



Submitted via Federal eRulemaking Portal.

August 8, 2023

Michael Regan, Administrator
U.S. Environmental Protection Agency
WJC West Building, Room 3334
1301 Constitution Avenue NW
Washington, DC 20004

RE: Docket ID No. EPA-HQ-OAR-2023-0072. Comments of Center for Resource Solutions on New Source Performance Standards for Greenhouse Gas Emissions from New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units and Emission Guidelines for Greenhouse Gas Emissions from Existing Fossil Fuel-Fired Electric Generating Units

Dear Administrator Regan:

Center for Resource Solutions (CRS) appreciates this opportunity to comment on the Environmental Protection Agency's (EPA's) proposed revisions to new source performance standards (NSPS) for greenhouse gas (GHG) emissions from new, modified, and reconstructed fossil fuel-fired electric generating units (EGUs)¹ and GHG emission guidelines for existing fossil fuel-fired EGUs, under section 111 of the Clean Air Act (CAA), as published in the Federal Register (Vol. 88, No. 99) on May 23, 2023 ("Proposed Rule").

Our comments focus on proposed requirements for demonstrating use of low-GHG hydrogen for compliance, and questions and solicitations for comment in Sec. VII.K.3 (pg. 33328-31) of the preamble of the Proposed Rule. To summarize, for electrolytic hydrogen, energy attribute certificate (EAC) retirement must be required, and use of grid-connected and offsite renewable electricity should be permitted. We support facility age restrictions for generators of EACs and expect that geographic and temporal alignment of EACs with hydrogen production will likely be available in 2032. EGUs should also be required to obtain any and all renewable fuel certificates (RFCs) associated with the low-GHG

¹ In these comments, we use "EGU" as it is used in the Proposed Rule to refer to the regulated fossil-fired generating unit, not to be confused with generators of (low-GHG or renewable) electricity (and EACs or RECs) used for electrolytic hydrogen production.

hydrogen used for compliance. Finally, we strongly support independent third-party verification for qualifying low-GHG hydrogen production.

Background on CRS and the Green-e® certification program

CRS is a 501(c)(3) nonprofit organization, established in 1997, that creates policy and market solutions to advance sustainable energy. CRS provides technical guidance to policymakers and regulators at different levels on renewable energy and GHG program design, accounting, tracking and verification, market interactions, and consumer protection. CRS also administers the Green-e® programs. For over 20 years, the Green-e® Energy program has been the leading independent certification for voluntary renewable electricity products in North America. In 2021, the Green-e® Energy program certified retail sales of over 110 million megawatt-hours (MWh), serving over 1.3 million retail purchasers of Green-e® certified renewable energy, including over 309,000 businesses.²

General Comment

CRS generally supports strong GHG emissions standards for new and existing EGUs under section 111 of the CAA, including pathways to a best system of emissions reduction (BSER) that include co-firing with low-GHG hydrogen.

Comments and Recommendations related to Requirements for Demonstrating Use of Low-GHG Hydrogen

1. For EGUs relying on electrolytic hydrogen, renewable energy certificate (REC) or energy attribute certificate (EAC) retirement must be required to ensure that electricity inputs to hydrogen production are consistent with the low-GHG hydrogen standard for EGUs under this rule.

To avoid double counting, all renewable or other specified electricity procurement for production of electrolytic hydrogen used for compliance must be substantiated with retirement of associated RECs, or EACs issued for non-renewable resource types, where the generation sources of that electricity are registered in a regional renewable energy or generation attribute tracking system,³ or with contractual transfer and/or exclusive ownership and retention of all associated environmental attributes by the hydrogen production facility where the specified generation sources of electricity used for hydrogen production are not registered in a regional renewable energy or generation attribute tracking system.

² See the 2022 (2021 Data) Green-e® Verification Report here for more information: <https://resource-solutions.org/g2022/>.

³ For a map of Renewable Energy Certificate Tracking Systems in North America, see <https://resource-solutions.org/wp-content/uploads/2018/02/Tracking-System-Map.pdf>.

A REC, a type of EAC, is the legal instrument representing property rights⁴ to all environmental and other nonpower attributes associated with the generation of a MWh of electricity from a renewable resource on the grid. RECs are required to contractually demonstrate and verify delivery and use of grid-connected renewable electricity, and associated generation attributes, for all procurement, transactions, and retail claims.⁵ RECs are therefore required to establish exclusive use of renewable electricity by a hydrogen producer for hydrogen production. EACs, where issued, and contractual transactions of generation attributes are likewise required for electricity generation from non-renewable resource types and non-registered facilities, respectively, to prevent double counting of electricity generation.

