PLACE: Dobbs Building, Raleigh, North Carolina
DATE: Thursday, October 12, 2023
TIME: 10:02 a.m. - 11:44 p.m.
DOCKET: E-100, Sub 190
BEFORE: Commissioner Karen M. Kemerait, Presiding
Commissioner ToNola D. Brown-Bland
Commissioner Daniel G. Clodfelter
Commissioner Kimberly W. Duffley
Commissioner Jeffrey A. Hughes
Commissioner Floyd B. McKissick, Jr.

IN THE MATTER OF:

Biennial Consolidated Carbon Plan and Integrated Resource Plans of Duke Energy Carolinas, LLC, and Duke Energy Progress, LLC, Pursuant to N.C.G.S. § 62-110.9 and § 62-110.1(c)

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Mike Quinto, Director, IRP Advanced Analytics
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P R O C E E D I N G S

COMMISSIONER KEMERAIT: Good morning, everyone. It looks like we have an almost full room for this technical conference. I know that there's a lot of interest in the -- the next Carbon Plan proceeding. So let's go on the record. My name is Karen Kemerait, and I'm a Commissioner with the North Carolina Utilities Commission. With me this morning are Commissioners ToNola D. Brown-Bland, Daniel G. Clodfelter, Kimberly W. Duffley, Floyd B. McKissick Jr., and Jeffrey A. Hughes.

In compliance with the requirements of the State Government Ethics Act, I remind all members of the Commission of their responsibility to avoid conflicts of interest, and I inquire whether any member of the Commission has a conflict of interest at this time as to whether any members of the Commission has a known conflict with respect to the matter coming before us?

(No response.)

COMMISSIONER KEMERAIT: Let the record reflect that I have no such conflict and that my fellow Commissioners have identified no conflict either.

This technical conference is being held in Docket E-100, Sub 190, which is titled, "In The Matter of Biennial Consolidated Carbon Plan and Integrated Resource Plans of Duke Energy Carolinas, LLC, and Duke Energy Progress, LLC" -- and I will refer to Duke Energy Carolinas, LLC, and Duke Energy Progress, LLC, collectively as Duke or Duke Energy going forward -- and it is also entitled, "Pursuant to North Carolina General Statute § 62-110.9 and North Carolina General Statute § 62-110.1(c)."

On December 30, 2022, in Docket Number E-100 Sub 179, the Commission issued an Order Adopting Initial Carbon Plan and Providing Direction for Future Planning, and I will refer to this going forward as the Initial Carbon Plan. The Initial Carbon Plan adopted initial steps for Duke Energy to take in furtherance of achieving the prescribed reductions.

The Carbon Plan statute directed the Commission to review the Carbon Plan every two years after the adoption of the initial Carbon Plan. The Initial Carbon Plan provided for the consolidation of the Carbon Plan and the Integrated Resource Plan -- that I will refer to as the IRP going forward -- processes, and the consolidated Carbon Plan and IRP

processes are referred to as the CPIRP. And it also required Duke Energy to file its first proposed biennial CPIRP by no later than September 1, 2023.

On March 15, 2023, the Commission issued an Order Establishing Biennial Proceeding and Opening several Dockets, including this Docket in Docket Number E-100, Sub 190, for the 2023 CPIRP proceeding, which I will refer to going forward as the primary docket.

On August 17, 2023, Duke Energy filed its Verified Petition for Approval of 2023, 2024 Carbon Plan in Integrated Resource Plans of Duke Energy Carolinas, LLC, and Duke Energy Progress, LLC, -- and I will refer to that going forward as the CPIRP or the Plan.

On September 1, 2023, Duke Energy prefiled its direct testimony and exhibits supporting the proposed CPIRP as filed with the Commission on August 17, 2023.

The purpose of this technical conference is for Duke Energy to provide information through an oral presentation of its proposed CPIRP. The Commission will have the opportunity to ask questions of Duke. Parties to this proceeding and interested members of

the public may attend today's technical conference. However, to be clear, participation in this conference is limited to representatives of Duke and members of the Commission. The technical conference this morning is being transcribed, and the transcript will be filed in the docket as soon as it is available.

And before we begin, I would ask for Duke Energy to identify themselves for purposes of the record.

MR. HIGGINBOTHAM: Good morning, presiding Commissioner Kemerait, and good morning to the rest of the Commission. My name is Jason Higginbotham, appearing on behalf of Duke Energy Carolinas and Duke Energy Progress, joined by Brett Breitschwerdt, is also appearing on behalf of the Companies. And with us today, Ms. Kendal Bowman, who will be providing some opening remarks, as well as a panel of subject matter experts who will be providing information and responding to questions on the CPIRP.

At this time, I'd ask if it's okay with the Commission that the panelists please introduce themselves.

COMMISSIONER KEMERAIT: Yes, please.

MS. BOWMAN: Good morning, Commissioners.

Kendal Bowman, Duke Energy State President.

COMMISSIONER KEMERAIT: Good morning.

MR. GAGNON: Good morning, Commissioners. Nate Gagnon, Director of IRP Regulatory and Policy Strategy for the Carolinas.

COMMISSIONER KEMERAIT: Good Morning.

MR. QUINTO: Mike Quinto, Director of IRP Advanced Analytics.

MR. DUFF: Tim Duff, General Manager, Customer Solutions Regulatory Enablement.

MR. PEELER: Good morning. Nelson Peeler, Senior VP of Transmission and Fuel Strategy and Planning.

COMMISSIONER KEMERAIT: Good morning. And before we begin, are there any matters that need to be addressed?

MR. HIGGINBOTHAM: No, there are not.

COMMISSIONER KEMERAIT: Thank you. So at this time, I'll turn it over to Duke to provide your technical -- your presentation.

MS. BOWMAN: I think we have some slides to put up. So while we're getting up the slides, I do just want to say, on behalf of Duke Energy and my colleagues with me today, I want to thank the

Commission for letting us come and present to you our overview of the 2023 Carbon Plan Integrated Resource Plan, also known as the CPIRP. You'll hear us talking about those interchangeably. Sometimes I'll refer to it as just the Plan.

So we definitely recognize the critical importance of pursuing the emissions reductions targets set by the General Assembly here in North Carolina in House Bill 951. We're trying to do that with the guardrails set by the General Assembly, as well. Those guardrails of least cost planning and reliability.

The entire Duke Energy team is focused on achieving this transition in a manner that's consistent with that State Energy Policy. We have had over, I think, 90 employees. And you can see we have a lot of them in the room with us working around the clock to identify ways that we can meet this transition in the most beneficial and cost-effective manner for our customers. We are continuing to see a steady stream of economic development in this state. For the second year in a row, North Carolina has been ranked number one place to do business. This tells me that we're doing something right in North Carolina. I

think our path to the Clean Energy transition and the fact that we've been able to keep our energy rates affordable has aided in this economic development. And we really want to continue that as we march on our way to this Clean Energy transition. I know, Commissioners, you will be hearing from others in this proceeding, and you've probably already heard from some in the media that suggests that Duke Energy is not moving fast enough on this -- this clean energy transition -- and we look forward to working and engaging with all parties to this proceeding, but I want to make clear that we at Duke Energy are working as hard as we can. We are transitioning at an unprecedented level, and I am proud of the progress that we have already made since the 2022 Carbon Plan that we've filed. We've made tremendous progress on solar RFPs and integration. We're working on battery storage. We're coming up with innovative EE DSM programs. We are deploying work on the Red Zone transmission projects. We have started development work on new natural gas facilities that will be hydrogen-capable. We are developing outreach plans in our communities for impacted communities where we're retiring those and environmental justice impacts. So

we are really rolling up our sleeves to put us on the path as fast as we can that maintains those guardrails of least cost and reliability.

So if we can switch to the next slide. And I think we've already done most of the introductions of all of the presenters. So you will hear, with this team here with me today, but we also have out in the audience -- if there are questions that come up -- we have Sammy Roberts, who's General Manager of Transmission Planning, Phil Stillman, Managing Director of Load Forecast, and Ben Smith, Generation and Regulatory Strategy Director -- just in the event we have a question that we need one of them to answer.

So if we could go to the next slide on the agenda. And I'll hit this at a very high level. We're going to be providing an overview today of the key components of the CPIRP. You know, the first one is really the changing landscape that we're in, and I would say, boy, what a difference a year makes. Since we filed the 2022 Resource Plan, we have seen increasing load, dramatically increasing load, and you'll hear more about that, increasing economic development, electrification to the system, we're also seeing increasing pricing, supply chain issues, we've

also had some federal and regulatory policies out there, EPA 111. We're taking those into consideration in this new plan. IRA, IIJA, we're taking all of that into account into this resource plan. The one thing I know for certain is that, we are in an evolving landscape. It doesn't stay the same, and we look forward to continuing to check and adjust our resource plans as we come in front of you.

