

STATE OF NORTH CAROLINA  
UTILITIES COMMISSION  
RALEIGH

DOCKET NO. E-2, SUB 1197  
DOCKET NO. E-7, SUB 1195

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of )  
)  
Application by Duke Energy Carolinas, ) **PARTIAL PROPOSED ORDER**  
LLC And Duke Energy Progress, LLC ) **OF GREENLOTS**  
For Approval Of Proposed Electric )  
Transportation Pilot )

Pursuant to the *Order Granting Motion for Extension of Time* issued in these dockets, Zeco Systems, Inc. d/b/a Greenlots ("Greenlots"), submits this Partial Proposed Order addressing certain aspects of the proposed Electric Transportation Pilot Program ("Pilot Program") described in the Application filed by Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, LLC ("DEP") (collectively, "the Companies" or "Duke"), on March 29, 2019.

**FINDINGS OF FACT**

1. Utility investment in public fast chargers proposed as part of the Companies' Pilot Program is appropriate and necessary given that there is not currently sufficient demand for public charging infrastructure to make it economically feasible for private investment to profitably deploy public fast charging infrastructure in North Carolina.

2. The Companies' proposed pilot Fast Charging Program, where they would install, own, and operate a network of foundational infrastructure consisting of up to 70 public-access fast chargers in DEC's service territory and up to 50 public-access fast chargers in DEP's service territory, at locations along highway corridors to enable intrastate and

interstate travel in electric vehicles (“EVs”), and thereby foster EV adoption, should be approved as proposed.

3. The Companies should procure, competitively select, own, operate, and maintain the public-access fast charging infrastructure installed under the Pilot Program.

4. Taken as a whole, the components of the entire proposed Pilot Program are an experimental trial of an appropriate scale and design to offer necessary and valuable learnings to inform grid planning and investment decisions that will enable, prepare for, and manage the coming growth of electric transportation.

5. The Companies’ proposed Pilot Program aligns with and supports Executive Order 80, “North Carolina’s Commitment to Address Climate Change and Transition to a Clean Energy Economy,” which sets a goal of at least 80,000 zero emission vehicle registrations in North Carolina by 2025.

6. Transportation electrification is in the public interest, as it will provide a host of benefits to North Carolina and society at large, including increasing and optimizing the utilization of the electric grid to the benefit of all ratepayers, while delivering significant environmental, human health, economic development and cost savings benefits.

#### **EVIDENCE AND CONCLUSIONS SUPPORTING FINDINGS OF FACT NO. 1 AND 2**

Duke’s Pilot Program is a portfolio of targeted offerings designed to gain insights and help accelerate transportation electrification. The various components of the Pilot portfolio would leverage the Companies’ core competencies and ability to help support and accelerate the market to the benefit of all utility customers.

The portfolio of the proposed Pilot Program includes:

- (1) Residential charging with up to \$1,000 rebates for 500 DEC customers and 300 DEP customers;
- (2) Fleet charging stations with up to \$2,500 rebates to 500 DEC customers and 400 DEP customers;
- (3) EV school bus charging stations with a \$215,000 rebate per bus for 55 buses for DEC and 30 buses for DEP;
- (4) EV transit bus charging for 60 stations for DEC and 45 for DEP; contribution of \$75,000 per bus acquired in the last 24 months;
- (5) Multi-family charging stations with 100 stations for DEC and 60 for DEP;
- (6) Public L2 charging stations - 100 for DEC and 60 for DEP; and
- (7) Fast charging stations - 70 chargers at 35 locations for DEC and 50 chargers at 25 locations for DEP, all of which are to be located along highway corridors to enable intrastate and interstate EV travel.

The Pilot Program is intended to gather data, advance the public interest in electric vehicle adoption and to test different charging technologies, applications and programs. The various components of the Pilot Program will be complemented by a marketing, education and outreach program, leveraging Duke's existing relationships with agencies and organizations, and utilizing electronic communications, direct mail, social media, public event, and mass market advertising.

Transportation electrification offers an opportunity to increase and optimize the utilization of the electric grid, to the benefit of all ratepayers. The nascent state of EV adoption in North Carolina presents a "chicken and egg" causality dilemma. The current lack of private investment and deployment of public-access charging infrastructure inhibits EV adoption by the public. Adequate public charging facilities are the essential backbone for transportation electrification, and deployment of publicly accessible charging infrastructure is a necessary foundation for promoting EV adoption. Increased EV adoption will create demand for more charging facilities that will, in turn, promote private competitive investment in publicly accessible charging infrastructure. As a result, utility

investment in charging infrastructure at this time, as part of the proposed Pilot Program, is appropriate.

Duke noted on page 3 of its Application that the U.S. Department of Energy, Alternative Fuels Data Center, reported in early 2019 that North Carolina had only 43 publicly accessible fast charging locations with a total of 86 charging ports. NCSEA pointed out in its comments that while there were only 86 public fast charging ports available in North Carolina when the Companies filed their Application, that as of July 2, 2019, the number of ports had increased to 144. (NCSEA Comments p. 4). While certainly a positive step, the additional ports are a product of the National Zero Emission Vehicle Investment Plan (a part of Volkswagen AG's settlement with various federal agencies relating to emissions issues), rather than private investment that is not a product of a legal settlement. (T. pp. 72-73).

