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Clean Hydrogen Tax Credits: IRS Releases Proposed Treasury Regulations

The Internal Revenue Service (IRS) and U.S. Department of the Treasury (Treasury) issued **proposed regulations**, published in the Federal Register Dec. 26, 2023, applicable to clean hydrogen production facilities.

Notably, the proposed regulations address:

- determining lifecycle greenhouse gas (GHG) emissions rates resulting from hydrogen production processes and how taxpayers may use energy attribute certificates for this purpose;
- petitioning for provisional emissions rates;
- verifying production and sale or use of clean hydrogen;
- modifying or retrofitting existing qualified clean hydrogen production facilities to establish a new original placed-in-service date (using the familiar 80/20 Rule);
- using electricity from certain renewable or zero emissions sources to produce qualified clean hydrogen; and
- electing to treat part of a specified clean hydrogen production facility instead as property eligible for the Section 48 investment tax credit (ITC) in respect of such facility.

Because the amount of the Internal Revenue Code (Code) Section 45V hydrogen credit depends on the lifecycle GHG emissions associated with produced hydrogen, Treasury's guidance on three issues regarding how the emissions associated with electricity used to produce hydrogen will be measured have become a key industry focus: (1) whether renewable electricity used to produce hydrogen must be generated by new renewable generation facilities (incrementality); (2) whether renewable electricity must have been generated in the hour in which it is used (temporal matching); and (3) whether renewable electricity must be generated in the same region in which it is used (deliverability). These issues and certain other provisions of these proposed regulations are discussed in more detail below.

Background: Clean Hydrogen Income Tax Credits

For 2023 and later, Section 45V(a) provides a production tax credit (PTC) for qualified clean hydrogen produced during the 10-year period beginning on the date the facility was originally placed in service, if construction of the facility begins before Jan. 1, 2033. The Section 45V PTC amount is based on the verified lifecycle GHG emissions (which may not exceed four kilograms of CO_{2e} per kilogram of hydrogen to claim any Section 45V PTCs). The lesser the lifecycle GHG emissions, the greater the Section 45V credit amount.

The Code provides that lifecycle GHG emissions for this purpose only include emissions through the point of production (well-to-gate), as determined under the most recent Greenhouse gases, Regulated Emissions, and Energy use in Transportation model (commonly referred to as the GREET model) developed by Argonne National Laboratory, or a successor model (as determined by the Treasury Secretary).

In lieu of the Section 45V PTC, a qualified clean hydrogen production facility that includes carbon capture equipment could potentially claim the carbon sequestration tax credit under Section 45Q. In lieu of both the Section 45V PTC and Section 45Q carbon sequestration tax credit, taxpayers can elect to claim an ITC (the percentage of which is also based on verified lifecycle GHG emissions) in respect of such facility.

To qualify for the full amount of PTC or ITC, construction on the clean hydrogen facility must have begun before Jan. 29, 2023, or it must meet the applicable prevailing wage and apprenticeship requirements. The preamble to the proposed regulations states that Section 45V does not provide for the domestic content or energy community enhancers for the Section 45V PTC, or the hydrogen facility ITC.

Lifecycle GHG Emissions Rate

The lifecycle GHG emissions rate is critical to determining the value of the Section 45V PTC and clean hydrogen ITC. The proposed regulations provide guidance on the GREET model to be used—the 45VH₂-GREET—and count emissions associated with feedstock growth, gathering, extraction, processing, and delivery to a hydrogen production facility together with emissions associated with the hydrogen production process, including electricity used by the hydrogen production facility and any capture and sequestration of carbon dioxide generated by the hydrogen production facility. The Department of Energy (DOE) also released a [publication](#) describing a variety of potential pathways for determining lifecycle emissions in connection with clean hydrogen production and the new 45VH₂-GREET 2023 model.

For taxpayers unable to use the 45VH₂-GREET, the proposed regulations detail a process to petition for a “provisional emissions rate” (PER), which must include an emissions value obtained from the DOE. The proposed regulations indicate that the emissions value request process will open April 1, 2024. A PER petition is permitted only if the relevant hydrogen production pathway uses a feedstock or technology not addressed in the relevant GREET model.

Use of Clean Renewable Power

In performing the lifecycle analysis of clean hydrogen, an important variable is the amount of GHG emitted in connection with the generation of power used to produce hydrogen. The proposed regulations introduce a familiar concept—the energy attribute certificate (EAC)—and provide that taxpayers may treat their facility’s use of electricity as being from a specific clean energy electricity generating facility (counting as zero emissions) rather than being from the regional electricity grid (counting as the emissions determined in the relevant GREET model) only if the taxpayer acquires and retires a qualifying EAC for each unit of electricity the taxpayer claims from such source. EACs are defined in the proposed regulations as tradeable contractual instruments, issued through a qualified EAC registry or accounting system that represents the energy attributes of a specific unit of energy produced. Renewable Energy Certificates (RECs), which are issued and tracked by registries for each megawatt of generated renewable electricity, qualify as EACs, and ERCOT, MIRECS, M-RETS, NY-GATS, PJM-GATS, NC-RETS, and WREGIS are all qualified EAC registries.

A qualifying EAC must meet the requirements for incrementality (additionality), temporal matching, and deliverability.

