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June 20, 2022

VIA ELECTRONIC FILING

Ms. A. Shonta Dunston
Chief Clerk
North Carolina Utilities Commission
4325 Mail Service Center
Raleigh, North Carolina 27699-4300

RE: Duke Energy Carolinas, LLC and Duke Energy Progress, LLC's Second Update on Responses to RFIs
Docket No. M-100, Sub 164

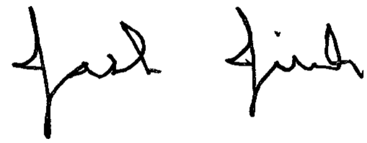
Dear Ms. Dunston:

As noted in their Initial and Reply Comments in this docket, Duke Energy Carolinas, LLC and Duke Energy Progress, LLC (collectively, "Duke Energy" or the "Companies") are committed to keeping the North Carolina Utilities Commission ("Commission") apprised of developments as the Companies evaluate opportunities to pursue federal funds that have been appropriated under the Infrastructure Investment and Jobs Act ("IIJA"). To that end, the Companies attached to their April 14, 2022 Reply Comments in this proceeding copies of their responses to Requests for Information ("RFI") submitted to the Federal Highway Administration related to electric vehicle charging infrastructure deployment and to the U.S. Department of Energy ("DOE") related to regional clean energy hydrogen hubs and the domestic manufacturing and recycling of clean hydrogen technologies. Additionally, on June 10, 2022, the Companies filed with the Commission a copy of their response to an RFI from the DOE on the implementation of formula grants to states and Indian tribes for preventing outages and enhancing the resilience of the grid.

By this letter, Duke Energy is providing the Commission and interested parties with an additional update on the Companies' continued involvement in the IIJA federal funding process. On June 16, 2022, the Companies submitted to the DOE a response to an RFI regarding the solicitation process and structure of a DOE Funding Opportunity Announcement, in accordance with the IIJA, to help inform DOE's implementation of the Long Duration Energy Storage for Everyone, Everywhere Initiative. That response is attached to this letter.

Please contact Jason Higginbotham (Jason.higginbotham@duke-energy.com) if there are any questions.

Sincerely,



Jack E. Jirak

Enclosure

cc: Jason Higginbotham
Parties of Record

June 16, 2022

VIA submission to energystorage41001RFI@ee.doe.gov
Subject: "BIL 41001 RFI Response"

U.S. Department of Energy
Office of Clean Energy Demonstrations

Duke Energy Contacts:

[redacted]

[redacted]

[redacted]

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Duke Energy respectfully submits the following comments in response to the Notice of Request for Information (RFI) issued by the U.S. Department of Energy (DOE) on May 12, 2022, to obtain public input regarding the solicitation process and structure of a DOE Funding Opportunity Announcement (FOA), in accordance with the Infrastructure Investment and Jobs Act (IIJA), to help inform DOE's implementation of Long Duration Energy Storage for Everyone, Everywhere (LD ESEE) Initiative.

Duke Energy (NYSE: DUK), a Fortune 150 company headquartered in Charlotte, N.C., is one of America's largest energy holding companies and employs 28,000 people. Our electric utilities serve 8.2 million customers in North Carolina, South Carolina, Florida, Indiana, Ohio and Kentucky, and collectively own 51,000 megawatts of energy capacity. Our natural gas utilities serve 1.6 million customers in North Carolina, South Carolina, Tennessee, Ohio and Kentucky. Duke Energy owns and operates 31,000 miles of transmission infrastructure and 283,000 miles of electric distribution infrastructure. Duke Energy has set ambitious climate goals for our company, striving toward at least a 50% reduction in CO_2 emissions from electricity generation in 2030 and net-zero CO_2 by 2050. We are also targeting net-zero methane emissions for our natural gas distribution business by 2030.

We believe long-duration energy storage is an essential technology to achieve our net-zero carbon goals," said Lynn Good, chair, president and CEO. "Storage is the linchpin needed to run large amounts of intermittent renewables, and its importance will continue *to grow as we decarbonize. To achieve our goals, we'll need to have 13 gigawatts of total storage on our system by 2050.*

Duke Energy is transforming the energy grid that we operate across multiple states, making them more reliable and resilient, while enabling a cleaner, lower-carbon future. We are making strategic, data-driven improvements to increase reliability, strengthen the grid against physical and cyber threats, expand renewables and distributed energy technologies, and provide customers tools and information to make smart energy choices and save money.

