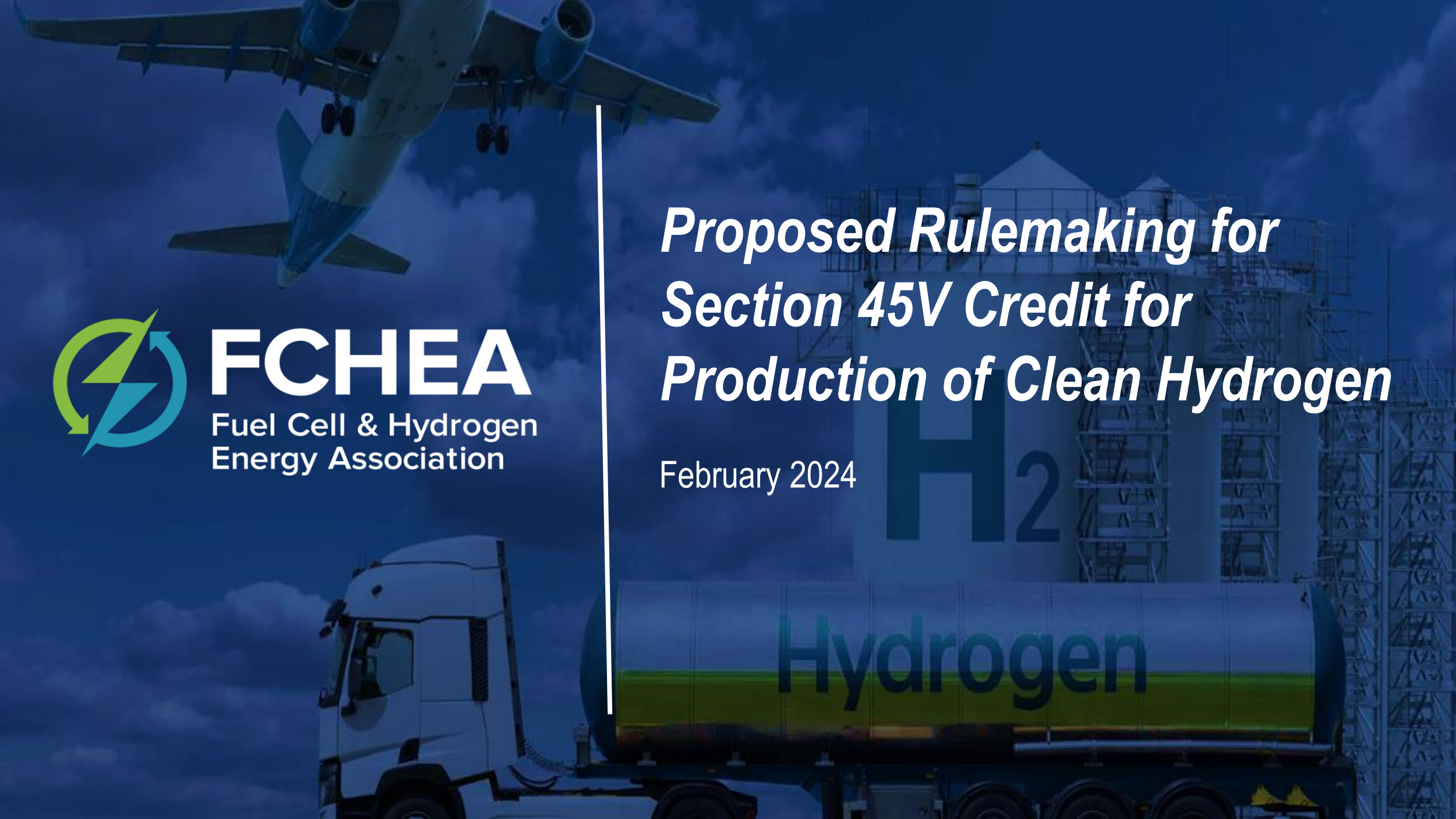

FCHEA
Fuel Cell & Hydrogen Energy Association

Proposed Rulemaking for Section 45V Credit for Production of Clean Hydrogen

February 2024

The Industry Association for Hydrogen in the United States

Based in Washington, DC

- **Advocating** for Hydrogen and Fuel Cell technology for over 30 years.
- **Representing** over 100 leading companies and organizations that are advancing the *production, distribution, and use* of Hydrogen.
- **Providing** a consistent industry voice to regulators and policymakers at both *Federal and State* levels.
- **Educating** about the *environmental, economic and societal* benefits of Hydrogen as a key contributor to decarbonization

