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45V or 45Q – Which Letter Benefits Louisiana Hydrogen Producers?

Navigating the Final Section 45V and 45Q Rules for Hydrogen Projects in a New Administration

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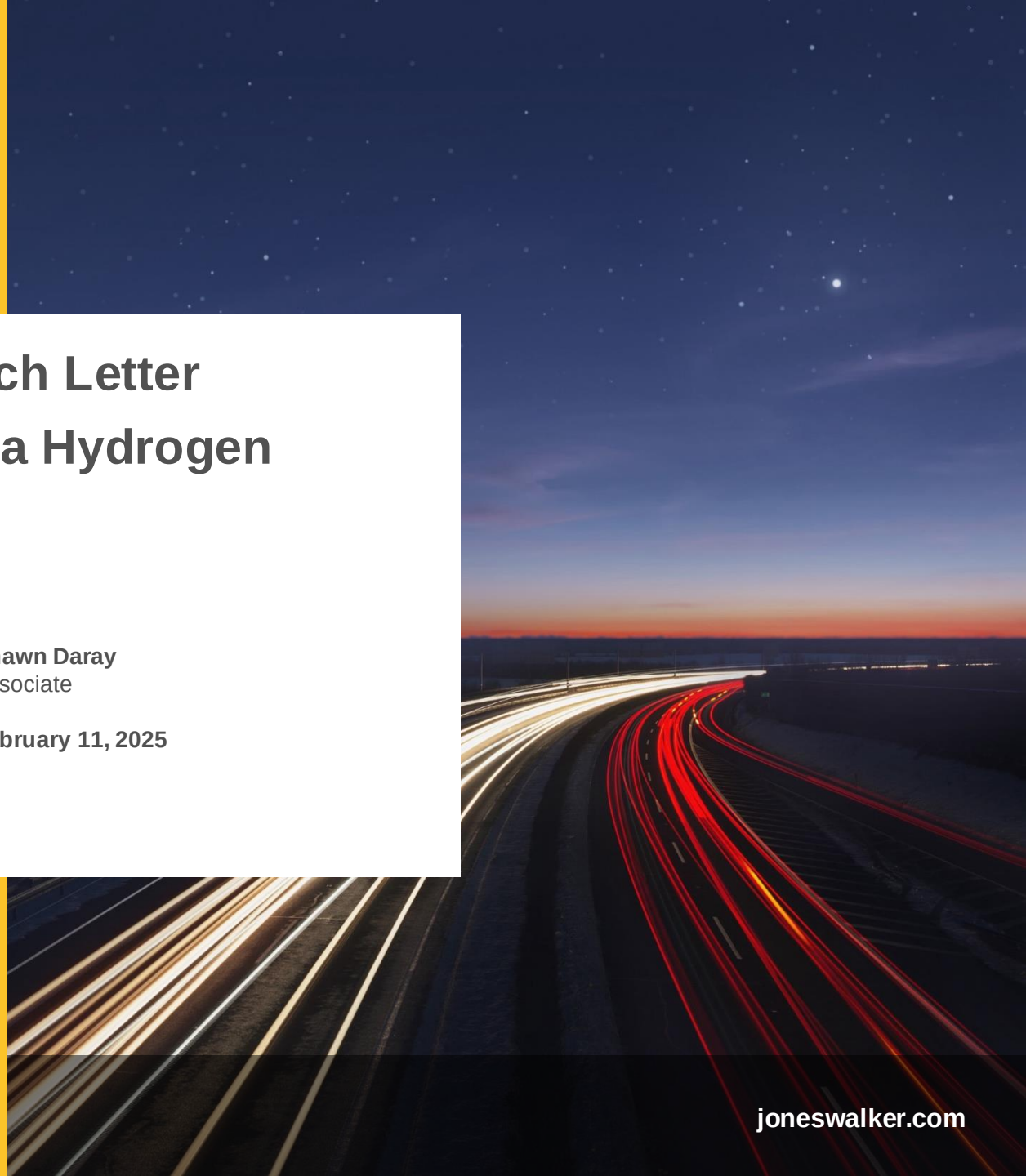
February 11, 2025