Introduction & Key Recommendations

At Duke Energy, we believe energy storage will play a significant role in how we deliver energy to our customers now and in the future as we strive to reduce CO_2 emissions by at least 50% by 2030 and achieve net-zero CO_2 by 2050. Energy storage will help enable the integration of renewables onto the grid and improve customer reliability and grid security while keeping costs affordable for our customers. As part of Duke Energy's broader efforts to modernize the grid, we are strategically deploying energy storage on our system in areas where it can deliver maximum benefit for our customers and the communities we serve.

As we invest in energy storage, we will benefit from declining costs while providing a transparent and reasonable cost structure for our customers. In addition, we will comply with regulations and standards regarding reliability, national security and cybersecurity. The versatility of battery storage systems enables the technology to become a natural extension of the energy grid, and we will continually look for ways to apply our engineering and operations experience to maximize its full potential.

Looking to the future, we are also investigating and supporting the development of longer-duration energy storage technologies that can store energy for days, weeks, months or even seasons. These include a wide range of thermal, mechanical and chemical technologies such as molten salt, compressed/liquefied air, sub-surface pumped hydro, power to gas (e.g., hydrogen) and advanced battery chemistries. Robust long-duration energy storage integrations can also help minimize the impact of supply disruptions and restore electricity more quickly when outages occur.

In Duke Energy's role as an electric grid manager and operator, we have a unique understanding of how to leverage energy storage, among other things, as both a distribution and transmission resource. We believe we are in the best position to implement energy storage systems that deliver value to the broader system and our customers.

Based on the company's extensive experience and expertise as a grid operator and in piloting and deploying energy storage technologies, our key recommendations for the LD EESE Initiative include:

- Broaden the criteria for technology maturity to recognize that significant uncertainty exists around the levelized cost of new technologies.
- Consider the value of a system between 10 hours and the currently economic 1- to 4-hour duration of li-ion. Systems that can dispatch for 6+ hours at rated power can address the gap for long-duration storage between 2022 and 2030.
- Target a broad set of eligible applicants, including regulated utilities. It is essential for utilities to engage in long-duration storage pilots and demonstrations today to gain cost efficiencies and operating experience, and develop dispatch algorithms for the future. Cost share through grants and cooperative agreements is most effective to mitigate cost and risk for customers.
- Consider the use case of supporting the transmission system by locating diurnal charging in regions of the grid with excess current and future solar generation. To enable projects in regions of the power system where the available renewable energy resource is predominantly solar, facilities that are connected directly to the bulk power system, rather than coupled at a solar facility, should be eligible for diurnal charging off other system solar resources if charging scheduling is coordinated with resource availability of the solar resources. If this is not possible, DOE should expand eligibility to projects capable of 8-10 hours of storage.
- When implementing the STORE scale, include information on other scales such as Technology Readiness Level (TRL). This will assist institutions that use traditional scales, especially as they gain familiarity with the new scale.

Duke Energy appreciates the opportunity to respond to this RFI to inform the scope and priorities of DOE's Long Duration Energy Storage for Everyone, Everywhere initiative. Below, we have provided comments on the following considerations:

Category 1: BIL 41001 Energy Storage Program-Specific Requirements Implementation Strategy

Category 1A: Long-Duration Demonstration Initiative

Prototype Demonstrations

(c) What portfolio of projects (technology, use case, location, community engagement, etc.) would constitute successful implementation? How can success be measured?

As it establishes program guidance, we encourage DOE to seek to advance several emerging technologies, rather than focusing on the one or two that seem the most promising today. Hundreds of companies are rapidly working to develop various energy storage technologies, that have a variety of benefits and challenges.

(e) DOE proposes requiring technologies to substantiate a pathway to a levelized cost of storage (LCOS)of $0.05/kWh-cycle by 2030, using a methodology similar to: https://arpa-e.energy.gov/sites/default/files/documents/files/DAYS_ProgramOverview_FINAL.pdf

(ii) What alternate approaches exist, not based on LCOS, that enable the development of robust storage market? For example, capacity costs or a combination of capital cost and round trip efficiency (RTE) may be more appropriate for a given situation.

Alternative approaches include: (1) a combination of capital cost estimates and RTE, (2) cost estimates across a wide range of charging costs (from free/curtailed to higher than average market costs), and (3) cycle life costs (this is important because degrading technologies and/or short-lived technologies have much different long-term outlooks on pricing).

