

Comments on the White House Council on Environmental Quality’s Implementing Instructions for Executive Order 14057 Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability¹

March 7, 2023

In August 2022, the White House Council on Environmental Quality (CEQ) issued Implementing Instructions (Instructions) to provide Federal executive departments and agencies (Agencies) with direction for implementing Executive Order 14057 (E.O. 14057), 86 Fed. Reg. 236, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability* (Dec. 8, 2021) using a whole-of-government approach. Clean Air Task Force, The NorthBridge Group, and Green Strategies, Inc. fully support the Administration’s initiative to transition to a carbon pollution-free electricity supply, as established by E.O. 14057, and want the Administration to succeed in achieving its stated goals. In this spirit, we offer these comments and respectfully recommend that CEQ update and amend its Instructions. CEQ, in consultation with OMB, has the authority to update or amend the Instructions or issue additional guidance and Agencies may issue supplementary internal instructions or guidance regarding implementation of E.O. 14057.²

Clean Air Task Force is a global nonprofit organization working to safeguard against the worst impacts of climate change by catalyzing the rapid development and deployment of low-carbon energy and other climate-protecting technologies. With over 25 years of internationally recognized expertise on climate policy and a fierce commitment to exploring all potential solutions, CATF is a pragmatic, non-ideological advocacy group with the bold ideas needed to address climate change. CATF has offices in Boston, Washington D.C., and Brussels, with staff working remotely around the world.

The NorthBridge Group is a leading economic and strategic consulting firm serving regulated utilities, competitive generators and energy suppliers, and other companies and policy organizations active in the energy space. NorthBridge’s work uses a combination of market insights, policy and regulatory expertise, perspectives on the energy transition, and rigorous analytic and economic skills to help its clients formulate and evaluate investment and operational strategies to satisfy climate-related goals.

Green Strategies, Inc. is a clean energy and sustainability management consulting firm founded in 2001. Green Strategies has worked with some of the world’s largest companies, financial institutions, and leading innovative solution providers to help them align their business strategies with sustainability and decarbonization best practices. Green Strategies has pioneered the concept of “climate capitalism” – the notion that sustained business value creation and competitive advantage are best achieved by incorporating climate considerations and emissions mitigation into business and investment strategies.

¹ https://www.sustainability.gov/pdfs/EO_14057_Implementing_Instructions.pdf.

² Instructions, §1.2, at 1. Per E.O. 14057 section 510(b), CEQ shall “issue and, as needed, update implementing guidance for agencies.”

I. Background: The Administration has Established Ambitious Goals to Transition to a Carbon Pollution-Free Electricity Sector by 2035

E.O. 14057 commits the Federal Government to procure carbon-free electricity (CFE) by 2035,³ setting a bold benchmark for electricity procurement, leveraging the U.S. Federal Government’s immense buying power to advance carbon-free technologies, and establishing a strong definition of qualifying technologies.⁴ Achieving this goal will require matching 100 percent of consumption on the grid with CFE supply (including storage discharge) in every hour of the year. E.O. 14057 also establishes a series of other goals, including:

- **Annual CFE Match:** Each agency shall increase its percentage use of carbon pollution-free electricity, so that it constitutes 100 percent of facility electrical energy use on an annual basis by fiscal year 2030. (E.O. 14057, section 203)
- **Hourly CFE Match:** Each agency shall seek to match use on an hourly basis to achieve 50 percent 24/7 carbon pollution-free electricity by fiscal year 2030. (E.O. 14057, section 203)
- **Reduction in GHG Emissions:** The Federal Government shall achieve a 65 percent reduction in Scope 1 and 2 greenhouse gas emissions, as defined by the Federal Greenhouse Gas Accounting and Reporting Guidance, from federal operations by 2030 from 2008 levels. (E.O. 14057, section 102 iv)
- **New CFE Resource Development:** The Federal Government expects that compliance with section 203 of E.O. 14057 will catalyze the development of at least 10 GW of new American clean electricity production by 2030.⁵

The Federal Government, as the largest purchaser of electricity in the country, can lead by example by adopting electricity procurement practices that deploy new clean energy resources, maximize carbon emissions reduction, and incentivize technology development. The implementation of CFE electricity procurement for Agencies, using a whole-of-government approach, can establish a valuable precedent for “higher-impact carbon-free” transactions not only for the Federal Government, but also can serve as a model for other buyers and sellers throughout the country. Therefore, it is critical that the government implementation plan be structured properly. The authors of these comments want the Administration to succeed and offer these recommendations so that Agencies can achieve the targets set forth in E.O. 14057. Our comments are limited predominantly to issues related to Agency procurement of electricity and are described below.

³ E.O. 14057 §1.3, at 1.

⁴ We support the definition of carbon pollution-free electricity provided in E.O. 14057 section 603. Any future additions to the authorized list of technologies should be determined on a case-by-case basis and supported by a lifecycle assessment, and as applicable, feedstock sourcing verification.

⁵ [Fact Sheet: President Biden Signs Executive Order Catalyzing America’s Clean Energy Economy Through Federal Sustainability](#), (Dec. 8, 2021). See also [Federal Sustainability Plan](#), December 2021, at 19.

II. Conclusions and Recommendations

Based on our review of the Instructions and knowledge of the industry, we have the following major conclusions and recommendations:

1. We Fully Support the Efforts of the Administration to Transition to a Carbon Pollution-Free Electricity Supply and Recommend that CEQ Update its Instructions to Measure Progress Using the Following Metrics.

- a. *Attributional Accounting*: Modify current Market-Based accounting to produce a more accurate measurement of emissions associated with electricity use (e.g., tied to the timing and location of purchased CFE and load), as well as disclosing the percentage of supply coming from CFE (referred to later in these comments as a “CFE Score”⁶);⁷ and
- b. *Incremental Resource Development*: Identify Agency procurement of new CFE resources, especially firm CFE, and/or other actions (e.g., investments in storage, load management, transmission, etc.) used to support reductions in emissions associated with electricity use.

In addition, we recommend that CEQ should consider encouraging Agencies, when possible, to prepare a separate calculation of the consequential impact (avoided emissions) of interventions associated with Agency CFE procurement and related actions (consequential accounting). The calculation of avoided emissions would be useful to better understand the actual carbon emissions reductions to the atmosphere associated with Agency actions and to help prioritize procurement actions when deciding how best to accomplish the Administration’s annual and hourly CFE matching goals. The inclusion of an avoided emissions calculation also would be consistent with our recommendations to rely on more relevant and accurate information for GHG reporting in a standardized format, like the Carbon Facts label shown in Attachment A. In the interim, absent any formal reporting of avoided emissions, we recommend that CEQ instruct Agencies to consider the emissions impact when making procurement decisions and to request their electricity suppliers to provide standardized disclosures and compliance reports that are

⁶ The CFE Score measures the percentage of electricity consumption that is matched with carbon-free electricity generation for a given market boundary and time interval. If measured hourly, such that the CFE and/or EACs cannot exceed consumption in any hour, the total CFE and/or EACs divided by total load across all hours in the year would result in the annual average CFE Score for hourly consumption.

⁷ In particular, CEQ should instruct Agencies to modify their calculation of Scope 2 Market-Based inventories to more accurately measure the emissions associated with their electricity use – by relying on energy attribute certificates (EACs) within or delivered to the same grid as load, not allowing EACs used for inventory calculations to exceed load in any time matching interval, using more granular time-based calculations (hourly) when possible, eliminating the current use of eGRID total output emissions factors in Market-Based accounting, and applying fossil average emissions rates as a last resort if EACs or other supplier-specific emissions rates are not available. These recommendations and the proposed Carbon Facts label are discussed in detail in [*Modernizing How Electricity Buyers Account and are Recognized for Decarbonization Impact and Climate Leadership*](#), Green Strategies and The NorthBridge Group, August 2022.

