

**STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH**

DOCKET NO. E-7, SUB 1115
DOCKET NO. E-100, SUB 147
DOCKET NO. E-100, SUB 153

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1115)	
)	
In the Matter of)	
Application of Duke Energy Carolinas, LLC,)	
for Approval of Advanced Metering)	
Infrastructure Opt-Out Tariff)	
)	ORDER APPROVING MANUALLY
DOCKET NO. E-100, SUB 147)	READ METER RIDER WITH
)	MODIFICATIONS AND
In the Matter of)	REQUESTING METER-RELATED
2016 Biennial Integrated Resource Plans and)	INFORMATION
Related 2016 REPS Compliance Plans)	
)	
DOCKET NO. E-100, SUB 153)	
)	
In the Matter of)	
Commission Rules Related to Electric)	
Metering)	

BY THE COMMISSION: On July 29, 2016, Duke Energy Carolinas, LLC (DEC or the Company), filed an application for approval of charges to be paid by DEC customers who choose not to have DEC install Advanced Metering Infrastructure meters (AMI or smart meters) to measure their electric service. At that time, DEC stated that it had deployed smart meters to about 25% of its customers in North Carolina and South Carolina and was engaged in ongoing projects to install smart meters to serve more customers. DEC noted that some customers had expressed concerns about having a smart meter installed at their premises. DEC stated that it was filing its Manually Read Meter Rider (Rider MRM or Smart Meter Opt-Out Tariff) in an attempt to respond to those concerns. Under DEC's proposal, opt-out customers would receive a smart meter with its communications disabled, and DEC would read the meter manually by visiting the customers' premises. DEC proposed that, under its opt-out tariff, participating customers would be charged an initial set-up fee of \$150, and a monthly fee of \$11.75.

On August 11, 2016, the Commission issued an Order Requesting Comments and Additional Information Regarding Proposed Smart Meter Opt-Out Charges. That Order required DEC to provide verified responses to questions about DEC's proposed tariff, its

smart meter deployment plans, and the loss of meter functionality when time-of-use customers are served via a smart meter. That Order also established a schedule for the filing of reply comments.

On August 23, 2016, the North Carolina Sustainable Energy Association (NCSEA) filed a petition to intervene, which petition the Commission granted by order dated August 25, 2016.

August 11, 2016 Order – DEC’s Response

On September 19, 2016, DEC filed public and confidential verified responses to the questions posed in the Commission’s August 11, 2016 Order. On September 22, 2016, DEC filed a revised response correcting administrative errors in its September 19, 2016 submittal. In its response, DEC reiterated that the tariff charges it proposes are “cost-based and represent the incremental costs identified that should be assigned to participating customers....” In response to the question of whether DEC would consider spreading some or all of the costs of smart meter opt-outs among all residential customers, DEC stated:

No, the costs to offer a smart meter opt-out should be assigned to those customers choosing to participate. By choosing to opt-out of a smart meter, many of the cost savings opportunities from smart meters are not recognized, and additional costs are incurred. All residential customers should not have to pay for the very small minority of customers choosing to opt-out.

The Commission asked DEC to provide a comparison of how DEC’s proposed opt-out tariff charges compare to those that have been approved for use by utilities in other states. DEC provided a spreadsheet showing the opt-out charges of 33 utilities. They showed up-front charges ranging from \$20 to \$167, and monthly fees ranging from \$5 to \$45. The spreadsheet also indicated that the State of Vermont had passed legislation forbidding opt-out fees, while the State of Pennsylvania had passed legislation requiring the installation of smart meters and precluding opt outs altogether.

The Commission requested that DEC respond to the concerns expressed by some members of the public regarding the Company’s smart meter installations. DEC stated that the primary concerns were with the health impacts of radio frequency (RF) emissions and the privacy aspects of the smart meter’s ability to capture granular usage data. DEC stated that its metering hardware complies with all applicable Federal Communications Commission (FCC) rules and guidelines, and that “nearly every household device that is powered by electricity emits RF electromagnetic frequencies in some amount.”

Smart meters emit a fraction of the types of RF emissions that come from cellular phones, microwave ovens, and many other household devices in use today. The drive-by meters that have been installed for over a decade in DEC territory also transmit using radios on the same frequency with a similar powered radio as the smart meters.

In terms of consumer concerns with privacy, DEC stated:

The Company abides by very strict standards of data privacy, and the only thing that has changed is the amount of data coming from the smart meters. DEC does not intend to force all customers onto time-of-use rates, nor does it intend to release any customer usage data without their specific written consent.