(f) Which technology families or types may be most applicable for consideration?

We recommend considering battery, compressed air, gravity, chemical, thermal and other mechanical options.

CATEGORY 1B: ENERGY STORAGE DEMONSTRATION PROJECTS

UTILITY-SCALE VALIDATION

(2) Demo Projects: The goal of this program is to utilize BIL funding to deploy first-of-a-kind technologies at utility scale which might not otherwise proceed given potential technology risk. Such technologies should have the capacity to discharge energy for a duration of >10 hours at rated power, with sufficient third-party testing/ validation to substantiate a pathway to a levelized cost of storage of $0.05/kWh-cycle by 2030. DOE proposes that projects in this program be 1st-of-a-kind MW-scale systems, with sufficient integration, controls, power conversion equipment (if applicable), and interconnection to the bulk power system. Please comment on the appropriate criteria for technology maturity at this stage.

We recommend DOE broaden the criteria for technology maturity at this stage, due to the significant uncertainty that exists around the levelized cost of new technologies. DOE may also want to consider the value of a system between 10 hours and the currently economic 1- to 4-hour duration of lithium-ion. It will be helpful to consider systems that can dispatch for 6+ hours at rated power to fill the gap for long-duration storage between 2022 and 2030.

(a) DOE is evaluating funding mechanisms for Demo Projects in accordance with the BIL. DOE is interested in removing barriers to participation for key communities, particularly underrepresented communities, and individuals; DACs as defined by DOE's Justice40 guidance; and fossil energy communities in transition, as well as organizations or institutions that represent them. Please comment on the ways different funding mechanisms may contribute to equitable selection and community engagement for Demo Projects. Specifically, as it relates to Demo Projects, please consider the following mechanisms:

(i) DOE is considering cost-share grants and cooperative agreements as a mechanism to make awards. Please comment on the effectiveness of cost-share grants and cooperative agreements to achieve the objectives of the Demo Projects.

(ii) DOE is interested in learning more about offtake agreement mechanisms, where DOE could fund an "adder" incremental to market payment, effectively funding just the innovative piece of a project (beyond standard market cost). The benefit of such an agreement for DOE is that the company is only funded if the project is successful; otherwise, DOE may reclaim the funds for use on other projects.

(iii) Please comment on the aspects of the listed funding mechanisms that may impede removing technology barriers to broader deployment and could potentially be addressed in an alternative funding mechanism to the ones described.

To enable equitable participation among underrepresented communities, it will be important to ensure that a broad set of entities are eligible to apply for funding opportunities. DOE should also allow for flexibility with respect to partnerships, as the operation and maintenance of new energy storage technologies will require a utility or independent power producer partner capable of maintaining assets over time. Ownership and operational agreements should also limit undue burdens on the industry as programs and technologies scale.

Offtake agreements should not be the sole mechanism for funding projects. This structure would prohibit regulated, vertically integrated utilities – including most Duke Energy utilities – from accessing federal funding to enable long-duration energy storage technologies. If offtake agreements are considered, a payment based on market revenue would need to be variable over time based on shifts in market revenue.

(b) One of the projects must supply power "(v) for weekly or monthly durations, which have the capacity to discharge energy for 10 to 100 hours, at a minimum," OR "(vi) for seasonal durations, which have the capability to address seasonal variations in supply and demand." What are the key barriers (technical, institutional, regulatory, etc.) and opportunities associated with a demonstration of this type, and which funding mechanisms can DOE use to overcome these barriers?

A key barrier for regulated utilities operating in a least-cost model is the lack of market incentive to build long-duration storage today, despite the critical role it may play in the future. However, it is essential to initiate long-duration storage pilots and demonstrations today to gain cost efficiencies and operating experience, and develop dispatch algorithms for the future. Six+ hour duration, non-lithium projects that would otherwise not be executed could become economically feasible across 2022-2030 with financial incentives that reduce the cost and risk to our customers (such as grants or cooperative agreements). (Note that the market need for longer-duration storage is anticipated to be gradual, including a gradual increase in the need for 6- to 10-hour installations and eventually 10 to 100 hours.)

Beyond funding mechanisms, DOE could promote state policies and regulatory frameworks – such as Duke Energy's Vision Florida program – that encourage and enable utilities to participate in demonstrations and early deployments of advanced clean energy technologies.

