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VIA ELECTRONIC FILING

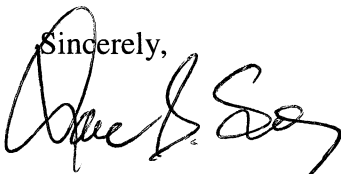
M. Lynn Jarvis, Chief Clerk
North Carolina Utilities Commission
4325 Mail Service Center
Raleigh, North Carolina 27699-4300

**RE: Duke Energy Progress, LLC and Duke Energy Carolinas, LLC's
Report of NC Power/Forward Technical Workshop
Docket Nos. E-2, Sub 1142 and E-7, Sub 1146**

Dear Ms. Jarvis:

Pursuant to the Commission's February 23, 2018 *Order Accepting Stipulation, Deciding Contested Issues and Granting Partial Rate Increase* in the Duke Energy Progress, LLC ("DEP") general rate case in Docket No. E-2, Sub 1142, and as also discussed in the Duke Energy Carolinas, LLC general rate case in Docket No. E-7, Sub 1146, the stipulation included a requirement for DEP to report to the Commission the results of its NC Power/Forward Technical Workshop, which was held May 17, 2018. I enclose the report prepared by Rocky Mountain Institute, the independent organization that facilitated the workshop.

Thank you for your attention to this matter. If you have any questions, please let me know.

Sincerely,

Lawrence B. Somers

Enclosure

cc: Parties of Record

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Power/Forward Carolinas Technical Workshop Report

June 25, 2018

Prepared by Rocky Mountain Institute

Contact: Mark Dyson, mdyson@rmi.org

Table of contents

Executive summary	2
Workshop objectives	2
Key workshop outcomes and takeaways	2
Criteria for an effective collaborative process going forward	4
Workshop activities and attendee list	5
Workshop outcomes	7
Objective 1: Develop understanding of proposed investments	7
Objective 2: Hear and explore stakeholder feedback	9
Objective 3: Support a collaborative process going forward	11
Appendix 1: Breakout discussion notes	15
Activity detail: Breakout Topic 1	16
Activity detail: Breakout Topic 2	16
Activity detail: Breakout Topic 3	17
Activity detail: Breakout Topic 4	18
Activity detail: Breakout Topic 5	21
Appendix 2: Plenary activity notes	22
Activity detail: “Cynics and believers”	22
Activity detail: Stakeholder input priorities	23
Appendix 3: Plenary record	25
Full notes: Clarifying questions and answers following Duke’s P/FC presentation	26
Full notes: Coaching questions following Duke’s P/FC presentation	28
Full notes: Stakeholder input priorities	30



Executive summary

In the settlement agreement approved by the North Carolina Utilities Commission (NCUC) on February 23, 2018, in Docket No. E-2, Sub 1142 for the Duke Energy Progress, LLC (DEP) general rate case, DEP agreed to “host a technical workshop during the second quarter of 2018 regarding the Company’s NC Power/Forward grid investments to explain the need for and ongoing benefits of grid investments, and to hear feedback from stakeholders in attendance.”¹

The workshop was held on May 17, 2018. Acting as a neutral facilitator, a team from Rocky Mountain Institute (RMI) convened 65 participants (inclusive of 18 Duke Energy and five RMI staff) for a day-long workshop that included content presentations, structured feedback sessions, and facilitated small group breakout sessions. RMI captured detailed notes for all small group and plenary discussions, and conducted an anonymous post-event survey among non-Duke, non-RMI attendees to gather stakeholder feedback.

This document provides a record of the day’s activities and outcomes, as well as a summary of survey results. This document contains an anonymized synthesis of what was shared by participants, and does not attribute specific comments to specific parties, in order to respect the ground rules agreed to by participants at the beginning of the meeting. Specifically, participants agreed that what was discussed at the workshop could be shared publicly, but specific comments could not be attributed to individuals without their permission.

Workshop objectives

The workshop was organized around three objectives, listed below. RMI defined these objectives in consultation with Duke Energy and other participants interviewed in advance of the event.

- **Objective 1:** *Develop stakeholder understanding of the needs for and benefits of the Power/Forward Carolinas (P/FC) proposal.*
- **Objective 2:** *Listen to and explore stakeholder feedback.*
- **Objective 3:** *Lay the groundwork for a collaborative process moving forward.*

Key workshop outcomes and takeaways

Five high-level themes emerged from the conversations during the workshop and in the post-event surveys as key outcomes and takeaways for future action. They are described below, with supporting detail in the subsequent sections of this report.

- 1. Participants generally viewed the workshop as a valuable step in building toward a future collaborative process around Power/Forward Carolinas.** A majority of survey respondents indicated that they were satisfied with the

¹ North Carolina Utilities Commission order issued on February 23, 2018, in Docket No. E-2, Sub 1142, page 25; <http://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=d2b2a1a0-dae1-45de-af9c-c987d4aedd8>



opportunity to provide feedback on the proposed grid investments and engage in dialogue with Duke staff in a neutral, facilitated setting. A majority of participants also reported that the workshop helped them build a better understanding of both the proposed investments and other stakeholders' points of view, and in doing so helped lay a foundation for a future collaborative process.

2. **Participants were divided over the degree to which the workshop was effective in addressing near-term issues around the Power/Forward Carolinas proposal.** While most participants indicated that the workshop improved their understanding of Duke Energy's proposed grid investments, a significant number of attendees felt that the information presented during the workshop was repetitive of what was covered in rate case proceedings. The former group expressed optimism that the workshop would lead to a collaborative process moving forward, while the latter group expressed uncertainty over whether Duke Energy is willing to make meaningful changes to the proposed investments or the process used to define them. Participants also raised concerns that the timing of the workshop, in between the DEP Order and the Duke Energy Carolinas, LLC (DEC) rate case hearings and the subsequent Commission ruling, could limit its effectiveness.
3. **Participants shared feedback that better metrics are needed to characterize the performance expectations, costs, and benefits of Duke Energy's proposed investments.** Participants expressed dissatisfaction with the process used to date by Duke Energy in developing and sharing information about Power/Forward Carolinas, and discussed the need for clear, concise metrics to prioritize grid modernization outcomes, measure the success of proposed programs, and determine the need for revisiting programs post-implementation. Participants also requested that Duke Energy make available breakdowns of expected costs and benefits across different customer classes, and for each proposed workstream within the broader Power/Forward Carolinas proposal.
4. **Participants expressed a wide and diverging range of views on grid investment priorities, and investments needed to address them.** In comments shared during plenary discussions and breakout sessions, attendees expressed differing priorities for grid modernization-related investments in North Carolina, including environmental benefits, incorporation of distributed energy resources (DERs), service quality and reliability, and minimizing rate impacts. Participants also disagreed on the extent to which current system performance (e.g., outage duration and frequency) was inadequate and needed to be addressed through incremental investment. Related to this, many participants voiced their concerns with the proposal to recover incremental investment costs through a rider, versus through the existing rate case mechanism.
5. **A majority of attendees expressed support for an ongoing collaborative process to shape the future of Power/Forward Carolinas.** Both during the event and in the post-event survey, participants indicated significant interest in continuing to engage with Duke Energy on refining the Power/Forward Carolinas proposal. Participants offered many forms of support for this process, including



data and analysis around topics where they had expertise or national context to bring to bear, and made specific recommendations and requests of both Duke Energy and other stakeholders to support the success of any such process. The following section of this Executive Summary includes a list of commonly expressed criteria for a successful process going forward.

Criteria for an effective collaborative process going forward

Workshop participants discussed a wide range of options for how to continue a collaborative process going forward, and offered related recommendations for how Duke Energy and other attendees could support an effective process. These recommendations do not necessarily represent the views of RMI, Duke Energy, or any specific attendees. Rather, we include them as a representation of common themes that arose in multiple conversations during the workshop, and thus could be considered by Duke Energy and other stakeholders as they design a process moving forward.

