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# Unpacking the Proposed 45V Hydrogen PTC Regulations

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# 45V Basics

# BACKGROUND

- The Inflation Reduction Act of 2022 includes a new incentive to produce “clean hydrogen,” the Section 45V production tax credit (PTC)
- Treasury/IRS published the overdue proposed 45V implementing regulations on 26 December 2023
- Comments must be received by 26 February 2024
- A public hearing on the Proposed 45V Regulations is scheduled for 25 March 2024 at 10:00 AM EST

# BASIC DETAILS OF THE CREDIT

- The amount of the credit depends on the lifecycle greenhouse gas emissions rate
- A base amount multiplied by the applicable percentage:
  - 20% if 2.5kg to 4kg of CO<sub>2</sub>e per 1 kg of hydrogen
  - 25% if <2.5kg to 1.5kg
  - 33.4% if <1.5kg to 0.45kg
  - 100% if <0.45kg
- Emissions determined through point of production (well-to-gate) using new 45VH2-GREET<sup>®</sup> model
- Base amount is 60¢
- If prevailing wage and apprenticeship rules are met (5x), base amount is \$3.00 (throughout the life of the credit)

# BASIC DETAILS OF THE CREDIT

- Adjusted for inflation
- Hydrogen must be produced in the United States
- For sale or use
- Third party must verify production, sale or use
- Credit available for 10 year period beginning when placed in service (PIS)
- Construction must begin before 1 January 2033
- Taxpayer cannot take both 45V and 45Q carbon capture credit

# Proposed 45V In-Depth

# THE FOUNDATION OF THE THREE PILLARS

- After the IRA passed in August 2022, two distinct approaches to 45V emerged among hydrogen stakeholders
  - A narrow approach mandating **additionality, locality, and time matching requirements** (aka **the Three Pillars**) that would limit sources of electricity and feedstocks
  - A broader approach making it easier for various sources of electricity/feedstocks to qualify for the credit
- The issue became political and many hydrogen industry participants, including electrolyzer manufacturers, renewable energy companies, and clean energy trade associations opposed the Three Pillar approach
- Prominent members on Capitol Hill staked out positions for and against

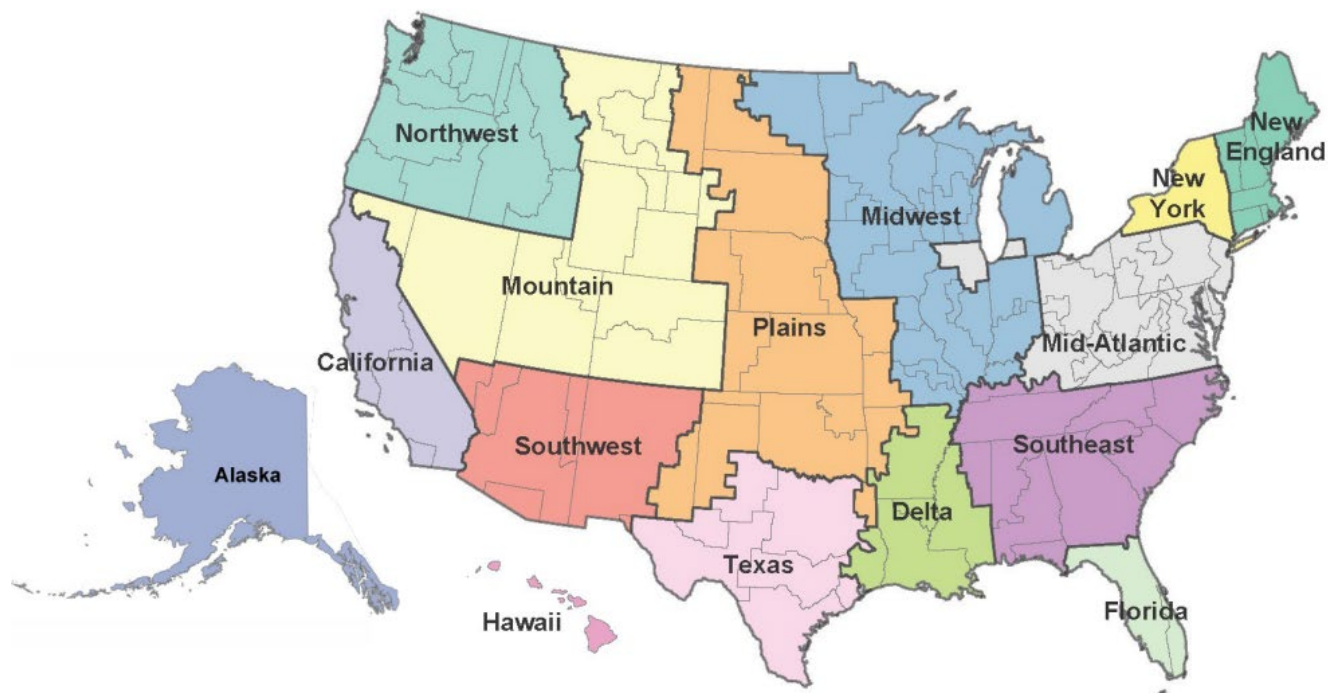
# THE THREE PILLARS

- Incrementality (Additionality)
  - An electricity generating facility must have been PIS, or updates made, within the last 3 years of when the facility is PIS
  - Possible exception if limited to 5% of electricity
  - Possible exception for facilities that are likely to be retired
- Deliverability (Locality)
  - Electricity must be generated in the same region
- Temporal matching (Timing)
  - Electricity must be produced within the hour of use beginning in 2028; annual matching applies through 2027
- Emissions Attribute Certificates (EACs) that meet the three pillars will generally be considered to meet the credit thresholds
  - Proposed 45V includes extensive criteria to establish this
- Expect stakeholders to comment on all elements of this structure