...

In response to all of these concerns, DEC is offering the Manually Read Meter option [the proposed Smart Meter Opt-Out Tariff] whereby energy usage would not be communicated via RF, and the meter provided to the customer would be manually read by a meter reader visiting the premises.

The Commission required DEC to respond to concerns expressed by time-of-use customers who asserted that they had lost functionality or ease of access to meter data when DEC changed them to a smart meter. DEC responded that through the AMI deployment DEC had delivered the capability for customers to view all of the relevant usage data through an online customer web portal. DEC stated further that it planned to remove meter displays that are not used in determining the customer's bill "so as not to display conflicting information."

The Commission asked DEC how many customers the Company had allowed to opt out of smart meters, and DEC responded that it had not allowed any customers to opt out. Rather, it had "temporarily bypassed" 549 customers who had unresolved concerns with the meter deployment.

The Commission also inquired of DEC whether it would be feasible to place a smart meter opt-out customer on DEC's Equal Payment Plan (EPP) with an annual true up and have the meter read manually once or twice a year. DEC responded that this option would be problematic for a variety of reasons. DEC stated:

[T]here would be no way for customers or DEC to identify if there are equipment malfunctions [T]he rate designed from some schedules have blocks and seasonal differentials, so it would be nearly impossible to ensure that the customer would be billed appropriately if the meter was only read every six months. ... Additionally, there would be implications for the delinquency process. ... Finally, the Company has attempted to offer self-reading options in the past that were unsuccessful. Customers would forget to submit readings, which would generate estimated bills and field work orders to read the meters.

In summary, DEC would have to create an entirely new EPP to attempt to address the issues outlined above, which would easily surpass the proposed tariff costs in IT work for the Customer Billing System alone.

DEC concurred that it is feasible to relocate a customer's meter to a different location on their property and stated that the Company has offered this option to customers who are concerned about smart meters. In this case, the customer must hire an electrician to relocate the meter base. DEC places the smart meter on the relocated meter base, and the customer's electrician then attaches the wiring from the meter base to the premise. Similarly, DEC has a Remote Meter Reading and Usage Data Service tariff via which consumers can have their meter read remotely via a telephone line. This involves a monthly charge of \$45 for a dedicated land-line. However, DEC stated that it is working to discontinue this tariff due to the declining inventory of land-line meters.

As required by the Commission, DEC provided copies of the communications materials that it gives to customers during its AMI deployment. DEC stated that once Rider MRM is approved by the Commission, DEC will contact all of the customers who were previously by-passed and inform them of the opt-out option. Going forward, DEC will inform customers who have not yet received smart meters of the manually-read meter option. DEC reiterated that it is transitioning to the smart meter as the standard meter across the Carolinas, and that for customers who are concerned about RF emissions, "the only way to adequately address these RF concerns is to provide customers with a non-communicating manually-read meter." DEC stated that the smart meter hardware it is deploying has a useful life of about 15 years.

Intervenors' Comments

On October 24, 2016, NCSEA filed comments in which it stated that it does not challenge DEC's proposed fees for tariff participants. NCSEA stated further that it is interested in AMI due to the energy efficiency options that it enables. NCSEA posed a variety of questions about DEC's potential obligation to provide customers with usage data from AMI meters, and concluded with the following statement:

As the Commission considers the costs and benefits of AMI in this and other dockets, NCSEA respectfully requests that the Commission also consider whether its current Rules enable the full potential of the benefits that can be afforded by AMI.

The Public Staff also filed comments on October 24, 2016. The Public Staff stated that it supports the availability of an AMI opt-out policy and believes that it is appropriate for DEC to recover the incremental costs of implementing such a policy through a one-time enrollment fee and an ongoing monthly fee. The Public Staff stated that it generally agreed that DEC's proposed fees are cost-based and accurate, but that it would be appropriate to revisit those costs, as well as DEC's estimated opt-out participation rate of 0.1%, in DEC's next general rate case or within five years. The Public Staff also recommended that DEC be required to file quarterly reports of the number of customers who receive an AMI meter and the number who opt out.

The Public Staff recommended that DEC's proposed tariff be modified so that:

- (1) An opt-out customer who starts service at a premise where the previous customer had also opted out would not have to incur the one-time setup fee;
- (2) Opt-out customers can make payment arrangements, over time, for the tariff's one-time set up fee; and
- (3) Customers who have had an AMI meter installed, but then were charged \$50 to have it removed, should have that \$50 credited toward the one-time set up fee.