(c) One of the projects must "demonstrate second-life applications of electric vehicle batteries as aggregated energy storage installations to provide services to the electric grid." What are the key barriers (technical, institutional, regulatory, etc.) and opportunities associated with a demonstration of this type, and which funding mechanisms can DOE use to overcome these barriers?

Duke Energy is planning to install about 15kW/60 kWh of second-life EV batteries as part of a DC microgrid pilot project, which is targeting completion by the end of 2023. Through this effort, we expect to develop insights that may contribute to standing up a demonstration for grid-scale second-life batteries. However, there are significant barriers to a grid-scale (~multi MW) demonstration of second-life batteries today, including: limited vendors, lack of available inventory, limited understanding of second-life battery performance or safety, limited knowledge of vendors integrating the second life batteries with a third-party battery management system, and unacceptable warranty (or no warranty) terms to protect the utility for 10 years consistent with other regulated energy storage projects.

(d) The Consolidated Appropriations Act, 2022 provides DOE with $20M for implementation consistent with “section 3201 of the Energy Act of 2020 for energy storage projects that are U.S-controlled, U.S.-made, and North American sourced and supplied. The Department is directed to include in this program large scale commercial development and deployment of long cycle life, lithium grid scale batteries and their components.” What are the key barriers (technical, institutional, regulatory, etc.) and opportunities associated with a demonstration of this type, and which funding mechanisms can DOE use to overcome these barriers?

A grid-tied energy storage system has hundreds of components across the cells, containers, balance of plant, controls and interconnection facilities. DOE should consider that not all components of a grid-tied battery energy storage system are manufactured by the same entity and define which components must be American-made to qualify for this incentive (e.g., battery cells).

(e) What is a sufficient individual award size to make a significant difference for its targeted technologies? DOE is interested in understanding the award size required across several project sizes and durations that may be required for different applications.

For these use cases, utilities are interested in MW-scale investments requiring $10-$100 million dollars in capital outlay.

(g) DOE defines long duration storage as systems capable of delivering 10 or more hours in duration. DOE is considering evaluating technologies for use on a daily, diurnal cycle (i.e., charging during the daytime and discharging at night).

(i) Which other use cases and application areas could be relevant for an applicant applying to Demo Projects with a proposed large-scale, mid maturity, long-duration technology demonstration?

We recommend DOE consider the use case of supporting the transmission system by locating diurnal charging in regions of the grid with excess current and future solar generation. The diurnal storage load allows solar generation from multiple local solar facilities to be utilized to charge local storage, rather than transport it across existing transmission facilities and increasing congestion. This energy can be discharged at night, or, to balance the output of the local solar resources, during the day. This would prevent the need to upgrade the transmission system to accommodate concurrent output of all facilities.

It is important to note that the diurnal use case may be limited by a 10+-hour duration requirement, especially if the storage facility is required to be coupled with a dedicated renewable resource. Depending on whether the charge cycle is decoupled from the discharge cycle, it may not be feasible to have a 10-hour duration that can charge in the remaining 14 hours.

This limitation may be particularly acute in regions of the power system where the available renewable resource is predominantly solar, like the state of Florida. In Florida, the duration of adequate solar generation varies from 9 to 13 hours (before local solar variability is considered) depending on the time of year. To meet a 10+-hour duration requirement, a storage facility would need to charge off non-renewable resources for part of the day. We may address this issue in two ways: (1) Afford eligibility to facilities that are connected directly to the bulk power system and not coupled at a solar facility eligible for diurnal charging off other system solar resources if charging scheduling is coordinated with resource availability of the solar resources. Another way to address it would be to expand eligibility to projects capable of 8-10 hours of storage.

(h) DOE proposes requiring technologies to substantiate a pathway to a levelized cost of storage of $0.05/kWh-cycle by 2030, using a methodology similar to *https://arpae.energy.gov/sites/default/files/documents/files/DAYS_ProgramOverview_FINAL .pdf*

(i) What level of analysis is appropriate for applicants to provide in order to show the likelihood, timeline, and major milestones for achieving the LCOS goal?
(ii) What alternate approaches exist, not based on LCOS, that enable the development of robust storage market? For example, capacity costs or a combination of capital cost and round trip efficiency (RTE) may be more appropriate for a given situation.

Because there is significant uncertainty around the levelized cost of new technologies, it may be helpful to entertain alternative approaches, which may include: a combination of capital cost estimates along with RTE (charging cost), estimating costs over a range of charging costs (i.e., from free/curtailed renewables to higher than average market costs) and estimating cycle life costs (degrading technologies and/or short-lived technologies have different long-term outlooks on pricing).

