



CLEAN ENERGY
ACCOUNTING
PROJECT

Best Practices for Power Source and Emissions Disclosure

Background Report | August 2025

Introduction

The U.S. electricity sector is undergoing a significant transformation, driven by rising electricity demand and growing pressure to decarbonize. In this dynamic environment, Power Source Disclosure (PSD) programs help utilities and other suppliers inform customers about the generation sources and associated emissions from their electricity, enhancing transparency and enabling more informed decision-making and credible environmental claims.

Whether implemented through state mandates or offered voluntarily, PSD frameworks can vary in how they are implemented. Some states require product-specific labels that reflect the exact generation portfolio used for a particular retail product, while others rely on utility-wide averages. Disclosure formats and methodologies vary widely, including differences in treatment of Renewable Energy Certificates (RECs), unspecified power, emissions attribution, Renewable Portfolio Standard (RPS) interaction, and use of tracking systems. This variation affects comparability, opens the door to double-counting, and leaves many customers without access to reliable information.

The role of PSD is growing in importance as more customers—especially large commercial buyers—demand credible retail greenhouse gas (GHG) emissions information that can be used to meet accounting and reporting standards such as the Greenhouse Gas Protocol. Yet PSD must also be practical for utilities to implement and flexible enough to accommodate different market structures and reflect emerging trends such as 24/7 hourly matching. As of 2025, 25 U.S. states have generation disclosure requirements in place.¹

However, the vast majority of these programs mandate only utility-specific disclosure, not product-specific transparency. This limits the granularity and usefulness of the data for customers who want to understand the specific generation attributes associated with the product they've purchased. This backgrounder describes product-level disclosure, as opposed to utility-level disclosures, by showing how it treats—or fails to address—a common set of policy and technical challenges.

This backgrounder identifies practices in PSD across ten technical and policy areas, drawing on examples from state programs such as California, New York, and Rhode Island. Each section outlines existing state rules and implementation differences,

¹ Database of State Incentives for Renewables & Efficiency® (DSIRE), "Generation Disclosure," U.S. Department of Energy, NC Clean Energy Technology Center, accessed June 2025. <https://programs.dsireusa.org/system/program>

highlighting where alignment with procurement structures, tracking systems, and emissions frameworks is essential. The goal is to support improved PSD design that empowers customers, supports credible claims, and aligns voluntary and compliance markets across jurisdictions.

1. Purpose and Principles of Power Source Disclosure

Power Source Disclosure provides customers with information about the generation sources and GHG emissions associated with the electricity they use. The intent of these programs generally includes helping customers understand their electricity mix, supporting emissions accounting (particularly for Scope 2 reporting), and reinforcing transparency in clean energy markets. PSD programs may vary in format and intent but typically aim to provide at least some insight into the characteristics of electricity consumption.

Implementation across the United States is uneven. Some states have well-defined PSD requirements, while others have none. Among those with rules in place, methodologies differ widely in scope, attribution, and granularity. In many cases, disclosures are provided at the utility level, meaning they reflect the average characteristics of electricity supplied by the provider. Other programs require or permit more detailed, product-specific reporting based on contractual procurement and certificate data.

For example, California requires each Load-Serving Entity (LSE) to issue a Power Content Label (PCL) for each retail electricity product, grounded in procurement contracts and certificate retirement. The state's framework prohibits double-counting of GHG attributes and requires disclosure of unbundled RECs separately from electricity-based fuel mixes.² By contrast, Rhode Island requires utilities and retail suppliers to disclose fuel mix percentages using data from the New England Power Pool Generation Information System (NEPOOL-GIS), but this disclosure is generally presented at the supplier or utility level.³

New York's Environmental Disclosure Program provides utility-level labels derived from NYGATS data. While retailers may develop internal, product-specific labels, these are not publicly standardized.⁴ Maryland does not currently require PSD, but recent legislation (Senate Bill 1) sets new requirements that limit marketing of "green" electricity products to those backed by RPS-eligible RECs.⁵