- **Continue direct engagement between Duke Energy and stakeholders to gain further understanding of perspectives surfaced in the workshop.** Duke Energy should develop and execute a plan for future stakeholder engagement activities, including one-on-one meetings and facilitated workshops on a regular basis. This process should be inclusive, allowing all relevant stakeholders to contribute. Duke Energy should plan future engagements to precede formal regulatory processes, in order to avoid the issues identified by workshop participants that may arise if open dialogue is precluded by ongoing negotiations or adversarial proceedings.
- **Duke Energy should continue developing metrics and analysis to support an ongoing dialogue around the costs and benefits of the proposed investments.** To the extent possible, this information should be tailored to specific stakeholder groups to address their gaps in understanding, and shared early in the planning process to allow for useful stakeholder input, including around goals for and prioritization of proposed investments. Duke Energy should consider offers from participants to help structure analysis processes and metrics, and share the results in a way that is at the appropriate level of detail to build stakeholder understanding and prompt input that can be incorporated into a collaborative planning process.
- **Duke Energy should consider integrating the Power/Forward Carolinas planning process with other processes to support related activities.** Workshop participants identified the potential value of integrating grid modernization planning with integrated resource planning, integrated distribution system planning, and the Smart Grid Technology Plan. Duke Energy should scope a collaborative process to encompass a wide range of planning processes that, together, fully capture all sources of value from Duke Energy's proposed grid investments.



Workshop activities and attendee list

RMI consulted with both Duke Energy and other participants in pre-workshop meetings and heeded calls to refine the objectives and design the workshop agenda to best meet the objectives. The workshop agenda as executed is included below in Table 1.

Table 1: May 17 Technical Workshop Agenda

Time	Activity	Objectives addressed
9:30	Welcome remarks	
10:10	Check-in and introductions	
10:25	Activity: “Cynics and believers”	#2, #3
10:40	Presentation (RMI): National grid modernization context	#1
11:10	Presentation (Duke Energy): Understanding the Power/Forward Carolinas proposal, and Q&A	#1, #2
12:20	Lunch	
1:20	Activity: Stakeholder priorities for process going forward	#2, #3
2:25	Activity: Breakout group discussions	#1, #2, #3
4:00	Plenary discussion: Breakout group reports	#2, #3
4:20	Checkout	#3
4:25	Closing remarks and adjournment	

A total of 65 participants attended the technical workshop, including 18 participants from Duke Energy and five from RMI. A full list of attendees is included below in Table 2.



Table 2: May 17 Technical Workshop Attendees

Last Name	First Name	Organization
Adair	Sarah	Duke Energy
Ayers	Chris	Public Staff NC Utilities Commission
Bowen	Lauren	Southern Environmental Law Center
Bowman	Kendal	Duke Energy
Brooks	Jeff	Duke Energy
Brown	Justin	Duke Energy
Brown	Mary Jo	Duke Energy
Burnett	John	Duke Energy
Chan	Coreina	Rocky Mountain Institute
Collins	Sarah	NC League of Municipalities
Culley	Thad	Vote Solar
Cummings	Layla	Public Staff NC Utilities Commission
Dalley	Bryce	Facebook
Delli-Gatti	Dionne	Environmental Defense Fund
Dodge	Tim	Public Staff NC Utilities Commission
Dory	Jacqueline	Facebook
Dyson	Mark	Rocky Mountain Institute
Edge	Chris	Duke Energy
Estes	Rachael	NC Conservation Network
Finnigan	John	Environmental Defense Fund
Floyd	Jack	Public Staff NC Utilities Commission
Fountain	David	Duke Energy
Geib	John	Duke Energy
Golin	Caroline	Vote Solar
Harrod	Jennifer	NC Department of Justice
Hawkins	Kathy	Duke Energy
Hicks	Warren	Bailey & Dixon - CIGFUR
Hipp	Dawn	SC Office of Regulatory Staff
Holder	Nathan	Advanced Energy
Josey	Robert	Public Staff NC Utilities Commission
Kalland	Steve	NC Clean Energy Tech Center
Kruse	Susan	Duke Energy
Ledford	Peter	NC Sustainable Energy Association
Li	Becky	Rocky Mountain Institute
Maurer	Christine	Advanced Energy
McIntire	Mark	Duke Energy
McLawhorn	James	Public Staff NC Utilities Commission
Miller	Sharon	Carolina Utility Customer Association
Mundt	Jennifer	NC Dept of Environmental Quality
Neal	David	Southern Environmental Law Center
Newcomb	James	Rocky Mountain Institute
O'Donnell	Kevin	Carolina Utility Customer Association
Ohms	Cindy	Carolina Utility Customer Association
Oliver	Jay	Duke Energy
Palmer	Miko	Duke Energy
Peedin	Darlene	Public Staff NC Utilities Commission
Ragsdale	Lee	NC Electric Cooperatives
Ralph	Karen	Duke Energy
Ripley	Al	NC Justice Center
Rogers	David	Sierra Club NC Beyond Coal Campaign
Ross	Deborah	NC League of Municipalities
Sides	Jim	United States Marine Corps
Simpson	Bobby	Duke Energy

Sipes	Robert	Duke Energy
Smith	Benjamin	NC Sustainable Energy Association
Stone	Greg	Duke Energy
Tarr	Jeremy	NC Dept of Environmental Quality
Thomas	Jeff	Public Staff NC Utilities Commission
Thompson	Gudrun	Southern Environmental Law Center
Trathen	Marcus	Brooks Pierce
Waller	Jeff	Rocky Mountain Institute
Weiss	Jennifer	Nicholas Institute for Environmental Policy
Williamson	Tommy	Public Staff NC Utilities Commission
Williamson	David	Public Staff NC Utilities Commission
Youth	Michael	NC Electric Cooperatives

Workshop outcomes

The following sections outline the workshop activities, common themes of discussion, and outcomes associated with each of the three technical workshop objectives. RMI developed these summaries based on notes taken during the workshop as well as on the results of the anonymous survey distributed to participants (excluding Duke Energy and RMI staff) afterwards. There was a 68% response rate to the survey.

Objective 1: Develop understanding of proposed investments

Activities

RMI designed several sections of the agenda to allow for explanation of the costs and benefits of grid modernization investment, including the context of grid modernization nationwide as well as the specifics of Duke Energy's Power/Forward Carolinas proposal.

A presentation from RMI (see Attachment 2) reviewed grid modernization trends across the nation, to place the proposed Power/Forward investments in context. The presentation outlined both the content of proposals across the country (e.g., specific investment, regulatory, and operational approaches to grid modernization) as well as processes used by utilities, regulators, and other stakeholders to reach alignment.

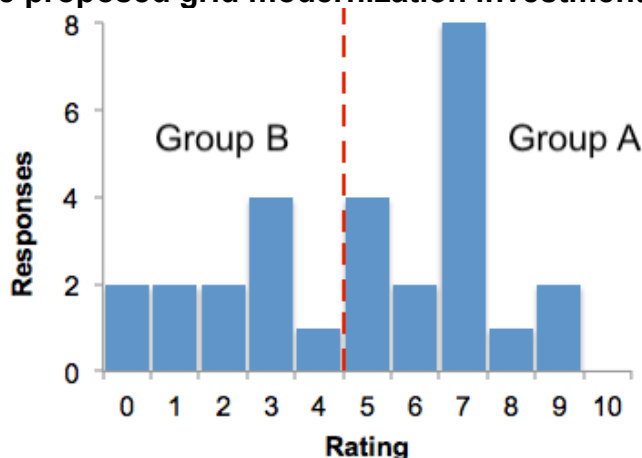
Following the discussion on national context, a presentation from Duke Energy (see Attachment 3) covered the unique factors in North Carolina that form the basis for Duke's proposed grid modernization efforts. After the presentation, participants had a chance to ask clarifying questions that were answered in real time by Duke Energy representatives (see Appendix 3).

In addition to the plenary discussions, where Duke Energy shared details on its proposed investments, the discussion in breakout group 1 also covered technical information. In particular, representatives from Duke Energy shared additional details on the expected reliability benefits of proposed investments—including targeted undergrounding—to customers during major events (e.g., hurricanes, ice storms, severe thunderstorm events, and other events that exceed the IEEE Major Event Day [MED] threshold) and to customers connected to currently underperforming feeders.

Outcomes

Most participants indicated that the workshop improved their understanding of Duke Energy's proposed grid investments, but a significant number indicated that the workshop did not present substantial new information.

Figure 1: Survey responses: “How well did this workshop enhance your understanding of the proposed grid modernization investments?”



The post-event survey asked participants “How well did this workshop enhance your understanding of the proposed grid modernization investments?” Participant answers are shown above in Figure 1. On a scale of one to 10, 57% of respondents answered with a score of five or higher. In comments, participants who awarded these high scores suggested that the presentations were useful in providing insight into both the content of the proposal as well as the priorities Duke Energy held in designing the portfolio. Responses along these lines included “Great overview” and “Helpful to understand Duke’s priorities.”