We're also going to be talking about the modeling and the modeling that we've done in this plan that supports those least-cost paths to getting to our carbon reduction goals. We're also going to hit on, as we did in the 2022 Plan, some near-term actions, that we really need your guidance on pursuing, and we have to start work on those now in order to reach our climate goals going forward.

And, finally, we're going to talk about some of the key updates to our "Shrinking the Challenge" that we've talked about in the 2022 Plan. Things that we can actually just reduce -- reduce that load by energy efficiency, demand side, grid edge things. We're also continuing to look and are planning to do a combined merger of Duke Energy Carolinas and Duke Energy Progress. And so you will hear more about that

as well.

If we could go to the next slide, please. This is just the overview of the CPIRP. It should look very familiar to many of you. It's the same structure and format that we used with the 2022 Carbon Plan filing, but we do have a few differences. And I'm not going to read through all of this. I'm just going to point out a couple of the differences that you will see with this -- this Plan. The biggest difference I'm going to point out is that with this CPIRP, unlike the 2022 Carbon Plan, Duke Energy's actually recommending a preferred portfolio. And we did that for multiple reasons. We operate a dual-state system. We serve both North and South Carolina. And the South Carolina laws require us, when we file a resource plan, to pick a preferred plan. And so we filed both this IRP here in North Carolina, but we filed it in South Carolina as well. And so we have picked that Portfolio 3. We believe it best balances the least cost path with reliability for our customers, and you will hear more about why we believe that.

In this CPIRP, we've also had a dedicated chapter to North Carolina and a dedicated chapter to

South Carolina. Really talking to -- every state has different enabling statutory constructs, and rules, and requirements, and so we've taken a chapter to focus on each of those. I wanted to make sure I highlighted some of those differences.

The next 10 to 15 years, for us in North Carolina, represents a significant phase of our energy transition. We will be retiring eight 8.4 gigawatts of generation and replacing it. So no matter which of those three pathways or portfolios you look at, we're going to get out of coal by 2035. And to do that, we have to retire a significant amount of generation and replace it with a significant amount of generation. So this is going to be a challenge to us all, and it's critically important that we make progress on these near-term actions so that we can get there together in the quickest way possible.

And with that, I'm going to turn it over now to Mr. Gagnon to start us on the details of the CPIRP.

MR. GAGNON: Thank you. And thank you, Commissioners for the opportunity to be here this morning.

So again, my name is Nate Gagnon, and I'm Director of IRP Regulatory and Policy Strategy for the

Carolinas. And I manage the process of putting together this CPIRP filing this year. And I just want to reiterate what Ms. Bowman said about just the number of people and amount of work that went into this -- into this plan. We've developed a very strong plan that is the product of very robust and thorough analysis. And Mr. Quinto is going to get into a little of the details around our process and our analytical results in a minute, but before we get there, I want to talk a little bit more about this -- this changing energy landscape in which we are operating and doing our planning.

So first, on the right-hand side of this slide, you can see the planning objectives that shaped the development of our Plan, and we talk about these pretty extensively in Chapter 2 of the filing. And I want to distinguish between the primary requirements that you see in the middle of that figure. And then the balancing objectives that are around the perimeter. The primary requirements are, of course, we have to comply with all applicable laws and regulations, and, of course, HB 951 is a significant one of those. And then, of course, we have to maintain or improve reliability for our customers. So

those two are nonnegotiable. The Plan has to meet those thresholds. And then given that, around the perimeter of the figure, you'll see the objectives that we then have to find the appropriate balance for, right? So we have the increasingly clean resource mix, and that speaks to the pace at which we pursue this energy transition. And then, in the bottom right, that has to be consistent with least-cost planning principles in maintaining affordability for our customers. And then, at the top left there, you see resource diversity. And that's risk diversification, but it's also making sure that we have an appropriate resource mix that can serve our customers' needs every hour of the day, every hour of the year. Then, in the bottom left, you see executability and other foreseeable conditions. And that's about making sure that we have a plan that we can actually execute on. That it anticipates risks. That it deals with uncertainty appropriately and that we're setting ourselves up for success.

So we have to balance all of those objectives, develop this Plan in the context of a landscape that is changing around us, and changing pretty rapidly. And we talk about that and the

changes and get into those details in Chapter 1 of the Plan. That's devoted to this. But you can see from the list on the slide and on the page that these changes affect every aspect of the business. They affect every aspect of resource planning. And they're pretty dramatic. And so I'll step through some of them.

The first one's on the list there; you see load growth -- and Ms. Bowman mentioned that, and I'll talk about that a little bit more in a couple slides -- but we are seeing rapid economic development in the Carolinas, and that brings rapid load growth that we have to incorporate in our plans related to that in maintaining or improving reliability. You'll see that our reserve margin has increased -- the target reserve margin has increased in this plan. And again, I have a couple slides we'll talk about that as well. But then, again, just to reiterate some of what Ms. Bowman said, there's a lot of flux -- that the policy and regulatory environment is in flux. You'll remember last year, before the '22 Carbon Plan hearings, the IRA had just been passed. And so we were figuring that out. And those credits have been reflected in this year's analytics. This year, we had the EPA

propose a new rule under Section 111 of the Clean Air Act. And those are just two of many changes that are going on at all levels. And then those are, to a certain extent, related to the financial environment that we find ourselves in. There's been significant inflation as you know over the last several year's. The costs of our resources are up in this year's analysis. And to a certain extent, the tax credits in the IRA and the incentives in the IIJ help offset some of those cost increases, but at the same time, those incentives also drive demand in an environment where supply chains are already constrained, right. So there's a lot of complexity there. Of course, we remain committed to our exit from coal. It's just important to remember there that, we have to have equally reliable replacement generation in place before we bring any of those coal units offline, right. So we can maintain or improve reliability for our customers. And then, of course, the ultimate success of the energy transition will depend on technological advancement across many avenues in order to achieve our carbon neutrality goals. So just broadly speaking, very rapid, very significant change that affects all aspects of the business and planning.

And we'll keep coming back to that. You'll see in the filing. You'll see throughout this presentation as we go forward.

So we'll go to the next slide and talk in particular about the load forecast. And so, again, this is a positive story for the Carolinas', right? Rapid economic development in North Carolina. People and businesses want to relocate to the state, and that just brings with it a greater demand. And we have to incorporate that in our forecast. And that has really accelerated over the last 12-18 months, and you see that reflected here.

So just to orient you to the -- to the slide on the left-hand side, there's a figure that shows our forecasted annual energy consumption. On the right-hand side, the figure shows our forecasted winter peak. The dotted line at the bottom is the load forecast that was included in the '22 Carbon Plan analysis. The solid line at the top is the load forecast that's in this year's CPIRP analysis. And the gray area in between is just the change between the two.

We filed the original Carbon Plan in May of last year, and so the load forecast that supports that

analysis was developed in the fall. So that's -- the change that you're seeing is from the fall '21 load forecast to the spring '23 load forecast. And over a period of just 18 months, you've seen our expectations increase dramatically, and that's driven by the rapid economic development in the state. And just to put in a little bit of context, on the right, just looking at 2030, you see that the expectation for peak demand has increased by 2.4 gigawatts from last load forecast to this load forecast. 2.4 gigawatts, when you put a reserve margin on top of that, now you're talking about capacity that's roughly equal to two combined cycle units to serve that peak load. And that's just the incremental peak load for 2030, right? So everything that we've talked about in the '22 Carbon Plan proceeding, and then another 2.4 gigawatts on top of that in this year's load forecast.

Similarly, on the left with the energy demand, the increase, again, just looking at 2030, we're talking about 13 terawatt hours of energy that we expect to have to serve in that year on top of what was in the -- the load forecast for the '22 Carbon Plan.

Thirteen terawatt hours -- you're talking

about the energy that's produced by, call it, one and a half units at the McGuire Nuclear Station over the course of a year. So if you want to meet that additional load without emitting any more carbon, it means that you have to have, call it, 16, 1,700 megawatts of carbon-free generation that can operate around the clock at a better than 90 percent capacity factor.

So hopefully that puts the significance of the change in context. And we go to the next slide and talk a little bit about what's driving that change.

So again, this is a positive story for the Carolinas. This is -- this is economic development success for the region. You can see on that pie chart, there are two big sections of data that are contributing to just the increase in the load forecast. The green section is economic development projects. That's large projects moving to the Carolinas. Think about manufacturing, onshoring, things like that. And then the light blue section, that 32 percent, that's electric vehicle load. So charging for electric vehicles. By the middle of the 2030's, you start to see that being a significant

contributor to our -- to our demand. And if you think about the electric vehicles, that affects us in the Carolinas in two different ways: One, when they're being manufactured, right? Vehicle manufacturers are increasing their operations in the Carolinas. Battery manufacturing is happening in the Carolinas. So the load forecast increases on the manufacturing side. And then when those vehicles hit the road, you see the load forecast increase from charging, right? So that compounds the effect, but again, technological development, advancement in the Carolinas, economic growth in the Carolinas -- this is a good problem to have, if that's even the right word. It just makes our job a lot bigger when we talk about the energy transition and what we have to accomplish.