*based on consistent accounting methodologies.*⁸ Defining these metrics, along with guidance and standards to calculate them, will increase transparency, improve accuracy, and can demonstrate progress over time toward meeting the Administration’s objectives. The Administration has already established important goals to match the location and timing of CFE supply with Agency consumption, to achieve emissions reductions, and to develop incremental CFE resources.

*Unfortunately, existing greenhouse gas accounting rules referenced in the Instructions are outdated and not designed to measure and incentivize the next generation procurement actions needed to achieve the Administration’s goal of grid decarbonization by 2035.*⁹ The recommended metrics shown in the Carbon Facts label (and described further below) are intended to provide greater credibility to Agency claims by addressing criticisms about current reporting and GHG standards that are currently under review by WRI and others. The metrics also are designed to unleash the power of the Federal Government to achieve greater climate benefit from its procurement by incentivizing, recognizing, and rewarding strategies with higher carbon reduction impact.

2. Promoting a Diverse CFE Portfolio is Critical to Achieving the Administration’s Goal of Grid Decarbonization by 2035. Therefore, Future Instructions Regarding the 50% Hourly Match Goal (Not Yet Developed) Should Promote the Development of a Diverse CFE Portfolio.

We applaud the Administration’s decision to include supply from the full range of clean electricity options. This is consistent with the predominant body of analysis on decarbonization of the electricity sector, which indicates that the fastest, most cost-effective, and reliable pathway to grid decarbonization is through a diverse portfolio of carbon-free technologies, including wind

⁸ These disclosures are discussed in CATF’s [Response to the Request for Information – Transitioning the United States Government to a Carbon Pollution-Free Electricity Supply – Market Capabilities in Competitive Retail Electricity Markets](#), March 7, 2022. The Federal Government could adopt and standardize a Carbon Facts label methodology based on publicly available data. (See Comments of CATF, NorthBridge, and Green Strategies, [Docket ID No. EPA-HQ-OAR-2022-0878](#), January 18, 2023.)

⁹ To be fair, the GHG Protocol was never intended to a) accurately measure emissions associated with the timing and location of an organization’s electricity use, b) actual emission reductions on the grid, or c) ensure a diverse mix of resources needed to achieve full decarbonization of the electric grid. Because of this, the existing Protocol cannot be relied on in its current form to incentivize or recognize Agency actions that will do the most to speed decarbonization. Improvements in accounting and reporting are needed to better reflect and recognize best practices in electricity procurement to measure progress toward the Administration’s new and more ambitious climate goal of achieving a carbon pollution-free electricity sector by 2035.

and solar, along with firm CFE¹⁰ and advanced storage technologies.¹¹ Consequently, it is essential that CEQ’s Instructions provide the incentives capable of promoting a diverse CFE portfolio necessary to achieve the Administration’s goal of reaching a carbon pollution-free electricity sector by 2035.¹² In particular, future CEQ instructions regarding the 50 percent hourly match goal need to support this important objective.

*CEQ has not yet specified how each Agency shall seek to match use on an hourly basis to achieve 50 percent 24/7 carbon pollution-free electricity by fiscal year 2030.*¹³ To drive the change in resource mix that is required, we recommend that CEQ adopt one of the following alternative definitions of the 50 percent hourly match goal:

- A minimum of 50 percent CFE in every hour (with time and non-time matched CFE able to be used to achieve the 100 percent CFE on an annual basis).¹⁴
- No minimum hourly time match requirement, but a high average of hourly time match – e.g., at least 80 percent or higher (again with time and non-time matched CFE able to be used to achieve the 100 percent CFE on an annual basis).¹⁵

CEQ should not adopt either of the following alternative definitions of the “50 percent” requirement by 2030 that CEQ may consider, as they will not meet the objectives of the Executive Order. For example:

¹⁰ Firm CFE technologies can supply electricity on demand such as hydropower, geothermal, energy storage, nuclear, hydrogen, and fossil fuels with carbon capture and storage.

¹¹ Bruce Phillips, Neil Fisher, and Anjie Liu, [*Review and Assessment of Literature on Deep Decarbonization in the United States: Importance of System Scale and Technological Diversity*](#), The NorthBridge Group, April 2021.

¹² CEQ also recognizes that achieving a fully CFE grid will require energy storage, clean firm, market access and operation, and demand flexibility. (*Carbon Pollution-Free Electricity for Section 203 of EO 14057 Implementing Instructions Overview*, CEQ External Stakeholder Presentation, September 2022, at 4.)

¹³ The Instructions state, “CEQ and OMB will develop further guidance for agencies on implementation of the CFE provisions of E.O. 14057 and M-22-06, including more detailed instructions on the 24/7 CFE goal and planning, purchasing, and accounting for hourly matched CFE,” §4.2.2, at 10.

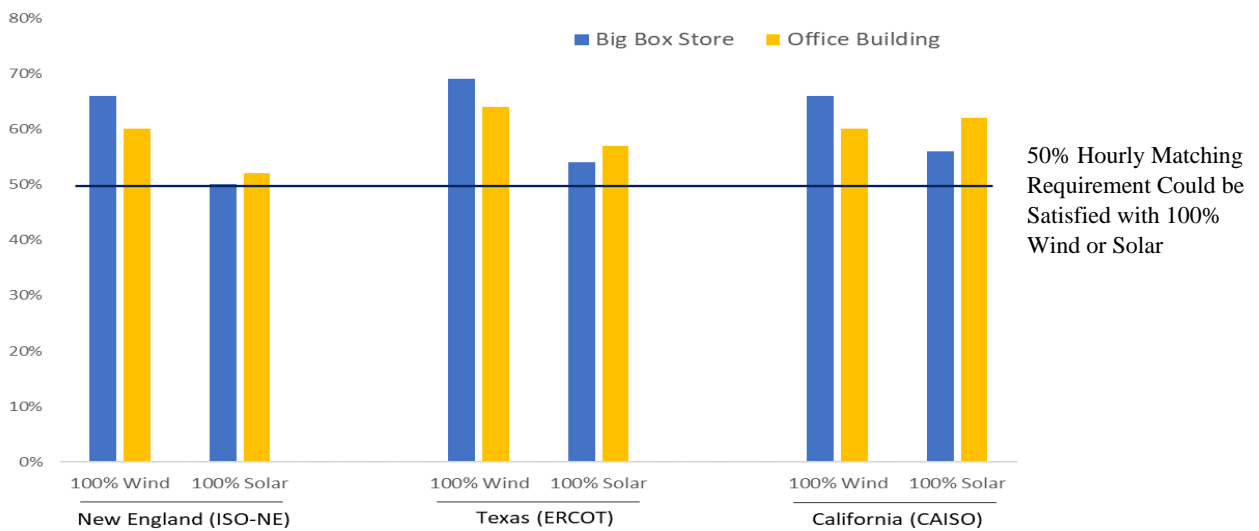
¹⁴ Establishing a goal that requires matching at least 50% of the load with CFE supply in every hour of the year by 2030 (when the average across all the hours is significantly higher) is consistent with the end-state objective in E.O. 14057 to achieve 100% matching in every hour by 2035.

¹⁵ Most private companies that have made commitments to purchase 24/7 CFE in the future have begun entering into supply agreements that include storage and/or some firm CFE resource and target a CFE Score of at least 80% or higher on an hourly basis. [*24/7 Carbon-Free Energy: Matching Carbon-Free Energy Procurement to Hourly Electric Load*](#), EPRI, December 2022, at 24. [*AES Announces First-of-Its-Kind Agreement to Supply 24/7 Carbon-Free Energy for Google Data Centers in Virginia*](#), May 2021.

