

**DEPARTMENT OF THE TREASURY****Internal Revenue Service****26 CFR Part 1**

[REG–117631–23]

RIN 1545–BQ97

**Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election To Treat Clean Hydrogen Production Facilities as Energy Property****AGENCY:** Internal Revenue Service (IRS), Treasury.**ACTION:** Notice of proposed rulemaking and notice of public hearing.

**SUMMARY:** This document contains proposed regulations relating to the credit for production of clean hydrogen (clean hydrogen production credit) and the energy credit, as established and amended by the Inflation Reduction Act of 2022, respectively. The proposed regulations would provide rules for: determining lifecycle greenhouse gas emissions rates resulting from hydrogen production processes; petitioning for provisional emissions rates; verifying production and sale or use of clean hydrogen; modifying or retrofitting existing qualified clean hydrogen production facilities; 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 energy credit. The proposed regulations would affect all taxpayers who produce qualified clean hydrogen and claim the clean hydrogen production credit, elect to treat part of a specified clean hydrogen production facility as property eligible for the energy credit, or produce electricity from certain renewable or zero-emissions sources used by taxpayers or related persons to produce qualified clean hydrogen. This document also provides notice of a public hearing on the proposed regulations.

**DATES:** Written or electronic comments must be received by February 26, 2024. The public hearing on these proposed regulations is scheduled to be held on March 25, 2024, at 10 a.m. (ET). Requests to speak and outlines of topics to be discussed at the public hearing must be received by March 4, 2024. If no outlines are received by March 4, 2024, the public hearing will be cancelled. Requests to attend the public hearing must be received by March 18, 2024. The public hearing will be made accessible to people with disabilities.

Requests for special assistance during the hearing must be received by March 18, 2024.

**ADDRESSES:** Commenters are strongly encouraged to submit public comments electronically via the Federal eRulemaking Portal at <https://www.regulations.gov> (indicate IRS and REG–117631–23) by following the online instructions for submitting comments. Requests for a public hearing must be submitted as prescribed in the “Comments and Requests for a Public Hearing” section. Once submitted to the Federal eRulemaking Portal, comments cannot be edited or withdrawn. The Department of the Treasury (Treasury Department) and the IRS will publish for public availability any comments submitted to the IRS’s public docket. Send paper submissions to: CC:PA:LPD:PR (REG–117631–23), Room 5203, Internal Revenue Service, P.O. Box 7604, Ben Franklin Station, Washington, DC 20044.

**FOR FURTHER INFORMATION CONTACT:** Concerning these proposed regulations, the Office of Chief Counsel (Passthroughs and Special Industries) at (202) 317–6853 (not a toll-free number); concerning submissions of comments or the public hearing, Vivian Hayes at (202) 317–6901 (not a toll-free number) or by email to [publichearings@irs.gov](mailto:publichearings@irs.gov) (preferred).

**SUPPLEMENTARY INFORMATION:****Background**

This document contains proposed regulations to amend the Income Tax Regulations (26 CFR part 1) under sections 45V and 48(a)(15) of the Internal Revenue Code (Code), as added to the Code by section 13204 of Public Law 117–169, 136 Stat. 1818 (August 16, 2022), commonly known as the Inflation Reduction Act of 2022 (IRA).

The IRA added several provisions to the Code related to the production of, and investment in, clean hydrogen, which, along with the provisions of sections 45V and 48(a)(15), are described in part I of this Background section. Part II of this Background section describes a previous request for public comment on these provisions.

**I. IRA Provisions for Clean Hydrogen Production and Investment**

This part I describes the credit for production of clean hydrogen as determined under section 45V (section 45V credit) and the irrevocable election to claim an energy credit under section 48 (section 48 credit) in lieu of the section 45V credit. Also described are statutory exceptions to the requirement that electricity be sold to an unrelated

person to be eligible for the renewable electricity production credit determined under section 45 (section 45 credit) or the zero-emission nuclear power production credit determined under section 45U (section 45U credit). Under these exceptions, electricity produced by a taxpayer from a qualified facility under section 45(d) or a qualified nuclear power facility under section 45U(b)(1) may be treated as sold by the taxpayer to an unrelated person during the taxable year if the electricity is used by the taxpayer or a related person at a qualified clean hydrogen production facility to produce qualified clean hydrogen.

**A. Section 45V****1. Amount of Credit**

Section 45V provides a tax credit for the production of qualified clean hydrogen. For purposes of section 38 of the Code, section 45V(a) provides that the clean hydrogen production credit for any taxable year is an amount equal to the product of (i) the kilograms of qualified clean hydrogen produced by the taxpayer during such taxable year at a qualified clean hydrogen production facility during the 10-year period beginning on the date such facility was originally placed in service, and (ii) the applicable amount as determined under section 45V(b) with respect to such hydrogen.

Section 45V(b)(1) provides that, for purposes of section 45V(a)(2), the applicable amount is an amount equal to the applicable percentage of \$0.60. If the amount so determined is not a multiple of 0.1 cent, then such amount is rounded to the nearest multiple of 0.1 cent.

Section 45V(b)(2) provides that, for purposes of section 45V(b)(1), the applicable percentage is determined based on the lifecycle greenhouse gas emissions (lifecycle GHG emissions) rate of the process to produce any qualified clean hydrogen as follows: (i) if the lifecycle GHG emissions rate is not greater than 4 kilograms of carbon dioxide equivalent (CO<sub>2e</sub>) per kilogram of hydrogen, and not less than 2.5 kilograms of CO<sub>2e</sub> per kilogram of hydrogen, then the applicable percentage is 20 percent; (ii) if the lifecycle GHG emissions rate is less than 2.5 kilograms of CO<sub>2e</sub> per kilogram of hydrogen, and not less than 1.5 kilograms of CO<sub>2e</sub> per kilogram of hydrogen, then the applicable percentage is 25 percent; (iii) if the lifecycle GHG emissions rate is less than 1.5 kilograms of CO<sub>2e</sub> per kilogram of hydrogen, and not less than 0.45 kilograms of CO<sub>2e</sub> per kilogram of

hydrogen, then the applicable percentage is 33.4 percent; and (iv) if the lifecycle GHG emissions rate is less than 0.45 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, then the applicable percentage is 100 percent.

Section 45V(b)(3) provides that the \$0.60 amount in section 45V(a)(1) is adjusted by multiplying such amount by the inflation adjustment factor (as determined under section 45(e)(2), determined by substituting “2022” for “1992” in section 45(e)(2)(B)) for the calendar year in which the qualified clean hydrogen is produced. If any amount as increased under section 45V(b)(3) is not a multiple of 0.1 cent, such amount is rounded to the nearest multiple of 0.1 cent.<sup>1</sup>

Section 45V(e)(1) provides that, in the case of any qualified clean hydrogen production facility that satisfies the requirements of section 45V(e)(2), the amount of the section 45V credit with respect to qualified clean hydrogen described in section 45V(b)(2) is equal to the amount determined under section 45V(a) (determined without regard to section 45V(e)(1)) multiplied by five.

A qualified clean hydrogen production facility meets the requirements of section 45V(e)(2) if: (i) the facility began construction before January 29, 2023, and with respect to any taxable year, for any period of such taxable year that is within the 10-year period beginning on the date the facility is originally placed in service, the prevailing wage requirements of section 45V(e)(3)(A) are met for any alteration or repair of the facility that occurs after January 29, 2023 (to the extent applicable);<sup>2</sup> or (ii) the facility satisfies the prevailing wage and apprenticeship (PWA) requirements of sections 45V(e)(3)(A) and (4).<sup>3</sup>

Generally, the prevailing wage requirements under section 45V(e)(3)(A) with respect to any qualified clean hydrogen production facility require the taxpayer to ensure that any laborers and

mechanics employed by the taxpayer or by any contractor or subcontractor in (i) the construction of such facility, and (ii) with respect to any taxable year, for any portion of such taxable year that is within the 10-year period beginning on the date such facility was originally placed in service, the alteration or repair of such facility, are paid wages at rates not less than the prevailing rates for construction, alteration, or repair of a similar character in the locality in which such facility is located as most recently determined by the Secretary of Labor, in accordance with subchapter IV of chapter 31 of title 40 of the United States Code, commonly known as the Davis-Bacon Act. Correction and penalty rules similar to the rules of section 45(b)(7)(B) also apply.

Section 45V(e)(4) provides that rules similar to the apprenticeship requirements of section 45(b)(8) apply for purposes of section 45V(e)(2).<sup>4</sup>

For purposes of section 45V(a), in the case of a qualified clean hydrogen production facility that does not satisfy the requirements of section 45(e)(2), the amount of the clean hydrogen production credit for any taxable year is \$0.12, \$0.15, \$0.20, or \$0.60 per kilogram of qualified clean hydrogen produced (before taking into account any inflation adjustment under section 45V(b)(3)), depending on the lifecycle GHG emissions rate associated with the facility’s hydrogen production process. For facilities meeting the requirements of section 45V(e)(2), the credit amount determined under section 45V(a) (as adjusted for inflation subject to section 45V(b)(3)) is multiplied by five.

## 2. Definitions

### a. Lifecycle Greenhouse Gas Emissions

Section 45V(c)(1)(A) provides that, subject to section 45V(c)(1)(B), the term “lifecycle greenhouse gas emissions” has the same meaning given such term under section 211(o)(1)(H) of the Clean Air Act (42 U.S.C. 7545(o)(1)(H)), as in effect on August 16, 2022. Under section 45V(c)(1)(B), the term “lifecycle greenhouse gas emissions” includes emissions only through the point of production (well-to-gate), as determined

under the most recent Greenhouse gases, Regulated Emissions, and Energy use in Transportation model, referred to as the “GREET model” commonly and in this document, developed by Argonne National Laboratory, or a successor model as determined by the Secretary of the Treasury or her delegate (Secretary).

### b. Qualified Clean Hydrogen

Section 45V(c)(2)(A) provides that the term “qualified clean hydrogen” means hydrogen that is produced through a process that results in a lifecycle GHG emissions rate of not greater than 4 kilograms of CO<sub>2</sub>e per kilogram of hydrogen. Section 45V(c)(2)(B) further provides that the term “qualified clean hydrogen” does not include any hydrogen unless (i) such hydrogen is produced (A) in the United States (as defined in section 638(1) of the Code) or a United States territory (having the meaning of the term “possession” as defined in section 638(2)), (B) in the ordinary course of a trade or business of the taxpayer, and (C) for sale or use; and (ii) the production and sale or use of such hydrogen is verified by an unrelated party.

### c. Provisional Emissions Rate

Section 45V(c)(2)(C) provides that, in the case of any hydrogen for which a lifecycle GHG emissions rate has not been determined for purposes of section 45V, a taxpayer producing such hydrogen may file a petition with the Secretary for a determination of the lifecycle GHG emissions rate with respect to such hydrogen, which is referred to as a “provisional emissions rate” or PER in the proposed regulations.

### d. Qualified Clean Hydrogen Production Facility

Section 45V(c)(3) provides that the term “qualified clean hydrogen production facility” means a facility (i) owned by the taxpayer, (ii) that produces qualified clean hydrogen, and (iii) the construction of which begins before January 1, 2033.<sup>5</sup>

<sup>1</sup> The IRS will publish the inflation-adjusted section 45V applicable amount annually. For the calendar year 2023, the section 45V(b)(3) inflation adjustment factor is equal to one, so the inflation-adjusted applicable amount remains \$0.60 for the calendar year 2023.

<sup>2</sup> Section 45V(e)(3)(A)(ii) requires the payment of wages at prevailing rates “with respect to any taxable year, for any portion of such taxable year which is within the period described in subsection (a)(2)”, with respect to the alteration or repair of the facility. There is no “period described in subsection (a)(2).” The Treasury Department and the IRS interpret the reference to “subsection (a)(2)” as a reference to section 45V(a)(1) where the 10-year credit period is identified.

<sup>3</sup> See proposed §§ 1.45V-7, 1.45V-8, 1.45V-12, and 1.45V-3 as proposed in the notice of proposed rulemaking (REG-100908-23) published in the *Federal Register* (88 FR 60018) on August 30, 2023, and corrected at 88 FR 73807 on October 27, 2023.

<sup>4</sup> Under proposed § 1.45V-3, the PWA requirements for purposes of section 45V(e)(2) would be satisfied if a facility meets the prevailing wage requirements of section 45(b)(7) and proposed § 1.45V-7, the apprenticeship requirements of section 45(b)(8) and proposed § 1.45V-8, and the recordkeeping and reporting requirements of proposed § 1.45V-12. Those proposed regulations are outside the scope of this notice of proposed rulemaking and proposed § 1.45V-3 is addressed only to the extent necessary for purposes of formatting the proposed regulations that are the subject of this notice of proposed rulemaking in accordance with CFR standards.

<sup>5</sup> Section 45V does not specify an earliest date on which a qualified clean hydrogen production facility must begin construction or be placed in service to be eligible to claim the section 45V credit. However, the section 45V credit is available for qualified clean hydrogen produced after December 31, 2022. Section 13204(a)(5)(A) of the IRA. Thus, the owner of a qualified clean hydrogen production facility originally placed in service after December 31, 2012, could claim the section 45V credit for qualified clean hydrogen produced during at least some portion of the 10-year period described in section 45V(a)(1), provided all other requirements are met.

### 3. Special Rules

#### a. Treatment of Facilities Owned by More Than One Taxpayer

Section 45V(d)(1) provides that rules similar to the rules of section 45(e)(3) apply for purposes of section 45V. Section 45(e)(3) provides that, in the case of a facility in which more than one person has an ownership interest, except to the extent provided in regulations prescribed by the Secretary, production from the facility is allocated among such persons in proportion to their respective ownership interests in the gross sales from such facility.

#### b. Coordination With Section 45Q

Section 45V(d)(2) provides that no section 45V credit is allowed with respect to any qualified clean hydrogen produced at a facility that includes carbon capture equipment for which a credit is allowed to any taxpayer as determined under section 45Q (section 45Q credit) for the taxable year or any prior taxable year.

#### c. Credit Reduced for Tax-Exempt Bonds

Section 45V(d)(3) provides that rules similar to the rules under section 45(b)(3) (credit reduced for tax-exempt bonds) apply for purposes of section 45V. Section 45V(d)(3) is effective for facilities that begin construction after August 16, 2022. Section 13204(a)(5)(B) of the IRA. Section 45(b)(3) provides that the amount of the credit determined under section 45(a) with respect to any facility for any taxable year (determined after the application of section 45(b)(1) and (2) regarding phaseout and inflation adjustment rules) is reduced by the amount that is the product of the amount so determined for such year and the lesser of 15 percent or a fraction (A) the numerator of which is the sum, for the taxable year and all prior taxable years, of proceeds of an issue of any obligations the interest on which is exempt from tax under section 103 and that is used to provide financing for the qualified facility, and (B) the denominator of which is the aggregate amount of additions to the capital account for the qualified facility for the taxable year and all prior taxable years. Section 45(b)(3) further provides that the amounts determined under section 45(b)(3) for any taxable year are determined as of the close of the taxable year.

#### d. Modification of Existing Facilities

Section 45V(d)(4) provides that for purposes of section 45V(a)(1), in the case of any facility that (A) was originally placed in service before

January 1, 2023, and, prior to the modification described in section 45V(d)(4)(B), did not produce qualified clean hydrogen, and (B) after the date such facility was originally placed in service (i) is modified to produce qualified clean hydrogen, and (ii) amounts paid or incurred with respect to such modification are properly chargeable to the capital account of the taxpayer, such facility is deemed to have been originally placed in service as of the date the property required to complete the modification described in section 45V(d)(4)(B) is placed in service. Section 45V(d)(4) is effective for modifications made after December 31, 2022. See section 13204(a)(5)(C) of the IRA.

#### B. Electricity Used at a Qualified Clean Hydrogen Production Facility

Section 45(e)(13) provides that electricity produced by the taxpayer is treated as sold by such taxpayer to an unrelated person during the taxable year if (i) such electricity is used during such taxable year by the taxpayer or a person related to the taxpayer at a qualified clean hydrogen production facility (as defined in section 45V(c)(3)) to produce qualified clean hydrogen (as defined in section 45V(c)(2)); and (ii) such use and production is verified (in such form or manner as the Secretary may prescribe) by an unrelated party. Section 45(e)(13) is effective for electricity produced after December 31, 2022. See section 13204(b)(3) of the IRA.

Section 45U(c)(2) provides that rules similar to the rules of section 45(e)(13) apply for purposes of section 45U. Generally, section 45U is effective for electricity produced at a qualified nuclear power facility and sold after December 31, 2023, in taxable years beginning after that date.

#### C. Election To Treat Clean Hydrogen Production Facilities as Energy Property

Section 48(a)(15)(A)(i) provides that, in the case of any qualified property (as defined in section 48(a)(5)(D)) that is part of a specified clean hydrogen production facility, such property is treated as energy property. Section 48(a)(15)(A)(ii) provides that the energy percentage of the basis of any qualified property that is treated as energy property is, for a facility that is designed and reasonably expected to produce qualified clean hydrogen with a lifecycle GHG emissions rate that is: (i) not greater than 4 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, and not less than 2.5 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, 1.2 percent; (ii) less than 2.5 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, and not less than 1.5

kilograms of CO<sub>2</sub>e per kilogram of hydrogen, 1.5 percent; (iii) less than 1.5 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, and not less than 0.45 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, 2 percent; and (iv) less than 0.45 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, 6 percent. Under section 48(a)(9), the amount of the section 48 credit determined for a specified clean hydrogen production facility under section 48(a)(15) is multiplied by five if the facility meets the requirements of section 48(a)(9)(B) (regarding application of certain maximum net output levels of electrical or thermal energy or prevailing wage and apprenticeship requirements). However, the domestic content and energy communities bonuses under section 48(a)(12) and (a)(14) do not apply to a specified clean hydrogen production facility.

Section 48(a)(15) is effective for property placed in service after December 31, 2022, and for any property the construction of which began before January 1, 2023, only to the extent of the basis thereof attributable to construction, reconstruction, or erection after December 31, 2022. See section 13204(c)(3) of the IRA.

#### 1. Denial of Production Credit

Section 48(a)(15)(B) provides that no section 45V credit or section 45Q credit is allowed for any taxable year with respect to any specified clean hydrogen production facility or any carbon capture equipment included at such facility.

#### 2. Specified Clean Hydrogen Production Facility

Section 48(a)(15)(C) provides that the term “specified clean hydrogen production facility” means any qualified clean hydrogen production facility (as defined in section 45V(c)(3)) (i) that is placed in service after December 31, 2022, (ii) with respect to which (I) no section 45V credit or section 45Q credit has been allowed, and (II) the taxpayer makes an irrevocable election to have section 48(a)(15) apply, and (iii) for which an unrelated third party has verified (in such form or manner as the Secretary may prescribe) that such facility produces hydrogen through a process that results in lifecycle GHG emissions that are consistent with the hydrogen that such facility was designed and expected to produce under section 48(a)(15)(A)(ii).

#### 3. Qualified Clean Hydrogen

Section 48(a)(15)(D) provides that, for purposes of section 48(a)(15), the term

“qualified clean hydrogen” has the meaning given such term by section 45V(c)(2).

#### 4. Regulations

Section 48(a)(15)(E) provides the Secretary authority to issue regulations or other guidance as she determines necessary to carry out the purposes of section 48, including regulations or other guidance that recaptures so much of any section 48 credit allowed as exceeds the amount of the credit that would have been allowed if the expected production were consistent with the actual verified production (or all of the credit so allowed in the absence of verification).

## II. Previous Request for Comments

On November 3, 2022, the Treasury Department and the IRS published Notice 2022–58, 2022–47 I.R.B. 483. The notice requested general comments on issues arising under section 45V and the associated clean hydrogen production and investment incentives in sections 45 and 48. The notice also requested specific comments concerning (i) definitions; (ii) boundaries of the well-to-gate analysis for determining the lifecycle GHG emissions rate; (iii) the PER process; (iv) recordkeeping and reporting; (v) verification by unrelated parties; and (vi) coordination with sections 45, 48, and 45Q. The Treasury Department and the IRS received over 200 comments from industry participants, environmental groups, individuals, and other stakeholders. The Treasury Department and the IRS appreciate the commenters’ interest and engagement on these issues. These comments have been carefully considered in the development of these proposed regulations.

## Explanation of Provisions

### I. Overview

Proposed § 1.45V–1 would provide guidance, including definitions of key terms used in proposed §§ 1.45V–1 through 1.45V–6 and 1.48–15, to determine the eligibility for, and the amount of, the section 45V credit for the production of qualified clean hydrogen. The term “section 45V credit” would be provided at § 1.45V–1(a)(12) and mean the credit for production of clean hydrogen determined under section 45V, so much of sections 6417 and 6418 that relate to section 45V, and the section 45V regulations. The term “section 45V regulations” would be provided at proposed § 1.45V–1(a)(13) to mean the provisions of §§ 1.45V–1 through 1.45V–6 and so much of the regulations under sections 6417 and

6418 that relate to the section 45V credit.

Proposed § 1.45V–2 would provide special rules for purposes of the section 45V credit. Proposed § 1.45V–4 would provide procedures for determining lifecycle GHG emissions rates for qualified clean hydrogen. Proposed § 1.45V–5 would provide procedures for verification of qualified clean hydrogen production and sale or use. Proposed § 1.45V–6 would provide rules for determining the placed in service date for an existing facility that is modified or retrofitted to produce qualified clean hydrogen. Additionally, proposed § 1.48–15 would provide procedures for a taxpayer to elect to treat any qualified property that is part of a specified clean hydrogen production facility as energy property for purposes of the section 48 credit.

### II. Definitions

Proposed § 1.45V–1(a)(2) through (13) would provide generally applicable definitions of terms for purposes of section 45V, so much of sections 6417 and 6418 of the Code that relate to the section 45V credit, and the section 45V regulations. The definitions for applicable amount, applicable percentage, and qualified clean hydrogen production facility would generally reflect the statutory definitions without additional elaboration on the terms. See proposed § 1.45V–1(a)(2), (3), and (10). This part II discusses those definitions in the proposed regulations that provide additional clarity beyond the statutory language.

#### A. Facility

Proposed § 1.45V–1(a)(7)(i) would provide that, for purposes of the definition of a qualified clean hydrogen production facility provided at section 45V(c)(3), the term “facility” means a single production line that is used to produce qualified clean hydrogen. A “single production line” would include all components of property that function interdependently to produce qualified clean hydrogen. Components of property are functionally interdependent if the placing in service of each component is dependent upon the placing in service of each of the other components to produce qualified clean hydrogen. Proposed § 1.45V–1(a)(7)(ii) would provide that a facility does not include equipment used to condition or transport hydrogen beyond the point of production. A facility would also not include electricity production equipment used to power the hydrogen production process, including any carbon capture

equipment associated with the electricity production process. Proposed § 1.45V–1(a)(7)(iii) would provide that components that have a purpose in addition to the production of qualified hydrogen may be part of a facility if such components function interdependently with other components to produce qualified clean hydrogen. Proposed § 1.45V–1(a)(7)(iv) would provide an example to illustrate the definition of facility for purposes of section 45V.

#### B. Lifecycle Greenhouse Gas Emissions

Proposed § 1.45V–1(a)(8)(i) would incorporate the statutory definition of the term “lifecycle greenhouse gas emissions” under section 45V(c)(1)(A) and (B), specifically providing that the term has the same meaning as that in 42 U.S.C. 7545(o)(1)(H) as in effect on August 16, 2022, and includes emissions only through the point of production (well-to-gate) as determined under the most recent GREET model.

#### C. Most Recent GREET Model

Proposed § 1.45V–1(a)(8)(ii) would provide that the term “most recent GREET model” means the latest version of 45VH2–GREET developed by Argonne National Laboratory (ANL) that is publicly available on the first day of the taxpayer’s taxable year in which the qualified clean hydrogen for which the taxpayer is claiming the section 45V credit was produced.<sup>6</sup> After consultation with the Department of Energy (DOE), the Treasury Department and the IRS believe that the use of the latest version of 45VH2–GREET would be appropriate because it is tailored to the administration of the section 45V tax credit and includes features that make it easy to use for taxpayers. Use of the latest version of 45VH2–GREET would also ensure that the pathways and approaches provided for determining well-to-gate emissions for various hydrogen production processes are of sufficient methodological certainty to be appropriate for determining eligibility of tax credits. The latest version of 45VH2–GREET is the only variant of GREET that is suitable for use and may be used to determine emissions rates for purposes of the section 45V credit.

Further, proposed § 1.45V–1(a)(8)(ii) would provide that, if a version of

<sup>6</sup> 45VH2–GREET is a user interface designed to accept input related to a hydrogen production facility, execute GREET calculations in the background, and display the well-to-gate carbon intensity of produced hydrogen in kg of CO<sub>2</sub>e/kg of H<sub>2</sub>. 45VH2–GREET is currently available at [www.energy.gov/45vresources](http://www.energy.gov/45vresources). Successor locations for 45V–H2GREET will be provided in IRS forms and instructions.

45VH2-GREET becomes publicly available after the first day of the taxable year of production (but still within such taxable year), then the taxpayer may, in its discretion, treat such version of 45VH2-GREET as the most recent GREET model.

Instead of defining “most recent GREET model” to be the latest version of 45VH2-GREET that is publicly available on the first day of the taxpayer’s taxable year, an alternative approach would be for the Secretary to determine that the latest version of 45VH2-GREET is an appropriate “successor model,” as provided by section 45V(c)(1)(B), for the purpose of administering the section 45V tax credit. The Treasury Department and the IRS request comment on these approaches.

#### D. Emissions Through the Point of Production (Well-to-Gate)

Proposed § 1.45V-1(a)(8)(iii) would provide that, for purposes of section 45V(c)(1)(B) and proposed § 1.45V-1(a)(8)(i), the term “emissions through the point of production (well-to-gate)” means the aggregate lifecycle GHG emissions related to hydrogen produced at a hydrogen production facility during the taxable year through the point of production. It includes emissions associated with feedstock growth, gathering, extraction, processing, and delivery to a hydrogen production facility. It also includes the emissions associated with the hydrogen production process, inclusive of the electricity used by the hydrogen production facility and any capture and sequestration of carbon dioxide generated by the hydrogen production facility.