# DELIVERABILITY LIMITATIONS

- DOE National Transmission Needs Study Regions



# WHAT IS THE LIFECYCLE OF HYDROGEN?

- The regulations take a broad view of the life-cycle emissions for hydrogen production
- Proposed regulations define the life cycle to include:
  - Feedstock growth
  - Gathering
  - Extracting
  - Processing
  - Delivering to the facility
  - Emissions during the hydrogen production process

# 45VH2-GREET

- What is the GREET<sup>®</sup> Model?
  - **Greenhouse gases, Regulated Emissions, and Energy use in Technologies**
  - Developed by Argonne National Laboratory in 1995 to evaluate energy and environmental performance of technologies to assess research, development, and deployment (RD&D) progress, inform RD&D directions, and inform performance goals
  - Assesses a range of life cycle energy, emissions, and environmental impact challenges, and guides decision-making, R&D and regulations related to the transportation and energy sectors
- Argonne created a specific GREET<sup>®</sup> Model for hydrogen for 45V

# 45VH2-GREET PATHWAYS

- 45VH2-GREET® is currently constructed to recognize and assess emissions from 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.
- Taxpayers can petition DOE to provide an emissions rate if their particular feedstock or technology is not considered in 45VH2-GREET®; the IRS can still audit this

# 45VH2-GREET

- 45VH2- GREET<sup>®</sup> is a moving target
  - 45VH2-GREET<sup>®</sup> will be updated each year
  - Taxpayers must conduct a GREET life cycle analysis each year using the updated model
  - Tax credit qualification will be based on each year's analysis, potentially rendering long-term planning difficult
  - This is an area this we expect that taxpayers may want to provide input in comments to the proposed regulations.

# IS CARBON CAPTURE OK?

- 45V allows for the use of carbon capture in connection with both electricity production and hydrogen production to meet emissions thresholds
- When taxpayers make the irrevocable election to take the ITC on the hydrogen facility instead of the PTC, carbon capture equipment that is functionally interdependent to produce low emissions hydrogen can be part of the basis to compute the ITC
- If the 45Q CCS credit was taken on a retrofitted facility, the facility is tainted and you cannot take the 45V credit

## 45V and RNG

- The 45V preamble provides criteria for producing hydrogen from renewable natural gas (RNG), including landfill gas, under specific conditions
  - RNG = “biogas that has been upgraded to be equivalent in nature to fossil natural gas”
- Treasury/IRS plan to include additional methods for hydrogen production using RNG and fugitive methane sources in final regulations
- Conditions that Treasury imposes will be consistent with the incrementality, temporal matching, and deliverability requirements for electricity-derived EACs
- It is clear from the wide-ranging questions posed in the Proposed Regulations that there is a current lack of clarity on how RNG will be treated—and when to expect final RNG regulations

## OTHER IMPORTANT CONSIDERATIONS

- Taxpayers producing their own electricity to produce the hydrogen can take both the Section 45 PTC for electricity and the Section 45V PTC for hydrogen
- Taxpayers electing to take the ITC instead of the PTC are subject to the normal 5 year recapture period
  - Recapture is based on the difference between the amount of emissions predicted and the actual amount at a rate of 20% of the excess
- The 80/20 rule can be used to determine if a hydrogen facility is newly PIS
- Section 45V is eligible for direct pay (for the first 5 years) and transferability



## OTHER IMPORTANT CONSIDERATIONS

- Third-party verification mandates, including around substantiation of production, sale, and use.
  - This information will be reported to the IRS
- Anti-abuse rules are interspersed throughout
  - Treasury is concerned about taxpayers producing hydrogen at a rate cheaper than the credit to make a profit on the credit
- The *owner* of the hydrogen facility is the party eligible to claim the credit; non-owner-operators are not eligible
- Taxpayers must keep records confirming emissions levels and other information for 6 years
  - Normal tax statute of limitations is 3 years
- Proposed regulations apply to tax years beginning after 26 December 2023

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What Next?

## WHAT CAN BE DONE?

- Comments must be received by 26 February 2024
- A public hearing on the Proposed 45V Regulations is scheduled for 25 March 2024 at 10:00 AM EST
- Political engagement is a consideration – Members of Congress are engaged on both sides of the Three Pillars approach, as well as other issues
- Depending on when the final regulations are published, they could be subject to repeal via the Congressional Review Act in the next Congress (Jan 2025)
- Legal challenges expected

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