



# **Carbon Credits and Carbon Markets: Plugging Orphaned, Idle, and Marginal Wells**

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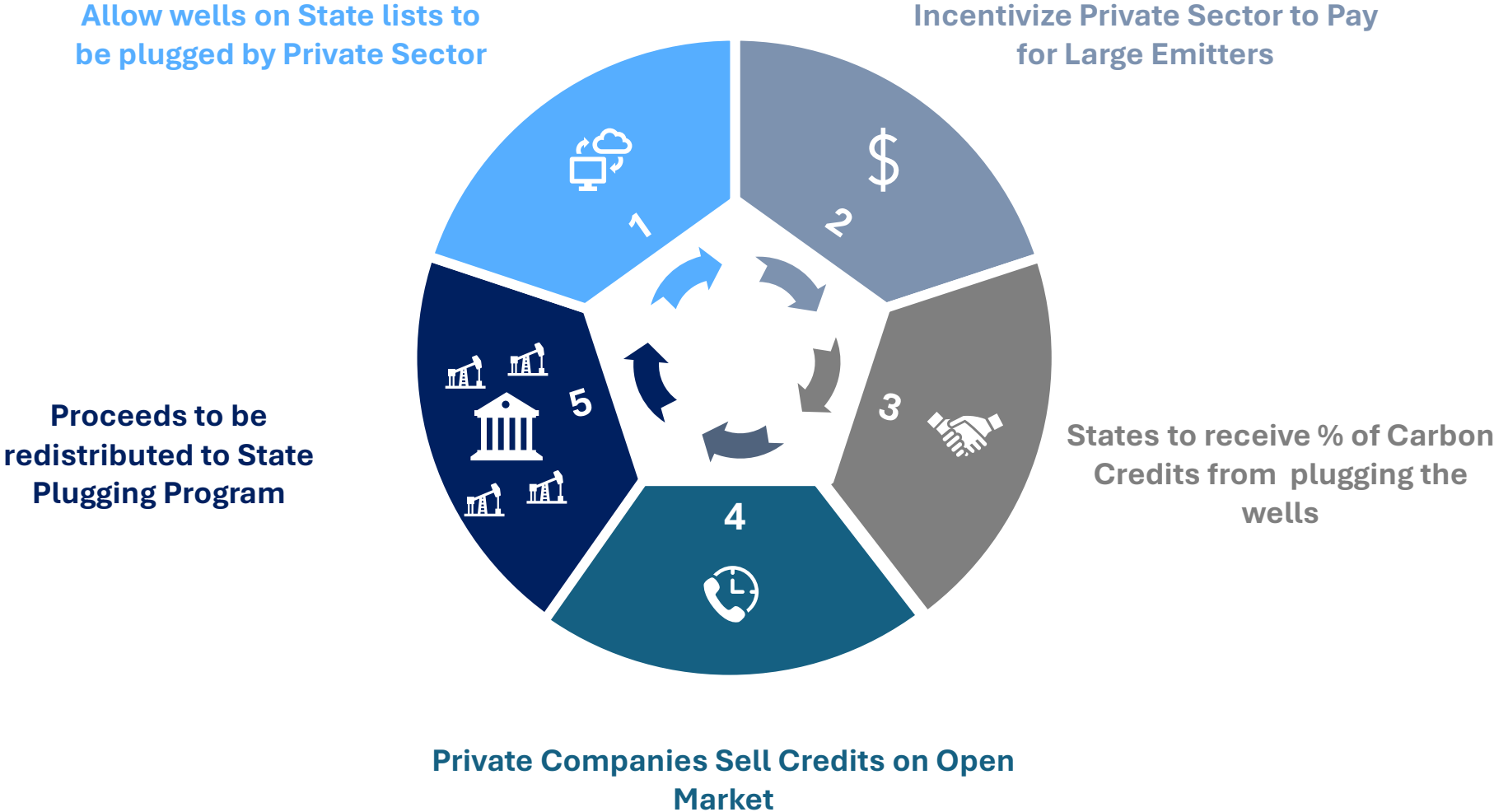
# Hypothesis to explore today