#### E. Qualified Clean Hydrogen

Proposed § 1.45V-1(a)(9)(i) would incorporate the statutory definition of the term “qualified clean hydrogen” provided at section 45V(c)(2)(A) and (B), including the requirement that the hydrogen be produced (i) in the United States or a U.S. territory (meaning possession as provided in section 638(2)); (ii) in the ordinary course of a trade or business of the taxpayer; and (iii) for sale or use. Proposed § 1.45V-1(a)(9)(i)(B) would provide that, to qualify as qualified clean hydrogen, the production and sale or use of such hydrogen must be verified by an unrelated party (as required by section 45V(c)(2)(B)(ii)). See also proposed § 1.45V-5.

Proposed § 1.45V-1(a)(9)(ii) would provide that for purposes of section 45V(c)(2)(B)(i)(III) and proposed § 1.45V-1(a)(9)(i)(C) the term “for sale or use” means for the primary purpose

of making such hydrogen ready and available for sale or use. Storage of hydrogen before its sale or use would not disqualify such hydrogen from being considered produced for sale or use.

#### III. Rules of General Applicability

Proposed § 1.45V-1(b)(1) would provide the general rules for calculating the amount of the section 45V credit.

Proposed § 1.45V-1(b)(2) would provide that, for purposes of section 45V(a)(1) and proposed § 1.45V-1(b)(1), the term “taxpayer” means the taxpayer that owns the qualified clean hydrogen production facility at the time of the facility’s production of qualified clean hydrogen with respect to which the section 45V credit is claimed, regardless of whether such taxpayer is treated as a producer under section 263A of the Code or under any other provision of law with respect to such qualified clean hydrogen. This rule is intended to avoid unintended consequences that could arise with respect to contract manufacturing and tolling arrangements under § 1.263A-2(a)(1)(ii)(A) and (a)(1)(ii)(B)(1) in the context of the section 45V credit, as well as to simplify the administration of the section 45V credit and provide clarity for taxpayers.

Proposed § 1.45V-1(c) would provide that, subject to any applicable Code sections that may limit the section 45V credit amount, the section 45V credit for any taxable year is determined with respect to the qualified clean hydrogen produced by the taxpayer during that taxable year although the verification of the production and sale or use of such hydrogen may occur in a later taxable year. However, the taxpayer would not be eligible to claim the section 45V credit until all relevant verification requirements, and the verification itself, have been completed. Therefore, despite such verification occurring in a later taxable year, the section 45V credit would be properly claimed with respect to the taxable year of hydrogen production and subject to the general period of limitations for filing a claim for credit or refund. Thus, if verification occurred after the extended return filing deadline for the taxable year in which the hydrogen was produced, the taxpayer would need to file an amended return or administrative adjustment request (AAR) to claim the section 45V credit for such hydrogen. The Treasury Department and the IRS request comments on this proposed rule, specifically whether taxpayers anticipate they will be able to complete all the requirements for claiming the section 45V credit, including the proposed requirements for verification specified below, by the extended return

filing deadline for the taxable year of hydrogen production. If taxpayers anticipate that they will not be able to complete all the requirements by such filing deadline, comments are also requested on what specific alternatives to the proposed rule, if any, should be considered and their rationale.

#### IV. Special Rules

Proposed § 1.45V-2(a) would address the coordination between the section 45V credit and the section 45Q credit.

Proposed § 1.45V-2(b)(1) would provide an anti-abuse rule that would make the section 45V credit unavailable in extraordinary circumstances in which, 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 that the taxpayer knows or has reason to know will be vented, flared, or used to produce hydrogen.

If the cost of producing qualified clean hydrogen were to be less than the amount of the section 45V credit that would be available with respect to such hydrogen, the Treasury Department and the IRS are concerned that taxpayers may have an incentive to produce qualified clean hydrogen solely for the purpose of exploiting the section 45V credit in a manner that is inconsistent with a purpose of section 45V, which is to provide an incentive to produce qualified clean hydrogen for a productive use. Producing and selling or using qualified clean hydrogen with the primary purpose of obtaining the benefit of the section 45V credit in a wasteful manner would not, in certain circumstances, satisfy the requirement in section 45V(c)(2)(B)(i)(II) for hydrogen to be produced in the ordinary course of a trade or business of the taxpayer. Proposed § 1.45V-2(b)(2) would provide an example illustrating this anti-abuse rule.

#### V. Procedures for Determining Lifecycle Greenhouse Gas Emissions Rates for Qualified Clean Hydrogen

Proposed § 1.45V-4(a) would provide that the amount of the section 45V credit is determined under section 45V(a) and proposed § 1.45V-1(b) based upon the lifecycle GHG emissions rate (as defined in proposed § 1.45V-1(a)(8)(i)) of all hydrogen produced at a qualified clean hydrogen production facility (as defined in proposed § 1.45V-1(a)(10)) during the taxable year. This determination is made following the close of each such taxable year and must include all hydrogen production from

the year. Further, proposed § 1.45V–4(a) would provide that the lifecycle GHG emissions rate for purposes of section 45V is determined under the most recent GREET model (as defined in proposed § 1.45V–1(a)(8)(ii)).

Additionally, proposed § 1.45V–4(a) would provide that in the case of any hydrogen for which a lifecycle GHG emissions rate has not been determined under the most recent GREET model for purposes of section 45V, a taxpayer producing such hydrogen may file a petition with the Secretary for a determination of the lifecycle GHG emissions rate with respect to such hydrogen (a provisional emissions rate (PER)).

#### A. GREET Model

Proposed § 1.45V–4(b) would provide procedures to calculate the lifecycle GHG emissions rate of hydrogen produced at a hydrogen production facility using the most recent GREET model as defined in proposed § 1.45V–1(a)(8)(ii) (referring to 45VH2–GREET). Proposed § 1.45V–4(b) would provide that for each taxable year during the period described in section 45V(a)(1), a taxpayer claiming the section 45V credit determines the lifecycle GHG emissions rate of hydrogen produced at a hydrogen production facility using the most recent GREET model. Such a determination is made separately for each hydrogen production facility the taxpayer owns and as of the close of each respective taxable year in which such production occurs (that is, such a determination is made for that taxable year's total hydrogen production at a hydrogen production facility). Proposed § 1.45V–4(b) would provide that in calculating the lifecycle GHG emissions rate for purposes of determining the amount of the section 45V credit, the taxpayer must accurately enter all information about its qualified clean hydrogen production facility requested within the interface of 45VH2–GREET in compliance with the most recent version of the *Guidelines to Determine Well-to-Gate Greenhouse Gas (GHG) Emissions of Hydrogen Production Pathways using 45VH2–GREET* (GREET User Manual), which currently can be found at: [www.energy.gov/45vresources](http://www.energy.gov/45vresources). Current 45VH2–GREET, previous versions of 45VH2–GREET, and subsequent updates to 45VH2–GREET can be found at [www.energy.gov/45vresources](http://www.energy.gov/45vresources). Proposed § 1.45V–4(b) would provide that information for the location of 45VH2–GREET and accompanying documentation will be included in the instructions to the Form 7210, *Clean Hydrogen Production Credit*.

45VH2–GREET includes various hydrogen production pathways. As of the publication date of these proposed regulations, 45VH2–GREET includes the following hydrogen production pathways—

(1) Steam methane reforming (SMR) of natural gas, with potential carbon capture and sequestration (CCS);

(2) Autothermal reforming (ATR) of natural gas, with potential CCS;

(3) SMR of landfill gas with potential CCS;

(4) ATR of landfill gas with potential CCS;

(5) Coal gasification with potential CCS;

(6) Biomass gasification with corn stover and logging residue with no significant market value with potential CCS;

(7) Low-temperature water electrolysis using electricity; and

(8) High-temperature water electrolysis using electricity and potential heat from nuclear power plants.

As described in *Guidelines to Determine Well-to-Gate Greenhouse Gas (GHG) Emissions of Hydrogen Production Pathways using 45VH2–GREET* (GREET User Manual), certain parameters in 45VH2–GREET are fixed assumptions, referred to as “background data” in this document. Users of 45VH2–GREET may not change background data. Examples of background data include upstream methane loss rates, emissions associated with power generation from specific generator types, and emissions associated with regional electricity grids. Background data are parameters for which bespoke inputs from hydrogen producers are unlikely to be independently verifiable with high fidelity, given the current status of verification mechanisms. The Treasury Department and the IRS seek comment on the readiness of verification mechanisms that could be utilized for certain background data in 45VH2–GREET if it were reverted to foreground data in future releases. For example, the upstream methane loss rate is background data in 45VH2–GREET, and the Treasury Department and the IRS seek comment on conditions, if any, under which the methane loss rate may in future releases become foreground data (such as certificates that verifiably demonstrate different methane loss rates for natural gas feedstocks, sometimes described as responsibly sourced natural gas).

45VH2–GREET allows users to input the quantity of valorized co-products (that is, co-products from the hydrogen production process that are

productively utilized or sold) and allocates emissions to those co-products (rather than to the hydrogen production) as described in *Guidelines to Determine Well-to-Gate Greenhouse Gas (GHG) Emissions of Hydrogen Production Pathways using 45VH2–GREET 2023*. As described in that document, 45VH2–GREET utilizes the “system expansion” approach for all co-products if possible, but restricts the amount of steam co-product that reformers can claim based on the quantity of steam that an optimally designed reformer is expected to be capable of producing based on modeling from the National Energy Technology Laboratory.<sup>7</sup> This restriction is included within the model to avoid incentivizing generation or over-production of hydrogen co-products like steam to enable access to a higher tax credit value by artificially reducing the calculated carbon intensity of the hydrogen (for example, by combustion of fuel onsite that is unnecessary for hydrogen production). The Treasury Department and the IRS seek comments on this approach, including whether alternative co-product accounting methods, such as physical allocation (for example, energy allocation or mass allocation) or allocation based on other characteristics, would better ensure well-to-gate carbon intensity of hydrogen production is accurately represented.

#### B. Provisional Emissions Rate

Proposed § 1.45V–4(c)(1) would provide that, for purposes of section 45V(c)(2)(C) and proposed § 1.45V–4(a), the term “provisional emissions rate” or “PER” means the lifecycle GHG emissions rate of the process by which qualified clean hydrogen is produced by the taxpayer at a qualified clean hydrogen production facility as determined by the Secretary under proposed § 1.45V–4(c).

Proposed § 1.45V–4(c)(2)(i) would provide that a taxpayer may not file a petition with the Secretary for a PER unless a lifecycle GHG emissions rate has not been determined under the most recent GREET model (as defined in proposed § 1.45V–1(a)(8)(ii) as 45VH2–GREET) for hydrogen produced by the taxpayer at a hydrogen production facility. Proposed § 1.45V–4(c)(2)(i) would further provide that a lifecycle GHG emissions rate has not been determined under the most recent GREET model with respect to hydrogen

<sup>7</sup> National Energy Technology Laboratory, DOE, “Comparison of Commercial, State-of-the-Art, Fossil-Based Hydrogen Production Technologies,” April 12, 2022, available at <https://www.netl.doe.gov/energy-analysis/details?id=ed4825aa-8f04-4df7-abef-60e564f636c9>.

produced by the taxpayer at a hydrogen production facility if it uses a hydrogen production pathway that is not included in the most recent GREET model—that is, if either the feedstock used by such facility or the facility’s hydrogen production technology is not included in the most recent GREET model.

For example, the initial version of 45VH2–GREET does not model every possible biomass fuel as a feedstock nor does it represent all hydrogen production technologies that are currently of commercial interest or that may be commercially viable in the future, including geologic hydrogen, trigeneration, or other technologies if sufficient technical analysis had not been completed at the time the model was published. A taxpayer with one of these types of hydrogen production pathways may use the PER process to obtain carbon intensities because such hydrogen production technologies or feedstocks are not currently in 45VH2–GREET. To use the PER process, the hydrogen production pathway that the taxpayer is utilizing must either be consuming a feedstock that is not represented in 45VH2–GREET (for example, a type of biomass that is not represented in the model) or using a hydrogen production technology that is not represented in 45VH2–GREET (for example, technologies used to drill for geologic hydrogen or trigeneration that can use a fuel cell to co-produce hydrogen, heat, and power). A taxpayer may not use the PER process if its feedstock and hydrogen production technology are represented in 45VH2–GREET, even if the taxpayer disagrees with the underlying assumptions (that is, background data) or calculation approach used by the most recent 45VH2–GREET. Future versions of 45VH2–GREET may include additional hydrogen production pathways, such as geologic hydrogen, as sufficient technical information becomes available to provide consistent treatment in 45VH2–GREET.

Proposed § 1.45V–4(c)(2)(i) would also provide that, if a taxpayer’s request for an emissions value from the DOE under proposed § 1.45V–4(c)(5) with respect to the hydrogen produced by the taxpayer at a hydrogen production facility is pending at the time such hydrogen production facility’s pathway is included in an updated version of 45VH2–GREET, the taxpayer’s request for an emissions value will be automatically denied.

Proposed § 1.45V–4(c)(2)(ii) would specify that, notwithstanding proposed § 1.45V–1(a)(8)(ii), for the taxable year in which the hydrogen production pathway the taxpayer uses to produce

hydrogen at a qualified clean hydrogen production facility is first included in an updated version of 45VH2–GREET, the updated version of 45VH2–GREET will be considered the most recent GREET model with respect to the hydrogen produced by the taxpayer at the hydrogen production facility.

#### 1. Process for Filing a Provisional Emissions Rate Petition

Proposed § 1.45V–4(c)(3) would provide that a taxpayer petitions the Secretary for a PER by attaching a PER petition to its Federal income tax return or information return for the first taxable year of hydrogen production ending within the 10-year period described in section 45V(a)(1) for which the taxpayer claims the section 45V credit for hydrogen to which the PER petition relates and for which a lifecycle GHG emissions rate has not been determined, as defined under proposed § 1.45V–4(c)(2)(i). Proposed § 1.45V–4(c)(3) would provide that a PER petition must contain (i) an emissions value obtained from the DOE setting forth the DOE’s analytical assessment of the lifecycle GHG emissions rate associated with the facility’s hydrogen production pathway, and (ii) a copy of the taxpayer’s request to the DOE for an emissions value, including any information that the taxpayer provided to the DOE pursuant to the emissions value request process specified in proposed § 1.45V–4(c)(5). Proposed § 1.45V–4(c)(3) would further provide that, if the taxpayer obtained more than one emissions value from the DOE, then the PER petition must contain the emissions value setting forth the lifecycle GHG emissions rate of the hydrogen for which the section 45V credit is claimed on the Form 7210, *Clean Hydrogen Production Credit*, to which the PER petition is attached.

#### 2. Provisional Emissions Rate Determination

Proposed § 1.45V–4(c)(4) would provide that upon the IRS’s acceptance of the taxpayer’s Federal income tax return or information return containing a PER petition, the emissions value specified on such PER petition will be deemed accepted. Proposed § 1.45V–4(c)(4) would provide that a taxpayer would be able to rely upon an emissions value provided by the DOE for purposes of calculating and claiming a section 45V credit, provided that any information, representations, or other data provided to the DOE in support of the request for an emissions value are accurate. Proposed § 1.45V–4(c)(4) would also state that the IRS’s deemed acceptance of such emissions value is

the Secretary’s determination of the PER. Proposed § 1.45V–4(c)(4) would state, however, that the production and sale or use of such hydrogen must be verified by an unrelated party under section 45V(c)(2)(B)(ii) and in compliance with the procedures provided in proposed § 1.45V–5. Proposed § 1.45V–4(c)(4) would state that such verification and any information, representations, or other data provided to the DOE in support of the request for an emissions value are subject to later examination by the IRS.

#### 3. Department of Energy Emissions Value Request Process

Proposed § 1.45V–4(c)(5) would provide that, in order to obtain an emissions value, an applicant must submit a request for an emissions value following procedures that will be specified by the DOE. The emissions value request process will open on April 1, 2024.

Proposed § 1.45V–5 would also provide that emissions values will be evaluated using the same well-to-gate system boundary that is employed in 45VH2–GREET, as proposed in § 1.45V–1(a)(8)(iii). Additionally, proposed § 1.45V–5 would also provide that if applicable, background data parameters in 45VH2–GREET would also be treated as background data (with fixed values that an applicant cannot change) in the emissions value request process. The emissions value request process would be subject to any guidance issued under section 45V, including any guidance related to the use of EACs.

Proposed § 1.45V–4(c)(5) would also provide that an applicant may request an emissions value from the DOE only after a front-end engineering and design (FEED) study or similar indication of project maturity, such as project specification and cost estimation sufficient to inform a final investment decision, has been completed for the hydrogen production facility. Forthcoming guidance from the DOE, which will be published prior to the April 1, 2024, opening of the emissions value request process, will specify criteria the DOE intends to consider in evaluating whether a FEED study has been completed or that a similar indicator of project readiness has been achieved. The Treasury Department and the IRS seek comments on appropriate indicators of project readiness that should be in place before an applicant requests an emissions value to ensure that requests correspond to hydrogen production facilities with significant commercial interest, and standards against which these indicators could be measured.

Additionally, proposed § 1.45V–4(c)(5) would provide that the DOE may decline to review applications that are not responsive, including those applications that use a hydrogen production technology and feedstock already in GREET or applications that are incomplete. Guidance and procedures for applicants to request and obtain an emissions value from the DOE will be published by the DOE,<sup>8</sup> including a process for, under limited circumstances, a revision to the DOE's initial analytical assessment of an emissions value, such as to address revised technical information or facility design and operation.

#### 4. Effect of Provisional Emissions Rate

Proposed § 1.45V–4(c)(6) would provide that a taxpayer may use a PER determined by the Secretary to calculate the amount of the clean hydrogen production credit under section 45V(a) and proposed § 1.45V–1(b) with respect to qualified clean hydrogen produced by the taxpayer at a qualified clean hydrogen production facility beginning with the first taxable year in which a PER determined by the Secretary has been obtained and for any subsequent taxable year during the 10-year period beginning on the date such facility was originally placed in service, provided all other requirements of section 45V are met, and until the lifecycle GHG emissions rate of such hydrogen has been determined (for purposes of section 45V(c)(2)(C)) under the most recent GREET model (as defined in proposed § 1.45V–1(a)(8)(ii)).

Proposed § 1.45V–4(c)(6) would provide that the Secretary's PER determination is not an examination or an inspection of books of account for purposes of section 7605(b) of the Code, and would not preclude or impede the IRS (under section 7605(b) or any administrative provisions adopted by the IRS) from later examining a return or inspecting books or records with respect to any taxable year for which the section 45V credit is claimed. Proposed § 1.45V–4(c)(6) would provide that a verification report submitted under section 45V(c)(2)(B)(ii) and § 1.45V–5 and any information, representations, or other data provided to the DOE in support of an emissions value request would still be subject to IRS examination. Further, proposed § 1.45V–4(c)(6) would state that a PER determination would not mean that the IRS has determined that all the requirements of section 45V have been satisfied for any taxable year, nor would

it create an inference that such a presumption exists.

#### C. Use of Energy Attribute Certificates

The Treasury Department and the IRS, in consultation with the United States Environmental Protection Agency (EPA) and the DOE, have preliminarily determined that energy attribute certificates (EACs) may be considered under certain conditions in documenting purchased electricity inputs and assessing emissions impacts of electricity used in the production of hydrogen for purposes of the section 45V credit.<sup>9</sup> For purposes of these proposed regulations, the term “EACs” refers solely to EACs that represent attributes of electricity generated by a specific facility or source. The EPA has advised that EACs are an established mechanism for substantiating the purchase of electricity from zero GHG-emitting sources and that the use of EACs with attributes that meet certain criteria is an appropriate way for the Treasury Department and the IRS to document electricity inputs to electrolytic hydrogen production. Such EACs can also serve as a reasonable methodological proxy for quantifying certain indirect emissions associated with electricity for purposes of the section 45V credit. Similarly, the EPA and the DOE have advised that it would be appropriate for EACs with attributes that meet certain criteria to be included as part of the basis for assessing emissions for purposes of the section 45V credit. The Treasury Department and the IRS have preliminarily determined that the use of certain EACs, which satisfy the qualifying EAC requirements (as specified in proposed § 1.45V–4(d)(3)), is consistent with the references to subparagraph (H) of section 211(o)(1) of the Clean Air Act (42 U.S.C. 7545(o)(1)(H)) and the most recent GREET Model, as specified in section 45V(c)(1).

Proposed § 1.45V–4(d)(1) would provide that for purposes of section 45V, if a taxpayer determines a lifecycle GHG emissions rate for hydrogen produced at a hydrogen production facility using the most recent GREET model (as defined in proposed § 1.45V–1(a)(8)(ii)) or a PER (as defined in proposed § 1.45V–4(c)(1)), then the taxpayer may reflect in GREET or include in a PER such hydrogen

production facility's use of electricity as being from a specific electricity generating facility rather than the being from the regional electricity grid (as represented in 45VH2–GREET) only if the taxpayer acquires and retires a qualifying EAC (as defined in proposed § 1.45V–4(d)(2)(iv)) for each unit of electricity that the taxpayer claims from such source. For example, one megawatt-hour of electricity used to produce hydrogen would need to be matched with one megawatt-hour of qualifying EACs. The Treasury Department and the IRS seek comments on whether a different treatment would be more appropriate to account for transmission and distribution line losses.

Further, proposed § 1.45V–4(d)(1) would provide that to satisfy this requirement, a taxpayer's acquisition and retirement of qualifying EACs must also be recorded in a qualified EAC registry or accounting system (as defined in proposed § 1.45V–4(d)(2)(v)) so that the acquisition and retirement of such EACs may be verified by a qualified verifier (as defined in proposed § 1.45V–5(h)).

The double counting of EACs and their underlying attributes would undermine the integrity of lifecycle GHG emissions rate determinations that incorporate EACs. A double counting occurs if two different parties claim the same environmental benefits from the same generated energy.<sup>10</sup> Uniformly requiring claims of using electricity generated from specific sources to be evidenced by EACs that meet the requirements of proposed § 1.45V–4(d)(1) would mitigate the risk of double counting. Thus, proposed § 1.45V–4(d)(1) would provide that certain requirements must be met regardless of whether the electricity generating facility giving rise to the qualifying EAC is grid connected, directly connected, or co-located with the hydrogen production facility (that is, regardless of whether the underlying source of the qualifying EAC physically supplies electricity through a direct connection to the hydrogen production facility).

#### 1. Definitions Related To Use of Energy Attribute Certificates

Proposed § 1.45V–4(d)(2)(i) would define the term “commercial operations date” or “COD” as the date on which a facility that generates electricity begins commercial operations. The COD, as defined here, is the first date of the operation of the relevant electricity

<sup>8</sup>DOE will provide guidance and procedures at [www.energy.gov/45vresources](http://www.energy.gov/45vresources).

<sup>9</sup>EPA Letter, available at <https://home.treasury.gov/system/files/136/45V-NPRM-EPA-letter.pdf>; DOE. 2023. “Assessing Lifecycle Greenhouse Gas Emissions Associated with Electricity Use for the Section 45V Clean Hydrogen Production Tax Credit.” Washington, DC: U.S. Department of Energy available at [www.energy.gov/45vresources](http://www.energy.gov/45vresources).

<sup>10</sup>EPA, “Double Counting,” last updated Feb. 5, 2023, available at <https://www.epa.gov/green-power-markets/double-counting>.

generating facility. The general rules for determining an electricity generating facility's placed in service date for Federal income tax purposes would not apply in determining its COD.

Proposed § 1.45V-4(d)(2)(ii) would define the term "energy attribute certificate" or "EAC" to mean a tradeable contractual instrument, issued through a qualified EAC registry or accounting system (as defined in proposed § 1.45V-4(d)(2)(v)), that represents the energy attributes of a specific unit of energy produced. An EAC may be acquired with or separately from the underlying energy it represents. An EAC can be retired by or on behalf of its owner, which is the party that has the right to claim the underlying attributes represented by an EAC. Renewable energy certificates (RECs) and other similar energy certificates issued through a registry or accounting system are forms of EACs.

Proposed § 1.45V-4(d)(2)(iii) would define the term "eligible EAC" to mean an EAC that, with respect to the electricity to which the EAC relates, provides, at minimum, the following information: (i) a description of the electricity generating facility, including the technology and feedstock used to generate the electricity; (ii) the amount and units of electricity; (iii) the date on which the facility that generated the electricity first began commercial operations (referred to as the commercial operations date (COD)) (as defined in proposed § 1.45V-4(d)(2)(i)); (iv) for electricity that is generated before January 1, 2028, the calendar year in which such electricity was generated; (v) for electricity that is generated after December 31, 2027, the date and hour in which such electricity was generated; and (vi) a unique project identification number or assigned identifier for each EAC that can be used to cross reference any additional electricity generating facility information that may be needed, such as location.

Proposed § 1.45V-4(d)(2)(iv) would define the term "qualifying EAC" to mean an eligible EAC (as defined in proposed § 1.45V-4(d)(2)(iii)) that meets the requirements of proposed § 1.45V-4(d)(3) and for which the satisfaction of those requirements has been verified by a qualified verifier (as defined in proposed § 1.45V-5(h)).

Proposed § 1.45V-4(d)(2)(v) would define the term "qualified EAC registry or accounting system" to mean a tracking system that (i) assigns a unique identification number to each EAC tracked by such system, (ii) enables verification that only one EAC is associated with each unit of electricity, (iii) verifies that the underlying

attributes of each EAC is claimed and retired only once, (iv) identifies the owner of each EAC, and (v) provides a publicly accessible view (for example, through an application programming interface) of all currently registered electricity generators in the tracking system to prevent the duplicative registration of such generators. Qualified EAC registries currently include, but are not limited to, the following: Electric Reliability Council of Texas (ERCOT); Michigan Renewable Energy Certification System (MIRECS); Midwest Renewable Energy Tracking System, Inc. (M-RETS); North American Registry (NAR); New England Power Pool Generation Information System (NEPOOL-GIS); New York Generation Attribute Tracking System (NYGATS); North Carolina Renewable Energy Tracking System (NC-RETS); PJM Generation Attribute Tracking System (PJM-GATS); and Western Electric Coordinating Council (WREGIS).