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Agenda

- History of 45V Clean Hydrogen Production Tax Credits and 45Q Carbon Sequestration Tax Credits
- Potential Challenges
- 45Q and 45V Tax Credits Overview
- Special Rules
- 45Q vs. 45V

Clean Hydrogen Production Tax Credits - 45V and Final Regulations – A Brief History and Potential Risks

- The Inflation Reduction Act of 2022 provides for a new clean hydrogen production tax credit introduced in Internal Revenue Code ("Code") Section 45V along with a mutually exclusive investment tax credit in Code Section 48.
- Final Regulations effective January 10, 2025.
- Potential challenges:
  - Congressional Review Act
  - Notice and Comment
  - Loper Bright Challenge
  - Recent Executive Orders
  - Future Tax Legislation

Carbon Sequestration Tax Credits: Code Section 45Q History

- Original Law
  - Originally enacted by the Energy Improvement and Extension Act of 2008 (P.L. 110-343).
  - Amended by the American Recovery and Reinvestment Tax Act of 2009 (P.L. 111-5).
  - Amended by the Tax Increase Prevention Act of 2014 (P.L. 113-295).
- Current Law
  - **Amended by the 2018 Bipartisan Budget Act (P.L. 115-123) which reformed and expanded the tax credit beginning after December 31, 2017**.
  - **Amended by the Taxpayer Certainty and Disaster Tax Relief Act of 2020**.
  - Final Treasury Regulations effective January 13, 2021.
  - Amended by the 2021 Infrastructure and Jobs Act.
  - Enhanced by the 2022 Inflation Reduction Act.
- Potential challenges

Congressional Review Act (5 U.S.C. Sections 801-808)

- The Congressional Review Act ("CRA") is a legislative tool to overturn certain federal agency actions.
- Effects:
  - The agency action goes out of effect immediately and is treated as if the rule had never taken effect.
  - The agency rule may not be reissued in substantially the same form and no new rule may be issued if it is substantially the same.
- Requires a simple majority vote in the House of Representatives and the Senate and the President's signature.
- A CRA resolution must be introduced within 60 legislative days of when the agency finalizes its regulations.
- The CRA has not been previously used to reverse a tax regulation.

Modification of Regulations and New Rulemaking - Notice and Comment

- The new administration could modify previously issued regulations and guidance through a notice and comment process.
- Further the administration will have greater discretion to modify or change sub-regulatory guidance (IRS Notices, for example).
- As an example, the new administration could make future updates to the 45VH-2-GREET model.

Loper Bright v. Raimondo, 603 U.S. 369 (2024)

- Loper Bright overturned Chevron U.S.A., Inc. v. NRDC, 467 U.S. 837 (1984) and “Chevron deference”.
- Where there is ambiguity in the agency’s governing statute, courts must exercise their independent judgment in deciding whether an agency has acted within its statutory authority.
- Code Section 45V has no explicit statutory language permitting implementation of the “Three Pillars” rule.
- Thus, stakeholders might have grounds to challenge the Final Regulations under 45V on the basis that the IRS is exceeding its authority implementing the “Three Pillars” rule.

Executive Orders

- Executive Orders
  - Unleashing American Energy (January 20, 2025)
    - Orders all agencies to pause the disbursement of funds appropriated through the Inflation Reduction Act of 2022 (“IRA”) and Infrastructure Investment and Jobs Act.
    - All agencies must review policies and programs for issuing grants, loans, contracts, or any other financial disbursements.
    - Grants and loans advancing clean energy are affected.
  - Regulatory Freeze Pending Review (January 20, 2025)
    - Requires withdrawal of any rules that were sent to the Office of Federal Register and not yet finalized and freezes any new rules pending a 60 day review.
      - Section 45V Final Regulations unaffected (effective January 10, 2025).
  - Declaring a National Energy Emergency (January 20, 2025)
    - Orders agencies to exercise all authorities available to facility generation of domestic energy resources.

