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Clean Energy Baselines for Load-Serving Entities Under a Federal Clean Energy Standard

Center for Resource Solutions · Clean Energy Accounting Project (CEAP)

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Executive Summary

Leading concepts for a Federal Clean Energy Standard (CES) are embracing designs that measure progress made by load serving entities (LSEs) towards clean energy targets for retail sales against customized starting points that recognize existing clean resources. This approach has certain benefits, but it also poses some challenges when considering how to define these customized starting points (called baselines) and implement the program. Policy makers should understand these issues when crafting legislation and designing compliance programs. This paper evaluates these key issues in detail and makes recommendations that will help facilitate the development of consistent and credible baselines while utilizing existing market infrastructure.

KEY ISSUES

These decisions will have varying impacts on the baseline calculation methodology and the effect the policy may have overall.

1. CES Policy Framework

Baselines developed for a Federal CES will depend in part on the definition of eligible resources, the program's implementation schedule, the baseline's time frame, whether the baseline will be a current or historical year, and the scope of the market.

- The criteria used to define eligible generation directly impacts how much eligible generation will be in each LSE's baseline and inversely, how aggressively LSEs will have to work to meet program targets.

- Implementing the program in phases may justify the design of more a simplified initial baseline estimation method, which could then be refined as enhancements are added to existing tracking infrastructure.

POLICY DESIGN ASSUMPTIONS

- LSEs will be the regulated entity subject to the CES

- Retail sales of clean generation attributes to LSE customers will be used to establish baselines and demonstrate compliance

- Establishing the baseline period as an average of multiple years is typically favored when significant variability can be seen from year to year but selecting a single year often makes for simpler reporting.

- Adopting the current year as the baseline could result in market transactions that manipulate the perception of existing resources and necessitate a lag while current year data is made available. A baseline year at least two years in the past could be easier to document.

- Current electricity market activity can cross regional and national borders. The scope of the market an LSE can use to comply will inform whether cross boundary transactions are included or excluded from baselines.

2. Purchases, Transactions, and Instruments

Electric power markets include significant complexity and variability. Different generation ownership structures and electricity purchases, transactions, and instruments may or may not be counted in baselines and calculation approaches must be defined for individual generation and transaction types. Key recommendations for addressing generation and transactions in LSE baselines include:

- Ownership of generation should not be used to justify a resource's inclusion in the owner's baseline as, on its own, it does not demonstrate delivery of generation attributes to retail customers.

- Specified purchases of CES-eligible generation for retail sales should be included in an LSE's baseline.

- RECs and certificates for eligible non-renewable resources should be required for owned generation and specified purchases to be included in a baseline. Where certificates are not issued, proof of ownership and attribute retention or contracts that demonstrate delivery of generation attributes should be required.

- Unclaimed eligible generation attributes should be assigned to the "residual mix" and allocated to LSE baselines based on each LSE's share of unspecified generation in that region.

3. Generation used for a specific purpose or program

Some clean energy generation is used for state Renewable Portfolio Standard (RPS) programs and voluntary renewable energy (VRE) sales. The Federal CES baseline calculation methodology should specify whether LSEs can count RECs used for these purposes in their baselines.

- A significant amount of existing renewable generation in the U.S. is used for state RPS compliance. Including it in baselines and when demonstrating compliance may help LSEs achieve their targets faster while excluding generation claimed for state compliance from the baseline could allow state programs to provide "incremental impact."

- Voluntary demand is a key driver of renewable energy development in the U.S. A Federal CES should do no harm to this market and ensure that new voluntary generation continues to have the same value to market participants.

4. Best practices for establishing baselines

There are a number of best practices for designing baselines that have been proven effective at the state level and in other target-based policies. These include:

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- Design a clear baseline calculation methodology that is consistent with how compliance is determined.

- Leverage calculation approaches and tracking infrastructure being used by existing state compliance and voluntary programs.

- Specify which existing data sources can be used and design methodologies to document specified purchases that are not currently issued certificates.

- Avoid designing artificially low baselines by allocating unclaimed eligible retail sales to LSEs based on a new protocol for calculating a regional residual mix.

- Ensure that if load served by behind the meter (BTM) generation is counted towards compliance, it is factored into LSE calculations of retail load served.

Policymakers have a unique opportunity to move forward with a Federal CES as well as a wealth of existing programs and market practices that can be leveraged to ensure an effective program with minimal disruption to U.S. electricity markets. Legislative language for a Federal CES must allow the implementing agency to address existing data availability and inconsistency issues and develop a baseline methodology that is consistent, avoids double counting, utilizes existing accounting tools and infrastructure to the extent possible, and does not harm state and voluntary programs in order to achieve desired outcomes.

