

**STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH
DOCKET NO. E-100, SUB 161**

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of	)	
Commission Rules Related to Electric	)	SUPPLEMENTAL COMMENTS OF
Customer Billing Data	)	THE ATTORNEY GENERAL'S
	)	OFFICE

The North Carolina Attorney General's Office (AGO) respectfully submits these Supplemental Comments concerning proposed rules that address electric customer access to detailed billing data and customer privacy. Two years ago, the AGO and other parties filed extensive comments and proposed rules in this matter. At the time, Duke Energy Carolinas (DEC) and Duke Energy Progress (DEP, and collectively with DEC, Duke) were in the process of installing advanced meter infrastructure (also called AMI or smart meters) throughout their service areas and were implementing Customer Connect, a new customer billing and information system. Now that Duke has completed the infrastructure installations and transitioned its legacy customer account data to the new billing system, the Commission has directed Duke, Dominion Energy North Carolina (DENC),¹ and the Public Staff to explain the impact of these developments on earlier comments

¹ DENC is at an early stage of installing smart meters and implementing a new customer information platform, and these comments will focus primarily on Duke. In response to AGO DR2-2, Dominion stated that it is developing plans to deploy smart meters for all North Carolina customers and has installed only approximately 5,000 so far.

submitted in the docket, and to address related matters. Other parties are also permitted to file supplemental comments.

By these supplemental comments, the AGO will provide an update on the adoption of Green Button Connect or a similar standard for access to data by customers and authorized third parties. In addition, the AGO will recommend an important modification to the proposed rule submitted in 2020 concerning limits on the disclosure of aggregated customer data and a related safe harbor.² Other than as described in these supplemental comments and revised proposed rule, the AGO's comments remain unchanged from the 2020 filings.

I. Update on Green Button Connect or a like standard

Electric customers should be able to realize the full benefits of their smart meters, as promised when Duke began installing advanced meter infrastructure throughout North Carolina. In DEC's 2017 general rate case, Duke's witness testified that the value of smart meters is a foundational investment that enables additional customer choice, convenience and control.³ Consistent with that promise, now that smart meters are installed and Customer Connect is implemented, customers should be able to make use of their data, and not only through energy-saving programs offered by their utility, but also by exercising their choice to make use of innovative applications offered by authorized third parties.

² See Attachment 1, Revised AGO Proposed Rule.

³ Order Accepting Stipulation, Deciding Contested Issues, and Requiring Revenue Reduction in Docket No. E-7, Sub 1146, Jun 22, 2018 (DEC 2017 Rate Order) at 117.

To that end, the rule proposed by the AGO and most parties in this matter require electric utilities to maintain data and make it available to customers and customer-authorized third parties in an electronic machine-readable format that conforms to nationally-recognized standards and best practices described in NAESB Req.21, such as the approved Green Button Connect My Data standard.⁴ The reason for the requirement is to offer the ease of portability and interoperability available under national standards that apply best practices, which will result in more options available to customers.⁵

Duke opposes this proposed requirement and has not complied with it voluntarily in the plan it has implemented so far. Instead, Duke offers a non-standard functionality called *My Duke Data Download* that imposes an access regime unique to Duke. It is modeled on an older national standard called Green Button Download.⁶ Whereas Green Button Connect would provide data automatically to authorized third parties, Duke's approach does not offer comparable functionality.⁷ Instead, customers must download their data themselves and share it with third parties. Because the system will not be interoperable, Duke's approach discourages developers who would need to design

⁴ See Attorney General's Office Proposed Rule R8-51(f)(1) and Initial Comments in Docket No. E-100, Sub 161, Feb. 10, 2020 (Feb. 10, 2020 AGO Comments) at 4; Reply Comments of the Attorney General's Office, Jul 17, 2020 (AGO Reply) at 1, 14-19.

⁵ Id.

⁶ Initial Joint Comments of Duke Energy Carolinas, LLC and Duke Energy Progress, LLC, Docket No. E-100, Sub 161 (Feb. 10, 2020 Duke Comments) at 3-6.

⁷ See Attachment 2, AGO DR 2-3 and Attachment 3, AGO DR 2-1 (updating Public Staff Data Request No. 1).

tools to work with Duke's discrete regime, and that effectively limits the energy conservation opportunities available to North Carolina customers. Customers tend to be steered to Duke's programs and applications based on the difficulty of accessing other options, not based on the merits of the programs offered by Duke.