2. Use of grid-connected and offsite renewable and low-GHG electricity for hydrogen production should be permitted, in addition to off-grid and co-located renewable electricity.

EPA should allow EGUs to demonstrate that electrolytic hydrogen is low-GHG hydrogen by demonstrating that zero-emitting electricity has been contractually and exclusively allocated to the electrolyzer's consumption.

In the U.S., grid-connected electricity generation is transacted and allocated to load on a resource-specific basis using contractual instruments. These transactions of specified power and contractual allocations to retail customers are legally enforceable, recognized and even required by state regulators across the country, despite differences in regulation and market structure. These instruments include generation attribute certificates (e.g. RECs) and certificate tracking systems, which enable exclusive delivery and use of low-GHG and other specified electricity and allow for consumers, e.g. electrolytic hydrogen producers, to reliably claim specified electricity input emissions.

⁴ See U.S. Federal Trade Commission (FTC) (November 27, 2007). *Guides for the Use of Environmental Marketing Claims; Carbon Offsets and Renewable Energy Certificates; Public Workshop*. Announcement of public workshop; request for public comment. Federal Register. Vol. 72, No. 227. Pg. 66095. Footnote 9. <https://www.govinfo.gov/content/pkg/FR-2007-11-27/pdf/FR-2007-11-27.pdf>

See U.S. Commodity Futures Trading Commission (CFTC). (August 13, 2012). *Further Definition of "Swap," "Security-Based Swap," and "Security-Based Swap Agreement"; Mixed Swaps; Security-Based Swap Agreement Recordkeeping; Final Rule*. Federal Register. Vol. 77, No. 156. pg. 48233-48235. <https://www.govinfo.gov/content/pkg/FR-2012-08-13/pdf/FR-2012-08-13.pdf>

See Weinstein, J. (Jan 2021). *What are Renewable Energy Certificates?* Futures and Derivatives Law Report, Volume 41, Issue 1. Thomson Reuters.

See CRS. (April 2023). *The Legal Basis of Renewable Energy Certificates*. v2.0. Footnotes 15, 21, 22, 35, 36, 38, 39, 44, and 49. Available at: <https://resource-solutions.org/wp-content/uploads/2015/07/The-Legal-Basis-for-RECs.pdf>.

⁵ U.S. Federal Trade Commission (FTC). (2012). *Guides for the Use of Environmental Marketing Claims; Final Rule*. Sec. 260.15. Available at: https://www.ftc.gov/sites/default/files/documents/federal_register_notices/guides-use-environmental-marketing-claims-green-guides/greenguidesfrn.pdf

U.S. Federal Trade Commission (FTC). (2015). *Letter from James A. Kohm, Associate Director, Division of Enforcement, Bureau of Consumer Protection, to R. Jeffrey Behm, Esq., Sheehy, Furlong & Behm, P.C.* February 5, 2015. Available at: www.ftc.gov/system/files/documents/public_statements/624571/150205gmpletter.pdf.

See CRS. (April 2023). *The Legal Basis of Renewable Energy Certificates*. v2.0. Available at: <https://resource-solutions.org/wp-content/uploads/2015/07/The-Legal-Basis-for-RECs.pdf>.

See Weinstein, J. (Jan 2021). *What are Renewable Energy Certificates?* Futures and Derivatives Law Report, Volume 41, Issue 1. Thomson Reuters.

3. Market infrastructure to support more precise geographic and temporal alignment of RECs/EACs with electrolytic hydrogen production, specifically hourly EAC alignment, will likely be available at the onset of the compliance period in 2032.

According to our recent report, *Readiness for Hourly: U.S. Renewable Energy Tracking Systems*,⁶ the energy attribute tracking systems will be able to provide the infrastructure needed for hourly energy attribute tracking for low-GHG hydrogen standards by 2032. Generator location is already tracked on RECs issued in all systems. All of the tracking systems have similar functionality in terms of issuance, tracking and retirement of certificates.

The Green-e® Energy program's 21-month vintage window for RECs—which includes the calendar year in which electricity use occurred, the last six months of the prior calendar year, and the first three months of the following calendar year—is commonly used as a minimum requirement for credible renewable electricity usage claims in the U.S. National sourcing of RECs is also acceptable for voluntary renewable electricity claims, creating markets that can scale renewable and clean generation over a larger area and making it more cost effective. However, depending on EPA's objectives, a narrower vintage requirement (i.e. more precise or hourly time matching of EACs to load) and/or a narrower geographic requirement (i.e. requiring that the sources of EACs be located in closer proximity to load) may be important for renewable electricity used for hydrogen production in particular.