These examples illustrate the diversity of PSD approaches in the U.S. Rather than reflecting a single model or set of best practices, current PSD policies span a

² California Public Utilities Code §§ 398.4(d), (e).

https://leginfo.ca.gov/faces/codes_displayText.xhtml?lawCode=PUC&division=1.&title=&part=1.&chapter=2.3.&article=14

³ R.I. Gen. Laws § 39-26-9(e). <https://webserver.rilegislature.gov/Statutes/TITLE39/39-26/39-26-9.htm>

⁴ New York Public Service Commission, Opinion 98-19, Case 94-E-0952. <https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7BF46FEA38-434A-4682-8FC8-797C0F26B2B3%7D>

⁵ Maryland General Assembly. Senate Bill 1 (Enrolled): Electricity and Gas – Retail Supply – Regulation and Consumer Protection. 2024 Regular Session, enrolled 23 Feb. 2024. <https://mgaleg.maryland.gov/2024RS/bills/sb/sb0001E.pdf>

spectrum from generalized, utility-wide disclosures to product-specific frameworks with detailed tracking and verification.

2. Energy Attributes and Contractual Relationships

At the core of PSD is the concept of energy attributes and certificates, which represent the environmental characteristics of electricity generation. These attributes are transferred through contractual relationships, and their proper assignment is essential for credible claims about the renewable content and emissions intensity of specific electricity products. Whether RECs are bundled with electricity or sold separately, PSD frameworks must clearly define how they are reflected in product fuel mixes and emissions profiles.

California's model requires separate reporting for unbundled RECs, RECs that are procured separately from the electricity. PCLs must disclose the percentage of annual sales derived from unbundled RECs apart from the main fuel mix and emissions intensity, ensuring they are not double-counted. California also recognizes a special treatment of "firmed-and-shaped procurements", where the emissions intensity of the substitute electricity must be reported. Retailers are also required to submit any proposed language describing unbundled RECs to the Energy Commission for review, ensuring accuracy and consistency in public-facing disclosures.⁶

Rhode Island also recognizes contractual complexities. Its rules require that any supplier selling renewable electricity directly to customers—such as through the Green-Up Program—must provide a dedicated energy source disclosure, even if the customer is also served or billed by the utility.⁷ This ensures that RECs procured outside of the utility's portfolio are accurately disclosed by the responsible party and not conflated with the utility's default mix.

Across these models, one theme remains clear: PSD must align emissions and fuel mix claims with underlying procurement structures. Clear distinctions must be made between bundled and unbundled products, voluntary and compliance markets, and the entities responsible for each offering. Without such clarity, there is a heightened risk of double-counting, inconsistent reporting, and weakened customer trust.

3. Tracking Systems

Tracking systems are regional or national registries that issue, record, and retire energy attribute certificates (EACs), such as RECs, to document the generation, ownership, and use of specific electricity attributes. These systems provide the verification infrastructure needed to ensure that PSD claims are accurate, auditable, and not double-counted. They provide the verifiable data needed to link electricity generation with specific retail claims, primarily through the issuance and retirement of EACs. These systems support transparency and credibility by allowing suppliers

⁶ California Energy Commission, Power Source Disclosure Frequently Asked Questions. <https://www.energy.ca.gov/programs-and-topics/programs/power-source-disclosure-program/psd-frequently-asked-questions>

⁷ R.I. Gen. Laws § 39-26-9(e); Rhode Island Code of Regulations, 810-RICR-40-05-3.

and regulators to confirm the renewable content of electricity products. However, while tracking systems are widely used for RPS compliance, their integration into state PSD frameworks remains inconsistent, and their potential in enabling full, product-specific disclosure is often underutilized.

Many states require the use of tracking systems but do not create disclosures that reflect actual retail products. For example, New York⁸ uses the New York Generation Attribute Tracking System (NYGATS) to produce utility-level emissions and fuel mix labels, but it does not require product-level reporting. Utilities may internally differentiate portfolios for specific customer groups, but the state's Environmental Disclosure Program stops short of requiring public disclosure for individual retail offerings. As a result, customers receive generalized information that may not align with the electricity product they are paying for, especially in cases where utilities offer multiple procurement options. Like New York, Rhode Island's⁹ rules recognize the value of tracking systems but do not mandate the differentiated reporting that customers need to make informed procurement decisions.