Proposed § 1.45V-4(d)(2)(vi) would define the term "region" to mean a United States region derived from the National Transmission Needs Study (DOE Needs Study) that was released by the DOE on October 30, 2023.<sup>11</sup> The DOE has mapped the DOE Needs Study regions to actual balancing authorities. The data file and map of the resulting United States regions can be found in *Guidelines to Determine Well-to-Gate Greenhouse Gas (GHG) Emissions of Hydrogen Production Pathways using 45VH2-GREET* (GREET User Manual) as of December 26, 2023. The location of an electricity generation source and the location of a hydrogen production facility will be based on the balancing authority to which it is electrically interconnected (not its geographic location), with each balancing authority linked to a single region. The MISO balancing authority is an exception because it is split into two U.S. regions as shown in the map located at GREET User Manual as of December 26, 2023. Alaska, Hawaii, and each U.S. territory will be treated as separate regions.

## 2. Eligible Energy Attribute Certificate Requirements

Proposed § 1.45V-4(d)(3) would provide that an EAC meets the requirements to be a qualifying EAC if it meets the requirements for incrementality, temporal matching, and deliverability. The incrementality requirement in proposed § 1.45V-4(d)(3)(i) would require qualifying EACs

to represent incremental source electricity, such as electricity from an electricity generating facility that has a recent COD. As discussed in more detail later in this section, the Treasury Department and the IRS are requesting comments on whether and under what circumstances electricity generated by an existing electricity generating facility (that is, with a less recent COD) that is dedicated to hydrogen production may be treated as satisfying the incrementality requirement. The temporal matching requirement in proposed § 1.45V-4(d)(3)(ii) would require that qualifying EACs are retired that represent electricity produced in the same time period in which the hydrogen production facility consumes electricity in the production of hydrogen. The deliverability requirement in proposed § 1.45V-4(d)(3)(iii) would require qualifying EACs to represent electricity that was produced by an electricity generating facility that is in the same region as the relevant hydrogen production facility.

The Treasury Department and the IRS, in consultation with the EPA and the DOE, have preliminarily determined that these qualifying EAC requirements are consistent with the requirements of section 45V(c)(1)(A) and (B) of the Code.<sup>12</sup> The EPA has advised that, based on its prior implementation of section 211(o)(1)(H) of the Clean Air Act in other contexts, it would be reasonable and consistent with the EPA's precedent for the Treasury Department and the IRS to determine that induced grid emissions are an anticipated real-world result of electrolytic hydrogen production that must be considered in lifecycle GHG analyses for purposes of the section 45V credit. Such interpretation would be consistent with the EPA's long-standing interpretation and application of section 211(o)(1)(H) of the Clean Air Act in the context of the Renewable Fuel Standard (RFS) program. The EPA has also noted that EACs are an established means for documentation and verification of the electricity generation and purchase of zero-GHG electricity. Moreover, the EPA has advised that it believes it would be reasonable for the Treasury Department and the IRS to use EACs that possess specific attributes that meet certain criteria as a means of reducing the risk of induced grid emissions resulting from

<sup>11</sup> DOE, National Transmission Needs Study, Oct. 2023, available at [https://www.energy.gov/sites/default/files/2023-10/National\\_Transmission\\_Needs\\_Study\\_2023.pdf](https://www.energy.gov/sites/default/files/2023-10/National_Transmission_Needs_Study_2023.pdf).

<sup>12</sup> EPA Letter, available at <https://home.treasury.gov/system/files/136/45V-NPRM-EPA-letter.pdf>; DOE, 2023. "Assessing Lifecycle Greenhouse Gas Emissions Associated with Electricity Use for the Section 45V Clean Hydrogen Production Tax Credit." Washington, DC: U.S. Department of Energy, available at [www.energy.gov/45vresources](http://www.energy.gov/45vresources).

new load from electrolytic hydrogen production being added to an existing grid. Such requirements would mitigate the risk of inappropriately crediting hydrogen production that does not meet the lifecycle GHG levels required by section 45V.

DOE has published a technical paper, *Assessing Lifecycle Greenhouse Gas Emissions Associated with Electricity Use for the Section 45V Clean Hydrogen Production Tax Credit*, which the Treasury Department and the IRS have reviewed, and which has informed the development of the proposed regulations. As discussed therein, incrementality, temporal matching, and deliverability requirements are important guardrails to ensure that hydrogen producers' electricity use can be reasonably deemed to reflect the emissions associated with the specific generators from which the EACs were purchased and retired. If hydrogen producers rely on EACs without attributes that meet these three criteria there is 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.

Electricity from a specific generator will have a GHG emissions profile that results from both its direct and indirect emissions. EACs with attributes that meet the three criteria are intended to address indirect GHG emissions resulting from the dynamics of the electricity market and the electric grid. If a hydrogen producer purchases zero GHG-emitting electricity that is represented by such EACs it is relatively straightforward to verify both the direct and indirect emissions resulting from such purchase and use. However, for minimal-emitting sources of electricity, additional considerations may be necessary to verify the full range of direct and indirect emissions. The Treasury Department and the IRS request comment on what information is needed to document and verify GHG emissions related to minimal-emitting electricity generation that is purchased and used for hydrogen production for purposes of claiming the section 45V credit.

While the Treasury Department and the IRS are soliciting comment on the type of information that hydrogen producers must provide in order to document and verify the direct and indirect GHG emissions associated with purchased electricity generally, we are also seeking input on two specific types of electricity generation for which GHG emissions can be highly variable or uncertain: fossil fuel-powered electricity generation with CCS and biomass-

powered electricity generation. With regard to non-minimally emitting electricity generation, and fossil fuel-powered generation and biomass powered generation with or without CCS in particular, the Treasury Department and the IRS request comment on mechanisms to verify accurately real-world emissions related to hydrogen production. This includes mechanisms for, among other things, verification of the origin of the feedstock, rate of carbon capture, and other parameters that are relevant to accurate lifecycle analysis, as well as the ability of EAC instruments to represent accurately such attributes. The Treasury Department and the IRS also request comment on specific lifecycle GHG emissions considerations, including the use of counterfactual scenarios, that should be considered in evaluating direct and indirect emissions associated with specific types of biomass and its consumption. The Treasury Department and the IRS also request comment on the extent and manner in which incrementality, temporal matching, and deliverability should be applied in accounting for existing or new electricity generation from biomass or fossil feedstock. These comments may inform future versions of 45VH2-GREET.

#### a. Incrementality

Proposed § 1.45V-4(d)(3)(i)(A) would provide that an EAC meets the incrementality requirement if the electricity generating facility that produced the unit of electricity to which the EAC relates has a COD (as defined in proposed § 1.45V-4(d)(2)(i)) that is no more than 36 months before the hydrogen production facility for which the EAC is retired was placed in service.

The Treasury Department and the IRS understand that EAC tracking systems capture the COD of each electricity generating facility during the registration process (often using data also reported to the Energy Information Administration), inclusive of month and year, which can be cross-referenced based on project identification codes included on those EACs. That COD should represent the initial date of operation for the relevant electricity generating facility. Third-party verifiers should use this data to confirm the eligibility of purchased and retired EACs.

The Treasury Department and the IRS note that there are circumstances in which an existing higher-emitting electricity generating facility may make upgrades to subsequently deliver minimal-emitting electricity. For example, an existing fossil-fuel

electricity generating facility may add CCS capability, thereby reducing its lifecycle emissions rate as determined in 45VH2-GREET. The Treasury Department and the IRS request comments on whether the electricity generated by such a facility should be considered incremental under circumstances such as if an existing fossil fuel electricity-generating facility after the addition of CCS (after upgrade), had a COD that is no more than 36 months before the relevant hydrogen production facility was placed in service. Comment is also requested on the related question of whether, depending on its carbon dioxide capture rate, it would be appropriate to treat such a facility as a new source of minimal-emitting generation on the grid that would not be associated with induced grid emissions. Relevant to these questions, the Treasury Department and the IRS additionally request comment on what information would be needed to allow for qualifying EACs representing existing fossil fuel-powered electricity from facilities that have added CCS. In particular, comment is requested on whether there are safeguards that can ensure that a hydrogen producer's purchase and use of electricity from an existing fossil fuel-fired electricity generating facility that installs CCS does not result in indirect GHG emissions due to the dynamics of the electricity market and electric grid. The Treasury Department and the IRS request comment on the direct and induced emissions impacts of making such a facility eligible, and whether and under what circumstances it would be appropriate to do so.

Proposed § 1.45V-4(d)(3)(i)(B) would provide an alternative test for establishing incrementality for electricity generating facilities that undergo an uprate. Proposed § 1.45V-4(d)(3)(i)(B) would provide that an EAC satisfies this alternative test if the electricity represented by the EAC is produced by an electricity generating facility that had an uprate no more than 36 months before the hydrogen production facility with respect to which the EAC is retired was placed in service and such electricity is part of such electricity generating facility's uprated production.

Proposed § 1.45V-4(d)(3)(i)(B) would provide rules for determining uprated production. Specifically, proposed § 1.45V-4(d)(3)(i)(B) would provide that an uprated electricity generating facility's production must be prorated to each hour or year, consistent with the requirements in proposed § 1.45V-4(d)(3)(ii), of such facility's generation by multiplying each hour's production

by the uprated production rate to determine the electricity to which the uprate relates. Proposed § 1.45V–4(d)(3)(i)(B) would define key terms, including: (i) “uprate,” which means an increase in an electricity generating facility’s rated nameplate capacity (in nameplate megawatts); (ii) “pre-uprate capacity,” which means the nameplate capacity of an electricity generating facility immediately before an uprate; (iii) “post-uprate capacity,” which means the nameplate capacity of an electricity generating facility immediately after an uprate; (iv) “incremental generation capacity,” which means the increase in an electricity generating facility’s rated nameplate capacity from the pre-uprate capacity to the post-uprate capacity; (v) “uprated production rate,” which means the incremental generation capacity (in nameplate megawatts) divided by the post-uprate capacity (in nameplate megawatts); and (vi) “uprated production,” which means the uprated production rate of an electricity generating facility multiplied by its total generation output in a given hour (in megawatt hours). Proposed § 1.45V–4(d)(3)(i)(C) would provide an example to illustrate the application of the alternative test for establishing incrementality due to uprates.

The DOE has advised that there are circumstances during which diversion of existing minimal (that is, zero or near-zero) emissions power generation to hydrogen production is unlikely to result in significant induced GHG emissions.<sup>13</sup> Such circumstances may include generation from minimal-emitting power plants (i) that would retire absent the ability to sell electricity for qualified clean hydrogen production, (ii) during periods in which minimal-emitting generation would have otherwise been curtailed, if marginal emissions rates are minimal, or (iii) in locations where grid-electricity is 100 percent generated by minimal-emitting generators or where increases in load do not increase grid emissions, for example, due to State policy capping total GHG emissions such that new load must be met with minimal-emitting generators. The Treasury Department and the IRS seek comments on whether and how to provide alternative approaches to identifying circumstances in which there is minimal risk of significant induced grid emissions for

<sup>13</sup> DOE. 2023. “Assessing Lifecycle Greenhouse Gas Emissions Associated with Electricity Use for the Section 45V Clean Hydrogen Production Tax Credit.” Washington, DC: U.S. Department of Energy, available at [www.energy.gov/45vresources](http://www.energy.gov/45vresources).

certain existing electricity generating facilities.

The Treasury Department and the IRS are considering providing, in the final regulations, alternative circumstances under which an EAC may be deemed to satisfy the incrementality requirement. The Treasury Department and the IRS request comments on these specific circumstances as described in part V.C.2.a.i through iii of this Explanation of Provisions.

#### i. Avoided Retirements Approach

The Treasury Department and the IRS seek comments on whether to recognize an avoided retirements approach that would treat EACs from an existing electricity generating facility as satisfying the incrementality requirement if the facility is likely to avoid retirement because of its relationship with a hydrogen production facility. With respect to this potential approach, the Treasury Department and the IRS request comments on the following: (i) the appropriate criteria that should be considered to assess retirement risk; (ii) the extent to which demonstration of financial loss, projected or actual local electricity market conditions, presence of out-of-market financial support (which could potentially include financial support driven by Federal or State policy, bilateral contracts for EACs or above-market electricity sales, or revenue provided by cost-of-service regulation), or upcoming relicensing decisions, in combination, are appropriate criteria to assess risk; (iii) industry best practices for estimating financial loss and the documentation necessary to support those estimates; (iv) the appropriate criteria that should be taken into account to assess the likelihood that an electricity generator’s relationship with a hydrogen production facility avoids retirement of the generator (for example, size of electrolyzer, co-location, contract length, or otherwise); (v) the appropriate criteria that should be taken into account to ensure that only electricity generation supplying the minimum hydrogen production necessary to avoid retirement is counted as incremental, and, in particular, whether there should be a cap on the amount of generation from a given facility that qualifies as incremental and how such a cap should be determined; (vi) the period during which any determination of incrementality of existing electricity generators would be maintained before a new showing would be required; (vii) the process by which eligibility for this approach should be determined and any related administrability considerations;

and (viii) what role, if any, EAC tracking systems should play in the verification or tracking of eligible EACs from such electricity generators.

With respect to processes that may be used to implement this approach, the Treasury Department and the IRS request comments on whether such approach should allow existing minimal-emitting generators that wish to provide EACs to hydrogen producers to demonstrate incrementality through submission to the IRS or another Federal agency, such as the DOE, specific information that supports a conclusion that the electricity generator is at risk of retirement that may be mitigated by sales to hydrogen producers, and, if so, what information and information submission process should be required.

The available data on retirement risk indicates this approach may be warranted. Some clean power plants, primarily nuclear plants, have retired in recent years. Based on data from the Energy Information Administration (EIA), from 2013 through 2022, 10,800 megawatts (MW) of nuclear, 1,700 MW of wind, 950 MW of hydropower, and 360 MW of solar have retired.<sup>14</sup> Studies have shown that there is risk of continued retirement in the years ahead.<sup>15</sup> The EIA, for example, estimates that an additional 4,600 MW of existing nuclear plants may retire through 2032, equivalent to five percent of the existing nuclear fleet (1,900 gigawatts (GW) of renewable power plants may retire as well).<sup>16</sup> Some of these plant owners (primarily owners of nuclear plants) may decide whether to retire the plants based on the finances of continuing to operate the plants. It is likely that for some plants, additional revenue from selling EACs and electricity to hydrogen producers may improve the financial outlook of the plant and help avert retirement, thereby keeping the minimal-emitting power plant in operation and not resulting in induced grid emissions compared to a scenario in which the plant retires.

<sup>14</sup> Monthly Generator Report Based on Form 860 available at <https://www.eia.gov/electricity/data/eia860m/>.

<sup>15</sup> See John Bistline et al, “Emissions and energy impacts of the Inflation Reduction Act”, 380Science, 1324–27, June 29, 2023, available at <https://www.science.org/doi/10.1126/science.adg3781>; U.S. Energy Information Administration, Annual Energy Outlook 2023, March 16, 2023, available at [https://www.eia.gov/outlooks/aeo/tables\\_ref.php](https://www.eia.gov/outlooks/aeo/tables_ref.php).

<sup>16</sup> U.S. Energy Information Administration, Annual Energy Outlook 2023, March 16, 2023, available at [https://www.eia.gov/outlooks/aeo/tables\\_ref.php](https://www.eia.gov/outlooks/aeo/tables_ref.php).

ii. Zero or Minimal Induced Grid Emissions Through Modeling or Other Evidence

The Treasury Department and the IRS seek comments on whether to provide an opportunity to demonstrate zero or minimal induced grid emissions through modeling or other evidence under specific circumstances. A demonstrated or modeled minimal-emission approach could treat electricity produced by certain existing electricity generating facilities under certain circumstances as satisfying the incrementality requirement if it is demonstrated that such sources and circumstances would not give rise to significant induced grid emissions. Such a showing could be based on modeling or potentially be deemed to be made in certain circumstances based on regional grid characteristics, state policy, or facility history.

The Treasury Department and the IRS request comments on this demonstrated or modeled minimal-emission approach, including: (i) the circumstances in which it should be available and the criteria that are appropriate to evaluate and determine whether those circumstances occur; (ii) who should apply under this approach, the electricity generation facility, the hydrogen producer, or both; (iii) what data or modeling should be submitted; (iv) best practices for making such demonstrations, including for ensuring the impartiality and replicability of calculation approaches; (v) how an administrator of such a program would validate the accuracy of applicant submissions; (vi) under what circumstances, if any, it would be appropriate to deem generation to satisfy the incrementality requirement without modeling, and what documentation should be provided in these cases; (vii) the process by which eligibility for this approach should be determined and any related administrability considerations; (viii) the period during which any determination of incrementality would be maintained before a new showing would be required; and (ix) the circumstances and capability of EACs and tracking systems to track and verify energy attributes from such sources.

There are several circumstances that may be covered under this pathway. Periods of curtailment or zero or negative pricing is one such circumstance. Hydropower plants sometimes “spill” water, a form of curtailment. Curtailment of minimal-emitting electricity generation tends to occur during times when wholesale electricity prices are zero or negative on

a system-wide basis. Purchasing EACs from existing minimal-emitting electricity generators under these conditions would have limited or no induced grid emissions as these are times during which increased load would tend to be met by the otherwise curtailed minimal-emitting electricity generators rather than inducing increased generation from emitting electricity generators, and so is unlikely to significantly increase induced grid emissions.

Similarly, if in a particular region, all generation—including imported generation—comes from minimal-emitting electricity generators, then increased load is unlikely to significantly increase induced grid emissions. The same may be true if a region is subject to a state or local policy that ensures that new load is met with minimal-emitting electricity generation.

There may be limited risk of significant induced GHG emissions for islanded generation systems. Diversion of generation from a minimal-emitting electricity generator that has never been connected to the grid generally may not have the same induced GHG emissions effects as diversion from an electricity generator that is connected to the grid. Induced GHG emissions could occur, however, if the energy demand that the existing minimal-emitting electricity generator previously met is instead met by a different, emitting, energy source. For example, an onsite minimal-emitting electricity generator that powers an industrial facility could be diverted for hydrogen production, in which case the induced GHG emissions would depend on what happens at the site to meet the power needs of the industrial facility (unless the industrial facility ceases operation).

iii. Formulaic Approaches To Addressing Incrementality From Existing Clean Generators

The Treasury Department and the IRS recognize the difficulty in reliably identifying the specific electricity generators and specific times and places in which the circumstances described in part V.C.2.a.i and ii of this Explanation of Provisions might occur. Therefore, the Treasury Department and the IRS are also considering alternative approaches that would serve as proxy for all the pathways described in part V.C.2.a.i and part V.C.2.a.ii of this Explanation of Provisions. EACs that satisfy the incrementality requirement through this pathway would still be required to meet temporal matching and deliverability requirements.

One such approach would deem five percent of the hourly generation from

minimal-emitting electricity generators (for example, wind, solar, nuclear, and hydropower facilities) placed in service before January 1, 2023, as satisfying the incrementality requirement. This pathway may be appropriate because some circumstances (including periods of curtailment or times when generation from minimal-emitting electricity generation is on the margin) may make the resulting incremental generation difficult to anticipate or identify, or because the process for identifying the circumstances (such as avoided retirement risk or modeling of minimal-emissions) may be overly burdensome to evaluate for specific electricity generators or require data that is not available. In some instances, for example, in determining whether EACs come from electricity generation that would otherwise have been curtailed, these circumstances require understanding of counterfactual “what if” scenarios that depend on numerous assumptions. In other circumstances, for example, in determining whether EACs come from minimal-emitting electricity generators that otherwise would have retired or if policy regimes restrict increases in grid emissions in the face of growing electricity demand, they may require detailed assessment and pre-qualification based on applicant-submitted information and forecasts with related concerns about information accuracy. In still other cases, they may require complex geographically and temporally granular modeling and data (such as for marginal emission rates that consider operational and structural effects<sup>17</sup>) in concert with hourly EAC tracking infrastructure that is not yet widely available.

The Treasury Department and the IRS are mindful of the risk that an allowance without further temporal, spatial, and circumstantial precision results in hydrogen production facilities receiving credits for which they should not be eligible given their induced emissions rates. Given the risks of induced GHG emissions, the Treasury Department and the IRS believe that a broadly available allowance that is not tailored to specific geographic or other conditions should not be greater than the national average rate of the occurrence of the above circumstances and instead should be a conservative lower bound of the national average. The DOE reports that wind curtailment in 2022 averaged 5.3 percent of total wind generation

<sup>17</sup> DOE 2023. “Assessing Lifecycle Greenhouse Gas Emissions Associated with Electricity Use for the Section 45V Clean Hydrogen Production Tax Credit.” Washington, DC: U.S. Department of Energy, available at [www.energy.gov/45vresources](http://www.energy.gov/45vresources).

nationwide (data are only available for Independent System Operator (ISO) regions),<sup>18</sup> and Lawrence Berkeley National Laboratory reports curtailment rates for solar photovoltaics at over 10 percent of solar generation in ERCOT and over 3 percent in California Independent System Operator (CAISO).

Purchasing EACs from existing minimal-emission electricity generators, whether or not from the electricity generators that would otherwise curtail their output, under these conditions would have limited risk of induced grid emissions. As noted earlier, curtailment is most likely to occur in the face of negative wholesale electricity prices if the marginal grid emissions rate is minimal or zero. Based on a data tool developed by Lawrence Berkeley National Laboratory that considers over 50,000 wholesale pricing nodes across the nation, negative wholesale prices occurred during roughly five percent of hours over the last several years (6.3 percent of hours in 2022, 5.8 percent in 2021, 4.8 percent in 2020, 3.3 percent in 2019, and 2.3% in 2018).<sup>19</sup> These are times during which increased load is unlikely to increase significantly induced grid emissions.<sup>20</sup> Modeled data from the National Renewable Energy Laboratory (NREL) is broadly consistent with these trends. Specifically, NREL's Cambium data set for 2024 shows that long-run marginal emissions rates on a national basis are projected to be at or near zero for about five percent of hours, times during which minimal-emitting electricity generators are on the margin and often curtailed.<sup>21</sup>

In addition, some minimal-emitting electricity generators are at risk of retirement, including about five percent of the nuclear fleet according to EIA estimates. A percentage allowance can also serve as proxy for avoided retirements.

The Treasury Department and the IRS seek comments on this five percent-

allowance approach, including the merits of this approach compared to the targeted pathways described, particularly with respect to balancing administrative feasibility and burden with accuracy of identifying circumstances with a low risk of induced grid emissions. The Treasury Department and the IRS also seek comments on whether 5 percent is the appropriate magnitude for an allowance. In particular, as noted earlier, data show that curtailment rates have increased in recent years, and NREL's Cambium model predicts additional increases going forward. In light of these data and projections, the Treasury Department and the IRS seek comments on whether a higher amount, such as up to 10 percent, would be appropriate, either in general or in certain cases or circumstances. The Treasury Department and the IRS also seek comments on: (i) how a five-percent allowance should be tracked, allocated, and administered and how feasible it is for EAC tracking systems to incorporate data on such an allowance; (ii) whether the five percent should apply to all existing minimal-emitting electricity generators in all locations or a subset and for what reasons; (iii) whether such an allowance should be assessed at the individual plant level or across an operator's fleet within the same deliverability region; and (iv) any other administrability considerations. The Treasury Department and the IRS seek comments specifically on whether and how the "averaging" approach of a proxy appropriately captures the circumstances in which generation is incremental or does not generate induced grid emissions. The Treasury Department and the IRS also seek comments on how and whether the targeted alternative approaches or the other proxy approaches described subsequently in this part V.C.2.a.iii of this Explanation of Provisions might replace the five-percent allowance or might be coordinated with the allowance.

The Treasury Department and the IRS invite comments on alternative formulaic, proxy approaches that might better capture conditions under which using existing minimal-emitting electricity generation to produce hydrogen does not significantly impact induced grid emissions. The Treasury Department and the IRS request comments on whether there would be an appropriate, more formulaic approach to capturing retirement risk, instead of the application-based process or the five-percent allowance. Comments are specifically requested on

whether such an alternative approach should be limited to facilities with specific technical, market, or geographic characteristics corresponding with a greater risk of retirement (for example, participation in a wholesale market, lack of state support for a facility, nuclear plants with a single reactor) and higher likelihood that using a subset of electricity generation and related EACs for hydrogen production would minimize the risk.

In particular, the Treasury Department and the IRS seek comments on whether existing nuclear and hydroelectric facilities that need to undertake a relicensing process are generally at higher risk of retirement without additional financial assistance and, if so, what considerations should be integrated into a potential formulaic approach. Comments are further requested on whether there are particular characteristics of hydrogen production facilities associated with existing generators at risk of retirement that should be considered (i) to demonstrate that the hydrogen production reduces retirement risk, such as co-location of hydrogen production with an existing generator and (ii) to assess the minimum hydrogen production necessary to reduce retirement risk, such as limitations on project size, electrolyzer capacity, or percent of generation used by the hydrogen production. Comments are further requested on how to determine the portion of such electricity generation and related EACs, which is generally likely to be sufficient to minimize that risk. Similarly, with respect to the modeled or demonstrated approach described in part V.C.2.a.ii of this Explanation of Provisions, the Treasury Department and the IRS request comments on whether there are formulaic approaches that might be used instead of an application-based pre-qualification process and the broad five-percent allowance.

For each of these possible alternative approaches to establish incrementality, the Treasury Department and the IRS request comments on how eligibility for the approach may be reliably verified by an unrelated party and administered by the IRS.

#### b. Temporal Matching

Proposed § 1.45V-4(d)(3)(ii)(A) would provide the general rule that an EAC satisfies the temporal matching requirement if the electricity represented by the EAC is generated in the same hour that the taxpayer's hydrogen production facility uses electricity to produce hydrogen. Proposed § 1.45V-4(d)(3)(ii)(B) would

<sup>18</sup> Office of Energy Efficiency & Renewable Energy, DOE, "Land-Based Wind Market Report: 2023 Edition," Aug. 24, 2023, available at <https://www.energy.gov/eere/wind/articles/land-based-wind-market-report-2023-edition>.

<sup>19</sup> Berkeley Lab, Electricity Markets & Policy, The Renewables and Wholesale Electricity Prices (ReWEP) Tool, available at <https://emp.lbl.gov/renewables-and-wholesale-electricity-prices-rewep>.