CRS is in the process of developing a standard for green hydrogen transactions and programs under the Green-e® Renewable Fuels certification program. As a part of that process, we will evaluate different potential requirements related to temporal and geographic alignment of EACs with hydrogen production. CRS would be happy to share input from that process with EPA at that time.

It is important to consider, however, that rules regarding temporal and geographic alignment will determine the generation and load data needed for procurement to meet the low-GHG hydrogen standard and therefore affect which entity or entities can procure renewable electricity to meet the standard. Hourly alignment of EACs with hydrogen production lends itself to renewable electricity purchasing by hydrogen producers, as opposed to by EGUs on behalf of hydrogen producers, since EGUs may not have the information needed to do hourly matching.

It is also important to consider that the effectiveness of hourly matching may depend on whether “whole-plant” renewable electricity purchasing is required for electrolytic hydrogen production—meaning 100% of electricity consumption at an electrolyzer is matched with purchased zero-emissions electricity generation. This will also be evaluated as a part of our own green hydrogen standard

⁶ CRS. (June 2023). *Readiness for Hourly: U.S. Renewable Energy Tracking Systems*. Available at: <https://resource-solutions.org/document/061523/>.

development process for the Green-e® Renewable Fuels program. But, allowing partial-plant renewable electricity use or matching for low-GHG hydrogen production (where less than 100% of hydrogen production load is matched with renewable electricity) may undermine the incentive to produce hydrogen only in hours when purchased renewable electricity is operating by allowing hydrogen plants to continue to operate in hours when renewable electricity is not operating and cherry-picking load to match purchased renewable electricity. So, to implement hourly matching without whole-plant renewable electricity matching, EPA should carefully design the monitoring and verification requirements to ensure that hourly matching creates the intended incentive (e.g., by requiring proportional use by hour).

4. We support facility age requirements for generators of qualifying RECs/EACs used with hydrogen production.

In addition to vintage and geographic requirements, EPA should set restrictions on facility age for EACs/RECs to drive more production of clean electricity to meet new electrolytic hydrogen production load. For example, the Green-e® Energy program enforces a 15-year “new date” or facility age requirement for all renewable electricity generators supplying Green-e® certified renewable electricity and REC sales. However, a more restrictive facility age requirement may be appropriate for renewable electricity used for hydrogen production. This is also something that will be evaluated during the development of the green hydrogen standard under the Green-e® Renewable Fuels program over the next year.

In general, when evaluating different potential facility age restrictions, it is important to balance the intended effect of having electricity demand for hydrogen production drive new clean electricity generation, using a more restrictive requirement, with allowing clean electricity generators to serve the market for low-GHG hydrogen that can be used for CAA for a longer period of time, using a less restrictive requirement, potentially better enabling that market to affect clean electricity project development decisions.

5. EGUs should be required to obtain any and all renewable fuel certificates (RFCs) associated with the low-GHG hydrogen used for compliance, in order to prevent double counting where that hydrogen is mixed with non-low-GHG hydrogen or delivered through a shared distribution network/system for hydrogen. RFCs can also help operationalize and verify compliance with low-GHG hydrogen production standards.

Where hydrogen produced by different sources and using different fuel inputs is mixed together or delivered using a shared distribution system, it is necessary to track low-GHG hydrogen to consumers (e.g. EGUs) using RFCs or some other method, to ensure that low-GHG hydrogen is not double counted. Hydrogen RFCs identify the hydrogen generator and the fuel type for hydrogen production, e.g.