The Public Staff stated that DEC's proposed tariff would only be available to those small general service customers who use fewer than 3,000 kilowatt-hours per month and have a maximum demand of less than 15 kilowatts. The Public Staff stated that it would be more appropriate to eliminate the energy and demand thresholds and limit the rider to customers who take service under a rate schedule that does not require a demand meter or differentiate energy charged between on- and off-peak periods.

The Commission had inquired as to whether the DEC Equal Payment Plan, self-reading options, or dedicated phone lines could address some of the concerns that consumers had raised with DEC's proposal. The Public Staff generally concurred with DEC that these options could be impractical and could result in additional costs. The Public Staff recommended that DEC update the metering portion of its website to provide information about the tariff and easy access to DEC staff who can address customer concerns with smart meters.

The Public Staff stated that it did not agree with DEC's proposed solution to the loss of functionality or ease of access to usage data that had been experienced by time-of-use (TOU) customers when they were transitioned to an AMI meter. The Public Staff recommended that the Commission require DEC to take steps to ensure that each installed AMI meter displays basic real-time information consistent with the customer's rate schedule.

The Public Staff noted that the question of cost recovery for DEC's AMI deployment had not yet been brought before the Commission in a general rate case, and that the Public Staff's comments in this tariff proceeding "are not necessarily reflective of what will be the Public Staff's position in a future proceeding when the issue of [whether] DEC's AMI deployment is reasonable, prudent, and cost-effective is ripe for adjudication."

The Public Staff stated that it supports a generic proceeding where the rules associated with metering and billing for electric service can be reviewed and revised, stating that current rules predate many of today's metering and billing technologies:

The current rules do not reflect the current metering paradigm, nor do they adequately address the engineering and design standards that are used to build, test, and deploy electric meters.

Finally, the Public Staff recognized the health concerns raised by numerous consumers in this docket, as well as in Docket No. E-100, Sub 141. The Public Staff stated that it "believes that these types of concerns are more appropriately regulated through the Federal Communications Commission (FCC) DEC's metering hardware complies with all applicable FCC requirements and its RF emissions are a fraction of the types of RF that are emitted by many other household devices in use today."

In addition, the Public Staff notes that the majority of the customers who have been bypassed have been served for over a decade with an AMR [automated meter reading] or "drive-by" meter, which uses RF transmission similar to that used by AMI meters. The Public Staff is not aware of complaints from DEC customers regarding concerns or health-related issues as a result of their AMR or drive-by meters.

Reply Comments

On November 28, 2016, DEC filed reply comments in which it responded to the Public Staff's concerns. DEC stated that it does not object to revisiting its proposed opt-out charges within five years or in a future rate case. DEC said it would prefer to include opt-out statistics in its annual Smart Grid Technology Plan filing, rather than filing separate quarterly reports as the Public Staff had suggested. As to the Public Staff's suggestion that an opt-out customer who starts service at a premise where the previous customer had also opted out should not have to incur the one-time setup fee, DEC disagreed and stated that this approach would cause DEC to incur additional costs (unless the new customer elected the opt-out tariff prior to the final billing of the previous customer). DEC stated that it does not object to working with customers on a case-by-case basis to set up payment arrangements for the Rider's one-time set-up fee. DEC agreed to provide updated information about smart meters on its website, including information about the Rider, once it is finalized.

As to the Public Staff's suggestion to limit application of Rider MRM to customers who are under a rate schedule that does not require a demand meter or differentiate energy charges between on- and off-peak periods, DEC stated that it does not object to this change, but that it would limit participation to a smaller group of customers.

For by-passed customers who were charged \$50 to revert to an AMR meter, DEC disagreed with the Public Staff and stated that crediting that \$50 fee toward the one-time setup fee under Rider MRM would result in a subsidy from other customers. Similarly,

DEC opposed the Public Staff's recommendation that DEC allow customers who were by-passed to continue to receive service using their current meter for the remainder of the meter's useful life. DEC stated that, "Continuing to offer an older meter technology for a few customers would unduly burden the Company with respect to having to maintain, test and continue to support unique meters for only a few customers."

DEC stated that for customers who were by-passed where the majority of meters in their area have already been exchanged with an AMI meter, the Company will require those customers to either receive a communicating AMI meter, or elect to participate in Rider MRM with a non-communicating meter, once the tariff is approved.