In 2020, Duke argued that compliance with a requirement to use Green Button Connect or otherwise meet the NAESB Req.21 standard might delay the process of deploying the Customer Connect Program, which was planned for DEC by April 2021.⁸ By this point, that is no longer an obstacle to compliance with the requirement. Nonetheless, Duke still has no plan to offer functionality comparable to Green Button Connect, pending further action from the Commission.⁹

The cost to comply with Green Button Connect or a comparable standard is not a reason to decline to require its adoption, as the cost is only a small percentage of the cost of the smart meter/Customer Connect project. Duke's updated estimate of the cost projects that \$3.2 million will be spent over five years.¹⁰ By comparison, DEC had invested roughly \$200 million on smart meters in the Carolinas,¹¹ and DEP had also invested roughly \$200 million at the time of Duke's last rate cases.¹² In addition, the total expenditures on Customer Connect

⁸ Feb. 10, 2020 Duke Comments at 4-5.

⁹ Attachment 2.

¹⁰ Attachment 4, AGO 3-1 and GBC Estimate NC update.pdf

¹¹ DEC 2017 Rate Order at 117; Duke Energy Carolinas 2019 General Rate Case, E-7, Sub 1214, Transcript Vol 13, p. 140.

¹² Duke Energy Progress 2019 General Rate Case, E-2, Sub 1219, Transcript Vol 11, p 948.

in the Carolinas were just over \$196 million for DEC and just over \$160 million for DEP according to a report filed February 15, 2022.¹³

In sum, the final rule needs to require electric utilities to incorporate the proposed provision for national standards that will give customers and authorized third parties access to data and will enable customers to have more choices, convenience, and control.

II. Recommendation to modify the proposed rule regarding aggregated data

The AGO has already described the crucial need to protect consumer privacy.¹⁴ In short, appliances have discernible “load signatures,” so someone looking at smart-meter data can determine what appliance a consumer was using and when.¹⁵

¹³ See DEP and DEC Annual Report on Customer Connect Program, Docket Nos. E-2, Sub 1142 and E-7, Sub 1146, at 8.

¹⁴ See, e.g., Feb. 10, 2020 AGO Comments at 6–8.

¹⁵ *Guidelines for Smart Grid Cybersecurity Vol 2 – Privacy and the Smart Grid*, Nat’l Inst. of Stds. & Tech., at 10–11 (PDF pages 306–08) (rev. 1 2014), available at <https://go.usa.gov/xScRE> (“NIST Volume 2”) (describing how appliance load monitoring can be used to determine what appliances were used and when, and how that can then be used to infer private characteristics); see also Sung-Wook Park et al, *Electric Load Signature Analysis for Home Energy Monitoring System*, 12 Int’l J. of Fuzzy Logic & Intelligent Sys. 3, 193–97 (2012), available at <https://tinyurl.com/ms9w9u6n> (showing that with 30-minute snapshots, researchers could accurately identify five appliances 94% of the time); Elias Leake Quinn, *Privacy and the New Energy Infrastructure*, Center for Energy & Env. Sec. Working Paper No. 09-001, 21–32 (2009), available at <https://ssrn.com/abstract=1370731> (literature review containing numerous other examples).

Advertisers, insurers, and many other third parties would be delighted to have access to these data to infer the private actions of individuals.¹⁶ “[A]nyone with access to a resident’s [smart-meter data] could review the load signature to determine what time the person arrives and leaves home, if the security system is activated, if one cooks with a microwave or the stove, the presence of certain medical equipment, how much and when the household watches television, if someone gets up in the middle of the night and uses the computer, which equipment is left on 24/7, etc.”¹⁷ The data are also valuable to businesses seeking a competitive advantage: the usage data also can be used for “corporate espionage” because one’s competitors can infer “confidential processes or proprietary data.”¹⁸ That is because smart-meter data of industrial and commercial users “can reveal highly sensitive information, for example the technologies used, manufacturing output, sales events, etc.”¹⁹

The AGO’s initial proposed rule sought to address the privacy implications of sharing this data by using the Fair Information Practices’s framework. The AGO stands behind this widely accepted approach.²⁰ However, the AGO has since concluded that its previous proposed rule should be revised to better assure that

¹⁶ See *id.* at 32–34 (chart with “Concern Type” and “Related Questions Answered by Detailed Usage Data”); NIST Volume 2, §§ 5.3.1, 5.6.

