ATTACHMENT 4

NCUC Docket Nos. E-2, Sub 1314, E-7, Sub 1289, E-2, Sub 1315, E-7, Sub 1288





24/7 Carbon-Free Transition Tariffs

Eligible Resources, Data Requirements, and Infrastructure Requirements

August 19 2023

Introduction

Electric customers who are seeking to decarbonize their electricity consumption during every hour of the day face a common, high-level challenge. They must all negotiate a tariff or contract with their local utility or retail service provider to implement their hourly decarbonization goals. To align the goals of these customers with the needs of a decarbonizing grid, RAP has convened stakeholder work groups to develop regulatory tools that can be tailored for use in all fifty states.

The product these customers are seeking has been named, 24/7 Carbon-Free Energy or 24/7 CFE. Our research and interviews to date have identified additional challenges that all tariffs and contracts will need to address. These challenges fall into three categories.

- **Resources**: Identifying eligible carbon-free technologies and documenting the hourly products (energy, capacity, ancillary services) that they can produce
- **Emissions**: Accurately tracking and reporting the hourly carbon emissions associated with the participant's resource portfolio as it fully transitions to 100% 24/7 CFE.
- **Ratemaking:** Ensuring that ratemaking and resource compensation support the feasibility and long-term sustainability of 24/7 carbon-free energy.

This memo is designed to engage the Resources Working Group (RWG) in a discussion of resource, infrastructure and data requirements. It is organized into four sections: Principles, Eligibility Requirements, Data Requirements, and Infrastructure Requirements.

Principles

REQUEST FOR STAKEHOLDER COMMENT: The Principles section builds on principles that have been adopted by the Coalition for CFE and by the Emissions Tracking Working Group. We invite comments on these choices and do expect that there will be further development and discussion about principles as the Rate Design Working Group develops its recommendations. We request your input on: a) have we effectively knit together the principles noted with principles required to address resource issues; b) are there any changes you would like to see in the articulation of the principles proposed; and c) are there any principles missing that you would like to see added?

To develop high-level eligibility requirements, the CFE Resources Work Group first compiled the CFE principles that were developed and adopted by the Coalition for Carbon Free Energy (Coalition for CFE) and RAP's 24/7 Emissions Tracking Work Group (ETWG). These principles are applied to the subset of resource-related issues in this memo, but are expected to apply generally to the development of 24/7 CFE tariffs. They may be applied, for example, to subsequent work on the emissions and ratemaking topic areas.

Coalition for CFE

The principles that CCFE developed¹ are summarized below and are mapped to a series of eligibility requirements in the table that concludes this section.

1. Time Matched Procurement

24/7 Carbon Free Energy (CFE) focuses on matching each hour of electricity consumption with carbon-free electricity generation. Hourly matching helps connect clean energy purchasing to underlying electricity consumption.

2. Local Procurement

- 24/7 CFE means purchasing clean energy on the local/regional electricity grids where electricity consumption occurs. This is the only way to drive the electricityrelated emissions that a consumer is directly responsible for to zero.

3. Technology-Inclusive

- 24/7 CFE recognizes the need to create zero-carbon electricity systems as fast as possible, and that all carbon-free energy technologies can play a role in creating this future.

¹ 24/7 CARBON-FREE ENERGY COMPACT, <u>https://gocarbonfree247.com/the-movement/</u>, <u>https://www.un.org/sites/un2.un.org/files/2021/09/principles - updated.pdf</u>

4. Enable New Generation

- 24/7 CFE focuses on enabling new clean electricity generation, in order to support the rapid decarbonization of electricity systems.

5. Maximize System Impact

 24/7 CFE focuses attention on maximizing emissions reductions and solving for the dirtiest hours of electricity consumption.

Emissions Tracking Work Group (ETWG) Principles

The principles that ETWG developed are summarized below and are mapped to a series of eligibility requirements in the table that concludes this section.