In terms of the loss of meter data, DEC clarified that this is "only an issue for customers on a TOU rate or other non-kilowatt-hour based rate schedule who choose to read their billing determinants from the meter instead of via the customer web portal." DEC agreed to investigate a comprehensive solution and report to the Public Staff by the end of April 2017. DEC stated further that the Company had identified a potential manual workaround, but that it might require impacted customers to change to a common billing cycle.

DEC stated that it does not object to a separate proceeding where the Commission's rules for metering and billing electric service could be revised to accommodate industry changes.

April 28, 2017 Order – DEC's Related Filings

On April 28, 2017, the Commission issued an Order Requiring Further Study and Additional Information in which it:

- (1) Held in abeyance a decision on Rider MRM until DEC informed the Commission, as required by the Smart Grid Technology Plan Order it had issued on March 29, 2017, in Docket No. E-100, Sub 147, that DEC intended to move forward with the deployment of smart meters;
- (2) Required DEC to work with the Public Staff to design three alternatives to Rider MRM and report back to the Commission by July 1, 2017;
- (3) Required DEC to respond to additional questions by July 1, 2017; and
- (4) Required DEC within 30 days to file a report detailing the real-time electric usage information that was available at the meter and thermostat to TOU customers using AMR meters compared to the real-time electric usage information that is available at the meter and thermostat to TOU customers using a smart meter.

On May 5, 2017, DEC filed Supplemental Information for its 2016 Smart Grid Technology Plan in Docket No. E-100, Sub 147. In that submittal, DEC stated that the

Company had completed its AMI deployment evaluation and had made the decision in late 2016 to begin a full-scale smart meter deployment in North Carolina. The Company stated that it had begun implementing that deployment in early 2017. DEC supplemented its 2016 Smart Grid Technology Plan consistent with those decisions.

On May 30, 2017, DEC filed the required information about real-time electric usage information that is available to TOU customers. In addition, DEC stated that when TOU customers initially received an AMI meter, they did not see holidays accurately reflected on the meter as being off-peak days, and the on-peak demand register was not re-set with each billing cycle. In addition, DEC stated that, for a subset of TOU customers, the rate indicator stopped flashing during on-peak periods. DEC stated that, due to concerns from TOU customers, the Company had taken steps to ensure that all billing determinants are updated at the beginning of each season. The Company also implemented a manual process to ensure that each TOU meter's on-peak demand register is reset following each billing cycle. DEC stated that it plans to automate this demand reset effort in late 2017.

On June 30, 2017, DEC filed the additional information required by the Commission's April 28, 2017 Order. Among other things, DEC filed information about the health impacts of the RF energy produced by smart meters. This included information from the Smart Grid Consumer Collaborative, which stated:

In-depth review of the scientific literature by the World Health Organization (WHO) revealed that the small amount of radio frequency (RF) energy produced by smart meters is not harmful to human health.

...

RF emitted by smart meters is well below the limits set by [the] Federal Communications Commission and it is below levels produced by other common household devices like cell phones, baby monitors, satellite TVs and microwaves. In fact, you would have to be exposed to the RF from a smart meter for 375 years to get a dose equivalent to that of one year of 15-minutes-per-day cell phone use.

...

In fact, an Electric Power Research Institute (EPRI) analysis of 47,000 smart meters installed in southern California found that 99.5% of the meters were transmitting for approximately three minutes or less daily.

DEC also submitted an August 24, 2015 report entitled Health Impacts of Advanced Metering Systems (Smart Meters) by the N.C. Department of Health and Human Services,

Division of Public Health, Occupational and Environmental Epidemiology Branch (DHHS Report). That report concluded:

There are few studies available on the health effects of RF exposures from smart meters. However, the potential health effects associated with RF exposures from cellphone use have been studied extensively. The [four-member review] team concluded the current Federal Communication Commission (FCC) guidelines protect the public from the thermal health effects related to RF exposure.... Non-thermal health concerns evaluated included cancer, reproductive effects, cellular effects, neurological behavioral effects, and electromagnetic sensitivity. There is insufficient evidence to link RF exposures to adverse health outcomes.

To support its findings, the DHHS Report included statements and citations from Lawrence Berkeley National Laboratory, the American Cancer Society, the Centers for Disease Control and Prevention, the FCC, the Food and Drug Administration, the International Agency for Research on Cancer Working Group, and the National Institute of Environmental Health Sciences. The DHHS Report included a 2013 National Cancer Institute list of ongoing research on the health impacts from RF, as well as a list of “study limitations,” to explain why it is difficult for scientists to definitively address the question of biological impacts of RF exposure.

