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# Climate and Carbon: A Pathway for the Future

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Jim Blackburn

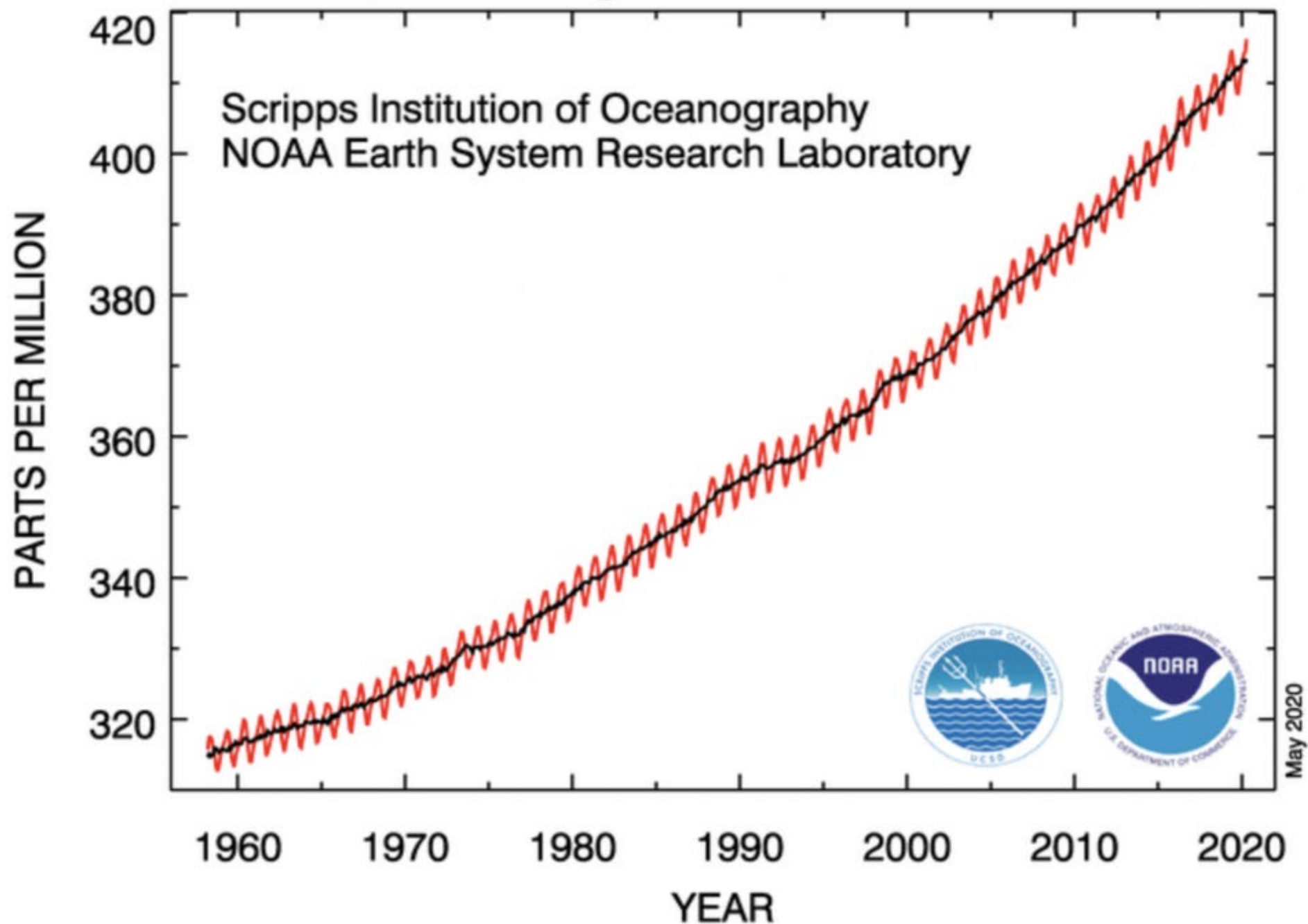
Co-Director SSPEED Center, Rice University