The private sector attributes a value to the carbon-emissions equivalent of methane leakage from orphaned wells

Using Federal funding for plugging wells fails to monetize the 'value of cleaning up pollution' – whereas doing so can help States plug far more wells

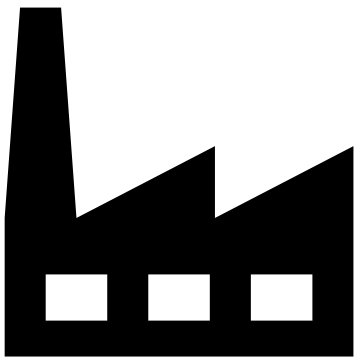
Consider the following – what if...

# States and Carbon Registries could create a Positive Public/Private Carbon Credit Cycle for Orphaned Wells



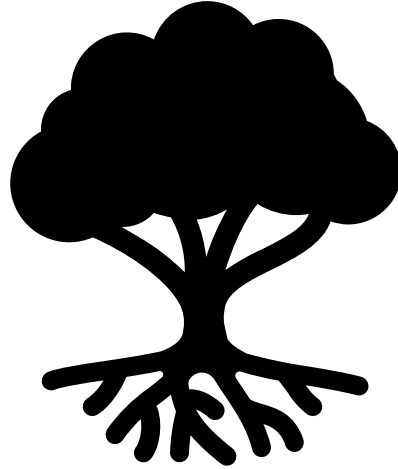
# The essence of a carbon credit

**Carbon Emitter  
in Location A**

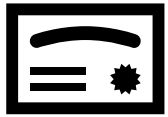
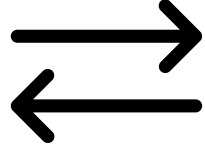


**Factory**

**Carbon Emissions  
*Reducer or Avoider*  
in Location B**



**Nature-Based Carbon  
Offering**



**Carbon Credit**

# Majority of new carbon credits are science-based



## REAL / ACCURATE

All emission reductions, removals, and the associated project activities must be **verifiably demonstrated** to have **genuinely occurred**



## MEASURABLE

All emission reductions and removals shall be **quantifiable**, using **recognized measurement tools** (including adjustments for uncertainty and leakage), against a credible emissions baseline



## PERMANENT

Carbon Credits shall represent **permanent emission reductions and removals**. Where projects carry a risk of reversibility, at minimum, adequate safeguards shall be in place to ensure that the risk is minimized and that, should any reversal occur, a mechanism is in place



## UNIQUE

**No more than one Carbon Credit can be associated with a single emission reduction or removal** as one (1) metric ton of carbon dioxide equivalent (CO<sub>2</sub>e). Credits shall be stored and retired in an independent registry