- i) Allowing CFE to range from 0 percent in some hours to 100 percent of consumption in other hours so long as the average across all hours of the year is 50 percent; or
- ii) Requiring CFE to be 100 percent of consumption in at least 50 percent of the hours.

Both actual market experience and expert modeling indicate that selecting either of these alternative definitions will not promote a diverse portfolio of CFE technologies and will not lead the country on a reliable and affordable path to reach a carbon pollution-free electricity sector by 2035.¹⁶

An Annual 100% Match Could Satisfy the 50% CFE Hourly Time-Matching Requirement If (i) or (ii) is Adopted, But Will Not Support the Development of Firm CFE and Storage Resources Needed to Achieve Full Decarbonization



Source: The NorthBridge Group.

As shown above, if CEQ adopts (i) or (ii) to measure the 50 percent 24/7 carbon pollution-free electricity goal, then the standard to match actual electricity consumption on an hourly basis would be so lenient that it would render the 24/7 goal in E.O. 14057 to be virtually meaningless with little or no practical impact.¹⁷ That is why we recommend that the CEQ require a minimum percentage of CFE supply in each hour, such that by 2030 at least 50 percent of load is being matched by CFE supply in every hour of the year, and the average across all the hours is

¹⁶ Google, 24/7 by 2030: [Realizing a Carbon-free Future](#), 6 (Sept. 2020). Qingyu Xu et al., [System-level Impacts of 24/7 Carbon-free Electricity Procurement](#), Zero-carbon Energy Systems Research and Optimization Laboratory, Princeton University, November 2021. Melissa Lott & Bruce Phillips, [Advancing Corporate Procurement of Zero Carbon Electricity in the United States: Moving from RE100 to ZC100](#), Columbia University and The NorthBridge Group, December 2021.

¹⁷ This is discussed in greater detail in CATF’s [Response to the Request for Information – Transitioning the United States Government to a Carbon Pollution-Free Electricity Supply – Market Capabilities in Competitive Retail Electricity Markets](#), March 7, 2022.

significantly higher.¹⁸ Alternatively, CEQ could provide suppliers flexibility to average CFE across all hours of the year where CFE can fall below the 50 percent threshold in some hours and up to 100 percent in other hours (like i), so long as CEQ instructs Agencies to use a higher average hourly percentage than 50 percent.¹⁹ Specifically, our alternative recommendation is that CEQ instruct Agencies to use at least an 80 percent annual matching requirement by 2030. One or the other of these two options is necessary to provide the incentives capable of promoting the development of firm CFE and storage resources needed to achieve the Administration’s 2035 goal of full decarbonization.

3. Tracking of CFE Should be Modified to Align Mandatory and Voluntary Procurement Markets So That All CFE can be Accounted for Accurately Without Double Counting²⁰

The August 2022 Instructions measure progress toward the “Net Annual CFE Goal” by adding “Purchased CFE,” “On-site CFE,” “Purchased Energy Attribute Certificates (EACs),”²¹ and “Grid-Supplied CFE.”^{22, 23} Agencies are instructed to match consumption with all eligible CFE sources except Grid-Supplied CFE by obtaining and retiring EACs.²⁴ We support CEQ’s effort to match Purchased CFE, On-Site CFE, and Purchased EACs to Agency load within the same regional grid. *However, we have some concerns with the definitions of Purchased CFE and Grid-Supplied CFE, which may result in instances where Agencies could make ownership claims on some EACs that they do not own while relinquishing claims on other EACs that have been purchased. Further, the CEQ should ensure that all EACs used to support CFE goals qualify as CFE as defined in the executive order.*

¹⁸ The starting CFE percentage in 2023 could be tailored by RTO or service area, as needed, taking into account the CFE resources currently available. Higher percentage requirements should be phased in over time, especially for long-term contracts. This would allow more time for new CFE resources to be developed and to ensure that the 2030 goal can be achieved. In any event, Agencies should establish near-term goals (e.g., for the 2023 through 2029 period) consistent with reaching the 2030 objective.

¹⁹ While the 80% figure averaged across all hours of the year is higher than a 50% minimum requirement in every hour, the 80% standard may be easier for Agencies to achieve since it allows CFE to fall below 50% in some hours.

²⁰ As described later, this will require modifications to how Agencies calculate their Scope 2 market-based emissions and their ability to rely on eGRID total output system average data.

²¹ EACs referenced in this document refer to certificates that align with the definition of carbon pollution-free electricity as established in E.O. 14057 section 603.

²² Each of these terms is defined in the Instructions, §4.2.4, at 11.

²³ We recommend that the term “purchases” should not be limited to Agency “contracts” and should include all forms of EAC purchases (e.g., through utility tariffs) made directly or on behalf of the Agency. Even if not purchased by a customer via a contract, a customer may be required to pay for CFE (or unbundled EACs) in non-bypassable utility charges.

²⁴ Instructions, §4.2.4 and 4.2.5, at 11-12.

These concerns and their solutions are detailed below but, in general, when measuring progress toward annual or hourly matching, a key consideration is the treatment of existing or legacy CFE²⁵ and who owns the “rights” to claim and retire the associated EACs, and what happens to these rights if they are not claimed and retired. Existing CFE (and the associated EACs) should not be doubled counted,²⁶ nor should they be ignored when meeting the annual or hourly attributional accounting matching goals. For these reasons, all CFE should be tracked, even if that CFE is not currently used to satisfy state renewable portfolio standards (RPS).²⁷ As a guiding principle, Agencies should be allowed to count qualifying EACs (bundled with supply or unbundled) that they pay for whether purchased in voluntary procurement markets,²⁸ mandatory / compliance markets,²⁹ or other forms of non-bypassable CFE purchases.³⁰ Similarly, Agencies should not be allowed to count EACs associated with CFE supply that they do not pay for. *The Instructions do not make clear how legacy CFE and any associated EACs will be treated. CEQ should clarify that Purchased CFE (or Purchased EACs, if unbundled) includes an Agency’s share of qualifying EACs attributed or allocated to the Agency associated with compliance and*

²⁵ Existing CFE represents about 40% of total U.S. generation.

²⁶ No double counting means that no certificate should be double issued, duplicated during transfer, double registered, double cancelled, or used more than once.

²⁷ State RPS programs vary by state. In some states, the load-serving entity (LSE) must procure EACs or make alternative compliance payments for the load it serves. In other states, a central procurement agency or the utility may obtain EACs on behalf of all customers in its service area.

²⁸ As the Instructions indicate (at 11), Agencies can purchase CFE and the associated EACs from a utility provider (including through a green tariff), retail service provider, energy supply contractor, or through a power purchase agreement (PPA) or could purchase unbundled EACs independently from the agency’s purchases of physical power.

²⁹ Mandatory or compliance markets involve utilities or electric suppliers that are required by state regulations (RPS or clean energy standard) to have a certain percentage of their electricity generation or sales from renewable or clean energy sources. Renewable energy certificates (RECs), for example, are transferable commodities that represent the environmental attributes of renewable energy and are used to demonstrate compliance with state RPSs. REC transactions are tracked and verified. *We recommend that CEQ adopt policies that maintain the integrity of existing mandatory programs while ensuring that there is no “double counting” of EACs and no “double paying” by Agencies for clean energy. Further, the CEQ should specify procedures to ensure that only EACs that qualify as CFE will count towards CFE purchasing goals.*

³⁰ Non-bypassable CFE purchases are defined here to include other CFE and/or EACs (bundled or unbundled) that do not meet the state RPS requirements that a customer must purchase regardless. Examples include an Agency’s allocated share of nuclear and hydroelectric generation that is recovered in a vertically integrated utility’s standard tariff service charges or utility non-bypassable charges associated with state-supported nuclear EACs (e.g., in New York, New Jersey, Illinois, and Connecticut). These EACs currently may or may not be allocated to load, claimed, and retired on behalf of customers who must pay for them.