Chairman of the Board and Founder,

BCarbon Carbon Credit Registry

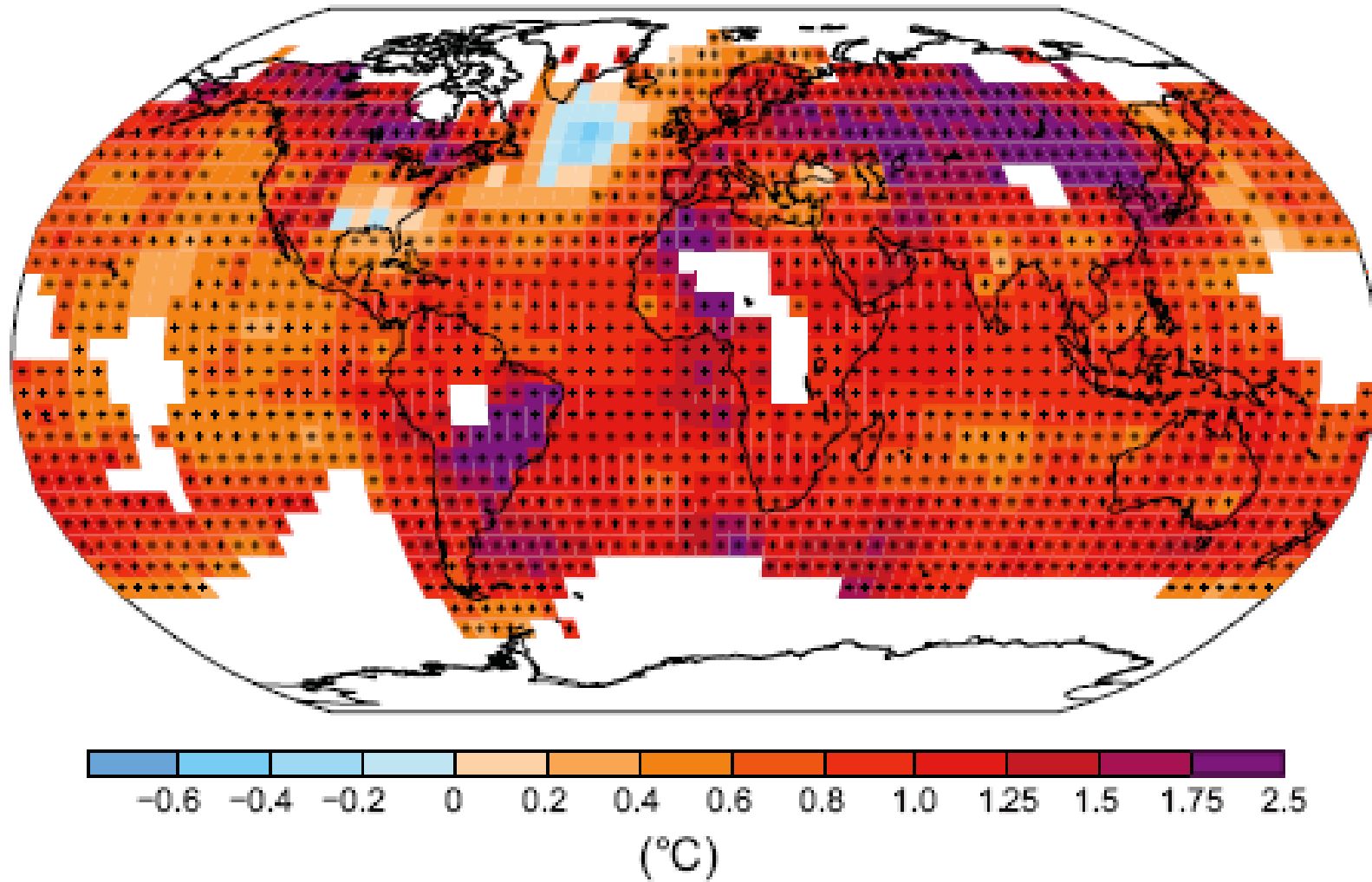
- Presentation at Environmental Superconference
  - August 7, 2026

# Atmospheric CO<sub>2</sub> at Mauna Loa Observatory



(b)

