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# PR FOR H2: OVERVIEW

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# WHAT DID WE GET?

- **Proposed** Regulations for Code Section 45V
  - Generally effective post-2022
  - Applies to materials the manufacturing of which began pre-2023, but must complete and sell after 2022
- Final Regulations...
  - Overlap?
  - New stuff??
  - When will they be out???

## WHAT IS CODE SECTION 45V?

Per-kg tax credit for  
**the person who produces (in the U.S.)**  
**hydrogen (with sufficiently low CO<sub>2</sub>e)**  
**at a qualified facility**  
**(primarily) for sale or use**

# LET'S DO THE NUMBERS

- Find the CO2e score for each kilogram produced during the year
  - If you use EACs, apply annually through 2027, then hourly
- Find the average CO2e score per kilogram
- Match to the table:

CO2e Score	Base Credit
2.5kg CO2e/kg H2 to 4kg CO2e/kg H2	\$0.12/kg
1.5 to less than 2.5	\$0.15/kg
0.45 to less than 1.5	\$0.20/kg
Less than 0.45	\$0.60/kg

- Adjust for inflation after 2022
- Multiply by 5 for wage/apprenticeship compliance
- If ITC conversion, add domestic content and/or energy communities (maybe)

## THE PERSON WHO PRODUCES

- Owner (of H2) operated
- Contract manufacturing/tolling
- Production must occur in the United States

## HYDROGEN (WITH SUFFICIENTLY LOW CO2E)

- Focus is on emissions to achieve H<sub>2</sub>, not molecules after H<sub>2</sub>
- A third party must validate amount and CO<sub>2</sub>e score of H<sub>2</sub> produced
- Must use the “most recent” 45V H<sub>2</sub> GREET model, i.e., as of day one of each tax year (may change if 45V H<sub>2</sub> GREET subsequently changes that year)
- Baseline v. three pillars
  - Incrementality/time
  - Geography

# HYDROGEN (WITH SUFFICIENTLY LOW CO2E)

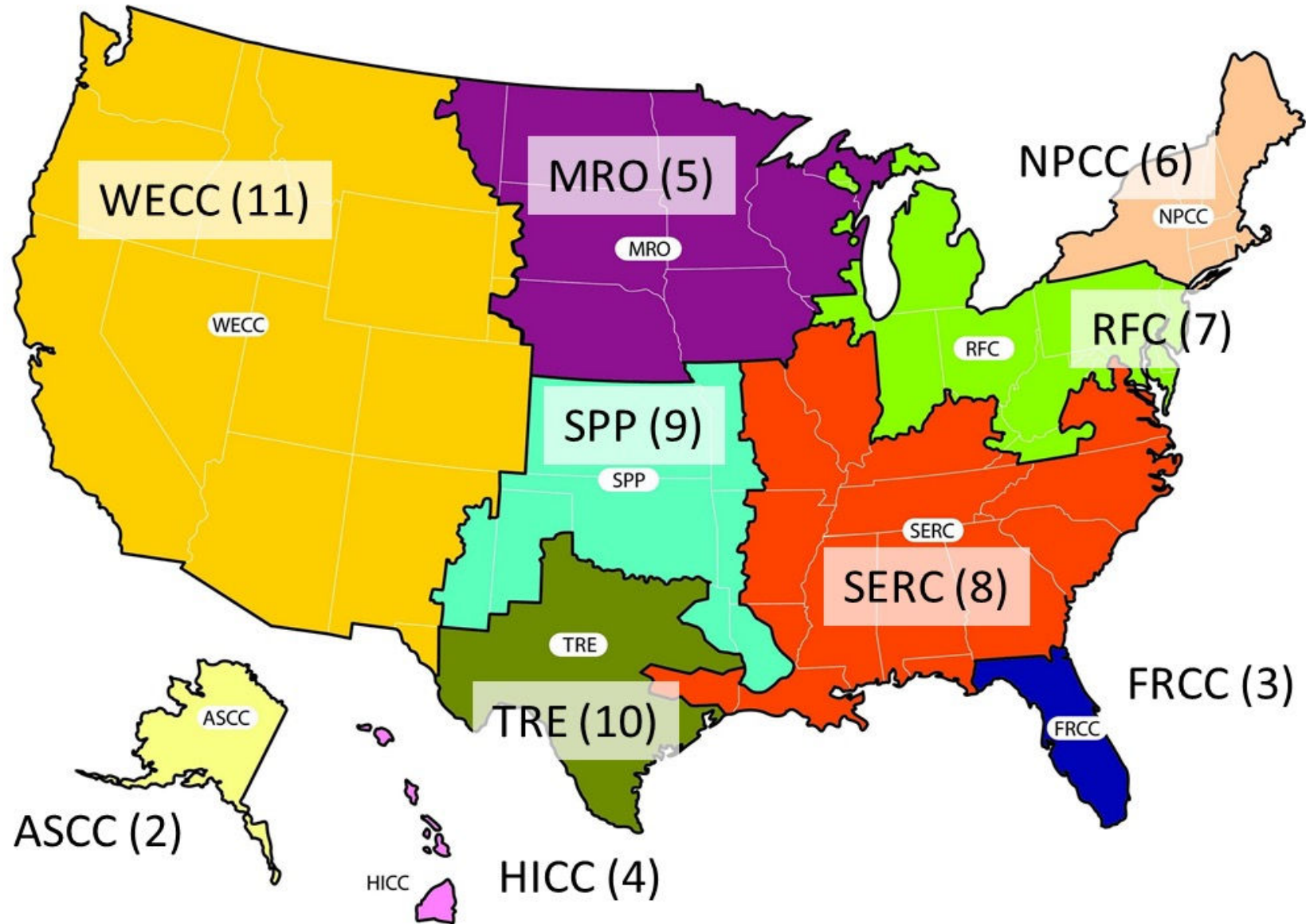
- Pathways
  - Gaseous fuel: NG, LFG (RNG? Fugitive methane?)
  - Gasification: coal, biomass (w/ corn stover & logging residue with no significant market value)
  - Water Electrolysis: low-temp using electricity, high-temp using electricity and potential heat from nuclear power plants
  - PER
- Inputs
  - Well-to-gate (and CCS?)
  - Fixed assumptions (background data)
  - Changeable inputs (foreground data)
    - Valorized co-products