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Introduction

Baselines may be a key component of a Federal Clean Energy Standard (CES)[1] for retail sales of clean energy by load-serving entities (LSEs). There is existing market infrastructure and data that can be used to calculate baselines, but they are incomplete and inconsistent for the purposes of a Federal CES. Data availability and consistency challenges must be anticipated and solved in order to move quickly. This paper identifies key issues to be addressed in a consistent CES baseline methodology for LSEs.

WHEN IS IT NECESSARY TO CALCULATE A BASELINE?

A baseline is a starting point from which progress towards a target will be measured. CES targets that measure progress from a starting point of zero will not require a baseline calculation. Examples of this include:

·   A fixed percentage or amount of new and existing clean energy (e.g., 80% eligible resources by 2030); and

·   A fixed percentage or amount of clean energy from "new" generating facilities starting operation on or after the start date of the program.

Both are common in state Renewable Portfolio Standard (RPS) programs. In the first example, the baseline is zero total clean energy, but LSEs can use existing clean energy to reach a fixed target. In the second, the baseline is zero because existing clean energy cannot be counted and eligible clean energy has not yet been generated. In both cases, LSEs simply count everything that is defined as eligible for compliance.

A baseline methodology *would be* needed if the CES target is set as an increase over some intermediate point. Examples include:

·   A fixed percentage increase above existing clean energy (e.g., 10% increase from 2020 by 2025);

·   Variable percentage increase above existing clean energy (e.g., for LSEs <50% clean, 5% annual percent increase; for LSEs >50% clean, 3% increase);

·   A fixed or escalating percentage increase above the previous year's results (e.g., 2% increase from 2021 by 2022, 2% increase from 2022 in 2023, etc.).[2]

KEY ISSUES FOR BASELINE METHODOLOGIES

The remainder of this paper discusses issues that are relevant when baselines must be calculated to accurately reflect the retail sales of clean energy (or clean generation attributes delivered) by LSEs to their end-use customers. Baseline calculation methodologies will be affected by the selected CES policy framework, how clean energy is transacted, claims made for other programs, and calculation and data issues.

CES Policy Framework

In order to facilitate the calculation of consistent and credible baselines, the CES policy framework will need to define:

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1   In this document, the term CES refers to both a compliance standard (via "regular order") and a clean energy payment or incentive program for LSEs being discussed in the context of budget reconciliation and the American Jobs Plan.

2   If the target is a percentage increase in new clean energy each year or by a certain year, then the first year of the program is the baseline and the compliance methodology for year one serves as the baseline methodology.

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- *Regulated Entity.* This paper assumes that the LSEs[3] will be subject to the CES.

- *Regulatory Metric.* This paper assumes that retail sales of clean generation attributes to LSE customers will be used to establish baselines and demonstrate compliance.[4] Measuring this requires tracking clean energy attributes using renewable energy certificates (RECs)[5] and other similar instruments owned by the LSE and retired on behalf of its customers.

- *Resource Eligibility.* Clean energy must be defined in terms of generation fuel types, technologies, facility size, and facility location.

- *Implementation Schedule.* Implementation of the CES could occur all at once with consistent metrics, targets, and eligibility rules or in different phases, with different targets, metrics, and/or eligible resources, affecting baseline calculations.

- *The Baseline Timeframe.* The baseline can be calculated for a single base year (e.g., 2020) or as a multi-year average (e.g., 2018–2020).

- *A Current or Historical Baseline.* CES legislation passed in 2021 could establish 2021 as the base year, or a past year or multi-year period. Adopting the current year could allow LSEs to change or even "game" their baselines through different market transactions. Data availability is likely to be less of an issue if the

baseline period is at least two years in the past due to lags in reporting.

- *Market Scope.* The CES should describe whether the compliance market will be a single national market or multiple regional markets. It should also address whether imports and exports across national or regional boundaries will be factored into LSE baselines.

Purchases, Transactions, and Instruments

When developing the baseline calculation methodology, the implementing agency will need to determine what generation ownership structures and electricity purchases, transactions, and instruments are included, and how individual generation and transaction types are accounted for and treated. Purchasing is affected by market structure, accounting and trading infrastructure and tools, and state compliance program design.