1. Attributional (Resource-based) Accounting

- 24/7 CFE accounting should proceed from the bottom up by accounting for the actual, individual resource-by-resource generation and characteristics.

2. Market-Based (Ownership-based) Accounting

- 24/7 CFE accounting should proceed based on the contractual obligations that are established between the owners of individual resources and their customers.

3. Geographic Deliverability

- A 24/7 tariff should identify the market or geographic boundaries within which the utility will procure generation resources to match with customer load...a utility's balancing area authority.

4. Fairness to Non-Participants

Non-participating consumers should not be harmed by the implementation of 24/7 CFE tariffs.

Principle Modifications and Exclusions

Three of the aforementioned principles are modified or excluded for the purposes of the RWG.

- Exclude Maximize System Impact (Coalition for CFE)
 - This principle is in conflict with the attributional, market-based accounting principles that are being recommended by the ETWG. The ETWG's preferred accounting principles require bottom-up accounting that places CFE eligibility on individual resources and maps them through bilateral contracts to specific owners.
 - Maximizing system impact by requiring CFE resources to reduce emissions during high-emissions hours implies a "consequential" approach to tracking emissions. The

consequential approach to emissions accounting requires that the emissions of the electric system, defined as a single balancing authority, decrease as CFE resources are brought online. Although we agree that this principle is desirable, it requires a system-wide, top-down accounting method that not only introduces complexity to the CFE emissions tracking challenge, but also could be in conflict with another principle, Enable New Generation.

- For example, requiring resources to maximize system impact could render distributed, intermittent resources, such as run-of-river hydro, solar, and wind, ineligible. As these types of resources saturate a balancing authority, there is an increasing need for dispatchable resources that can provide reserves during the morning and evening hours when loads are changing rapidly. Because the primary source of dispatchable resources is presently fossil fueled, intermittent CFE can increase emissions during some hours of the day. For the purpose of this draft, we accept the ETWG's attributional accounting principle which allows any CFE resource to qualify, even if it causes emissions within the balancing authority to increase during some hours.
- Consolidate Local Procurement and Geographic Deliverability
 - These principles are close synonyms for each other. The following table uses the Local Procurement label which is intended to capture the essence of both.
- Generalize Fairness to Non-Participants
 - This principle can be generalized to apply to both participants and non-participants because there are both costs and benefits to adding new CFE resources to the system.

Eligibility Requirements

REQUEST FOR STAKEHOLDER COMMENT: The Eligibility Requirements section seeks to articulate the categories of CFE resources that could contribute to a 24/7 CFE Transition Portfolio and it seeks to articulate the capabilities that each resource type may provide. We request your comment on: a) Are eligibility requirements in Table 1 well-stated; b) Are the resource types in Table 2 sufficiently comprehensive; and c) are the capabilities of resources in Table 2 adequately described?

There are seven remaining principles, and each of them implies a series of high-level eligibility requirements that must be met for a resource to be included in a 24/7 CFE tariff or product offering. For example, **time-matched procurement** requires that hourly metering be required for both CFE resources and the customer's load. Similarly, **local procurement** requires that resources be delivered and settled in the same balancing authority as the load

being served.

The **technology inclusive** principle is deliberately interpreted through a broad lens. As long as a resource does not emit carbon and meets the other eligibility requirements, it is considered eligible. Two resource categories deserve special attention: storage and aggregations. As a critical CFE-enabling resource, storage resources are eligible as long as they are charged with 24/7 CFE energy and hourly accounting for losses is used. Aggregated resources such as Virtual Power Plant (VPPs) are also eligible, as long as the resources used to build them do not emit carbon. This includes resources from both the demand and the supply side.

The **enabling new generation** principle is considered met when the 24/7 CFE tariff results in the development of a new resource(s). No minimum threshold for how much new, additional CFE is included in the tariff is being proposed. However, disclosure of such a percentage is a proposed requirement. This ensures that both customers and regulators know to what extent this principle is being employed. Finally, allowing existing CFE resources to be eligible under this principle also meets the technology inclusive principle.