# HYDROGEN (WITH SUFFICIENTLY LOW CO2E)

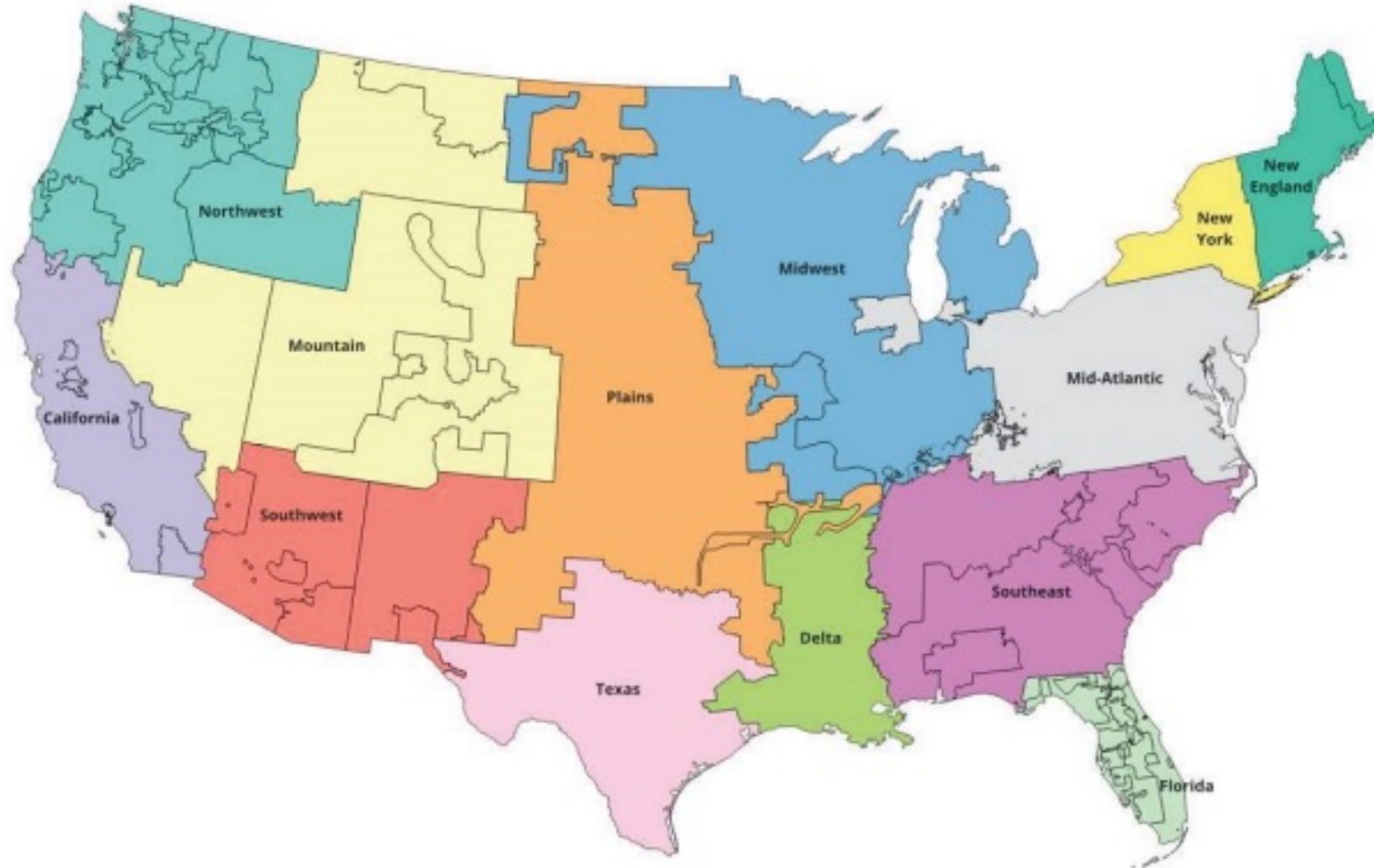
- Offsets
  - Energy (electricity) Attribute Certificates
    - Must be registered (always)
    - No double counting; must be retired
    - Must be verified by a third party
    - Incrementality: Must be from a generation facility that CODs within 36 months prior to H2 facility PIS date
    - Deliverability: Generation facility must be within same NERC transmission needs study area
    - Temporal matching?
      - Hourly default; annual through 2027
        - What to do with batteries?
      - Uprated production
        - Pro rated to each hour or year
        - What about the 80/20 test?