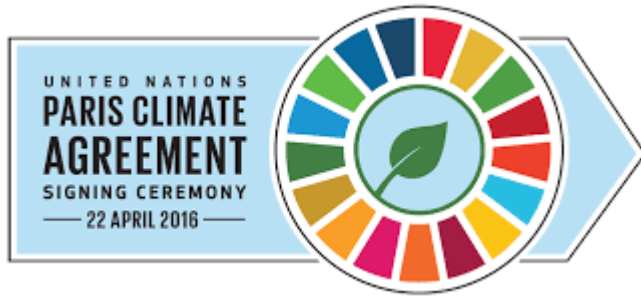
Observed change in surface temperature 1901–2012



No Rules  
Exist For  
Voluntary  
Carbon  
Market



**No Rules Does Not Mean “No Pressure”  
Pressure May Be Worse With No Rules**



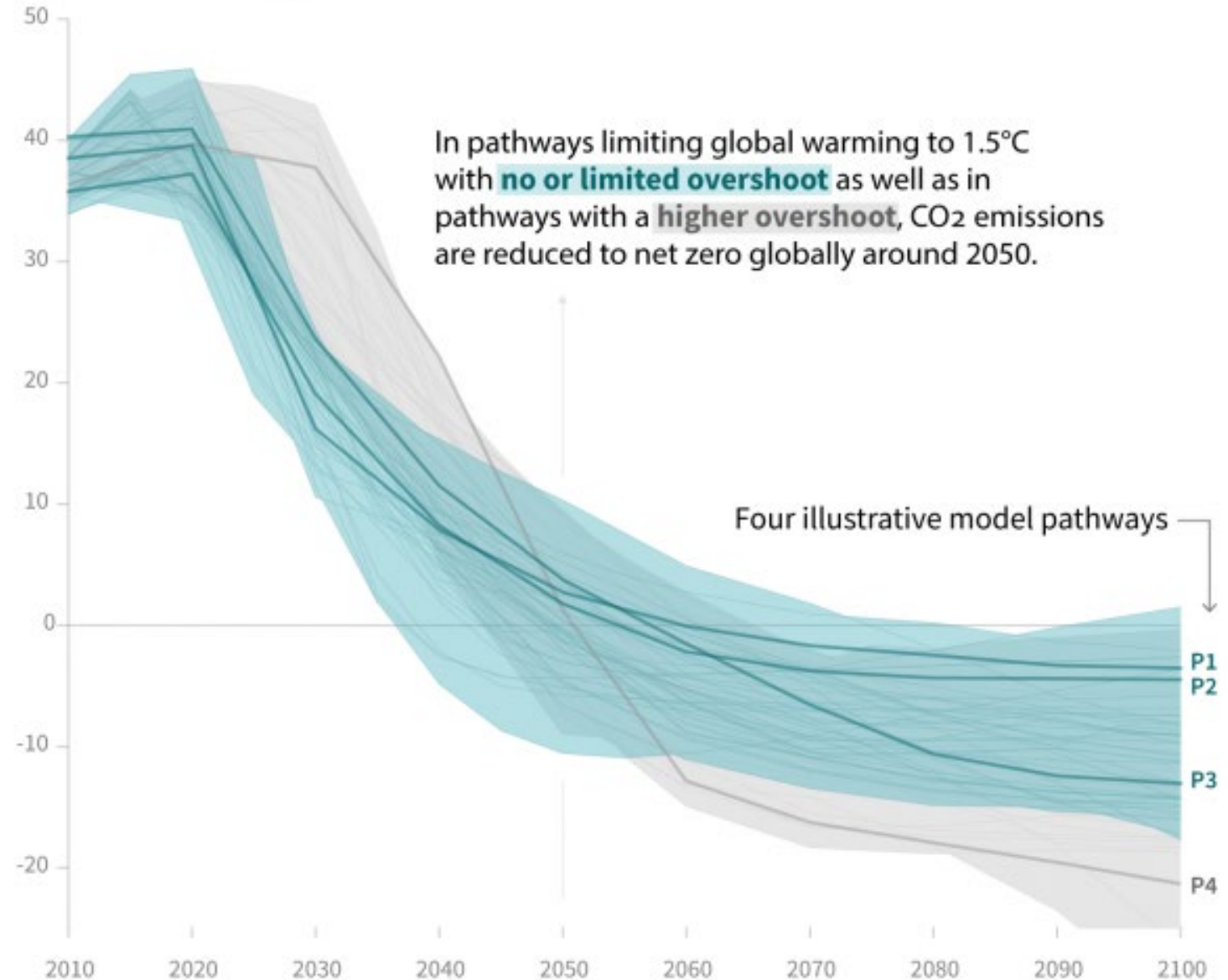
## Action Needed to Implement the Paris Accord Of 2015