Outline of Discussion

- What is the 45V Credit for Production of Clean Hydrogen
- 45V Proposed Rulemaking – Contents and Schedule
- 45V Proposed Rulemaking – General Requirements
  - *Retrofits and Modifications*
  - *Interaction of 45V and 45Q*
- 45V Proposed Rulemaking – 45VH2-GREET Model
  - *Pathways and Feedstocks*
  - *Upstream Methane Loss*
  - *Co-Products*
- 45V Proposed Rulemaking – Electricity and EACs
- 45V Proposed Rulemaking – Renewable Natural Gas
- Timeline and Next Steps

Section 45V Credit for Production of Clean Hydrogen

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- Established by the Inflation Reduction Act of 2022
- Provides a ten-year incentive for qualified clean hydrogen facilities which begin construction before January 1st, 2033
- Incentive is technology-neutral and based on kilograms of qualified clean hydrogen produced at facility with value determined by the carbon intensity of the hydrogen produced

Kg of CO_2 per kg of H_2	Credit Value ($)
4 - 2.5 kg CO_2	$0.60 / kg of H_2
2.5 - 1.5 kg CO_2	$0.75 / kg of H_2
1.5 - 0.45 kg CO_2	$1.00 / kg of H_2
0.45 - 0 kg CO_2	$3.00 / kg of H_2

- Full value of the credit only provided if meet prevailing wage and apprenticeship requirements
- Lifecycle greenhouse gas emissions are tracked only through the point of production (well to gate) as determined by the most recent GREET model developed by DOE or a successor model
- The credit also provides for a one-time election to claim the clean hydrogen property as energy property under the Section 48 Energy Credit

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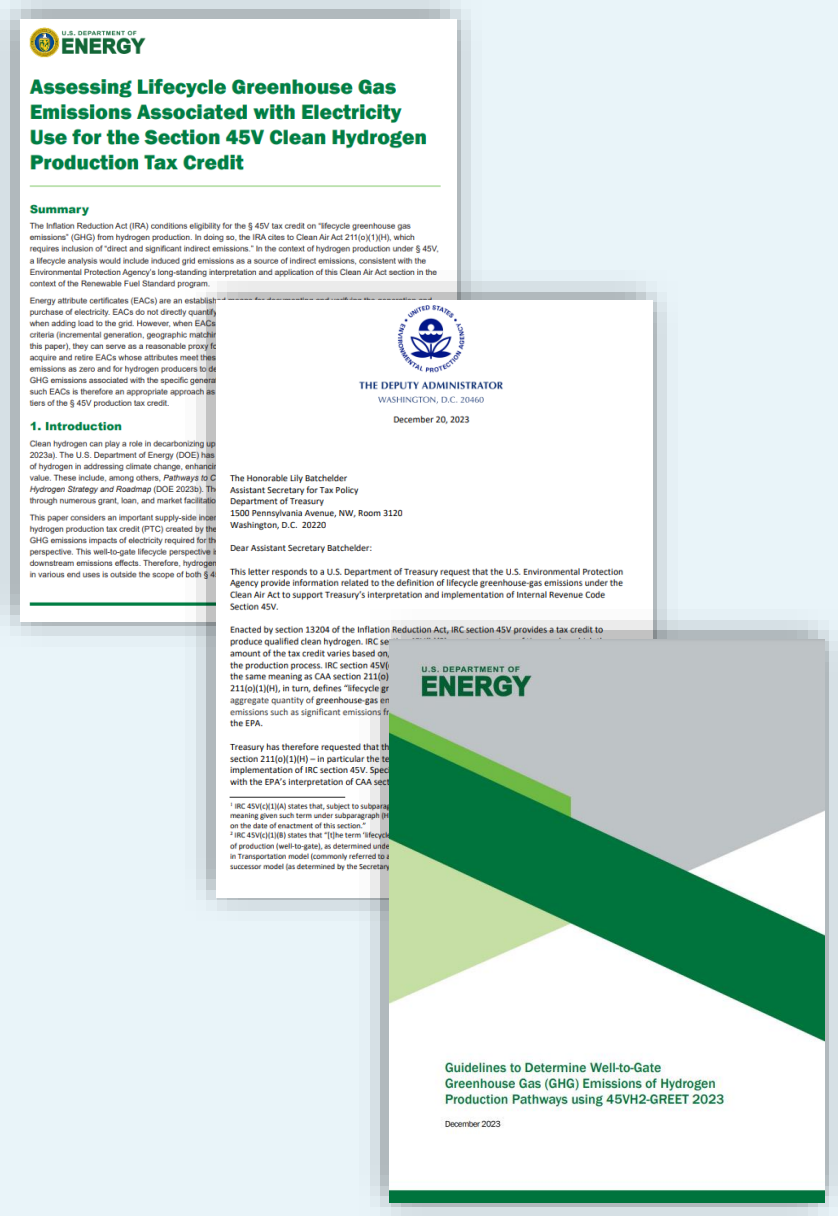
45V Proposed Rulemaking