¹⁷ Cheryl Dancey Balough, *Privacy Implications of Smart Meters*, 86 Chi.-Kent L. Rev. 161, 167 (2011).

¹⁸ See NIST Volume 2 at 32 (PDF page 328).

¹⁹ Rajenda Kumar Pandey et al., *Cyber Security Threats – Smart Grid Infrastructure*, 2016 Nat’l Power Sys. Conf. 1, 6 (2016), available at <https://www.iitk.ac.in/npsc/Papers/NPSC2016/1570293178.pdf>.

²⁰ See also NIST Volume 2, §§ 5.3.3, 5.7.2–5.7.3 (noting report recommends using Fair Information Practices).

any transferred aggregated data are sufficiently anonymized. As discussed below, the AGO now provides a revised proposal.

- A. The AGO's revised proposed rule addresses concerns about the treatment of aggregated data.

Three parties submitted proposed rules in 2020: the AGO, Mission:data (whose submission was nearly identical to the AGO's), and the Public Staff. Upon further consideration, none of the proposals sufficiently protected consumer privacy because they permitted utilities to share anonymized data that, researchers now know, can be deanonymized (meaning traced back to an individual). Specifically, the proposals permitted utilities to transfer "aggregated data," based on the theory that aggregating data and anonymizing it protects customer privacy. The AGO now submits a revised proposal to shore up three aspects: First, the revised proposal better defines "aggregated data" Second, it reduces the rule's reliance on the "15-15 Rule" as a safe harbor because recent studies have shown the vulnerabilities with the 15-15 Rule. Finally, given the increased attention to the difficulty of truly anonymizing data, the AGO now believes that the rule should place more limits on transferring aggregated data.

1. The AGO's revised rule better anonymizes "aggregated data."

Both the AGO and the Public Staff defined aggregated data by what had been *removed* from "customer data" or "usage data."²¹ Yet the AGO now believes

²¹ The Public Staff's definition was: "customer data, alone or in combination with non-customer data, resulting from processing (e.g., average of a group of customers) or the compilation of customer data from which all unique identifiers

that a better approach would be not only to remove identifying information but also to ensure that utilities use anonymization techniques. Indeed, as the NIST noted, merely removing identifying information is not enough because smart-meter data can be linked back to individuals using other available datasets.²²

One plausible part of the solution is to require a sufficiently large number of customers' data be included in the data set. The AGO's revised definition requires that. (Neither the AGO nor the Public Staff's definition initially did so.) The revised definition (1) focuses on the end result, i.e., privacy, (2) requires both removing identifiers *and* combining usage data, and (3) opens up the possibility of additional privacy-preserving technologies:

“Aggregated data” means usage data from which no individual, family, household, residence or customer could be identified or reidentified without extraordinary effort if such usage data were made public. Before transferring any aggregated data, a utility shall:

have been removed.” “Unique identifiers” was defined as “a customer’s name, account number, meter number, mailing address, telephone number, or email address.”

The AGO defined aggregated data as “usage data, alone or in combination with other data, from which sufficient identifying information has been removed such that an individual, family, household, residence, or customer cannot reasonably be identified or re-identified.”

²² NIST Volume 2, at 26 (“While current privacy and security anonymization practices tend to focus on the removal of specific personal information data items, the studies referenced in this section show that re-identification and linking to an individual may still occur.”). Moreover, the Public Staff's definition required only “unique identifiers” be removed—but those unique identifiers were defined narrowly. The aggregated data could still contain, for instance, a meter’s IP address or MAC address. See NIST Volume 2, at 26–27 (noting those as example data elements linked to smart meters “that could impact privacy if not properly safeguarded”).

- (i) Remove all information that could identify any particular individual, family, household, residence or customer;
- (ii) Combine and/or process the usage data with the usage data of a sufficiently large group of customers; and
- (iii) In appropriate cases, utilize other anonymization techniques. Such techniques may include, without limitation, reducing the granularity of the data transferred or differential privacy.

This revised definition requires the utility to aggregate the data, not just remove clear identifiers. Accordingly, it better protects privacy by making reidentification more difficult.

- 2. The previous drafts would permit transfers that could be reidentified to individuals.