<sup>20</sup> For example, see New York State Energy Research and Development Authority (NYSERDA), 2022 "Projected Emission Factors for New York State Grid Electricity," NYSERDA Report Number 22-18, available at <https://www.nyserd.ny.gov/-/media/Project/Nyserda/Files/Publications/Energy-Analysis/22-18-Projected-Emission-Factors-for-New-York-Grid-Electricity.pdf>.

<sup>21</sup> See National Renewable Energy Laboratory, Energy Analysis, Cambium, available at <https://www.nrel.gov/analysis/cambium.html>. Long-run marginal emissions rates at or near zero defined as under 25 kg CO<sub>2</sub>e/MWh.

provide a transition rule to allow an EAC that represents electricity generated before January 1, 2028 to fall within the general rule provided in proposed § 1.45V–4(d)(3)(ii)(A) if the electricity represented by the EAC is generated in the same calendar year that the taxpayer's hydrogen production facility uses electricity to produce hydrogen. The DOE has advised that hourly matching is necessary to properly address significant indirect emissions from electricity use and that the tracking systems and related contractual structures for hourly matching will take some time to develop to an appropriate level of maturity.<sup>22</sup> This transition rule is intended to provide time for the EAC market to develop the hourly tracking capability necessary to verify compliance with this requirement.

Hourly tracking systems for EACs are not yet broadly available across the country and will take some time to develop.<sup>23</sup> In a recent survey of nine existing tracking systems,<sup>24</sup> two of the tracking systems indicated that they are already tracking on an hourly basis, although software functionality in these two systems remains limited. Fully developing the functionality of these systems will take time, as will creating and developing the functionality of hourly tracking infrastructure in other regions of the country. Of the other tracking systems, assuming that challenges are overcome, four gave a timeline of less than one year to two years, and one gave a timeline of three to five years; in the latter case, the respondent noted that the timeline could be closer to three years if there is full state agency buy-in, clear instructions are received from federal or state agencies, and funding for stakeholder participation is made available. Two tracking systems declined to give a timeline to develop this functionality. In the same survey, tracking systems identified a number of challenges to hourly tracking that will need to be overcome, including cost, regulatory approval, interactions with state policy, sufficient stakeholder

engagement, data availability and management, and user confusion. Moreover, once the tracking software infrastructure is in place nationally, it may take additional time for transactional structures and efficient hourly EAC markets to develop. Among the issues that require resolution as EAC tracking systems move to hourly resolution is the treatment of electricity storage.<sup>25</sup>

Given the state of tracking systems, the expected responses to this proposed rule, and the impact of demand to drive development of the tracking systems, the Treasury Department and the IRS anticipate that the proposed duration of the transition rule would allow sufficient time for systems to develop hourly tracking mechanisms and for the associated trading markets to develop. The Treasury Department and the IRS acknowledge uncertainty in the timing of implementing an hourly matching requirement, however, and request comments on the appropriate duration of this transition rule to hourly matching, including specific data regarding current industry practices, the predicted timelines for development of hourly tracking mechanisms, and the predicted timeline for market development for hourly EACs.

#### c. Deliverability

Proposed § 1.45V–4(d)(3)(iii) would provide that an EAC meets the deliverability requirements if the electricity represented by the EAC is generated by a source that is in the same region (as defined in proposed § 1.45V–4(d)(2)(vi)) as the relevant hydrogen production facility. This approach provides reasonable assurances of deliverability of electricity because the regions, as defined earlier, were developed by the DOE in consideration of transmission constraints and congestion and, in many cases, match power-systems operation. The Treasury Department and the IRS recognize that transmission limitations also exist within these specified regions but are not aware of readily administrable options to reflect those grid constraints. The DOE has generally found that inter-regional transmission constraints tend to be greater than within-region constraints.<sup>26</sup> The Treasury Department and the IRS request comments on

whether there are additional ways to establish deliverability, such as circumstances indicating that electricity is actually deliverable from an electricity generating facility to a hydrogen production facility, even if the two are not located in the same region or if the clean electricity generator is located outside of the United States.

#### VI. Procedures for Verification of Qualified Clean Hydrogen Production and Sale or Use

Section 45V(c)(2)(B)(ii) provides that hydrogen is not qualified clean hydrogen unless “the production and sale or use of such hydrogen is verified by an unrelated party.”

##### A. Requirements for Verification Reports

Proposed § 1.45V–5(a) would provide that a verification report must be attached to the taxpayer's Form 7210, *Clean Hydrogen Production Credit*, or any successor form(s), and included with the taxpayer's Federal income tax return or information return for each qualified clean hydrogen production facility and for each taxable year in which the taxpayer claims the section 45V credit. Proposed § 1.45V–5(b) would provide that the verification report specified in § 1.45V–5(a) must be prepared by a qualified verifier (as defined in § 1.45V–5(h)) under penalties of perjury. Proposed § 1.45V–5(b)(1) through (6) would describe the following information that a verification report must contain: (i) an attestation from the qualified verifier regarding the taxpayer's production of qualified clean hydrogen for sale or use during the taxable year (production attestation), (ii) an attestation from the qualified verifier regarding the amount of such qualified clean hydrogen sold or used (sale or use attestation), (iii) an attestation from the qualified verifier regarding conflicts of interest (conflict attestation), (iv) certain information regarding the qualified verifier, including documentation of the qualified verifier's qualifications (qualified verifier statement), (v) certain general information about the taxpayer's hydrogen production facility where the hydrogen production undergoing verification occurred, and (vi) any documentation necessary to substantiate the verification process given the standards and best practices prescribed by the qualified verifier's accrediting body and the circumstances of the taxpayer and the taxpayer's hydrogen production facility.

<sup>22</sup> DOE. 2023. “Assessing Lifecycle Greenhouse Gas Emissions Associated with Electricity Use for the Section 45V Clean Hydrogen Production Tax Credit,” Washington, DC: U.S. Department of Energy, available at [www.energy.gov/45vresources](http://www.energy.gov/45vresources).

<sup>23</sup> Electric Power Research Institute, “24/7 Carbon-free Energy: Matching Carbon-free Energy Procurement to Hourly Electric Load,” Dec. 15, 2022, available at <https://www.epri.com/research/products/00000003002025290>.

<sup>24</sup> Center for Research Solutions, “Readiness for Hourly: U.S. Renewable Energy Tracking Systems,” June 15, 2023, available at <https://resourcesolutions.org/wp-content/uploads/2023/06/Readiness-for-Hourly-U.S.-Renewable-Energy-Tracking-Systems.pdf>.

<sup>25</sup> DOE. 2023. “Assessing Lifecycle Greenhouse Gas Emissions Associated with Electricity Use for the Section 45V Clean Hydrogen Production Tax Credit,” Washington, DC: U.S. Department of Energy, available at [www.energy.gov/45vresources](http://www.energy.gov/45vresources).

<sup>26</sup> DOE, National Transmission Needs Study, Oct. 2023, available at [https://www.energy.gov/sites/default/files/2023-10/National\\_Transmission\\_Needs\\_Study\\_2023.pdf](https://www.energy.gov/sites/default/files/2023-10/National_Transmission_Needs_Study_2023.pdf).

### B. Requirements for Production Attestation

Proposed § 1.45V–5(c)(1) would provide that a production attestation must state, under penalties of perjury, that the qualified verifier performed a verification sufficient to determine that the operation, during the applicable taxable year, of the hydrogen production facility that produced the hydrogen for which the section 45V credit is claimed, and any EACs applied pursuant to proposed § 1.45V–4(d), are accurately reflected in: (i) the amount of qualified clean hydrogen produced by the taxpayer that is claimed on the Form 7210, *Clean Hydrogen Production Credit*, or any successor form(s), to which the verification report is attached; and (ii) either the data the taxpayer entered into the most recent GREET model (as defined in proposed § 1.45V–1(a)(8)(ii)) to determine the lifecycle GHG emissions rate that is claimed on the Form 7210, or the data the taxpayer submitted in the PER petition relating to the hydrogen for which the section 45V credit is claimed, and which was provided to the DOE in support of the taxpayer's request for the emissions value provided in the PER petition. For any acquisition and retirement of qualifying EACs, the verification must include validation that any purchases of EACs from specified sources as entered into the most recent GREET model or used as part of a PER application meet all requirements for being qualifying EACs, and that any required technical parameters of the generating source (for example, CCS capture rate, or sources of biomass) as entered into 45VH2–GREET or as part of a PER application are accurate.

Proposed § 1.45V–5(c)(2) would provide that, if the production attestation attests to the information specified in proposed § 1.45V–5(c)(1)(ii)(B), then the production attestation must also specify the emissions value received from the DOE that was calculated using such data, expressed in kilograms of CO<sub>2</sub>e per kilogram of hydrogen.

Proposed § 1.45V–5(c)(3) would provide that the production attestation must specify the lifecycle GHG emissions rate (expressed in kilograms of CO<sub>2</sub>e per kilogram of hydrogen) and the amount of qualified clean hydrogen produced by the taxpayer, (expressed in kilograms), that are claimed on the Form 7210, *Clean Hydrogen Production Credit*, or any successor form(s), to which the verification report is attached.

### C. Requirements for Sale or Use Attestation

Proposed § 1.45V–5(d)(1) would provide that the sale or use attestation must be an attestation, made under penalties of perjury, that the qualified verifier performed a verification sufficient to determine that the amount of qualified clean hydrogen that is specified in the production attestation (described in proposed § 1.45V–5(c)), and that is claimed on the Form 7210, *Clean Hydrogen Production Credit*, or any successor form(s), to which the verification report is attached, has been sold or used.

Proposed § 1.45V–5(d)(2) would provide that, for purposes of section 45V(c)(2)(B)(ii) and § 1.45V–1(a)(9)(ii), the hydrogen specified in proposed § 1.45V–5(d)(1) has been used if a person makes a verifiable use of such hydrogen. Section 45V does not deny a section 45V credit if the hydrogen is sold or used outside the United States (as defined in section 638(1) or a United States territory (having the meaning of the term “possession” as defined in section 638(2))). Thus, a verifiable use can occur within or outside the United States. A verifiable use can be made by the taxpayer or a person other than the taxpayer. For example, in a tolling arrangement pursuant to which a service recipient provides raw materials or inputs such as water or electricity to a third-party service provider that owns a hydrogen production facility (the toller), and the toller produces hydrogen for the service recipient using the service recipient's raw materials or inputs in exchange for a fee, use of the hydrogen by the service recipient would be a verifiable use. However, 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.

Excluding those activities from qualifying as a verifiable use is intended to prevent the wasteful production of hydrogen and abusive section 45V credit generation schemes. For example, without this restriction, the section 45V credit could be exploited through the production of qualified clean hydrogen that is used to generate electricity that is, in turn, used to produce additional qualified clean hydrogen. The primary purpose of these arrangements would be the exploitation of the section 45V credit and possibly other Federal income tax credits. Such arrangements are inconsistent with the intent of section 45V and with the statutory “use” requirement because they would incentivize the inefficient production of

qualified clean hydrogen for unproductive use and would result in excessive claims of the section 45V credit. The Treasury Department and the IRS request comments on whether there are additional safeguards that the regulations could adopt to prevent this or similar types of abusive section 45V credit claims, including section 45V credit claims arising if such circular arrangements are coordinated among multiple parties.

### D. Requirements for Conflict Attestation

Proposed § 1.45V–5(e)(1) would provide that the verification report must also include a conflict attestation, made under penalties of perjury, that (i) the qualified verifier has not received a fee based to any extent on the value of any section 45V credit that has been or is expected to be claimed by any taxpayer and no arrangement has been made for such fee to be paid at some time in the future; (ii) the qualified verifier was not a party to any transaction in which the taxpayer sold qualified clean hydrogen it had produced or in which the taxpayer purchased inputs for the production of such hydrogen; (iii) the qualified verifier is not related, within the meaning of section 267(b) or 707(b)(1), to, or an employee of, the taxpayer; (iv) the qualified verifier is not married to an individual described in proposed § 1.45V–5(e)(1)(iii); and (v) if the qualified verifier is acting in his or her capacity as a partner in a partnership, an employee of any person, whether an individual, corporation, or partnership, or an independent contractor engaged by a person other than the taxpayer, the attestations under proposed § 1.45V–5(e)(1)(i) through (iv) must be made with respect to the partnership or the person who employs or engages the qualified verifier.

Proposed § 1.45V–5(e)(2) would provide that, if a transfer election has been made under section 6418(a) of the Code with respect to the section 45V credit, then the attestation requirements under proposed § 1.45V–5(e)(1) would need to be made with respect to the qualified verifier's independence from both the eligible taxpayer (as defined in section 6418(f)(2) and § 1.6418–1(b)) and the transferee taxpayer (as described in section 6418(a) and defined in § 1.6418–1(m)).

### E. Requirements for Qualified Verifier Statement

Proposed § 1.45V–5(f) would provide that the qualified verifier statement must contain (i) the qualified verifier's name, address, and taxpayer identification number; (ii) the qualified verifier's qualifications to conduct the

verification, including the qualified verifier's education and experience and a photocopy of the qualified verifier's certificate received from their accrediting body; (iii) if the qualified verifier is acting in his or her capacity as a partner in a partnership, an employee of any person, whether an individual, corporation, or partnership, or an independent contractor engaged by a person other than the taxpayer, the name, address, and taxpayer identification number of the partnership or the person who employs or engages the qualified verifier; (iv) the signature of the qualified verifier and the date signed by the qualified verifier; and (v) a statement that the verification was conducted for Federal income tax purposes.

#### F. General Information Required To Be Included in Verification Report

Proposed § 1.45V–5(g) would provide that the verification report must include (i) the location of the hydrogen production facility; (ii) a description of the hydrogen production facility, including its method of producing hydrogen; (iii) the type(s) of feedstock(s) used by the hydrogen production facility during the taxable year of production; (iv) the amount(s) of feedstock(s) used by the hydrogen production facility during the taxable year of production; and (v) a list of the metering devices used to record any data used by the qualified verifier to support the production attestation along with a statement that the qualified verifier is reasonably assured that the device(s) underwent industry-appropriate quality assurance and quality control, and that the accuracy and calibration of the device has been tested in the last year.

#### G. Definitions Related to Verifications

Proposed § 1.45V–5(h) would define the term “qualified verifier” to mean any 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 Treasury Department and the IRS request comment on this definition of “qualified verifier,” including on whether additional accreditations that demonstrate sufficient expertise for verification of lifecycle analysis for the section 45V credit should be included.

Proposed § 1.45V–5(i) would define the term “unrelated party” (as described in section 45V(c)(2)(B)(ii)) to mean a

qualified verifier who meets the conflict attestation requirements as provided in proposed § 1.45V–5(e).

#### H. Requirements for Taxpayers Claiming Both the Section 45V Credit and the Section 45U Credit

Proposed § 1.45V–5(j) would provide requirements that, in the case of a taxpayer who produces electricity for which either the section 45 credit or section 45U credit is claimed and the taxpayer or a related person (as defined in section 45(e)(4)) uses such electricity (and related EACs) to produce hydrogen for which the section 45V credit is claimed, the verification report must also contain attestations that the qualified verifier performed a verification sufficient to determine that (i) the electricity used to produce hydrogen was produced at the relevant facility for which either the section 45 credit or section 45U credit was claimed, (ii) the given amount of such electricity (in kilowatt hours) used to produce hydrogen at the relevant qualified clean hydrogen production facility is reasonably assured of being accurate, and (iii) the electricity for which a section 45 or section 45U credit was claimed is represented by EACs that are retired in connection with the production of such hydrogen.

#### I. Required Time for Filing a Verification Report

Proposed § 1.45V–5(k) would provide that a verification report must be signed and dated by the qualified verifier no later than (i) the due date, including extensions, of the Federal income tax return or information return for the taxable year during which the hydrogen undergoing verification is produced; or (ii) in the case of a section 45V credit first claimed on an amended return or administrative adjustment request (AAR), the date on which the amended return or AAR is filed.

### VII. Placed in Service Date for Existing Facility That Is Modified or Retrofitted To Produce Qualified Clean Hydrogen

#### A. Modification of an Existing Facility

Under section 45V(d)(4), in the case of any facility that was originally placed in service before January 1, 2023, and, prior to the modification (described in section 45V(d)(4)(B)), did not produce qualified clean hydrogen, and after the date the facility was originally placed in service (i) is modified to produce qualified clean hydrogen, and (ii) amounts paid or incurred with respect to the modification are properly chargeable to the taxpayer's capital

account, the facility will be deemed to have been originally placed in service as of the date the property required to complete the modification is placed in service. The rule in section 45V(d)(4) for modification of existing facilities applies to modifications made after December 31, 2022. See section 13204(a)(5)(C) of the IRA.

Proposed § 1.45V–6(a)(1) would incorporate the statutory provisions of section 45V(d)(4). Proposed § 1.45V–6(a)(2) would further provide that an existing facility will not be deemed to have been originally placed in service as of the date the property required to complete the modification is placed in service unless the modification is made for the purpose of enabling the facility to produce qualified clean hydrogen and the taxpayer pays or incurs an amount with respect to such modification that is properly chargeable to the taxpayer's capital account for the facility. Proposed § 1.45V–6(a)(2) would also provide that a modification is made for a purpose of enabling the facility to produce qualified clean hydrogen if the facility could not produce hydrogen with a lifecycle GHG emissions rate that is less than or equal to 4 kilograms of CO<sub>2</sub>e per kilogram hydrogen but for the modification. Changing fuel inputs to the hydrogen production process, such as switching from conventional natural gas to renewable natural gas, would not qualify as a facility modification for purposes of proposed § 1.45V–6(a)(2).

Examples 1, 2, and 3 of proposed § 1.45V–6(c) would provide examples illustrating the application of the rules provided by section 45V(d)(4) and proposed § 1.45V–6(a).

#### B. Retrofit of an Existing Facility (80/20 Rule)

Proposed § 1.45V–6(b) would provide that an existing facility may establish a new date on which it is considered originally placed in service for purposes of section 45V, even though the facility contains some used property, provided the fair market value of the used property is not more than 20 percent of the facility's total value (the cost of the new property plus the value of the used property) (80/20 Rule). Proposed § 1.45V–6(b) would further provide that for purposes of the 80/20 Rule, the cost of new property includes all properly capitalized costs of the new property included within the facility. Proposed § 1.45V–6(b) would provide that, if a facility satisfies the requirements of the 80/20 Rule, then the date on which such facility is considered originally placed in service for purposes of section 45V(a)(1) is the date on which the new property added to the facility is placed

in service. Proposed § 1.45V–6(b) would also provide that the 80/20 Rule applies to any existing facility, regardless of whether the facility previously produced qualified clean hydrogen and regardless of when the facility was originally placed in service (before application of proposed § 1.45V–6(b)). Examples 4 and 5 of proposed § 1.45V–6(c) would provide examples illustrating the application of the 80/20 Rule.

#### VIII. Election To Treat a Clean Hydrogen Production Facility as Energy Property for Purposes of the Section 48 Credit

##### A. Overview

Section 48(a)(15) allows a taxpayer that owns and places in service a specified clean hydrogen production facility (as defined in section 48(a)(15)(C)) to make an irrevocable election to claim the section 48 credit in lieu of the section 45V credit for any qualified property (as defined in section 48(a)(5)(D)) that is part of the facility. This provision is effective for property placed in service after December 31, 2022. For any property that is placed in service after December 31, 2022, and the construction of which begins before January 1, 2023, section 13204(c)(3) of the IRA provides that section 48(a)(15) applies only to the extent of the basis of such property that is attributable to construction, reconstruction, or erection occurring after December 31, 2022.

Proposed § 1.48–15(a) would provide that a taxpayer that owns and places in service a specified clean hydrogen production facility (as defined in section 48(a)(15)(C) and proposed § 1.48–15(b)) can make an irrevocable election under section 48(a)(15)(C)(ii)(II) to treat any qualified property (as defined in section 48(a)(5)(D)) that is part of the facility as energy property for purposes of section 48.

Proposed § 1.48–15(b) would define the term “specified clean hydrogen production facility” to mean any qualified clean hydrogen production facility (within the meaning of section 45V(c)(3)) and proposed § 1.45V–1(a)(10): (i) that is placed in service after December 31, 2022; (ii) with respect to which no section 45V credit or section 45Q credit has been allowed, and for which the taxpayer makes an irrevocable election to have section 48(a)(15) apply; and (iii) for which an unrelated party has verified in the manner specified in proposed § 1.48–15(e) that such facility produces hydrogen through a process that results in lifecycle GHG emissions that are consistent with the hydrogen that such

facility was designed and expected to produce under section 48(a)(15)(A)(ii) and proposed § 1.48–15(c).

Proposed § 1.48–15(c)(1) would provide the energy percentage (used by a taxpayer to calculate a section 48 credit) for a specified clean hydrogen production facility that is designed and reasonably expected to produce qualified clean hydrogen through a process that results in a lifecycle GHG emissions rate of not greater than 4 kilograms of CO<sub>2</sub>e per kilogram of hydrogen. Proposed § 1.48–15(c)(2) would further provide that “designed and reasonably expected to produce” means hydrogen produced through a process that results in the lifecycle GHG emissions rate specified in the annual verification report for the taxable year in which the section 48(a)(15) election is made. The Treasury Department and the IRS request comments on this proposed rule and whether there are any challenges to using the lifecycle GHG emissions rate achieved in the taxable year in which the section 48(a)(15) election is made to determine the facility’s energy percentage for purposes of calculating the section 48 credit amount.

##### B. Election Procedures

###### 1. Time and Manner of Making Election

Proposed § 1.48–15(d)(1) would provide that, to make an election under section 48(a)(15)(c)(ii)(II), a taxpayer must claim the section 48 credit with respect to a specified clean hydrogen production facility on a Form 3468, *Investment Credit*, or any successor form(s), and file the form with the taxpayer’s Federal income tax return or information return for the taxable year in which the specified clean hydrogen production facility is originally placed in service. Proposed § 1.48–15(d)(1) would provide that the taxpayer must also attach a statement to its Form 3468, *Investment Credit*, or any successor form(s), filed with its Federal income tax return or information return that includes all the information required by the instructions to Form 3468, *Investment Credit*, or any successor form(s), for each specified clean hydrogen production facility subject to an election. Proposed § 1.48–15(d)(1) would provide that a separate election must be made for each specified clean hydrogen production facility that meets the requirements provided in section 48(a)(15) to treat the qualified property that is part of the facility as energy property.

Proposed § 1.48–15(d)(1) would further provide that, if any taxpayer owning an interest in a specified clean

hydrogen production facility makes an election with respect to the facility, then that election would be binding on all taxpayers that directly or indirectly own an interest in the facility. Thus, consistent with section 48(a)(15)(B), if a taxpayer owning an interest in a specified clean hydrogen production facility makes an election under section 48(a)(15)(C)(ii)(II), then no other taxpayer owning an interest in the same facility will be allowed a section 45V credit or section 45Q credit with respect to the facility.

The Treasury Department and the IRS request comments on whether, in the context of a specified clean hydrogen production facility that is directly owned through an arrangement properly treated as a tenancy-in-common for Federal income tax purposes or through an organization that has made a valid election under section 761(a) of the Code, each co-owner’s or member’s undivided ownership share of the qualified property comprised in the facility should be treated for purposes of section 48(a)(15)(C)(ii)(II) as a separate facility owned by such co-owner or member, with each such co-owner or member eligible to make a separate election under section 48(a)(15)(C)(ii)(II) to claim the section 48 credit in lieu of the section 45V credit with respect to its undivided ownership interest in the facility or share of the underlying qualified property.

###### 2. Special Rule for Partnerships and S Corporations

Proposed § 1.48–15(d)(2) would provide that, in the case of a specified clean hydrogen production facility owned by a partnership or an S corporation, the election under section 48(a)(15)(C)(ii)(II) would be made by the partnership or S corporation and would be binding on all ultimate credit claimants (as defined in § 1.50–1(b)(3)(ii)). Proposed § 1.48–15(d)(2) would provide that the partnership or S corporation must file a Form 3468, *Investment Credit*, or any successor forms(s), with its partnership or S corporation return for the taxable year in which the specified clean hydrogen production facility is placed in service to indicate that it is making the election, and attach a statement that includes all the information required by the instructions to Form 3468, *Investment Credit*, or any successor form(s), for each specified clean hydrogen production facility subject to the election. Proposed § 1.48–15(d)(2) would provide that the ultimate credit claimant’s section 48 must be based on each claimant’s share of the basis (as defined in § 1.46–3(f)) of the specified

clean hydrogen production facility on a completed Form 3468, *Investment Credit*, or any successor forms(s), and file such form with a Federal income tax return or information return for the taxable year that ends with or within the taxable year in which the partnership or S corporation made the election. Proposed § 1.48–15(d)(2) would provide that the partnership or S corporation making the election must provide the ultimate credit claimants with the necessary information to complete Form 3468, *Investment Credit*, or any successor forms(s), to claim the section 48 credit.

### 3. Election Irrevocable

Proposed § 1.48–15(d)(3) would provide that the election to treat any qualified property that is part of a specified clean hydrogen production facility as energy property would be irrevocable.

### 4. Election Availability Date

Proposed § 1.48–15(d)(4) would provide that the election to treat any qualified property that is part of a specified clean hydrogen production facility as energy property would be available for property placed in service after December 31, 2022, and, for any property that began construction before January 1, 2023, only to the extent of the basis thereof attributable to the construction, reconstruction, or erection after December 31, 2022.

### C. Third-Party Verification

Proposed § 1.48–15(e)(1) would provide that, in the case of a taxpayer that makes an election under section 48(a)(15)(c)(ii)(II) to treat any qualified property that is part of a specified clean hydrogen production facility as energy property for purposes of the section 48 credit, the taxpayer must obtain an annual verification report for the taxable year in which the election is made and for each taxable year thereafter of the recapture period specified in proposed § 1.48–15(f)(3). Proposed § 1.48–15(e)(1) would further provide that the taxpayer must also submit the annual verification report as an attachment to the Form 3468, *Investment Credit*, or any successor form(s), for the taxable year in which the election is made.

