

24/7 Carbon-free Energy

Matching Carbon-free Energy Procurement to Hourly Electric Load

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What is 24/7 Carbon Free Energy?

- There is **no generally agreed upon definition** of “24/7 CFE,” but CFE typically includes renewables (e.g., wind and solar) and “carbon-free” resources (e.g., nuclear, hydro, geothermal, NG-CCS and others).
- **US Presidential Executive Order 14057** defines “*carbon pollution-free electricity*” and “*24/7 carbon pollution-free electricity.*” For now, these definitions apply to procurement by US federal agencies.
- Since 2021, a few large high-tech companies (e.g., GOOG, MSFT) and others (e.g., Iron Mtn and JPM) have executed 24/7 CFE power supply agreements.
- **UN 24/7 Energy Compact (2021)** includes a group of energy buyers, energy suppliers, governments, system operators, solutions providers, investors and others focused on advancing deployment of 24/7 CFE.

Executive Order 14057*

“***Carbon pollution-free electricity***” means “...electrical energy produced from resources that generate no carbon emissions...”

“***24/7 carbon pollution-free electricity***” means carbon pollution-free electricity procured to match actual electricity consumption on an hourly basis and produced within the same regional grid where the energy is consumed.”

Goals: Among other goals, the E.O. requires federal agencies by 2030 to purchase:

- 100% CFE on a net annual basis
- 50% CFE on a 24/7 basis

* Issued by President Biden 12/14/21

Drivers for 24/7 CFE

End-use Customers

- Achieve corporate sustainability and decarbonization goals
- Reduce Scope 2 GHG emissions
- Desire to better match RE generation profile to actual 24/7 load profile
- Drive decarbonization of the power grid
- Partially address criticism related to using market-based GHG emissions factors to report Scope 2 GHG emissions
- Provide 24/7 CFE to “downstream” customers (e.g., Iron Mountain)

Power Suppliers

- Meet evolving customers’ desire to procure 24/7 CFE
- Provide 24/7 CFE to US federal facilities based on E.O. 14057
- New business development and new customer acquisition
 - Maintain existing customers
 - Acquire potential new customers
 - Increase revenue

Customer Demand and Energy Supplier Interest in 24/7 CFE is Growing

US Utilities are Starting to Provide 24/7 CFE

Nevada Energy (NVE)

- In December 2020, NVE received state approval to provide 24/7 CFE to a new \$600 million Google data center in Henderson, NV.
- NVE will provide Google with 350 MW of solar capacity and up to 280 MW of battery storage.
- NVE agreed to deliver 24/7 CFE to Google “to the greatest extent possible,” and to deliver 24/7 CFE for a minimum of 70% of the hours annually.

Georgia Power Company (GPC)

- In 2022, GPC obtained state approval to offer eligible customers an option to subscribe to “carbon-free energy around the clock” (CFE/ATC).
- GPC plans to offer a total of 100 MW of CFE/ATC for subscription by eligible C&I customers.
- GPC anticipates it will take ~5 years to complete key program development milestones. GPC plans to start accepting subscribers in Q1, 2028.

Challenges to Deploying 24/7 CFE at Scale

- Limited availability of CFE technologies and projects.
- Different regulatory operating environments.
- New (i.e., “additional) versus existing CFE resources and potential cross subsidies.
- Methods and infrastructure to track hourly RECs and CFE resources do not exist yet
- Lack of standard definitions for “carbon-free energy” and methods to measure 24/7 delivery
- Lack of standard 24/7 CFE contracts and use of customized power supply agreements
- Ongoing review and updates to the WRI/ WBCSD’s Corporate GHG Accounting Protocol and Scope 2 Guidance may change how “market-based” GHG emission factors are used in the future.
- Focus of some parties on maximizing marginal GHG emissions reductions from new investments in RE or CFE (i.e., “emissionality”).
- Data challenges:
 - Data quality
 - Collecting, processing, tracking, and matching real-time CFE generation and hourly customer load data
 - Managing large-scale, real-time data sets
 - Data interoperability across jurisdictions and entities

Key Insights (1 of 2)

1. **24/7 Matching** – 24/7 CFE is a potentially significant evolution of corporate RE procurement designed to better match RE production to real-time hourly load and further decarbonize the electricity supply.
2. **Limited Current Demand** – To date, there have been very few active corporate buyers of 24/7 CFE. Anecdotal information suggests corporate and municipal demands may be growing.
3. **US Government Procurement** – The largest CFE buyer in the U.S. in the near term is likely to be the federal government as it implements E.O. 14057. To serve this demand, or maintain existing power supply agreements with federal agencies, electric companies may want to consider developing 24/7 CFE power products, services, and tariffs.
4. **Regulatory Environment** – It is more common today in the US for 24/7 CFE supply agreements to be developed in deregulated power markets where independent power producers (IPPs) have more flexibility to develop customized power supply agreements than it is for regulated electric companies to develop new 24/7 products and tariffs.
5. **Regulated Electric Utilities in the US are Developing 24/7 CFE** – Both Georgia Power Company and Nevada Energy recently received state regulatory approval to provide 24/7 CFE to corporate C&I customers.
6. **Challenges for 24/7 CFE Suppliers** – Power suppliers face challenges, including product pricing, identifying suitable CFE projects, potential overbuilding of generation assets, addressing asymmetric financial and operational risks, and the need to develop customized power supply agreements and regulated tariffs.

Key Insights (2 of 2)

7. **No Market Infrastructure** – There is virtually no market infrastructure today to match customer load to unit specific CFE generation on an hourly basis. However, the existing REC infrastructure is evolving rapidly to track hourly renewable generation and provide time-stamped RECS.
8. **Decarbonization Goals** – It is not clear if corporate procurement of 24/7 CFE will lead to more rapid decarbonization compared to existing policies and measures and other potential approaches.
9. **Emissionality** – The move by some corporate, municipal, and institutional power buyers to make new RE investments based on marginal GHG emissions impact could reduce demand for 24/7 CFE.
10. **Scope 2 GHGs**– Existing Scope 2 GHG accounting guidance provides a strong incentive for corporate RE buyers in the US to continue to use RECs and renewable PPAs to reduce their reported Scope 2 emissions.
11. **Data Challenges** – There are a variety of data-related challenges that will need to be overcome to securely deploy 24/7 CFE, including ensuring data quality, access to real-time, unit specific grid generation data and end-use customer hourly load data.
12. **C&I Customer Procurement**– C&I customers have procured 24/7 CFE using two approaches:
 - Some corporate buyers seek to procure a “turn-key” 24/7 CFE power product from a power supplier
 - Others prefer to manage their own portfolio of electricity supplies to achieve high-levels of load-matched CFE

Thank You

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