Future Tax Legislation

- The 2017 TCJA tax cuts are set to expire at the end of 2025.
- Congress and the President have indicated that there will be significant tax legislation this year to extend the 2017 tax cuts.
  - Likely via the reconciliation process.
- House Budget Committee identified various areas of spending cuts to pay for the tax legislation.
- The IRA and “Green Energy Tax Credits” are under scrutiny.

Hydrogen Tax Credits – Code Section 45V

- A clean hydrogen production tax credit is allowed per kilogram of “qualified clean hydrogen” produced at a “qualified clean hydrogen production facility”.
- Credit is claimed over a 10-year period.
- Credit period begins on the date the qualified clean hydrogen facility is placed in service.
- No recapture provisions (typical for production tax credits).
- No Code Section 45V tax credit is allowed at a facility where the Section 45Q tax credit is taken in the same year or any prior taxable year.

Hydrogen Tax Credits – Code Section 45V (cont'd) – Definitions

- Qualified Clean Hydrogen:
  - Produced through a process with a lifecycle greenhouse gas emissions rate of not greater than 4 kg of CO_2e per kg of hydrogen, and:
    - (i) is produced:
      - in the United States;
      - in the taxpayer's ordinary course of trade or business; and
      - for sale or use.
    - (ii) the production and use of the hydrogen is verified by an unrelated party.
- Qualified Clean Hydrogen Production Facility – owned by the taxpayer, produces qualified clean hydrogen and construction begins before January 1, 2033.

Hydrogen Tax Credits – Code Section 45V (cont'd) – Credit Amounts

- Credit value phases down depending on how much hydrogen is emitted through the production process (well-to-gate):

KG of CO_2 Emitted Per KG of H_2 Produced*	PTC Credit Percentage	Base Credit	Increased Credit**
Not greater than 4 kg and less than 2.5 kg	20%	$0.12	$0.60
Less than 2.5 kg and not less than 1.5 kg	25%	$0.15	$0.75
Less than 1.5 kg and not less than 0.45 kg	33.4%	$0.20	$1.00
Less than 0.45 kg	100%	$0.60	$3.00

*Lifecycle greenhouse gas emissions

**Increased value is available for projects that meet certain wage and apprenticeship requirements

Hydrogen Tax Credits – Code Section 45V (cont'd)

- Lifecycle Greenhouse Gas Emissions
  - Includes all emissions through the point of production (well-to-gate).
  - Determined by the most recent "GREET" model developed by Argonne National Laboratory - 45VH2-GREET was tailored for the clean hydrogen production tax credit.
- Treasury Regulations Section 1.45V-1(a)(9)(iii) – Emissions through point of production includes emissions from:
  - Feedstocks – growth, gathering, extraction, processing and delivery to a hydrogen facility.
  - Hydrogen production, which includes:
    - Production of a mixed gas or impurity.
    - Electricity used by the hydrogen production facility.
    - Any capture and sequestration of carbon dioxide generated by the hydrogen production facility.
- Emissions related to purification are also included.