Further, proposed § 1.48–15(e)(2)(i) would provide that the annual verification report must be signed under penalties of perjury by a qualified verifier (as defined in proposed § 1.45V–5(h)) and contain (i) the information specified in §§ 1.45V–5(b) and 1.45V–5(d) through § 1.45V–5(h); (ii) a statement attesting to the lifecycle GHG emissions rate (determined under

section 45V(c) and § 1.45V–4) of the hydrogen produced at the specified clean hydrogen production facility for the taxable year to which the annual verification report relates and that the operation, during such taxable year, of the specified clean hydrogen production facility, and any EACs applied pursuant to § 1.45V–4(d) for the purpose of accounting for such facility's emissions, are accurately reflected in the data the taxpayer entered into the most recent GREET model (as defined in § 1.45V–1(a)(8)(ii)) (or in the data the taxpayer provided to the DOE in support of the taxpayer's request for an emissions value), to determine the lifecycle GHG emissions rate of the hydrogen undergoing verification; and (iii) an attestation that the facility produced hydrogen through a process that results in a lifecycle GHG emissions rate that is consistent with, or lower than, the lifecycle GHG emissions rate of the hydrogen that such facility was designed and expected to produce.

Proposed § 1.48–15(e)(2)(ii) would provide that if a transfer election has been made under section 6418(a) of the Code with respect to the section 48 credit for a specified clean hydrogen production facility, then the conflict attestation containing the information specified in proposed § 1.45V–5(e)(1) must be made with respect to the qualified verifier's independence from both the eligible taxpayer (as defined in section 6418(f)(2) and § 1.6418–1(b)) and the transferee taxpayer (as described in section 6418(a) and defined in § 1.6418–1(m)), and without regard to the requirements under proposed § 1.45V–5(e)(2).

Proposed § 1.48–15(e)(2)(iii) would provide that in the event the facility produces qualified clean hydrogen through a process that results in a lifecycle GHG emissions rate greater than the lifecycle GHG emissions rate such facility was designed and expected to produce (and thus the qualified verifier cannot provide the attestation specified in proposed § 1.48–15(e)(2)(i)(B)), resulting in a reduced energy percentage under section 48(a)(15)(A)(ii) with respect to such facility, an emissions tier recapture event under proposed § 1.48–15(f)(2) will occur. Proposed § 1.48–15(e)(2)(iv) would provide that the hydrogen a facility was “designed and expected to produce” would mean hydrogen produced through a process that results in the lifecycle GHG emissions rate specified in proposed § 1.48–15(c)(2).

Additionally, proposed § 1.48–15(e)(2)(v) would require that the annual verification report must be signed and dated by the qualified

verifier no later than the due date, including extensions, of the Federal income tax return or information return for the taxable year in which the hydrogen undergoing verification was produced. Proposed § 1.48–15(e)(2)(vi) would provide that in addition to the recordkeeping requirements set forth in § 1.48–15(g), the taxpayer must retain the annual verification report for at least six years after the due date, with extensions, for filing the Federal income tax return or information return for the taxable year in which the hydrogen undergoing verification was produced.

### D. Credit Recapture

Section 48(a)(15)(E) directs the Secretary to issue such regulations or other guidance as determined necessary to carry out the purposes of section 48, including regulations or other guidance addressing recapture of so much of the credit allowed under section 48 as exceeds the amount of the credit that would have been allowed if the expected production were consistent with the actual verified production or all of the credit so allowed in the absence of such verification.

#### 1. Emissions Tier Recapture Events Under Section 48(a)(15)(E)

Proposed § 1.48–15(f)(1), would provide that, for purposes of section 48(a)(15)(E), in any taxable year of the recapture period specified in proposed § 1.48–15(f)(3) in which an emissions tier recapture event (as defined in proposed § 1.48–15(f)(2)) occurs, the tax imposed on the taxpayer under chapter 1 of the Code for the taxable year of the emissions tier recapture event is increased by the recapture amount specified in proposed § 1.48–15(f)(4).

Proposed § 1.48–15(f)(2) would provide that an emissions tier recapture event under section 48(a)(15)(E) occurs during any taxable year of the recapture period specified in proposed § 1.48–15(f)(3) under the following circumstances: (i) the taxpayer fails to obtain an annual verification report by the deadline for filing its Federal income tax return or information return (including extensions) for any taxable year in which an annual verification report was required under proposed § 1.48–15(e)(1); (ii) the specified clean hydrogen production facility actually produced hydrogen through a process that results in a lifecycle GHG emissions rate that can only support a lower energy percentage than the energy percentage used to calculate the amount of the section 48 credit for such facility for the year in which the facility is placed in service; or (iii) the specified clean hydrogen production facility

actually produced hydrogen through a process that results in a lifecycle GHG emissions rate of greater than 4 kilograms of CO<sub>2</sub>e per kilogram of hydrogen.

### 2. Recapture Period Under Section 48(a)(15)(E)

Proposed § 1.48–15(f)(3) would provide that the recapture period begins on the first day of the first taxable year after the taxable year in which the facility was placed in service and ends on the last day of the fifth taxable year after the close of the taxable year in which the facility was placed in service. For example, if a calendar-year taxpayer places in service a specified clean hydrogen production facility on June 1, 2023, then the last day of the fifth taxable year following the close of the taxable year in which the facility was placed in service is December 31, 2028. Therefore, the recapture period is January 1, 2024, through December 31, 2028.

### 3. Recapture Amount

Proposed § 1.48–15(f)(4) would provide that, if an emissions tier recapture event has occurred under proposed § 1.48–15(f)(2), the recapture amount for the taxable year in which the emissions tier recapture event occurred is equal to 20 percent of the excess of (i) the section 48 credit allowed to the taxpayer for the specified clean hydrogen production facility for the taxable year in which the facility was placed in service, over (ii) the section 48 credit that would have been allowed to the taxpayer for the facility if the taxpayer had used the energy percentage supported by the actual production to calculate the amount of the section 48 credit. Proposed § 1.48–15(f)(4)(ii) would provide that, in the case of any emissions tier recapture event described in proposed § 1.48–15(f)(2), the carrybacks and carryovers under section 39 must be adjusted by reason of the emissions tier recapture event. Proposed § 1.48–15(f)(4)(iii) would further provide that, if the specified clean hydrogen production facility produced hydrogen through a process that results in a lifecycle GHG emissions rate of greater than 4 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, or if the taxpayer fails to submit an annual verification report with its Federal income tax return or information return with respect to a specified clean hydrogen production facility for any taxable year of the recapture period, then the section 48 credit that would have been allowed to the taxpayer for the facility would be zero. Thus, in that case, the recapture amount in the taxable year of the

emissions tier recapture event would be 20 percent of the section 48 credit allowed to the taxpayer with respect to such specified clean hydrogen production facility. Proposed § 1.48–15(f)(5) would provide an example illustrating the application of proposed § 1.48–15(f)(1) through (4).

Unless modified in future guidance, any reporting of emissions tier recapture under proposed § 1.48–15(f) is made on the taxpayer's annual tax return. The Secretary may issue future guidance and/or prescribe tax forms and instructions to address the reporting of emissions tier recapture under proposed § 1.48–15(f) and any additional annual reporting obligations. The Treasury Department and IRS therefore request comments on the reporting of recapture and any additional annual reporting obligations.

### 4. Coordination With Recapture Rules Under Sections 50 and 48(a)(10)(C)

Proposed § 1.48–15(f)(6) would provide that, during any taxable year of the recapture period for any credit allowed under section 48(a) with respect to qualified property that is part of a specified clean hydrogen production facility, the recapture rules would be applied, if applicable, in the following order: (i) section 50(a) (recapture in case of dispositions, etc.); (ii) section 48(a)(10)(C) (recapture relating to the prevailing wage requirements); and (iii) section 48(a)(15)(E) (emissions tier recapture).

### E. Recordkeeping Requirements

Proposed § 1.45V–2(c) would provide that a taxpayer claiming the section 45V credit would need to meet the general recordkeeping requirements under section 6001 necessary to substantiate the amount of the section 45V credit claimed by the taxpayer. Section 6001 provides that every person liable for any tax imposed by the Code, or for the collection thereof, must keep such records as the Secretary may from time to time prescribe. Section 1.6001–1(a) provides that any person subject to income tax must keep such permanent books of account or records as are sufficient to establish the amount of gross income, deductions, credits, or other matters required to be shown by such person in any return of such tax. Section 1.6001–1(e) provides that the books and records required by § 1.6001–1 must be retained so long as the contents thereof may become material in the administration of any internal revenue law.

Proposed § 1.45V–2(c) would also provide that taxpayers must retain all raw data used for submission of the

request for an emissions value to the DOE for at least six years after the due date (including extensions) for filing the Federal income tax return or information return to which the PER petition is ultimately attached.

Proposed § 1.48–15(g) would provide corresponding recordkeeping rules.

### IX. Renewable Natural Gas and Fugitive Sources of Methane

The Treasury Department and the IRS intend to provide rules addressing hydrogen production pathways that use renewable natural gas (RNG) or other fugitive sources of methane (for example, from coal mine operations) for purposes of the section 45V credit. In the context of this guidance, the term RNG refers to biogas that has been upgraded to be equivalent in nature to fossil natural gas. Fugitive methane refers to the release of methane through, for example, equipment leaks, or venting during the extraction, processing, transformation, and delivery of fossil fuels to the point of final use, such as coal mine methane or coal bed methane. Such rules would apply to all RNG used for the purposes of the section 45V credit and would provide conditions that must be met before certificates for RNG or fugitive methane (representations of the environmental attributes of the methane) and the GHG emissions benefits they are meant to represent may be taken into account in determining lifecycle GHG emissions rates for purposes of the section 45V credit. Such conditions would be logically consistent with but not identical to the incrementality, temporal matching, and deliverability requirements for electricity derived EACs, in that they would be designed to reflect the ways in which additional RNG or demand for fugitive methane can impact lifecycle GHG emissions and also to address the differences between electricity and methane, including but not limited to the different sources of emissions, markets, available tracking and verification methods, and potential for perverse incentives.

The Treasury Department and the IRS anticipate requiring that for purposes of the section 45V credit, for biogas or biogas-based RNG to receive an emissions value consistent with that gas (and not standard natural gas), the RNG used during the hydrogen production process must originate from the first productive use of the relevant methane. For any specific source of biogas,<sup>27</sup>

<sup>27</sup> Biogas is gas resulting from the decomposition of organic matter under anaerobic conditions, and the principal constituent is methane (50–75 percent).

productive use is generally defined as any valuable application of biogas (including to provide heat or cooling, generate electricity, or upgraded to RNG), and specifically excludes venting to the atmosphere or capture and flaring. The Treasury Department and the IRS further propose to define “first productive use” of the relevant methane as the time when a producer of that gas first begins using or selling it for productive use in the same taxable year as (or after) the relevant hydrogen production facility was placed in service. The implication of this proposal is that biogas from any source that had been productively used in a taxable year prior to taxable year in which the relevant hydrogen production facility was placed in service would not receive an emission value consistent with biogas-based RNG but would instead receive a value consistent with natural gas in the determination of the emissions value for that specific hydrogen production pathway. This proposal would limit emissions associated with the diversion of biogas or RNG from other pre-existing productive uses.

For existing biogas sources that typically productively use or sell a portion of the biogas and flare or vent the remaining excess, the flared or vented portion may be eligible for first productive use as defined above if the flaring or venting volume can be adequately demonstrated and verified. In such circumstances, the flared or vented volume may be determined based on the previous taxable year’s flared or vented volume as demonstrated via reported data to programs such as the Greenhouse Gas Reporting Program. Requirements would be established to reduce the risk that entities will deliberately generate additional biogas for purposes of the section 45V credit, above historic and expected future levels or an equivalent metric, for example by generating biogas through the intentional generation of waste, and to ensure that other factors affecting the emissions rate of hydrogen produced with biogas-based RNG or RNG procurement via RNG certificates are taken into account. The Treasury Department and the IRS request comment on these and other potential conditions. Any fugitive sources of methane would be treated in the same fashion as described above for RNG.

For purposes of the section 45V credit, hydrogen producers using RNG or fugitive methane would be required to acquire and retire corresponding attribute certificates through a book-and-claim system that can verify in an electronic tracking system that all

applicable requirements are met. Hydrogen producers would also be required to have a pipeline interconnection and measurement using a revenue grade meter. These rules would apply to the use of certificates with both direct and non-direct claims of RNG or fugitive methane use. Direct use would involve the production of hydrogen with a direct exclusive pipeline connection to a facility that generates RNG or from which fugitive methane is being sourced, while non-direct use would involve producing hydrogen using RNG or fugitive methane sourced from a commercial or common-carrier natural gas pipeline. In all cases, attribute certificates would need to document the RNG or fugitive methane procurement for qualified clean hydrogen production claims and that the environmental attributes of the RNG or fugitive methane being used are not sold to other parties or used for compliance with other policies or programs.

The Treasury Department and the IRS request comments on these and other rules related to RNG and fugitive methane. Regarding fugitive methane, the Treasury Department and the IRS request comment on the appropriate lifecycle analysis considerations associated with specific fugitive methane sources, such as counterfactual scenarios, to account for direct and significant indirect emissions, and also the manner in which to assess methane from these sources if the current practice is flaring. These comments may inform future versions of 45VH2–GREET. In particular, the Treasury Department and the IRS request comments on the following questions:

(1) What data sources and peer reviewed studies provide information on RNG production systems (including biogas production and reforming systems), markets, monitoring, reporting, and verification processes, and GHG emissions associated with these production systems and markets?

(2) What conditions for the use of biogas and RNG would ensure that emissions accounting for purposes of the section 45V credit reflects and reduces the risk of indirect emissions effects from hydrogen production using biogas and RNG? How can taxpayers verify that they have met these requirements?

(3) How broadly available and reliable are existing electronic tracking systems for RNG certificates in book and claim systems? What developments may be required, if any, before such systems are appropriate for use with RNG certificates used to claim the section 45V credit?

(4) How should RNG or fugitive methane resulting from the first productive use of methane be defined, documented, and verified? What industry best practices or alternative methods would enable such verification to be reflected in an RNG or methane certificate or other documentation? What additional information should be included in RNG certificates to help certify compliance?

(5) What are the emissions associated with different methods of transporting RNG or fugitive methane to hydrogen producers (for example, vehicular transport, pipeline)?

(6) How can the section 45V regulations reflect and mitigate indirect emissions effects from the diversion of biogas or RNG or fugitive methane from potential future productive uses? What other new uses of biogas or RNG or fugitive methane could be affected in the future if more gas from new capture and productive use of methane from these sources is used in the hydrogen production process?

(7) How can the potential for the generation of additional emissions from the production of additional waste, waste diversion from lower-emitting disposal methods, and changes in waste management practices be limited through emissions accounting or rules for biogas and RNG use established for purposes of the section 45V credit?

(8) To limit the additional production of waste, should the final regulations limit eligibility to methane sources that existed as of a certain date or waste or waste streams that were produced before a certain date, such as the date that the IRA was enacted? If so, how can that be documented or verified? How should any changes in volumes of waste and waste capacity at existing methane sources be documented and treated for purposes of the section 45V credit? How should additional capture of existing waste or waste streams be documented and treated?

(9) Are geographic or temporal deliverability requirements needed to reflect and reduce the risk of indirect emissions effects from biogas and RNG or fugitive methane use in the hydrogen production process? If so, what should these requirements be and are electronic tracking systems able to capture these details?

(10) How should variation in methane leakage across the existing natural gas pipeline system be taken into account in estimating the emissions from the transportation of RNG or fugitive methane or establishing rules for RNG or fugitive methane use? How should methane leakage rates be estimated based on factors such as the location

where RNG or fugitive methane is injected and withdrawn, the distance between the locations where RNG or fugitive methane is injected and withdrawn, season of year, age of pipelines, or other factors? Are data or analysis available to support this?

(11) What counterfactual assumptions and data should be used to assess the lifecycle GHG emissions of hydrogen production pathways that rely on RNG? Is venting an appropriate counterfactual assumption for some pathways? If not, what other factors should be considered?

(12) What criteria should be used in assessing biogas and RNG-based PERs? What practices should be put in place to reduce the risk of unintended consequences (for example, gaming)? Should conservative default parameters and counterfactuals be used unless proven otherwise by a third party?

The Treasury Department and the IRS understand that, before final regulations addressing the section 45V credit are issued, taxpayers will use 45VH2–GREET or the PER process to determine a lifecycle GHG emissions rate for hydrogen production facilities that rely on direct use of landfill gas or any fugitive methane feedstock, provided they meet the requirement that the gas being used results from the first productive use of methane from the landfill source or fugitive methane source. The term “direct use” means that there is a direct, exclusive pipeline connection between the hydrogen production facility and the source of the gas that is procured (for example, the upgrading or processing facility that produces RNG from landfill gas). Relative to a book-and-claim system, the direct connection between a gas supplier and a hydrogen production facility can reduce the uncertainty of pipeline leakage, tracking, and verification. The Treasury Department and the IRS are considering providing a rule that taxpayers would need to provide and maintain documentation to substantiate that (i) the RNG being used results from the first productive use of the methane at the landfill source and is not displacing a previous productive use; and (ii) the environmental attributes of the RNG being used, including those of the underlying biogas, are not sold to other parties or used for compliance with other policies or programs. When additional conditions addressing hydrogen production pathways that use RNG or fugitive methane for purposes of the section 45V credit are determined at a later date, taxpayers would also be required to maintain documentation that the RNG or fugitive methane being

used meets those requirements and to acquire and retire any RNG or fugitive methane certificates that are established. The Treasury Department and IRS are also considering providing rules for using RNG certificates and documentation required in the event additional conditions for use of RNG are later imposed.

Tracking and verification mechanisms for RNG or fugitive methane specific to the needs of the section 45V credit are not yet available, and existing systems have limited capabilities for tracking and verifying RNG pathways, especially in the part of the production process before the methane has been reformed to RNG. Existing tracking and verification systems do not clearly distinguish between inputs, verify or require verification of underlying practices claimed by RNG production sources, require proof of generator interconnection or revenue-quality metering, provide validation of generation methodology, include exclusively United States based-generation, verify generator registration, and track the vintage of generator interconnection. The Treasury Department and IRS are considering providing rules to address whether or how book-and-claim systems with sufficient tracking and verification mechanisms may be used to attribute the environmental benefits of RNG or fugitive methane to hydrogen producers in the final regulations. Additional certainty is also needed to accurately account for emissions from pathways that do not yet exist in 45VH2–GREET and from RNG that is injected into a commercial or common-carrier pipeline. The Treasury Department and IRS understand that, before final regulations are issued, taxpayers will determine a lifecycle GHG emissions rate for hydrogen production pathways using landfill gas by using 45VH2–GREET in cases in which the hydrogen production facility is receiving RNG through a direct dedicated pipeline connection and measurement using a revenue grade meter. The PER process will not address other hydrogen production pathways using biogas and RNG until after the final regulations are issued.

#### Proposed Applicability Dates

These regulations are proposed to apply to taxable years beginning after these proposed regulations are published in the **Federal Register**. Taxpayers may rely on these proposed regulations for taxable years beginning after December 31, 2022, and before the date the final regulations are published in the **Federal Register**, provided the taxpayers follow the proposed

regulations in their entirety and in a consistent manner.

#### Special Analyses

##### *I. Regulatory Planning and Review*

Pursuant to the Memorandum of Agreement, Review of Treasury Regulations under Executive Order 12866 (June 9, 2023), tax regulatory actions issued by the IRS are not subject to the requirements of section 6 of Executive Order 12866, as amended. Therefore, a regulatory impact assessment is not required.

##### *II. Paperwork Reduction Act*

The Paperwork Reduction Act of 1995 (44 U.S.C. 3501–3520) (PRA) generally requires that a Federal agency obtain the approval of the Office of Management and Budget (OMB) before collecting information from the public, whether such collection of information is mandatory, voluntary, or required to obtain or retain a benefit. A Federal agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the collection of information displays a valid control number.

The collections of information in these proposed regulations would include reporting, third-party disclosure, and recordkeeping requirements. These collections are necessary for taxpayers to claim the section 45V credit, or the section 48 credit with respect to a specified clean hydrogen production facility, and for the IRS to validate that taxpayers have met the regulatory requirements and are entitled to claim either credit.

The recordkeeping requirements in these proposed regulations would include the requirement that taxpayers claiming the section 45V credit, or the section 48 credit with respect to a specified clean hydrogen production facility, need to meet the general recordkeeping provisions under section 6001 necessary to substantiate the amount of the section 45V credit or section 48 credit claimed by the taxpayer as detailed in proposed §§ 1.45V–2(c) and 1.48–15(g). These recordkeeping requirements are considered general tax records under § 1.6001–1(e). For PRA purposes, general tax records are already approved by OMB under 1545–0074 for individuals/sole proprietors, 1545–0123 for business entities, and 1545–0047 for tax-exempt organizations, and 1545–0092 for trust and estate filers.

The proposed regulations would reference the DOE’s process for applicants to request an emissions value from the DOE that could then be used

to file a petition with the Secretary for a PER determination as detailed in proposed § 1.45V–4. The petition made to IRS will be performed by attaching the emissions value obtained from the DOE to the filing of Form 7210. The burden for these requirements will be included within the Form and Instructions for 7210. Form 7210 will be approved by OMB, in accordance with 5 CFR 1320.10, under the following OMB Control Numbers: 1545–0074 for individuals, 1545–0123 for businesses, 1545–0047 for tax-exempt organizations, and 1545–NEW for trust and estate filers.

The proposed regulations mention the collection of information associated with the process for taxpayers to request an emissions value from the DOE and is reflected in the DOE's Paperwork Reduction Act Submission relating to such process. These proposed regulations are not creating or changing any of the collection requirements submitted by DOE to OMB for approval. Approval of the DOE's Paperwork Reduction Act Submission is pending with OMB. These proposed regulations are not creating or changing any of the collection requirements being approved by OMB under the DOE OMB Control Number 1910–XXXX.

The proposed regulations would include reporting requirements that taxpayers claiming the section 45V credit provide a verification report with their annual Federal income tax return or information return for each taxable year in which they claim the section 45V credit as detailed in proposed § 1.45V–5. The proposed regulation also includes a third-party disclosure requirement that a verification report must be certified by an unrelated third party. The verification report must contain an attestation regarding the taxpayer's production of qualified clean hydrogen for sale or use, the amount of qualified clean hydrogen sold or used by the taxpayer, conflicts of interest, the verifier's qualifications, and documentation necessary to substantiate the verification process. The taxpayer must submit the verification report to the IRS by attaching it to Form 7210, *Clean Hydrogen Production Credit*, or any successor form(s). The burden for these requirements will be included within the Form and Instructions for Form 7210. Form 7210 will be approved by OMB, in accordance with 5 CFR 1320.10, under the following OMB Control Numbers: 1545–0074 for individuals, 1545–0123 for businesses, 1545–0047 for tax-exempt organizations, and 1545–NEW for trust and estate filers.

The proposed regulations include reporting, third-party disclosure, and recordkeeping requirements that taxpayers making the election under section 48(a)(15) to claim the energy credit under section 48 with respect to a specified clean hydrogen production facility. The reporting requirement is that taxpayers submit an annual verification report with their Federal income tax return or information return for the year in which they claim the section 48 credit. The third-party disclosure requirement is that an annual verification report must be certified by an unrelated third-party. The annual verification report must contain an attestation regarding the taxpayer's production of qualified clean hydrogen for sale or use, the amount of qualified clean hydrogen sold or used by the taxpayer, conflicts of interest, the verifier's qualifications, the lifecycle GHG emissions rate of the hydrogen that the specified clean hydrogen production facility produced, and documentation necessary to substantiate the verification process. The proposed regulations also include a requirement that the taxpayer obtain and retain an annual verification report for each taxable year of the recapture period. The taxpayer must obtain the annual verification report by the return filing deadline (with extensions) for the taxable year to which the annual verification report relates. The annual verification report must contain an attestation regarding the taxpayer's production of qualified clean hydrogen for sale or use during the taxable year, the amount of qualified clean hydrogen sold or used by the taxpayer during the taxable year, the lifecycle GHG emissions rate of the hydrogen that the specified clean hydrogen production facility produced during the taxable year, conflicts of interest, the verifier's qualifications, and documentation necessary to substantiate the verification process. The annual verification report for the taxable year in which the section 48(a)(15) election is made will be attached to Form 3468. The annual verification report for each taxable year of the recapture period will be retained by the taxpayer for at least six years after the due date (with extensions) for filing the Federal income tax return or information return for the year to which the report relates. The burden for these requirements will be included within the Form and Instructions for 3468. The revisions to Form 3468 will be approved by OMB, in accordance with 5 CFR 1320.10, under the following OMB Control Numbers: 1545–0074 for individuals, 1545–0123 for businesses, 1545–0047 for tax-

exempt organizations, and 1545–0155 for trust and estate filers.

### III. Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) (RFA) imposes certain requirements with respect to Federal rules that are subject to the notice and comment requirements of section 553(b) of the Administrative Procedure Act (5 U.S.C. 551 *et seq.*) and that are likely to have a significant economic impact on a substantial number of small entities. Unless an agency determines that a proposal is not likely to have a significant economic impact on a substantial number of small entities, section 603 of the RFA requires the agency to present an initial regulatory flexibility analysis (IRFA) of the proposed rule. The Treasury Department and the IRS have not determined whether the proposed rule, when finalized, will likely have a significant economic impact on a substantial number of small entities. This determination requires further study. However, because there is a possibility of significant economic impact on a substantial number of small entities, an IRFA is provided in these proposed regulations. The Treasury Department and the IRS invite comments on both the number of entities affected and the economic impact on small entities.

Pursuant to section 7805(f), this notice of proposed rulemaking has been submitted to the Chief Counsel of the Office of Advocacy of the Small Business Administration for comment on its impact on small business.

#### A. Need for and Objectives of the Rule

The proposed regulations provide guidance to taxpayers intending to claim the section 45V credit for the production of qualified clean hydrogen or make the election under section 48(a)(15) to treat qualified property that is part of a specified clean hydrogen production facility as energy property and claim the section 48 credit. The proposed regulations would provide needed guidance for taxpayers on use of the GREET model to determine the lifecycle GHG emissions rate resulting from the hydrogen production process, procedures for petitioning the Secretary for a PER determination, requirements for the verification of the production and sale or use of the hydrogen, requirements for modifications to an existing hydrogen production facility, and procedures for making the election under section 48(a)(15).