Incrementality. In general, the electricity specified in the EAC must have been generated by an electric generating facility that was (i) placed in service no more than 36 months before the hydrogen facility was placed in service or (ii) generated from increased (“uprated”) capacity at an older facility, provided the uprate occurred no more than 36 months before the hydrogen facility was placed in service, and the unit of electricity specified in the EAC is from the uprated capacity. Treasury has requested comments on other approaches to incrementality, including avoided retirements, certain purchases of power from minimally emitting facilities based on a percentage of production or during periods of curtailment or negative pricing.

Temporal Matching. This requirement seeks to match the time when the power covered by the EAC is generated, and the time it is used by the clean hydrogen facility. The proposed Treasury Regulations provide a temporary rule that permits matching on an annual, calendar-year basis for electricity generated before Jan. 1, 2028. Beginning in 2028, the power covered by the EAC must be used by the clean hydrogen facility within one hour of its generation. The preamble to the proposed regulations recognizes that there is not currently a generally available system to provide accurate, hourly matching, and it states that as tracking systems move to hourly resolution, the issue of the treatment of electricity storage will need to be resolved. The European Union recently initiated a requirement for monthly matching, with a requirement for hourly matching to take effect in 2030. This requirement may generate considerable comment.

Deliverability. This requirement is intended to limit the distance between the power generation source and the clean hydrogen facility. This requirement is met if the electricity represented by the EAC is generated in the same “region,” defined in the proposed regulations as regions identified in the [National Transmission Needs Study \(DOE Needs Study\)](#) released by the DOE Oct. 30, 2023. The preamble to the proposed regulations requests comments on other ways to address deliverability and concerns about power delivery and transmission constraints. Below is a map of the regions from the DOE Needs Study:



The IRS and Treasury developed these rules based on a DOE paper ([Assessing Lifecycle Greenhouse Gas Emissions Associated with Electricity Use for the Section 45V Clean Hydrogen Production Tax Credit](#)) to address “a significant risk that hydrogen production would significantly increase induced grid GHG emissions beyond the allowable levels required to qualify for the section 45V credit.”

Renewable Natural Gas

The proposed regulations do not address how lifecycle GHG emissions will be measured when renewable natural gas is used to produce hydrogen, including how fugitive sources of methane (from mining operations) would be treated, but the preamble to the proposed regulations requests comments.

Sale or Use of Hydrogen

Qualified clean hydrogen must be sold or used to qualify for the Section 45V PTC. The proposed regulations provide clarification that storage of hydrogen before its sale or use would not disqualify such hydrogen from being considered produced for sale or use, and that the use can be outside the United States. Further, a verifiable use includes neither (i) use of hydrogen to generate electricity that is then directly or indirectly used in the production of more hydrogen nor (ii) venting or flaring hydrogen.

Verification

The proposed regulations contain detailed provisions regarding a verification report that must be included with the form for claiming the Section 45V PTC. The verification report must be prepared by a qualified verifier, which is an unrelated party who is an individual or organization with active accreditation (i) as a validation and verification body from the American National Standards Institute National Accreditation Board or (ii) as a verifier, lead verifier, or verification body under the California Air Resources Board Low Carbon Fuel Standard program. The verification report must attest to, among other things, the production of the hydrogen, the data inputs to the GREET model, the lifecycle GHG emissions rate, and the sale or use of the hydrogen.

The proposed regulations provide this verification may occur in a later taxable year. However, the Section 45V PTC cannot be claimed until all relevant verification requirements, and the verification itself, have been completed. Accordingly, a delay in meeting the verification requirement would necessitate an amended return or administrative adjustment request to claim the Section 45V PTC.

Anti-Abuse

The proposed regulations provide that in extraordinary circumstances where, based on a consideration of all the relevant facts and circumstances, the primary purpose of the production and sale or use of qualified clean hydrogen is to obtain the benefit of the section 45V credit in a manner that is wasteful, such as the production of qualified clean hydrogen the taxpayer knows or has reason to know will be vented, flared, or used in the production of more hydrogen, the Section 45V PTC will be unavailable.

ITC and Recapture

A taxpayer may elect to claim the ITC in lieu of the Section 45V PTC. The rate of ITC varies, based on the lifecycle GHG emissions rate, and a verification report must be submitted with the claim for ITC, and each year during the five-year ITC recapture period. In addition to the usual ITC recapture provisions (e.g., recapture in case of dispositions, etc. and recapture relating to the prevailing wage requirements), recapture may occur to the extent that the verified GHG lifecycle emissions rate increases during the five-year ITC recapture period.

Takeaway

The temporal matching requirements are perhaps the most controversial aspect of the proposed regulations because they limit the ability of the solar and wind industry to provide power for clean hydrogen production. Solar and wind facilities cannot generate power 24/7 without storage capabilities, so the proposed regulations may result in curtailed production by hydrogen facilities when solar and wind suppliers are not generating, or they may force hydrogen producers to seek other technologies to cover the energy shortfall or to accept a lower PTC/ITC rate. The adverse effects of temporal matching requirements on wind and solar power sources could be mitigated if Treasury allows annual or monthly matching or extends the phase-in period, or adopts favorable rules regarding use of storage.

Taxpayers may rely on these proposed regulations for tax years beginning after Dec. 31, 2022, and before the date the final Treasury regulations are published in the Federal Register.

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