45VH2-GREET (Rev. January 2025) – Lifecycle GHG Emissions Illustration

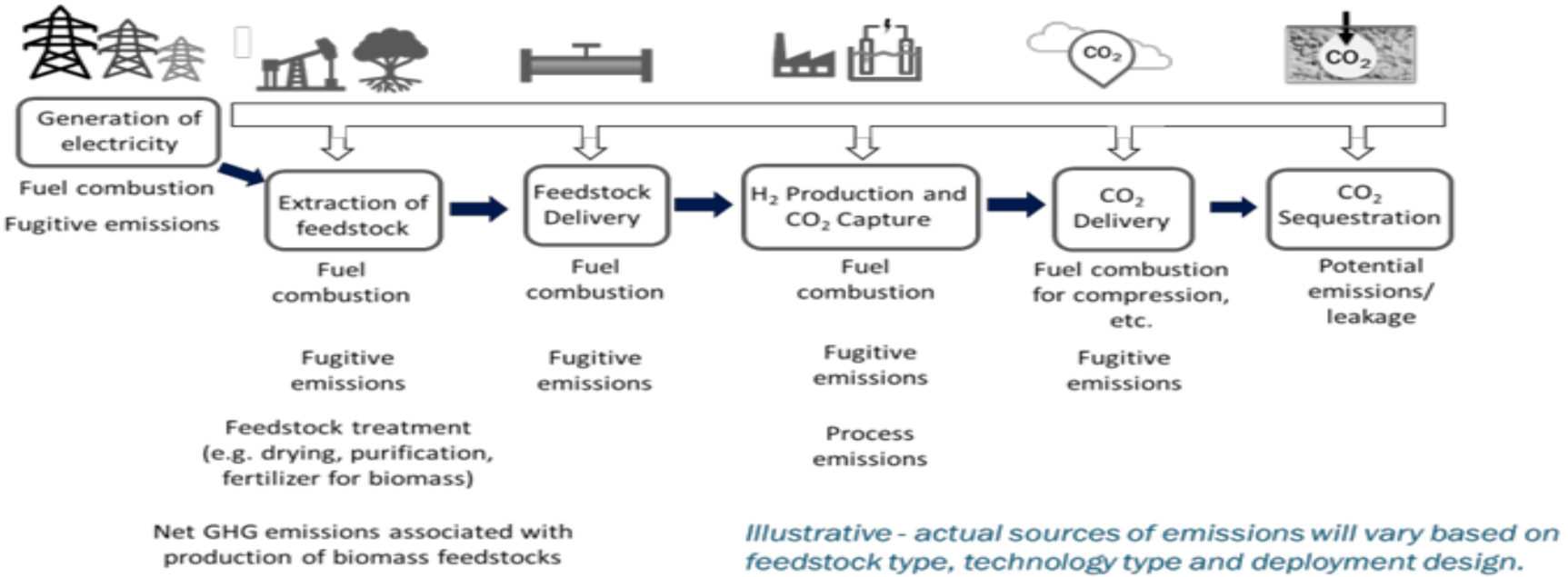

Figure 1. Examples of key activities related to GHG emissions within the well-to-gate system boundary for clean hydrogen production.

- Source: U.S. Department of Energy - Guidelines to Determine Well-to-Gate Greenhouse Gas (GHG) Emissions of Hydrogen Production Pathways using 45VH2-GREET Rev. January 2025 (page 6).

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45VH2-GREET (Rev. January 2025) – Hydrogen Production Pathways

Table 2. Hydrogen Production Pathways in 45VH2-GREET

Processes in 45VH2-GREET
• Steam methane reforming (SMR), with potential CCS. Users must select a single primary feedstock to the SMR. Primary feedstocks currently represented are fossil natural gas and water, renewable natural gas (RNG) from landfill gas and water, RNG from animal manure and water, RNG from wastewater treatment plants and water, and pipeline-quality coal mine methane and water. • Autothermal reforming (ATR), with potential CCS. Users must select a single primary feedstock to the ATR. Primary feedstocks currently represented are the same as those available for SMR (itemized above). • Coal gasification with potential CCS • Gasification of corn stover with potential CCS • Low-temperature water electrolysis using electricity • High-temperature water electrolysis using electricity and/or heat (as described below)

- Source: U.S. Department of Energy - Guidelines to Determine Well-to-Gate Greenhouse Gas (GHG) Emissions of Hydrogen Production Pathways using 45VH2-GREET Rev. January 2025 (page 13).

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45VH2-GREET (Rev. January 2025) – Electricity Emissions Factors

Table 3. Emissions Factors of Electricity Generation from Various Specific Sources in 45VH2-GREET

Source of Electricity	Emission Factor ($kgCO_2e/kWhe$)[12]
Residual oil fuel combustion	1.1
Natural gas combustion[13]	0.54
Natural gas combined cycle turbine with CCS[14]	*Depends on amount of CCS represented*
Coal combustion	1.1
Nuclear power[15]	0.0028
Hydroelectric	0
Geothermal	0.096
Wind	0
Solar PV	0

- Source: U.S. Department of Energy - Guidelines to Determine Well-to-Gate Greenhouse Gas (GHG) Emissions of Hydrogen Production Pathways using 45VH2-GREET Rev. January 2025 (page 19).