*non-bypassable bundled CFE or unbundled EAC purchases.*³¹ CEQ should also clarify that Agencies cannot claim non-bypassable purchases of CFE and/or EACs that are attributed or allocated to other customers (even if that CFE is not claimed and the associated EACs are not retired by those other customers) to satisfy an Agency’s voluntary procurement goals. This is necessary to ensure that voluntary EAC procurement is additional to mandatory or non-bypassable purchases, not simply a reshuffling of non-bypassable EACs to customers interested in voluntary procurement.

*More specifically, CEQ’s proposed inclusion of “Grid-supplied CFE” is problematic; and the proposed reliance on data based on the Emissions and Generation Resource Integrated Database (eGRID) model is particularly flawed.*³² CEQ’s “top down” residual mix³³ methodology relies on broad, non-attributional, eGRID data (i.e., total output emissions factors and grid mix) for sub-regions that span utility service areas with different CFE requirements. Calculating the residual mix is challenging given that a buyer’s “claims” can be made well after the time of generation and not all types of CFE ownership rights are currently tracked or reported in the United States. The GHG Protocol Scope 2 Guidance instructs companies not to attempt to calculate their own residual mix.³⁴ Yet, this is precisely what CEQ attempts to do in its Instructions. CEQ directs the DOE-Federal Energy Management Program to provide necessary data on Grid-Supplied CFE, by eGRID subregion, using a residual mix methodology that subtracts CFE and unbundled EACs that third parties have purchased, retired or claimed.³⁵ However, for both restructured and vertically integrated markets, eGRID data does not account for state-level clean energy mandates or other non-bypassable CFE purchases that customers are already paying for in their utility charges. *Because eGRID data is disconnected from the attributional accounting framework, using it to establish Grid-Supplied CFE will result in some Agencies getting credit for clean energy they did not buy and other Agencies not getting credit for clean energy they bought.*

³¹ Agencies should be allowed to include all EACs that are purchased and retired by an Agency or by its LSE on behalf of the Agency to satisfy mandatory, non-bypassable, and voluntary procurement from either new or legacy CFE resources.

³² Instructions, §4.2.4, at 11.

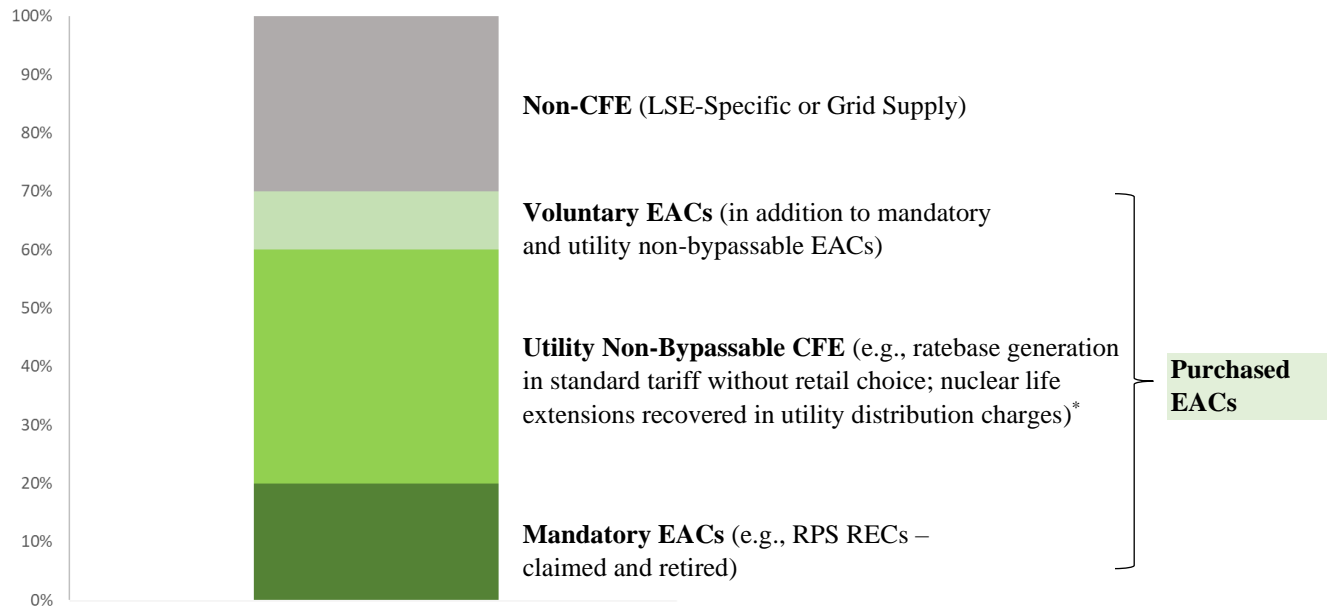
³³ Residual mix refers to the average emissions factor associated with untracked and unclaimed sources of electricity. It is used when calculating the emissions from unspecified purchased or acquired electricity where more-accurate information about the resources and emissions associated with electricity use is not available from the user’s state, region, or electricity supplier. *Scope 2 Guidance*, at 27.

³⁴ *Scope 2 Guidance*, at 56.

³⁵ The Instructions indicate that CFE delivered as part of utility default service could be included in Grid Supplied CFE (at 11). *We recommend that if mandatory or non-bypassable CFE and/or EACs are included in utility (or LSE) service to Agencies (either in vertically integrated utility or restructured markets), then CEQ should instruct Agencies to request their LSE to fairly allocate this purchased CFE to Agency load in their service area so that this CFE can be tracked, claimed, and verified to support Agency annual and hourly matching claims.*

To address these double counting concerns, we propose CEQ adopt a “bottom up” book and claim approach where EACs from all types of CFE are retired to substantiate Agency claims.³⁶ The “bottom up” book and claim approach will allow CFE delivered as part of mandatory or non-bypassable purchases (e.g., CFE included in utility standard tariff or non-bypassable distribution service) to be included in an Agency’s initial CFE Score (before any Agency action is taken to improve that score through voluntary procurement).³⁷

Purchased Qualifying EACs and Non-CFE Supply (Illustrative)



* This CFE does not qualify for RPS but utilities could allocate the output of this CFE to customer load that pays for these resources. The associated EACs currently may or may not be registered and retired. These EACs should not be transferred or “given away for free” in the residual mix to satisfy voluntary procurement goals of customers who did not pay for these EACs.

This approach will also allow an Agency to count the qualifying EACs they pay for, including all EACs that they purchase and retire directly and/or are retired on their behalf. Likewise, it will help avoid situations where an Agency might otherwise inadvertently claim what they do not pay

³⁶ Hourly matching claims should be substantiated with the use of hourly granular certificates.