(i) What project sizes and power ratings should be targeted for optimal demonstration under Demo Projects?

For mechanical/thermal energy storage technologies that use turbomachinery in the charge and discharge cycles, it is important to have equipment of meaningful size to reduce the overhead operation and maintenance (O&M) cost burden. Turbomachinery comes with a higher O&M floor price than other technologies, so turbomachinery that is too small (i.e., <10MW) will have approximately the same O&M costs as larger systems, reducing the operating economics and affecting the dispatchability of the system. For technologies serving a community resiliency need, a size in the 2MW+ scale will make the most impact.

(j) Which technology families or types are most applicable for consideration under Demo Projects?

The most applicable technology families include those that have lower incremental costs of energy ($/kWh) than li-ion storage but potentially higher relative capital costs such as flow, mechanical, thermal and gravitational technologies.

(l) To maximize the impact of a technology, what partnerships (directly or indirectly on the project team) are most essential (e.g., technology vendor, EPC, off taker, community, labor unions, etc.)?

Essential partners for any project include the owner/utility, technology vendor, EPC and off-taker. For all projects, the communities we serve are also a critical stakeholder. Other partners could include a wide range of entities such as universities, community colleges and NGOs.

(m) DOE proposes giving priority to technologies that leverage a secure supply chain. What considerations should be given to the manufacturing/supply chain needs, challenges and RD&D opportunities for a technology? For example, the availability of a domestic, secure, and ethical source of materials; the ability to use underutilized manufacturing capacity, and/or the speed at which manufacturing can be scaled to meet future demand.

(i) What level of analysis would an applicant be able to provide to demonstrate the supply chain criteria listed above?

It is unknown whether energy storage technology vendors will be willing or able to publicly share this information. All utility project vendors must adhere to a strict supplier code of conduct to remain in partnership with Duke Energy. When evaluating a supply chain, it will be most important for DOE to determine how the supply chain is sourced, including countries involved. If there are foreign inputs, projects should evaluate those, rather than the whole project with greater scrutiny.

(n) What cybersecurity considerations, opportunities, barriers, and metrics are most relevant for Demo Projects?

Cybersecurity is a critical consideration for any asset that is deployed on the electric grid. Control of, and data access to, grid assets must be protected at all times. Utilities will need to seek investment partners and opportunities that do not present a cybersecurity threat. Real-time access to grid assets may not be available to non-utility entities.

CATEGORY 1C: ENERGY STORAGE PILOT GRANT PROGRAM ("PILOT GRANTS")

MARKET CREATION

(3) Pilot Grants: The goal of this program is to build enduring capabilities for targeted communities to invest in storage resources that provide local benefits (including resilience, decarbonization, and financial). Please comment on the appropriate criteria for technology maturity at this stage.

(a) What portfolio of projects (technology, use case, location, community engagement, etc.) would constitute a successfully implemented pilot project? How can success be measured?

A successfully implemented pilot program would include a wide variety of technologies. Hundreds of companies are rapidly working to develop various energy storage technologies that have a variety of benefits and challenges.

(b) DOE is required to establish a "competitive grant program … to carry out demonstration projects for pilot energy storage systems." The direction also specifies giving consideration to "proposals from eligible entities for securing energy storage through competitive procurement or contract for service." DOE is evaluating funding mechanisms for Pilot Grants in accordance with the BIL, including investigating innovative structures to fund states and communities, so they can further invest in energy storage. DOE is interested in removing barriers to participation for key communities, particularly underrepresented communities, and individuals; DACs as defined by DOE's Justice40 guidance; and fossil energy communities in transition, as well as organizations or institutions that represent them. Please comment on the ways different funding mechanisms may contribute

to equitable selection and community engagement for Pilot Grants. Specifically, as it relates to Pilot Grants, please consider the following mechanisms:

(i) DOE is considering a competitive grant program. Please comment on the effectiveness of a competitive grant program to achieve the objectives of Pilot Grants.

Competitive grants are an effective tool for reducing the cost and risk of pilot projects. Eligible applicants should include a broad range of entities, including utilities, to maximize participation from industry, technology developers and other community partners.

(iv) An energy storage subscription model may enable users to obtain energy storage functions on a trial or part-time basis. This model could be particularly useful with the combination of mobile storage architectures and users that only have a seasonal need for storage. Please comment on the effectiveness of an energy storage subscription model to support the objectives of Pilot Grants.