August 21, 2017 Order – DEC’s and Public Staff’s Related Filings

On August 21, 2017, the Commission issued an Order Requiring Smart Meter Plan Presentation By Duke Energy Carolinas, LLC, in Docket No. E-100, Sub 147. That Order required DEC to appear before the Commission and address specific questions about DEC’s decision to deploy AMI meters. Also on August 21, 2017, the Commission issued an Order Requiring Additional Information in Docket No. E-7, Sub 1115 based on its review of the information DEC had filed on June 30, 2017.

On September 8, 2017, the Company filed the information required by the Commission’s August 21, 2017 Order. On September 28, 2017, the Public Staff filed comments in response to the Company’s September 8, 2017 submittal. In summary, the Public Staff stated that it believes that the Company’s proposal to provide opt-out customers a smart meter, with its communication capabilities fully disabled, remains the “most practical and reasonable” means of addressing the concerns of those customers who wish to opt out of a smart meter.

On October 6, 2017, DEC submitted written responses to the Commission’s questions in Docket No. E-100, Sub 147, and on October 10, 2017, DEC appeared before the Commission as requested.

November 20, 2017 Order – DEC’s Related Filings

On November 20, 2017, the Commission issued an Order Requiring Additional Information in which it required DEC to provide verified responses to questions that were prompted by DEC’s October 10, 2017 presentation. DEC filed those responses on December 15, 2017. As requested, DEC provided additional information about the “cellular direct connect meter” option that it is using in rural areas where it is not feasible or economical to install AMI using the RF mesh technology. DEC stated that when its AMI deployment is complete, an estimated 45,371 customers will be served via the cellular direct connect meter option. DEC filed confidential information confirming that these meters cost more than a standard AMI meter, and stated that “DEC is not proposing separate fees to charge customers served by a cellular direct connect meter due to the RF mesh not being available at a customer location.”

On December 20, 2017, DEC filed a supplemental report regarding real-time electric usage information for AMR and smart meters in order to update the Commission as to the status of issues affecting TOU customers who had been given smart meters. DEC stated that it had completed and released into production new functionality to automatically reset the demand on these meters once a month. DEC stated that there remains another outstanding issue where the rate indicator light stops flashing on the meter display during on-peak periods. DEC stated that it had been working with the meter vendor, but that testing in the vendor’s lab had not yet led to a technical fix. DEC stated that additional tests are planned for January of 2018 in order to confirm the root cause of the problem and develop a solution.

Customer Statements of Position on Proposed Rider MRM

The Commission received about 130 customer statements of position in Docket No. E-7, Sub 1115. Nine of the statements appeared to be from Duke Energy customers who reside in other states.

All but one of the commenters opposed DEC’s proposed smart meter opt-out rider and/or DEC’s smart meter deployment in its totality. The vast majority of commenters stated that it is not fair to charge a fee for opting out of a technology when that technology poses a threat to the customer’s health, safety, and/or privacy. More than half of the commenters stated that AMI meters emit RF radiation that is dangerous to human health, and harmful to plants and animals as well. (Several expressed similar concerns with AMR meters.) About a third of the commenters cited scientific experts, and many provided articles, citations, and website links, ostensibly demonstrating the potential harm being caused by RF emissions. For example, many people stated that the World Health Organization has classified smart meters as a “class 2b carcinogen.” About a dozen people stated that the FCC’s safety standards are inadequate to address RF emission risks because the standards only address the thermal, not the biological, impacts of RF emissions. Given the increasing number of RF emission sources in our environment, they state that the FCC’s standards are inadequate and obsolete. More than a dozen individuals, including a physician, stated that they have personally experienced debilitating health impacts from the

cumulative impact of RF emissions from technologies including wi-fi (wireless local area networking) systems, cell phones, and smart meters. They described a condition called electro-hypersensitivity, in which certain individuals experience a myriad of symptoms due to exposure to RF emissions. Commenters who said they suffer from this affliction described the steps they have taken to limit their exposure to RF emissions, including avoiding cell phones and wi-fi systems. A few went so far as to assert that RF emissions from smart meters contribute to violence and homicides. Many commenters stated that the Commission has a duty to protect the health of DEC's customers, and, thus, the Commission should deny DEC's request to charge customers who want to opt out of a smart meter.

The Commission received a statement from David Carpenter, MD, who is Director of the Institute for Health and the Environment at the University at Albany in Rensselaer, New York. The letter was co-signed by four other scientists and doctors, and was cited by many public commenters as providing proof that smart meters are a risk to human health. Among other things, Dr. Carpenter's letter stated:

The majority of the scientific literature related to RFR [radiofrequency radiation] stems from cell phone studies.