³⁷ Similarly, the Center for Resource Solutions (CRS) explains that customers can claim to be consuming renewable energy that they do not actively procure under certain circumstances. Standard Delivery Renewable Energy (SDRE) is defined as delivered energy as a result of an LSE’s own renewable energy or carbon targets, a state government’s renewable or clean energy standard, or circumstances where renewables are a cost-effective resource. SDRE is provided to all customers often to comply with a government mandate, and in such instances, customers have no documentation that RECs have been retired on their behalf. SDRE may be credibly reported by a customer as consumed renewable energy and by a provider as delivered renewable energy when the attributes of the renewable energy are retained or retired on behalf of the customer (or a group including the customer), and other established requirements for credible renewable electricity usage claims are met. (CRS, Standard Delivery Renewable Energy, CEAP).

for. This approach does not require the use of e-Grid system average emissions factors or a calculation of residual mix Grid-Supplied CFE.³⁸ It will support the integrity of Agency claims, prevent double counting, and allow an Agency to fairly take credit for the qualifying EACs that it purchases or is purchased on its behalf. It also will allow the Federal Government to properly target spending efforts on a state-by-state basis, in the locations where new CFE is needed the most to reach a 100 percent clean grid. Better tracking of all forms of CFE is necessary to harmonize U.S. compliance and voluntary markets and align the interests of Agencies (and other buyers) and policymakers to support grid decarbonization regardless of whether it is through mandatory (including utility non-bypassable CFE) programs or voluntary EAC purchases.³⁹ Mandatory, utility non-bypassable, and voluntary EAC purchases should complement rather than compete. All qualifying EACs purchased within or delivered to the same grid that matches the timing (annually or hourly) as load should count equally in reducing an Agency’s emissions associated with electricity use and improve its CFE Score.^{40, 41}

³⁸ Given the mix of compliance and voluntary markets and diversity of market structures in the United States, it should be easier to identify an Agency’s share of EAC purchases on a bottom-up basis than it would be to accurately calculate the grid residual mix (i.e., taking the system average resource mix and subtracting all the rights and claims of all other buyers in the region, especially since not all CFE that is paid for by customers is currently tracked and has associated EACs that are retired.)

³⁹ This harmonization will become more important as RPS and clean energy standards increase over time. Most jurisdictions with a current or recently updated RPS have set targets of at least 40% and recent RPS legislation has seen a push toward 100% clean or renewable energy requirements. To date, 10 states, Washington, D.C., Puerto Rico, and Guam have set 100% clean or renewable portfolio requirements with deadlines ranging between 2030 and 2050.
<https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx>.

⁴⁰ For example, if a state enacts a 100% *annual* match RPS requirement from specific renewable resources (e.g., 100% solar or wind) and an Agency, or its supplier, converts the RECs to granular hourly certificates, then this could translate into an *hourly* matching CFE Score of about 60%. In this case, the Agency would need to purchase EACs to fill in the gaps (40%) between the Agency’s hourly consumption and granular certificates to achieve an hourly CFE Score of 100%. The granular EACs purchased by the Agency could be used to satisfy the state annual RPS requirement and satisfy an Agency hourly match claim without double counting the underlying EACs.

⁴¹ A recent IEA study similarly states that, “policy planning should seek to better define and assess the ways in which renewable electricity targets set by the government interact with clean electricity procurement by corporates” and re-allocation of mandatory / non-bypassable EAC purchases “can be avoided by designing government obligation-based schemes to ensure that all consumers must receive a minimum allocation. In this case, entities or tariff offers seeking to claim ‘100%’ renewables would need to procure additional clean electricity since the mandated minimum has to be allocated to other consumers.” (Enrique Gutierrez, Julia Guyon, Craig Hart, Zoe Hungerford, and Luis Lopez, [Advancing Decarbonisation Through Clean Electricity Procurement](#), International Energy Agency, November 2022, at 34.)

Further, when matching EACs from generation sources that deliver CFE to the same grid region as Agency consumption, the Instructions unnecessarily complicate what CFE counts in its proposed measurement. The Instructions state that Agencies must source EACs from generation resources that were placed in service on or after October 1, 2021, either as a new resource or as new capacity at an existing resource modified to increase output,⁴² with exceptions allowed for “bridge EACs” to allow for development and construction timeframes, “swap EACs” to support on-site CFE production, legacy treatment of renewables for EPACT 2005 compliance, and Grid-Supplied CFE, which does not require an Agency to obtain and retire the associated EACs.⁴³ In addition, the Instructions provide an exception to the location requirement (i.e., delivery to the same grid region) for “bridge EACs” and an exception to the timing requirement (i.e., when EACs are generated to when facility electricity is actually consumed) by allowing CFE to be generated within six months prior to or three months after the net annual CFE compliance year. The Instructions further note that use of EACs to meet 24/7 CFE goals will be subject to a more restrictive timing alignment than the annual matching criteria.⁴⁴

While we appreciate the desire of the Administration to encourage the development of new CFE resources (sometimes referred to as “additionality”), presumably to maximize the carbon emissions impact of its procurement, additionality (typically measured in new MWh) should not be confused with actual reductions in carbon emissions on the grid (measured in reduced tons of CO₂). As described later, not all CFE MWh, even if from new resources, have the same environmental benefit. Emissions associated with electricity use and the CFE Score (as part of attributional accounting) and *actual* avoided carbon emissions into the atmosphere (as part of consequential accounting) should ideally be measured separately in parallel.⁴⁵ Both types of analysis provide valuable insight and answer different questions. *Therefore, we recommend that CEQ direct Agencies to calculate their emissions associated with their electricity use (and CFE Score) without an additionality requirement based on all EACs that an Agency procures and retires (including any allocations of EACs associated with legacy non-bypassable CFE described earlier) or their LSE procures and retires on the Agencies behalf.* This would eliminate the need for CEQ’s proposed exemptions and simplify the Scope 2 and CFE Score

⁴² Despite this requirement for new CFE resources, Grid-Supplied CFE could potentially include EACs associated with legacy CFE resources, and in some cases, Grid-Supplied CFE could include CFE not actually purchased by or on behalf of Agencies.

⁴³ Instructions, §4.2.5 through §4.2.8, at 12-13.

⁴⁴ Instructions, §4.2.5 (footnote 12), at 12.

⁴⁵ Later in these comments we offer guidance regarding how consequential avoided emissions could be calculated and benefit Agency decision-making.

calculations and Instructions.^{46, 47} This approach will provide a complete and accurate depiction of total purchased EACs (CFE Score) across mandatory, utility non-bypassable, and voluntary programs as well as emissions associated with non-CFE supply.⁴⁸

4. CEQ Has Begun to Develop an Action Plan to Move Toward Grid Decarbonization But CEQ Must Accurately Measure Progress to Properly Manage the Shift to a Truly Decarbonized Grid.

The Federal Sustainability plan focuses on making the 2020s a decade of action. The Federal Government is implementing a three-part strategy to drive decarbonization of electricity procurement. It plans to engage utilities,⁴⁹ use power purchase agreements,⁵⁰ and develop more on-site energy on federal lands.^{51, 52}

Key components of the decarbonization plan include: 1) matching deliverable CFE MWh with Agency consumption within the same grid region (100 percent CFE *annual* matching and 50 percent *hourly* matching by 2030), 2) developing at least 10 GW of new American clean electricity production by 2030, and 3) reducing Scope 1 and Scope 2 carbon emissions by 65 percent by 2030. As suggested by CEQ, Agencies should set planning milestones, gather electricity supply data, and identify opportunities to participate in “all-of-government” initiatives by participating in CFE procurement initiatives, setting annual CFE progress targets, sharing

⁴⁶ *Rather than impose different guidelines for annual matching (i.e., allowing CFE to be generated within six months prior to or three months after the compliance year) versus hourly matching (i.e., not yet specified), we recommend that both should follow the same (or at least similar) timing alignment guidelines. Annual matching should transition to better matching when EACs are generated to when facility electricity is actually consumed.*

⁴⁷ *The Instructions should also clarify that Agency compliance should be based on actual load and actual CFE supply (not forecasts) with appropriate audit procedures in place.*

⁴⁸ *If CEQ chooses to continue to impose an additionality requirement on Agencies, CEQ should clarify that this additionality requirement only applies to voluntary procurement and does not apply to mandatory programs or other forms of non-bypassable or allocated EACs associated with legacy CFE included a vertically integrated utility standard tariff service or as a result of state-mandated nuclear plant life extensions.*

⁴⁹ The Federal Government plans to work with utility service providers to negotiate supply contracts that include CFE and energy storage for multiple Federal agencies in a service territory.

