD: Okay. Perfect.

So good morning, everyone. I'm Laura Ward, the Energy Innovator Fellow at Department of Energy and Environment, and yeah. So I'm here today to discuss advancing grid modernization, and achieving 15 percent solar generation by 2041 with advanced inverters, and multilayer research roadmap for the District of Columbia.

My mentor is Thomas Bartholomew; and also, we have been working with Peter. Today, he is not in the meeting, and yeah. So I have a presentation online.

Basically, the District of Columbia has set ambitious goals for grid modernization and renewal energy integration, and the main goal is achieving 15 percent. This is a key target that we have. And I'm going to start with the motivation; purpose of the roadmap for advanced inverters; the research roadmap in advanced inverters; and technical and regulatory aspects.

Also, I'm going to explain an example of short-term actions that we are actually doing right now, and an example of medium-term actions, as well.

We are focused on the FERC 2222 implementation, and I'm going to present aggregating ideas and the roadmap study. And we have some references, as well, of this study. Current study.

Current study of the grid that we have can be represented by these two figures. Actually, our existing grid infrastructure faces several limitations: traditional technologies, a struggle to keep up with the growing demand for renewable energy, grid resilience, and customer-centric services.

Actually, as we can see here in these two figures, we have the current situation of the grid with the current inverters that we have. Basically, we call them "grid following" inverters, because the control of them is actually following the signal of the conventional system.

However, in the right side, we can see the main idea of the future of the grid modernization that we call with advanced inverters, that can actually be, you know, incorporated into the grid. And the key objective is to leverage advanced inverter technologies to enhance system reliability and facilitate higher penetration of solar energy in D.C. We have a scope that actually is, you know, taking more steps to advance grid modernization goals.

Also, I would like to present the advanced inverters as our power electronic devices that can transform the way we manage the grid. So they offer engaged capabilities such as improved efficiency, advanced control and communication, and the ability to support greater renewal energy penetration. We have a comparison of inverter capabilities.

And based on the three following inverter controls that currently we have in our system, we can mention that they act as current sources, control current and phase angle. They cannot function without an externally-regulated voltage, and cannot operate standalone, cannot achieve 100 percent penetration, and the control of acting and reactive power, as well as fault currents.

Other functionality for advanced inverters focus on all other technology that incorporate other functionalities. We can have, like, the grid forming inverters, for example, that are other type of advanced inverters. These inverters act as voltage source controls for frequency and fundamental voltage magnitude, and inverter controls that don't require a PLL can operate standalone; can achieve 100 percent or greater penetration. This is our main goal. And also, they can provide, instantaneously, balances lots without coordination controls. So we have these different principles for these advanced inverters, and we are working on that roadmap in order to achieve this main goal in the future.

We want to present, as well, this research roadmap, and we have been able to specify a multi-year research roadmap based on short, medium, and long-term. The main idea is to analyze the capabilities and compliances for interconnection of distributed energy resources that use advanced inverters. We are focused on capabilities, such as voltage and frequency regulations, and also the black star capability of these advanced inverters. We are focused on the IEEE 1547-2018, and also on the FC 1050 in the main idea, and actually, we are working on these short-term tasks during the first and second year.

We started in 2024. So we have been advancing in the revision of the current deployment of advanced inverters in D.C.; and update regulatory and technical standards, we are working on it; review and deploy pilot projects to evaluate advanced capabilities; and also, we have established some tasks for medium-term.

That is going to be between the third and the fifth year, such as the expansion of advanced inverter deployment; ongoing research and refinement of the default settings, and, you know, the adjustment that we can do in order to reach the main goal, if we can be focused on the penetration levels, as John was mentioning in the previous presentation, so we can have these inverters default settings. However, other aspects are important when we are increasing the deployment of these advanced inverters, and that can be readjusted by the penetration levels on the distribution system.

Also, we have the refined regulatory frameworks and technical standards in the developed advanced planning and modeling techniques, workforce develop development and training, and as a long-term, that is going to be after the fifth year.

We have full integration into the grid system optimization of clear stability efficiency, and establishment of long-term regulatory and technical standards.