Subscription models are an effective tool to address the upfront cost barrier for low-to-moderate income households and businesses. DOE should consider a variety of options when testing the subscription-based model, including: traditional versus time-of-use structures; battery controlled by customer versus third party/utility (aggregator) versus utility (demand response); market versus non-market connected systems; net metered versus behind the meter only; and solar/wind coupled versus standalone.

DOE should also test multiple subscription models, including traditional, hybrid and hosting. A traditional model comprises a monthly fee over a specified term with removal or new system (w/ subscription renewal) at the end; the term is typically based on life expectancy of the battery. A hybrid model allows the customer to opt into a demand response/demand-side management program that would earn them credits to buy down their monthly subscription fee, with the customer giving up control of the battery to the provider, except during outages. In a hosting model, the utility (or provider) pays/credits customers to host a battery for full control of its discharge at all times.

Often these types of programs target those with good credit/balance sheets. We encourage DOE to focus on all customer types, including from various income demographics. For customer with low income/ability to pay, DOE should encourage program designs that would (1) enable the participant to reduce (or even eliminate) monthly cost through demand response/demand side management and (2) allow the hosting of batteries for a bill credit or payment, but not be able to use the battery – this may be good on distribution circuits that are at/near capacity.

Both new and retrofit construction scenarios should also be considered for eligibility. In many new neighborhood or business/industrial park construction projects, developers include a battery coupled with every meter or building. These batteries can be aggregated to provide grid reliability services, among other beneficial uses at commercial-to-utility-scale. Retrofit and post-construction programs will allow for cost comparisons.

Finally, for pilots to be effective, it is important to collect comprehensive data and provide open access to the results. Variables should include the following: installed cost, O&M costs over term, program management costs, system specifications (capacity, energy, manufacturer, installer, standalone/coupled with solar/wind), usage (number of cycles, energy stored and released), bill impacts (including savings, revenues and credits) and results of cost-benefit analyses.

(c) What is a sufficient individual award size for a pilot project to make a significant difference for its targeted use and technologies? DOE is interested in understanding the award size required across several project sizes and durations that may be required for different applications.

For these use cases, utilities are interested in MW-scale investments requiring $10-$100 million dollars in capital outlay.

(g) How might an entity create structures that address barriers to storage deployment in a leveraged manner, potentially enabling many repeatable deployments?

Electric utilities and entities that can utilize system-level data analytics including GIS, historic outages, and local power system design can identify the opportunity for repeat investments to utilize energy storage for local system resiliency. Entities that can prove this capability can show the potential for future repeatable deployments.

(h) Which technology families or types are most applicable for consideration under Pilot Grants?

Applicable technology types include batteries, compressed air, gravity, chemical, thermal and other mechanical options.

(j) To maximize the impact of a technology, what partnerships (directly or indirectly in the project team) are most essential? (e.g., states, Tribes, technology vendor, EPC, off taker, community, labor unions, etc.)

Essential partners for any project include the owner/utility, technology vendor, EPC and off-taker. For all projects, the community is also a critical stakeholder. Other partners could include a wide range of entities such as universities, community colleges and NGOs.

(k) What considerations should be given to the potential supply chain for a technology? For example, the availability of a domestic, secure, and ethical source of materials; the ability to use underutilized manufacturing capacity, and/or the speed at which manufacturing can be scaled to meet future demand.

(i) What level of analysis would an applicant be able to provide to demonstrate the supply chain criteria listed above?

It is unknown if energy storage technology vendors will be willing or able to publicly share this information. All utility project vendors must adhere to a strict supplier code of conduct to remain in partnership with Duke Energy.

(l) What cybersecurity considerations, opportunities, barriers, and metrics are most relevant for Pilot Grants?

Cybersecurity is a critical consideration for any asset that is deployed on the electric grid. Control of, and data access to, grid assets must be protected at all times. Utilities will need to seek investment partners and opportunities that do not present a cybersecurity threat. Real-time access to grid assets may not be available to non-utility entities.

Category 1D: Rapid Operational Validation Initiative (ROVI)

(4) DOE seeks comment on the how the ROVI program could be structured or revised to maximize the objective of enabling commercial financing and adoption of technologies that would not otherwise have robust performance projections.

(a) Please comment on the kinds of data that project performers would be required to provide, as well as any necessary safeguards.