## VERIFIED

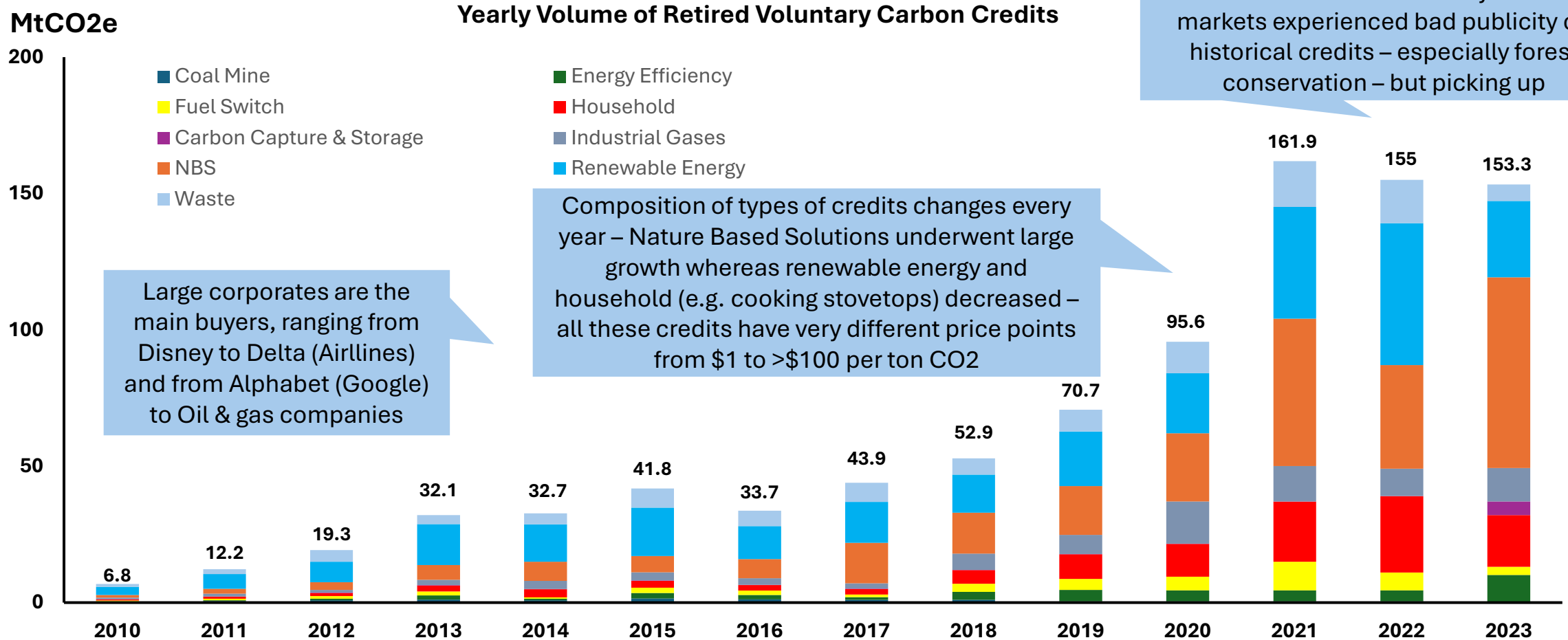
All emission reductions and removals shall be verified to a reasonable level of **assurance by an independent third-party verifier** accredited under one of the approved offset standards in the sector in which the project is taking place



## ADDITIONAL

Project-based emission reductions and removals shall be **additional to what would have occurred if the project had not been carried out**. Project would not have occurred without the availability of Methane abatement finance

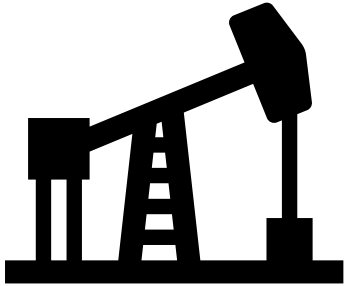
# The voluntary carbon credit market has grown to >150M of tons of carbon equivalent 'retired' per year



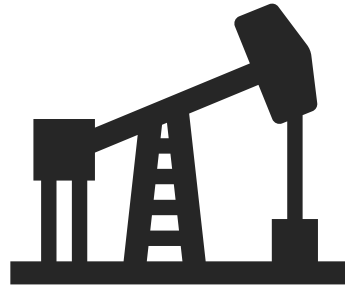
Source: Ecosystem Marketplace; MtCO2e = Million Tons of CO2-equivalent; e.g. 1 ton Methane is ~34 tons of Carbon based on lifecycle impact

# Voluntary Carbon Markets can become a strong incentive for methane reduction from (earlier) plugging of marginal / idle / orphaned wells

**Marginal**



**Idle**



**Orphaned**



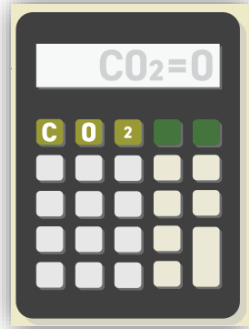
Currently limited (buyer) interest because considered mainly responsibility of Oil & Gas companies who own(ed) & operate(d) the wells

Current focus for Carbon Credits generation  
Highest perceived 'additionality'  
No current owner