I would like to present this example as short-term actions that we have. So focus on three specific items. As you can see here, we have the advanced inverter settings. So first of all, we need to refine, test, and implement default and optional inverter settings. We are working on it with Pepco; voltage ride-through, frequency response, and all that through coefficients, and all the parameters for these coefficients in order to present default settings, but also taking, you know, more settings in the future, because the penetration levels can define, as well, these settings.

Define technical settings and develop

guidance for the distribution of energy resources. The developers begin pilot projects with advanced inverters, analyze pilot outcomes, and refine the settings, and roll out mandatory compliance for all new distributor energy resources. And finally, our goal is to evaluate grid impacts and improve system-wide settings.

Related to the hosting capacity analysis, we have been actually conducting a study focused on the current law that we have in D.C. So the main idea is to evaluate this study in order to realize results and propose grid upgrades or solutions, implement capacity upgrades based on studies, continue monitoring capacity, and optimize results allocation, finalize hosting capacity analysis framework for D.C.

Related to interconnection standards, we have been taking some actions, and we are working on it. Basically, we've been updating and aligning interconnection process with IEEE 1547-2018, including new requirements for the distributed energy resources. And we actually initiate standards update and stakeholder audit.

As a part of the examples for medium-term actions, we are focused on the FERC 2222. They basically present two -- two different, no, but several, you know, several aspects. We can incorporate advanced inverters for improved stability and faster interconnection to assist with the FERC Order 2222 implementation.

Basically, this order is focused on the deployment of this new technology into a conventional power system; develop a reliable grid to provide resilience technologies; and embrace stakeholder driving pathways for equitable energy solutions, and our planned system upgrades and funding mechanisms for the adoption of this technology.

So as a summary of the roadmap procedure, we actually have been starting with some tasks on this roadmap. First of all, we conduct workshops and interviews with utility regulators in those three spurs and research community, gather feedback or capabilities, challenges, and research means.

And also I want to mention that we start, you know, basically from the last year, and we have some goals. We are working also in this technology and the interconnection process. The roadmap drafting is basically emphasizing stakeholder input into a comprehensive draft roadmap outline short-term. We are doing that through this working group, and we have a roadmap review and revision. So the main idea is to present a draft of this roadmap by the end of May, in order to have responses, and also questions. First of all, questions, and then the answer for these questions. And I think after this meeting, I can provide the draft in order to get this feedback for the stakeholders.

And finally, we are going to present the roadmap document at the end of July, and yeah. So publish and disseminate a roadmap to key stakeholders, and establish ongoing tracking and reporting mechanisms. This is our program procedure related to the roadmap, and yeah. Thank you for your attention.

MR. KOMMINENI: Thank you, Laura, for that presentation. It was very informative. Thank you for that.

Before I open up for the team to -- for the questions, if you can share this deck with me of the whole thing, that would be helpful. I don't think so I have a copy of it, but that would be helpful.

DR. WARD: Yeah, for sure.

MR. KOMMINENI: Thank you.

DR. WARD: Yeah, for sure. Thank you.

MR. KOMMINENI: I will open up for questions from the team members here. I do see one question from Harry. Go ahead, Harry.

MR. WARREN: You can always rely on me to ask questions.

MR. KOMMINENI: Yes.

MR. WARREN: Hey, Laura. I don't know if this is -- if you're able to sort of handicap this for us, but could you help me understand a little bit your DOEE's roadmapping exercise that you're working on, and how that integrates with, like, this working group process; right?

So we have a working group. And I think, Dilip, correct me if I'm wrong, but we're looking forward to, by July, coming up with some recommendations to bring forward to the commission on this issue as a working group.

So Laura, is the idea that the roadmap that you are looking to develop kind of in that same timeframe -- is the input that you're getting the same input that we are sharing in this meeting, or is there a separate process, and you're imagining bringing your roadmap forward as a part of this working group's recommendations, or is it on a separate track?

I'm a little -- I was just a little confused as to how you were talking about this, as to whether we had some parallel tracks here, or whether this is all merged together into one unified kind of product that's, you know, that we're working on.

DR. WARD: Thank you, Harry. This is a good question. So I can say this is a parallel track that we are trying to do based on the feedback, you know, provided by this working group.

As a team, you know, we have been compiling the main ideas to be able to get all the feedback from the utility and for the different actors and stakeholders, and also provide a product that can be, like, a guide for this main goal; that is, the grid modernization, always keeping in mind the main goal: that is the 15 percent of solar generation by 2041.