So then, moving to the next slide --

COMMISSIONER KEMERAIT: Let me ask you a clarifying question.

MR. GAGNON: Yeah. Please.

COMMISSIONER KEMERAIT: You talked about manufacturing of electric vehicles and also charging. Is the manufacturing of electric vehicles; is that included in the green -- the large economic development --

MR. GAGNON: Yes.

COMMISSIONER KEMERAIT: -- projects. And so it is separated in the chart?

MR. GAGNON: That's right. I'm sorry. I should have been clear on that. So the manufacturing, that would in the economic development projects. And then once they're actually on the road, that's in the blue that you're seeing there.

So if we go to the next slide, we'll change gears a little bit to talk about reliability and reserve margin, and that's linked to those winter peaks that we were talking about just a couple slides ago. So as you know, we -- Commission does Astrapé consulting to perform an updated resource adequacy study to support this year's CPIRP analysis, and the results of that study showed that, if we want to maintain the same level of reliability, then it's prudent for us to increase the reserve margin that we target from the 17 percent that came out of the 2020 study and that was used in the -- in the initial Carbon Plan filing to 22 percent in this year's CPIRP analysis. And that's accounting for things like extreme weather loads, particularly on those cold winter mornings. The fact that we can rely on our

neighbors a little bit less than maybe we've been able to in the past. Long-term load forecast error, and there I'm talking about economic load forecast error. So think about load forecasting connected to GDP growth over many years. So that's what that's referring to there. And then, of course, there's the updated unit performance and availability. And part of that is just the fact that our coal fleet is getting older and it's nearing retirement. And then, on top of that, we're asking it to operate in a much more agile, dynamic fashion than we have before, that it was designed to do. And that's going to affect the availability. And then part of the reason for that is that we are transitioning to a greater mix of variable energy resources. Think about solar, and then in the future, more wind. And that just requires a more flexible fleet. It makes your generation a little bit more uncertain. And so the whole fleet has to operate more flexibly, and that's also driving the necessity for us to carry a little bit higher reserves. And that may continue into the future.

COMMISSIONER KEMERAIT: I have a clarifying question. I think you said that the reserve margin would be -- would be increased from 17 percent to 22

percent based upon the Astrapé study, and I think you said the 22 percent was in order to maintain the reliability. Would the 22 percent reserve margin actually improve reliability due to Winter Storm Elliott? Would it -- would the 22 percent reserve margin improve reliability from the previous 17 percent reserve margin?

MR. GAGNON: So I guess a couple parts to the answer to that question. First, the study does include, I think, it's 43 years of weather history up until the end of last year, so Winter Storm Elliot is part of the data set that goes into the analysis for this year's resource adequacy study. And when we do that study, or when Astrapé does that study, we target a loss of load expectation of one event day in 10 years. And what this study showed is that, with the changing energy mix, with some of the factors on the page here, and with the fact that we're moving to more variable energy resources, in order to be able to maintain that loss of load expectation of one event day in 10 years, we need to carry more reserves to maintain that level of reliability.

COMMISSIONER KEMERAIT: Thank you.

MR. GAGNON: Okay. I think we can go to the

next slide and just explain a little bit more about the neighbor assistance piece. We're not pursuing this energy transition in a vacuum. All of our neighbors are moving in the same direction. And that just means that our systems, as we retire coal, add more renewables, are starting to look -- all of our systems across the southeast are starting to look more similar. Means our risks are more correlated. The reliability risk is concentrated on those cold winter mornings, and that just makes it more likely that when our system is strained and we need resources, our neighbors are going to be in the same position. And that just makes less likely that they'll be able to provide the assistance at the same levels that maybe they have in the past. And so it's prudent on us to carry more reserves, and that's reflected in the higher reserve margin.

So just to -- to wrap it up, changes across every aspect of the business, policy, technology, load, and then, as it pertains to our ability to -- and the pace at which we can execute the energy transition and reduce carbon emissions, that load growth is -- is a really big one. And that rapid economic development is translating to rapid load

growth that we're seeing, and you'll see that reflected in the resource additions. The pay, scope, and scale of what we're trying to do and what Mr. Quinto will talk about on the next several slides.

MR. QUINTO: Good morning, Commission. It's good to be in front of you again. Again, my name is Mike Quinto. I am the Director of IRP Advanced Analytics. My team is responsible for developing the modeling framework and overseeing the overall modeling process and analytical framework that's presented here in the development of the CPIRP.

Today I'm going to overview with you the -- how those changing energy landscape assumptions have been worked into the IRP modeling. The analytical process we'll overview very similar to the '22 plan. I'll talk at about modeling framework that the Company's used to develop 33 different portfolios to present this robust analysis, and we'll touch on results, particularly related to the core portfolios, which we'll talk about in a little bit. Really showing the magnitude and impact to customers over time.

So moving to the next slide here. This is really an illustrative example of what IRP is planning

for. So looking at the resources on the system today and the load growth that's presented in front of us. So making sure that we have those adequate resources to meet that load. As Mr. Gagnon discussed, the load forecast is a significant impact. Looking to add an incremental 7 gigawatts worth of planning capacity that we need to plan for going out into the future. Over that same timeframe, we're looking at retiring and replacing 4.8 gigawatts worth of coal capacity on the system. And the pace in the transition over time for which we do that is really looking at: what is that right, orderly transition to maintain reliability and affordability for customers over time on an executable path to achieving these emissions reductions targets? You can go to the next slide.

So this is an overview of the analytical process. It probably looks fairly familiar to what you have seen in the '22 Carbon Plan.

Starting just from the left and working to the right over the process flow chart here, we have the development of the assumptions and modeling software that we use. We use the same encompass model that we use to develop the '22 Carbon Plan, with some updates and revisions to that model.

As we work through the updating of modeling assumptions, those include the net load forecast, the update to the reliability requirements, including the planning reserve margin, planning up to that 22 percent, and growing into that.

We also have updated demand-side measures, including energy efficiency, which Mr. Duff will discuss in more detail later on in the presentation. From the supply side, we're also updating the resource availability and cost information related to those technologies. And the current inflationary impacts that we're seeing on those. And then, from a tax incentive perspective, continuing to factor in the changes to the IRA and how that incentivizes carbon-free energy resources added to the system.

As we move over to the next block -- I'm sorry -- portfolio development stage, we did conduct an updated coal retirement analysis, which is used as the basis for developing our portfolios. So each of the portfolios looks at the -- goes through the capacity expansion model, which identifies the resources needed to meet the energy capacity and emissions reductions targets. That's intended for each of the portfolios. Those portfolios then go to

the detailed production cost modeling and verification steps. Where you look at detailed hourly production cost models that access unit performance, system requirements, reliability checks, including for the core portfolios, additional reliability verifications, and our resource adequacy model to ensure that those portfolios that we are developing continue to maintain that standard of reliability as outlined by House Bill 951.

Finally, we move to the performance analysis step, and I'll touch on these in the last two of my slides. Both the additional sensitivities and other metrics used to look across the portfolios on risks of transition, the cost of the portfolios in terms of PVRR and bill impacts, and then their ability to meet the emissions reduction targets along the timelines that is intended for each of the portfolios.

Next slide.

So this slide shows the Companies overall modeling framework. So how we developed portfolios in the Plan. Starting on the left, we have three energy transition Pathways. Pathways can be thought of as overarching planning factors that are used to develop these portfolios and largely in line with the time to

meet the interim 70 percent emissions reductions target outlined by House Bill 951, and the resources needed to achieve those.

So Pathway 1 is set up to achieve the 70 percent CO2 emissions reduction targets by 2030. Pathway 2 targets the interim target by 2033, with the introduction of offshore wind into the portfolio in that timeframe. And then, Pathway 3 targets 70 percent by 2035 with the availability of new nuclear resources. Along all the Pathways, all continue to target net-zero carbon emissions by 2050. So there're consistency in that on a long-term basis and variation based on when the interim target is achieved. We have -- moving to the center block here -- we have two different sets of portfolios under each energy transition Pathway. We have core portfolios and portfolio variants. Our core portfolios are based planning assumptions. Under each of those energy transition pathways where the portfolio variants look at opportunities and risks associated with resource availabilities. So different levels of solar or wind, natural gas on the system, and then also related to natural gas supply and how that impacts the selection of resources to achieve these emissions reduction

targets.

Finally, or additionally, in the green block here we see sensitivity analysis portfolio. So this is further evaluating the impacts of key drivers to resource selection, including technology costs, resource costs, and fuel prices, demand-side measures such as EE and DSM, and then continuing to evaluate risks and opportunities associated with load growth in the state and continuing to meet those resource requirements to meet the needs of the system.