...

Smart meters and cell phones occupy similar frequency bands of the electromagnetic spectrum, meaning that cell phone research can apply to smart meter RFR.

...

While the strongest evidence for hazards coming from RFR is for cancer, there is a growing body of evidence that some people develop a condition called electrohypersensitivity (EHS). These individuals respond to being in the presence of RFR with a variety of symptoms, including headache, fatigue, memory loss, ringing in the ears.... Some reports indicate that up to three percent of the population may develop these symptoms, and that exposure to smart meters is a trigger for development of EHS.

About a dozen people stated that DEC is not communicating the truth to its customers about health risks posed by smart meters. Several commenters were aware of the 2015 DHHS Report submitted by DEC and alleged that the report was biased, that it was prepared by people who lack the required expertise, and that its drafters were inappropriately influenced by DEC. Several commenters noted that in March of 2018, scientists reviewing a study by the National Toxicology Program (for the U.S. Food and Drug Administration) found that RF waves can be decisively linked to cancer in rats.

Many people referenced DEC's handling of coal ash as indicating that the Company cannot be trusted, stating that the Company is focused on saving money rather

than on protecting its customers. About a dozen people expressed concern that smart meters present a risk of fires, interfere with pacemakers, present national security risks, and have the potential to cause power outages. Some stated that smart meters are poorly designed, making them vulnerable to lightning strikes and likely to cause power quality problems for customers. Several people asserted that smart meters could not meet Underwriters Laboratories, Inc. (UL), standards, which necessitated the establishment of a special certification for smart meters.

Several commenters were aware that DEC had received federal grants to partially cover the cost of the Company's smart meter deployments. They stated that it was unfair that they should have to subsidize these meters multiple times, first via their taxes, second via their utility bills, and finally to have to pay the proposed opt-out fee to avoid having a smart meter installed at their home.

About a third of the commenters opposed smart meters because of privacy concerns. Some stated that, in their opinions, the meters constitute a form of trespass or surveillance that requires informed consent (which consent they refuse to grant). Several people expressed concern that smart meters would allow DEC to control their appliances, to monitor their behavior, and to sell their personal data. Several others opposed smart meters due to cyber security concerns. Some people expressed concern that smart meters have a much shorter useful life than analog meters, and that they contain batteries and modems that must be replaced. About a dozen stated a strong preference for analog meters, with a phone line for communication, as the only option that is accurate and safe. Several commenters mistakenly believe that DEC still uses analog meters, and they expressed a strong desire to retain their analog meter.

One commenter said that DEC is using its smart meter deployment as a partial explanation for its need to increase rates, but that DEC's rate request fails to mention the \$1 billion in benefits the Company will receive. Several people stated that there is no proof that smart meters will save money for customers. Another noted that DEC charges all customers for its internet billing service, even though that service only benefits those customers who choose to participate. They asserted that the costs of opting out of a smart meter are excessive and should similarly be spread to all customers.

About a dozen commenters argued that the Energy Policy Act of 2005 does not require the installation of smart meters. Several individuals stated that DEC had installed smart meters at their homes without prior communication or permission, sometimes when the customer was not at home.

One commenter expressed concern that, due to his home's rural location, DEC might want to install a cellular direct connect meter at his home. He sought clarification as to whether that would still be a digital meter, which he opposed. One commenter opposed DEC's proposed opt-out solution, saying it would not be possible to know for sure that DEC had disabled the meter's communications.

One commenter asked that the Commission hold a public hearing on DEC's opt-out proposal, and also asked the Commission to consider the public testimony and comments about smart meters from Docket No. E-100, Sub 141 (the 2015 Integrated Resource Planning docket).

One DEC customer who is on a TOU rate wrote multiple times to express concerns with his smart meter installation. He described numerous problems that he was experiencing including inaccurate displays and false data.

Several customers stated that their electric bills had increased markedly since receiving a smart meter. One stated that he had researched the issue and confirmed that, "Smart Meters record the spikes in usage and result in readings that are higher than with the previously used analog meters." This customer stated that DEC would thus collect more revenues than is appropriate unless the Commission adjusts DEC's rates.

One customer opposed DEC's opt-out proposal because it would require a DEC employee or contractor to enter the customer's home in order to read the meter. The customer's meter is located indoors, and the customer is concerned about home security.