Further, given that it is estimated that at least 455 ports would be required to support the 80,000 zero emissions vehicle ("ZEV") registration goal established in Executive Order 80, the additional 120 fast chargers which the Companies propose to install under the Pilot Program would hardly saturate the market for public-access charging locations. This is even more the case to the extent that future adoption of EVs is significantly underestimated, as was the case with the extent of cellular phone adoption/penetration as forecast in 1991. (See In the Matter of Exemption of Domestic Cellular Radio Telecommunications Service Providers from Regulation Under Chapter 62 of the North Carolina General Statutes, Docket P-100, Sub 114).

Indeed, as Greenlots noted in its reply comments:

[P]rivate market [Electric Vehicle Supply Equipment] EVSE developers have been operating both in North Carolina and the

broader region for several years now, and have not been successful in achieving the market state that is suggested can be attained if utility investment is precluded.

(Greenlots Reply Comments p. 6).

This information as to the relative rarity of publicly accessible charging locations in North Carolina tends to corroborate the reality of one of the core challenges associated with EV adoption recognized by numerous commenters. This challenge is described in the April 22, 2019, letter from the Alliance for Transportation Electrification:

**Consumer surveys consistently cite two major barriers to greater EV adoption nationally: first, the low level of general awareness of the EV models and types of plugs for charging among potential consumers, and secondly, the fear of “range anxiety,” namely running out of “fuel” (in this case battery power) on the road. Siting and deploying a larger number of DC fast charging stations (as well as Level 2 chargers, mentioned below) is an effective way to counter such anxiety.** The Alliance recognizes this component has the largest projected cost of the overall program (\$34 million) and that they are sometimes a challenge to site, permit, and develop. Yet, in our view, that is all the more reason for a strong utility involvement in the process and allowing Duke the ability to own and operate these with a long-term perspective in mind.

(Emphasis added).

To the extent that consumers disqualify EVs from their purchasing/leasing considerations due to the lack of publicly accessible charging infrastructure and “range anxiety,” this concern can be mitigated with the installation of more and visible public charging infrastructure.

The fast charging component of the Pilot Program proposes installation of 70 fast chargers at 35 public locations for DEC and 50 fast chargers at 25 public locations for DEP – meaning there would be two charging ports at each location. As noted by Duke witness Reynolds at the November hearing,

[T]he kinds of DC fast charging that we hoped to invest in, this sort of corridor DC fast charging to support highway travel of EVs across the state, it's pretty well-documented that that's not profitable on a stand-alone basis. So right now the usage is not enough to make it economical or profitable for an unregulated competitive provider to invest in. And that's why we haven't seen the addition of any new charging stations and so that's where we think the utility has a unique opportunity to play a role in making that investment.

\* \* \*

So right now the usage is not enough to make it economical or profitable for an unregulated competitive provider to invest in.

(T. pp. 49-50).

The marketplace for public EV charging facilities in North Carolina has not yet matured to a point sufficient to attract robust private investment. To paraphrase Mr. Reynolds, until EV adoption here reaches the point where there is sufficient usage to make it economical or profitable for unregulated competitive providers to invest in public-access charging infrastructure on a larger scale, further such investment will likely continue to be slow and sparse.

The International Council on Clean Transportation's publication "Emerging Best Practices for Electric Vehicle Infrastructure," stands for the proposition that there is a fundamental link between charging infrastructure visibility, availability, and EV adoption, as it can both confine and slow EV adoption when scarce, or act as a market and EV adoption accelerator when prominent and adequately available. (Greenlots Comments p. 8). This is consistent with Siemens' observation in its letter of November 20, 2019, that Duke's proposed investment will stimulate private investment in charging facilities:

In contrast to claims made otherwise, there is no evidence anywhere – in spite of over 50 utility programs in progress around the country – that utility ownership hurts the competitive market for EV charging. **In fact, utility participation promotes market growth and competition, as evidenced in these many programs.**

(Emphasis in original).

As Siemens also stated in that letter, “utility participation in provision of EV charging infrastructure animates the competitive market for providing EV charging services.” That being the case, utility investment in publicly accessible charging infrastructure as a component of the Companies’ proposed Pilot Program is appropriate. Utility deployment of publicly accessible charging infrastructure can only help promote EV adoption, which will create demand for more charging facilities. Increased demand will, in turn, promote private competitive investment in publicly accessible charging infrastructure, as economics and supply adjust to increased demand.

Various commenters, including Greenlots, likewise noted that the fundamental lack of investment – both public and private – in EV charging infrastructure is the primary barrier to EV adoption by prospective buyers familiar with EVs, and forces EV drivers to be takers of and captive to very limited charging options.

**At this stage of the market, captivity to limited optionality is most concerning from a geographic standpoint – there are simply too few places for drivers to go to charge their EV.** Especially for public charging, the fundamental economics simply do not currently support sufficient private investment to get the market to where it needs to be to support current and future drivers and their purchasing decisions sufficiently, let alone providing meaningful choice.