Keep Temperature Rise  
Below 1.5 to 2.0 degrees  
Centigrade

**Net Zero By 2050**

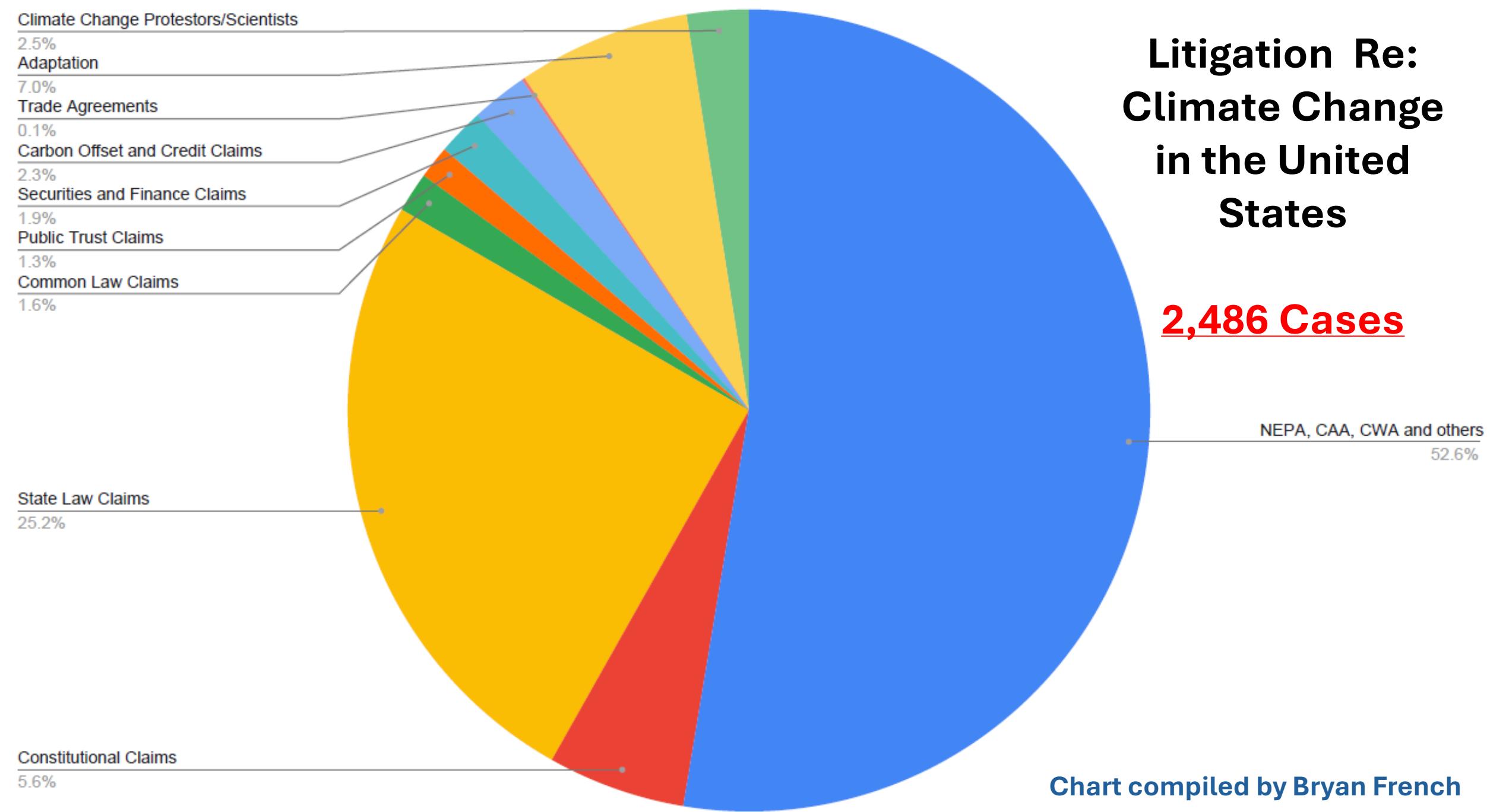
## Global total net CO<sub>2</sub> emissions