### B. Affected Small Entities

The RFA directs agencies to provide a description of, and if feasible, an estimate of, the number of small entities that may be affected by the proposed rules, if adopted. The Small Business Administration's Office of Advocacy estimates in its 2023 Frequently Asked Questions that 99.9 percent of American businesses meet the definition of a small business. The applicability of these proposed regulations does not depend on the size of the business, as defined by the Small Business Administration. As described more fully in the preamble to this proposed regulation and in this IRFA, sections 45V and 48(a)(15) and these proposed regulations may affect a variety of different businesses across several different industries. Because the potential credit claimants can vary widely, it is difficult to estimate at this time the impact of these proposed regulations, if any, on small businesses. Although there is uncertainty as to the exact number of small businesses within this group, the current estimated number of respondents to these proposed rules is between 800 and 1000 taxpayers.

The Treasury Department and the IRS expect to receive more information on the impact on small businesses through comments on these proposed rules and again when taxpayers start using the guidance and procedures provided in these proposed regulations to claim the section 45V credit, or the section 48 credit with respect to a specified clean hydrogen production facility.

### C. Impact of the Rules

The proposed regulations provide rules for how taxpayers can claim the section 45V credit, or the section 48 credit with respect to a specified clean hydrogen production facility. Taxpayers that claim the section 45V credit, or the section 48 credit with respect to a specified clean hydrogen production facility, will have administrative costs related to reading and understanding the rules as well as recordkeeping and reporting requirements because of the verification and Federal income tax return or information return requirements. The costs will vary across different-sized entities and across the type of project(s) in which such entities are engaged.

To claim a section 45V credit, a taxpayer must determine the lifecycle GHG emissions rate for all hydrogen produced at a qualified clean hydrogen production facility during the taxable year. If the hydrogen production technology or feedstock used by the taxpayer to produce hydrogen is

addressed in the most recent 45VH2-GREET, the taxpayer must use 45VH2-GREET to determine the emissions rate for the hydrogen produced during that taxable year at the qualified clean hydrogen production facility. If the hydrogen production technology or feedstock used by the taxpayer to produce hydrogen is not included in the most recent 45VH2-GREET, the taxpayer must petition the Secretary for a provisional emissions rate (PER). As part of the process for a taxpayer to petition for a PER, a taxpayer must submit an application to the DOE for an emissions value that it may use to claim the section 45V credit.

In addition to determining the lifecycle GHG emissions rate for hydrogen produced by the taxpayer at a qualified clean hydrogen production facility during the taxable year, before claiming the section 45V credit, a taxpayer must submit a verification report, certified by an unrelated third party, attesting to the taxpayer's production of qualified clean hydrogen for sale or use, the amount of qualified clean hydrogen sold or used by the taxpayer, conflicts of interest, the verifier's qualifications, and documentation necessary to substantiate the verification process. The process for claiming the section 48 credit with respect to a specified clean hydrogen production facility requires a taxpayer to submit an annual verification report with its Federal income tax return or information return for the taxable year in which it claims the section 48 credit, as well as to obtain an annual verification report for the five taxable years following the taxable year in which the section 48(a)(15) election is made. Additionally, the taxpayer would need to retain records sufficient to establish compliance with these proposed regulations for as long as may be relevant.

Although the Treasury Department and the IRS do not have sufficient data to determine precisely the likely extent of the increased costs of compliance, the estimated burden of complying with the recordkeeping and reporting requirements are described in the Paperwork Reduction Act section of the preamble.

### D. Alternatives Considered

The Treasury Department and the IRS considered alternatives to the proposed regulations. The proposed regulations were designed to minimize burdens for taxpayers while ensuring that the statutory requirements of sections 45V and 48(a)(15) are met. For example, in providing rules related to the information required to be submitted to

claim the section 45V credit, or the section 48 credit with respect to a specified hydrogen production facility, the Treasury Department and the IRS considered whether the production and sale or use of the hydrogen could be verified by an unrelated party without requiring the unrelated party to possess certain qualifications or conflict of interest characteristics. Such an option would, however, increase the opportunity for fraud or excessive payments under section 45V or section 48. Section 45V(f) specifically authorizes the IRS to promulgate regulations or other guidance providing for requirements for recordkeeping or information reporting for purposes of administering the requirements of section 45V. As described in the preamble to these proposed regulations, these proposed rules carry out that Congressional intent as the verification requirements allow the IRS to verify the taxpayer's entitlement to the section 45V credit.

Additionally, the Treasury Department and the IRS considered whether to require taxpayers to submit an annual verification report with their Federal income tax returns or information returns claiming the section 45V credit. Section 45V requires the taxpayer to obtain an annual verification report, and the Treasury Department and the IRS determined that requiring the taxpayer to attach such a report to their federal income tax return or information return is the most efficient way of ensuring the completion and accuracy of the report.

Additionally, the Treasury Department and the IRS considered allowing taxpayers to treat the section 45V credit as determined in the taxable year of hydrogen production or verification. However, such an option would create administrability issues and potentially a mismatch between the taxable year in which the hydrogen is produced and the taxable year in which the section 45V credit for such production is claimed. Thus, the proposed regulations would require the credit to be determined in the taxable year of production.

Comments are requested on the requirements in the proposed regulations, including specifically whether there are less burdensome alternatives that do not increase the risk of duplication, fraud, or improper payments under section 45V.

### E. Duplicative, Overlapping, or Conflicting Federal Rules

The proposed regulations would not duplicate, overlap, or conflict with any relevant Federal rules. As discussed

above, the proposed regulations would merely provide procedures and definitions to allow taxpayers to claim the section 45V credit, or the section 48 credit with respect to a specified clean hydrogen production facility. The Treasury Department and the IRS invite input from interested members of the public on identifying and avoiding overlapping, duplicative, or conflicting requirements.

#### IV. Unfunded Mandates Reform Act

Section 202 of the Unfunded Mandates Reform Act of 1995 (UMRA) requires that agencies assess anticipated costs and benefits and take certain other actions before issuing a final rule that includes any Federal mandate that may result in expenditures in any one year by a State, local, or Tribal government, in the aggregate, or by the private sector, of \$100 million (updated annually for inflation). This proposed rule does not include any Federal mandate that may result in expenditures by State, local, or Tribal governments, or by the private sector in excess of that threshold.

#### V. Executive Order 13132: Federalism

Executive Order 13132 (Federalism) prohibits an agency from publishing any rule that has federalism implications if the rule either imposes substantial, direct compliance costs on State and local governments, and is not required by statute, or preempts State law, unless the agency meets the consultation and funding requirements of section 6 of the Executive order. This proposed rule does not have federalism implications and does not impose substantial direct compliance costs on State and local governments or preempt State law within the meaning of the Executive order.

#### Comments and Public Hearing

Before these proposed regulations are adopted as final regulations, consideration will be given to comments regarding the notice of proposed rulemaking that are submitted timely to the IRS as prescribed in the preamble under the **ADDRESSES** section. The Treasury Department and the IRS request comments on all aspects of the proposed regulations. All comments will be made available at <https://www.regulations.gov>. Once submitted to the Federal eRulemaking Portal, comments cannot be edited or withdrawn.

A public hearing has been scheduled for March 25, 2024, beginning at 10 a.m. (ET), in the Auditorium at the Internal Revenue Building, 1111 Constitution Avenue NW, Washington, DC. Due to building security procedures, visitors

must enter at the Constitution Avenue entrance. In addition, all visitors must present photo identification to enter the building. Because of access restrictions, visitors will not be admitted beyond the immediate entrance area more than 30 minutes before the hearing starts. Participants may alternatively attend the public hearing by telephone.

The rules of 26 CFR 601.601(a)(3) apply to the hearing. Persons who wish to present oral comments at the hearing must submit an outline of the topics to be discussed and the time to be devoted to each topic by March 4, 2024. A period of 10 minutes will be allotted to each person for making comments. An agenda showing the scheduling of the speakers will be prepared after the deadline for receiving outlines has passed. Copies of the agenda will be available free of charge at the hearing. If no outline of the topics to be discussed at the hearing is received by March 4, 2024, the public hearing will be cancelled. If the public hearing is cancelled, a notice of cancellation of the public hearing will be published in the **Federal Register**.

Individuals who want to testify in person at the public hearing must send an email to [publichearings@irs.gov](mailto:publichearings@irs.gov) to have your name added to the building access list. The subject line of the email must contain the regulation number REG-117631-23 and the language TESTIFY in Person. For example, the subject line may say: Request to TESTIFY in Person at Hearing for REG-117631-23.

Individuals who want to testify by telephone at the public hearing must send an email to [publichearings@irs.gov](mailto:publichearings@irs.gov) to receive the telephone number and access code for the hearing. The subject line of the email must contain the regulation number RE-117631-23 and the language TESTIFY Telephonically. For example, the subject line may say: Request to TESTIFY Telephonically at Hearing for REG-117631-23.

Individuals who want to attend the public hearing in person without testifying must also send an email to [publichearings@irs.gov](mailto:publichearings@irs.gov) to have your name added to the building access list. The subject line of the email must contain the regulation number REG-117631-23 and the language ATTEND In Person. For example, the subject line may say: Request to ATTEND Hearing in Person for REG-117631-23. Requests to attend the public hearing must be received by 5:00 p.m. EST on March 18, 2024.

Hearings will be made accessible to people with disabilities. To request special assistance during a hearing please contact the Publications and

Regulations Branch of the Office of Associate Chief Counsel (Procedure and Administration) by sending an email to [publichearings@irs.gov](mailto:publichearings@irs.gov) (preferred) or by telephone at (202) 317-6901 (not a toll-free number) by at least March 18, 2024.

#### Statement of Availability of IRS Documents

IRS guidance cited in this preamble is published in the Internal Revenue Bulletin and is available from the Superintendent of Documents, U.S. Government Publishing Office, Washington, DC 20402, or by visiting the IRS website at <https://www.irs.gov>.

#### Drafting Information

The principal author of these proposed regulations is the Office of the Associate Chief Counsel (Passthroughs and Special Industries). However other personnel from the Treasury Department, the DOE, the EPA, and the IRS participated in the development of the proposed regulations.

#### List of Subjects in 26 CFR Part 1

Income taxes, Reporting and recordkeeping requirements.

#### Proposed Amendments to the Regulations

Accordingly, the Treasury Department and the IRS propose to amend 26 CFR part 1 as follows:

#### PART 1—INCOME TAXES

■ **Paragraph 1.** The authority citation for part 1 is amended by adding entries in numerical order for §§ 1.45V-1 through 1.45V-6 and 1.48-15 to read in part as follows:

**Authority:** 26 U.S.C. 7805 \* \* \*

\* \* \* \* \*

Section 1.45V-1 also issued under 26 U.S.C. 45V(f).

Section 1.45V-2 also issued under 26 U.S.C. 45V(f).

Section 1.45V-3 also issued under 26 U.S.C. 45V(e) and (f).

Section 1.45V-4 also issued under 26 U.S.C. 45V(f).

Section 1.45V-5 also issued under 26 U.S.C. 45V(f).

Section 1.45V-6 also issued under 26 U.S.C. 45V(c) and (d).

\* \* \* \* \*

Section 1.48-15 also issued under 26 U.S.C. 48(a)(15).

\* \* \* \* \*

■ **Par. 2.** Sections 1.45V-0 through 1.45V-6 are added to read as follows: Sec.

\* \* \* \* \*

1.45V-0 Table of contents.

1.45V-1 Credit for production of qualified clean hydrogen.

1.45V-2 Special rules.

- 1.45V-3 [Reserved]  
 1.45V-4 Procedures for determining lifecycle greenhouse gas emissions rates for qualified clean hydrogen.  
 1.45V-5 Procedures for verification of qualified clean hydrogen production and sale or use.  
 1.45V-6 Rules for determining the placed in service date for an existing facility that is modified to produce qualified clean hydrogen.

\* \* \* \* \*

#### § 1.45V-0 Table of contents.

This section lists the captions contained in §§ 1.45V-1 through 1.45V-6.

#### § 1.45V-1 Credit for production of qualified clean hydrogen.

- (a) Overview.  
 (1) In general.  
 (2) Applicable amount.  
 (i) In general.  
 (ii) Inflation adjustment.  
 (3) Applicable percentage.  
 (4) Claim.  
 (5) Code.  
 (6) DOE.  
 (7) Facility.  
 (i) In general.  
 (ii) Treatment of certain indirect production and post-production equipment.  
 (iii) Multipurpose components.  
 (iv) Example.  
 (8) Lifecycle GHG emissions.  
 (i) In general.  
 (ii) Most recent GREET model.  
 (iii) Emissions through the point of production (well-to-gate).  
 (9) Qualified clean hydrogen.  
 (i) In general.  
 (ii) For sale or use.  
 (10) Qualified clean hydrogen production facility.  
 (11) Secretary.  
 (12) Section 45V credit.  
 (13) Section 45V regulations.  
 (b) Amount of credit.  
 (1) In general.  
 (2) Producer of qualified clean hydrogen.  
 (3) Increased credit amount for qualified clean hydrogen production facilities.  
 (c) Determination of credit.  
 (d) Applicability date.

#### § 1.45V-2 Special rules.

- (a) Coordination with credit for carbon oxide sequestration.  
 (b) Anti-abuse rule.  
 (1) In general.  
 (2) Example.  
 (i) Facts.  
 (ii) Analysis.  
 (c) Recordkeeping.  
 (d) Applicability date.

#### § 1.45V-3 [Reserved]

#### § 1.45V-4 Procedures for determining lifecycle greenhouse gas emissions rates for qualified clean hydrogen.

- (a) In general.  
 (b) Use of the most recent GREET model.  
 (c) Provisional emissions rate (PER).  
 (1) In general.  
 (2) Rate not determined.  
 (i) In general.  
 (ii) Subsequent inclusion in 45VH2-GREET.

- (3) Process for filing a PER petition.  
 (4) PER determination.  
 (5) Department of Energy emissions value request process.

- (6) Effect of PER.  
 (d) Use of Energy Attribute Certificates (EACs).

- (1) In general.  
 (2) Definitions.  
 (i) Commercial operations date.  
 (ii) Energy attribute certificate.  
 (iii) Eligible EAC.  
 (iv) Qualifying EAC.  
 (v) Qualified EAC registry or accounting system.

- (vi) Region.  
 (3) Qualifying EAC requirements.  
 (i) Incrementality.

- (ii) Temporal matching.  
 (iii) Deliverability.  
 (e) Applicability date.

#### § 1.45V-5 Procedures for verification of qualified clean hydrogen production and sale or use.

- (a) In general.  
 (b) Requirements for verification reports.  
 (c) Requirements for the production attestation.

- (d) Requirements for the sale or use attestation.

- (1) In general.  
 (2) Verifiable use.  
 (e) Requirements for the conflict attestation.

- (1) In general.  
 (2) Special rule for transfer elections.  
 (f) Requirements for the qualified verifier statement.

- (g) General information on the taxpayer's hydrogen production facility.

- (h) Qualified verifier.  
 (i) Unrelated party.  
 (j) Requirements for taxpayers claiming both the section 45V credit and the section 45 credit or the section 45U credit.

- (k) Timely verification report.

- (l) Applicability date.

#### § 1.45V-6 Rules for determining the placed in service date for an existing facility that is modified to produce qualified clean hydrogen.

- (a) Modification of an existing facility.

- (1) In general.  
 (2) Modification requirements.  
 (b) Retrofit of an Existing Facility (80/20 Rule).

- (c) Examples.  
 (1) Example 1: Modification of an existing facility.

- (i) Facts.  
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 (2) Example 2: Modification of an existing facility; coordination with the section 45Q credit previously allowed.

- (i) Facts.  
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- (i) Facts.  
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 (4) Example 4: Retrofit of an Existing Facility (80/20 Rule) and coordination with section 45Q credit previously allowed.

- (i) Facts.  
 (ii) Analysis.

- (5) Example 5: Retrofit of an Existing Facility (80/20 Rule) and coordination with section 45Q credit previously allowed.

- (i) Facts.  
 (ii) Analysis.  
 (d) Applicability date.

#### § 1.45V-1 Credit for production of clean hydrogen.

(a) *Overview*—(1) *In general*. For purposes of section 38 of the Code, the section 45V credit is determined under section 45V of the Code, so much of sections 6417 and 6418 of the Code that relate to section 45V, and the section 45V regulations (as defined in paragraph (a)(13) of this section). Paragraphs (a)(2) through (13) of this section provide generally applicable definitions of terms that, unless otherwise provided, apply for purposes of section 45V, the section 45V regulations, and any provision of the Code or this chapter that expressly refers to any provision of section 45V or the section 45V regulations. Paragraph (b) of this section provides rules for determining the amount of the section 45V credit for any taxable year, which generally depends on the kilograms of qualified clean hydrogen produced during the taxable year and the emissions intensity of the process used to produce such hydrogen, as well as whether certain requirements, including the requirements under § 1.45V-3, are satisfied. Paragraph (c) of this section provides rules regarding the taxable year for which a section 45V credit is determined. *See* § 1.45V-2 for special rules, including rules to coordinate the section 45V credit with the credit for carbon oxide sequestration determined under section 45Q of the Code, an anti-abuse rule, and recordkeeping requirements. *See* § 1.45V-3 for rules relating to the increased credit amount for satisfying the prevailing wage and apprenticeship requirements. *See* § 1.45V-4 for procedures to determine lifecycle greenhouse gas (GHG) emissions rates for qualified clean hydrogen and § 1.45V-5 for procedures for verification of qualified clean hydrogen production and sale or use. *See* § 1.45V-6 for rules to determine the placed in service date for an existing facility that is modified or retrofitted to produce qualified clean hydrogen. *See also* § 1.48-15 for procedures to elect to treat any qualified property that is part of a specified clean hydrogen production facility as energy property for purposes of section 48 of the Code.

(2) *Applicable amount*—(i) *In general*. The term *applicable amount* means the amount equal to the applicable percentage of \$0.60, provided that if any such amount is not a multiple of 0.1

cent, such amount is rounded to the nearest multiple of 0.1 cent.

(ii) *Inflation adjustment.* The \$0.60 amount specified in section 45V(b)(1) and paragraph (a)(2)(i) of this section is adjusted annually by multiplying such amount by the inflation adjustment factor (as determined under section 45(e)(2) of the Code, determined by substituting “2022” for “1992” in section 45(e)(2)(B)) for the calendar year in which the qualified clean hydrogen is produced, provided that if any such amount as adjusted is not a multiple of 0.1 cent, such amount is rounded to the nearest multiple of 0.1 cent.

(3) *Applicable percentage.* The term *applicable percentage* means the percentage set forth in paragraphs (a)(3)(i) through (iv) of this section, which is determined according to the lifecycle GHG emissions rate of the process by which the qualified clean hydrogen is produced:

(i) In the case of any qualified clean hydrogen that is produced through a process that results in a lifecycle GHG emissions rate of not greater than 4 kilograms of carbon dioxide equivalent (CO<sub>2</sub>e) per kilogram of hydrogen, and not less than 2.5 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, the applicable percentage is 20 percent.

(ii) In the case of any qualified clean hydrogen that is produced through a process that results in a lifecycle GHG emissions rate of less than 2.5 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, and not less than 1.5 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, the applicable percentage is 25 percent.

(iii) In the case of any qualified clean hydrogen that is produced through a process that results in a lifecycle GHG emissions rate of less than 1.5 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, and not less than 0.45 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, the applicable percentage is 33.4 percent.

(iv) In the case of any qualified clean hydrogen that is produced through a process that results in a lifecycle GHG emissions rate of less than 0.45 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, the applicable percentage is 100 percent.

(4) *Claim.* With respect to the section 45V credit determined for qualified clean hydrogen produced by the taxpayer at a qualified clean hydrogen production facility, the term *claim* means the filing of a completed Form 7210, *Clean Hydrogen Production Credit*, or any successor form(s), with the taxpayer’s Federal income tax return or annual information return for the taxable year in which the credit is determined, and includes the making of an election under section 6417 or 6418

and the regulations in this chapter under section 6417 or 6418, as applicable, with respect to such section 45V credit on the applicable entity’s or eligible taxpayer’s timely filed (including extensions) Federal income tax return or annual information return.

(5) *Code.* The term *Code* means the Internal Revenue Code.

(6) *DOE.* The term *DOE* means the U.S. Department of Energy.

(7) *Facility*—(i) *In general.* For purposes of the definition of *qualified clean hydrogen production facility* provided at section 45V(c)(3) and paragraph (a)(10) of this section, unless otherwise specified, the term *facility* means a single production line that is used to produce qualified clean hydrogen. A single production line includes all components of property that function interdependently to produce qualified clean hydrogen. Components of property function interdependently to produce qualified clean hydrogen if the placing in service of each component is dependent upon the placing in service of each of the other components to produce qualified clean hydrogen.

(ii) *Treatment of certain indirect production and post-production equipment.* The term *facility* does not include—

(A) Equipment that is used to condition or transport hydrogen beyond the point of production; or

(B) Notwithstanding paragraph (a)(7)(iii) of this section, electricity production equipment used to power the hydrogen production process, including any carbon capture equipment associated with the electricity production process.

(iii) *Multipurpose components.* Components that have a purpose in addition to the production of qualified hydrogen may be part of a facility if such components function interdependently with other components to produce qualified clean hydrogen.

(iv) *Example.* The following example illustrates the definition of facility provided in this paragraph (a)(7). A hydrogen production facility is equipped with carbon capture equipment (as defined in § 1.45Q–2(c)), as distinguished from the carbon capture equipment described in paragraph (a)(7)(ii)(B) of this section. One purpose of this equipment is the capture of carbon oxides. The facility produces hydrogen through a process that results in a lifecycle GHG emissions rate falling within the range specified in section 45V(b)(2)(C). Without the carbon capture equipment, the facility could not produce hydrogen through a process

that results in a lifecycle GHG emissions rate falling within the range specified in section 45V(b)(2)(C). Because the carbon capture equipment is functionally interdependent with other components of property to produce qualified clean hydrogen within the meaning of paragraph (a)(9)(i) of this section, the carbon capture equipment is part of the facility for purposes of section 45V(c)(3) and the regulations in this part under section 45V, along with all other components of property that function interdependently with the carbon capture equipment to produce qualified clean hydrogen.

(8) *Lifecycle GHG emissions*—(i) *In general.* Subject to section 45V(c)(1)(B) and paragraphs (a)(8)(ii) and (iii) of this section, and unless otherwise specified in the section 45V regulations, the term *lifecycle GHG emissions* has the meaning given the term *lifecycle greenhouse gas emissions* by 42 U.S.C. 7545(o)(1)(H), as in effect on August 16, 2022. For purposes of section 45V, lifecycle GHG emissions include emissions only through the point of production (well-to-gate), as determined under the most recent Greenhouse gases, Regulated Emissions, and Energy use in Transportation model (GREET model) developed by Argonne National Laboratory, or a successor model.

(ii) *Most recent GREET model.* Unless otherwise specified in the section 45V regulations, for purposes of the section 45V credit, the term *most recent GREET model* means the latest version of 45VH2–GREET developed by Argonne National Laboratory that is publicly available, as provided in the instructions to the latest version of Form 7210, *Clean Hydrogen Production Credit*, or any successor form(s), on the first day of the taxable year during which the qualified clean hydrogen for which the taxpayer is claiming the section 45V credit was produced. If a version of 45VH2–GREET becomes publicly available after the first day of the taxable year of production (but still within such taxable year), then the taxpayer may, in its discretion, treat such later version of 45VH2–GREET as the most recent GREET model.

(iii) *Emissions through the point of production (well-to-gate).* The term *emissions through the point of production (well-to-gate)* means the aggregate lifecycle GHG emissions related to hydrogen produced at a hydrogen production facility during the taxable year through the point of production. It includes emissions associated with feedstock growth, gathering, extraction, processing, and delivery to a hydrogen production facility. It also includes the emissions

associated with the hydrogen production process, inclusive of the electricity used by the hydrogen production facility and any capture and sequestration of carbon dioxide generated by the hydrogen production facility.

(9) *Qualified clean hydrogen*—(i) *In general.* The term *qualified clean hydrogen* means hydrogen that is produced through a process that results in a lifecycle GHG emissions rate of not greater than 4 kilograms of CO<sub>2</sub>e per kilogram of hydrogen. Such term does not include any hydrogen unless the production and sale or use of such hydrogen is verified by an unrelated party in accordance with, and satisfying the requirements of, § 1.45V–5, and such hydrogen is produced—

(A) In the United States (as defined in section 638(1) of the Code) or a United States territory, which, for purposes of section 45V and the regulations in this part under section 45V, has the meaning of the term *possession* provided in section 638(2) of the Code;

(B) In the ordinary course of a trade or business of the taxpayer; and

(C) For sale or use.

(ii) *For sale or use.* The term *for sale or use* means for the primary purpose of making ready and available for sale or use. Storage of hydrogen following production does not disqualify such hydrogen from being considered produced for sale or use.

(10) *Qualified clean hydrogen production facility.* The term *qualified clean hydrogen production facility* means a facility—

(i) Owned by the taxpayer;

(ii) That produces qualified clean hydrogen; and

(iii) The construction of which begins before January 1, 2033.

(11) *Secretary.* The term *Secretary* means the Secretary of the Treasury or her delegate.

(12) *Section 45V credit.* The term *section 45V credit* means the credit for production of clean hydrogen determined under section 45V of the Code, so much of sections 6417 and 6418 of the Code that relate to section 45V, and the section 45V regulations.

(13) *Section 45V regulations.* The term *section 45V regulations* means this section, §§ 1.45V–2 through 1.45V–6, and the regulations in this chapter under sections 6417 and 6418 of the Code that relate to the section 45V credit.

(b) *Amount of credit*—(1) *In general.* The amount of the section 45V credit determined under section 45V(a) and the section 45V regulations for any taxable year is the product of the kilograms of qualified clean hydrogen

produced by the taxpayer during such taxable year at a qualified clean hydrogen production facility during the 10-year period beginning on the date such facility was originally placed in service, multiplied by the applicable amount with respect to such hydrogen.