(Greenlots Comments p. 14) (emphasis added).

If there are simply too few places for drivers to charge their EV, then utility investment that expands the number, visibility and range of charging locations available to EV drivers in North Carolina will serve and promote the important public interest in EV adoption and the obvious benefit of wringing increased value from the electric grid.

The Regional Transportation Alliance commented in its letter of May 3, 2019, that Duke’s “proposed initiative would jumpstart electrifying transportation usage and scalability with the largest EV infrastructure pilot in the southeast, while leveraging complementary programs including VW settlement and “Low/No” grants.”

In this regard, Advanced Energy noted that the “proposal’s plan for a network of fast-charging stations will help meet demand and bring new commerce and tourism opportunities. Furthermore, the installation and operation of public Level 2 and multifamily stations will make operating an EV more feasible not only for customers of the Companies but also other electric consumers and visitors to our state.” (Advanced Energy Statement of Position pp. 1-2). While the NCSEA questions whether it is 455, or 300 or 1,320 DC fast charging ports that are necessary to support the 80,000 EV goal established in Executive Order 80, “North Carolina’s Commitment to Address Climate Change and Transition to a Clean Energy Economy,” signed by Governor Cooper on October 29, 2018 (“EO80”) (NCSEA Comments pp. 2-3), there can be no dispute that deployment of the public-access fast chargers contemplated as part of the Pilot Program can only serve to increase the number of EVs on the road in North Carolina – a clear goal of EO80.

Both the NCSEA and NCCEBA express concern that the Pilot Program’s provision for placement of public charging facilities will give Duke too large a presence in the market for charging services or allow Duke to secure “prime locations” for charging infrastructure. We believe that these concerns are overstated. The scale of the proposed utility-owned publicly accessible charging infrastructure offering represents only a relatively small percentage of the public-access fast charging infrastructure needed to support EV growth

in North Carolina. We are convinced that there is a need for deployment of many more charging ports, which the forces of private enterprise are free to provide when they determine it is economically rational to do so – something that Duke and various other commenters say has not yet occurred here on a large scale. We agree that this aspect of the Pilot Program can be one part of the larger holistic framework needed for EV growth sufficient to by 2025 to obtain the 80,000 ZEV registrations targeted by EO80.

Duke witness Reynolds noted at the November hearing, the Pilot Program’s “objectives are to first and foremost gather data around the impacts of electric vehicle charging across our system from multiple types of electric vehicles. We are also looking to advance market adoption of electric vehicles throughout our service territories. We also intend to support the installation of a foundational level of infrastructure in support of that advanced adoption of electric vehicles [and] . . . to support the Governor’s Executive Order 80 to have 80,000 electric vehicles on the roads of North Carolina by 2025.” (T. pp. 13-14). These are legitimate objectives.

The Pilot Program is supported by numerous commenters, including the Southeast Energy Efficiency Alliance, which offered the following commentary regarding the public fast charging component:

[W]e strongly support Duke’s proposal to deploy a combined 120 DC fast chargers throughout the state, primarily on highway corridors. We believe it is important for a utility, like Duke, to adopt a portfolio approach of charging infrastructure to test and assess how EV owners and consumers will actually use it, and to be able to spread the costs out in aggregate among these different assets over time. Most consumer surveys have shown that range anxiety is the major impediment to greater adoption and purchase of EVs. While consumers may realize that most of the charging will be done at home (or the workplace if they have that benefit through their employers and spaces are available), but they are anxious of losing battery power, leaving them stranded on the side of the highway.

Duke's proposal with appropriately-sited DC fast charging stations throughout the state should be able to test that concern, and address range anxiety.

(Letter dated May 6, 2019).

Installation of a foundational level of publicly accessible fast charging infrastructure across the Companies' service territories in North Carolina is in the public interest. We conclude that this facet of the larger Pilot Portfolio can help promote successful integration of electric vehicles into the grid and establish a foundation for realizing the full potential of transportation electrification. Given the potential benefit in terms of both acquiring data concerning consumer behavior regarding adoption and use of EVs, and in promoting the goal of increasing EV adoption, it is appropriate for Duke to go forward with this part of the Pilot Program.

### **EVIDENCE AND CONCLUSIONS SUPPORTING FINDING OF FACT NO. 3**

We conclude that the Companies should own, operate and maintain the public-access fast chargers installed under the Pilot Program in order to ensure that those public charging stations are maintained in good working order. Because a primary goal of the Fast Charging Program component of the Pilot Program is to promote EV adoption, that goal is best served by creating the most favorable charging experience for future EV owners. We conclude that reliable operation of charging facilities will go a long way in convincing the traveling public that electric vehicles are a reliable and viable means of traveling, and that properly functioning public charging stations are essential to building and maintaining that perception.