(i) Technical Performance: basic performance characteristics at most basic repeat unit, module, and system level. E.g., for battery storage systems the expected duty cycle, current, voltage, temperature, round trip efficiency, depth of discharge, maximum charge capacity, discharge rates for cells, modules, and system.

Project performers should be required to provide information on auxiliary loads, capacity performance at different ambient conditions (i.e., winter/summer), self-discharge rate or other stand-by losses and ramp-up times, including both cold and warm starts, if different.

(ii) Frequency of collection: live feed to secure database or weekly, monthly, quarterly upload of data. Differentiation of scheduled maintenance/calibration vs. unscheduled shutdown.

We would recommend a requirement for monthly upload of data. Live feed to bulk grid assets will be very challenging to achieve with cybersecurity requirements.

Category 2: BIL 41001 Energy Storage Program Crosscutting Topics

Category 2A. Storage Technology Opportunity Readiness Evaluation (STORE)

(5) DOE is seeking input on the clarity of the STORE scale as it relates to the energy storage programs described above and additional metrics to further define the technology and community acceptance landscape for long-duration storage.

(a) Please comment on how effectively or thoroughly the STORE scale can be used when describing the major barriers to commercialization of new innovative storage technologies.

Adoption is a key challenge when creating a new scale. We recommend DOE also include information on other scales, such as Technology Readiness Level (TRL). This will assist institutions that use traditional scales, especially as they gain familiarity with the new scale.

(b) Based on the STORE scale described in the section *DOE's Draft Strategy for BIL 41001 Implementation* and summarized in Figure 2, how clearly can an applicant find and know which program or solicitation to apply to?

The use of "demo initiative," "demo projects," and "pilot grants" is confusing and appears to be out of order of conventional and accepted terminology. Typically, a pilot project would occur prior to a demonstration project and be smaller scale. Understanding that several of these terms were defined in the enabling legislation, DOE may wish to provide clarity to potential applicants throughout the process.

(c) What additional details could be present in a funding opportunity announcement to increase applicant confidence in which program to apply to?

We recommend including clarification of energy and capacity expectations as well as example use cases.

Category 2B. BIL Provision, Requirements and Proposed Implementation

(6) Are the proposed funding levels for the various phases appropriate/adequate?

Compared to other DOE programs, overall funding levels for long-duration storage pilots and demonstrations appears insufficient. This is especially true for non-lithium-ion energy storage technologies, for which significant pilot and demonstration efforts are needed to move the needle forward and help validate performance and more importantly bring down costs to commercialization. Notably, of the three required projects, two would be li-ion-based.

Category 5: Additional Input

(55) Please provide any additional information or input not specifically requested in the questions above that you believe would be valuable to help DOE develop 41001 funding announcements and opportunities, including any specific criteria that DOE may take into consideration in implementing 41001 energy storage programs.

At Duke Energy, we believe equity and justice are fundamental to our operations and a pillar of meaningful stakeholder engagement for successful project implementation. We recognize and understand the importance of both the impact of our work on communities as well as on early engagement. We believe in being transparent on what we are trying to accomplish, seeking feedback and input and adjusting and aligning where possible to provide the best outcomes for the communities we serve. This requires that we consider the needs and concerns of a diverse stakeholder audience, which includes customers, shareholders, regulators, environmental organizations, social advocates, community agencies, elected officials, employees and many others. To effectively do this, we must get their perspectives early and often and work together to deliver smart energy solutions.

We recommend that DOE consider the same wide range of stakeholders when selection criteria are reviewed. Through the voices of diverse stakeholders, DOE can then ensure that the project will benefit the community in the most relevant way by ensuring the barriers, needs and opportunities unique to a specific community are being addressed through the project. Ensuring that stakeholder meetings are accessible to all members of the community is key and should include various days, times and channels (in person, online, survey, etc.) for conversation.

DOE can further support an inclusive ecosystem for the project around workforce, supply chain and stakeholders by emphasizing partnerships and collaborations and communities with robust stakeholder plans. Ensuring a diverse supply chain will be an important factor in implementing this project and the Justice 40 initiative. Collaborations like DiCE can provide resources and connections that promote diversity.[1] DiCE's goal is to advance the voice of diverse suppliers by using existing relationships, influence and advocacy to raise awareness, open doors and amplify the voices of diverse suppliers.