Several commenters cited a recent decision by the New Mexico Public Regulation Commission which denied a local utility's application to install smart meters, which order purportedly stated that the utility's smart meter deployment plan "does not provide a net public benefit."

One customer stated that he had had a positive experience with his DEC smart meter. He related that for many years he had believed that his power bills were too high. With the hourly usage data provided by his new meter, he was able to identify the cause and take action to reduce his electricity consumption.

Discussion and Conclusions

After careful consideration, the Commission finds good cause to approve DEC's Rider MRM with modifications, as discussed below. As a preliminary matter, the Commission notes that DEC sought to recover costs associated with its smart meter deployment in its most recent general rate case, Docket No. E-7, Sub 1146, and the questions of whether DEC's smart meter deployment is prudent and necessary for serving customers and whether DEC should be allowed to recover its smart meter deployment costs from customers have been addressed in that case. However, the Commission believes it has enough information without holding a public hearing, as some commenters requested, to decide the questions before it in Docket No. E-7, Sub 1115: Whether DEC customers should be able to opt out of having a smart meter installed, and if so, under what terms.

No participant in this proceeding, including DEC, has asserted that customers should be precluded from opting out of having a smart meter installed. Therefore, the Commission concludes that customers should be able to opt out.

DEC asserted, and the Public Staff agreed, that those customers who opt out should pay the incremental cost of that decision. DEC demonstrated that its proposed charges of a one-time fee of \$150 followed by \$11.75 per month were based on reasonable estimates of its actual incremental costs. However, the Commission is not convinced that DEC's proposal for recovering those costs would be fair to those consumers who maintain that they must avoid to the extent possible exposure to RF emissions due to impacts on their health. DEC and the Public Staff correctly stated that the FCC, not the Commission, is the appropriate regulatory body to address the health impacts of RF emissions. The Commission is aware that the FCC's exposure guidelines were last updated in 1996 and that the FCC has had an open docket on the question of biological impacts from exposure to those radio frequency waves that fall in the range of 300 Hz to 100 GHz since 2013.¹ DEC's smart meters operate within that range, at 900 MHz; thus, the Company's decision to deploy smart meters was made in the context of this uncertain regulatory environment.

While DEC's smart meter technology meets current FCC standards, the Commission believes it is inappropriate to require customers who maintain that they need to avoid exposure to RF emissions to the extent possible to protect their health to pay DEC's proposed smart meter opt-out charges. Therefore, the Commission will require DEC to amend its Rider MRM to remove the customer charges for those customers who provide the Company with a notarized statement from a medical physician licensed by the North Carolina Medical Board that the customer must avoid exposure to RF emissions to the extent possible to protect their health. Upon receipt of such statement, the Company shall waive both the one-time and the monthly fees under Rider MRM. The Commission further requires that such medical statements must be handled and processed by the Company in a secure and confidential manner to protect customer privacy.

As proposed, DEC's \$150 one-time fee for initial set up includes costs for the meter exchange, route analysis, IT, and account and billing set up. The Public Staff reviewed DEC's cost estimate and found it to be reasonable. Nonetheless, the Commission believes it might be possible for this one-time charge to be reduced for customers located in areas where DEC has not yet begun its AMI deployment. DEC should explore the feasibility and cost of identifying opt-out customers early and providing them manually-read meters during the AMI deployment, and report back to the Commission as to whether the initial set-up fee could be reduced in those situations.

Regardless of whether it is possible to reduce the initial set-up fee, the Public Staff recommended, and DEC agreed, that the Company will work with customers on a case-by-case basis to establish payment arrangements for the initial set-up fee. The Commission will require DEC to modify its Rider MRM to explicitly state that such payment arrangements are available. For the reasons cited by DEC, however, the Commission will decline to adopt the other tariff modifications that the Public Staff proposed.

¹ See the FCC's website at <https://www.fcc.gov/general/radio-frequency-safety-0> for more information.

Finally, as regards both the initial set-up fee and the ongoing monthly charges, DEC shall file an analysis of the appropriateness of those charges by June 1, 2022, or in its next general rate case, whichever occurs first.

DEC's proposal to use smart meters with their communications disabled for those customers who want to opt out of having a smart meter is a reasonable one. It appropriately balances DEC's need for efficiency with some customers' desires to avoid being served via a communicating meter. Some commenters expressed a desire to be served via an analog meter, but DEC is not required to offer any and every metering option that some customers might prefer.