The **attributional**, **market-based accounting** requirements are based on making a series of disclosures mandatory and transparent to the customer. At a minimum, these must include technology type, the source and sink settlement locations, owner, the contractual path to the customer, and the product(s) being conferred. The product(s) being conferred is especially important, and the proposed eligibility requirements under market-based accounting allow for both bundled energy plus Renewable Energy Credits (RECs) and unbundled RECs. If unbundled RECs are used to support the product being offered, then disclosure of the percentage of unbundled RECs and the underlying resource(s) must be made.

Finally, **fairness to non-participants** implies several requirements. First, a pro-rata share of existing CFE resources must be retained for non-participating customers. This gives nonparticipants a fair allocation of existing CFE resources, but stops short of ensuring that the overall cost and emissions profile of the resources within the balancing authority remains unchanged. In other words, the addition of a 24/7 CFE tariff may change the dispatch order and mix of resources on the system, which could impact the cost and/or carbon emissions for non participant. Because this possibility cannot be ruled out, a second fairness requirement is being proposed.

The 24/7 CFE tariff should be designed to manage costs for non-participants. Utilities and load serving entities who offer 24/7 CFE products to their customers should use their best efforts to quantify the impacts, both benefits and costs, of its product on the electric system and to nonparticipants specifically. Categorically, this may include quantifying energy, generation capacity and ancillary services impacts, but could also include impacts such as deferred transmission and distribution investment. Finally, to the extent practical, the tariff should include provisions that compensate participants and nonparticipants for the net cost or benefit

of the CFE product being introduced to the system.

The following table summarizes the proposed requirements as they relate to each principle.

Table 1: Summary of Eligibility Requirements for 24/7 CFE Resources

Principle	Requirement
1. Time- Matched Procurement	• Must be metered and reported in at least hourly increments that match up to the time increments being used to meter the customer's load.
2. Local Procurement	• Must be delivered to and settled in the same balancing authority as the load being served.
3. Technology Inclusive	 Must not emit carbon. Storage resources must use eligible CFE resources for charging energy and account for losses. May include resources from both the supply and the demand sides.
4. Enable New Generation	 Must be made up of newly constructed CFE resource(s) or a combination of existing and new CFE resources. Must disclose the percentage of new CFE resources that are included in the tariff or product offering.
5. Attributional Accounting	• Must disclose resource-specific characteristics. See Data Requirements.
6. Market Based Accounting	 Must disclose the resource owner and the contractual path to the customer. Must disclose the product(s) being conferred to the customer, at a minimum, energy plus bundled or unbundled RECs. Must disclose the percentage of unbundled RECs, and identify the underlying resource(s) backing them.
7. Fairness	 Must retain a pro-rata share of existing CFE resources for non-participating customers. Must manage costs for non-participants. Must compensate non-participating and participating customers alike for any net costs or benefits that are attributable to the 24/7 CFE resource(s).

Eligible Technologies

The following table lists the technologies that could be eligible for a 24/7 CFE tariff. The initial list was compiled using the National Renewable Energy Lab's (NREL) Alternative Technology Baseline (ATB). The list was consolidated somewhat by removing market sectors (residential and commercial) that created redundancy in the list. Then Lazard's 2023 Levelized Cost of Energy (LCOE) analysis was consulted, which represents more commercially mature resources. Finally, two other categories were added because:

- **1. Imports / Transmission** can be delivered to and settled in the same balancing authority as the load they are intended to serve.
- **2. Aggregations** from both the demand and supply side can be used to meet the eligibility requirements as envisioned under FERC Order 2222.

The result is a list of nine technology categories, and a series of sample resources whose primary products are identified in the far-right column. The list is meant to be comprehensive at the level of the categories, but it is deliberately incomplete with respect to the list of sample resources that are listed. For the sake of brevity, the sample resources for aggregations, storage and imports is left incomplete, and we acknowledge that there are examples of these resources that are left out of the table.