California's approach demonstrates how tracking systems can be more integrated into PSD.¹⁰ The state mandates the use of Western Renewable Energy Generation Information System (WREGIS) for validating renewable claims and links certificate retirement directly to the preparation of Power Content Labels. These labels must be issued for each retail product and reflect only electricity that has been contractually delivered or procured for that specific offering. While California does not require all-generation tracking, it has created a framework where tracking systems support product-level transparency and accountability.

In short, tracking systems are indispensable to credible PSD, but their potential is underutilized. States that want to improve the reliability and comparability of disclosure programs must ensure that tracking data—renewable and otherwise—is integrated into how product claims are substantiated and disclosed. Requiring tracking system use is not enough; rules must also address how that data is interpreted, reported, and verified at the product level.

4. Forms of Power Procurement

The way electricity is procured—whether through direct delivery, firm-and-shaped contracts, or system power—has important implications for how emissions and resource content are disclosed. Different procurement methods—such as directly delivered contracts, null power, and purchases through asset-controlling suppliers—each carry distinct implications for emissions attribution and certificate ownership. For PSD to offer meaningful and accurate information, it must reflect these distinctions transparently.

California's PSD rules provide detailed categorization of power procurement types. Directly delivered procurements, typically involving generation with a first point of

⁸ NY PSC Opinion 98-19, Case 94-E-0952.

⁹ Rhode Island Code of Regulations, 810-RICR-40-05-3.10(B). <https://rules.sos.ri.gov/Regulations/Part/810-40-05-3>

¹⁰ California Code of Regulations, Title 20, § 1394.2(b). <https://www.energy.ca.gov/sites/default/files/2021-07/Title%2020%20Updated%20July%2023%2C%202021.pdf>

interconnection within a California balancing authority or scheduled through a continuous transmission path, are assigned the emissions intensity of the generating facility. Firmed-and-shaped products, which combine RECs from an out-of-state renewable generator with substitute electricity delivered into the California grid, are treated differently: the substitute electricity carries its own emissions profile, and if it is not known, it is reported using the state's unspecified power emissions factor. California also accounts for null power, electricity from in-state renewable resources where the RECs have been sold off, by assigning a static emissions factor.¹¹

In Rhode Island, power procurement arrangements must also be accounted for in supplier disclosures. State regulations acknowledge that customers may engage in voluntary renewable energy programs outside the standard utility offering. As such, suppliers providing renewable electricity through programs like Green-Up are required to issue their own energy source disclosures. These rules emphasize that disclosure responsibilities follow the supplier-customer contractual relationship, even if the utility remains the billing entity.¹² This helps ensure that the attributes of different procurement structures are fairly and accurately represented in public-facing labels.

The variation in how states handle these contractual procurement methods underscores the need for clear PSD guidance that defines categories consistently. Many disclosure programs fail to distinguish between how power is procured, which leads to potential confusion and inconsistent emissions reporting.

5. RPS Power and Eligibility

RPSs are state-level policies that require electricity suppliers to obtain a specified share of their electricity from eligible renewable resources, usually demonstrated through REC retirement. The interaction between RPS requirements and PSD is often ambiguous and varies significantly across state programs. While both aim to increase renewable energy use and promote transparency, they serve different purposes. RPS rules are primarily compliance mechanisms, requiring electricity suppliers to procure a minimum percentage of renewable electricity, typically demonstrated through REC retirement. PSD, by contrast, is a customer-facing disclosure tool designed to inform end-users about the generation attributes and emissions profile of specific retail products.