On the other hand, a significant number of respondents (43%) responded with a score of four or lower, indicating that the information presented at the workshop did not improve their understanding of the proposed investments. In comments, respondents indicated that the presented information was not substantially different from what had been shared previously, in particular during the DEC rate case hearings. Responses in this vein included “[Duke] presented no new information in the workshop,” and “Repetitive with rate case.”

The divergence in responses to the survey question around Objective 1 is reflected in Figure 1. For later reference, this document refers to respondents who answered the question with a five or higher Group A (those who felt the workshop significantly improved their understanding of Power/Forward), and those that responded with a four or lower Group B (those who felt the workshop did not provide significantly new information to them). As discussed below in the section related to Objective 3, these groups tended to respond differently to other survey questions, as well. Overall, individuals in Group A expressed satisfaction with the open dialogue and diversity of stakeholders present, and look forward to substantive discussions in the future. On the other hand, Group B generally sought more details on work plans and investments than

what was presented at the workshop, and expressed more uncertainty regarding whether this collaborative process would continue.

Objective 2: Hear and explore stakeholder feedback

Activities

Most activities within the agenda allowed for open discussion of participant feedback. Following the Power/Forward presentation, participants asked coaching questions that were not answered directly, but were recorded and served to guide the discussion in subsequent activities. This activity allowed participants to offer suggestions in the form of a question, in order to phrase the feedback in a forward-looking way rather than purely as a critique of past actions.

In addition to the opportunity to share feedback in plenary discussions, all five breakout sessions provided extensive opportunities for stakeholders to share feedback on the proposed grid investments. Specific discussions hosted in each breakout session, outlined below, allowed participants to raise points of feedback:

- Group 1: Participants discussed the question “how do costs and benefits of the proposed investments transfer to different customer groups?” and shared feedback on specific items (e.g., targeted undergrounding) as well as the process used to arrive at and communicate the proposed investments.
- Group 2: Participants provided their reactions to an underlying premise of Power/Forward that “the time is now and the need is clear” for grid modernization, and discussed ways to more clearly communicate the needs for the proposed investments.
- Group 3: Participants discussed the regulatory changes required to advance grid modernization, and reflected on the relationship between Power/Forward and other activities in North Carolina. Participants suggested integrating grid modernization planning into other related processes to capture the full value of grid investments.
- Group 4: Participants reflected on the question “what are the next collaborative steps for a successful stakeholder process,” and shared feedback on the timing and level of detail of information sharing from Duke regarding the proposed investments.
- Group 5: Participants reflected on what a successful grid modernization program should look like, and discussed metrics for measuring program success. Participants also provided feedback on the impacts of P/FC on low-income groups.

Common Themes

Key points of feedback from participants centered around information sharing, planning processes, and the scope and pace of Duke Energy’s proposed investments.

Information sharing

Most participants agreed that additional information regarding the proposed investments should be shared among stakeholders. Some participants voiced desire to understand the costs and benefits of P/FC versus maintaining the grid under current practices.



Participants also asked whether Duke Energy had evaluated “the cost of doing nothing” in terms of expected reliability degradation, and compared it to costs of the proposed investments.

Many participants requested specific cost and benefit analysis for proposed investments. In particular, several participants requested that Duke make available specific breakdowns of costs and benefits across different customer classes (e.g., transmission-connected industrial, residential) as well as across different customer types within customer classes (e.g., rural versus urban residential). Participants acknowledged that the full suite of benefits from the proposed investments is difficult to quantify and communicate effectively. In particular, participants acknowledged that, while benefits related to average system reliability are straightforward to quantify using existing metrics (e.g., SAIDI and SAIFI),² there are no straightforward means to quantify many other benefits of the proposed investments (e.g., increased ability to integrate renewable energy).

Planning and communication process

Participants raised concerns with the way Power/Forward Carolinas was developed and initially shared. Many participants agreed that a more transparent, collaborative process would have been preferable to the way that Duke Energy was perceived to have arrived at the original Power/Forward proposal; i.e., through an entirely utility-driven process. Participants recommended that arriving at shared priorities and goals for grid modernization with stakeholders in advance of assessing solutions in a full proposal would have been preferable.

Participants also commented that Duke’s initial messaging around Power/Forward Carolinas discussed the expected costs without clarifying the full range of benefits. Participants acknowledged that the full stack of benefits is difficult to quantify (as noted above), but recommended that Duke should have led with messaging around the benefits of investment proposals, rather than focusing on the costs and expected investment magnitude.

Objectives, scope, and pace of investments

Participants voiced diverging perspectives on the necessity and prioritization of individual P/FC investments, and expressed differing perspectives on priorities of grid modernization investments including environmental benefits, integration of distributed energy resources, power quality and reliability, and rate stability. Some stakeholders questioned whether the need for reliability is strong enough to justify the investments, with several participants sharing a view that reliability for the customer groups they were representing was adequate, and improvements were not necessarily worth the anticipated rate impacts of the proposed investments.

Participants also proposed giving priority to certain projects for earlier completion, based on their ability to address reliability or other goals and prove the case for further investment. For example, participants discussed the potential value of prioritized

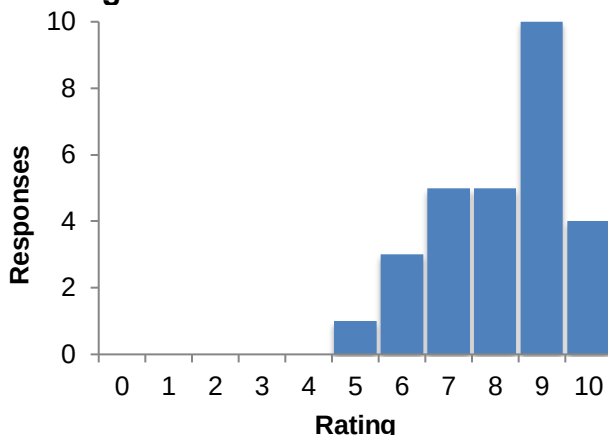
² System Average Interruption Duration Index and System Average Interruption Frequency Index

investment in integrated volt/VAR control (IVVC) to arrive at near-term energy savings and peak demand savings, or specific targeted undergrounding (TUG) pilots to demonstrate the value proposition. More broadly, participants voiced concern around whether targeted undergrounding should be included within the P/FC proposal at all, and whether additional cost/benefit analysis on TUG is needed.

Outcomes

A majority of participants indicated they were satisfied with the opportunity to provide feedback and engage in dialogue with Duke Energy staff and other participants.

Figure 2: Survey responses: “How satisfied are you with the opportunity to provide feedback and dialogue with Duke?”



The post-event survey asked participants, “how satisfied are you with the opportunity to provide feedback and dialogue with Duke?” The average score given was 8.1 out of 10, as shown in Figure 2. Quotes from survey respondents indicate a broad appreciation of the opportunity to provide feedback to and discuss with Duke Energy:

- “Open dialogue with a broad group of stakeholders”
- “Ability to share different perspectives in a safe space”
- “Great representation from Duke. Executives were present and engaged.”

Objective 3: Support a collaborative process going forward

Activities

Several activities within the agenda focused on considerations for setting up a collaborative process moving forward. The workshop started with a “cynics and believers” activity (see Appendix 2), where participants in pairs discussed arguments for why the collaborative workshop might be a failure or success. In an activity following a Duke Energy-led discussion on next steps, participants were asked to break into nine groups to discuss the top grid modernization issues that require stakeholder input to address effectively (see Appendix 2).

Outside of plenary discussions, each breakout group also discussed a possible set of next steps to guide a more collaborative planning process moving forward, with summaries below:

- Group 1: Participants discussed ways that stakeholders could contribute data

and analysis to inform updated grid modernization plans.

- Group 2: Participants discussed the importance of maintaining ongoing and frequent communication with stakeholders, and tailoring information to individual groups.
- Group 3: Participants suggested adopting an integrated planning process better suited to assessing the value of grid modernization investments such as DERs.
- Group 4: Participants developed proposals for mid-term and long-term plans to engage stakeholders in various stages of planning for specific P/FC investments.
- Group 5: Participants suggested a process to revisit investments and make necessary adjustments through future stakeholder engagements.

Common Themes

Workshop participants proposed several objectives and criteria for future collaborative processes, with common themes including a recommendation for regular facilitated workshops, early sharing of additional analysis, and an integrated process across multiple planning domains.

Regular facilitated workshops

Many participants recommended continuing stakeholder engagement in a workshop format with third-party facilitators on a regular basis. Participants suggested that a comprehensive list of stakeholders should be involved in the conversations early, to ensure an inclusive process.