Importantly, the table includes a column labeled "Products Provided". This column is populated with a categorical list of four high-level products that can be provided, in concept, by each resource. They include:

1. Energy

- Delivered at specific locations and points in time.
- All resources are capable of providing energy.

2. Generation Capacity

- To provide energy when it is needed most.
- Only dispatchable (not intermittent) resources can provide capacity.

3. T&D Capacity (Deferred)

- To enable delivery of energy when and where it is most needed.
- This includes resources behind the customer's meter, and storage which can *defer* the need for T&D investments.

4. Reliability Services

- Including operating reserves, regulation reserves, frequency response, voltage regulation, and black start capabilities.
- If a resource can provide any one of these reliability services, it receives an 'X' in the following table.



#	Category	Sample Resources	Energy	Generation Capacity	T&D Capacity	Reliability Services
1	Aggregations	CFE DERs ²	Х	Х	Х	X
2	Biopower	Digesters	X	X		
		Woody Biomass	Х	Х		
3	Geothermal	Geothermal	Х	X		X
4	Hydropower	Large	X	Х		X
		Small Run of River	Х			
5	Imports	Transmission	X	Х		X
6	Nuclear	Conventional	Х	Х		X
		Small Modular Reactors	X	Х		Х
7	Solar	Concentrating	Х	Х		X
		PV	X			Х
8	Storage & Storage + Other Resources	Battery (short & long duration)	Х	Х	Х	Х
		Battery + Solar	Х	Х	Х	X
		Compressed Air	Х	Х	Х	Х
		High Temp. Thermal	Х	Х	Х	X
		Hydrogen – Green	Х	Х	Х	Х
		Pumped Hydropower	X	X	X	Х
9	Wind	Off-Shore	X			
		On Shore	X			

Table 2: Eligible Resource List

² Carbon-Free Energy Distributed Energy Resources



Three categories of resources deserve more explanation. First, **aggregations** of carbon-free energy, distributed energy resources may include any CFE resource that is interconnected at the distribution level. This includes resources that are behind the customer's retail consumption meter, as long as they are measurable and controllable at the Balancing Authority level under FERC Order 2222. Such resources may commonly include solar, battery storage and demand response programs that control electric water heaters and thermostats. Legacy interruptible load control and demand response programs may also be included, as long as they are controlling aggregations of CFE resources.

Imports are expected to be an increasingly significant source of CFE resources in the future, and do qualify under the proposed eligibility requirements. The data requirements for such resources would not differ from other CFE resources, but the data itself may be sourced from either the load serving entity (LSE) or the Balancing Authority (BA). The National Electric Reliability Council (NERC) has published a standard that governs "Evaluation of Interchange Transactions"³ between Balancing Authorities, and it requires that both the LSE and the BA have the capability to electronically verify both the generation source and the load sink of such transactions.

Finally, there are a variety of **storage** resources and potential for combinations of storage with other CFE resources. The most common example is presently battery storage combined with solar, but other combinations will surely surface. In all cases, storage resources must utilize CFE resources during the charging cycle, account for losses, and be time-matched with load during the discharging cycle. As a result,

³ INT-0006-6, Evaluation of Interchange Transactions, NERC, <u>https://www.nerc.com/pa/Stand/Reliability%20Standards/INT-006-5.pdf</u>

Data Requirements

REQUEST FOR STAKEHOLDER COMMENT: The Data Requirements section seeks to articulate the data that will be needed to cost effectively establish 24/7 CFE Transition Tariffs and Portfolios. We request your comment on: a) Are the CFE and non-CFE data requirements adequately characterized; b) Do you have proposed changes or additions to the data requirements?

The data requirements for CFE and non-CFE resources are expected to be different, and the next two sections deal with each one separately.