- **Department of Treasury released notice of proposed rulemaking (NPRM) on December 22, 2023, and subsequently published in the federal register on December 26, 2023**
- **NPRM includes a 60-day comment period concluding on February 26, 2024**
- **A public hearing will also be held on March 25, 2024, request to testify must be received by March 4, 2024**
- **In addition to release of NPRM, the Administration published supplemental materials including:**
  - Department of Energy released new 45VH2-GREET 2023 Model and accompanying user guide
  - Environmental Protection Agency letter that outlines guidance to Treasury regarding reference to Clean Air Act in Section 45V
  - Department of Energy white paper explaining approach to hydrogen production using grid-connected electricity
- **Taxpayers may use the proposed regulations for now until the final regulations are published in the Federal Register.**



45V Proposed Rulemaking – Retrofits and Modifications

- **The 45V credit provides allows for an existing clean hydrogen production facility to establish a new placed in service date for purposes of section 45V, even though the facility contains some used property**
- **The proposed 45V rulemaking limits application of a new placed in service date only for facilities that meet the 80/20 rule, meaning that it qualifies only if the retrofitted energy property is not more than 20% of the facility's total fair market value.**
- **The proposed 45V rulemaking further states 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.**

Previous FCHEA Comment: To encourage taxpayers with nonqualifying facilities to bring such facilities into compliance with section 45V standards, Treasury guidance should clarify that *any* capital expenditures paid or incurred with respect to the modification, no matter the amount, are sufficient under section 45V.

Treasury guidance should clarify that the acquisition of new feedstocks necessary to produce qualified clean hydrogen at a previously nonconforming facility may give rise to a new qualified facility under section 45V, regardless of whether the feedstock expenditure is chargeable to capital. For this purpose, the acquisition of new feedstocks should include the acquisition of clean energy attributes under a book-and-claim method.

45V Proposed Rulemaking and Interaction with 45Q

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- **45V does not allow "stacking" of the incentive with the carbon sequestration credit 45Q**
- **This is based on a per facility basis where if the facility includes carbon capture equipment for which a credit is claimed for carbon sequestration under 45Q then no 45V credits can be claimed at the facility**
- **The definition of "facility" is limited to a single clean hydrogen production line which is defined as "all components of property that function interdependently to produce qualified clean hydrogen**
- **The term "facility" is also determined to not include "any carbon capture equipment associated with the electricity production process."**
- **The proposed rule would not allow 45V and 45Q credits to be claimed for a clean hydrogen production line.**
- **However, if a facility included separate production lines for clean hydrogen and clean electricity (such as a natural gas plant with CCS), then it is possible for the clean electricity generation to obtain 45Q and clean hydrogen production to claim 45V at the same location.**
- **Previous FCHEA Comment:** Treasury should confirm and clarify that taxpayers with separate process trains may be eligible for 45V and 45Q credits for such separate trains even if co-located in a complex, which is a distinct issue from stacking or double counting.

45VH2-GREET Hydrogen Pathways and Feedstocks

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- **The proposed rulemaking requires that all clean hydrogen producers using a pathway detailed in the new 45VH2-GREET model must use the emissions rate detailed by GREET**
- **Hydrogen production pathways included in the new 45VH2-GREET include:**
  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.
- **Any hydrogen production pathways or feedstocks not detailed in 45VH2-GREET can apply for a provisional emissions rate determined by the Secretary of Energy**

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45VH2-GREET and Upstream Methane Loss

- **The new 45VH2-GREET model has some inputs that are in the "foreground" that hydrogen producers can adjust in accordance with their facility, while other data is only in the "background" with no ability to adjust**
- **Current background data types include emissions associated with power generation from specific generator types, emissions associated with regional electricity grids, and upstream methane loss rates**

Treasury Seeking Comment: What conditions, if any, exist where in the future methane loss rate may become foreground data (such as certificates that verifiably demonstrate different methane loss rates for natural gas feedstocks, sometimes described as responsibly sourced natural gas)?

FCHEA Previous Comments: Should include the use of certified lower carbon intensity natural gas certificates as a viable pathway for hydrogen producers using natural gas a feedstock to meet the carbon intensity requirements

45VH2-GREET and Co-Products

- **The new 45VH2-GREET model allocates co-products utilizes a system expansion approach, but restricts the amount of steam co-product that reformers can claim based on quantity of steam that an optimally designed reformer is expected to produce based on NETL modeling**
- **Meant to avoid incentivizing generation of over-production of hydrogen co-products like steam to artificially reduce the carbon intensity of clean hydrogen produced**

Treasury Seeking Comment: Is this approach appropriate or should alternative co-product accounting methods, such as physical allocation (for example, energy allocation or mass allocation) be more appropriate to ensure well-to-gate carbon intensity of hydrogen production is accurately represented?