(2) *Producer of qualified clean hydrogen.* The term *taxpayer* means the taxpayer that owns the qualified clean hydrogen production facility at the time of the facility's production of hydrogen for which the section 45V credit is claimed, regardless of whether such taxpayer is treated as a producer under section 263A of the Code or under any other provision of law with respect to such hydrogen.

(3) *Increased credit amount for qualified clean hydrogen production facilities.* Pursuant to section 45V(e)(1), § 1.45V–3 provides rules that permit the amount of the section 45V credit determined under section 45V(a) and paragraph (b)(1) of this section to be multiplied by five if certain requirements related to prevailing wages and apprenticeships are met. *See* § 1.45V–3(a).

(c) *Determination of credit.* Subject to any applicable sections of the Code that may limit the section 45V credit amount, the section 45V credit for any taxable year of a taxpayer who produces qualified clean hydrogen and claims such credit is determined with respect to the qualified clean hydrogen produced by the taxpayer during that taxable year, regardless of whether the verification of the production and sale or use of that hydrogen occurs in a later taxable year. Although the section 45V credit is determined with respect to the taxable year in which the qualified clean hydrogen is produced, a taxpayer is not eligible to claim the section 45V credit with respect to the production of that hydrogen until all relevant verification requirements, and the verification itself, have been completed for both the production of the hydrogen and the sale or use of that hydrogen. Accordingly, although the sale or use of the hydrogen and the verification thereof may occur in a taxable year after the taxable year of production, the section 45V credit is properly claimed with respect to the taxable year of production and is subject to the general period of limitations for filing a claim for credit or refund under section 6511 and other applicable provisions of the Code.

(d) *Applicability date.* This section applies to taxable years beginning after December 26, 2023.

#### § 1.45V–2 Special rules.

(a) *Coordination with credit for carbon oxide sequestration.* In the case of any qualified clean hydrogen produced at a qualified clean hydrogen production facility that includes carbon capture equipment for which a credit is allowed to any taxpayer under section 45Q of the Code (section 45Q credit) for the taxable year or any prior taxable year, no section 45V credit is allowed under section 45V of the Code. However, if the 80/20 Rule provided in § 1.45Q–2(g)(5) is satisfied with respect to such carbon capture equipment, and no new section 45Q credit has been allowed to any taxpayer for such carbon capture equipment, then the unit of carbon capture equipment (as defined in § 1.45Q–2(c)(3)) for which the 80/20 rule is satisfied will not be treated as carbon capture equipment for which a section 45Q credit was allowed to any taxpayer for any prior taxable year for purposes of section 45V(d)(2) and this paragraph (a).

(b) *Anti-abuse rule*—(1) *In general.* The rules of section 45V of the Code (and so much of sections 6417 and 6418 of the Code related to the section 45V credit) and the section 45V regulations (as defined in § 1.45V–1(a)(13)) must be applied in a manner consistent with the purposes of section 45V and the section 45V regulations. A purpose of section 45V and the regulations in this part under section 45V (and so much of sections 6417 and 6418 and the regulations in this chapter under sections 6417 and 6418 related to the section 45V credit) is to provide taxpayers an incentive to produce qualified clean hydrogen for a productive use. Accordingly, the section 45V credit is not allowable if 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 that the taxpayer knows or has reason to know will be vented, flared, or used to produce hydrogen. A determination of whether the production and sale or use of qualified clean hydrogen is inconsistent with the purposes of section 45V and the regulations in this part under section 45V of the Code is based on all facts and circumstances.

(2) *Example*—(i) *Facts.* Taxpayer is a C corporation that has a calendar year taxable year. In 2031, Taxpayer places Facility in service in the United States. Facility produces qualified clean hydrogen that qualifies for the highest applicable amount of the section 45V credit at a production cost of \$2 per

kilogram of hydrogen (assuming Taxpayer also claims the increased credit under section 45V(e), without taking into account any future inflation adjustment, the amount of the section 45V credit would be \$3 per kilogram of qualified clean hydrogen). The cost of producing each kilogram of qualified clean hydrogen is less than the amount of the section 45V credit that would be available if Taxpayer qualified for the section 45V credit. In 2031, Taxpayer sells all the qualified clean hydrogen produced at Facility that year to Customer at a price that is well below the current market price. Taxpayer knows or reasonably expects that Customer will vent or flare a portion of the qualified clean hydrogen it purchased from Taxpayer. In addition, Taxpayer intends to obtain the benefit from the section 45V credit by claiming such credit itself or monetizing such credits through an election under section 6417 or 6418 of the Code.

(ii) *Analysis.* Based on all the facts and circumstances, the primary purpose of Taxpayer's production and sale of qualified clean hydrogen is to obtain the benefit of the section 45V credit in a manner that is wasteful. Taxpayer is not eligible for the section 45V credit with respect to the qualified clean hydrogen that Taxpayer produced and sold in 2031 to Customer that is subsequently vented or flared by Customer.

(c) *Recordkeeping.* Consistent with section 6001 of the Code, a taxpayer claiming the section 45V credit for qualified clean hydrogen produced at a qualified clean hydrogen production facility must maintain and preserve records sufficient to establish the amount of the section 45V credit claimed by the taxpayer. At a minimum, those records must include records to substantiate the information required to be included in the verification report under § 1.45V-5, records establishing that the facility meets the definition of a qualified clean hydrogen production facility under section 45V(c)(3) and § 1.45V-1(a)(10), records of past credit claims under section 45Q by any taxpayer with respect to carbon capture equipment included at the facility, and records establishing the date the qualified clean hydrogen production facility was placed in service. If the requirements under section 45V(e) and § 1.45V-3(b) for the increased credit amount were satisfied, then the taxpayer must also maintain records in accordance with § 1.45-12. Taxpayers must also retain all raw data used for submission of a request for an emissions value to the DOE for at least six years after the due date (including extensions) for filing the Federal income tax return

or information return to which the provisional emissions rate (PER) (as defined in § 1.45V-4(c)(1)) petition is ultimately attached.

(d) *Applicability date.* This section applies to taxable years beginning after December 26, 2023.

#### § 1.45V-3 [Reserved]

#### § 1.45V-4 Procedures for determining lifecycle greenhouse gas emissions rates for qualified clean hydrogen.

(a) *In general.* The amount of the section 45V credit is determined under section 45V(a) of the Code and § 1.45V-1(b) according to the lifecycle GHG emissions rate of all hydrogen produced at a hydrogen production facility during the taxable year. The lifecycle GHG emissions rate of such hydrogen is determined under the most recent GREET model. In the case of any hydrogen for which a lifecycle GHG emissions rate has not been determined under the most recent GREET model for purposes of section 45V, a taxpayer producing such hydrogen may file a petition for a provisional emissions rate (PER) with the IRS for the Secretary's determination of the lifecycle GHG emissions rate with respect to such hydrogen.

(b) *Use of the most recent GREET model.* For each taxable year during the period described in section 45V(a)(1), a taxpayer claiming the section 45V credit determines the lifecycle GHG emissions rate of hydrogen produced at a hydrogen production facility under the most recent GREET model separately for each hydrogen production facility the taxpayer owns. This determination is made following the close of each such taxable year and must include all hydrogen production during the taxable year. In using the most recent GREET model to calculate the lifecycle GHG emissions rate for purposes of determining the amount of the section 45V credit under section 45V(a) and § 1.45V-1(b), the taxpayer must accurately enter all information about its facility requested within the interface of 45VH2-GREET (as described in § 1.45V-1(a)(8)(ii)). Information regarding where taxpayers may access 45VH2-GREET and accompanying documentation will be included in the instructions to the Form 7210, *Clean Hydrogen Production Credit*, or any successor form(s).

(c) *Provisional emissions rate (PER)*—(1) *In general.* For purposes of section 45V(c)(2)(C) and paragraph (a) of this section, the term *provisional emissions rate* or *PER* means the lifecycle GHG emissions rate of the process by which qualified clean hydrogen is produced by

the taxpayer at a hydrogen production facility as determined by the Secretary under this paragraph (c).

(2) *Rate not determined*—(i) *In general.* For purposes of section 45V(c)(2)(C), a taxpayer may not file a petition for a PER unless a lifecycle GHG emissions rate has not been determined under the most recent GREET model with respect to hydrogen produced by the taxpayer at a hydrogen production facility. A lifecycle GHG emissions rate has not been determined under the most recent GREET model with respect to hydrogen produced by the taxpayer at a hydrogen production facility if either the feedstock used by such facility or the facility's hydrogen production technology is not included in the most recent GREET model. A facility's hydrogen production pathway is not included in the most recent GREET model if the feedstock used by such facility or the facility's hydrogen production technology is not included in the most recent GREET model. If a taxpayer's request for an emissions value pursuant to paragraph (c)(5) of this section with respect to the hydrogen produced by the taxpayer at a hydrogen production facility is pending at the time such facility's hydrogen production pathway becomes included in an updated version of 45VH2-GREET, the taxpayer's request for an emissions value will be automatically denied. In such case, the taxpayer must determine the lifecycle GHG emissions rate with respect to such hydrogen under paragraph (c)(2)(ii) of this section.

(ii) *Subsequent inclusion in 45VH2-GREET.* Notwithstanding the definition of the most recent GREET model provided at § 1.45V-1(a)(8)(ii), for the taxable year in which the hydrogen production facility's hydrogen production pathway is first included in an updated version of 45VH2-GREET, the updated version of 45VH2-GREET will be considered the most recent GREET model with respect to the hydrogen produced by the taxpayer at the hydrogen production facility during such taxable year, and for purposes of section 45V(c)(2)(C), a lifecycle GHG emissions rate for such hydrogen will be considered to have been determined.

(3) *Process for filing a PER petition.* To file a PER petition with the Secretary, a taxpayer must submit a PER petition attached to the taxpayer's Federal income tax return for the first taxable year of hydrogen production ending within the 10-year period described in section 45V(a)(1) for which the taxpayer claims the section 45V credit for hydrogen to which the PER petition relates and for which a lifecycle GHG emissions rate has not been

determined, as defined under paragraph (c)(2)(i) of this section. A PER petition must contain an emissions value obtained from the DOE setting forth DOE's analytical assessment of the lifecycle GHG emissions associated with the facility's hydrogen production pathway, which must be consistent with the lifecycle GHG emissions framework provided in the section 45V regulations, and a copy of the taxpayer's request to the DOE for an emissions value, including any information provided by the taxpayer to the DOE pursuant to the emissions value request process provided in paragraph (c)(5) of this section. If the taxpayer obtained more than one emissions value from the DOE, the PER petition must contain the emissions value setting forth the lifecycle GHG emissions rate of the hydrogen for which the section 45V credit is claimed on the Form 7210, *Clean Hydrogen Production Credit*, to which the PER petition is attached.

(4) *PER determination.* Upon the IRS's acceptance of the taxpayer's Federal income tax return containing a PER petition, the emissions value of the hydrogen specified on such petition will be deemed accepted. A taxpayer would be able to rely upon an emissions value provided by the DOE for purposes of calculating and claiming a section 45V credit, provided that any information, representations, or other data provided to the DOE in support of the request for an emissions value are accurate. The IRS's deemed acceptance of such emissions value is the Secretary's determination of the PER. However, the production and sale or use of such hydrogen must be verified by an unrelated party under section 45V(c)(2)(B)(ii) and § 1.45V-5. Such verification and any information, representations, or other data provided to the DOE in support of the request for an emissions value are subject to later examination by the IRS.

(5) *Department of Energy (DOE) emissions value request process.* An applicant that submits a request for an emissions value must follow the procedures specified by the DOE to request and obtain such emissions value. Emissions values will be evaluated using the same well-to-gate system boundary that is employed in 45VH2-GREET. Additionally, if applicable, background data parameters in 45VH2-GREET will also be treated as background data (with fixed values that an applicant cannot change) in the emissions value request process. Treatment of EACs and other proposals outlined in the regulations in this part under section 45V will be consistently applied in the emissions value request

process. An applicant may request an emissions value from the DOE only after a front-end engineering and design (FEED) study or similar indication of project maturity, as determined by the DOE, such as project specification and cost estimation sufficient to inform a final investment decision has been completed for the hydrogen production facility. The DOE may decline to review applications that are not responsive, including those applications that use a hydrogen production technology and feedstock already in 45VH2-GREET or applications that are incomplete. Guidance and procedures for applicants to request and obtain an emissions value from the DOE will be published by the DOE, including a process for, under limited circumstances, a revision to the DOE's initial analytical assessment of an emissions value on the basis of revised technical information or facility design and operation.

(6) *Effect of PER.* A taxpayer may use a PER determined by the Secretary to calculate the amount of the section 45V credit under section 45V(a) and § 1.45V-1(b) with respect to qualified clean hydrogen produced at a qualified clean hydrogen production facility, provided all other requirements of section 45V are met, until the lifecycle GHG emissions rate of such hydrogen has been determined (for purposes of section 45V(c)(2)(C)) under the most recent GREET model. The Secretary's PER determination is not an examination or inspection of books of account for purposes of section 7605(b) of the Code and does not preclude or impede the IRS (under section 7605(b) or any administrative provisions adopted by the IRS) from later examining a return or inspecting books or records with respect to any taxable year for which the section 45V credit is claimed. For example, the verification report submitted under section 45V(c)(2)(B)(ii) and § 1.45V-5 and any information, representations, or other data provided to the DOE in support of the request for an emissions value are still subject to examination. Further, a PER determination does not signify that the IRS has determined that the requirements of section 45V have been satisfied for any taxable year.

(d) *Use of Energy Attribute Certificates (EACs)*—(1) *In general.* For purposes of the section 45V credit, if a taxpayer determines a lifecycle GHG emissions rate for hydrogen produced at a hydrogen production facility using the most recent GREET model or the Secretary determines a provisional emissions rate for hydrogen produced at a hydrogen production facility subject to a PER petition, then the taxpayer may

treat such hydrogen production facility's use of electricity as being from a specific electricity generating facility rather than being from the regional electricity grid (as represented in 45VH2-GREET) only if the taxpayer acquires and retires qualifying EACs (as defined in paragraph (d)(2)(iv) of this section) for each unit of electricity that the taxpayer claims from such source. For example, one megawatt-hour of electricity use to produce hydrogen would need to be matched with one megawatt-hour of qualifying EACs. Further, to satisfy this requirement, a taxpayer's acquisition and retirement of qualifying EACs must also be recorded in a qualified EAC registry or accounting system (as defined in paragraph (d)(2)(v) of this section) so that the acquisition and retirement of such EACs may be verified by a qualified verifier (as defined in § 1.45V-5(h)). The requirements of this paragraph (d)(1) apply regardless of whether the electricity generating facility is grid connected, directly connected, or co-located with the hydrogen production facility.

(2) *Definitions.* For purposes of this section—

(i) *Commercial operations date.* The term *commercial operations date* or *COD* means the date on which a facility that generates electricity begins commercial operations.

(ii) *Energy attribute certificate.* The term *energy attribute certificate* (EAC) means a tradeable contractual instrument, issued through a qualified EAC registry or accounting system (as defined in paragraph (d)(2)(v) of this section), that represents the energy attributes of a specific unit of energy produced. An EAC may be traded with or separately from the underlying energy it represents. An EAC can be retired by or on behalf of its owner, which is the party that has the right to claim the underlying attributes represented by an EAC. Renewable energy certificates (RECs) and other similar energy certificates issued through a registry or accounting system are forms of EACs.

(iii) *Eligible EAC.* The term *eligible EAC* means an EAC that, with respect to the electricity to which the EAC relates, provides, at a minimum, the information described in paragraphs (d)(2)(iii)(A) through (F) of this section—

(A) A description of the facility, including the technology and feedstock used to generate the electricity;

(B) The amount and units of electricity;

(C) The COD of the facility that generated the electricity;

(D) For electricity that is generated before January 1, 2028, the calendar year in which such electricity was generated;

(E) For electricity that is generated after December 31, 2027, the date and hour in which such electricity was generated; and

(F) The project identification number or assigned identifier.

(iv) *Qualifying EAC*. The term *qualifying EAC* means an eligible EAC that meets the requirements of paragraph (d)(3) of this section and for which the satisfaction of those requirements has been verified by a qualified verifier (as defined in § 1.45V-5(h)).

(v) *Qualified EAC registry or accounting system*. The term *qualified EAC registry or accounting system* means a tracking system that—

(A) Assigns a unique identification number to each EAC tracked by such system;

(B) Enables verification that only one EAC is associated with each unit of electricity;

(C) Verifies that each EAC is claimed and retired only once;

(D) Identifies the owner of each EAC; and

(E) Provides a publicly accessible view (for example, through an application programming interface) of all currently registered generators in the tracking system to prevent the duplicative registration of generators.

(vi) *Region*. The term *region* means a region derived from the National Transmission Needs Study that was released by the DOE on October 30, 2023. Alaska, Hawaii, and each U.S. territory will be treated as separate regions.

(3) *Qualifying EAC requirements*. An eligible EAC meets the requirements of this paragraph (d)(3) if it meets the requirements of paragraphs (d)(3)(i) through (iii) of this section.

(i) *Incrementality*. An EAC meets the requirements of this paragraph (d)(3)(i) if it meets the requirements of paragraph (d)(3)(i)(A) or (B) of this section. Paragraph (d)(3)(i)(C) of this section provides an example that illustrates the application of paragraph (d)(3)(i)(B) of this section.

(A) An EAC meets the requirements of this paragraph (d)(3)(i)(A) if the electricity generation facility that produced the unit of electricity to which the EAC relates has a COD that is no more than 36 months before the hydrogen production facility for which the EAC is retired was placed in service.

(B) *Upgrades*. An EAC meets the requirements of this paragraph (d)(3)(i)(B) if the electricity represented by the EAC is produced by an electricity

generating facility that had an uprate no more than 36 months before the hydrogen production facility with respect to which the EAC is retired was placed in service and such electricity is part of such electricity generating facility's uprated production. The term *uprate* means an increase in an electricity generating facility's rated nameplate capacity (in nameplate megawatts). The term *pre-uprate capacity* means the nameplate capacity of an electricity generating facility immediately before an uprate. The term *post-uprate capacity* means the nameplate capacity of an electricity generating facility immediately after an uprate. The term *incremental generation capacity* means the increase in an electricity generating facility's rated nameplate capacity from the pre-uprate capacity to the post-uprate capacity. The term *uprated production rate* means the incremental generation capacity (in nameplate megawatts) divided by the post-uprate capacity (in nameplate megawatts). The term *uprated production* means the uprated production rate of an electricity generating facility multiplied by its total generation output (in megawatt hours). An uprated electricity generating facility's production must be prorated to each hour of such facility's generation by multiplying the production for each hour or each year, consistent with the requirements in paragraph (d)(3)(ii) of this section, by the uprated production rate to determine the electricity to which the uprate relates.

(C) *Example*. Power Plant undergoes an uprate that expands its rated nameplate capacity from a pre-uprate capacity of 10 megawatts (MW) to a post-uprate capacity of 12 MW. After the uprate, its generation output increases to a total of 40,000 MW hours for the year. Power Plant's incremental generation capacity is 2 MW, its uprated production rate is 0.167 (2 MW divided by 12 MW), and its total uprated production for the year is 6,667 megawatt hours (MWh) (2 megawatts divided by 12 MW multiplied by 40,000 MWh). Two-twelfths (0.167) of each hour of the Power Plant's production may be considered uprated production.

(ii) *Temporal matching*—(A) *In general*. An EAC meets the requirements of this paragraph (d)(3)(ii) if the electricity represented by the EAC is generated in the same hour that the taxpayer's hydrogen production facility uses electricity to produce hydrogen.

(B) *Transition rule*. For EACs that represent electricity generated before January 1, 2028, the EAC will be considered generated in the same hour that the taxpayer's hydrogen production

facility uses electricity to produce hydrogen as required in paragraph (d)(3)(ii)(A) of this section if the electricity represented by the EAC is generated in the same calendar year that the taxpayer's hydrogen production facility uses electricity to produce hydrogen.

(iii) *Deliverability*. An EAC meets the requirements of this paragraph (d)(3)(iii) if the electricity represented by the EAC is generated by a facility that is in the same region (as defined in paragraph (d)(2)(vi) of this section) as the hydrogen production facility.

(e) *Applicability date*. This section applies to taxable years beginning after December 26, 2023.

#### § 1.45V-5 Procedures for verification of qualified clean hydrogen production and sale or use.

(a) *In general*. For each qualified clean hydrogen production facility for which a taxpayer claims a section 45V credit, a verification report must be attached to the taxpayer's Form 7210, *Clean Hydrogen Production Credit*, or any successor form(s), for each qualified clean hydrogen production facility and for each taxable year in which the taxpayer claims the section 45V credit.

(b) *Requirements for verification reports*. A verification report specified in paragraph (a) of this section must be prepared by a qualified verifier under penalties of perjury and must contain—

(1) An attestation from the qualified verifier regarding the taxpayer's production of qualified clean hydrogen for sale or use (production attestation);

(2) An attestation from the qualified verifier regarding the amount of qualified clean hydrogen sold or used (sale or use attestation);

(3) An attestation from the qualified verifier regarding conflicts of interest (conflict attestation);

(4) Certain information regarding the qualified verifier, including documentation of the qualified verifier's qualifications (qualified verifier statement);

(5) Certain general information about the taxpayer's hydrogen production facility where the hydrogen production undergoing verification occurred; and

(6) Any documentation necessary to substantiate the verification process given the standards and best practices prescribed by the qualified verifier's accrediting body and the circumstances of the taxpayer and the taxpayer's hydrogen production facility.

(c) *Requirements for the production attestation*. The following requirements apply to the production attestation.

(1) The production attestation must be an attestation, made under penalties of

perjury, that the qualified verifier performed a verification sufficient to determine that the operation, during the applicable taxable year, of the hydrogen production facility that produced the hydrogen for which the section 45V credit is claimed, and any energy attribute certificates (EACs) applied pursuant to § 1.45V-4(d) for the purpose of accounting for such facility's emissions, are accurately reflected in—

(i) The amount of qualified clean hydrogen produced by the taxpayer that is claimed on the Form 7210, *Clean Hydrogen Production Credit*, or any successor form(s), to which the verification report is attached; and

(ii) Either—

(A) The data the taxpayer entered into the most recent GREET model to determine the lifecycle GHG emissions rate that is claimed on the Form 7210, *Clean Hydrogen Production Credit*, or any successor form(s), to which the verification report is attached; or

(B) The data the taxpayer submitted in the PER petition relating to the hydrogen for which the section 45V credit is claimed, and which was provided to the DOE in support of the taxpayer's request for the emissions value provided in the PER petition.

(2) If the production attestation attests to the information specified in paragraph (c)(1)(ii)(B) of this section, then the production attestation must also specify the emissions value received from the DOE that was calculated using such data, expressed in kilograms of CO<sub>2</sub>e per kilogram of hydrogen.

(3) The production attestation must specify the lifecycle GHG emissions rate (expressed in kilograms of CO<sub>2</sub>e per kilogram of hydrogen) and the amount of qualified clean hydrogen produced by the taxpayer (expressed in kilograms), that are claimed on the Form 7210, *Clean Hydrogen Production Credit*, or any successor form(s), to which the verification report is attached.

(d) *Requirements for the sale or use attestation*—(1) *In general.* The sale or use attestation must be an attestation, made under penalties of perjury, that the qualified verifier performed a verification sufficient to determine that the amount of qualified clean hydrogen that is specified in the production attestation pursuant to paragraph (c)(1)(i) of this section, and that is claimed on the Form 7210, *Clean Hydrogen Production Credit*, or any successor form(s), to which the verification report is attached, has been sold or used by a person who makes a verifiable use of such hydrogen.

(2) *Verifiable use.* For purposes of section 45V(c)(2)(B)(ii) of the Code and

the section 45V regulations (as defined in § 1.45V-1(a)(13)), a person's *verifiable use* of the hydrogen specified in paragraph (d)(1) of this section can occur within or outside the United States. A verifiable use can be made by the taxpayer or a person other than the taxpayer. For example, a verifiable use includes a tolling arrangement pursuant to which a service recipient provides raw materials or inputs, such as water or electricity, to a toller (that is, a third-party service provider that owns a hydrogen production facility), and the toller produces hydrogen for the service recipient using the service recipient's raw materials or inputs in exchange for a fee, use of the hydrogen by the service recipient would be a verifiable use. However, a verifiable use does not include—

(i) Use of hydrogen to generate electricity that is then directly or indirectly used in the production of more hydrogen; or

(ii) Venting or flaring of hydrogen.

(e) *Requirements for the conflict attestation*—(1) *In general.* The conflict attestation must include attestations, made under penalties of perjury, that—

(i) The qualified verifier has not received a fee based to any extent on the value of any section 45V credit that has been or is expected to be claimed by any taxpayer and no arrangement has been made for such fee to be paid at some time in the future;

(ii) The qualified verifier was not a party to any transaction in which the taxpayer sold qualified clean hydrogen it had produced or in which the taxpayer purchased inputs for the production of such hydrogen;

(iii) The qualified verifier is not related, within the meaning of section 267(b) or 707(b)(1) of the Code, to, or an employee of, the taxpayer;

(iv) The qualified verifier is not married to an individual described in paragraph (e)(1)(iii) of this section; and

(v) If the qualified verifier is acting in his or her capacity as a partner in a partnership, an employee of any person, whether an individual, corporation, or partnership, or an independent contractor engaged by a person other than the taxpayer, the attestations under paragraphs (e)(1)(i) through (iv) of this section must also be made with respect to the partnership or the person who employs or engages the qualified verifier.

(2) *Special rule for transfer elections.* If an election has been made under section 6418(a) of the Code with respect to the section 45V credit, then the attestations under paragraph (e)(1) of this section must be made with respect to the qualified verifier's independence

from both the *eligible taxpayer* and the *transferee taxpayer* (as those terms are defined in section 6418 and the regulations in this chapter thereunder).