This is a goal that was actually established by 2018 in our Clean Energy D.C. And based on it as a fellow, as an energy innovator fellow, I have been working in IDP, and in IDP with my mentor, Thomas, in order to provide this guide, with this, you know, handbook, yeah, related to the grid modernization.

So everything that is related to the advanced inverters; the interconnection process; actually, in the future, the tariff and the structure of tariffs for this technology -- that is going to be included into the conventional power, is very important as a guide for us to, you know, have something in which we can have a base. We can have some goals in a short term, in a medium term, in a long term. So this is the main idea of this project in D.C.

MR. WARREN: Okay. Well, Dilip, I think that's something that maybe, you know, you and Brian sort of want to make sure you've got your heads around, is how these parallel -- how these different processes are working together so that we kind of have a one, I don't know, one playbook, if you will.

MR. KOMMINENI: Yeah.

MR. WARREN: Sounds like some of the things that DOEE is working on are things that probably lend themselves to, like, in the long term, how is this working group, or the commission, going to deal with sort of the future, you know, the long-term issues of making better and better use of advanced inverters over time? And just being able to articulate how the processes flow together would probably be helpful to get some direction from, you know, you all, or your participation.

So I'll put my hand down now, but I would like to come back to another question later, if I could.

MR. KOMMINENI: Yeah. Sounds good. Thanks, Harry.

And I do agree. I think it's going to be evolving, and we need to collaborate with DOEE as they develop their recommendations and stuff like that. We want to either modify or consider their recommendation as it comes. They'll be trying to wrap this up soon.

And Laura, if I remember looking at your deck, I think for the near term, you had Q4 of 2025. So probably, that's when you'll have at least the near-term thing wrapped up. So we'll keep a close eye on that. Thank you.

DR. WARD: All right. Thank you so much.

MR. KOMMINENI: Moving on. Ms. Nina Dodge.

MS. DODGE: Yes. Thank you, Dilip, and thank you, Laura. It's N-I-N-A D-O-D-G-E, Dodge.

I think it's very useful to be looking at the overarching goal of meeting our local generation solar carve-out for D.C. goal -- statutory goal, I should add -- and to see where we are now in terms of reaching that goal.

I'm just thinking of a sort of timeline, a different perspective on timeline, and fitting in the actions that Laura described, and where the working group is now. And I really see a sort of past/present/future in all of this. I think it's very good for this group to embrace the past, the near past, the present, and the future. We don't have time to just move at the slowest pace.

And on the one hand, we see -- and in that respect, I think what's missing here is the example of where other jurisdictions are for the current term, the medium term, and the long term, whether it's for DOEE's timeline, or for what we're doing here in the working group.

For instance, I see the volt watt discussion as sort of in the past. There have been a lot of -- there's been deployment of volt watt in other jurisdictions that's been studied. There have been pilots run. I'm not saying that a pilot is a waste of time, but I think the idea of spending two to three years on piloting one functionality that's already been studied elsewhere before it's used for site-specific work in any one jurisdiction of PHI, to me, that's sticking in the past, holding us hostage to something that really, arguably, should be really subjective to evaluation in terms of how we're moving and where others have moved, you know.

So -- and I say that respectfully, of what the engineers really need to understand of their own networks; but I really do think that there's something troubling about that timeline, given what's been done elsewhere.

And then there's the present where we're moving forward -- advanced inverters being used in a different way by DOEE than is being used in our regulations. So I really request DOEE to be very clear about what they mean.

THE REPORTER: Excuse me for a second. Could you repeat, about the last ten seconds of what you said, if you can recall? I'm sorry.

MS. DODGE: Let's see if I -- you're asking a lot.

MR. KOMMINENI: So Nina, I think, yeah. Just to let you know, Nina, when you said you were going to talk about the present, that's when I think the screen froze.

MS. DODGE: That it went off? Okay. Thank you. Sorry about that.

In the present, I'd like to see -- I think it's very important that DOEE describe where we are now in their current part of the timeline; what's the reality encapsulating what we've been discussing in this group, which has been very productive. And I really thank John Budd for his ongoing presentations and Q and A responses. Okay.