Participants recommended that Duke Energy's next steps be made transparent and openly discussed with the stakeholder group in attendance. However, some participants also questioned the usefulness of a stakeholder engagement process focused narrowly on the existing Power/Forward Carolinas proposal, given the NCUC's pending decision in the DEC rate case, and suggested a collaborative process would be most applicable if held in advance of formal regulatory proceedings.

Early and tailored sharing of analysis results

Participants recommended that Duke Energy perform additional analysis around proposed investments, and share with stakeholders early in the planning process. In particular, participants requested that Duke Energy provide more clarity on the costs and benefits of individual P/FC investments, especially the values delivered outside of reliability (as noted above around Objective 2). Attendees recommended that Duke Energy work with individual stakeholder groups to identify group-specific gaps in understanding that require more education, and suggested that Duke could tailor communication and analysis to be most useful for different stakeholders.

Participants also recommended that Duke Energy provide technical information in a way that is more digestible and useful for stakeholders than currently available work plans, which participants perceived to be too detailed and technical to generate useful understanding of the proposed investments. Participants emphasized that sharing digestible information early in the planning process, before final proposals had been crafted, could allow for useful stakeholder input that could be used to shape and generate alignment around a final proposal that reflected input from a broad group.



Relation to other activities

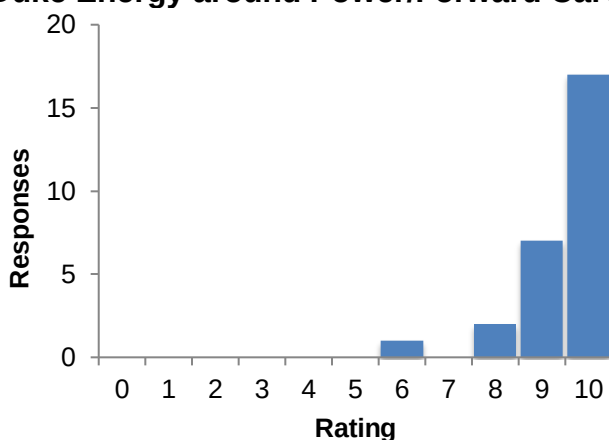
Attendees discussed the potential value of developing a planning process better suited to understanding and testing the value of grid modernization investments in the context of other, related activities. Specifically, participants discussed the potential to integrate P/FC planning into other planning processes (e.g., integrated resource planning, integrated distribution system planning, and the Smart Grid Technology Plan) to fully capture all sources of value from the proposed grid investments.

Participants acknowledged a need to identify and reconcile gaps between existing planning processes, in order to effectively bridge them in the future. Participants also prioritized creating corrective mechanisms that could revisit different components of the plan and allow for adjustment with ongoing learning from previous investments.

Outcomes

Participants overwhelmingly indicated interest in continuing to engage with Duke Energy on grid modernization planning, and a majority stated that the workshop provided an effective foundation for future collaboration.

Figure 3: Survey responses: “How willing are you to engage in future follow-up conversations with Duke Energy around Power/Forward Carolinas?”

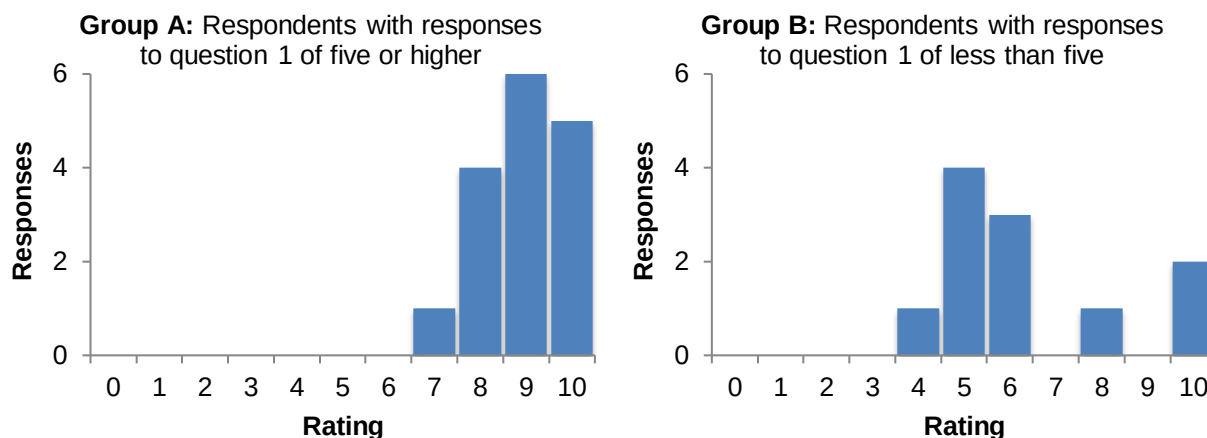


The post-event survey asked “How willing are you to engage in future follow-up conversations with Duke Energy around Power/Forward Carolinas?” Participants responded with an average score of 9.3 out of 10, indicating significant interest in continuing to engage; see Figure 3 above.

In addition, in response to the question “How effective was this workshop in providing a foundation for new kinds of conversation and collaboration going forward?”, respondents gave an average score of 7.9 out of 10. However, individual responses depended heavily on whether participants felt the workshop had enhanced their understanding of the Power/Forward proposal; the more participants felt that the workshop enhanced their understanding of proposed investments, the more they felt that it also laid a foundation for future collaboration. Respondents in Group A (i.e., those who felt the workshop significantly improved their understanding of Power/Forward)

gave an average score of 8.9, while respondents in Group B (i.e., those who felt the workshop did not provide new information) gave an average score of 6.4.

Figure 4: Survey responses: “How effective was this workshop in providing a foundation for new kinds of conversation and collaboration going forward?”



In survey comments, Group A generally expressed optimism that the workshop would lead to a collaborative process moving forward, with example responses including “[This workshop helped] build relationships. Business is done through relationships” and “We have some great ideas for future discussions. We need to keep the momentum going!”

However, Group B expressed uncertainty as to whether Duke is actually willing to make changes to the proposed investments. Example responses indicated that participants’ willingness to engage going forward “depends on if Duke will listen to what was said today” and “depends entirely on whether I see results from this process.”

Appendix 1: Breakout discussion notes

This appendix provides detailed notes from the five breakout discussions, including a synthesis of common points of discussion and potential next steps. The summaries of common themes for each breakout session were not necessarily endorsed by every participant within the group, nor are they necessarily the recommendations of RMI or Duke Energy.

Description of breakout sessions:

RMI selected four breakout topics based on the most common areas of interest/concern that surfaced during the stakeholder interviews RMI conducted prior to the workshop. The fifth breakout topic was sourced from the participants at the event after the morning plenary discussions. Participants chose their preferred topic of discussion, which was facilitated by RMI. Following the breakout group discussions, each group reported the answers to the following questions out to the plenary:

1. What did we learn?
2. Were there any areas of convergence or divergence?
3. What can be taken forward?

List of breakout topics:

Breakout Topic 1

How do costs/benefits of proposed investments transfer to different customer groups, and what changes to the investments would you like to see in P/FC?

Breakout Topic 2

P/FC is built on the premise that “the time is now and the need is clear.” Does that resonate with you? Why, why not?

Breakout Topic 3

What changes (e.g., policy, regulatory, technology, customer adoption) need to happen in North Carolina for grid modernization to advance?

Breakout Topic 4

This is a 10-year process—what are the criteria for a successful stakeholder process going forward? What are the next collaborative steps that need to happen?

Breakout Topic 5

What does a successful grid modernization program look like?

Activity detail: Breakout Topic 1

Prompt: How do costs/benefits of proposed investments transfer to different customer groups, and what changes to the investments would you like to see in P/FC?

Summary of key points discussed:

1. Breakout participants generally agreed that there is a need to quantify the benefits of P/FC, but that doing so outside of standard reliability metrics (e.g., SAIDI, SAIFI) is difficult, especially by different customer class.
 - a. The group identified three kinds of cost shifts: time/intergenerational, retail vs wholesale, and shift between retail customer classes. Participants suggested that, while such costs shifts may be possible to quantify for small programs, the cost shifts for a large grid modernization program such as P/FC are difficult to quantify.
 - b. Participants suggested that it is difficult to quantify all benefits/values of distributed energy resources without an organized wholesale market in Duke Energy territory with transparent price signals. While the operational cost savings to Duke Energy may be concrete, other value streams (e.g., mitigating customer load loss) are not as clear.
2. There was disagreement around the role and value of targeted undergrounding programs within P/FC.
 - a. The group voiced concern about TUG investments becoming stranded assets, should other investments in distributed energy resources obviate the value provided by undergrounding.
 - b. Participants voiced concern with large and near-term investment in TUG while overhead lines still have long useful life.
 - c. Participants discussed the argument that, without TUG, customers without DERs at the ends of distribution lines will be harmed (i.e., suffer from extended outages during major events).
 - d. The group raised the question of whether there could be a reliability guarantee from Duke Energy associated with the \$5 billion investments on TUG.