Finally, we did also develop supplemental portfolios. So these are not intended for planning purposes but to provide additional insights to the Commission. Ms. Bowman mentioned EPA 111; that's an example of one of the rules -- or one of the supplemental portfolios that the Companies did develop, looking at how the Companies would meet portfolios that are compliant with the proposed rules as such, and because those rules are still being developed and finalized, they are in that supplemental category, but for presented for informational purposes at this time. So overall, the Companies are presenting a robust modeling framework, presenting 13 -- excuse me -- 33 portfolios that capture risk over

resource availability and impacts -- that may impact the resource selection and provides paths to check and adjust over time as we continue to gather more information on this changing energy landscape.

So what we have presented here is the results of the Companies' coal retirement analysis. The Companies did conduct an updated coal retirement analysis consistent with the updated planning assumptions I discussed previously, including the new load forecast reserve margin resource costs and timing. Importantly, the Companies continue to follow the retire -- or replace before retire approach to maintain reliability on the system. That is enabled through those replacement generation coming online. Really underscoring our ability to maintain reliability and meet that load growth in the near term.

So overall, Pathway 3 really does strike a balance between maintaining that reliability and meeting load growth in the near term while allowing for that orderly transition of the fleet to mitigate customer -- and to mitigate risk to customers on long term by eliminating coal generation from the portfolio.

So once we have the coal retirement analysis conducted and those dates used, we develop portfolios through the analytical process that we discussed. What we're showing here is three snapshots in time: 2030, 2033, and 2035, for the core portfolios under each pathway. So these are base-planning assumptions under each of the three energy transition pathways. With P1 Base targeting that emissions -- interim emissions reduction target of 70 percent by 2030. P2 Base achieving that interim emissions reduction target by 2033. And P3 Base by 2035.

The snapshots in time also help Duke provide a comparison of the pace of the transition and the resources needed based on the energy transition pace that each of the portfolios are targeting. So first, looking at the 2030 snapshot and really focusing first on P1 Base, the portfolio targeting the 70 percent emissions reductions by this 2030 timeframe. We see 6.6 gigawatts of solar, 5.1 gigawatts of battery, support of about 4 gigawatts -- a little over 4 gigawatts of combined cycle and natural gas capacity -- hydrogen-capable natural gas capacity to support retirements. And then accelerated deployment of onshore and offshore wind. So to put some of these in

perspective, that 6.6 gigawatts of solar that's more than the combined DEC and DEP have on the system today. And that is also on top of 3 gigawatts of solar that's already under development. So a significant transition pace that is really -- continues to be challenging. 5.1 gigawatts is roughly equivalent to the amount of battery capacity the United States had on the system throughout the entire U.S. just two years ago. So the amount of deployment just in the Carolinas is -- is significant.

And then 300 megawatts of onshore wind and 1.6 gigawatts of offshore wind do represent accelerations from the Companies' base planning assumptions to achieve this 70 percent emissions reduction by 2030.

The 7.1 gigawatts of coal retirements that you see there associated with P1 base are really enabled by this unprecedented amount of resource additions that would be required under a P1 -- Pathway 1 portfolio.

Moving then to the 2033 snapshot and focusing on P2 Base here. We do continue to see strong additions of solar and battery over time. Continued support of hydrogen-capable natural gas to

continue to retire that coal capacity and help with emissions reductions from those hydrogen-capable natural gas combine cycles. Looking out to the last row there, in terms of offshore wind, the allowable extension past 2030 is set up here in Pathway 2 based on the availability of 1.6 gigawatts of offshore wind to allow the Companies to reach that 70 percent emission reductions target with those resources.

So again, continuing to present an aggressive deployment of solar and battery, along with the natural gas and wind capacity needed to reach that target by 2030.

Finally, in 2035 -- and now focusing on portfolio P3 Base, again, still significant amounts of solar addition relative to 2030 and 2033. And we look over to the extension based on the availability of new nuclear. So this portfolio targets 2035 based on the availability of new nuclear resources to the portfolio. And not only is new nuclear added to achieve the 70 percent emissions reductions in P3 base, but it's actually added in all the portfolios as soon as it's available there in 2035, underscoring really the critical importance of nuclear in achieving the emissions reductions. We also see pump storage

coming into the portfolio in this timeframe. This is incremental storage capacity that represents a diversified long duration storage option to help balance the renewables coming onto the system, as we see. So this really underscores the pace of transition.

The last point I'll touch on here on the P3 Base is, as you can see for portfolios P1 Base and P2 Base, those have significant amount of offshore wind by 2035. We have a grayed-out box there on the bottom right-hand corner. This is 0 to 1.6 gigawatts of offshore wind. While offshore wind was not selected in our base portfolio base planning assumptions for pathway 3, it was select in a variety of our portfolio variants and sensitivity analysis portfolios really representing the ability for offshore wind to deliver value in reducing carbon emissions. So Mr. Gagnon will speak a little bit more of how we're proposing dealing with offshore wind and its ability as a long-term option for the Carolinas.

So with that, the pace in transition here really looking at the differentiation of incremental resources. As we look at this slide, we see the capacity mix of -- the last slide was incremental

resources; this is looking at the entire portfolio of resources at different snapshots in time.

Looking first at 2024, we have about 40 gigawatts of planning capacity on the says -- excuse me -- nameplate capacity on the system. By 2033, we see significant increases in capacity both from storage and solar, along with growth in hydr- -- additions of hydrogen-capable natural gas resources to reduce and replace the retiring coal capacity.

As we look towards 2038, the amount of resources across the three different portfolios begins to converge, with the main differentiator across the portfolios being the amount of offshore wind that's in the portfolio by 2038. And as we look forward to 2050, the biggest increase that you'll see here is the growth of nuclear resources on the system, and really looking at nuclear's ability to provide carbon-free capacity to the system. And it's critically important for carbon neutrality in 2050. So while each of these energy transition pathways present different timelines for achieving that interim reduction target, as we look out to 2038 and through 2050, the resources really do begin to converge with the achieving of carbon neutrality in that timeframe.

Next slide, please.

So while looking at capacity on the last slide, this is the energy mix of the system over time and how energy actually gets served. So starting with 2024, the Companies project about 50 percent of our energy coming from the existing nuclear on our system. We continue to see that as foundational to our energy transition, maintaining those units, pursuing separate license renewal, and having those resources as a foundation for continued reduce -- reducing emissions on the system. About 35 percent of our energy in '24 projected from natural gas. About 8 percent from solar, 5 percent from coal, and about 2 percent from other renewables, including hydro.

As we look towards '33 -- 2033, the incremental renewables that we're adding to the system are helping to meet load growth and reduce the amount of generation that we need from natural gas on a long-term basis. So continuing to fill in and represent an emissions reduction tool that we have in the near term.

As we look forward to 2038 and 2050, we see the growing contribution of new nuclear onto the system, first being introduced to the system in the

mid-2030's, and then by 2050 representing roughly 70 percent of our energy coming from nuclear to achieve carbon neutrality.

We see there in 2050, a small sliver of hydrogen cap- -- or hydrogen serving energy in that timeframe. Hydrogen plays an important but limited role in the long-term carbon neutrality planning of the system, representing generation during the most extreme peak times of our system and really working flexibly with renewables and their variable energy output which are, by 2050, serving roughly 30 percent of our energy in that timeframe.

So while the analysis is showing the different ways that the system will operate over time, wanting to look at some of the analytics of each of these portfolios from an execution risk and an overall cost perspective. So starting here first on the energy transition risk of each of the portfolios. As I mentioned, the system today is roughly 40 gigawatts worth of generating capacity. While P3, allowing for 2035 and new nuclear to achieve that 70 percent emissions reduction target, still does present a very aggressive transition in terms of planning, procuring, interconnecting, and commissioning all of these

resources. It's roughly 50 percent of our existing system today over the next ten years. So what took us 60 years to build up the resources that we have on the system today? We're going to need to add another 50 percent of that generating capacity to the system in just 10 years. And that the pace only increases as we look across portfolios P1 base and P2 base under those energy transition pathways. So while P3 does continue to present this aggressive pace of transition, it does present an overall more executable plan relative to the other portfolios as presented here.

Next slide.

And then last, but certainly not least, the cost considerations for each of these portfolios. So on the left, we have the present value of revenue requirements cumulatively taken through 2038, the end of the base planning 15-year planning horizon, and through 2050, our carbon neutrality planning horizon. And then on the right, customer bill impacts, looking at snapshots in time in 2033 and 2038 of the compound annual growth rate of customer bills. So how much does customer bill grow here over year. So on the left, P3 continues to present the lowest-cost planning portfolio on a long-term basis relative to the core

portfolios, and really being reflective of the pace of transition needed in that portfolio to achieve the interim target by 2035. On the bill impact side, similar to PVRR, P3 base does represent a strong balance between customer impact and the transition over time relative to the other portfolios, with the overall increases in bills projected to be generally in line with inflation over the 2033 and 2038 timeframes.