# Carbon Credits from plugging Orphaned wells have attractive characteristics vs other types of carbon credits



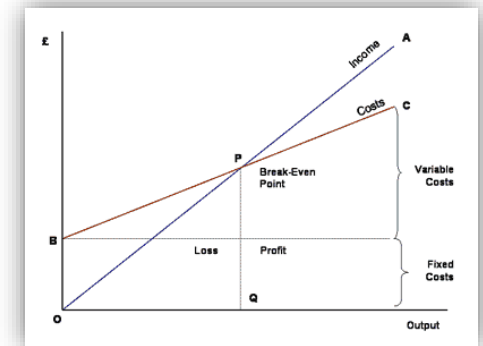
**America-based**



**Highly  
Quantifiable**



**Community Impact**



**Attractive Pricing vs other  
high-quality carbon credits**

Est. ~\$8-\$25/ton vs >\$100  
for carbon capture

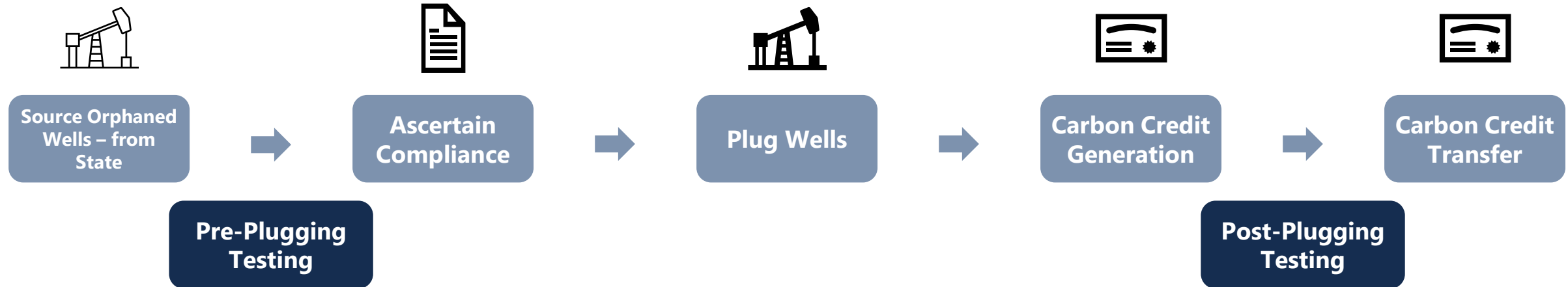


# The process of orphaned wells projects follows typical carbon credit projects

## Typical Carbon Credit project



## Orphaned Wells project



# There are currently several factors that withhold private sector capital to commit to project development in orphaned well space