In this regard, the Alliance for Transportation Electrification included this observation in its comments:

Siting and deploying a larger number of DC fast charging stations (as well as Level 2 chargers, mentioned below) is an effective way to counter [range] anxiety. **The Alliance recognizes this component has the largest projected cost of the overall program (\$34 million) and that they are sometimes a challenge to site, permit, and develop. Yet, in our view, that is all the more reason for a strong utility involvement in the process and allowing Duke the ability to own and operate these with a long-term perspective in mind.**

(April 22, 2019 letter)(emphasis added).

By virtue of their experience and resources, the Companies are well capable of maintaining their public-access charging facilities in proper working order – which will have significant value to the traveling public. Utility ownership, maintenance and operation of EV infrastructure will increase the likelihood of consistent uptime and a positive EV driver experience. This will, in turn, be beneficial to continued growth of EV adoption. In addition, as the market for charging service develops in North Carolina, the quality of service available at utility public charging stations will constitute a market force incenting private investors in the charging market to maintain their facilities in good operating order.

As described by Duke witness Reynolds at the November hearing, Duke is cognizant of this concern.

[I]n terms of the DC fast charge program, the reason why we've proposed to own and operate is that we feel it's important to ensure that the stations are well-maintained and operable for the full life of the asset. With a make-ready program, the utility just puts in the make-ready and we have no recourse after that to make sure that the station is useful or in good shape and we've seen a lot over the past couple of years. We've seen a lot of examples where those stations are not maintained and that's not something we want to see happen with this program.

(T. p. 76).

In addition to Duke owning and operating its public fast-charging infrastructure, leveraging its ability to select and procure hardware and software connecting to its network will boost competition and further add value by growing that market. As Greenlots noted,

[W]holesale-level competition that results from utility procurement, which provides a significant motivated buyer to a market that generally otherwise lacks this, represents the purest form of competition in today's market, based on product features, price, service, etc., allowing different types of players, regardless of size or market position to compete on a leveled playing field. Additionally, this wholesale-level competition that results from utility procurement is significantly more powerful in driving down program and charger costs, as equipment is being bought in bulk rather than via one-by-one individual retail transactions.

(Greenlots Reply Comments p. 12).

There are advantages for ratepayers in terms of economy and efficiency if the utility selects and procures the software and hardware for use at charging locations to be connected to its network. These benefits are not limited to ensuring interoperability of software between the utility network and the software deployed at charging locations. Enabling developers of charging locations to select and purchase on an individual retail basis software and hardware to be connected with the electric network, rather than having the utility procure and select hardware and software, deprives ratepayers of the value and benefits offered by wholesale bulk procurement by a utility. The latter scenario also avoids increased implementation time, cost and system vulnerabilities due to the often-complex back-end software integration required to be performed by the utility.

As Greenlots noted on this point,

[It] would be expensive and inefficient if Duke was required to integrate its back-end system with or otherwise accommodate each and every hardware provider's particular network system. It could also result in increased consumer protection and security concerns with respect to the flow of customer data, and outside entry points

into utility billing systems. The experience of many utilities in EV charging pilots is that the time, cost and complexity to separately integrate with each EV charging provider's specific network offering is one of the most challenging aspects of such programs.

(Greenlots Reply Comments p. 13).

Several parties including ChargePoint and the NCSEA offered comments in favor of maximizing customer choice as a way to support competition in the market. These comments reflect a view of the site host as the customer. We are concerned, however, that such an approach may have the opposite effect of, in fact, diminishing competition. ChargePoint reports that it is the "leading electric vehicle charging network in the world." Presumably, the dominant company in a market holds an inherent advantage in terms of its capacity to similarly dominate a retail-oriented marketplace. Instead, we view the electric utility as ideally suited to play both the role of the customer for EV charging products and services as well as steward for competition, particularly in the context of the fast charging pilot. And, as noted above, we believe that utility procurement will better enable competition in this still emerging industry than would a more retail-sales approach.

Furthermore, several commenters have noted that a smooth and positive driver experience is beneficial to encouraging EV adoption. We agree with that premise and subscribe to the notion that Duke, an electric utility whose core business is centered around delivering electricity reliably to customers, is arguably better positioned than a generic prospective site host to be well informed about and identify the hardware, software and operations strategies that will best ensure a positive driver experience.

Integral to the goal of ensuring a positive driver – and site host – experience is the notion of interoperability, described by Siemens as "a key requirement for cost reduction" (Siemens Second Statement of Support p. 4). Greenlots expands on the value of

interoperability as enabling greater site host choice of hardware and networks – including greater flexibility to change networks in the future – than certain infrastructure that may be more likely to be purchased by one who is less well-informed than an electric utility (Greenlots Reply Comments p. 15).

We conclude that the Companies’ proposed Fast Charging Program in which Duke will procure, select, own and operate the charging infrastructure would incentivize competition. That approach will (1) create market demand and grow the market for suppliers; (2) enable market competition based on clear standards; (3) offer the greatest likelihood of reduced costs through the utility’s bulk purchasing power, especially compared with individual retail sale; and (4) avoid incurring unnecessary, expensive and burdensome costs, vulnerabilities and other challenges associated with integrating multiple networks as has been recommended by other parties.