(f) *Requirements for the qualified verifier statement.* The qualified verifier statement must include the following—

(1) The qualified verifier's name, address, and taxpayer identification number;

(2) The qualified verifier's qualifications to conduct the verification, including a description of the qualified verifier's education and experience and a photocopy of the qualified verifier's certificate received from their accrediting body;

(3) If the qualified verifier is acting in his or her capacity as a partner in a partnership, an employee of any person, whether an individual, corporation, or partnership, or an independent contractor engaged by a person other than the taxpayer, the name, address, and taxpayer identification number of the partnership or the person who employs or engages the qualified verifier;

(4) The signature of the qualified verifier and the date signed by the qualified verifier; and

(5) A statement that the verification was conducted for Federal income tax purposes.

(g) *General information on the taxpayer's hydrogen production facility.* The verification report must include the following information for the taxpayer's hydrogen production facility where the hydrogen production undergoing verification occurred:

(1) The location of the hydrogen production facility;

(2) A description of the hydrogen production facility, including its method of producing hydrogen;

(3) The type(s) of feedstock(s) used by the hydrogen production facility during the taxable year of production;

(4) The amount(s) of feedstock(s) used by the hydrogen production facility during the taxable year of production; and

(5) A list of the metering devices used to record any data used by the qualified verifier to support the production attestation under paragraph (c) of this section along with a statement that the qualified verifier is reasonably assured that the device(s) underwent industry-appropriate quality assurance and quality control, and the accuracy and calibration of the device has been tested in the last year.

(h) *Qualified verifier.* The term *qualified verifier* means any individual or organization with active accreditation—

(1) As a validation and verification body from the American National Standards Institute National Accreditation Board; or

(2) As a verifier, lead verifier, or verification body under the California Air Resources Board Low Carbon Fuel Standard program.

(i) *Unrelated party.* For purposes of section 45V(c)(2)(B)(ii), the term *unrelated party* means a qualified verifier who meets the requirements of paragraph (e) of this section.

(j) *Requirements for taxpayers claiming both the section 45V credit and the section 45 credit or the section 45U credit.* In the case of a taxpayer who produces electricity for which either the section 45 or section 45U credit is claimed and the taxpayer or a related person uses such electricity to produce hydrogen for which the section 45V credit is claimed, the verification report must also contain attestations that the qualified verifier performed a verification sufficient to determine that—

(1) The electricity used to produce such hydrogen was produced at the relevant facility for which a section 45 or section 45U credit is claimed;

(2) The given amount of electricity (in kilowatt hours) used to produce such hydrogen at the relevant hydrogen production facility is reasonably assured of being accurate; and

(3) The electricity for which a section 45 or 45U credit was claimed is represented by EACs that are retired in connection with the production of such hydrogen.

(k) *Timely verification report.* A verification report must be signed and dated by the qualified verifier no later than—

(1) The due date, including extensions, of the Federal income tax return or information return for the taxable year during which the hydrogen undergoing verification is produced; or

(2) In the case of a credit first claimed on an amended return or administrative adjustment request, the date on which the amended return or administrative adjustment request is filed.

(l) *Applicability date.* This section applies to taxable years beginning after December 26, 2023.

**§ 1.45V–6 Rules for determining the placed in service date for an existing facility that is modified or retrofitted to produce qualified clean hydrogen.**

(a) *Modification of an existing facility—(1) In general.* Under section 45V(d)(4) of the Code, in the case of an existing facility that—

(i) Was originally placed in service before January 1, 2023, and, prior to the

modification described in this paragraph (a), did not produce qualified clean hydrogen, and after the date such facility was originally placed in service—

(A) Is modified to produce qualified clean hydrogen; and

(B) Amounts paid or incurred with respect to such modification are properly chargeable to the taxpayer's capital account for the facility.

(ii) Such facility will be deemed to have been originally placed in service as of the date the property required to complete the modification described in this paragraph (a) is placed in service.

(2) *Modification requirements.* For purposes of section 45V(d)(4) and paragraph (a)(1) of this section, an existing facility will not be deemed to have been originally placed in service as of the date the property required to complete the modification is placed in service unless the modification is made for the purpose of enabling the facility to produce qualified clean hydrogen and the taxpayer pays or incurs an amount that is properly chargeable to the taxpayer's capital account with respect to the facility. A modification is made for the purpose of enabling the facility to produce qualified clean hydrogen if the facility could not produce hydrogen with a lifecycle greenhouse gas (GHG) emissions rate that is less than or equal to 4 kilograms of CO<sub>2</sub>e per kilogram of hydrogen but for the modification. For example, if a taxpayer solely pays or incurs capital expenses to modify existing components of a hydrogen production facility that are not necessary for the production of hydrogen with a lifecycle GHG emissions rate that is less than or equal to 4 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, such modification does not entitle the facility to a new placed in service date.

(b) *Retrofit of an Existing Facility (80/20 Rule).* For purposes of section 45V(a)(1), a facility may establish a new date on which it is considered originally placed in service, even though the facility contains some used property, provided the fair market value of the used property is not more than 20 percent of the facility's total value, calculated by adding the cost of the new property to the value of the used property (80/20 Rule). For purposes of the 80/20 Rule, the cost of new property includes all properly capitalized costs of the new property included within the facility. The 80/20 Rule applies to any existing facility, regardless of whether the facility previously produced qualified clean hydrogen and regardless of when the facility was originally placed in service (before application of

this paragraph (b)). If a facility satisfies the requirements of the 80/20 Rule, then the date on which such facility is considered originally placed in service for purposes of section 45V(a)(1) is the date on which the new property added to the facility is placed in service.

(c) *Examples.* The following examples illustrate the application of paragraphs (a) and (b) of this section:

(1) *Example 1: Modification of an existing facility—(i) Facts.* Facility X, a hydrogen production facility that was originally placed in service on January 1, 2018, could not produce qualified clean hydrogen as described in section 45V(c)(2). After January 1, 2023, Facility X was modified to produce qualified clean hydrogen, and all amounts paid or incurred with respect to such modifications were properly chargeable to the taxpayer's capital account for Facility X. The property required to complete the modification was placed in service on June 1, 2023.

(ii) *Analysis.* Under section 45V(d)(4) and paragraph (a) of this section, because Facility X was originally placed in service before January 1, 2023, and before the modification could not produce qualified clean hydrogen, it is deemed to be originally placed in service as of the date the property required to complete the modification is placed in service. Accordingly, for purposes of section 45V(a)(1) and (d)(4), Facility X is deemed to have been originally placed in service on June 1, 2023.

(2) *Example 2: Modification of an existing facility; coordination with the section 45Q credit previously allowed—(i) Facts.* The facts are the same as in paragraph (c)(1) of this section (*Example 1*), except that taxpayer was allowed a section 45Q credit with respect to carbon capture equipment (CCE) included at Facility X before June 1, 2023.

(ii) *Analysis.* Under paragraph (a) of this section and § 1.45V–2(a), although Facility X is deemed to have been originally placed in service on June 1, 2023, because taxpayer had previously been allowed a section 45Q credit with respect to the CCE included at Facility X, no section 45V credit is allowable for qualified clean hydrogen produced at Facility X, despite the modification.

(3) *Example 3: Modification of an existing facility and coordination with section 45Q credit not previously allowed—(i) Facts.* Facility Y, a hydrogen production facility that was originally placed in service on February 1, 2020, could not previously produce qualified clean hydrogen as described in section 45V(c)(2). On February 1, 2026, Facility Y was modified to produce

qualified clean hydrogen by adding new CCE to allow Facility Y to capture, process, and prepare carbon dioxide for transport for disposal, injection, or utilization. All amounts paid or incurred with respect to such modifications were properly chargeable to the taxpayer's capital account for Facility Y. The property required to complete the modification of Facility Y was placed in service on February 1, 2026, and as a result, Facility Y, including the new CCE, is deemed to be originally placed in service on February 1, 2026, for purposes of sections 45V and 45Q. No section 45Q credit has been allowed to any taxpayer with respect to the new carbon capture equipment located at Facility Y.

(ii) *Analysis.* Under paragraph (a) of this section and § 1.45V-2(a), because no section 45Q credit has been allowed to any taxpayer with respect to the new CCE located at Facility Y, a section 45V credit is allowable for the qualified clean hydrogen produced at Facility Y, assuming all other requirements of section 45V are met.

(4) *Example 4: Retrofit of an Existing Facility (80/20 Rule)*—(i) *Facts.* Facility Z, a hydrogen production facility that was originally placed in service on February 1, 2023, does not produce qualified clean hydrogen as described in section 45V(c)(2). On January 1, 2026, Facility Z was retrofitted to produce qualified clean hydrogen. After the retrofit, the cost of the new property included in Facility Z is greater than 80 percent of Facility Z's total value.

(ii) *Analysis.* Even though Facility Z does not satisfy the requirements of section 45V(d)(4) because Facility Z was not originally placed in service before January 1, 2023, under paragraph (b) of this section, Facility Z is deemed to be originally placed in service on January 1, 2026, because Facility Z meets the 80/20 Rule. Thus, a section 45V credit is allowable for qualified clean hydrogen produced at Facility Z during the 10-year period beginning on January 1, 2026, assuming all other requirements of section 45V are met.

(5) *Example 5: Retrofit of an Existing Facility (80/20 Rule) and coordination with section 45Q credit previously allowed*—(i) *Facts.* The facts are the same as in paragraph (c)(4) of this section (*Example 4*), except that before the retrofit, Facility Z included CCE for which a section 45Q credit was allowed to a taxpayer.

(ii) *Analysis.* Under paragraph (b) of this section and § 1.45V-2(a), Facility Z is deemed to be originally placed in service on January 1, 2026, because Facility Z meets the 80/20 Rule. However, a section 45V credit is not

allowable for qualified clean hydrogen produced at Facility Z during the 10-year period beginning on January 1, 2026, because a section 45Q credit has been allowed to a taxpayer with regard to the CCE included in Facility Z.

(d) *Applicability date.* This section applies to taxable years beginning after December 26, 2023.

■ **Par. 3.** Section 1.48-15 is added to read as follows:

**§ 1.48-15 Election to treat clean hydrogen production facility as energy property.**

(a) *In general.* Under section 48(a)(15) of the Internal Revenue Code (Code), a taxpayer that owns and places in service a specified clean hydrogen production facility (as defined in section 48(a)(15)(C) and paragraph (b) of this section) can make an irrevocable election under section 48(a)(15)(C)(ii)(II) to treat any qualified property (as defined in section 48(a)(5)(D)) that is part of the facility as energy property for purposes of section 48.

(b) *Specified clean hydrogen production facility.* The term *specified clean hydrogen production facility* means any qualified clean hydrogen production facility—

(1) That is placed in service after December 31, 2022;

(2) With respect to which no credit has been allowed under section 45V or 45Q of the Code, and for which the taxpayer makes an irrevocable election to have section 48(a)(15) apply; and

(3) For which an unrelated party has verified in the manner specified in paragraph (e) of this section that such facility produces hydrogen through a process that results in lifecycle greenhouse gas (GHG) emissions that are consistent with the hydrogen that such facility was designed and expected to produce under section 48(a)(15)(A)(ii) and paragraph (c) of this section.

(c) *Energy percentage*—(1) *In general.* In the case of a specified clean hydrogen production facility that is designed and reasonably expected to produce qualified clean hydrogen through a process that results in a lifecycle GHG emissions rate of:

(i) Not greater than 4 kilograms of carbon dioxide equivalent (CO<sub>2</sub>e) per kilogram of hydrogen, and not less than 2.5 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, the energy percentage is 1.2 percent;

(ii) Less than 2.5 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, and not less than 1.5 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, the energy percentage is 1.5 percent;

(iii) Less than 1.5 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, and not less than 0.45 kilograms of CO<sub>2</sub>e per

kilogram of hydrogen, the energy percentage is 2 percent; and

(iv) Less than 0.45 kilograms of CO<sub>2</sub>e per kilogram of hydrogen, the energy percentage is 6 percent.

(2) *Designed and reasonably expected to produce.* Hydrogen that a facility is *designed and reasonably expected to produce* means hydrogen produced through a process that results in the lifecycle GHG emissions rate specified in the annual verification report described in paragraph (e)(2) of this section for the taxable year in which the election is made.

(d) *Time and manner of making the election*—(1) *In general.* To make an election under section 48(a)(15)(C)(ii)(II), a taxpayer must claim the section 48 credit with respect to a specified clean hydrogen production facility on a completed Form 3468, *Investment Credit*, or any successor form(s), and file the form with the taxpayer's Federal income tax return or information return for the taxable year in which the specified clean hydrogen production facility is placed in service. The taxpayer must also attach a statement to its Form 3468, *Investment Credit*, or any successor form(s), filed with its Federal income tax return or information return that includes the information required by the instructions to Form 3468, *Investment Credit*, or any successor form(s), for each specified clean hydrogen production facility subject to an election. A separate election must be made for each specified clean hydrogen production facility that meets the requirements provided in section 48(a)(15) to treat the qualified property that is part of the facility as energy property. If any taxpayer owning an interest in a specified clean hydrogen production facility makes an election under section 48(a)(15)(C)(ii)(II) with respect to the specified clean hydrogen production facility, then that election is binding on all taxpayers that directly or indirectly own an interest in the specified clean hydrogen production facility.

(2) *Special rule for partnerships and S corporations.* In the case of a specified clean hydrogen production facility owned by a partnership or an S corporation, the election under section 48(a)(15)(C)(ii)(II) is made by the partnership or S corporation and is binding on all ultimate credit claimants (as defined in § 1.50-1(b)(3)(ii)). The partnership or S corporation must file a Form 3468, *Investment Credit*, or any successor forms(s), with its partnership or S corporation return for the taxable year in which the specified clean hydrogen production facility is placed

in service to indicate that it is making the election, and attach a statement that includes all the information required by the instructions to Form 3468,

*Investment Credit*, or any successor form(s), for each specified clean hydrogen production facility subject to the election. The ultimate credit claimant's section 48 credit must be based on each claimant's share of the basis (as defined in § 1.46–3(f)) of the specified clean hydrogen production facility on a completed Form 3468, *Investment Credit*, or any successor form(s), and file such form with a Federal income tax return for the taxable year that ends with or within the taxable year in which the partnership or S corporation made the election. The partnership or S corporation making the election must provide the ultimate credit claimants with the necessary information to complete Form 3468, *Investment Credit*, or any successor form(s), to claim the section 48 credit.

(3) *Election irrevocable.* The election to treat qualified property that is part of a specified clean hydrogen production facility as energy property is irrevocable.

(4) *Election availability date.* The election to treat qualified property that is part of a specified clean hydrogen production facility as energy property is available for property placed in service after December 31, 2022. In the case of any property placed in service after December 31, 2022, for which construction began before January 1, 2023, the election under section 48(a)(15)(C)(ii)(II) applies only to the extent of the basis of such property that is attributable to construction, reconstruction, or erection occurring after December 31, 2022.

(e) *Third party verification—(1) In general.* In the case of a taxpayer that makes an election under section 48(a)(15)(C)(ii)(II) to treat any qualified property that is part of a specified clean hydrogen production facility as energy property for purposes of the section 48 credit, the taxpayer must obtain an annual verification report for the taxable year in which the election under section 48(a)(15)(C)(ii)(II) is made for the facility and for each taxable year thereafter during the recapture period specified in paragraph (f)(3) of this section. The taxpayer must also submit the annual verification report as an attachment to the Form 3468, *Investment Credit*, or any successor form(s), for the taxable year in which the election under section 48(a)(15)(C)(ii)(II) is made for the facility.

(2) *Annual verification report—(i) In general.* For purposes of paragraph (e)(1) of this section, the annual verification

report must be signed under penalties of perjury by a qualified verifier (as defined in § 1.45V–5(h)) and contain an attestation providing all of the following—

(A) The information specified in § 1.45V–5(b) and (d) through (h);

(B) A statement attesting to the lifecycle GHG emissions rate (determined under section 45V(c) and § 1.45V–4) of the hydrogen produced at the specified clean hydrogen production facility for the taxable year to which the annual verification report relates and that the operation, during such taxable year, of the specified clean hydrogen production facility, and any energy attribute certificates (EACs) applied pursuant to § 1.45V–4(d) for the purpose of accounting for such facility's emissions, are accurately reflected in the data that the taxpayer entered into the most recent GREET model (as defined in § 1.45V–1(a)(8)(ii)) (or that the taxpayer provided to the Department of Energy (DOE) in support of the taxpayer's request for an emissions value), to determine the lifecycle GHG emissions rate of the hydrogen undergoing verification; and

(C) A statement attesting that the facility produced hydrogen through a process that results in a lifecycle GHG emissions rate that is consistent with, or lower than, the lifecycle GHG emissions rate of the hydrogen that such facility was designed and expected to produce.

(ii) *Conflict attestation in the case of a transfer election.* If a transfer election has been made under section 6418(a) of the Code with respect to the section 48 credit for a specified clean hydrogen production facility, then a conflict attestation containing the information specified in § 1.45V–5(e)(1), must be made with respect to the qualified verifier's independence from both the eligible taxpayer (as defined in section 6418(f)(2) and § 1.6418–1(b)) and the transferee taxpayer (as described in section 6418(a) and defined in § 1.6418–1(m)), and without regard to the requirements under § 1.45V–5(e)(2).

(iii) *Inconsistent lifecycle GHG emissions.* In the event the facility produces hydrogen through a process that results in a lifecycle GHG emissions rate that is greater than the lifecycle GHG emissions rate that such facility was designed and expected to produce (and thus the qualified verifier cannot provide the attestation specified in paragraph (e)(2)(i)(C) of this section), resulting in a reduced energy percentage under section 48(a)(15)(A)(ii) with respect to such facility, an emissions tier recapture event under paragraph (f)(2) of this section will occur.

(iv) *Designed and expected to produce.* Hydrogen that the facility was designed and expected to produce means hydrogen specified in paragraph (c)(2) of this section.

(v) *Timely annual verification report.* The annual verification report must be signed and dated by the qualified verifier no later than the due date, including extensions, of the Federal income tax return for the taxable year in which the hydrogen undergoing verification was produced.

(vi) *Records retention.* In addition to the recordkeeping requirements set forth in paragraph (g) of this section, the taxpayer must retain the annual verification report for at least six years after the due date, with extensions, for filing the Federal income tax return for the taxable year in which the hydrogen undergoing verification was produced.

(f) *Recapture—(1) In general.* For purposes of section 48(a)(15)(E), in any taxable year of the recapture period specified in paragraph (f)(3) of this section in which an emissions tier recapture event (as defined in paragraph (f)(2) of this section) occurs, the tax imposed on the taxpayer under chapter 1 of the Code for the taxable year of the emissions tier recapture event is increased by the recapture amount specified in paragraph (f)(4) of this section.

(2) *Emissions tier recapture event.* For purposes of paragraph (f)(1) of this section, an emissions tier recapture event occurs in any taxable year of the recapture period specified in paragraph (f)(3) of this section under the following circumstances—

(i) The taxpayer fails to obtain an annual verification report by the deadline for filing its Federal income tax return (including extensions) for any taxable year in which an annual verification report is required under paragraph (e)(1) of this section;

(ii) The specified clean hydrogen production facility actually produced hydrogen through a process that results in a lifecycle GHG emissions rate that can only support a lower energy percentage than the energy percentage used to calculate the amount of the section 48 credit for the facility for the taxable year in which the facility is placed in service; or

(iii) The specified clean hydrogen production facility actually produced hydrogen through a process that results in a lifecycle GHG emissions rate of greater than 4 kilograms of CO<sub>2</sub>e per kilogram of hydrogen.

(3) *Recapture period.* For purposes of paragraph (f) of this section, the recapture period begins on the first day of the taxable year after the taxable year

in which the facility was placed in service and ends on the close of the fifth taxable year following the close of the taxable year in which the facility was placed in service.

(4) *Recapture amount*—(i) *In general.* In the case of an emissions tier recapture event under paragraph (f)(2) of this section, the recapture amount for the taxable year in which the emissions tier recapture event occurred is equal to 20 percent of the excess of the section 48 credit allowed to the taxpayer for the specified clean hydrogen production facility for the taxable year in which the facility was placed in service, over the section 48 credit that would have been allowed to the taxpayer for the facility if the taxpayer had used the energy percentage supported by the actual production to calculate the amount of the section 48 credit. Such increase in tax is the *recapture amount*.

(ii) *Carrybacks and carryovers.* In the case of any emissions tier recapture event described in paragraph (f)(2) of this section, the carrybacks and carryovers under section 39 must be adjusted by reason of the emissions tier recapture event.

(iii) *Recapture amount in case of recapture events under paragraph (f)(2)(i) or (iii) of this section.* For purposes of paragraph (f)(4)(i) of this section, in the case of an emissions tier recapture event under paragraph (f)(2)(i) or (iii), the amount of the section 48 credit that would have been allowed to the taxpayer for the specified clean hydrogen production facility if the taxpayer had used the energy percentage supported by the actual production is zero. Accordingly, the recapture amount in the taxable year of an emissions tier recapture event under paragraph (f)(2)(i) or (iii) is 20 percent of the section 48 credit allowed to the taxpayer for such specified clean hydrogen production facility.

(5) *Example.* The following example illustrates the application of paragraphs (f)(1) through (4) of this section.

(i) *Facts.* On June 1, 2023, Taxpayer, a calendar-year taxpayer, originally places in service Facility X, a specified clean hydrogen production facility. At such time, Taxpayer's basis in qualified property that is part of Facility X is \$100,000,000. In the taxable year in which Facility X was originally placed in service (taxable year 2023), Facility X produces qualified clean hydrogen through a process that results in a lifecycle GHG emissions rate of 0.44kg/CO<sub>2</sub>e per kilogram of hydrogen. Taxpayer submits with its 2023 Federal income tax return an annual verification report attesting that, for the taxable year 2023, Facility X produced hydrogen

through a process that resulted in a lifecycle GHG emissions rate of 0.44kg/CO<sub>2</sub>e, which is consistent with the lifecycle GHG emissions rate of the hydrogen that the facility was designed and expected to produce. Taxpayer makes a valid election under section 48(a)(15)(C)(ii)(II) with respect to Facility X on its Federal income tax return for the taxable year 2023. In the first year of the recapture period (taxable year 2024), Taxpayer fails to obtain an annual verification report by the deadline (including extensions) for filing its 2024 Federal income tax return. In the second year of the recapture period (taxable year 2025), Facility X produces qualified clean hydrogen through a process that results in a lifecycle GHG emissions rate of 1.4kg/CO<sub>2</sub>e per kilogram of hydrogen and obtains an annual verification report attesting to such lifecycle GHG emissions rate. In the third, fourth, and fifth years of the recapture period (taxable years 2026, 2027, and 2028), Facility X produces qualified clean hydrogen through a process that results in a lifecycle GHG emissions rate of 0.44kg/CO<sub>2</sub>e per kilogram of hydrogen and obtains an annual verification report attesting to such lifecycle GHG emissions rate, and attesting that such lifecycle GHG emissions rate is consistent with the lifecycle GHG emissions rate of the hydrogen that the facility was designed and expected to produce, by the deadline (including extensions) for filing its 2026, 2027, and 2028 Federal income tax returns, respectively.

(ii) *Analysis.* Facility X is designed and reasonably expected to produce hydrogen through a process that results in a lifecycle GHG emissions rate of 0.44kg/CO<sub>2</sub>e, which is the rate specified in Taxpayer's annual verification report submitted with Taxpayer's Federal income tax return for the taxable year in which the election under section 48(a)(15)(C)(ii)(II) with respect to Facility X was made. Under paragraph (c)(1)(iv) of this section, Facility X's energy percentage is therefore 6 percent. For the taxable year 2023, the year in which Taxpayer places in service Facility X, Taxpayer claims a section 48 credit for its basis in qualified property that is part of Facility X in the amount of \$6,000,000 (6 percent of \$100,000,000). In taxable year 2024, there is an emissions tier recapture event under paragraph (f)(2)(i) of this section because Taxpayer failed to obtain an annual verification report. Under paragraph (f)(4)(i) of this section, the amount of the section 48 credit recaptured in 2024 is \$1,200,000. This

reflects 20 percent of the section 48 credit allowed (\$6,000,000) for Facility X. In taxable year 2025, there is an emissions tier recapture event under paragraph (f)(2)(ii) of this section because Facility X produced hydrogen through a process that resulted in a lifecycle GHG emissions rate that could only support an energy percentage of 2 percent, which is lower than the energy percentage used to calculate the amount of the section 48 credit for Facility X. Under paragraph (f)(4)(i) of this section, the amount of the section 48 credit recaptured in 2025 is \$800,000. This reflects 20 percent of the difference between the amount of the section 48 credit allowed (\$6,000,000) and the amount of the section 48 credit that would have been allowed for Facility X if Taxpayer had used the energy percentage supported by the actual production (\$2,000,000). There is no emissions tier recapture event in taxable years 2026, 2027, or 2028 because, in those years, Facility X produced hydrogen through a process that resulted in a lifecycle GHG emissions rate that was consistent with the lifecycle GHG emissions rate of the hydrogen that Facility X was designed and expected to produce, and Taxpayer obtained an annual verification report attesting to such by the deadline (with extensions) for filing its Federal income tax return for each of those taxable years.

(6) *Coordination with sections 50(a) and 48(a)(10)(C) of the Code.* In each taxable year of the recapture period specified in paragraph (f)(3) of this section for any credit allowed under section 48 with respect to a specified clean hydrogen production facility, the recapture rules, if applicable, apply in the following order:

- (i) Section 50(a);
- (ii) Section 48(a)(10)(C); and
- (iii) Section 48(a)(15)(E).

(g) *Recordkeeping.* Consistent with section 6001 of the Code, a taxpayer making the election under section 48(a)(15)(C)(ii)(II) with respect to a specified clean hydrogen production facility must maintain and preserve records sufficient to establish the amount of the section 48 credit claimed by the taxpayer. At a minimum, those records include records to substantiate the information required to be included in the annual verification report under paragraph (e)(2) of this section, records establishing that the facility meets the definition of a specified qualified clean hydrogen production facility under section 48(a)(15)(C) and paragraph (b) of this section, and records establishing the date the specified clean hydrogen production facility was placed in

service. If the increased section 48 credit amount was allowed under section 48(a)(9), then the taxpayer must

also maintain records in accordance with § 1.45–12.

(h) *Applicability date.* This section applies to taxable years beginning after December 26, 2023.

**Douglas W. O'Donnell,**  
*Deputy Commissioner for Services and Enforcement.*

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