CFE Resource Data Requirements

Data requirements for CFE resources flow naturally out of the choice to follow attributional, market-based accounting procedures. These include the data elements that are routinely captured with the IT systems of distribution utilities (DU), their balancing authorities (BA), and/or the load serving entities (LSE). In regions with generation and/or emissions tracking systems, much of the same information may be sourced from within those organizations. Table 3 summarizes the requirements in the language that is often used in commercial term sheets.

#	Category	Data Element	Source Organization(s)	
1		Balancing Authority	Load Serving Entity (LSE)	
2	Administration	Distribution Utility	LSE	
3		Emissions Tracking System(s)	LSE	
4	Customer	Premise ID	Distribution Utility (DU)	
5	Characteristics	Customer Name & Address	DU, LSE	
6		Meter ID(s)	DU	
7		Distribution Line Losses	DU	
8	Losses	Storage Losses	LSE	
9		Transmission Line Losses	BA	
10		Balancing Authority	LSE	
11	Location	Source Location	LSE	
12		Sink Location	LSE	
13	Ownorship	Buyer Name	LSE	
14	Ownership	Seller Name	LSE	
15	Resource Characteristics	Resource Name/ID	LSE	
16		Product(s)	LSE	
17		Technology Type	LSE	
18	Time	Commercial Operation Date	LSE	

Table 3: Data Requirements

19		Metering Interval	LSE
20		Begin Date & Time	LSE
21		End Date & Time	LSE
22	Valerenaa	Delivered CFE Quantity	BA, DU
23	volumes	Customer Usage	DU, LSE
24	Other		

This list is intended to be comprehensive and is deliberately missing any data requirements that deal with emissions. This is simply due to the fact that it is only applicable to CFE resources who, by definition, have no emissions to begin with. This list is probably missing some elements at this point in the working group's progress. As a result, comments and additions are welcome.

Many of these data elements are self-explanatory. However, the losses category does deserve more explanation. Conceptually, measuring storage losses is straightforward. Both the hourly charging and discharging energy can be readily metered, and storage losses are simply the difference between the two.

However, measuring line losses is more difficult. A CFE customer's load will be metered at their premise or building location. Because line losses are incurred to deliver CFE energy from the generator to the customer, they must be accounted for during the time-matched procurement process. Line losses do vary hourly and by location, and are sometimes measured hourly at the transmission level. However, they are known to be difficult to calculate generally, particularly at the distribution level. As a result, a methodology for calculating and attributing line losses to CFE customers must be made transparent in the 24/7 CFE tariff.

Non-CFE Resource Data Requirements

CFE products that guarantee 100% CFE in every hour are not yet a commercial reality. As a result, non-CFE resources must be accounted for and reported on to determine the emissions profile for customers who subscribe to a CFE tariff. Consistent and transparent measurement and verification (M&V) will be key. In this section, we examine what data is necessary for M&V, obstacles to obtaining data and potential ways to overcome these obstacles.

The first step in creating a national data set for measuring hourly emissions is to gather hourly emissions data collected by the Environmental Protection Agency ("EPA"). EPA's Clean Air Markets Division (CAMD) has monitored and collected emissions and operating data from power plants since 1990. Hourly CO2 emissions data are among the data collected by EPA⁴. This data is collected on an individual Electric Generation Unit ("EGU") basis from all units with

⁴ For a complete description of types of data collected see: <u>https://www.epa.gov/system/files/documents/2022-07/CAMD%27s%20Power%20Sector%20Emissions%20Data%20Guide%20-%2007182022.pdf</u>

capacity greater than 25 MW. Hourly electricity generation is also reported. These data are publicly available and are reported on a quarterly⁵ basis. A dataset consisting of one year of hourly emissions data for a designated test year would allow for computation of annual emission rates as well as comparison of annual output to check EPA's data against other data sources that report annual production of electricity.