Billion tonnes of CO<sub>2</sub>/yr

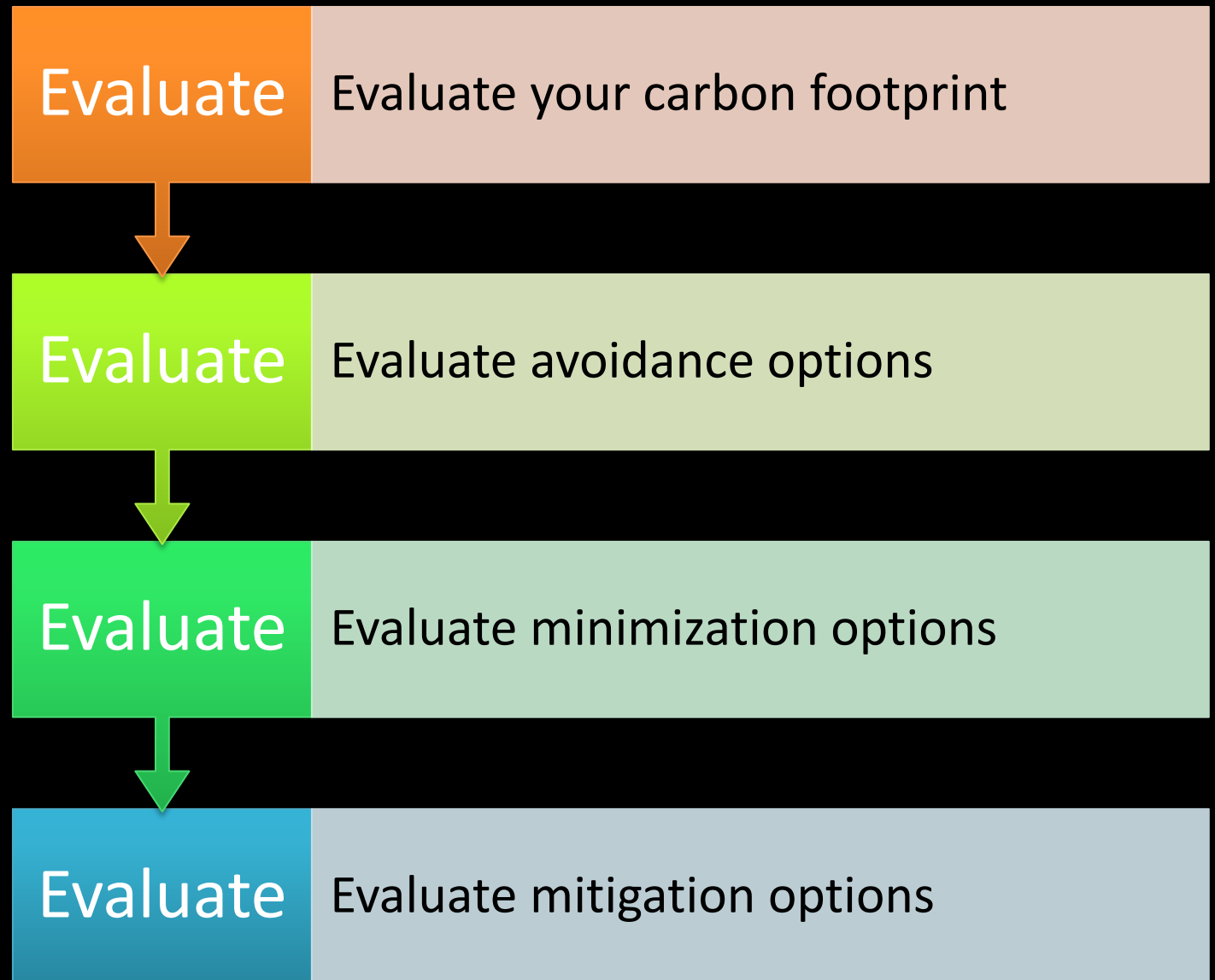


# Litigation Re: Climate Change in the United States

**2,486 Cases**



## Steps In Carbon Analysis (Or Water, Or Sustainability)



CO<sub>2</sub>

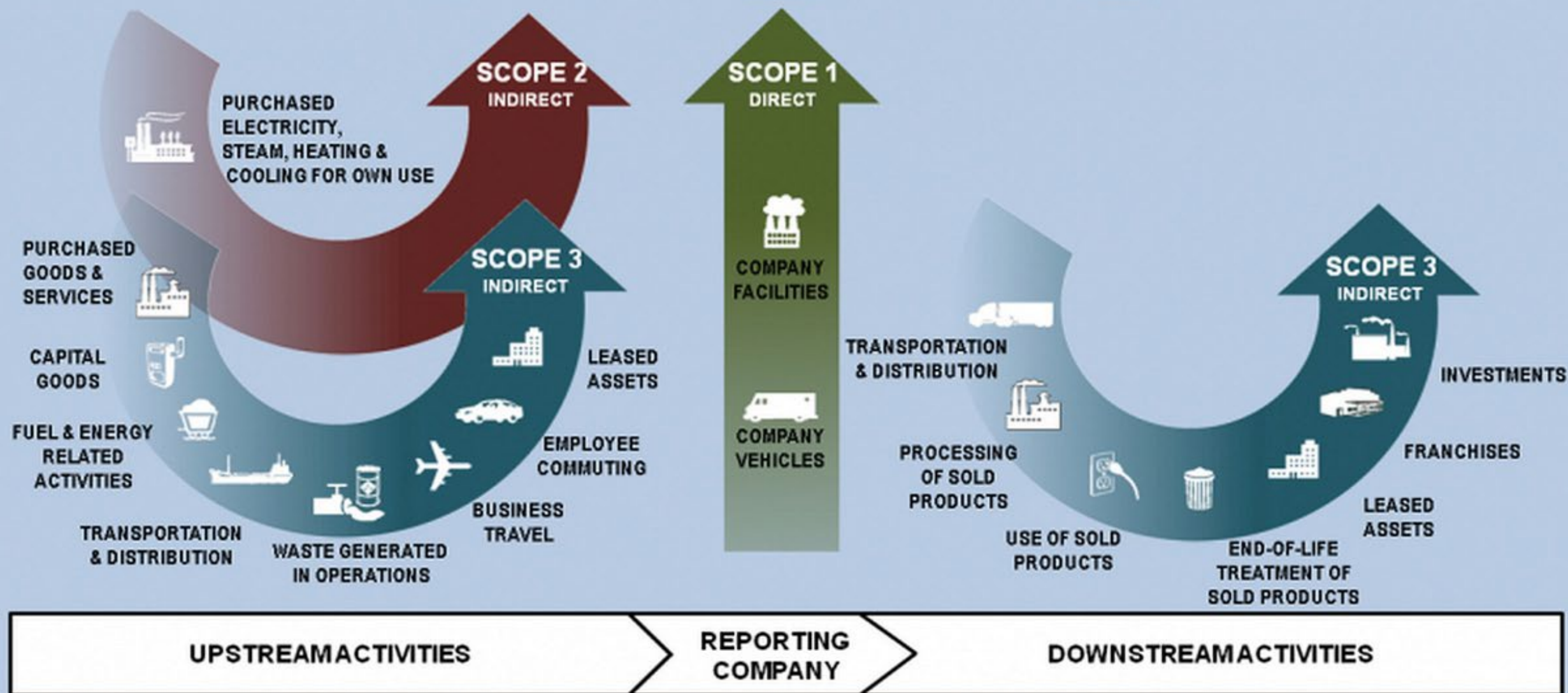
CH<sub>4</sub>

N<sub>2</sub>O

HFCs

PFCs

SF<sub>6</sub>



# Organizing Emission Reduction Strategies

## Avoid

Fossil Fuel  
Avoidance (5)



Renewable Fuels  
& Electricity (4)

Nuclear Fission (1)

## Minimize

Energy Efficiency &  
Conservation (4)



Fossil Fuel Switching (1)