Some commenters state that smart meters represent an invasion of their privacy, with some going so far as to assert that the technology would constitute surveillance. In order to address this concern, the Commission will require DEC to annually file in its Smart Grid Technology Plan filing a verified statement by an officer of the Company providing a comprehensive list of all the ways DEC is using customer-related smart meter data, and the procedures DEC uses to keep that data secure and to protect customer privacy. The Commission requests that the Public Staff audit and provide comments on the Company's submittal.

Some commenters expressed concerns that smart meters have caused fires, power outages, interference with devices such as pacemakers, and inaccurate bills. Others stated that smart meters pose cyber security risks. While these concerns appear to be anecdotal, the Commission will require DEC to include in its annual Smart Grid Technology Plan filing a report detailing any such occurrences involving their model(s) of smart meters, and how the occurrences were resolved. This report should include information about cyber incidents, at DEC or elsewhere, involving its model(s) of smart meters. As suggested by the Public Staff and agreed to by DEC, the Company should also include in its annual Smart Grid Technology Plan filing information about the number of customers who choose to opt out of having a smart meter, with separate data for those who opt out for health reasons and for those who opt out for any other reason.

As stated earlier, one DEC customer commented that his smart meter offered less functionality and accuracy than his previous meter in the context of his service on a TOU tariff. Based on submittals from the Company, it is the Commission's understanding that DEC has largely resolved these problems. Nonetheless, DEC is to report on the status of these efforts by August 1, 2018.

Because it would limit availability of the opt-out rider to a smaller group of customers, the Commission rejects the Public Staff's recommendation to restrict the opt-out rider to customers who take service under a rate schedule that does not require a demand meter or differentiate energy charged between on- and off-peak periods.

Several public commenters asserted that DEC had installed a smart meter without prior notification. DEC should investigate those specific situations and report back to the Commission as soon as practicable, but no later than August 1, 2018.

In its August 21, 2017 Order Initiating Rulemaking Proceeding in Docket No. E-100, Sub 153, the Commission stated that there is good reason to believe its rules for the location, testing facilities, average error calculations, and accuracy of electric meters are no longer adequate and meaningful, given the migration away from mechanical meters to digital meters. The Commission, therefore, initiated a proceeding to review and revise its rules. However, at the request of the Public Staff, the Commission issued an Order on October 24, 2017, suspending the procedural schedule and holding the rulemaking docket in abeyance. In order to move this important work ahead, the Commission will require DEC to research the following questions and submit verified responses to the Commission by September 1, 2018, in Docket No. E-100, Sub 153:

- (1) For all States in which Duke Energy operates that have updated their meter accuracy and testing rules to accommodate AMI and/or AMR meters, provide copies of those regulations.
- (2) What protocols or processes does DEC currently use, before and after installation, to assure the accuracy of its smart meters at the time of installation and over time?
- (3) What protocols or processes have been recommended by the meter manufacturer in order to assure accuracy at the time of installation and over time?
- (4) What portions of the Commission's current metering rules are no longer relevant or should otherwise be revised?

The Commission will review the information submitted by DEC and then establish a further procedural schedule in that docket to update its meter-related rules.

IT IS, THEREFORE, ORDERED as follows:

1. That DEC shall re-file its proposed Rider MRM consistent with this Order on or before July 23, 2018, along with a proposed plan and schedule for implementing the Rider;
2. That DEC shall update the smart meter portion of its website to include information about Rider MRM;
3. That DEC shall report on the status of efforts to address problems with its smart meters relative to TOU tariff implementation on or before August 1, 2018;
4. That DEC shall include in its annual Smart Grid Technology Plan filing details of smart meter malfunctions or problems, data on the number of customers on Rider MRM, and a verified statement about its smart meter data privacy procedures, as discussed in this Order;

5. That DEC shall investigate public comments in this docket that state that the Company installed a smart meter without prior notification to the resident. The Company shall report back to the Commission as soon as practicable, but no later than August 1, 2018;

6. That DEC shall file in Docket No. E-100, Sub 153 the information in items (1)–(4) described herein on or before September 4, 2018; and

7. That DEC shall file an analysis of its Rider MRM charges on or before June 1, 2022, or in its next general rate case, whichever occurs first.

ISSUED BY ORDER OF THE COMMISSION.

This the 22nd day of June, 2018.

NORTH CAROLINA UTILITIES COMMISSION

A handwritten signature in black ink, appearing to read "Linnetta Threatt", with a long horizontal flourish extending to the right.

Linnetta Threatt, Deputy Clerk

Commissioners Daniel G. Clodfelter and Charlotte A. Mitchell did not participate in this decision.