The second step in creating a national data set for measuring hourly emissions is to assign each generator that reports emissions data to EPA to its respective balancing authority. This will produce a comprehensive list of emitting resources and their respective emissions rates by balancing authority.

Next, annual generation output from non-emitting generating units should be gathered from FERC Form 1 or the Energy Information Administration (EIA). Non-emitting resources should also be assigned to their respective balancing authority. This will result in a data set that consists of total annual generation by balancing authority⁶.

Third, load should also be computed by balancing authority and compared with generation output from that balancing authority to determine the level of exports across balancing authority lines. Generation data and load data should be compared to see if imports and exports materially change the emission rates.

Fourth and finally, hourly data from non-emitting generating resources must be gathered or modeled from the operator of the balancing authority. Totaling non-emitting hourly output with emitting hourly output renders an hourly emissions generation rate by balancing authority⁷. Adjusting for imports and exports, if material, results in hourly load emissions data by balancing authority.

Annual generation and load computed by balancing authority can then be compared to other publicly available reports of total generation and total load to determine the level of completeness of the data set for each balancing authority. For example, the generation output for all EGU's in a balancing authority for the test year computed from EPA emissions data and reporting of output of non-emitting resources could be compared to the RTO/ISO annual generation and load data to check for completeness. There is no such thing as a perfect data set, but deficiencies should be measured and reported. Output from resources below 25 MW in size should be estimated or modeled in that small resources are often omitted from reporting requirements.

⁵ Must confirm the frequency of EPA's reporting.

⁶ This will render an annual emissions rate. For hourly emissions rate, hourly output non-emitting resources must also be gathered as is discussed below.

⁷ As of 2022, there are 66 balancing authorities in the U.S., eight in Canada, and one in Mexico.

Description of issues still under development:

Conclusion = Hourly Emissions Rate by BA. lbs/MWH of **load** or generation. Be clear on this. Lag Time = **3-4 months.**

System ave vs unit level emissions factor.

Are both non emitting and emitting resources included in Singularity's method?

Imports/Exports - Track with NERC data. Or document the Singularity method?

MRETs? How does it propose to do it?

Infrastructure Requirements

REQUEST FOR STAKEHOLDER COMMENT: The Infrastructure Requirements section seeks to articulate the Information Technology and Physical Infrastructure requirements that may come into play in implementing cost effective 24/7 CFE Transition Tariffs and Portfolios. We request stakeholder comment on: a) Have we characterized the potential IT requirements well; b) have we described the process for determining T&D infrastructure requirements well; and, c) have we characterized potential customer infrastructure requirements well?

There are three categories of infrastructure involved in supporting 24/7 CFE products: information technology, transmission and distribution, and customer infrastructure⁸. These categories are discussed in the next three sections with an emphasis on how the implementation of a 24/7 CFE tariff would impact their development, operation and cost.

Information Technology (IT) Infrastructure

A series of IT systems must be integrated to enable attributional, market-based accounting. These include the distribution utility's:

Customer Metering System

- This would include Automated Metering Infrastructure (AMI) and a Meter Data Management System (MDMS).
- Customer Information System (CIS)
 - This system records relevant details about the customer including contact information, usage and billing history.
- Distributed Energy Resource Management System (DERMS)
 - o Although strictly necessary, DERMS systems are a common way to control and

⁸ Note that generation infrastructure is not listed. This is because its development is implied by the offering of a 24/7 CFE product.

measure DERs on a distribution system. In instances where a DERMS system does not exist, information about DERs may be aggregated and reported through the aggregator's own systems.

• Power Supply Information System (PSIS)

- This system records the utility's supply entitlements, and how they operated and settled within the Balancing Authority.
- Supervisory Control and Data Acquisition (SCADA) System
 - This system controls and directs the flow of power on the distribution system, with an emphasis on controlling distribution system equipment.
- Cyber Security Systems
 - As the interconnectedness and number of nodes in this network of systems grow, so too does the **cybersecurity risk**. As a result, cybersecurity is an essential IT function that must evolve along with, and ideally in advance of, the integration of these systems.