## Private capital attraction hurdles

**'Competition' with federal programs to 'find unregistered orphaned wells first'**

**Lack of emissions data available at well level**

**Financial Risk of Environmental Liability by taking title to wells**

**Asymmetry of 20 years of credits vs 'forever risk' of taking title to well**

## High level solutions (Directional)

**Allow private sector to pay for plugging of wells that have been tested with public funding**

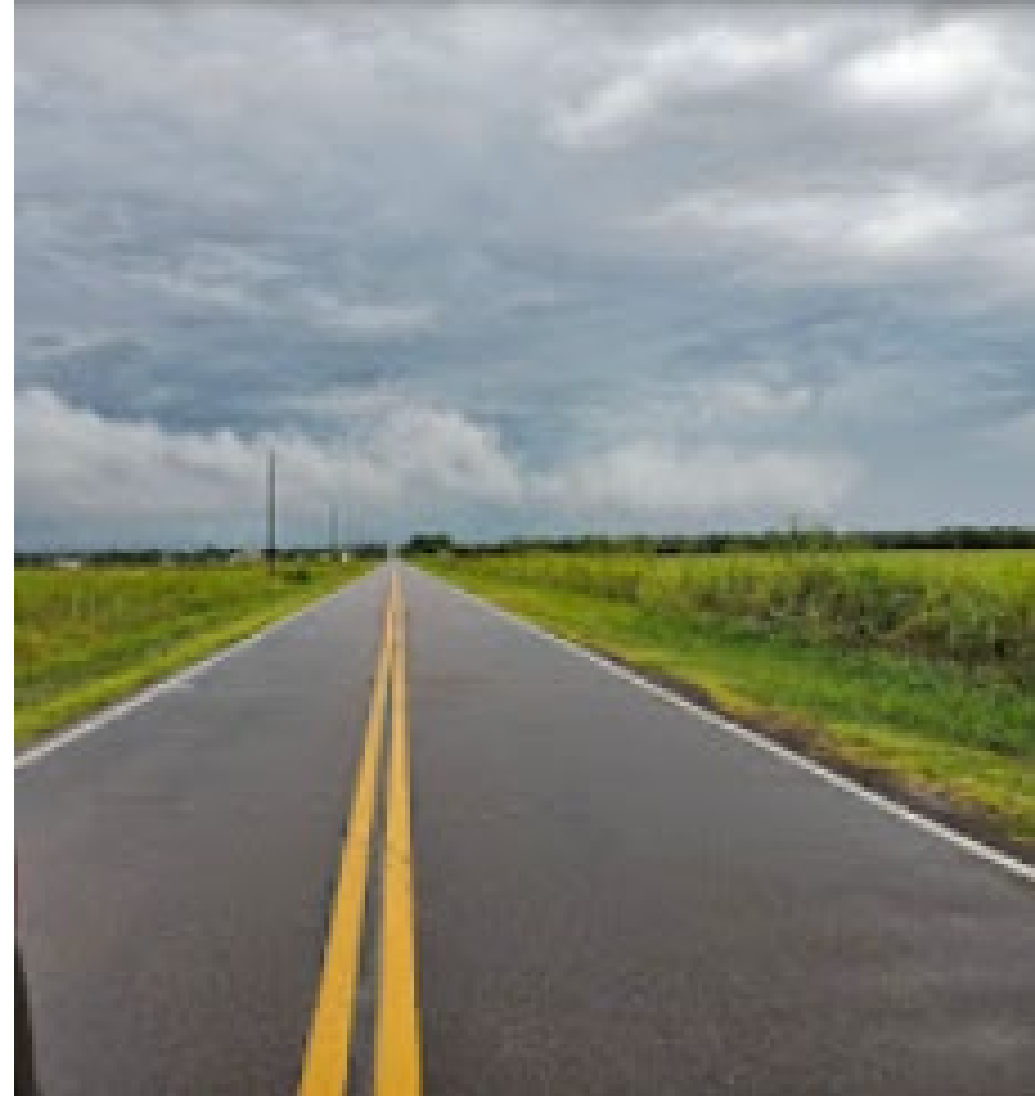
**Let project developers be responsible for methane emissions and plug following most recent best practices**

# Exploratory: What could States do towards organizing orphaned well public/private pilots?

- Calculate additional number of wells that can be plugged when the top 10% emitting wells are plugged by private sector – and when 15% of such credits are for the State
- Create inventory of highly emitting wells on public lands
- Review current methodologies (host working session with key registries & ICROA) and what requirements State would set for such pilots
- Talk with large voluntary carbon credit buyers within the State
- Consider possibilities past Orphaned wells to Marginal / Idle wells

# Carbon Credits: Carbon Registries

- American Carbon Registry (ACR)
  - ICROA Accredited
- BCarbon
- International Carbon Registry (ICR)
- CarbonPath
- ZeroSix
- APPCIO (Avoidance of Planned Production of Carbon Intensive Oil)
- Capturiant



# American Carbon Registry (ACR)



## ORPHAN WELLS

- Carbon crediting program
- Methodology for earning carbon credits for Orphaned Wells 2023
- ACR earned program-level Core Carbon Principle (CCP) approval from the Integrity Council for the Voluntary Carbon Market (ICVCM)
- ACR has been an approved International Carbon Reduction and Offset Alliance (ICROA) offsetting standard since 2011
- ACR is approved by the ICAO Council to supply emission reduction and removals credits under (CORSA)
- ACR requires independent third-party validation and verification of all projects
- Website: <https://acrcarbon.org/>

## EARLY DECOMMISSIONING OF MARGINAL OIL AND GAS WELLS IN THE UNITED STATES

- Carbon crediting program with a registry platform
- Methodology under public consultation: February-March 2024
- ICR is pursuing ICROA and Carbon Offsetting and Reduction Scheme for International Aviation (CORSI) endorsements
- Currently under review by ICROA
- ICR requires independent third-party validation and verification of all projects
- Website: <https://www.carbonregistry.com/m-icr-0006>