And then in terms of the future, I think there's enough brainpower in this group to start really encompassing the future -- some of what's been discussed by Laura for DOEE. And again, there are examples of some of these more futuristic applications of these functionalities of inverters. There are examples, living examples of deployment and of pilots. So I think to make DOEE's less sort of pie in the sky futuristic-sounding with a lot of three to four-syllable words that most lay people really aren't used to, please illustrate what's been going on elsewhere.

I think that also will provide some sort of an easier way for our group to imagine what's being talked about. Again, some of it's not totally in the future. The pilot projects I would put in future, testing for the future, but there's also deployment.

So sorry to be sort of impressionistic here, but I'm also trying to anchor all of these initiatives more in the realities that we're dealing with, and I think we need to tweak all of our timelines. I don't think they all really correspond to what we need and to what's possible. So I'll stop there for now. Thank you.

MR. KOMMINENI: Thank you, Nina. I think that's a, you know, a lot of information you just presented and you mentioned. But at least, you know, I think if I look at simple lines here, if I were to look at the past, I think your concern is if this study is looking at other jurisdictions so that we don't re-create the wheel, right, for certain settings, and stuff like that.

And then for the present, at least we

would like to plot, in this roadmap, where we are today so that it's easy to move forward. And it looks like for the future, we could still consider pilots, and look at other items which are left out. So that's my understanding. And I would like to -- yeah. Go ahead.

MS. DODGE: Sorry, Dilip. Just to add one thing. For the future, is looking at existing pilots, as well as deployment for some of these ideas in the future, part of the timeline? And I don't know; does anybody in this group attend DISTRIBUTECH conferences? Maybe you don't know what I'm even talking about. Well, I guess --

MR. KOMMINENI: I did. In my past organization, I used to, but not here.

MS. DODGE: Yeah. Yeah. I mean, I think for those of us who have attended them, it's a very, very good way to know what's going on, and future-oriented among very conservative utilities, mind you. We're not talking about, you know, the fringe here -- because they present what's going on before those findings are published. So you can get an idea of some of what Laura's talking about actually implemented.

And I think, you know, we don't want to be held back from lack of exposure in, you know, sharing of knowledge. And I'm not saying that we should wildly go and adopt what others have been doing and testing for a decade, but we need to know better where we are in the grander scheme of things.

Thank you. And thanks, Dilip, for your summary.

MR. KOMMINENI: Thank you, Nina. Before I get to Harry, I just wanted to see if DOEE or Pepco has any reactions? If not, I'll move on to Harry. At least I would like them to think through this as, you know, as presented here.

Harry, back at you.

MR. WARREN: Yeah. Thanks. Sorry I'm holding you all up here. Hey, so, you know, I've had the benefit of seeing this presentation from Laura, and a couple other ones that she did, you know, back at our seminar we did in our workshop in December. So one question I would have that may kind of put something concrete, like Nina's talking about as far as the future.

A question that we may want to make sure gets addressed at some point is, you know, Laura's talked about, if we think forward to the district's 15 percent penetration goal right now, where are we right now? I think -- are we in the low single digits right now at this point? Are there, you know, Laura talked a lot about these grid-forming, you know, capabilities of the inverters; the fact that they actually have a very important role in maintaining grid stability; right? They're not just there to make sure that they're not messing up the voltage on the distribution line, but they actually have the capability, in some scenarios, to really help manage grid stability.

And a question might be for Pepco to opine on, at some point, at what level of penetration and in what parts of their system do those kinds of advanced inverters, like, start becoming those important tools in managing their grid, as opposed to tools that are there almost to make sure that distributed generation isn't messing up their system, if you know what I mean; right? I mean, right now, they have a way of operating their system. We're making sure, through the use of these advanced inverters, that we minimize the amount of interconnection cost we have, and we're good citizens on the grid.

But Laura, you know, maybe you could correct me. But as I understand you, there's a level of penetration, and it might be very localized on the Pepco system at first, where, at a high level of penetration, well, by golly, you need these inverters to do more.

If I'm understanding that right, I think that might be something to make sure is on our list that makes the future state sort of concrete as to where we want to get to. Did I misunderstand you at all, Laura? Or was that kind of -- am I thinking -- am I getting something out of your presentation that I should be getting?