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Hydrogen Tax Credits – Final Treasury Regulations (Section 1.45V-1, et seq.)

- Energy Attribute Certificates (EACs) and the “Three Pillars” Rule remain, but in a more relaxed form:
  - EACs document purchased electricity from specific sources and reflecting the emissions impacts of that electricity.
  - Pillar 1 - Incrementality/Additionality (Treas. Reg. Section 1.45V-4(d)(3)(i))
    - Hydrogen producers are required to derive electricity from power facilities that began operation no more than three years before the hydrogen facility is placed in service.
      - The Final Regulations allow additional pathways:
        - Carbon Capture Technology – may derive electricity from facilities with CCUS operations that begin no more than three years before the hydrogen facility is placed in service.

Hydrogen Tax Credits – Final Treasury Regulations

- "Three Pillars" Rule (cont'd)
  - Pillar 1 – Incrementality/Additionality
    - Additional Pathways:
      - Nuclear - qualifying nuclear reactor - nuclear reactor is at risk for retirement and dependent on hydrogen production.
        - Capped at 200 megawatts.
      - Electricity Producer located in Qualifying States – states that have GHG emissions policies paired with clean energy or renewable portfolio standards.
        - Currently, only Washington and California are qualifying states.
  - Pillar 2 – Deliverability (Treas. Reg. Section 1.45V-4(d)(3)(iii))
    - Electricity must be sourced in the same region as hydrogen facility.
    - Interregional deliveries permitted in limited circumstances.

Hydrogen Tax Credits – Final Treasury Regulations

- "Three Pillars" Rule (cont'd)
  - Pillar 3 – Temporal Matching (Treas. Reg. Section 1.45V-4(d)(3)(ii))
    - Prior to January 1, 2030 – Annual matching for EACs.
    - After December 31, 2029 – Hourly matching for EACs.
- CCUS – hydrogen facilities may account for carbon captured that is utilized or sequestered. Treas. Reg. Section 1.45V-5(e).
  - Final Regulations added "utilization".
  - Must comply with CCUS rules under Code Section 45Q and associated regulations. Treas. Reg. Section 1.45V-4(e).
  - Any CCUS that does not meet the 45Q rules is considered emitted.
  - Areas where CCUS may be considered:
    - Electricity
    - Fuel
    - Feedstock
    - Hydrogen production

Hydrogen Tax Credits – Final Treasury Regulations

- Additional provisions adding flexibility (Treas. Reg. Section 1.45V-4):
  - Renewable Natural Gas – first productive use requirement is removed.
  - Establishes Book and Claim System – Starting January 1, 2027.
  - Additional Biogas Feedstock Pathways for RNG:
    - Landfill gas
    - Animal waste
    - Wastewater treatment plants
    - Coal mine methane
  - Taxpayers may petition Department of Energy and the Treasury for Provisional Emissions Rate if the GREET model is incompatible.
  - Added flexibility to taxpayers choosing which version of the GREET model to use.

CCUS Tax Credits – Code Section 45Q

- A carbon oxide capture, utilization or sequestration (CCUS) tax credit is allowed per metric ton of carbon oxide captured at a qualified facility and later utilized or sequestered.
- Credit is claimed over a 12-year period.
- Credit period begins on the date the qualified carbon capture equipment is placed in service.
- Subject to a 3-year recapture period beginning on the first date of injection or use.
    - Last-in-first-out calculation.