## **METHANE CAPTURE AND RECLAMATION (MCR) PROTOCOL**

- Carbon crediting program for plugging of leaking idle and orphan oil and gas wells in the U.S. and Canada
  - Decline Curve Model
  - Leak Rate Model
- BCarbon requires independent third-party validation and verification of all projects
- Website: <https://bcarbon.org/methane>



## TWO METHODOLOGIES

- **ORPHANED WELL METHANE EMISSION REMOVAL VIA DECOMMISSIONING**
- **METHANE & CARBON DIOXIDE EMISSIONS PREVENTION VIA THE PREMATURE ABANDONMENT OF OIL AND NATURAL GAS WELLS v2.1**
- Carbon crediting program for removing methane emissions by plugging orphan wells (involves direct measurement and calculations)
- Carbon crediting for premature abandonment of oil and natural gas wells (involves Scope 1, 2, and 3)
- Website: <https://www.carbonpath.io/>



## **METHANE EMISSION REMOVAL VIA THE EARLY RETIREMENT OF WELLS PRODUCING OIL AND/OR GAS**

- Carbon crediting program for removing methane emissions by plugging producing oil and gas wells
- Required engineering report for reserves left in the ground
- Tokenized carbon credit
- Partnered with BeZero
- Carbon Credit Calculator <https://www.zerosix.co/develop-projects/>
- Website: <https://www.zerosix.co/>

## INTEGRATED ENVIRONMENTAL ASSET AUTHENTICATOR, REGISTRY, AND REGULATED EXCHANGE

- Carbon crediting program for sequestration in place
- List of approved verification bodies
- Tokenized carbon credit
- 45 Series Credits
- Sequestration Value Calculator:  
<https://www.capturiant.com/sequestration-value-calculator>
- Glossary of terms: <https://www.capturiant.com/glossary>
- Website: <https://www.capturiant.com/>

# The 10 Core Carbon Principles

- **GOVERNANCE**

- Effective governance
- Tracking
- Transparency
- Robust independent third-party validation and verification

- **EMISSIONS IMPACT**

- Additionality
- Permanence
- Robust quantification of emission reductions and removals
- No double counting

- **SUSTAINABLE DEVELOPMENT**

- Sustainable development benefits and safeguards
- Contribution to net zero transition

## ACCREDITATION PROGRAM

- The International Carbon Reduction and Offsetting Accreditation (ICROA) Accreditation Programme certifies best practice in greenhouse gas (GHG) emission reductions, removals, and the use of high-quality carbon credits.
- Process:
  - Expression of interest
  - Application form
  - Fee
  - Third-party Audit (annual cycle)
- Glossary of voluntary market terminology: <https://icroa.org/glossary/>
- Website: <https://icroa.org/>

## VOLUNTARY CARBON CERTIFICATION PROGRAM

- Cercarbono is a standard with a voluntary carbon certification programme that facilitates and guarantees the registration of Climate Change Mitigation Programmes or Projects (CCMPs), the certification of emissions, and the registration of the carbon credits generated by these initiatives. List of approved verification bodies
  - Reviews and develops process guidelines and methodologies
  - Guarantees transparency of the carbon market
  - Aligns with national and international standards and regulations
  - Provides an efficient certification process
- Website: <https://www.cercarbono.com/>

# ACTION STEPS: STATE-focused orphaned well public/private pilots

- **IDENTIFY PLUGGING CANDIDATES:** Calculate additional number of wells that can be plugged when top 10% emitting wells are plugged by private sector – and when 15% of such credits are for the State
- **PRIORITIZE INVENTORIES:** highly emitting wells on public lands
- **ESTABLISH PROCEDURES:** Working session with key registries & ICROA
- **IDENTIFY BUYERS:** Start with those who have a history of purchasing credits
- **EXPAND TO MARGINAL:** Include repurposing and long-term solutions for economic development and infrastructure development
- **DEVELOP WHITE PAPERS** for large-scale infrastructure & economic development projects, with the use of facilitating technologies.



# AAPG

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## Thank you!

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