Different generation and transaction types may include the following:

1. LSE-owned Generation

Owned resources may include both eligible and non-eligible resources. Because ownership does not necessarily determine use of generation attributes (e.g., RECs), demonstration of resource ownership alone should not suffice for inclusion in a baseline for clean energy sales to retail

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3   LSE is a broad term and may include investor-owned utilities, publicly owned utilities, cooperatives, municipal utilities, competitive retail electricity marketers, community choice aggregators, and others. They may be different sizes, own and control different assets, and transact and participate in electricity and renewable energy markets and state programs differently. These differences may affect what data is available, how it is reported, and consequently how baselines might be determined.

4   This method, and RECs, are industry common practice and adopted by existing state RPS programs and the voluntary market. We describe alternative measurement options in a separate brief: *Measuring What an LSE Manages Under a Federal Clean Energy Standard (July 2021).* Available for download at: https://resource-solutions.org/document/072821/. Each treats electricity contracts and generation attributes differently and which metric is chosen will determine what a baseline includes.

5   RECs were created more than 20 years ago to track and account for the attributes of renewable energy generation because the nature of the shared electric grid does not facilitate tracking the physical delivery of renewable power and associated emissions to customers.

customers. Wholesale sales of specified and unspecified owned generation must be properly accounted for as described below.

2. Power Purchases

LSE power purchases may include both specified purchases, where the fuel type of the generating resource is known, and unspecified purchases, where it is not. Both specified and unspecified purchases may also include generation that has historically been tracked and issued certificates (e.g., RECs), as well as generation for which certificates did not exist in the baseline period.

Specified power purchases include:

• Renewable energy purchases that include both the energy and the RECs ("bundled renewable energy purchases"); and

• Other CES-eligible purchases that convey the attributes (certificates, where issued).

Across the country, renewable energy generation is tracked with RECs. Other resource types, such as certain hydropower and nuclear, are tracked using certificates only in specific regions, including the Northeast and Mid-Atlantic, where all-generation certificate tracking systems exist. Specified purchases of these resources are demonstrated outside of these regions based on contract language that identifies the resource type, and conveyance of the attributes in the contract or evidence that the attributes were not otherwise transacted.

Specified purchases of CES-eligible generation for retail sales contribute to a baseline for clean energy sales to retail customers. Purchases of unspecified power should be assigned the "residual mix" of untracked or unclaimed generation in the region, and any portion of this that is determined to be eligible can be allocated to LSE baselines. The baseline methodology will need to identify the regional residual mix, where it is not already calculated by an existing all-generation certificate tracking system.[6] Unspecified purchases include:

• Electricity-only contracts from known generators (even if they are eligible resources) that do not include the attributes or RECs or where they have been sold to a different buyer;

• Spot market, power exchange, or other purchases that represent a mix of generation resources and do not include associated attributes or RECs.

There may be generator-specific market purchases and potentially different mechanisms for tracking generation across different wholesale markets and for different state programs, such that not all market purchases may be considered unspecified. See "Best Practices for Establishing Baselines" (p. 8) for more information on this topic.

3. REC Purchases

LSEs may purchase RECs—which represent renewable energy generation attributes—separately from or without the underlying power. These are called "unbundled" REC purchases. LSEs may also own "banked" RECs associated with previous renewable energy generation that they have held for future use in compliance markets.

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6   By tracking all generation and associated emissions attributes, the New England Power Pool Generation Information System (NEPOOL-GIS), the New York Generation Attribute Tracking System (NYGATS), and the PJM Generation Attribute Tracking System (PJM-GATS) automatically calculate residual and system mixes and emission rates. The residual mix is calculated as the weighted average of resource types and emission rates for all unclaimed certificates. This rate is applied to load that has not been matched to certificates (i.e., unfulfilled load) as Residual Mix Certificates, without being actively sourced by the account holder to meet their load.

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These unbundled attributes may be paired with unspecified or other specified power to qualify under different state and voluntary renewable energy programs, and as clean energy for retail sales in an LSE's baseline for a Federal CES.

4. Wholesale Sales

Clean energy delivered by an LSE to its retail customers is often supported by wholesale transactions. Those transactions can affect whether retail sales actually deliver the attributes to retail customers. For example:

- If an LSE generates or purchases specified renewable energy but then sells the RECs, this generation becomes "unspecified" and should not count as clean energy delivered to customers in its baseline.

- If an LSE generates or purchases clean energy but then sells at wholesale bundled energy and attributes, the generation should not count in its baseline for retail sales.