What can be taken forward?

1. Some participants proposed that Duke pursue an alternative, bottom-up approach of a stakeholder process before continuing the P/FC investments.
2. Participants suggested that stakeholders could assist Duke Energy in defining the priorities of grid modernization investments in advance of a formal proposal, and structuring the cost/benefit analysis of specific components of Power/Forward Carolinas.

Activity detail: Breakout Topic 2

Prompt: P/FC is built on the premise that “the time is now and the need is clear.” Does that resonate with you? Why, why not?

Summary of key points discussed:

1. Not everyone in the breakout group agreed with both “the time is now” and “the need is clear.” There was a sense that the message came across as too dire and urgent.
2. “The time is now” didn’t resonate with some who pointed to the need for Duke to ensure that the grid is continuously well-maintained (i.e., we should not have gotten to a point where major upgrades need to happen). One participant raised the argument that “now is always now,” i.e., Duke always has a responsibility to invest prudently in a reliable and cost-effective system.
3. Others pointed out that, when the grid was originally engineered, renewable energy integration did not exist and storm resilience was not as significant a factor, so a major transformation is needed given recent and expected trends.
4. The sheer breadth of P/FC makes it harder for some to grasp the overall need. Participants wanted more clarity around certain aspects of the P/FC proposal to better understand the needs being addressed. Some suggested that Duke disaggregate the needs and run cost/benefit analyses for different aspects of the work.

What can be taken forward?

Participants suggested several actions that Duke Energy could take to better explain and generate alignment with stakeholders around the motivation for P/FC:

- Maintain ongoing and frequent communication with stakeholders, rather than providing an overwhelming amount of information at one time.
- Surface different stakeholder perspectives and tailor communication and analysis that is relevant to the individual groups, e.g., provide cost/benefit analyses for specific aspects of the P/FC work.
- Highlight the economic benefits of P/FC because they resonate with certain populations.
- Be more transparent—especially around rate impact and cost recovery—so no one is caught off guard.
- Consider changing the slogan to something that sounds less decisive and dire; rather, it should be more forward looking and aspirational.

Activity detail: Breakout Topic 3

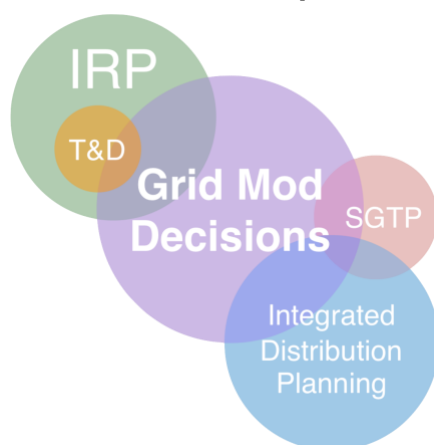
Prompt: What changes (e.g., policy, regulatory, technology, customer adoption) need to happen in North Carolina for grid modernization to advance?

Summary of key points discussed:

- Participants discussed ways in which grid modernization planning can be better integrated with other planning processes (e.g., IRP, integrated distribution planning, and the Smart Grid Technology Plan) to fully encompass the types of the investments that grid modernization represents. The overlapping nature of these planning processes is reflected in Figure 5, below.
 - Current regulatory structure does not support investment in assets such as storage that can provide multiple benefits across different planning and operational domains. Integrated distribution planning would allow investments to be evaluated on a level playing field.



Figure 5: Grid modernization decisions overlap with existing planning processes



- Customers may be able to provide grid services in the future, but participants disagreed on how reliably these services can be procured. Further, questions remain about how these services can be fairly compensated.
 - What are the performance risks, and how can they be properly managed?
 - How to align utility incentives with growing customer adoption of DERs?
- Several other questions remained:
 - Unclear whether NC is a proactive or reactive policy state, and whether Duke is a proactive or reactive investor. Should the customers and market dictate this relationship?
 - How would the business model need to shift to evaluate grid modernization using a least-cost paradigm?

What can be taken forward?

Participants suggested several actions that Duke Energy could take to better integrate P/FC with other processes:

- Develop a planning process better suited to assessing the value of grid modernization investments, including the deployment and grid integration of DERs.
- Reconcile gaps between existing planning processes.
- Characterize the values and risks associated with third-party services, to better understand the role of third-party providers in a modernized grid.

Participants also discussed the potential for the NCUC to adopt a regulatory incentive structure that supports a more simple, transparent, holistic process toward grid modernization.

Activity detail: Breakout Topic 4

Prompt: This is a 10-year process—what are the criteria for a successful stakeholder process going forward? What are the next collaborative steps that need to happen?

Summary of key points discussed:

Participants discussed both near- and long-term process criteria for ongoing stakeholder collaboration.

Near-term proposal

The next stakeholder meeting should be held within a few months, with one representative from each major stakeholder organization. The following objectives were proposed:

1. All stakeholders: Identify whether there is any definitive common ground and/or low-hanging fruit to implement.
2. Duke: Answer detailed questions that remain regarding the seven elements of P/FC.
3. Duke: Identify benefits for each proposed project.
4. Duke: Identify gaps where others can offer input, data, or analysis.

Long-term proposal

After identifying gaps that show the need for more education, gather stakeholder input on specific projects through ongoing meetings. As shown in Figure 6, below, P/FC projects can be grouped into buckets based on their proposed start dates, which dictate the types of stakeholder engagement that could be used to inform each project's planning and deployment:

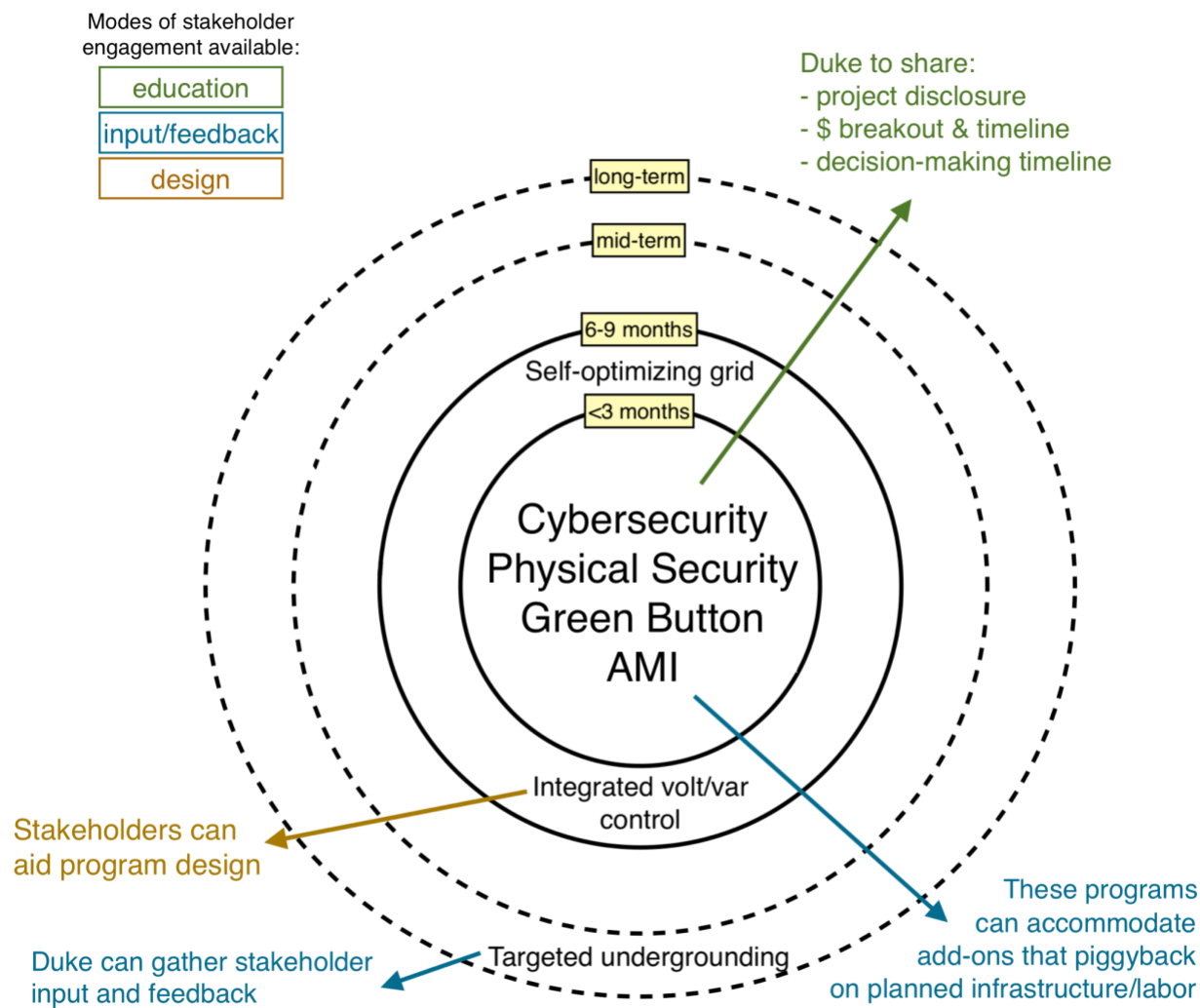
1. Certain projects are already underway or slated to start within the next three months: **cybersecurity & physical security measures, AMI, and Green Button.**³ Due to their imminence, these projects are already mostly finalized, but Duke is open to suggestions for *adding on* additional functionality to these workstreams.
2. Mid-term projects to be implemented within six to nine months, such as a **self-optimizing grid and integrated volt/VAR control**, can accommodate more stakeholder involvement in the *design process*.
3. Long-term projects, such as **targeted undergrounding**, can accommodate extensive stakeholder *input, design recommendations, and feedback*.