Regions who have a Regional Transmission Organization (RTO), a generation tracking, and/or emissions tracking system may be able to collect much of the same information through these organizations instead of the distribution utility. In any case, the information from each of these systems must be integrated to enable attributional, market-based, time-matched accounting and to ultimately issue a bill to the customer.

Transmission & Distribution (T&D) Infrastructure

When large, new resources or loads are connected to the electric system, a series of engineering studies are conducted to assess what infrastructure upgrades are required to integrate the resource or load into the grid. If the ratings on any number of grid components are exceeded or a reliability scenario is identified that requires additional infrastructure or protection equipment, then a facilities study is conducted to estimate the cost of the necessary upgrades.

When large, new supplies are added to the grid, these costs are typically paid by the developer under the "cost causer pays" principle. When the cost of upgrading the system is prohibitively high for the developer to bear, then the project may be shelved. As new CFE resources are connected to the grid over time, the hosting capacity of the grid can be expected to decrease, and the cost of interconnection can be expected to increase. At some point, further CFE development can be expected to stop because of the increasing cost of interconnecting to the grid.

The alternative is to socialize some or all of the interconnection costs for a specific project or to increase the hosting capacity of the grid generally. In both cases, non-participating customers would pay more, and this raises equity concerns.

These concerns are traditionally addressed during system planning and rate design/rate making proceedings. In both cases, stakeholders are brought together to identify concerns, consider alternatives, and negotiate compromises. In the context of developing a grid that includes ever higher percentages of CFE resources, the importance of these proceedings also rises. The

implication for developing 24/7 CFE products is this. Using best practices for stakeholder engagement, system planning and rate design/rate making will become ever more important.

Customer Infrastructure

A customer who subscribes to a 24/7 CFE product has an intrinsic incentive to make investments to align its demand with the available supply. The capability to increase demand when CFE resources are abundant, or to decrease demand when CFE resources are scarce, can reduce the cost of the 24/7 CFE product compared to a customer whose demand is inflexible.

The majority of customer infrastructure investments are likely to be behind the retail meter. If the flexibility of those investments is unmetered, then the benefits the customer can expect will be realized solely through the net load at the retail meter and compensated through the design of the 24/7 CFE rate.

In addition to reducing its own costs, a customer's efforts to shape and control its own demand can also reduce the cost of operating grid. For example, decreasing demand when CFE resources are scare can not only reduce the customer's retail bill, but also create grid services such as demand response, operating reserves and even frequency and voltage regulation.

To realize some of the value of the grid services it provides, the customer must invest in submetering. This not only makes the grid services measurable, but also enables them to be aggregated for use by grid operators. Then under FERC Order 2222, they may be eligible for compensation for the grid services they provide.

The implication for the 24/7 CFE tariff is that CFE customers will have to make a choice whether or not to meter their investments in on-site flexibility. If the customer chooses to meter, then it may use FERC Order 2222 to seek compensation from the grid operator(s). In theory, the load serving entity offering the CFE tariff could use the tariff itself to flow through some or all of this value to the customer. Similarly if the customer chooses not to meter, there could be ways to offset proposed grid integration charges with the known benefits of load flexibility. This too have implications for the design of the CFE rate itself and may become a topic to be developed further by the Rate Design Working Group.

Resources

- EnergyTag and Granular Energy Certificates, EnergyTag.org, 2021, <u>https://www.energytag.org/wp-content/uploads/2021/05/EnergyTag-and-granular-energy-certificates.pdf</u>
- Open Grid Emissions Initiative, Singularity, https://docs.singularity.energy/docs/open-

grid-emissions-docs/about_ogei-about-the-open-grid-emissions-initiative

• Hourly Electric Grid Monitor, EIA Form 930, Energy Information Administration, https://www.eia.gov/electricity/gridmonitor/about