- On the other hand, if an LSE generates or purchase renewable energy but then sells unspecified electricity at wholesale, while retaining the RECs for pairing with other power that it delivers to retail customers, those attributes may be counted in its baseline for retail sales.

Generation Used for a Specific Purpose or Program

Some eligible generation will have been used or claimed for a specific purpose or program. The two categories where claims have already been made are:

- *State RPS REC retirements.* States that have already adopted an RPS require covered LSEs to include renewable energy in their retail supply portfolio. Compliance is verified by the LSE acquisition and retirement of RECs. LSEs have likely already claimed a large portion of existing renewable generation for RPS compliance in the baseline year. The baseline calculation methodology should specify whether LSEs can count RECs used for this purpose in their baselines.[7] If generation claimed for state compliance is excluded from eligibility in the baseline and when demonstrating compliance, it could allow state programs to provide "incremental impact."

- *Voluntary renewable energy (VRE) sales.* A significant amount of renewable energy is purchased voluntarily by end-use consumers in the U.S. These include many large corporations meeting their own social and environmental goals, as well as smaller commercial and residential consumers who have supported the demand for more renewable energy through their voluntary actions. Alongside state renewable mandates, this voluntary demand is a key driver of renewable energy development in the U.S. and should be maintained. Historically, these buyers are motivated by a desire to make a difference above and beyond what is required by mandate or regulation—a quality called "regulatory surplus." Some VRE is delivered to retail customers by LSEs via a differentiated green power

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7   Note that REC retirements or generation used for RPS compliance might be different from total RPS compliance, depending on LSE use of alternative compliance payments, multipliers, banking, and other available compliance mechanisms.

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product or tariff.[8] The baseline methodology should specify whether LSEs can count RECs used for these voluntary sales in their baselines. Claims and benefits for voluntary buyers, and specifically regulatory surplus, of existing renewable generation appear to be the same whether voluntary purchases are included in an LSE baseline or not.[9] However, it is important that new VRE purchases not be counted toward compliance, in order to ensure that the Federal CES does not harm the voluntary market for renewable energy.[10] To the extent that the baseline methodology and compliance determination should be consistent (see below), VRE should either not be included in the baseline or if it is, VRE should not be counted toward compliance.

Best Practices for Establishing Baselines

There are a number of best practices for designing baselines that have been proven effective at the state level and in other target-based policies. The following examples explore how they would apply to a Federal CES being implemented today:

1. LSEs need a clear baseline calculation methodology

Assuming that a CES will credit LSEs for eligible clean energy sales to retail customers prior to the adoption of legislation, LSEs will need direction on how they calculate this baseline using existing and credible data. The methodology must define what generation and transactions are being measured, how, and by whom. Provisions for missing data must also be developed to address the limited availability and significant inconsistencies across data sources.[11] Frequency of baseline calculations may need to be addressed if the CES design calls for regular updates.[12]

2. The baseline methodology should be consistent with how compliance is determined.

The baseline calculation and compliance determination should measure the same thing in the same way, to the extent possible. This apples-to-apples comparison is the only way to ensure a true assessment of progress. One exception would be if existing VRE generation is included in the baseline, new VRE generation should not be counted toward compliance in order to protect voluntary demand for renewable energy in the U.S.

3. The baseline methodology should be consistent with existing state compliance and voluntary programs.

The availability of existing data for the baseline generally depends on how Federal CES compliance compares to existing state RPS compliance and voluntary programs in which LSEs may

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8   Not all VRE is acquired from LSEs. Large consumers, in particular, have been very successful in purchasing renewable energy directly from generators, and many consumers, small and large, purchase solar either through rooftop installations or from community solar projects. Their LSEs in these cases would have no claim on the renewable energy attributes, unless otherwise specified.

9   Where existing voluntary renewable energy generation is included in the baseline, an increase in retail sales of clean energy for Federal CES compliance would be beyond (or surplus to) the baseline and the level of existing voluntary generation. So voluntary benefits for that existing generation remain unchanged. On the other hand, where existing voluntary generation is excluded from the baseline, it would not affect compliance at all, and again voluntary benefits remain unchanged.

10   Any new voluntary generation used for compliance with a Federal CES would not be surplus to regulation and voluntary sales would subsidize compliance. That should be avoided to maintain voluntary demand.

11   Data may not be available because generation is not specifically tracked or because an LSE is new or short-lived, which may be more prevalent in certain parts of the country due to market structure.