So with those costs and executability considerations, I'm going to hand it back to Mr. Gagnon to discuss some of the ways that we're using these results in developing our near-term actions and recommended portfolio.

MR. GAGNON: All right. Thank you.

So I guess, just to reorient us a little bit, we start at the beginning talking about the changing energy landscape. That's chapter one of the plan. Planning objectives that's going to be in Chapter 2 of the Plan. Then Mr. Quinto went through the -- the analytical process that's also in Chapter 2 and started to get into the results that's in Chapter 3.

I'm going to continue to talk a little bit

about the results, go into a bit more detail on energy transition Pathway 3. And then we'll get into the near-term action plan, and that is Chapter 4, which is our execution plan and near-term actions.

So we'll go to the next slide. And just to reiterate, Pathway 3 is the one that achieves that 70 percent interim target by 2035 using new nuclear capacity to get there. And that new nuclear also provides the flexibility under HB951, right around the timing of the 70 percent target.

And, as the numbers on the last couple of slides that Mr. Quinto had showed, Pathway 3 is a very ambitious plan, but it also allows us to proceed in a measured, deliberate, orderly manner to make sure that we are maintaining reliability throughout this transition and being able to control costs for customers. So Pathway 3 finds that right balance across the objectives that I talked about at the beginning.

And if you look at the second part of -- of Chapter 3 in the Plan, you'll see a comparative analysis of the -- of the energy transition pathways and the core portfolios under each. And, as Mr.Quinto said, when you look at that, you'll see that Pathway 1

-- when you start talking about 1,600 megawatts of offshore wind, 6,600 megawatts of solar, in addition to the 3,000 already under contract or designated under other programs, over 5,000 megawatts of batteries, 4 combustion turbines, 2 combined cycles -- there's a laundry list there that all has to be online by the end of this decade to make Pathway 1 viable. That's over 20,000 megawatts. And so you'll see that Pathway 1 is really only a plan that is executable on paper and is not the most reasonable and prudent plan for our customers. And if you look at energy transition Pathway 2, it is similarly ambitious to Pathway 3, with the exception that it relies on those 1,600 megawatts of offshore wind being available by the beginning of 2033 to achieve that interim 70 percent target, and to support that increased pace, it also accelerates 2,500 megawatts of batteries to the early 2030's, that would show up later in the 2030's under Pathway 3. And so, by relying on that offshore wind and accelerating those batteries, you're increasing the risks to successful and reliable plan execution. You're increasing costs to customers. And so, again, thinking about Pathway 3, which gives us until 2035 which relies on the new nuclear, that one

finds the right balance. And it's important to keep in mind, as Mr. Quinto said, that the energy mixes across all pathways converge by the time you get to the late 2030's and into the 2040's, right? They all require substantial additions of renewables and storage. They all rely on new nuclear to ultimately get to carbon neutrality. And they all require that hydrogen-capable turbine capacity that can support the shift to variable energy resources and maintain reliability for our customers as we retire the coal and serve their growing needs. So energy transition Pathway 3, as all the pathways, keeps us squarely on the path to carbon neutrality by 2050.

If we go to the next slide, you'll see the cumulative resource additions on a nameplate basis under energy transition Pathway 3. And this is for portfolio P3 Base, which is the core portfolio under that Pathway.

And again, you can see that by 2038, we're talking about pushing 25,000 megawatts of new resources on the system. As Mr. Quinto said, by '33, it's over half of what's on the system today. By '38, it's 86 percent of what is on the system today. So this is an enormous undertaking.

By the time you get to 2038, you see the resource additions. About three-quarters of it is renewables and storage. Most of that is solar. You see the advanced nuclear coming on in the mid-2030's to support that interim target. And as I said, if this chart extended to the right further, you'd see that nuclear becoming more important, really being the backbone of the transition to carbon neutrality. And then at the bottom, making up a relatively small portion of the total capacity but being essential to maintaining reliability and having the flexibility on the system that we need. You see the hydrogen-capable turbans, the combined cycles, and combustion turbans.

And the other point I want to make on this slide is that these resources in the portfolio, they work together right as one whole system. And that's what makes it so important for us to drive the plan in a coordinated and deliberate manner. You have the renewables to provide the carbon-free generation; you need the storage to make sure that that generation is aligned in time with our customer load; you need the nuclear to provide that around-the-clock carbon-free, and then you need the turbans to provide the flexibility as we shift to more variable energy

resources. And so all of that has to happen together in a coordinated way. That's important for successful planning and execution. It's important for cost control. It's important for making sure that we maintain reliability as we go.

We can go to the next slide. So this one, I think, tells a good story about that transition. It can be a little bit hard to interpret, so let me walk through it. And, please, ask questions if you have any. So on the Y axis, you have the expected winter peak load in percentage terms. So percentage of forecasted winter peak load. And you'll see a horizontal line at 100 percent there, so that is the level of the forecasted winter peak. And then you'll see another horizontal line up at 122 percent, and so that's the forecasted winter peak plus that 22 percent reserve margin.

And then, across the X axis, you'll see time. Each year has two bars: one for the winter and one for the summer. And the bars are broken up into three sections. The blue, that is dispatchable firm capacity. The orange section, that is limited duration. Think about energy storage demand response programs. Then the yellow section at the top, that's

variable energy resources. That's your renewables. And you can see that, today, we have enough firm dispatchable capacity on the system to meet that expected winter peak load and summer peak load.

And, of course, you need the whole system to meet your reserve margin, right? Because there's going to be fluctuation around that expected peak, but we have enough firm dispatchable on the system to meet the expected peak.

But as we move out of coal and transition to more variable energy and limited duration resources, you see that that firm dispatchable capacity declines, and now we're relying more and more on the orange to get us to the expected winter peak and the yellow to provide the energy for those limited duration resources. And that period from, call it 2029 to 2035, '36, that Mr. Quinto highlighted on his first slide, that critical transition period. That's where the bulk of the coal capacity is coming offline, and substantial additions need to be in place to make sure that that doesn't jeopardize reliability for our customers. That's really the critical period where you see really a shift -- a fundamental shift in how we operate. From relying mostly on those firm

dispatchable resources to really leaning on the variable energy and limited duration resources in that period.

All right. So we'll go to the next slide, and that's -- this is the --

COMMISSIONER KEMERAIT: Commissioner Duffley has a clarifying question.

COMMISSIONER DUFFLEY: Just when you were creating the slide, like the blue sections, what data are you using?

MR. GAGNON: So this is data that comes out of the modeling results for energy transition Pathway 3. So that's the resources --

COMMISSIONER DUFFLEY: So it's Pathway 3?

MR. GAGNON: Yeah. Yeah. Sorry.

COMMISSIONER DUFFLEY: Thank you.

MR. GAGNON: All right. So now we're going to talk about the proposed near-term actions.

You'll see that there are a significant increase relative to what the Commission selected in the '22 Carbon Plan Order, and I just should say before we step through it in detail that these near-term actions are supported by the entirety of the analysis along energy transition Pathway 3, right? So

the core portfolio with the base assumptions is important, but it's also informed by the portfolio variants and the sensitivity analysis portfolios and the information that we get from that analysis as well.

So if you look at the blue row at the top, we are proposing 6,000 megawatts -- procured 6,000 megawatts of solar by -- or through 2026. That's the next CPIRP planning cycle, right? So between now and the next CPIRP, procurements of 6,000 megawatts of solar. That solar would be placed in service by the beginning of 2031, and that amount represents an increase of 3,150 megawatts to the amount that the Commission approved in the '22 Carbon Plan Order. You'll see that the procurement targets are ramping up over time. We've procured 965 megawatts in the '22 procurement. In '23 and '24, we're targeting over 1,400 megawatts, and then it rachets up again in '25 and six. And making sure that we get that solar online in a timely fashion really depends on the advancement of the RZEP transition projects.

Next, moving over to batteries. We're proposing 2,700 megawatts of batteries, again, to be online by the beginning of 2031, that's an 1,100

megawatt increase over the '22 amount.

And a substantial portion of that would be paired with solar, and acquired via procurements. Then if you look at the combined cycles, there are two additional combined cycles in this year's near term action plan. And, again, those are absolutely critical to maintaining reliability and serving growing customer needs as we transition out of coal and support more variable energy resources on the system. And on the next slide, going to combustion turbans. We talked about the reserve margin going up, having additional combustion turbine capacity on the system. It's a 900-megawatt increase. Two new turbans relative to what the Commission selected in '22. That's essential, again, for reliability.