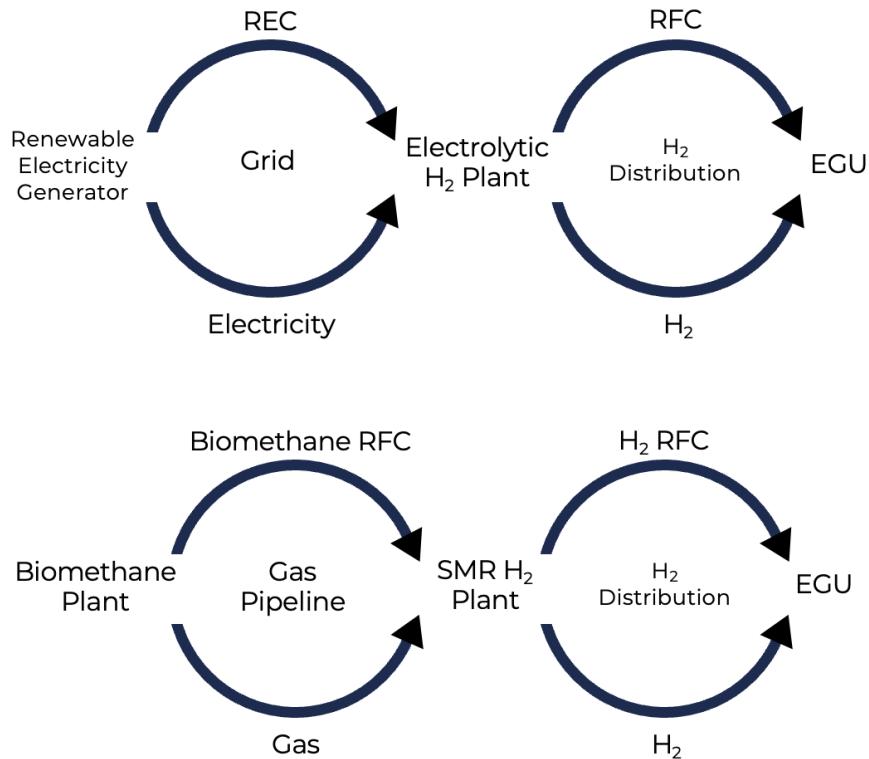
renewable electricity from wind, which can in turn be substantiated using EACs/RECs. Hydrogen RFCs can therefore be used by EPA to verify compliance with low-GHG hydrogen production standards for new and existing EGUs in the Proposed Rule. RFCs are also sometimes referred to as renewable thermal certificates (RTCs).

For hydrogen produced by electrolysis, even where whole-plant renewable electricity purchasing for hydrogen production is required, but especially where partial-plant purchasing is permitted, an instrument or method to establish the portion of total production during a reporting time period covered by RECs/EACs and track that volume to EGUs is required in order for that hydrogen to be used by EGUs for compliance. RFCs can be used for that purpose. But regardless, to prevent double counting, where hydrogen RFCs are issued, they must be retired by or on behalf of the EGU in order for that EGU to use associated hydrogen for compliance with low-GHG hydrogen production standards under this Proposed Rule.

RFCs should also be required as proof that hydrogen produced by steam methane reforming (SMR) is produced with biomethane or renewable natural gas (RNG), in the case that EPA determines that SMR hydrogen that uses biomethane meets the low-GHG hydrogen standard (e.g. due to lower lifecycle GHG emissions). In this case, an RFC represents the environmental benefits of one dekatherm (Dth) of biomethane. For each Dth of biomethane produced, an equivalent RFC is created. Purchasing and pairing RFCs with methane supply from a common carrier pipeline substantiates claims of using and receiving the benefits of that renewable fuel. RFCs in a Green-e® certified product are independently verified and the seller is required to disclose the quantity, type, vintage, carbon intensity, and geographic source of each certificate. Once biomethane RFCs are used to substantiate the use of biomethane for hydrogen production, RFCs may be issued to that hydrogen (hydrogen RFCs) and used to track that hydrogen to EGUs for compliance, if permitted.

The use of certificates to substantiate both low-GHG hydrogen production and the use of low-GHG hydrogen for electricity generation by EGUs for compliance is illustrated in Figure 1.

Figure 1. Illustration of the Use of Certificates for Compliance with Low-GHG Hydrogen Standards in the Proposed Rule



6. EGUs can provide documentation or attestation of qualifying REC retirement for production of electrolytic hydrogen from hydrogen producers. But the RECs may not be retired in the name or on behalf of the EGU.

The individual RECs (e.g. serial numbers) retired for the production of the hydrogen used by the EGU may not be transparent or accessible by the EGU. Rather RECs may be retired and matched on behalf of a volume of electric load for hydrogen production. Documentation or attestation that qualifying EACs/RECs were procured for hydrogen production sold to/used by the EGU would be required.

7. The EGU should not be required to verify the accuracy of the Greenhouse gases, Regulated Emissions, and Energy use in Transportation (GREET) model. However, the EGU should be required to demonstrate that they are exclusively using hydrogen associated with a certain

GREET model emissions profile and they should provide available substantiation of the inputs used for the GREET model, e.g. RECs, for that hydrogen production, as well as substantiation of their specified hydrogen purchase, e.g. hydrogen RFCs.

8. We recommend that EGUs be required to provide an independent third-party verification that hydrogen used to comply with this regulation meets the requirements for low-GHG hydrogen.

Our comments above apply in the context of both the proposed CAA section 111(b) rule for new combustion turbines and the state plan requirements for affected existing combustion turbines.

Please let me know if we can provide any further information or answer any other questions.

Sincerely,

_____/s/____

Todd Jones

Director, Policy