As a final note relating to this finding, we are cognizant of the experience in California when the California PUC banned utility investment in charging infrastructure in 2011 based on the same arguments presented by some parties here: concerns about the “competitive market” and the “crowding out” of private investment. The result of the elimination of any threat of utility investment in public charging infrastructure in that state was that the California market did not move. Indeed, the prohibition on utility ownership constrained EV growth there. In 2014 the California PUC reversed its decision and allowed utility ownership of EV charging infrastructure on a case-by-case basis.<sup>1</sup> According to Greenlots, “California is now host to the most vibrant market in the country for each, with limited private investment existing alongside and benefiting from both utility ratepayer and

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<sup>1</sup> See California PUC Decision 14-12-079 issued December 22, 2014 in Rulemaking 13-11-007.

public state investment.” (Greenlots Reply Comments p. 8). This point was echoed by Duke witness Reynolds, who identified California as the market leader in EV adoption in this country. (T. p. 71).

#### **EVIDENCE AND CONCLUSIONS SUPPORTING FINDING OF FACT NO. 4**

The Public Staff questions whether Duke’s proposed Pilot Program is a “pilot” program or a full-scale foray into the electric transportation business. We are mindful of this concern, but conclude that the purpose of the Pilot Program is for Duke to acquire data and learning that will inform its understanding of various aspects of consumer and market behavior relating to transportation electrification. These are seven different components to the Pilot Program, each relating to a different aspect of transportation electrification. Successful utility management of the transition to electrified transportation has the potential to be a significant positive impact on Duke’s core business, which can benefit all of its customers (even those who do not drive EVs), by facilitating a more productive use of the electric grid to generate additional revenues that, in turn, can lead to lower rates.

A pilot program is a short-term experimental trial that helps an organization learn how a large-scale project might work in practice. We conclude that, when viewed as a whole, the various components of Duke’s proposed Pilot Program are, in fact, a “pilot” in the sense that they constitute an incremental exploratory foray into a number of aspects of the sphere of transportation electrification, each of which will help Duke learn how various aspects of this future market will operate on a larger scale. For example, the proposal to provide \$1000 rebates for residential charging equipment to a total of 800 consumers would involve just 1% of the 80,000 ZEV registration goal established in EO80. One percent of that goal can hardly be considered anything other than Duke “dipping its toe” into this

aspect of the marketplace in order to gain learning regarding whether and to what extent consumers are influenced by the availability of that rebate, and the attendant opportunity to enjoy the savings that managed charging can yield.

Likewise, the Pilot Program proposal to provide rebates for a portion of the cost of purchasing a total of 85 electric school buses cannot, given the total number of school buses in use in North Carolina, be described as anything more than an experimental effort to explore what impact this type of rebate would have on the possibility of electrifying some larger portion of the state's school bus fleet

The same is true of the public fast charging station component of the Pilot Proposal. Depending on whose crystal ball is most accurate, North Carolina needs either 455 or 1,320 DC fast charging ports to support the 80,000 ZEV goal established in EO80. The reality is likely somewhere in between, but it may be more. Even with the addition of the ports resulting from the Volkswagen settlement, there are less than 150 publicly accessible ports now available in the state.

The addition of 120 fast charge ports proposed in the Pilot Program is obviously more than Duke just "dipping its toe" into the public charging market. But, as established by Duke and supported by numerous commenters, the fast charger component of the Pilot Program serves a dual purpose: it is intended to (1) provide data to Duke regarding consumer usage patterns and preferences, and (2) stimulate EV adoption by mitigating range anxiety. The latter goal cannot be accomplished with the addition of 10 or 20 fast chargers. In fact, there is no ironclad guarantee that 120 new publicly accessible fast chargers will prove sufficient to overcome consumers' range anxiety, however, there can be no doubt that increased public awareness of 120 new publicly accessible fast chargers

will help the cause of trying to achieve the ZEV registration goal set in EO80. The bottom line is that the Companies' proposed installation of up to 120 fast charge ports across the state is a "pilot" program, because it is an incremental investment that is not comparable to the level of investment that will be required when the EV charging market matures.

Duke's proposed ownership of publicly accessible charging infrastructure is both limited and appropriate. There is significant value in ensuring that the public-access fast charging infrastructure installed under the Pilot Program is a positive force in stimulating EV adoption. That being said, at least one commenter argued that "the major shortcoming of the proposed Pilot Program is that it is too modest in scale in relation to the significant benefits that stand to be unlocked with utility investment, and the critical need for this investment given the factors limiting private market investment." (Greenlots Comments p. 8). In fact, Greenlots "is disappointed that Duke's proposed EV charging portfolio is at pilot scale, rather than the program scale that could truly transform – not just accelerate – the market." (*Id.*).

Many commenters spoke to the value of learnings that the portfolio of components comprising the proposed Pilot Program will provide. Broadly, the value of transportation electrification to the grid requires both an understanding of how electrification will impact load on the grid, and tools to effectively manage that load. Accordingly, the Companies' proposed portfolio offers several different load management methods that include time-of-use ("TOU") rates, smart technology-based managed charging, and bi-directional charging.