We are leaning in on issues that matter to our communities and to the company. Topics like environmental justice, just transition, how we work together to create vibrant economies and climate resiliency are where we are focused and will continue to make an impact. Over the past year, we have worked with both internal and external stakeholders to build upon the principles that guide our work in environmental justice.[2] Internal processes and procedures are being implemented to ensure all new infrastructure and major projects will be screened for environmental justice considerations and impacts. As we retire our coal fleet, we will continue to serve those communities. Our employees have deep roots in the communities where they live and work, and we are thoughtfully building our just transition strategy to reflect the perspectives of local communities.

Energy storage programs can continue to offer key benefits to communities that are transitioning from fossil fuels by creating a sustainable workforce, economic growth and continued reliability for the community, helping them to grow and benefit from the clean energy transition.

We must have an innovative, talented team of professionals who represent the diversity of the customers we serve as a foundation for success. We are being very intentional about our actions. We are focused on identifying talent in the organization and providing coaching and development to build a strong pipeline of leaders. We are also providing learning solutions for upskilling and reskilling employees to support business transformation and are leveraging technology and innovation more than ever before. We are guided by our vision of an inclusive environment where all people are valued, respected and encouraged to reach their full potential. And we pursue a strategy that integrates diversity and inclusion into everything we do. The company has deployed strategies to increase the diversity of our workforce, including a team that is dedicated to building relationships with historically Black colleges and universities, community

[1] The Diversity in Clean Energy (DiCE) initiative is an action-based coalition, convened by Duke Energy, alongside corporations such as Kroger, Microsoft and T-Mobile, and representatives of diverse-owned businesses operating within the clean energy industry. DiCe homepage available at: https://dicesuppliers.org/

[2] Duke Energy Environmental Justice Principles. Available at: https://www.duke-energy.com/_/media/PDFs/Unindexed/Duke-Energy-Environmental-Justice-Principles.pdf

colleges and diverse professional organizations.[3] These strategies also include understanding and mitigating potential barriers for underrepresented groups.

DOE should consider value-added pieces to the project, including education and research, workforce development, supply chain and economic development, to name a few. For example, in 2021, Duke Energy's economic development team helped attract approximately 12,500 new jobs and $6.2 billion in capital investment to six states served by the company's electric utilities – North Carolina, South Carolina, Florida, Indiana, Ohio and Kentucky – that will build value for these communities for years to come and beyond the immediate footprint of the project.

Finally, we continue to evolve the use of data and analytics to identify when and where to invest based on local needs. Through a variety of internal and external tools, a wide range of demographics, insights and data points are being evaluated and considered as we build our strategy for infrastructure and the clean energy transformation and the impacts to disadvantaged communities. The tools include but are not limited to the Department's Energy Justice Dashboard (BETA), Climate and Economic Justice Screening Tool, U.S. Environmental Protection Agency's EJScreen tool, DOE's Low-Income Energy Affordability Data (LEAD) Tool, other state-level justice screening tools, customer data, and proprietary stakeholder mapping tools. These strategies and tools allow us to maximize customer benefit by transitioning from a programmatic to a project-based execution approach around our disadvantaged communities. DOE should consider an assessment of third-party tools but also the unique opportunities for communities to develop economic benefits, resiliency and customer benefit that are often not included in modeling tools but are demonstrated at the grassroots level through stakeholder conversations.

SUMMARY

Again, Duke Energy appreciates the opportunity to provide input on DOE's efforts to advance energy storage demonstrations and pilots in accordance with the IIJA. These initiatives are critical to facilitate advances in energy storage and domestic supply chains that will enhance reliability and, in some cases, enable the deferment of future grid investments that otherwise would be required. The company is actively engaged with long-duration energy storage research, development and demonstration efforts across our industry and service territories and welcomes the opportunity to further partner with DOE to advance energy storage demonstrations and facilitate ways to both support disadvantaged communities and decarbonize the grid.

[3] Duke Energy looks to HBCUs for diverse class of interns. Duke Energy Illumination. Available at: https://illumination.duke-energy.com/articles/duke-energy-looks-to-hbcus-for-diverse-class-of-interns

CERTIFICATE OF SERVICE

I certify that a copy of Duke Energy Carolinas, LLC and Duke Energy Progress, LLC's Second Update on Responses to RFIs, in Docket No. M-100, Sub 164, has been served by electronic mail, hand delivery or by depositing a copy in the United States mail, postage prepaid, to parties of record.

This the 20th day of June, 2022.

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