MR. KOMMINENI: Laura, if you're talking, maybe you are muted.

DR. WARD: Yeah. So yeah, actually, we have three different levels of penetration. So we can talk about if we have a low penetration, it can be between zero and 20 percent, that actually requires, like, minimum curtailment needed, the grid can usually accommodate variations. And when we are talking about medium penetration, we can talk about 20 percent, and 40 percent of, you know, penetration with DERs. And in that case, we normally use curtailment, begins increasing, and also, we estimate that network constraints become visible.

And in terms of high penetration, then we can talk about 40 percent penetration, you know, in the conventional system. So this is like, the estimations that we normally use when we are talking about penetration; that the highest penetration is actually exponential increase and curtailment needs. And also, we can consider system flexibility becomes crucial, and yeah. So many other factors, like limiting factors, pre-capacity, minimal load requirements, and yeah, things like that.

So basically, we expect to have, like,

15 percent solar generation in D.C. We don't necessarily talk about, "This is the high penetration that we can have," but it's higher than what we have today. Based on it, we consider other functionalities of advanced inverters crucial to reach this goal.

And that's why our presentation incorporates, for example, the grid-forming inverters, because they have the capability to form networks and also work by themselves, even when we don't have necessarily the conventional power system working, let's say because an outage occurs, and, you know, we don't have power. So in this case, these inverters with these functionalities can continue working to supply critical electricity for critical logs, such as hospitals, and yeah. So we have other different pilot projects that actually have been using this topology of inverters to provide this benefit to the grid. Yeah.

MR. WARREN: Well, my reaction to that is that's, like, yet another issue, like, for the future; right? So like, one thing, when I heard you talking about those, it was useful to hear there's different regimes of penetration, and how the functioning of the system changes in those different regimes.

You know, again, I haven't run any numbers, but just thinking out loud, you know, if we get to a 15 percent penetration in D.C., again, it's going to be localized; right? There'll be localized areas of much higher penetration, I'm sure, because there's some areas where we may not see that level of high penetration, you know. Or where the business district, a lot of the big buildings that are on spot networks, or the network services, you know, we might see higher penetration more out on the radial circuits, you know, just for other reasons. So you may start to get into some other regimes in the future, and you want to know, like, where you're going there.

And then I think your point about during outages, you know, the ability to island, and do those sorts of things, that's a whole other capability of these inverters that's out in the future that can be explored, as well.

And I guess the only third thing I would add to that list we haven't talked much about, I think Brian Lydic brought this up in our seminar back in December. The inverters acting together with other controls are going to be necessary if we start talking about when batteries get involved; EVs; V-to-grid. I mean, there's other levels of controls and other standards that come into play in those situations, but the way all of that is going to interact with the inverters, you know, on generation is going to be important, too. So I think that's another one that may be, you know.

If, to Nina's point, we're trying to get a feel now for what are some of the concrete things we're going to need to evaluate down the road, those are a few that come to mind, you know. How can we -- in those three areas?

DR. WARD: Yeah, for sure. In our next presentation, we are going to be able to present, yes, that interconnection with these advanced inverters and other technologies like EV batteries, microgrids. We are currently working on some regulation for microgrids, as well. We have some pilot projects already deployed in D.C., and yeah, we are working on this presentation for next time.

I mean, because, remember, this presentation was postponed. Yeah, that was the initial presentation that we have. But yeah, of course we are working on something more on-site with the current status of the grid in D.C.

We were waiting, as well, for the hosting capacity study that was just presented last week. So we still are, you know, reviewing the information that Electrify DC present to us in order to incorporate all the needs, or, you know, the analysis of possible upgrades that we need in the system.

MR. KOMMINENI: Thank you, Laura.

I think, Harry, if you're all set, then I have Albert LaFrance.

MR. LAFRANCE: Yes. Thank you. I'm Albert LaFrance, that's L-A-F-R-A-N-C-E, with Solar Solution.

I wanted to just kind of maybe reframe

something that we've discussed in this session, and previous sessions, and put this out both to DOEE and the Pepco team, and whatever; just a way of framing a question.

At various times, we've talked about two potential means of utilizing advanced inverter features -- high voltage conditions, which, if I understand correctly, are the primary bottleneck that we see for technical issues on interconnection; and of course, we've talked about volt watt controls, where the inverter throttles back power, as needed, to maintain the voltage within limits.