Various commenters assure us that technology-based managed charging in particular is a critical tool and strategy to optimize system efficiency, lessen the price of electricity for all ratepayers and help mitigate the need for costly system upgrades. It

likewise seems reasonable that technology-based managed charging can also improve integration of renewable and intermittent resources through dispatchable load.

As shown in Siemens' comments, the managed charging aspect of the Companies'

Pilot Program portfolio offers a multitude of benefits:

Utility planners can minimize their grid investment requirements if they know where and when EV charging loads are occurring and how those loads will grow over time. Utility operators can maintain reliability by having the same information in near real time, as well as the ability to either control such charging or accurately predict how EV owners (or their third party service providers) will control such charging in response to price signals. Utility customer engagement and charging management software can send price or control signals to smart phones and directly to electric vehicle supply equipment (EVSEs) or third party service providers, as well as allow consumers to program their charging preferences. Utility meter data management systems can use the data from chargers to disaggregate consumption – at the interval level – of EVSEs from the premise to enable application of separate tariffs to the premise owner and the EV. Utility billing systems can use this disaggregated data to calculate bills for EV-only tariffs, incentive payments for demand reductions during peak times, and other financial incentives adopted by the Commission. Utility rate designers can use the data to develop rates that enable EV owners to minimize the cost of charging by taking advantage of low-cost wholesale rates, especially during times of abundant wind and solar power. And because these rates can be EV-only by disaggregating the whole house data, customers can keep their preferred rate for their other-than-EV consumption. Utility demand response program operators can use the EV data to bid peak demand reductions and ancillary services into the wholesale market.

(Siemens' Second Statement of Support p. 3).

Greenlots highlights the value of managed charging in a variety of applications that pertain to Duke's portfolio of offerings as a tool "that can better shape, utilize, and dispatch flexible EV charging loads at charging stations with longer dwell times, such as residences and workplaces, to better maximize system-wide benefits and cost reductions. Other

dynamic pricing instruments can also be deployed in higher power charging and shorter dwell time contexts, including DC fast charging” (Greenlots Initial Comments p. 15).

Collectively, these comments and others in the record describe how technology-based managed charging offers broad value to unlock a suite of benefits to the system and its users, from more efficiently managing load to mitigating the need for investments in physical system upgrades to allowing EV users to benefit from discrete pricing and incentives. The Commission also recognizes that applying managed charging to the different market segments represented in Duke’s pilot portfolio will further strengthen the learning value of its pilot.

#### **EVIDENCE AND CONCLUSIONS SUPPORTING FINDING OF FACT NO. 5**

The portfolio of programs in the Pilot Program, which collectively would promote installation of residential chargers, fleet chargers, school bus chargers, transit bus chargers, multifamily chargers, public L2 charging and public fast charging, all align with and support EO80. That Order set a goal of at least 80,000 ZEV registrations in the state by 2025. Deployment of foundational public charging infrastructure essential to promoting EV adoption is in the public interest, and is essential if we are to achieve the EV goal set in EO80.

EO80 is not just a statement of broad policy objectives; it also sets forth specific policy goals relating to zero emission vehicles. Most relevant to the issues presented in these dockets, is EO80’s directive to the North Carolina Department of Transportation (“DOT”), in coordination with the Department of Environmental Quality (“DEQ”), to develop a plan to increase the number of EVs registered in the state to 80,000 by 2025. As a result, DOT issued its “North Carolina ZEV Plan,” part of which is to help establish

interstate and intrastate ZEV corridors, coordinate and "increase the installation of ZEV infrastructure, and incorporate, where appropriate, additional best practices for increased ZEV adoption."

The various components of the proposed Pilot Program are a portfolio of pilot programs that address diverse applications and market segments and directly support DOT's North Carolina ZEV Plan. The Pilot Program also meets the recommendation of DEQ's Energy Policy Council's that the state adopt, measure, and implement programs that promote EV adoption, urging regulatory agencies to consider measures that address barriers to transportation electrification. (Duke Application pp. 4-5).

As noted in the October 7, 2019, letter on behalf of The Alliance of Automobile Manufacturers, the Association of Global Automakers, General Motors LLC, Ford Motor Company, Jaguar Land Rover North America, Daimler North America Corporation, Mitsubishi Motors R&D of America, American Honda Motor Company Inc., Kia Motors Corporation, and Hyundai Motor Company (collectively "Joint Automakers"):

In order to achieve Governor Cooper's goal of 80,000 zero emission vehicles (ZEVs) by 2025, it is extremely critical for North Carolina to expand transportation electrification infrastructure and consumer outreach efforts. The Joint Automakers are supportive of Duke Energy's Electric Transportation (ET) Pilots and believe they are a step in the right direction. North Carolina currently has fewer than 16,000 ZEVs, so there is no time to delay if the state intends to meet its goal of 80,000 ZEVs by 2025. Delaying approval of this application will only slow the state's response to the need for electrification infrastructure.