## Mitigate

Carbon Dioxide  
Removal (5)

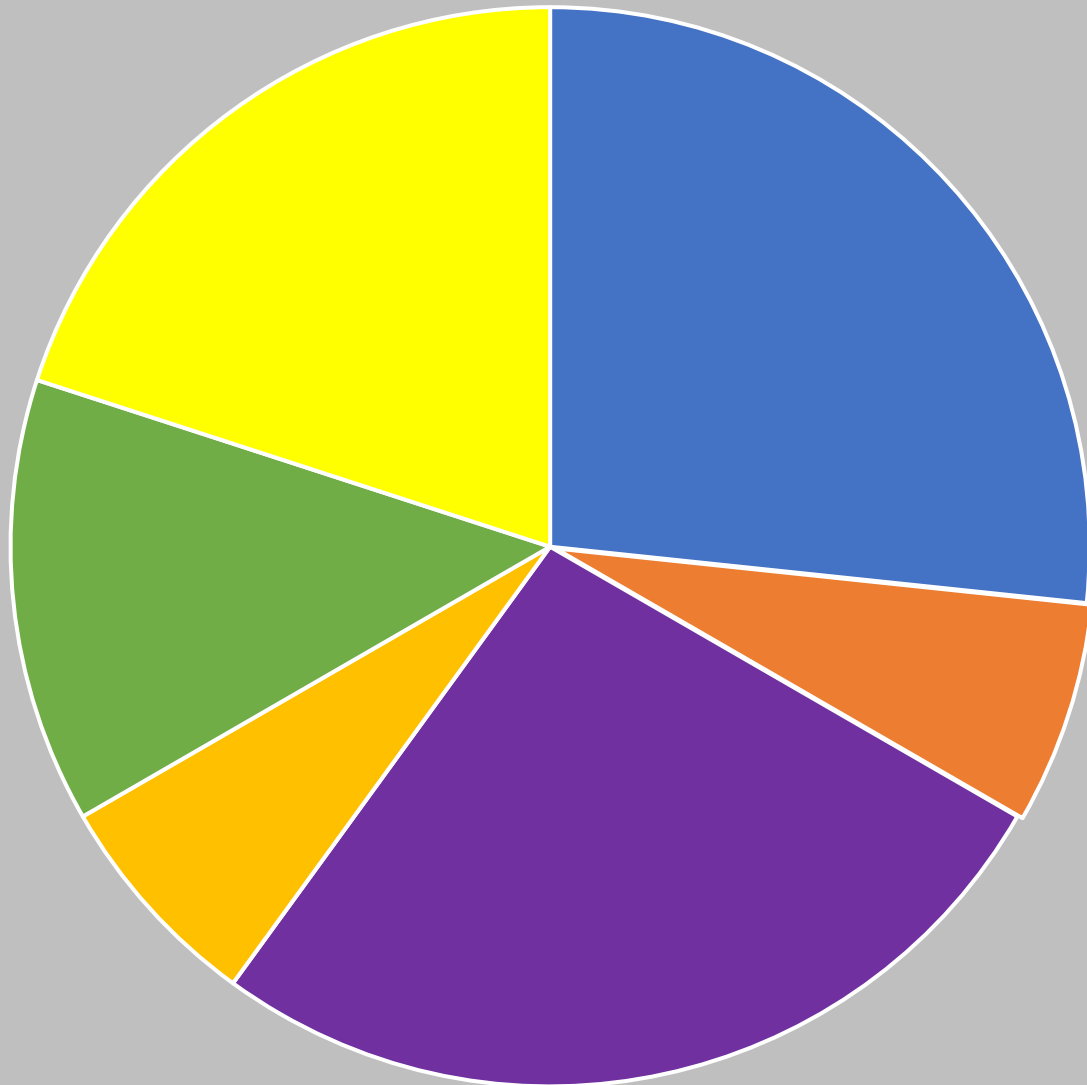


Forest and Soil  
Storage (2)

CO<sub>2</sub> Capture  
& Storage (3)