And then you go to onshore wind: 1,200 megawatts in this year's proposed near-term actions to be online by the beginning of 2033, a little bit longer lead time there. And I just want to underscore the value of the wind generation profile on a system that is heavily geared towards solar in terms of the renewables, right? That we have, right? So the wind generation profile is not correlated with the solar generation profile, and so they're really

complementary. And because we are so solar-rich in the Carolinas, that wind really has a lot of value in terms of diversifying when carbon-free generation occurs.

Then we have additional pump storage hydro, 1,700 megawatts. That's a second powerhouse at our Bad Creek facility in South Carolina. That long duration storage with a proven technology is just absolutely vital.

And then, if we go to the next slide, you'll see the long lead time items. We have the advanced nuclear on there, similar to last year's proposal and -- and we've -- we're developing the early site permit for site one. We're proposing now to begin work on the early site permit and file that for site two, so that we can stay on pace to deploy that advanced nuclear. And then, looking at offshore wind as Mr. Quinto said, offshore is not included in the base portfolio for Pathway 3, but it does show up in several of the portfolio variants by the mid 2030s. And so at this point, we think it's really important to continue to monitor the domestic market and supply chain, continue to monitor our changing needs, and then make a recommendation as part of our check and

adjust in the next CPIRP filing as to whether it's prudent to pursue an RFP for offshore wind at that time.

So again --

COMMISSIONER KEMERAIT: Referring to offshore can you -- you may be getting to this, but can you clarify the slide on page -- slide 16 that refers to 0 to 1.6 gigawatts of offshore wind, and the difference between -- you've given a range; can you explain the range?

MR. GAGNON: Sure. So that's related to all of the different portfolios that we modeled under Transition Pathway 3. Offshore wind is not selected in the base portfolio. That's the zero. There are some portfolios where it does come into the resource mix. If you think about lower costs or some of the even higher load growth scenarios, offshore wind starts to come into the mix. In some cases, it's 800 megawatts. In some cases, it's 1,600 megawatts. And so that's what that gray box means: it's -- there's a range; it's not in the base. But it's important to maintain it as an option going forward.

COMMISSIONER KEMERAIT: Thank you.

MR. GAGNON: Sure.

And so I think that brings us to the end of my section here, but I just want to underscore, again, the pace, scope, and scale of what we're proposing in these near-term actions and the entirety of energy transition Pathway 3. The near-term actions are over 1,700 megawatts of new capacity. That's nearly 11,000 megawatts more than was in the '22 Carbon Plan Order, and in order to be able to succeed and deploy these in time, it's going to take decisive action on a whole range of fronts. But we're well positioned to make this happen and to deliver the transition for our customers. And importantly, I want to turn it now to Mr. Duff to talk about how we shrink the challenge from the demand side and some of the enablers related to that.

MR. DUFF: Thank you. It's wonderful to be back here in front of the Commission today to talk about our commitment to shrinking the challenge through grid edge and customer programs, as we detailed in Appendix H of this year's CPIRP filing. I'm real proud of this slide because I think it really is very efficient in telling the great story around the modeling associated with utility EE in this year's Carbon Plan. So there's a lot of lines on here, but I

want to try and make it real clear what each line is and what it's really talking -- what it's really telling the audience.

First of all, we incorporated the Commission's direction to continue to maintain a base case assumption of 1 percent of eligible annual savings -- eligible retail sale savings -- as well as a high case sensitivity of 1.5 percent of eligible retail sales annual savings. Now, when I say that, I want to make sure I clarify, again, what I tried to in last year's Carbon Plan case, which is that this is a floor. It is not a ceiling. So what we're assuming is, over the 28-year period that's being modeled, energy efficiency savings will not drop below either 1 percent of eligible sales or 1.5 percent of eligible sales. And those two levels are shown with the two dotted green -- the two dotted lines. The dotted green showing 1.5 percent, and the dotted black line showing 1 percent eligible sales. But the real important lines to look at on here are the blue line and the purple line.

The blue line is really showing the new base case, or the 1 percent of eligible retail sales. And the purple line is showing what we're calling a low

case, or what was modeled in last years Carbon Plan. And so what you'll see in looking in both DEP and DEC, is there's a significant increase in the -- in the amount of energy efficiency that occurs in both DEP and DEC in that base case assumption. And when you look at it, there's really two drivers that are driving those increases, or the gaps between the blue and the purple line. In the area that's circled in red, the first 10 years, you're seeing the Companies' efforts through it's market potential study that was developed by resource invasions to quantify what the potential impact of the IRA is on energy efficiency for utility energy efficiency programs. And then you'll see after that red circle period, you'll also still see a gap between the blue and the purple lines. And that's being driven by the increase in the load forecast that, as discussed by Mr. Gagnon, is being driven -- 86 percent is being driven by either EV adoption or economic development. So those two things are driving up the load, which is in effect increasing the floor or spread -- or increasing the total amount of efficiency that's achieved over the forecasted horizon. Just to put it in context, over the 28-year plan, the DEC energy efficiency annual gigawatt-hour

savings increased by 18 percent. Again, this is base case to base case and DEP is increasing by 11 percent. In total, that's over 4,900 gigawatts-hours of additional energy savings just from moving from one plan to the next. So I want to focus a little bit, specifically on the red circle, to let you know how the company considered the IRA impacts. So there are two different rebate programs in the tax credit that were issued by the DOE as part of the Carbon Plan. And we have been working with the DOE as well as the State Energy Offices, who will be administering these Rebate Programs, to try and have our programs coordinate and complement their initiatives to get the rebates out. And so there's been ongoing conversations. We've filed a request for information with the DOE, so we understand how they're planning on trying to have our programs coordinate with the IRA. And in July, the DOE actually issued it's initial guidance on how the Home Rebates Program and the HEAR, or Home Electrification Appliance Rebate Program -- there's two -- how those would be administered in general. The State Energy Offices still have to apply with the DOE and get approval for the Rebate program, but those programs have now -- we have guidance on how

they are going to work. What's been modeled was based off of the initial guidance because of timing, but, essentially, as I've said, resource innovations look at those three programs -- there's tax credits, the home program, and the HEAR program -- and they determined that the almost $210 million that will be available in North Carolina how those -- what measures those would impact and how it would impact load. We then took that total impact of the IRA and assumed that 60 percent would be associated with utility EE programs; A, this recognizes our desire to work in coordination and collaboration with the State Energy Office to make sure our customers are aware of those programs and taking advantage of them, as well as the fact that we then took that other 40 percent and worked with our load forecasting group to make sure that they factored in that additional 40 percent into natural occurring energy efficiency so that the entire estimated impact of the IRA was in fact incorporated into this Carbon Plan.

If you go to the next slide, I want to talk about some of the progress that's been made on the -- in the near term on the grid edge enablers that were identified last year. One of the big enablers that

was identified was moving to an as-found savings base line, and I'm pleased to say that the Commission recently reaffirmed its support for the Company in certain programs that are designed to qualify for an as-found baseline, and, in this case, it was the Smart $aver early replacement and retrofit program. That program basically allows us to look at the savings associated with a customer who is replacing working, yet, inefficient, equipment with efficient equipment. So you're seeing savings coming on the system earlier than what they would. And we think that's really important because when you couple our incentives with IRA incentives, we think there's a real economic value proposition to customers to act earlier and adopt things even though their inefficient equipment may still be working. And so we're pleased that that program has been approved and is now in the process of being implemented in the market, so when those IR rebates come available in what we believe will be late '24, early '25, we'll have them in place to complement them.

Additionally, we've received a positive order on our tariffed On-bill Repayment Program. This is a key component of trying to remove financial

barriers for customers who want to take on efficiency investments because it's tied - this program is tied to the customer account where the savings are realized rather than the customer, so there isn't a credit requirement for them to actually get this amount put on their bill as a tariff charge, which will still be bill-positive for the customer, meaning the savings will exceed the monthly charge on that account's bill. But that received approval recently, and we're in the process of trying to implement that as well as an accompanying pilot, which we're really excited about with new construction from multi-family because we feel it can break down some of the landlord-tenant barriers that have stood in the way of giving new multi-family housing built at a high efficiency level here in North Carolina.

One of the other manufacture -- one of the other significant enablers that was identified that a lot of ongoing work has gone through was the updating of the EEDSM cost recovery mechanism, which really lays out the process by which the company gets programs approved, and how they are evaluated, and then the cost recovered from customers.

We initiated a formal review in April

consistent with the Commission's Order in the 2022 Carbon Plan and have been working with stakeholders since even before then to try and get input into this comprehensive review of the mechanism, but we have put specific focus on the four enablers that were identified in the Commission's Order and have provided draft language on how the mechanism could be modified to incorporate those enablers and continue to get feedback on that mechanism as well as meet with stakeholders about those enablers and hear more and more about other areas that they think may need modification in order to enable more EE and DSM in the future. There were recent filings about the next steps in this that are pending in front of the Commission that we're waiting on, but we're still working with stakeholders along the way because the Company, in its initiation of this, believes that we really need to work in a time manner to try and make sure that these enablers associated with the mechanism review can go into effect in 2025 and start changing the economics and increasing the amount of efficiency that's achieved in the near term.