The AGO's and Public Staff's previous proposals relied on the 15/15 Rule, which had been adopted by other states. Under that rule, utilities can transfer a dataset of "aggregated data" if the dataset contains at least 15 ratepayers, none of whom use at least 15% of the energy. This rule, originally adopted in California in a different context,²³ has come under heavy criticism. Indeed, federal-government researchers have criticized the rule as "naïve because there is no scientific reasoning that corroborates the rule itself."²⁴

²³ See *Resolution E-4535*, Cal. Pub. Util. Comm'n, at 10 n. 38, *available at* <https://go.usa.gov/xSTRR> (noting utility's proposed rule "relies on the '15/15 Rule' which was adopted in the context of availability of data for Direct Access; [the utility] has made no showing as to why a standard used in the context of retail choice should be a requirement in making aggregated data available to third parties").

²⁴ Olga V. Livingston et al., *An Analysis of Utility Meter Data Aggregation and Tenant Privacy to Support Energy Use Disclosure in Commercial Buildings*, 159 Energy 302 (2018), *available at* <https://tinyurl.com/2zkumt7n>.

There are at least two concerns with the 15/15 Rule. First, as a study from this year points out, it has a “fundamental flaw” because an individual can be reidentified “by simple algebra.”²⁵ By getting similar datasets, a recipient of aggregated data can reidentify individual customers by looking at the changes between the data sets.²⁶

Next, recipients can reidentify individual customers by combining the usage data with other information about the customers in the data set.²⁷ For instance, assume that a marketer requested a group of 15 (or even 100) customers’ smart-meter data, knowing that only one of those customers charges a plug-in electric vehicle at home. The marketer could then review the AMI data to determine which customer’s load signatures include an electric vehicle, thereby reidentifying that customer.²⁸

The revised draft largely removes the 15/15 rule, which was previously in subsection (j)(2) of the AGO’s proposal. Now, instead of focusing purely on the number of customers involved, the rule permits utilities to transfer aggregated data in set circumstances that are likely to have minimal privacy impacts. The AGO has identified two situations thus far: for researchers and for EnergyStar

²⁵ Nikhil Ravi et al., *Differentially Private K-Means Clustering Applied to Meter Data Analysis and Synthesis*, IEEE Transactions on Smart Grid (2022) available at <https://arxiv.org/pdf/2112.03801.pdf>.

²⁶ See *id.*

²⁷ See NIST Volume 2 § 5.5 & n.65 (discussing disaggregation techniques).

²⁸ See NIST Volume 2, at 3 (PDF page 339) (noting that “Specific solutions or mitigations for potential electric vehicles ... privacy issues will need to be explored”).

benchmarking.²⁹ The AGO believes that there are likely other appropriate situations to transfer aggregated data without obtaining customer consent, and the rule allows the utilities to file rate schedules describing those situations for approval by the Commission.

B. The AGO's revised rule makes several technical fixes.

Briefly, the AGO also makes several technical corrections to the AGO's proposed rule. The first modifications are in subsection (d), "Use and Disclosure Limitation." Subsection (d)(1) previously used "in the ordinary course of business," and revises that to use the defined term "primary purposes."

Second, subsection (d)(2) is revised to clarify that customer information, including aggregated data, may not be sold but charges and fees may be required as set forth by this Rule.

Third, subsection (d)(6) has been clarified to remove potential inconsistencies: it makes clear that utilities may disclose the data if the Rule expressly permits disclosure.

Finally, subsection (j)(4)(iii) requires that the utilities' updated tariffs include both security *and* privacy protections for transferred aggregated data.

²⁹ With respect to EnergyStar benchmarking, the AGO does use naïve aggregation rules like the 15/15 Rule in two limited circumstances. However, there are reduced privacy risks here: the data will be transferred subject to a nondisclosure agreement and the data show monthly use for an entire building or premises. Given the lack of granularity and the limited use, there are reduced privacy concerns.

Conclusion

The AGO requests that the Commission adopt its revised rule, which better promotes consumer choice and protects consumer privacy.

These supplemental comments are respectfully submitted this the 22nd day
of July, 2022.

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CERTIFICATE OF SERVICE

The undersigned certifies that she has served a copy of the foregoing SUPPLEMENTAL COMMENTS OF THE ATTORNEY GENERAL'S OFFICE upon the parties of record in this proceeding by email this the 22nd day of July, 2022.

/s/
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