And then we also discussed briefly in the last session about what Pepco has, in fact, implemented under their regulations, which is power export limitation. And as I see it, both of those methodologies, power export limitation and volt watt, are different means to achieving the same end. And so I think it would be valuable for us to maybe have some side-by-side comparison discussion of the benefits and drawbacks of those two methodologies to meet the overall goal.

And again, this would would be for, you know, both for Pepco, DOEE, and anyone else who has -- probably IREC, who has experience and knowledge with that. So I just wanted to kind of put those two things on the table side-by-side for discussion. Thank you.

MR. KOMMINENI: So it looks like one is the Volt-Var control, other one was the power export limitation. So --

MR. LAFRANCE: Limitation control.

MR. KOMMINENI: Limitation control.

MS. DODGE: Albert, wasn't that a volt -- weren't you speaking of volt watt?

MR. LAFRANCE: Yes. So basically, yeah, we've been talking about volt watt control, but then also, there is another modality which is what's implemented in Maryland. The inverter simply maintains a utility-specified maximum power export.

So both of them ultimately end up controlling the power export. The volt watt does it based on what the voltage is; the export limitation simply maintains a maximum export determined by the utility and agreed by the customer. So I think one of the issues in comparing those two is that, you know, who takes the risk, basically, of the curtailment, or how the risk of curtailment is assessed when you're using volt watt control? To some extent, the curtailment is at the mercy of conditions beyond the customer -- control affect voltage on that segment of the grid, whereas with an export limitation arrangement, the customer would know ahead of time that this is going to be your maximum export, based on an agreement with the utility, as part of the interconnection. So I think there are benefits and drawbacks to both, but I just thought it would be useful to look at them side-by-side.

MR. KOMMINENI: So I'm just thinking.

John, sorry to put you on the spot. Any thoughts on that? Or based on your presentation, is there something that you can share, or --

MR. BUDD: Yeah. Sure. I can give some opinions on that.

So from my perspective, it depends on what type of problem you're addressing. So if you're addressing a thermal overload problem, or a reverse power flow problem, the limited export option is probably the better way to go.

If you're directly trying to address a power quality issue, then I feel like using one of those Volt-Var, or volt watt, whatever we're talking about, one of those types of functionalities, is going to be the better way to go.

But in theory, I mean, Albert's correct. You could, in theory, use either one to fix a voltage problem; it's just, you know, what's the better way to go? That's just my opinion -- if a better way to go is to match volt watt with voltage problems, and limited export with thermal and reverse power flow problems.

MR. KOMMINENI: Thanks, John.

Albert, does that help?

MR. LAFRANCE: Yeah. That is exactly the kind of opinion that I was looking for, yeah. Because, you know, there are two different ways that ultimately lead to the same thing. To some extent, there's sort of a risk allocation that, with the limited export agreement, a little more of the risk maybe is on the utility, because the utility's telling the customer, "As long as you limit your export to X kilowatts, you're good." Whereas with volt watt, a little more of the risk is on the customer, because the customer agrees to throttle back their output to maintain the system voltage. So that's just another aspect, or way of looking at it.

But yeah, John's comment was exactly what I was interested in. Thank you.

MR. KOMMINENI: Perfect.

I don't see any other questions.

Again, thank you, Laura, for the presentation. If you can share that material, that'd be helpful.

Moving on to the next item, I think we're going to be looking at the next steps. But one thing I want to touch upon is I know there were a few questions to Pepco. And maybe, Taylor, if you can share those questions and responses, and if you need to expand on any of those, that would be helpful.

MS. BECKHAM: Sure. I can share my

screen with them. I don't think we have anything to expand on. I'm not -- I hope we have the right people on the call. But I can show we circulated them, let me just see here, last week. And I think you have our positions. Our response is pretty straightforward here. There we go.

So I mean, I think we'd be happy to take questions on the responses that we sent in. And if there's something that we can't answer on the phone here -- just looking at who we have.

THE REPORTER: I think either the audio went out, or did someone freeze? Did you freeze, Ms. Taylor?

MS. BECKHAM: I may have. Can you folks hear me now?

MS. DODGE: Yes.