We've also -- I'm sorry. Was there a question? We've also seen great headway in our

income-qualifier low-income programs. This year, we've seen Commission approval in both North and South Carolina of expanding our weatherization program, which works with in accordance with community action agencies to help income-qualified customers weatherize their homes and promises to make them more energy efficient. We also had received approval of a new program -- pilot program called the High Energy Use Pilot, which really is new and innovative because we're not just looking at income qualification through this pilot to determine customer eligibility; we're also looking at customers that use above 18,000 kilowatt hours a year to make sure that we're really targeting those customers that are income qualified that can benefit most from this pilot program and exceed the savings that can be achieved. So it's an exciting pilot that we've received a lot of positive press about and is being rolled out as I speak. We've also seen some progress on the demand-response side of things. We have seen additional measures added to our demand response programs, and we recently filed for approval in DEC of a nonresidential DR option for customers within the Power Share Program that was specifically developed off of feedback that we

received last year around a similar program in California. Obviously, this program has to be tailored around our economics, but the structure of it was based off of that feedback that we received, and that program has been filed recently with the Commission.

And then, finally, we've also recently filed an income-qualified DR program, which looks to bundle EE and DSM in the delivery of income-qualified DR to try and take advantage of the fact that we're in these income-qualified customers' homes and can try and get them to participate and see the bill savings as well as help realize the peak savings associated with participating in a demand response program.

And then last but not least, is the rapid prototyping associated with non-EE DSM. Again, this didn't have a formal initiation like the review of the EE DSM cost recovery mechanism, but we have been working with stakeholders on a regular basis since March to develop this process and guidelines for a rapid prototyping, or invasion program, and are very, very close to having a final design that will be filed with the Commission we believe in fourth quarter of this year. It's been a lot of meetings and a lot of

really great stakeholder feedback on how to try to make these non-EE DSM grid-edge-type resources that we need to prototype and test available more quickly. And so, again, excited with the progress that has been made, and I think you'll see, again, going back to those -- to the forecast that was included in this year's Carbon Plan that the Company is, again, having very aggressive assumptions associated with EE but believes that with these enablers and other steps taken, that it's a reasonable approach that can be checked and adjusted as we move forward.

And with that, I'm going to turn it over to Mr. Peeler.

MR. PEELER: Thank you. Good morning. As we've heard this morning, this is a substantial, you know, change in our resource mix and a huge task to undertake. And the amount of generation that we've talked about coming online over the next number of years, it's going to be extremely important that we properly plan for transmission expansion and that we have an effective and timely generator interconnection process in order to make that work. It just -- there are a lot of other challenges, but those are two really large ones that we need to take with -- pay a

lot of attention to. So we've been proactively working on, you know, both of these areas for proactive transmission planning as well as interconnection efficiencies. I'd like to talk a little bit about those enhancements and where we're headed. The details of this, of course, it's in Appendix L. A lot there. I'm just going to obviously summarize. So first of all, we'll start with the Red Zone Expansion Projects from the Red Zone Expansion Projects from the Red Zone 1. There are 14 projects. They are all in flight. They're all on track. The latest of which is due in service by mid-2027. So those will enable a significant amount of interconnection. Speed that process. Make that much more effective. Red Zone 2 projects have been identified. They are working their way through the planning process now through the NCTPC. We anticipate incorporating those into our plan as -- through that normal planning process regardless. They will enable, again, additional interconnections in an efficient manner.

Speaking, you know, specifically about the planning process, the planning process has to evolve. The local planning process, which, you know, it's in

our OATT -- that's the N-1 attachment -- we do anticipate making some revisions to that attachment later this year. Probably be filed in November. And, you know, highlighting those changes really helps us, you know, meet those objectives of interconnecting things more efficiently and quickly. But some key things. It will incorporate, you know, opportunities for more stakeholder engagement in the planning study scenarios, needs identification, solution development, also the ability to incorporate more potential solution alternatives to be evaluated, and consideration for multi-value projects. So not just, you know, not just look at one single view of what a project's value is but it's broad contribution to the system as a whole.

Additionally, one -- a naming change, so we intend to rename the NCTPC to the Carolinas TPC to really capture the fact that it really is a multi-state planning collaborative. It's not just North Carolina; even though we named it that, but we've been planning for both states through that process. As far as activity for the NCTPC this year, there is a public policy study that's been scoped and being prepared now. There were -- there were a couple

of requests. Those have been incorporated into one scope. That -- that study will, at a high level, it will take a look at green -- what the generation changes may drive needs for green field transmission. Long range stuff. As well as some high-renewable scenarios above, you know what some of our portfolios are. We expect that study to be available first quarter of '24. It will be informative to our plans. Help us, you know, validate or adjust our Red Zone Expansion proposals and other transmission plans. And, you know, again, just can't reiterate enough the importance of that proactive transmission planning to enable this transition.

Focusing a little more on the Interconnection Process. Of course, we were an early adopter of the Cluster Study Process. That has improved the throughput of our interconnection work.

We're seeing the fruits of that now, and we continue to refine it. We've also worked on, you know, other ways to speed the time from request to interconnections, such as some -- we have standard designs, we've compressed some of our construction durations, looking at, you know, how to ensure we have material availability through some, you know, advanced

or earlier procurement of those -- those things needed, that are needed for all interconnections. And much more interaction with developers. We have more touch points along the way to, you know, set expectations up front for both Duke and developers so that we can be aligned and get those projects online sooner.

Additionally, in the -- in the vein of both efficiency and reliability, we have established some technical requirements for inverter-based resources and some commissioning approaches for those. There's -- I'm sure the Commission's aware, there are a number of concerns across the country about the performance of inverter-based resources, and as they grow, we need to make sure that they are performing reliably. So we've worked to develop those technical standards. They are posted on our Oasis site. They are now incorporated in our Interconnection Agreements. And, you know, it serves two really good purposes: number one, it helps upfront be clear about what the needs are for a developer whose -- whose planning. The expectations are clear. And then, in the long run, we have a reliable asset that we can count on. So the technical requirements in commissioning are very

important as we move forward, and those are established and moving forward.

COMMISSIONER KEMERAIT: And, Mr.Peeler, before you move on, the last item was about continuing the interconnection process improvement work, and you've provided a fair amount of detail about the improvements to the process. Have you seen -- has Duke seen shortened timelines to date, and if so, can you -- is there any data about the time that has been improved?

MR. PEELER: Yeah. So we have. So the time has been shortened. I don't have the data with me for that, but we have seen shortened ability to get to an Interconnection Agreement. I will say, there are also headwinds that are kind of opposing some of those improvements with supply chain challenges, interest rates, and other issues that developers are actually asking for longer times in some of these where we could actually get to an agreement sooner, but they are actually pushing dates. So for a number of reasons, right? All those things I just mentioned, but we definitely see the ability to sign those Interconnection Agreements faster. I think the Cluster Study Process helps a lot, as well as some of

these other enhancements. And, you know, certainly we have some detail in our Appendix L, but we can -- we can provide additional information if desired.

COMMISSIONER DUFFLEY: So to follow up with the renaming, I just wanted to -- or if you could remind me, are all of the appropriate South Carolina entities currently participating in the NCTPC?

MR. PEELER: So they are not members. There's a separate planning collaborative that includes other utilities in South Carolina.

COMMISSIONER DUFFLEY: Okay. But so no one's attending or participating?

MR. PEELER: There is attendants from various groups, but as far as actual planning members, the utilities in South Carolina other than Duke are not members.

COMMISSIONER DUFFLEY: Okay. Thank you. It was the attendants I was wondering about. Thank you.

MR. PEELER: So let's move to the next slide. I'll talk about one more enabler to the overall transition, and that is a merger of the DEC and DEP utilities. And we talked about this one for, you know, a number of times in front of the Commission. At a high level, there are benefits here for customers

from a cost standpoint. There are benefits here from an operational standpoint. There are benefits here from the ability to implement this plan that we're talking about. The combination allows for more efficient planning. So it allows for, you know, more efficient investment in resources. Ultimately, over the life of the Plan, it results in fewer resources needed to meet the combined needs. And it allows for, you know, benefits and daily operations of lower-day-ahead operating reserves, efficient use of the transmission system, and all the resources. It also helps with investment as we go forward from a rate standpoint between the different Companies, allows the investment to be spread over a much larger customer base, and addresses the concerns between rate disparity between the two Companies going forward for customers. We believe it's the right direction and the right time to make this change. And what I've got here on this slide is a very high-level anticipated timeline. So the anticipated timeline for completion of the merger would be January of 2027. So that's roughly a 3-year project that we would start soon. Likely early next year. Carrying out a number of things. There's a lot of work to be done to

consolidate systems and processes, obviously. There's a lot of communication with customers and stakeholders, and there are various rate issues to resolve, contracts to resolve, and certainly there are regulatory approvals for both North Carolina, South Carolina, FERC, as well as the NRC. So the timeline you have here is, again, it's a high-level timeline, but you can see, we would anticipate the beginning of some of those actual filings to start the middle of '25, but the work is started earnest early next year.