One common area of confusion is whether and how RPS-qualified power should be reflected in PSD labels. In California, this issue is explicitly acknowledged in the required footnote on the Power Content Label. The label notes that “the eligible renewable percentage above does not reflect RPS compliance, which is determined using a different methodology.”¹³

Additionally, different utilities may allocate RPS-eligible resources differently across their retail offerings. Without clear rules requiring product-specific attribution of RPS

¹¹ California Energy Commission, Power Source Disclosure Requirements. See also California Code of Regulations, Title 20, § 1391–1394.

¹² Rhode Island Code of Regulations, 810-RICR-40-05-3.10(A). <https://rules.sos.ri.gov/Regulations/Part/810-40-05-3>

¹³ California Code of Regulations, Title 20, § 1394.1 – Retail Disclosure to Consumers.

generation, there is a risk that some customers will subsidize renewable procurement without receiving credit for it, or that claims will be overstated across multiple products. California’s approach of requiring separate product labels and explicit accounting of RECs helps reduce this risk, but similar protections are absent in many other states.

Rhode Island’s PSD rules, for example, do not include specific guidance on how RPS procurement should be reflected in energy source disclosures. Suppliers must disclose fuel mix information and NEPOOL GIS-derived emissions data, but there is no requirement to identify how much of the disclosed renewable content is attributable to compliance obligations versus voluntary procurement.¹⁴ This gap makes it difficult for customers to understand the provenance of reported renewables and whether they are supporting additional renewable energy generation.

6. Resource Type Categories

The classification of generation resources in PSD—such as by fuel type or eligibility for renewable programs—affects the clarity, usefulness, and comparability of disclosure labels for end-users. Customers often base procurement decisions on whether their electricity comes from fossil fuels, renewables, or other specific generation types. However, disclosure programs vary widely in the granularity of resource categories, with some states offering detailed subtypes and others relying on broad groupings that can obscure important distinctions.

California¹⁵ requires utilities to disaggregate both specified and unspecified power sources by detailed fuel type. Each Power Content Label breaks out categories such as coal, large hydroelectric, natural gas, nuclear, and RPS-eligible renewables like biomass, geothermal, small hydro, solar, and wind. This level of detail supports consumer understanding and aligns PSD with the state’s climate and clean energy goals.

Rhode Island similarly mandates specific resource breakdowns, requiring disclosures to report energy shares from nuclear, natural gas, oil, hydro, coal, and other NEPOOL GIS-reported sources.¹⁶

7. Unspecified Power

Unspecified power—electricity that cannot be traced to a known generator—poses particular challenges for emissions disclosure and highlights the need for consistent default treatment across jurisdictions. Without clear standards, emissions accounting for unspecified power can vary widely. California defines unspecified power clearly and assigns it a default emissions intensity based on CARB’s methodology—currently 944 lbs CO₂e/MWh.¹⁷ This standardized factor reflects a natural gas-like emissions profile and ensures consistency in disclosures.¹⁸ Most

¹⁴ Rhode Island Code of Regulations, 810-RICR-40-05-3.

¹⁵ Cal. Pub. Util. Code §§ 398.1–398.5 (West 2023).

¹⁶ Rhode Island Code of Regulations, 810-RICR-40-05-3.

¹⁷ CARB MRR Emissions Factor for Unspecified Imports, 2020–2024; California Code of Regulations, Title 20, § 1394.2

¹⁸ California Energy Commission PSD FAQs.

states do not offer explicit guidance for unspecified power, increasing the risk of inconsistent reporting and greenwashing.

8. Transmission and Distribution Losses

Transmission and distribution (T&D) losses represent the difference between electricity generated and electricity delivered to customers, raising important questions about how emissions should be reported and attributed. Whether disclosures reflect generation-level supply or net delivery to the customer can significantly affect emissions estimates and perceptions of product quality. Losses occur between the point of generation and customer delivery and are typically around 5% of total electricity flow in the United States, based on U.S. Energy Information Administration data.¹⁹

California addressed this issue through SB 1158, which mandates that suppliers must report loss-adjusted load and associated GHG emissions. These values are shown in a separate column on the Power Content Label called "Total Supplier Power Content," distinguishing retail sales from the total energy required to serve end-use demand.²⁰ This approach aligns with the Greenhouse Gas Protocol, which treats T&D losses as Scope 3 emissions and encourages separate disclosure.²¹