MS. BECKHAM: Okay. I said I think we sent these around last Wednesday, and they should be in the box.

MR. KOMMINENI: Yes. Thank you, Taylor.

So if folks have any follow-up

questions, send it to us. We will work with Pepco to respond. That said, I think those are the only items I had for today's session.

For the upcoming session, if you have any topics you would like us to discuss, or if you want to present anything, just share with us, and we will take that in.

And I have one more. I see Albert, your hand is up.

MR. LAFRANCE: Yes. Thank you.

Yeah, just in regards to the upcoming agenda, I was interested in possibly presenting some specific proposed rule changes related to advanced inverters, and was wondering if that would be appropriate for the next session.

MR. KOMMINENI: So Albert, if you can send that to us, we'll look, and I will touch base with Brian, and I'll try to add it for the next session.

MR. LAFRANCE: Okay. Thank you. I will get that to you. Thank you.

MR. KOMMINENI: Yeah. Too, and if you

can copy --

THE REPORTER: Can you repeat the last name, Mr. Dilip?

MR. KOMMINENI: And I believe we do have an another educational session by IREC, which is going to be scheduled for April 15th. I'm not sure if the invite has been sent out, but if not, we will send it out shortly. That's going to be just a virtual, and it'll be recorded if folks miss the session.

With that, I think, pretty much, I have everything covered. I think Kunle has his hand raised.

MR. ADEYEMO: I just wanted to confirm that DOEE was going to add their presentation to the box, or email it around.

MR. KOMMINENI: Yes. So Laura, if you can send it to the whole team, or if you can send it to me, I'll add it to the box so that it's available.

DR. WARD: All right. Thank you. Yeah.

MR. KOMMINENI: Thank you.

MS. BECKHAM: Also, Laura, I put in the

chat, are we able to get, I think you mentioned a draft report about what's been done until Q4 2024. If you have that, do you think you can drop that, or circulate that to the group, as well, please?

DR. WARD: Yeah, yeah. For sure. Yes.

MS. BECKHAM: Thank you.

DR. WARD: So we actually sent the presentation and the draft one month ago to Brian. But for any reason maybe he didn't circulate that, but yeah, I'm going to do that right now.

MR. KOMMINENI: Yeah, that'd be helpful. I know Brian is on leave right now, so that's why I couldn't find the material. So if you can send that around, that would be helpful.

DR. WARD: All right.

MR. KOMMINENI: And I do see Harry. Go ahead.

MR. WARREN: Yeah. Dilip, do we have a date for the next -- beyond the 15th, do we have a date for our next meeting here?

MR. KOMMINENI: Yes. For this one, I was going to look up -- I think the next one would be

May 15th --

MR. WARREN: May 15th?

MR. KOMMINENI: -- which is a Thursday from ten to twelve.

MR. WARREN: Okay. Thanks.

MR. KOMMINENI: And I will send out the notes so that you can have it in the calendar.

MR. WARREN: Thank you.

MR. KOMMINENI: Anything else before we wrap up? Okay, then. Thank you all. Thanks for participating, and thanks for presenting. I'll catch up in the next session. Have a great day.

MS. BECKHAM: Thanks, everyone.

MR. WARREN: Thanks, everyone.

MR. KOMMINENI: Bye-bye.

MR. LAFRANCE: Thank you.

(Whereupon, the meeting concluded at 11:41 a.m.)

CERTIFICATE

I, OLIVIA THOMPSON, the officer before whom the foregoing proceedings were taken, do hereby certify that any witness(es) in the foregoing proceedings, prior to testifying, were duly sworn; that the proceedings were recorded by me and thereafter reduced to typewriting by a qualified transcriptionist; that said digital audio recording of said proceedings are a true and accurate record to the best of my knowledge, skills, and ability; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this was taken; and, further, that I am not a relative or employee of any counsel or attorney employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

OLIVIA THOMPSON

Notary Public in and for the

District of Columbia

CERTIFICATE OF TRANSCRIBER

I, KELLI L. HAHN, do hereby certify that this transcript was prepared from the digital audio recording of the foregoing proceeding; that said transcript is a true and accurate record of the proceedings to the best of my knowledge, skills, and ability; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this was taken; and, further, that I am not a relative or employee of any counsel or attorney employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

KELLI L. HAHN

g

n