What can be taken forward?

Participants suggest that, for future decisions, Duke can provide certain information as early as possible in the planning process: a disclosure of proposed plans, a dollar breakdown, and decision-making timelines. This would create a common understanding among all stakeholders and consumers to allow them to participate more actively in the planning process.

³ Green Button Connect and integrated volt/VAR control were not included in the original Power/Forward proposal, but were raised by the breakout group as potential programs for stakeholder engagement in the future.

Figure 6: Visual representation of the long-term proposal for stakeholder collaboration



Activity detail: Breakout Topic 5

Prompt: What does a successful grid modernization program look like?

Summary of key points discussed:

1. The team discussed the metrics that should be included to measure the success of a grid modernization program, listed below:

Include clear metrics of the following characteristics:

- Power quality
- Reliability
- Peak load needs
- Flexibility

Include the key components, such as:

- Energy efficiency programs
- Demand-side management programs
- Data access

Include quantified measurement of:

- Cost
- Cost avoided
- Health benefits
- CO₂ emission reduction
- Enabled deployment of renewables

Include practical consideration of:

- Programs deployment
- Customer acceptance (willingness to pay)

2. The team also proposed other key characteristics that successful grid modernization programs should have. They identified the following needs:
 - a. Duke should identify and remove barriers that low-income groups are facing before implementing grid modernization programs.
 - b. Grid modernization should ultimately reduce the customer rates. If there's a rate increase, it should provide enough offsetting value and still give choices to customers.
 - c. Need to have trusted sources to provide customers with access to information and truly identify both sides of the program impact.
 - d. Need to have a life-cycle view of cost, especially for low-income groups.
 - e. Need to include behind-the-meter into the scope of grid modernization (e.g., heat pumps, EV, storage, solar, etc).

What can be taken forward?

Participants suggested several actions that Duke Energy could take to better define and measure the value of proposed grid investments:

1. Revisit different components of the plan and establish correcting mechanisms that allow for adjustment.
2. Initiate the next stakeholder engagement and continue having credible third-party facilitation.
3. Get aligned internally around the motivations, messages and work plans.

The participants also saw a role for Duke Energy to work closely with stakeholders to integrate different pieces that are not currently in the scope of grid modernization.

Appendix 2: Plenary activity notes

This appendix provides detailed notes from the two plenary sessions where significant information was shared by participants with the broader group: the “cynics and believers” exercise, and the stakeholder input needs discussion. The summaries of common themes for each session were not necessarily endorsed by every participant within the group, nor are they necessarily the recommendations of RMI or Duke Energy.

Activity detail: “Cynics and believers”

Description of process: Participants were assigned randomly to one of two groups: “cynics” or “believers.” Each participant was asked to pair with someone from the other group to discuss why the workshop was bound to either fail (for cynics) or succeed (for believers). In the plenary session, a few participants from each group shared what they had heard from the opposing group that resonated with them.

Summary of key points discussed:

1. Participants designated as cynics were asked to consider, “why is this workshop, at this time, in this location, with this group of people, bound to be a failure?”
 - a. After pairing with participants from the believers group, cynics shared the following reflections from the believers that resonated with them:
 - i. “There are a lot of smart people in this room. Everyone putting their head together can come up with solutions.”
 - ii. “We have things that we can agree on, we should find those common things.”
 - iii. “Resilience is a huge issue. It would be of huge benefit for NC customers.”
2. Participants designated as believers were asked to consider, “why is this workshop, at this time, in this location, with this group of people, bound to be a success?”
 - a. After pairing with participants from the cynics group, believers shared the following reflections from the cynics that resonated with them:
 - i. “There is high level of skepticism and lack of trust with the intent and purpose of P/FC.”
 - ii. “It’s a little late to have a collaborative process now.”
 - iii. “This might not be the best forum. People here might not truly represent the customers.”
 - iv. “Diverging priorities from different attendees might create barriers.”



Activity detail: Stakeholder input priorities

Description of process: Following a Duke Energy-led discussion that reflected on the process for creating the Power/Forward proposal to date and potential next steps, participants were asked to break into nine groups to discuss, “What are the top two or three grid modernization issues that require stakeholder input to address effectively?” Each group reported back to plenary the two or three most important issues that surfaced in their discussions, in order to guide a collaborative process moving forward.

Summary of most-common issues:

Three issues arose across a majority of the nine table groups, and are summarized here:

1. Scope and planning process for Power/Forward
 - a. How to distinguish grid modernization projects from customary spend and maintenance?
 - b. Define the *need* for grid modernization, and the vision or approach for solving that need.
 - c. Clearly define the *goals* for grid modernization, then compare potential solutions to identify the best candidates for addressing those goals.
 - i. The primary goal of P/FC is improving reliability. But what about meeting other goals, such as integrating renewables and planning for a new energy future?
 - ii. What is an acceptable reliability goal?
2. Costs and benefits of proposed investments
 - a. Identify the most cost-effective way to solve each problem or achieve each goal.
 - b. Quantify the benefits to customers, broken down by class: industrial, commercial, and residential (including vulnerable communities and rural vs. urban customers)
 - i. Will P/FC provide equal benefits to each class? If not, how to ensure each class pays in proportion to the benefits they receive?
 - c. Since P/FC is predicated on improving reliability, how much are customers willing to pay for improved reliability?
3. Prioritization of project completion
 - a. How to prioritize the deployment of the seven elements/towers of P/FC? What is the appropriate timing of project implementation?
 - b. What metrics are available to gauge the performance/success of grid modernization efforts?

Other common issues raised:

Two other common topics emerged at several tables:

1. Enabling customer choice and engagement
 - a. How to align Duke’s financial incentives with customer priorities for grid modernization outcomes?
 - b. What rate options and incentives can be offered to customers?
 - c. What tools can Duke provide customers to manage and control their energy use?
 - d. What data access system provides the most customer benefits?

2. Utility regulation and business models
 - a. Who should be responsible for the grid of the future? What will be the method of recovery?
 - b. What is the correct regulatory structure for vetting & recovering grid investments? A rate case, a rider?



Appendix 3: Plenary record

This appendix presents a full, transcribed record of questions asked following Duke's presentation on Power/Forward Carolinas, as well as the full notes from the plenary discussion of stakeholder input priorities.

List of Elements of this Appendix:

Full notes: Clarifying questions and answers following Duke's P/FC presentation

A presentation from Duke Energy covered the unique factors in North Carolina that form the basis for Duke's proposed grid modernization efforts. After the presentation, participants had a chance to ask clarifying questions that were answered in real time by Duke Energy representatives. This provides a full record of the questions raised and answers provided in this session.

Full notes: Coaching questions following Duke's P/FC presentation

Following the Power/Forward presentation, participants asked coaching questions that were not answered directly, but were recorded and that served to guide the discussion in subsequent activities. This activity allowed participants to offer feedback in the form of a question, in order to phrase the feedback in a forward-looking way rather than purely as a critique of past actions. This provides a full record of the coaching questions raised in this session.