9. Behind-the-Meter (BTM) Generation

Behind-the-meter generation refers to electricity produced, and often consumed, on-site (e.g., by solar panels) creating distinct treatment considerations for PSD and emissions accounting. BTM generation is typically excluded from PSD, as it is not delivered through the utility system and lacks contract-based delivery attributes. However, as BTM generation grows, particularly among large commercial and industrial customers, its treatment in disclosures raises important policy questions.

For accurate Scope 2 greenhouse gas (GHG) accounting, companies are required to report the total electricity purchased from the grid without subtracting on-site generation; self-generated energy is instead reflected in Scope 1 emissions, while gross grid purchases define Scope 2 emissions.²² California's PSD rules explicitly exclude BTM generation serving on-site load from delivered electricity calculations.²³

10. Disclosure Frequency and Granular Matching

The timeframe over which PSD data is collected and reported—typically annually—shapes the alignment between disclosure programs and emerging expectations for more granular, real-time electricity and emissions data. Most PSD programs rely on annual reporting, which aligns with REC issuance cycles, RPS compliance

¹⁹ U.S. Energy Information Administration (EIA), How much electricity is lost in transmission and distribution in the United States? Available at: <https://www.eia.gov/tools/faqs/faq.php?id=105&t=3> (Accessed June 2025).

²⁰ SB 1158 (2022), California Legislative Information. <https://www2.arb.ca.gov/2022-senate-bill-1158-becker-josh-retail-electricity-suppliers-emissions-greenhouse-gases-chaptered>

²¹ Greenhouse Gas Protocol. Technical Guidance for Calculating Scope 3 Emissions (Category 3: Fuel- and Energy-Related Activities). World Resources Institute and World Business Council for Sustainable Development, 2013. Available at: <https://ghgprotocol.org/scope-3-technical-calculation-guidance>

²² Greenhouse Gas Protocol. Scope 2 Guidance: An Amendment to the GHG Protocol Corporate Standard. World Resources Institute, 2015, p. 36. Available at: https://ghgprotocol.org/scope_2_guidance

²³ California Code of Regulations, Title 20, § 1391(3).

frameworks, and Scope 2 accounting under the Greenhouse Gas Protocol. California and New York both require annual PSD disclosures. Rhode Island distributes disclosure labels quarterly, but still relies on a rolling one-year data period based on NEPOOL-GIS finalization.²⁴

However, interest in hourly and monthly data is growing, driven by emerging markets for 24/7 clean energy. In response, California has taken a pioneering step by becoming the first state to mandate hourly electricity disclosure. Under Senate Bill 1158 (2022), large retail suppliers will be required to begin reporting hourly procurement, load, and emissions data starting in 2028.²⁵

Conclusion

Power Source Disclosure is a vital mechanism for linking electricity procurement with environmental accountability in the shift toward decarbonization. Across the United States, PSD policies vary significantly in scope, format, and rigor—ranging from detailed, product-specific disclosures based on tracking systems to broad utility-wide averages with limited transparency. These differences stem from diverse policy objectives, administrative capacities, and market contexts. However, as demand increases for credible, emissions-aligned electricity—especially among large buyers and entities with reporting obligations—there is a growing need for PSD systems that offer timely, verifiable disclosures. Addressing definitional clarity, alignment between contractual and emissions claims, and technical considerations such as treatment of RECs, unspecified power, and temporal granularity will be key to ensuring PSD programs effectively support consumer understanding, environmental claims, and broader decarbonization efforts.

²⁴ Rhode Island Code of Regulations, 810-RICR-40-05-3.7(C).

²⁵ California Legislature. (2022). *Senate Bill No. 1158, Chapter 367*. An act to add Section 398.6 to the Public Utilities Code, relating to energy. Retrieved from <https://legiscan.com/CA/text/SB1158/id/2606961>