Currently, public charging infrastructure is lacking in North Carolina. There are a limited number of publicly accessible fast charging stations here, and the lack of this essential backbone infrastructure hinders EV adoption. A solid public perception that

public-access charging is available on a practical and meaningful level is necessary to spur EV adoption, especially at the level targeted in EO80.

As noted above, there is a “chicken and egg” component to this aspect of the transition to transportation electrification. Currently there isn’t a business case for private investors to profitably deploy publicly accessible charging infrastructure. Duke’s proposed investment will spur competition in the publicly accessible charging infrastructure market by “seeding” the pace of EV adoption. Put simply, increasing the number of electric vehicles on the road in North Carolina will create more demand for EV infrastructure. Supply will respond to demand when it can do so profitably.

Utility investment in public charging infrastructure is consistent with the EO80’s clear goal of increasing the number of ZEVs on the road in North Carolina. Moreover, the Companies’ proposed investment in fast chargers is at a level appropriate to a pilot program and strikes an appropriate balance: it deploys enough foundational charging infrastructure to spur EV adoption and thereby grow the market, without deploying so much that the Companies would effectively dominate the market. Indeed, as noted above, the Companies’ limited investment proposed in public charging infrastructure is expected to grow the market and enable greater competition. We conclude that, for the reasons cited above, utility investment in this foundational infrastructure is appropriate and necessary, given the current state of the market and its failure to provide sufficient public-access charging infrastructure. Proliferation of public charging stations will help mitigate “range anxiety” and will, over time, increase EV adoption. Utility ownership and operation of such facilities, with reasonable provision for cost recovery, is appropriate given the current

lack of a business case to support deployment of publicly accessible charging infrastructure.

#### **EVIDENCE AND CONCLUSIONS SUPPORTING FINDING OF FACT NO. 6**

The various components of the Pilot Program align with state policy goals beyond EO80, as the Pilot Program's component parts (1) will reduce air pollution and help achieve emissions targets per EO80; (2) will support DEQ's Energy Policy Council's recommendation that the state adopt, measure and implement programs that promote EV adoption; and (3) will support North Carolina's national commitments, including to the US Climate Alliance.

As noted in Siemens letter of November 20, 2019, addressing the Public Staff's

Comments opposing the Pilot Program:

EVs also offer important benefits (or can impose additional costs) to the electricity grid, wholesale electricity markets, and integration of both centralized and distributed renewable generation. For the grid, EVs can provide peaking capacity and, thus, act as a non-wires alternative to traditional grid reinforcement when there is a need for additional capacity. For wholesale markets, EVs can provide peaking capacity and ancillary services such as imbalance energy. For renewable generation, EVs can reduce curtailments by using wind and solar energy at times of abundance (overgeneration). We refer to these as the full value stack of EV benefits.

The Pilot Program is in the public interest as it will help meet a need that is not being met by the private EV charging market, will support the development of the private EV charging market, will promote adoption of EVs, will meaningfully increase charging options for EV drivers, and will pilot a diverse portfolio of load management strategies.

The Pilot Program can also help promote successful integration of electric vehicles into the grid and set the foundation for realizing the full potential of vehicle electrification. Given the potential benefit in terms of both acquiring data regarding consumer behavior

regarding adoption and use of EVs, and in promoting the goal of increasing EV adoption, the Pilot Program is in the public interest and it is appropriate for Duke to move forward with it.

The Pilot Program's components will allow for the optimization of grid assets, which will apply downward pressure on rates, and will allow all ratepayers to benefit. In addition to consumer benefits, the Pilot Program will also help advance the adoption of zero emissions vehicles, which directly supports EO80.

As noted in Duke's Reply Comments, NCSEA and NCCEBA oppose the Pilot Program because their membership includes potential future market entrants who think that their businesses will benefit by excluding or limiting Duke's participation in this developing market. To the contrary, the Companies' efforts to develop a program that will support EV adoption across the state can benefit future potential market entrants by jumpstarting the market. As the market develops and barriers to EV adoption and ownership decrease, participation in the market can be expected to increase. NCCEBA's concern that the Pilot Program would be an inappropriate encroachment into a competitive market is misplaced because (1) to this point there has not been sufficient private investment in EV public charging infrastructure in North Carolina to obviate range anxiety and stimulate EV adoption, and (2) the Commission has the authority to monitor developments and take steps to assure that the Companies' participation in the market helps it develop fairly. (Duke Reply Comments p. 6).

The Public Staff also opposes the Pilot Program, even though in doing so it is at odds with the public policy directives clearly set forth in EO80. The Public Staff also bases

its views on its application of traditional ratemaking concepts which Duke describes as “ignor[ing] the realities of a changing environment.” (Duke Reply Comments p. 6).

With respect to the Public Staff’s concern that the “proposal contains no metrics or other standards for evaluating whether the programs are successful and appropriate to expand” the Commission notes that in large part the Pilot Program is designed to yield data that will provide insights as to adoption and usage of EVs, in both residential and commercial settings. Thus, the goal is not just to successfully advance EV adoption in the state, it is to increase the body of knowledge as to EV adoption and usage by residential and commercial users.