Full notes: Stakeholder input needs

Participants were asked to break into nine groups to discuss, "What are the top two or three grid modernization issues that require stakeholder input to address effectively?" Every participant wrote down two or three issues on sticky notes, which were then sorted into categories and discussed within each group. This provides a full record of all the sticky notes generated from each group.

Full notes: Clarifying questions and answers following Duke's P/FC presentation

Description of process: A presentation from Duke Energy covered the unique factors in North Carolina that form the basis for Duke's proposed grid modernization efforts. After the presentation, participants had a chance to ask clarifying questions that were answered in real-time by Duke Energy representatives. This provides a full record of the questions raised and answers provided in this session.

- [Question from participant] There was a chart from Ohio showing the incidence above ground line, cost associated of maintaining the line, cost of undergrounding. What's missing is what's the saving of undergrounding. If we can show the saving for putting those lines underground in NC, we can then make the case for the customers. Those are the things that are missing. Working with low-income communities, we never get a call that complains the power shuts down for 45 minutes. The calls are about "I can't afford the bill".
 - [Response from Duke Energy] OH is overhead, not Ohio. That cost is for NC.
- In that academic study, what's the 95% level?
 - It's the level of confidence that the trend will not change.
- The statistical analysis spoke about responsive action you have determined to act. Have you looked at any preventive measures to change the ongoing path, as well as reactive measures?
 - The hardening is a preventive measure.
- Will the transformation take place at the end of lifespan of an asset?
 - It will take place along the way throughout the 10-year period.
- Causation link of weather and reliability. What perspective of weather? Thunderstorms, high winds?
 - Convective weather event. Heavy precipitation, severe thunderstorm. Specific event drivers were not in the statistical analysis, but there are academic articles on it. We didn't do the breakout because weather tends to be a multiplier.
- Improvement or decline around SAIFI, SAIDI—what's the context?
 - It refers to what percentage did SAIDI increase in the past certain amount of years. If you look at SAIDI number, Duke ranked number 12 in Southeastern utilities a couple years ago, and now ranked number 20.
- What are some examples the companies are considering about non-wire solutions? What's the decision-making process of adopting that instead of T&D infrastructure?
 - The most common one is microgrid for communities that have long duration of outages, e.g., Hot Springs in North Carolina. It's a rural community. When the power goes out, it takes eight to 12 hours to get back. The solution is looking at cost/benefit analysis of building a microgrid (solar plus storage) that could carry a reliability benefit, and sometimes peak shaving benefit.
- What type of DER future you are planning for? Do you take into account likely shift to smaller (solar) systems, closer to customer loads? There's a trend of



moving away from 5 MW systems and getting to rooftop—is it influencing proposed investments?

- Yes, it's factored in. Good utility practice is a sustaining system while rooftop solar adoption increases.
- You showed 50% reduction in SAIDI and SAIFI. What's the cost of maintaining the current grid to keep the same numbers? Did you price out a P/FC initiative that would keep SAIDI and SAIFI where it is but keep same type of investments?
 - The investment to maintain SAIDI and SAIFI would be the same for integrating more renewables. We didn't do the calculation for what the cost would be for maintaining the current grid.
- Customer expectation. What has changed in the expectation? Who has voiced? What's the cost they are willing to pay for the changes?
 - The thing I'm most familiar with is the desire for more options and control.
- Following the previous question: Do you mean options and control over how they're using energy in their own domain, or over what resources they are using?
 - I was speaking specifically to smart meters. How can they be more personally involved? How can they save money?
- What are the drivers and determinants to scale up and down the current P/FC investment proposal?
 - Drivers include non-wires alternatives, if price points come down.
- What would be the driver from the cost sensitivity perspective to scale back on those projects? Is there a threshold or benchmark of cost sensitivity to customers?
 - Have a healthy respect for cost, taking that seriously of the concerns.
- Have you done the cost/benefit analysis for P/FC scenario vs. maintenance scenario?
 - Customary investment is not improving the performance. P/FC is incremental investment.
- What would rates look like in 10 years if you didn't do P/FC?
 - We did the forecast. Reliability forecasts show a worsening trend and would be causing customer disruption. We are willing to share that forecast.



Full notes: Coaching questions following Duke's P/FC presentation

Description of process: Following the Power/Forward presentation, participants asked coaching questions that were not answered directly, but were recorded and served to guide the discussion in subsequent activities. This activity allowed participants to offer feedback in the form of a question, in order to phrase the feedback in a forward-looking way rather than purely as a critique of past actions. This provides a full record of the coaching questions raised in this session.

- Is it possible to articulate the difference between modernization and maintenance?
- Is it possible to quantify how much more solar we are able to integrate with P/FC?
- Can we quantify financial benefit as a consequence of improved resiliency? What's the saving of building the system for hurricane?
- Is it possible to rethink P/FC without the emphasis on reliability, but instead, on energy transition and modernization?
- Can we consider priorities beyond reliability? Cost, transparency? How do they relate to each other?
- Is it possible to quantify cost and benefit for targeted undergrounding using Duke data?
- Given the lack of transparency (people controlling energy usage) and renewable goals, what is the process for getting buy-in from stakeholders in those areas given there hasn't been a lot progress in those areas? Don't sell if you are not going to do it. How are you going to do it?
- Would you consider integrated volt/VAR Control (IVVC)? There was a discussion in the DEC hearing. Studies show IVVC represents 40% of the benefit of the smart grid (DOE had ARRA grant for IVVC). No P/FC money is allocated for IVVC. How can P/FC be designed to account for IVVC?
- Would you consider doing IVVC, self-optimizing grid, and distribution automation at the same time? Would that capture labor efficiency (mobilize labor crews) as well as equipment efficiency? (RTUs, communication nodes)
- Would you consider taking a more flexible and marginal investment strategy?
- How can we test and document customer expectation across different customer groups and class?
- How can we design a plan that takes into account low-income needs at the outset?
- How can we disclose to the customer the cost of stranded asset? (understand the benefit and inherent cost)?
- How would Duke test cost and benefit, and make sure the benefit goes to the customers that are willing to pay the cost?
- Given that some info about critical energy infrastructure is protected for national security reasons, what are the company's plans for ensuring transparency and vetting of investments in geographies targeted?
- Would you reconsider cost/benefit analysis for P/FC to incorporate consumer benefits? In the filing it only shows operational benefits. If consumer benefit is not measured or identified, there's no way stakeholders can assure those are achieved.



- Can we consider a rate program that not only reflects the increase of the cost but also the benefit in the same rider mechanism as is being done in other states? This is the area RMI expertise can be helpful (e.g., RMI helped NY to conduct transparent cost/benefit analysis). [RMI rephrasing as a question: How do we ensure in ratemaking process that costs/benefits are equitably shared among customer classes?]
- Is there a way to insulate ratepayers from the risk of programs that don't work?
- Can we bring expertise from outside IOUs (academic, etc.) to ensure not falling prey to insular thinking? To ensure taking best ideas from all possible angles to be forward looking?
- What kind of guarantee do we have going forward? For service reliability. For consumer regulation of their energy usage and cost savings. A quicker interconnection queue for renewable energy resources.
- Can utility share if they have done any calculation on whether this will reduce the need for future capital investment? Plans for that?
- National standard on access to data from the program (e.g., Green Button Connect)? Would like to see it fully considered before it's applied. Concerned that Duke is heading down a path with the proprietary system that only the company can use, not third parties.
- Appreciate the company is considering non-wire solutions. Is there any detailed process of implementation? Can you share cost/benefit for non-wire solutions?
- What guarantees do we get for consumer regulation of cost savings? What guarantees for quicker interconnection queue?
- North Carolina is under a least-cost paradigm for generation investment. Would it be the same for P/FC?



Full notes: Stakeholder input priorities

Description of process: Participants were asked to break into nine groups to discuss, “What are the top two or three grid modernization issues that require stakeholder input to address effectively?” Every participant wrote down two or three issues on sticky notes, which were then sorted into categories and discussed within each group.