⁵⁰ The Federal Government plans to use physical power purchase agreements (PPAs) that provide for CFE and energy storage to promote 24/7 energy load profile matching and pursue virtual power purchase agreements (VPPAs) to scale procurements to match aggregated purchasing of CFE and energy storage.

⁵¹ The Federal Government plans to leverage opportunities to use Federal real property assets for development of new CFE generation and energy storage.

⁵² [Federal Sustainability Plan Powerpoint Presentation](https://www.sustainability.gov/federalsustainabilityplan/carbon.html), at 5, 7, and 8. See also <https://www.sustainability.gov/federalsustainabilityplan/carbon.html>.

electricity procurement data, and proposing load profile development approach(es).⁵³ We would emphasize that data gathering needs to begin quickly, including the hourly facility consumption profile data by grid region needed to track progress towards meeting the 50 percent 24/7 CFE goal. FY23 guidance should include a clear directive to gather these data so that agencies can understand their baselines, set milestones, and begin planning their compliance strategies.⁵⁴ The Administration wisely has developed a two-part strategy to put “points on the board” with CFE pilots and innovation projects while also developing a longer-term systematic CFE approach.^{55, 56}

Our primary concern is making certain that Agencies accurately measure what the Administration wants to manage – progress toward the CFE consumption matching, CFE resource development, and emissions reductions goals. The recommended Carbon Facts label is designed to measure progress toward each of the Administration’s goals more directly and more accurately. These objectives can be pursued simultaneously (as the Federal Sustainability Plan intends).⁵⁷ But in many instances, Agency decisions will involve trade-offs in economics, resource options, and emissions impact. How will a procurement decision affect an Agency’s emissions inventory associated with its electricity use? How will it impact actual carbon emissions reductions into the atmosphere? To what extent does CFE technology selection, site location, and timing matter when reducing emissions associated with electricity use? Or reducing carbon emissions into the air? Will the types of CFE resources necessary to achieve full decarbonization of the grid be deployed? These and other considerations should be measured and reported to track progress toward achieving the Administration’s objectives. Once finalized, CEQ could begin to instruct Agency suppliers to provide standardized CFE and emissions disclosures and compliance reports using consistent metrics (like those shown on the Carbon Facts label), along with guidance on best practices to report these metrics.

⁵³ *Carbon Pollution-Free Electricity for Section 203 of EO 14057 Implementing Instructions Overview*, CEQ External Stakeholder Presentation, September 2022, at 8.

⁵⁴ The current guidance requires Agencies to report the percentage of their electricity consumption by grid region on an hourly basis, *but only where agencies have the data*. There is no requirement to gather the data, only to report on their *approach* to producing or obtaining their hourly facility consumption profiles by grid region.

⁵⁵ *Carbon Pollution-Free Electricity for Section 203 of EO 14057 Implementing Instructions Overview*, CEQ External Stakeholder Presentation, September 2022, at 16.

⁵⁶ For example, the recently announced [*Memorandum of Understanding*](#) between the U.S. Administrator of General Services and Entergy Arkansas is a great example of an opportunity to put points on the board and provide a roadmap for future transactions. This plan recognizes “the critical importance of EAL’s existing nuclear generation and will work together to ensure that this source of CFE will be applied to reaching the annual and hourly matching CFE targets of Executive Order 14057.”

⁵⁷ For example, two new CFE resource projects with identical transactional details (e.g., same level of EACs and costs) can have enormously different carbon emission impacts. While both projects may increase the CFE Score and encourage new CFE resource development (i.e., satisfy 24/7 with additionality goals), understanding the carbon emissions impact can help prioritize which project to pursue first.

**Attributional Emissions Inventory Associated with Time and Location of Electricity Use
(and CFE Score)**

To measure progress toward the 100 percent CFE *annual* matching and 50 percent *hourly* matching goals with Agency consumption by 2030, *we recommend that the Federal Government measure the CFE Score both on an annual and hourly basis using all EACs purchased (including those allocated from legacy CFE in utility non-bypassable charges) and retired on behalf of Agency load.* The CFE Score could initially be measured on an annual basis with an effort to transition to monthly and hourly matching over time. Absent calculation of a CFE Score based on hourly data, an annual CFE Score figure could be converted to an estimated hourly CFE Score using hourly generation supply and customer load profiles for the applicable generator and customer type by U.S. region.⁵⁸ *We recommend that a CFE Baseline be established for all Agencies based on mandatory/non-bypassable CFE purchases.*⁵⁹ The CFE Baseline would serve as a “starting point” or benchmark from which Agencies could measure their progress to match CFE supply with their load. The CFE Baseline should include all mandated and non-bypassable EACs allocated to the Agency (e.g., state RPS programs, state-mandated life-extensions of existing nuclear generation, an allocated load share of carbon-free ratebase generation paid for by customers within a vertically integrated utility service area, etc.). *It is unclear from the Instructions whether Agencies can claim all these EAC sources in its CFE Score, and we suggest this be clarified.* The CFE Baseline, expressed in terms of a CFE Score, will likely vary significantly by utility service area. *Similarly, in addition to calculating a CFE Score, we also recommend that Agencies modify their methodology of calculating Scope 2 Market-Based emissions inventories to produce a more accurate measurement of emissions*

⁵⁸ Analysts and technology firms have already developed methods to convert annual matching goals to corresponding hourly matching figures. (See Melissa Lott & Bruce Phillips, [Advancing Corporate Procurement of Zero Carbon Electricity in the United States: Moving from RE100 to ZC100](#), Columbia University and NorthBridge, December 2021.)

⁵⁹ Alternatively, the starting point could be based on an Agency’s existing supply arrangement (e.g., with a competitive supplier or utility green tariff.) While Sect 4.2.9 of the Instructions state that, “DOE-FEMP will incorporate data on each agency’s FY 2021 CFE baseline and track progress toward the CFE goals in the Annual Energy Report,” the CFE baseline is not defined in the Instructions, and if consistent with the use of eGRID data Sec 4.2.4, then is different than the CFE Baseline we recommend.

associated with electricity use consistent with the Administration’s annual and hourly matching goals that purchased CFE be within (or delivered) to the same grid as Agency load.^{60, 61, 62, 63}

Incremental Resource Development

To measure progress toward the development of at least 10 GW of new American CFE production by 2030, CEQ should instruct Agencies to identify and disclose the quantity of incremental CFE (MW) it currently supports via contract and/or finances, inclusive of all forms of incremental carbon-free supply.⁶⁴ As part of this disclosure, Agencies should identify the

⁶⁰ The CFE Baseline (CFE Score) and carbon intensity used for calculating Scope 2 Market-based emissions (expressed in pounds per MWh) could be standardized for basic utility service based on state RPS or clean energy requirements, if any, and the utility supply mix. EEI, in collaboration with member companies, corporate customers, and the World Resources Institute, developed a carbon emissions and electricity mix reporting template to collect timely and consistent carbon dioxide intensity rates for delivered electricity by operating company to provide that information to customers in one central location. Further work likely would be needed to standardize this information across reporting utilities. [*EEI Utility CO₂ Emission Factor Database*](#).

⁶¹ Similarly, we support CRS’s comments to the EPA that, “The standardization of methodologies for calculating utility-specific emission factors that convey the GHG emissions intensity of contractually delivered electricity to customers...would significantly increase the accuracy of tracking progress towards corporate climate targets. Further working with utilities to centrally publish a comprehensive standardized dataset of utility-specific emission factors by product would streamline reporting and facilitate more accurate tracking of goals over time.” CRS Comments, [*Docket ID No. EPA-HQ-OAR-2022-0878*](#), January 18, 2023.