12   For example, if the target increases as a percent of the LSE's performance in the previous compliance period.

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participate. If they are very different, there may be a difference between the baseline calculation, which must utilize existing data sources, and the compliance determination, which may rely on new compliance instruments, tracking and reporting. Therefore, maintaining consistency with these programs will enable more accurate tracking over time.

4. Baseline calculations should use existing tracking system data to the extent possible.

One question of critical importance is whether there are existing tracking instruments to measure the baseline. Currently operating regional tracking systems have wide geographic coverage and store REC data for most renewable generation, which can be used to help establish a baseline. Some tracking systems—specifically those serving New England, New York, and the PJM region—already track generation from all generators dispatched by the regions' control area operators, including nuclear and fossil-fired generators. However, there are limitations to other tracking systems, including:

- Nuclear generation is not tracked in systems that focus only on renewable energy.

- Renewable generators in states without an RPS may not have registered with a tracking system unless they sell to the voluntary REC market, so certificates that might be used to demonstrate LSE retail sales may not exist.

- Because states with an RPS have different restrictions on eligibility, some clean resources, such as certain hydro generators, may not be registered and tracked.

- Generation from certain small, distributed, and/or behind-the-meter (BTM) generators,

for example, may not be tracked and allocated to LSEs.

For compliance with a Federal CES going forward, existing tracking systems can adapt relatively easily. They can begin issuing certificates to new resource types with sufficient data and support from generators and control area operators or balancing authorities.

5. Alternative baseline proofs are available if certificates do not exist.

Even where certificates are not issued, LSEs may be able to claim specified clean generation in their baselines by proving ownership of eligible generation and that there has been no further sale of those attributes, or by showing their purchase contracts with eligible generators where the attributes were conveyed or cannot otherwise be transacted. A consistent methodology should be established—specifying the circumstances under which different generation may be assigned to an LSE baseline—and specific data sources should be identified where possible. It is important to ensure that two or more LSEs are not claiming the same generation resources for their baselines.

6. Adjust the baseline upwards to account for unallocated eligible retail sales.

For a historical baseline, untracked and unallocated generation attributes, if they are to be counted, must be allocated to LSEs without using certificates. Otherwise, the baseline, both for the LSE and for the program as a whole, will be "artificially" low. This will result in the CES having no impact in its first several years as unallocated existing eligible generation is used for compliance.[13]

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13 Even where a portion of residual mix attributes is included in an LSE baseline under a Federal CES, this may not represent the LSE's legal ownership of those generation attributes as property rights (as REC ownership does, for example).

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One way to do this is to calculate a residual mix (see below).

7. Establish a protocol for calculating a regional residual mix.

A regional "residual mix" is a weighted average of the attributes of unclaimed and unallocated generation that has not been issued certificates in a tracking system and that is not contractually traceable to LSEs. This would represent unspecified generation that has been traded bilaterally or sold into regional wholesale electricity markets, including potentially both eligible and ineligible generation. This regional "residual mix" of generation attributes can then be assigned to LSEs' "unfulfilled" load (meaning the MWh sales that have not been matched with attributes), thereby replicating the functionality of all-generation certificate tracking systems in the Northeast and Mid-Atlantic. Any eligible generation thus included in this residual mix should be allocated to LSE baselines based on each LSE's share of unspecified generation in their region. The baseline methodology should specify an approach to this calculation and allocation that is consistent on a regional basis. Assigning a residual mix would also be useful for annual compliance verification because it ensures that all generation is being counted and assigned attributes.

8. Adjust for load not served by LSEs.

If policymakers want to include in the baseline eligible BTM clean generation consumed onsite or any other clean energy that is not delivered by the LSE, the same amount should be added to LSE load used for the baseline calculation.

9. Specify which data may be used.

A number of data sources are currently available to calculate LSE baselines. They include LSE self-reported data, state program data,

data from Regional Transmission Organizations, Independent System Operators and other control area operators, generation attribute and REC tracking system data, and other public data sources, e.g., the U.S. Energy Information Administration. These vary in scope, completeness, transparency, publication frequency, and oversight and verification, and hence may not be consistent with each other.

Conclusion

Policymakers have a unique opportunity to move forward with a Federal CES. If needed, existing tracking systems, data sources, transaction types, and allocation methods can support the development of credible and consistent LSE baselines that prevent double counting, avoid disruptions to U.S. electricity markets, and do no harm to state and voluntary programs. Legislative language for a Federal CES must allow the implementing agency to address data availability and inconsistency issues when designing a baseline calculation methodology to ensure effective program design.

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