This provides a full record of all the sticky notes generated from each group and used to build up the summary presented in Appendix 2. The notes are structured in the following way:

[Group # 1–9]

- [Sorted categories of common notes at each table]
 - [Individual sticky notes]

Group 1:

- Biggest one is rate impact, cost impact.
 - Rate impacts
 - TUG program & costs
 - Is modernization worth the cost, if so, who decided?
 - Rate design: investments may not fall into traditional [part?] of cost causation
 - Cost-effective implementation
- The other player in the room that’s impacting the grid: renewables, storage, etc.
 - Renewable integration
 - Energy storage applications
 - Deployment of self-optimizing grid
 - Non-wire solutions (microgrids, etc.)
- What’s the future benefit of the modernization?
- Prioritizing the work that needs to be done. How quickly it gets done?
 - Prioritizing benefits & expectations:
 - More than just grid reliability
 - Order of grid modernization
 - Outage mitigation
 - Data
 - Order of program deployment
- Data and customer access? If you make revenue neutral for me, why bother?
 - Data access & transparency
 - Customer data
- Business model; who’s going to take ownership of the grid?
 - Who will/should be responsible for the grid of the future?
 - Method of recovery

Group 2:

- Rate design:
 - Customer information and billing options. The incentives of the customers.

- What's the cost split coming in? Industrial, residential, commercial. Who gets the benefit, how to balance the cost?
- Need to take the lessons we learn on the generation side, IRP to the distribution level.
 - Determining integrated distribution planning parameters
 - What is the role of customer-owned DERs in future grid planning/operations?
 - Expansion of renewables: who/what is driving?
 - What is the acceptable reliability goal?
 - Technology and investment solutions assessed to provide grid management services

Group 3:

- Define modernization
 - Identify what problems we are trying to solve
 - What should grid modernization include?
- Cost/benefit analysis
 - Demonstrate cost savings through cost/benefit analysis on components of grid modernization
 - Identify the most cost-effective ways to solve a problem
 - Quantify benefits
- Prioritization
 - What elements of grid modernization should be given priority?
 - What projects will maximize positive impacts in the greatest number of ratepayers/people?
 - More renewables at what cost?
- Customer options
 - What customer-facing information and rate options can be offered?

Group 4:

- Balancing cost and benefit
 - Valuation of benefits without clear market signals (e.g., ancillary services)
 - Individual value gain vs system value gain
 - Impacts on ratepayers; equity concerns
 - Should the utility strive to provide the same level of service to everyone?
 - Who pays?
 - How much money should be spent over what time period?
- Players, process, priority
 - Timing of implementation of projects/proposals on the ground
 - Priority of program deployment
 - Balance of investments across the “towers”—need flexibility across towers
 - Role of third parties in construction, ownership, and operation of assets
- Parameters for moving forward
 - Customer impact: residential, commercial/industrial, vulnerable communities
 - Cost breakdown per class
 - Build framework consistently across jurisdictions

- Definition of “grid modernization”
 - Promote renewables?
 - Now is the time to plan for new technology
- Country goals vs. North Carolina needs/goals

Group 5:

- Cost/benefit
 - Prioritization of four elements (and many subelements) of P/FC
 - Framework (goals/values) for evaluating investments and measuring success
 - Are we choosing the “right” focus areas to accomplish our objectives?
 - What is the full detail of “customer choice”
 - How much are customers willing to pay for those additional benefits grid modernization is designed to provide?
- How do you measure success? (metrics)
 - What is the accountability like (reporting, other)?
 - What are the appropriate metrics to gauge the performance/success of grid modernization efforts?
- How do you pay for it? (recovery mechanisms, customer classes?)
 - Price and mechanism of cost recovery
 - Customary spend: maintenance vs upgrades
 - The cost of doing “nothing” vs the P/FC cost
 - TUG: is it grid modernization? To what extent is it needed?
 - How to ensure that customers who benefit from grid modernization pay for it on a proportional basis to benefits received?

Group 6:

- What is grid modernization vs. maintenance?
- Long-term planning/reform
 - What type of energy future is best for North Carolina?
 - Long-term technology evolution/changing needs
 - Stakeholder process could be used to rethink the utility model and create a process for more integrated planning across all areas
- How do you define and account for [grid modernization]? (defining process and objective)
 - How to define what is grid modernization vs normal course of action
 - How can we focus Duke’s grid modernization efforts on energy transition and not on reliability?
 - Defining the objectives for the program
 - What opportunity do stakeholders have to give input? so far, it’s just asking questions, suggesting topics
- Stakeholder process, transparency
 - Establish separate docket for further detailed discussion prior to moving forward with any grid modernization project
 - Communicate plan to stakeholders, policy makers, etc.
 - Assuming there is a rider, how will the benefits/savings be reflected in rates—during each annual rider update or when next rate case occurs?

- Benefits to customers and communities. How do you determine the benefit? (cost/consumer benefits)
 - Value of the improvement to various customer groups
 - Honest and transparent accounting of ratepayer impacts vs material benefits to Duke's customers (by customer class)
 - How much are customers willing to pay for reliability?
 - What tools do customers want/need to manage and control their energy use?
 - Has TUG been compared to other reliability mechanisms in terms of customer costs?
 - Assistance to identify risks and benefits
 - What types of investments should be made?
 - The evaluation of data access and what system provides the most customer benefits?
 - What will Duke do to ensure that all available cost-effective consumer benefits are achieved, even if this results in revenue erosion?

Group 7:

- Goal, overall vision, and methods
 - Agreement on how to define the need for grid investment ("why?") and the vision/approach for solving the need
 - What are the goals that the utility is trying to achieve?
 - How does grid modernization advance state policy goals (economic development, etc.)
 - Agreement on a method for defining desired benefits and assigning value
 - What is grid modernization vs general maintenance?
 - What is the relative weight/priority that customers assign to different values that grid modernization can deliver?
- DER integration
 - Effectively integrating DERs: solar, energy storage [x2]
- Rate impact and cost implication
 - What are the rate impacts on ratepayers, by class? [x2]
- Cost/benefit analysis, how it applies to non-wire solutions
 - Long-term and near-term cost/benefit analysis. What is acceptable?
 - Agreement on cost/benefit parameters for non-wires alternatives
- Regulatory incentives for investment priorities
 - Cost recovery (rider?)
 - How can financial incentives for Duke be aligned with customer priorities for grid modernization outcomes?
 - What is the correct regulatory structure for vetting & recovering grid investments?

Group 8:

- Value, cost/benefit, prioritization of delivery
 - Quantifying and timing customer benefits
 - From their perspective, what is the most important and what is it worth?
 - Investment prioritization: reliability improvements, DER enabling, storm hardening/resiliency, carbon reduction

- What is our common understanding of “cost-effectiveness” for different programs?
- Cost and benefit of equity. How to address low-income [customer groups]
 - Equity across customer base (rural/urban)
 - How to reconcile grid modernization with financial limitations of customers
 - How do we pay for these programs without overburdening customers?
- Transparency via data to customers and their ability to use it
 - Timing and structures of time-of-use and critical-peak pricing
- There’s not a shared vision of what the grid of the future is going to look like. What that vision is worth to the citizens.

Group 9:

- Planning and transparency with stakeholders
 - Prioritization of grid modernization impacts: when do you pull the trigger?
 - End of useful life/when to invest
 - Distribution planning process
 - How do we time investments in technology given the accelerating development of new functionality
 - Goals/visions for grid modernization
 - Clarity on what grid modernization investments cover
- Data and customer focus. Data access to customers
 - Integration of customer programs and data access with technology deployment
 - Data access [x2]
 - Data about customer needs/desires/expectations
 - Assessment of customer expectations/needs/wants
- Integration
 - Integrating DERs while maintaining grid stiffness, protection, reliability, and efficiency
 - Technologies that can integrate with evolving technologies
- Costs and benefits
 - Impact on ratepayers
 - Cost/benefit of TUG
 - Role of Duke and third parties in installing and operating
- Are there any game changers?



CERTIFICATE OF SERVICE

I certify that a copy of Duke Energy Progress, LLC's Report of NC Power/Forward Technical Workshop, in Docket No. E-2, Sub 1142, has been served by hand delivery, depositing a copy in the United States Mail, first class postage prepaid, or by electronic mail, properly addressed to the following parties of record:

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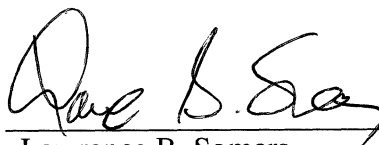
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CERTIFICATE OF SERVICE

I certify that a copy of Duke Energy Carolinas, LLC's Report of NC Power/Forward Technical Workshop, in Docket No. E-7, Sub 1146, has been served by electronic mail, hand delivery or by depositing a copy in the United States mail, postage prepaid to the following parties:

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This the 26th day of June, 2018.

A handwritten signature in black ink, appearing to read "Lawrence B. Somers", written over a horizontal line.

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