Such an effort to acquire learning is not susceptible to a metric for determining “success,” the success is in acquiring the new knowledge and information. The Companies committed in their Application to report full operational data and results from the Pilot Program to the Commission on an annual basis. Because the Commission can impose adequate reporting requirements, we are not persuaded that this concern is sufficient to reject the Pilot Program.

We also recognize the merit of Duke’s point that the gathering of data to determine and assign costs is not available to the Companies without first conducting the Pilot Program, and that for this reason the Companies have proposed a pilot instead of simply forging ahead with one or more EV programs.

The Public Staff appears to oppose the Pilot Program in large part because it believes that it is inappropriately designated as a pilot project. While we are not unmindful of the concerns expressed by the Public Staff, we conclude that the better course here is to recognize that the Pilot Program is a multi-faceted exploratory initiative led by North

Carolina's two largest electric utilities that is clearly aligned with established North Carolina public policy. The Public Staff, which represents the using and consuming public, is concerned about the customer impacts of the proposal, and rightfully so. However, in a situation such as this, when a new and transformative technology has been introduced, which holds the potential to benefit all North Carolinians in one or more ways, we believe that a longer view is appropriate.

Virtually all commenters recognize that transportation electrification stands to provide a host of benefits to North Carolina and its citizens. While there is argument as to the nature and extent of specific benefits, transportation electrification clearly holds the potential for significant public benefits. These can include economic development, cost savings, environmental, human health, energy security, and grid resiliency benefits. Collectively, commenters recognize that transportation electrification represents perhaps the single greatest opportunity to increase and optimize the utilization of the electric grid to the benefit of all ratepayers, while also delivering significant economic development and cost savings benefit to the state.

As pointed out by the Natural Resources Defense Council, “[t]ransportation electrification is an important strategy to reduce greenhouse gas emissions, mitigate the effects of climate change, improve air quality, and improve North Carolinians’ health. Additionally, transportation electrification can reduce vehicle fueling and maintenance expenditures, as well as optimize the operation of the electrical grid, to the benefit of all North Carolinians. Active utility transportation electrification programs, such as those proposed in the DEP and DEC dockets, will help to ensure successful integration of electric

vehicles into the grid and set the foundation to realize the full potential of vehicle electrification.” (Letter dated December 20, 2019).

We can see how EV adoption can benefit all utility ratepayers, even those who don’t drive EVs. EV adoption increases load, which spreads out fixed system and operating costs across increased power sales and applies downward pressure on rates for all ratepayers. The proposed components of the Pilot Program are effectively designed to support consumers in realizing the benefits of EV adoption, efficiently integrate EV load into the grid, and reduce persistent barriers to EV adoption. Additionally, we conclude that the proposed Pilot Program is a reasonable step for provision of critically needed backbone infrastructure necessary to support attainment of clearly articulated state policy goals, support economic development, and will be in the public interest.

If one looks only at the cost savings benefits from reduced electric bills and reduced vehicle operating costs, it is projected that by 2050 North Carolina will realize cumulative net benefits from transportation electrification that will exceed \$6.9 billion statewide under a moderate EV adoption trajectory assumed by the U.S. Energy Information Administration.<sup>2</sup> This figure increases to \$66.1 billion under an EV adoption trajectory that reduces light-duty greenhouse gas emissions by 70-80% from 2018 levels by 2050.<sup>3</sup>

These figures help illustrate the extent to which transportation electrification presents an excellent opportunity to increase and optimize the utilization of the electric grid to the benefit of all ratepayers, while also delivering significant cost savings benefit to this state. These benefits will not be realized without effort and investment. Duke’s proposal

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<sup>2</sup> MJB&A, “Plug-in Electric Vehicle Cost-Benefit Analysis: North Carolina”, June 2018, p. ii-iii. Available at: <https://mjbradley.com/sites/default/files/NC%20PEV%20CB%20Analysis%20FINAL.pdf>

<sup>3</sup> *Id.*

is in the public interest as it addresses significant barriers to widespread transportation electrification in North Carolina, including a lack of publicly accessible charging infrastructure, a lack of consumer awareness, and high upfront infrastructure costs.

NOW, THEREFORE, based on the foregoing, the Commission finds and concludes that the Companies' proposed Pilot Program serves the public interest to a sufficient extent that it should be approved as filed.

ISSUED BY ORDER OF THE COMMISSION

This the \_\_\_\_\_ day of \_\_\_\_\_, 2020.

NORTH CAROLINA UTILITIES COMMISSION

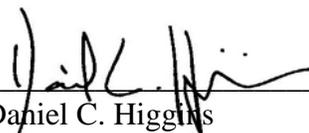
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Kimberley A. Campbell, Chief Clerk

**CERTIFICATE OF SERVICE**

I hereby certify that a true and exact copy of the foregoing document, has been served on all counsel of record for all parties in this docket, by either depositing same in a depository of the United States Postal Service, first-class postage prepaid and mailed by the means specified below, or by electronic delivery.

This the 28<sup>th</sup> day of February, 2020.

BURNS, DAY & PRESNELL, P.A.



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