# GRID ELECTRICITY



# EAC AREAS



## WORDS OF ADVICE FOR MINIMAL EMITTERS

- Minimal emitters:
  - 45V H2 GREET Background Data (kg CO<sub>2</sub>e/kWhe)
    - Minimals: Nuclear (0.0028), hydroelectric (0), wind (0), solar (0)
    - Natural gas (0.54),
- Avoided Retirement (“Upcycling for H<sub>2</sub>”)
  - Minimal emissions projects that are “likely to avoid retirement” if selling electrons or EACs for H<sub>2</sub> production
- Minimal Induced Emissions (“The Washington Solution”)
  - Modeling (curtailment, already clean)
  - State/local requirements
  - BTM/Islanded generation
- Formulaic approach (“The 5% Freebie”)
  - 5% of all hourly generation by minimal emitters is incremental

## AT A QUALIFIED FACILITY

- H2 production facility placed in service after 2022
- No 45Q (CCS) claimed on facility
  - Can restart the clock for conflict by updating CCS equipment (80/20 rule for CCS)
- Retrofitted H2 facility (new 10-year clock)
  - 80/20 rule
  - Applies to any existing facility regardless of PIS or previous production of clean H2
- Hydrogen facility may be modified (new 10-year clock) (SMR+CCS)
  - Must be capitalized cost
  - Must be for the purpose of enabling the facility to produce less than 4 kg CO2e H2 (+CCS)
  - Not mere change in feedstock

## (PRIMARYLY) FOR SALE OR USE

- Primarily
  - No waste!
    - Vented, flared, used to produce H<sub>2</sub>
    - Cost < credit?
- No windfalls?
- Sale or use can occur anywhere, as long as its verified
- Use can be by anyone, including producer or toll service recipient

# ITC CONVERSION

- Election in PIS year for facility (see 80/20 rule)
- Credit based on expected CO<sub>2</sub>e score
- Recapture, of a sort
  - Must verify and report for each of five years after PIS
  - GHGs too high: 20% of difference between rate claimed and qualified rate
  - No report, GHGs over 4.0 kg CO<sub>2</sub>e / kg H<sub>2</sub>: 20% of rate claimed

## WHAT NOW?

- Can still get involved
- Comment through February 26, 2024
  - Be mindful of specific requests for comments
- Public hearing March 25, 2024 (request and outline due by March 4, 2024)
- Comment independently and through trade associations
- *Chevron* deference



# THANK YOU

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