⁶² Emissions inventories should be calculated based on the best available information. Use of granular certificates, then specific LSE emissions information (with more granular market boundary and time interval data) would be preferred. Emissions should be based on load less the sum of voluntary EACs, mandatory EACs, and non-bypassable EACs, multiplied by the LSE’s emissions rate. When a reporting entity cannot rely on EAC purchases or specific LSE emissions factors, emissions inventories applicable to non-CFE MWh [load * (1-CFE%)] should be multiplied by the e-Grid average fossil, or alternatively, the non-baseload emissions factor for the applicable time-period and market region. *To prevent double counting, CEQ should instruct Agencies not to include Grid-Supplied CFE (or use eGRID total output emissions factors) when calculating their Scope 2 Market-Based emissions inventories and when measuring their CFE quantities.*

⁶³ eGRID fossil fuel output emission rates are calculated based on plants whose primary fuel is coal, oil, gas, or other fossil fuel. Alternatively, CEQ could instruct Agencies to use eGRID emissions factors for non-baseload generation. [*eGRID*](#) defines non-baseload emission rates as the output emission rates for plants that combust fuel and have capacity factors less than 0.8, weighted by generation and a percent of generation determined by capacity factor.

⁶⁴ For purposes of this disclosure, CEQ could define incremental CFE consistent with its Instructions (i.e., generation resources that were placed in service on or after October 1, 2021, either as a new resource or as new capacity at an existing resource modified to increase output).

types of CFE resources added, highlighting the development of any firm CFE. Moreover, Agencies should be encouraged to report investments in energy storage, demand flexibility and grid resources that will be needed to complement new wind and solar capacity. As noted earlier, numerous empirical studies on decarbonization of the electricity sector indicate that the fastest, most cost-effective, and reliable pathway to grid decarbonization is through a diverse portfolio of carbon-free technologies. Tracking and supporting the development of a diverse portfolio of CFE generation and balancing resources will be critical to achieving the Administration’s transition to a carbon pollution-free electricity sector by 2035.

Administration’s GHG Emissions Reductions Targets vs. Consequential Avoided Emissions

E.O. 14057 section 302 calls for supplier emissions tracking, including disclosure of greenhouse gas emissions and emissions reduction targets, and E.O. 14057 section 102 (iv) establishes a policy that the Federal Government will set ambitious government-wide goals for a 65 percent reduction in Scope 1 and 2 GHG emissions by 2030 from 2008 levels and achieving net-zero emissions procurement.⁶⁵ *Tracking of Scope 1 emissions since 2008 is appropriate, but many Agencies may not have Scope 1 emissions. Also, it is not clear how CEQ plans to compare Scope 2 Market-Based emissions inventories in 2008 calculated over broad geographic market boundaries and annual matching with Scope 2 Market-Based emissions inventories in future years based on narrower market boundaries with either annual or more accurate hourly matching.* It may be more meaningful to first calculate a CFE Baseline (CFE Score and emissions inventory like discussed earlier) using a modernized Scope 2 approach with narrower market boundaries and better time matching and then measure an Agency’s progress over time relative to those baseline measures, both in terms of CFE Score and emissions inventory.

As noted earlier, in addition to measuring reductions in Scope 2 emissions inventories, the Instructions state that Agencies must source EACs from generation resources that were placed in service on or after October 1, 2021, either as a new resource or as new capacity at an existing resource modified to increase output.⁶⁶ Sourcing EACs from new generation resources (or additionality) is not currently required as part of Scope 2 Market-Based accounting. Presumably, CEQ has added this requirement to its guidance to more directly link its procurement actions to actual carbon emissions reductions into the atmosphere. We support the Administration’s effort to encourage the development of new CFE resources. *But neither reductions in Scope 2 Market-Based emissions inventories nor adding new MWh of CFE should be confused with measuring actual carbon reductions.*⁶⁷ Even if Scope 2 Market-Based reporting is modified to match

⁶⁵ Instructions, §4.1.2, at 7.

⁶⁶ Despite this requirement for new CFE resources, Grid-Supplied CFE could potentially include EACs associated with legacy CFE resources, and in some cases, Grid-Supplied CFE could include CFE not actually purchased by or on behalf of Agencies.

⁶⁷ Numerous studies, articles, and analyses indicate that these attributional and consequential calculations should not be confused. Google, [24/7 Carbon-Free Energy: Methodologies and Metrics](#), February 2021, at 1, 6, 8, 12, 14, and 20. Matthew Brander, [The Most Important GHG](#)

consumption by time and location consistent with 24/7 attributional accounting, the purchase and retirement of EACs does not necessarily reflect any change in the overall emissions into the atmosphere.⁶⁸ Reductions in Scope 2 Market-Based emissions inventories were never intended to measure reductions in grid emissions.⁶⁹ Similarly, not all EACs, even if generated from new resources, have the same environmental benefit.⁷⁰ So additionality measured in terms of new MWh is a poor proxy for measuring the tons of carbon emissions avoided. *Therefore, we recommend that CEQ consider having Agencies more directly measure actual changes in emissions on the electric grid resulting from CFE procurement, investments in on-site generation, and other actions (e.g., load management).*⁷¹ Measuring avoided emissions directly,

[Accounting Concept You May Not Have Heard of: the Attributional Consequential Distinction](#), GHG Management Institute, March 2021, at 1-5. Enrique Gutierrez, Julia Guyon, Craig Hart, Zoe Hungerford, and Luis Lopez, [Advancing Decarbonisation Through Clean Electricity Procurement](#), International Energy Agency, November 2022, at 12-14, 23-25, 54-65, and 72-73. Roger Ballentine, Patrick Falwell, Liana Biasucci and Neil Fisher, [Modernizing How Electricity Buyers Account and are Recognized for Decarbonization Impact and Climate Leadership](#), Green Strategies and The NorthBridge Group, August 2022, at 32-45.

⁶⁸ An Agency could theoretically achieve a CFE Score of 100% and zero Scope 2 market-based emissions by purchasing EACs within the same regional grid that match an Agency’s hourly consumption with little or no reduction in actual carbon emissions on the electric grid.

⁶⁹ The *Scope 2 Guidance* recognizes that changes in Scope 2 inventories may not accurately reflect actual emissions reductions and was designed to calculate avoided emissions. Meanwhile, the *Scope 2 Guidance* notes that calculating avoided emissions would provide “strategic benefits” including identifying where low-carbon energy generation can have the biggest impact. (*Scope 2 Guidance*, at 28 and 52).

⁷⁰ Analyses have demonstrated that an additional MWh of CFE can have widely different carbon emissions impacts depending on the timing and location of when that CFE is produced. For example, WattTime found that an Illinois wind project can have three times the emissions impact as a California solar project. (Henry Richardson, [Accounting for Impact, Refocusing GHG Protocol Scope 2 Methodology on Impact Accounting](#), WattTime, September 2022, at 6-7.) Similarly, Salesforce concluded that a West Virginia solar project had almost three times the emissions impact as a California solar project (Salesforce, [More than a Megawatt: Embedding Social & Environmental Impact in the Renewable Energy Procurement Process](#), October 2020, at 10), and a Boston University study found that a South Dakota wind project would have two to three times the emissions impact as a similar project in New England. (<https://www.bu.edu/sustainability/projects/bu-wind/>).