FCHEA Previous Comments: FCHEA recommended that Treasury adopt a system in which taxpayers producing multiple products including hydrogen should be permitted to utilize any reasonable allocation method for the purposes of determining the lifecycle greenhouse gas emissions among co-products (e.g., energy / mass-based / displacement / economic allocation) absent compelling facts that such a method is patently unreasonable or would be abusive.

45V Proposed Rulemaking – Electricity and EACs

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- Treasury proposed rulemaking allows use of energy attribute credits (EACs) for electrolytic hydrogen using grid-connected electricity to meet the lifecycle analysis levels of the credit
- The guidance lays out three primary requirements for producers using EACs – **Incrementality, Temporal Matching, and Regionality.**
- **Incrementality:** The proposed incrementality rule requires clean hydrogen producers to only purchase EACs from new sources of clean power that begin commercial operations within three years prior to a hydrogen facility being placed into service. The proposed rule also allows for certain newly added capacity or uprates to qualify.
- **Temporal Matching:** The proposed temporal matching rule allows for annual matching of EACs until 2028, after which it will move to an hourly basis.
- **Regionality:** The proposed regionality rule requires EACs to be sourced from within the same region as the hydrogen producer.

45V Proposed Rulemaking – Electricity and EACs

Treasury Seeking Comment:

- **Incrementality:** Are there approaches for how to apply incrementality for existing clean energy producers, such as nuclear and hydropower?
  - **Avoided Retirements Approach**: Would allow existing clean power generators at risk of decommission
  - **Zero or Minimal Induced Grid Emissions Approach**: Would allow existing clean power if the local grid is already sufficiently low-emission
  - **Formulaic Approach**: Would allow a fixed percentage of electricity from all existing clean power generators to qualify based on expected curtailment rates
- **Temporal Matching:** Is 2028 appropriate to begin implementation of time-matching requirement?
- **Regionality:** How could inter-regional EACs or purchase of electricity from outside of the United States based on a deliverability system be applicable?

FCHEA Previous Comment: Support unrestricted use of EACs to meet lifecycle greenhouse gas requirements – opposing incrementality, temporal matching, and regionality

45V Proposed Rulemaking – Renewable Natural Gas

- **One of the largest comment sections of the proposed rulemaking was the section on how to incorporate renewable natural gas with much of the specifics not detailed at this time.**
- **Treasury states that they intend to apply conditions that are logically consistent with but not identical to the incrementality, temporal matching, and deliverability requirements for electricity derived EACs.**
- **Some of the differences to be addressed include address the different sources of emissions, markets, available tracking and verification methods, and potential for perverse incentives.**
- **The proposed rulemaking also seeks comment on how application of a "first productive use" requirement could be applied to RNG, defined as the time when a producer of that RNG 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 proposed rulemaking also seeks comment on whether or how a book-and-claim system could be applied to hydrogen producers using RNG in the final regulations.**
- **FCHEA Previous Comment:** Support RNG feedstocks using a book-and-claim method to apply towards the lifecycle greenhouse gas analysis without restrictions on incrementality, regionality, or temporal matching.

45V Resources and Links

Federal Register Publication of 45V Proposed Rule – Link

Department of Energy 45V Resources (White Paper and 45VH2-GREET Model Update) – Link

Environmental Protection Agency Letter to Treasury on Interpretation of 45V and Clean Air Act – Link

White House Briefing Video on 45V Proposed Rule – Link

Department of Treasury Press Release on 45V Proposed Rule – Link

FCHEA Press Statement on Release of 45V Proposed Rule – Link

FCHEA Factsheet on 45V Proposed Rule – Link

FCHEA Initial Public Comment December 2022 on 45V – Link

FCHEA 45V Clean Hydrogen Today Website - Link

Bracewell LLP Briefing Document on 45V Proposed Rule – Link

Baker Botts LLP Briefing Document on 45V Proposed Rule – Link

45V Proposed Rulemaking Comments

- Written comments must be submitted by February 26, 2024
- Requests to testify at in-person public hearing must be received by March 4, 2024
- Areas to Emphasize:
  - Impact of proposed rule on planned deployments of clean hydrogen production, distribution, and end-use
  - Impact of proposed rule on domestic manufacturing expectations, jobs, etc.
  - Impact of proposed rule on development of Regional Clean Hydrogen Hubs
  - Examples and specifics are important!

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Thank you