And with that, unless there are questions, I'll hand it back to Ms. Bowman.

COMMISSIONER KEMERAIT: Mr. Peeler, I actually do have one question about the merger. And in the materials provided in the Plan, it stated that the Cost Benefit Analysis -- that their preliminarily results have been provided. When will the full study for that Cost Benefit Analysis be available?

MR. PEELER: So I'm not certain, but I would think early next year we should be able to provide something. Preliminarily, like I said, we, you know, certainly qualitative; a lot of these things are beneficial, and we do have, you know, who have seen some quantitative work as well, but I'd say early next

year.

COMMISSIONER KEMERAIT: Thank you.

MS. BOWMAN: All right. I'll wrap us up. So in conclusion, again, I just want to thank the Commission for the opportunity to come talk to you all today about the important work that we're doing on the 2023 CPRIRP [sic]. As you've heard, we've got an ever-changing energy landscape. We have a big challenge in front of us, but I think we're up to that challenge. And we believe that -- that Pathway 3 is really going to put us on that best path to meet that challenge. It keeps us on a pace that provides that least-cost and reliability components for our customers. I would say that we do need kind of key, decisive direction so that we can keep on that pace, particularly around those near-term actions so that we can continue to work towards the retirement of our coal fleet by 2035.

And with that, I just want to say, we look forward to working with the Public Staff and the other intervenors during this process, and, again, we appreciate your time today. And with that, I'm going to open it up for whatever questions you all may have.

COMMISSIONER KEMERAIT: Thank you, Ms.

Bowman. I'll begin. I just have a few questions. And my questions are all geared entirely towards process questions. Since this is a technical conference and not an evidentiary hearing, I am making a specific point of asking only process questions. Who is the best person to ask questions about the stakeholder process?

MR. GAGNON: I think you can ask those questions to me.

COMMISSIONER KEMERAIT: Okay. Okay. Great. And in the information, it looks like there were five stakeholder meetings, and the last one was held in June of this -- of this year, and from the materials, it looked like there was, what I would describe as a robust participation in the stakeholder meetings. There have been some concern previously about questions being answered; can you explain how the stakeholder meetings were conducted and how questions were provided and answered during the process?

MR. GAGNON: Yeah. Absolutely. So the way we conducted the stakeholder meetings this year was they were open to all attendees, but we did request that interested parties provide technical experts to participate as part of the -- the discussion. So you

had during the registration, if you wanted to participate as a technical expert, you would say, okay, this is the topic for these meetings. I'm an expert, and I want to participate as part of the conversation in this meeting on this topic. And you can see on -- there's actually a slide in the Appendix. You can see that we have a number for overall attendees, but then external technical representatives as well. That's the first appendix, slide 36.

And so if -- for overall attendees, there was a chat function and a text Q&A function. And so our moderator from the Great Plains Institute would direct those questions that came in via that function, but then our technical representatives, they participated just as part of the conversation. So we would walk through the presentation with the Duke technical experts, and then the technical representatives could ask questions, could opine. And it was a much more collaborative for those folks as we went.

COMMISSIONER KEMERAIT: Okay. And then, Duke has said that it plans to make complete modeling input and output data files available to intervenors

once they have executed confidentiality agreements; can you talk about whether that modeling information has been requested by intervenors yet and provided to the intervenors? What is the status of providing that information to the intervenors?

MR. GAGNON: So we proactively provided that at the time of filing. There's a data site set up and so the parties that have executed the NDAs do have access to that. And actually, we did conduct a sixth stakeholder meeting. This was opened just to folks who were interested in that technical data and who have executed those agreements, but we did walk through that data for them just from a logical standpoint so they could understand how the site works, where the data is, what kind of data, and all that kind of thing. But, yeah, all of the modeling files are available to parties.

COMMISSIONER KEMERAIT: And that sixth stakeholder meeting, is that the modeling workshop that was referred to in the Plan? Is that the same thing as the -- Duke had said they would -- it would schedule a modeling workshop after it filed the Plan for the intervenors so that you could provide information about the modeling; is that the sixth

stakeholder meeting that you are referring to, or is that something different?

MR. GAGNON: No. That's -- that's right. And that was conducted, I think, maybe a week after we filed.

COMMISSIONER KEMERAIT: Okay. And then the Plan also talks about some additional stakeholder outreach in meetings with impacted communities and environmental justice efforts, can you -- are you the person that could provide information about -- or Ms. Bowman -- the work that's being done in that regard?

MR. GAGNON: Yeah. I might defer to Ms. Bowman on those questions.

COMMISSIONER KEMERAIT: Okay.

MS. BOWMAN: So as you recall, in the 2022 IRP stakeholder session, we did have an environmental justice-impacted communities workshop there as well. We've continued and try to expand that in this 2023. We've actually identified environmental justice advisory councils in our various communities throughout the state. You know, we serve over 80-some counties in North Carolina, and we've identified those. Particularly those where we have plants that we're planning to retire or significant assets we're

planning to construct. So we've identified various Environmental Justice Advisory Councils based in those communities. We're seeking their input. We had several kind of broad stakeholder sessions to walk through the updated 2023 Resource Plans with those advisory councils and other interested stakeholders really wanting to talk about environmental justice issues and community -- impacted to community issues.

COMMISSIONER KEMERAIT: Are those efforts ongoing, or have they been completed?

MS. BOWMAN: Oh, no. These are ongoing. We believe that these advisory councils will continue to -- continue to meet throughout the years, and they're going to develop their own cadence in with which they meet as we're making this clean energy transition. Because we're going to be continually out there constructing new projects, whether it's new substations, new solar panels, you name it. We've got a lot we've got to construct. So we're going to continue those. That's going to be an ongoing process.

COMMISSIONER KEMERAIT: Okay. Thank you. So I'll look to see if my fellow Commissioners have any questions.

Okay. Commissioner Mckissick?

COMMISSIONER MCKISSICK: And I want to thank you for an excellent presentation this morning. It's been very insightful, and a lot of meaningful data. Of course, the Pathway 3, you're talking about getting where we need to go -- the 70 percent reduction by 2035. Optimally, it would be great to accelerate that pace and do it faster, 2032, wherever that might be. What factors do you think would allow us to get to that point faster than the 2035 projected date? Are there any substantial factors that might influence it that would help us attain and achieve those goals at an earlier point and time that you can point to or identify that, perhaps, would allow those goals to be attained earlier in light of what the goals have been set, you know, legislatively? Understanding system reliability has to be a key factor.

MS. BOWMAN: So I can take a stab at one. And I'm speaking more from policy space than anything. And I'll -- I'll let my experts opine on other areas, but streamlining policy and permitting. You know, that sometimes is a gating issue for construction of new assets. Whether you're talking about transmission lines, or gas transportation lines, or hyrdrogen,

whatever you're talking about, or getting approval for new small marginal nuclear reactors, but streamlining the permitting process.

COMMISSIONER MCKISSICK: Thank you.

MS. BOWMAN: I don't know if anybody else has any.

MR. GAGNON: I think I'd add to that kind of along the same lines. We see supply chain challenges across pretty much all infrastructure, and so this will be part of our check and adjust, and we'll update everything obviously in the next filing. But just the pace at which steel in the ground can be deployed, can be acquired, brought to the Carolinas, and deployed -- that's a big one. And that's something that -- that is reflected in our planning assumptions now when it comes to resource availability.

So I think that, in addition to streamlining the processes, streamlining the supply chain is a really big one. And, you know, it's outside of our control, but that's one that has a significant impact on the pace in which we can execute this plan.

COMMISSIONER MCKISSICK: Thank you. That's helpful. Of course, both of those things are also factors that could project it and cause it to be

delayed even further, unfortunately. Thank you.

MR. GAGNON: That's right.

COMMISSIONER KEMERAIT: Okay. Seeing no further questions, I want to thank Duke for coming in and providing information about the proposed CPIRP. It's been informative and very helpful, and we appreciate your time and effort and coming in today. So with that, I'll adjourn the technical conference, and we'll go off the record.

(The proceedings were adjourned at 11:44 a.m.)

C E R T I F I C A T E

I, KAYLENE M. CLAYTON, do hereby certify that the Proceedings in the above-captioned matter were taken before me, that I did report in stenographic shorthand the Proceedings set forth herein, and the foregoing pages are a true and correct transcription to the best of my ability.

Kaylene Clayton

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