⁷¹ Methods to calculate avoided emissions have been explored by organizations including Tabors Caramanis Rudkevich, REsurety, WattTime, and others. An avoided emissions approach has already been adopted for renewable energy procurement by diverse organizations including Salesforce, Nucor, Boston University, Clearloop, Edison Energy, and others. Avoided emissions, like market-based emissions inventories, can be calculated more accurately using more granular location and time data, but this methodology can also be calculated with publicly available data sources that cover the globe including eGRID non-baseload factors, EPA’s AVERT, and UNFCCC’s Harmonized IFI Default Grid Factors. (Henry Richardson, [Accounting for Impact](#), WattTime, September 2022.)

and as accurately as possible, will help prioritize Agency procurement decisions and other interventions.⁷² Prioritizing decisions that reduce actual emissions can be done in combination with matching EACs with Agency consumption (e.g., when selecting the appropriate CFE technology or CFE site location within a regional grid) as well as inform Federal Government decisions about how best to prioritize projects across market areas and maximize carbon emissions reductions at the lowest possible cost.^{73, 74} Since the Federal Government operates throughout the United States, avoided emissions estimates can be used to identify which location to invest in first, and prioritize the staging of technology investments in each region to maximize emissions reductions.^{75, 76}

⁷² Other buyer actions could include investments in energy storage, load management, transmission, etc. that could impact grid emissions.

⁷³ “There are two primary metrics we use to measure our progress towards 24/7 CFE and our associated impact. The first, CFE Score, measures the degree to which each hour of our electricity consumption on a given regional grid is matched with CFE on an hourly basis. This is calculated using both carbon-free electricity under contract by Google, as well as CFE coming from the overall grid mix. The second metric, Avoided Emissions (tCO₂e), measures the carbon emissions impact of our procurement decisions, and is used to help prioritize our procurement activities across time and geography” and “While we are focused on moving toward round-the-clock CFE at every site, we also use a secondary emissions-related metric to differentiate the grids where we operate and prioritize both the grids and the hours where early action will have a greater impact on reducing carbon emissions. This is important because the CFE Score metric can mask significant variation in carbon intensity of electricity grids, as well as the sources of those grid emissions.” Google, [24/7 Carbon-Free Energy: Methodologies and Metrics](#), February 2021, at 6 and 12.

⁷⁴ On December 13, 2022, a group of global corporations and investors, including Akamai Technologies, Amazon, General Motors, Hannon Armstrong, Heineken, Intel, Meta, Rivian, Salesforce, and Workday, launched the [Emissions First Partnership](#), calling for a shift in corporate carbon accounting standards toward an emissions impact-centric system with a focus on maximizing greenhouse gas reductions.

⁷⁵ Mark Dyson, Sakhi Shah, and Chaz Teplin, [Clean Power by the Hour Assessing the Costs and Emissions Impacts of Hourly Carbon-Free Energy Procurement Strategies](#), RMI, July 2021, at 17.

⁷⁶ If hourly incremental supply and marginal emissions factors are not available, the annual incremental carbon-free MWh generation and EPA’s most recent AVERT annual avoided CO₂ emissions factor could be used as a proxy for avoided emissions. RESurety and WattTime announced in January 2023 that both organizations plan to increase the availability of high-quality marginal emissions data. These data can support impact-based decision making and more accurate carbon accounting.

III. Concluding Comments

We recognize that Agencies may need some flexibility while the necessary data to improve accuracy becomes available and calculation methodologies develop and become more automated. To the extent necessary, the Federal Government could play a valuable role in convening expert working groups to develop best practices to measure CFE on a 24/7 basis, emissions associated with electricity use, and to calculate avoided carbon emissions. The Federal Government could also help compile and harmonize the public data needed to support more accurate measurements.⁷⁷ The Federal Government also has an opportunity to use its immense buying power to advance the development of granular certificate markets that allow Agencies and other buyers to pursue hourly matching in a more cost-effective manner.⁷⁸ We, and other technical experts, would welcome the opportunity to work with the Administration on these important efforts.

Emerging next generation procurement approaches, like those suggested by E.O. 14057, seek to support the President's electric sector decarbonization goals, and Agencies should have pathways to disclose the results of those interventions more clearly. Attempting to measure emissions associated with electricity use and decarbonization impact, even if not perfectly, is a prerequisite. Better accounting and reporting, as recommended with the Carbon Facts label, can distinguish higher-impact procurement approaches from lower-impact approaches, can allow the most impactful Agency strategies to be recognized, and can help commercialize and deploy the expanded suite of carbon-free technologies needed to accelerate decarbonization of the electric grid.

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⁷⁷ See Comments of CATF, NorthBridge, and Green Strategies, [Docket ID No. EPA-HQ-OAR-2022-0878](#), January 18, 2023.)

⁷⁸ Granular certificate trading allows buyers to trade surplus EACs or purchase EACs when needed in specific hours, which effectively allows for aggregation of CFE generation to meet aggregated demand profiles (not just an individual Agency's consumption).

Attachment A

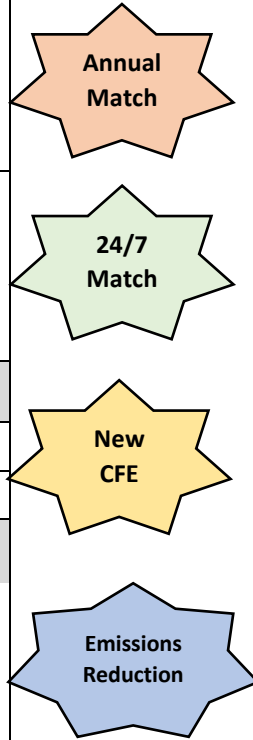
Carbon Facts 1.0 (Illustrative)		
Reported for Prior Calendar Year		
		Annual Consumption __ MWh
Attributional Information to Better Reflect Emissions from Electricity Use <small>(Tied to timing and location of buyer consumption)</small>	Modified Market-Based Inventory __ tons <small>(Annual Match)</small>	<u>Market Boundary</u> __ Within or Delivered to Same Regional Grid / BA
	CFE Score (Annual) __%	
Consequential Information to Measure Decarbonization Impacts from Buyer Actions <small>(Not necessarily tied to timing and location of buyer consumption)</small>	Modified Market-Based Inventory __ tons <small>(Monthly or Hourly Match)</small>	<u>Market Boundary</u> __ Within or Delivered to Same Regional Grid / BA __ Same LMP Load Zone
	CFE Score (Hourly) __%	
Description of Decarbonization Actions		
Incremental Total CFE (by resource type)		__ MW / __ MWh
Describe Other Buyer Actions		
Avoided Emissions		
Avoided Emissions [AE] (after interventions)		__ tons
Carbon Emissions Baseline [CEB]		__ tons
Avoided Emissions Score [AE/CEB]		__%

Attributional Information to Better Reflect Emissions from Electricity Use

(Tied to timing and location of buyer consumption)

Consequential Information to Measure Decarbonization Impacts from Buyer Actions

(Not necessarily tied to timing and location of buyer consumption)



Notes:

To calculate Avoided Emissions (AE), if hourly incremental supply and marginal emissions factors are not available, the annual incremental carbon-free MWh generation and EPA’s most recent AVERT annual avoided CO₂ emissions factor could be used as a proxy.

Carbon Emissions Baseline (CEB) equals a buyer’s consumption at a specific time and location multiplied by the marginal emissions factor at that time and location. If hourly customer load and marginal emissions factors are not available, annual load and average eGRID fossil, or alternatively non-baseload, emissions factors could be used as a proxy for marginal emissions associated with consumption absent any buyer contracts.

Agency compliance should be based on actual load and actual CFE supply (not forecasts) with appropriate audit procedures in place. But as granular data and certificates develop, if hourly data is not available, reported *annual* market-based inventories and *annual* matching CFE Score potentially could be converted automatically with a standardized computer model to corresponding estimated *hourly* market-based emissions inventories and *hourly* CFE Score using customer load profile and resource supply profile data by location.