CCUS Tax Credits – Final Regulations (I.R.C. Section 1.45Q-1, et seq.) – Permanent Sequestration

- The Final CCUS Regulations require that captured carbon must be injected into a well that complies with the EPA's Underground Injection Control regulations (Class VI injection wells).
- Annual certifications of qualified carbon oxide is required.
- Burden is on the taxpayer to report any leakages.
- EPA handles permitting and enforcement under the Class VI injection well regulations.
  - Three states have been granted Class VI Primary Enforcement Responsibility:
    - Louisiana – Effective February 5, 2024
    - North Dakota
    - Wyoming

CCUS Tax Credits – Code Section 45Q (cont'd) – Definitions

- Qualified Carbon Oxide:
  - Captured from an industrial source by carbon capture equipment,
  - would otherwise be released into the atmosphere, and
  - is measured at the source of capture and verified at the source of disposal, injection or utilization.
- Qualified Facility:
  - Any industrial facility or DAC that begins construction before January 1, 2033 and begins construction of carbon capture equipment or such equipment is in the original plans, and:
    - For DACs – captures at lease 1,000 metric tons of qualified carbon oxide.
    - For electricity generation facilities – captures at least 18,750 metric tons of qualified carbon oxide.
    - For any other facility – captures at least 12,500 metric tons of qualified carbon oxide.

CCUS Tax Credits – Code Section 45Q

- Tax credits for Carbon Capture, Utilization and Sequestration (CCUS) is dependent on (i) amount of qualified carbon oxide captured (measured in metric tons); (ii) method of capture; and (iii) end use:

Type of Capture & End Use	Base Value Per Metric Ton Captured	Increased Value Per Metric Ton Captured*
Traditional Carbon Capture Carbon Oxide Used or Utilized	$12	$60
Carbon Oxide Sequestered	$17	$85
Direct Air Capture Carbon Oxide Used or Utilized	$26	$130
Carbon Oxide Sequestered	$36	$180

- *Increased value is available for projects that meet certain wage and apprenticeship requirements.

CCUS and Hydrogen Tax Credits – Are they stackable?

- Code Section 45V is not allowed if the taxpayer claims 45Q with respect to the hydrogen facility in the same year or any prior year.
- Code Section 45Q makes no mention of Code Section 45V.
- Result – CCUS tax credits may be claimed *after* the last taxable year clean hydrogen production tax credits are claimed.
- Tax Credit Claim Periods:
  - Code Section 45V – 10 years
  - Code Section 45Q – 12 years

Direct Pay and Transferability (Code Sections 6417 and 6418)

- Code Section 6417 allows electing taxpayers to receive a payment of applicable credits directly from the IRS.
  - Generally limited to non-profits, states, political subdivisions, tribal governments, and electric cooperatives.
  - Exceptions – clean hydrogen production tax credits and carbon sequestration tax credits.
  - Limits
- Code Section 6418 allows taxpayers to transfer applicable credits to a third party for cash.
  - Clean hydrogen production tax credits and carbon sequestration tax credits are included.
  - Buyer beware!

Which Tax Credit is More Valuable?

- Section 45Q Carbon Oxide Sequestration Tax Credits
  - Linear increase with higher capture rates resulting in more credits.
  - Dependent on type of facility and use/sequestration after capture.
  - Minimum capture amounts based on facility type.
- Section 45V Clean Hydrogen Production Tax Credits
  - Credit amounts are based on steps depending on emissions rates.
  - Green hydrogen most favored.
  - Potentially beneficial for high capture rate blue hydrogen.
- Relative value will depend on capture rate and lifecycle emissions rate.

Who has Incentive to Pursue a Loper Bright Challenge?

- If Section 45V is disallowed, do hydrogen producers have any other options?
- Treasury Secretary authority under Section 45V:
  - The Secretary shall issue such regulations or other guidance as the Secretary determines necessary to carry out the purposes of this subsection, including regulations or other guidance which provides for requirements for recordkeeping or information reporting for purposes of administering the requirements of this subsection. Code Section 45V(e)(5).
- Senator Capito sent a letter to the Treasury Secretary after Section 45V Proposed Regulations released.
  - Directly states that the "Three Pillars" rule lacks any statutory authority.

Tax Credit Risks – 45Q vs. 45V

- Code Section 45Q:
  - Is the only production tax credit subject to a recapture period.
  - Enhanced under the IRA, which is under scrutiny.
  - Might be affected by future tax legislation.
- Code Section 45V:
  - Multiple avenues for Final Regulations to be contested or modified.
  - New tax credit created under the IRA, which is under scrutiny.
  - Might be affected by future tax legislation.

QUESTIONS?