# The Path To Net Zero

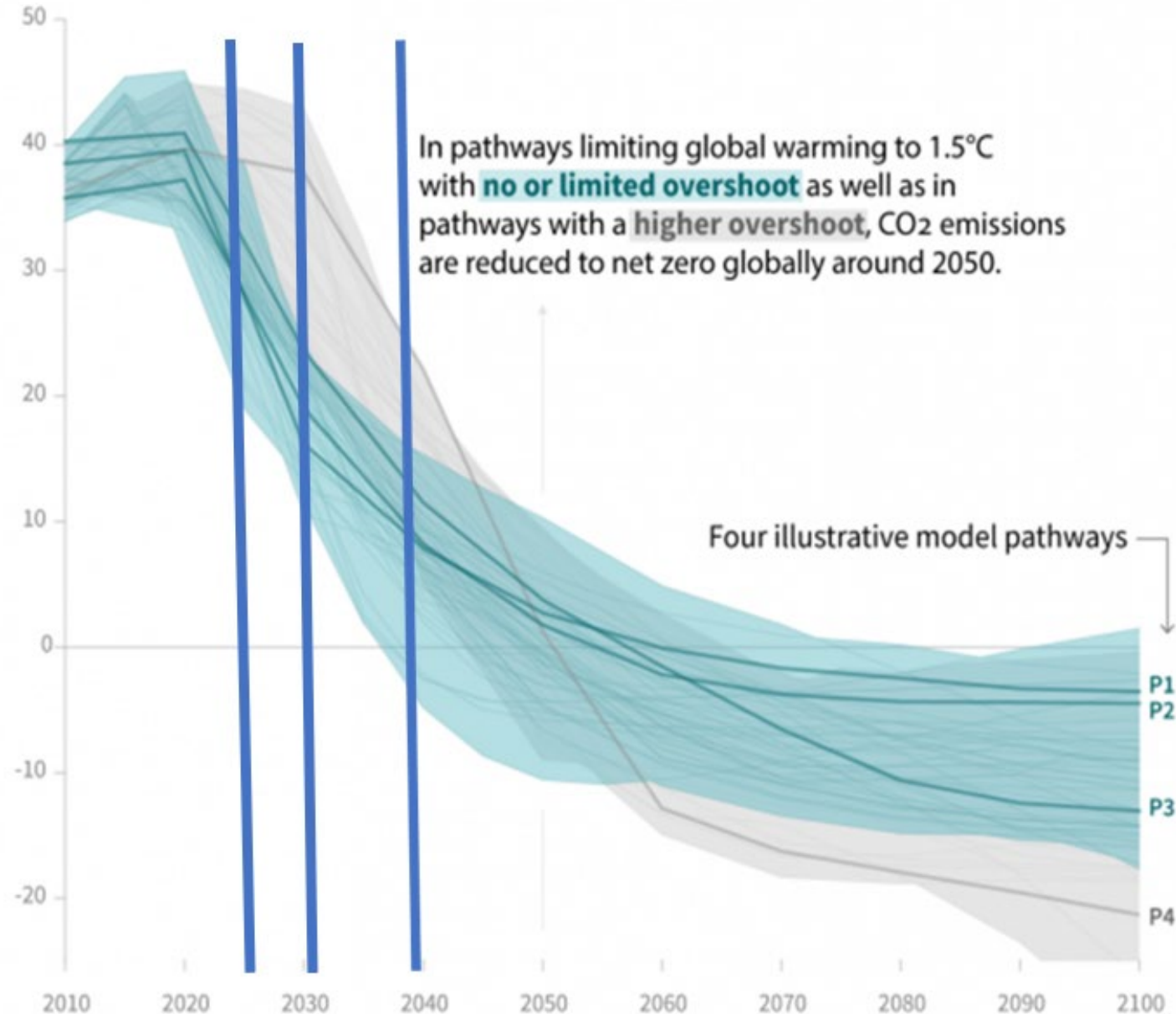
## Avoid, Minimize and Mitigate



|                               |     |
|-------------------------------|-----|
| <div></div> Renewables        | 27% |
| <div></div> Nuclear           | 7%  |
| <div></div> Efficiency        | 27% |
| <div></div> Nat Gas Switching | 7%  |
| <div></div> Nature            | 13% |
| <div></div> CCUS              | 20% |

# Global total net CO<sub>2</sub> emissions

Billion tonnes of CO<sub>2</sub>/yr



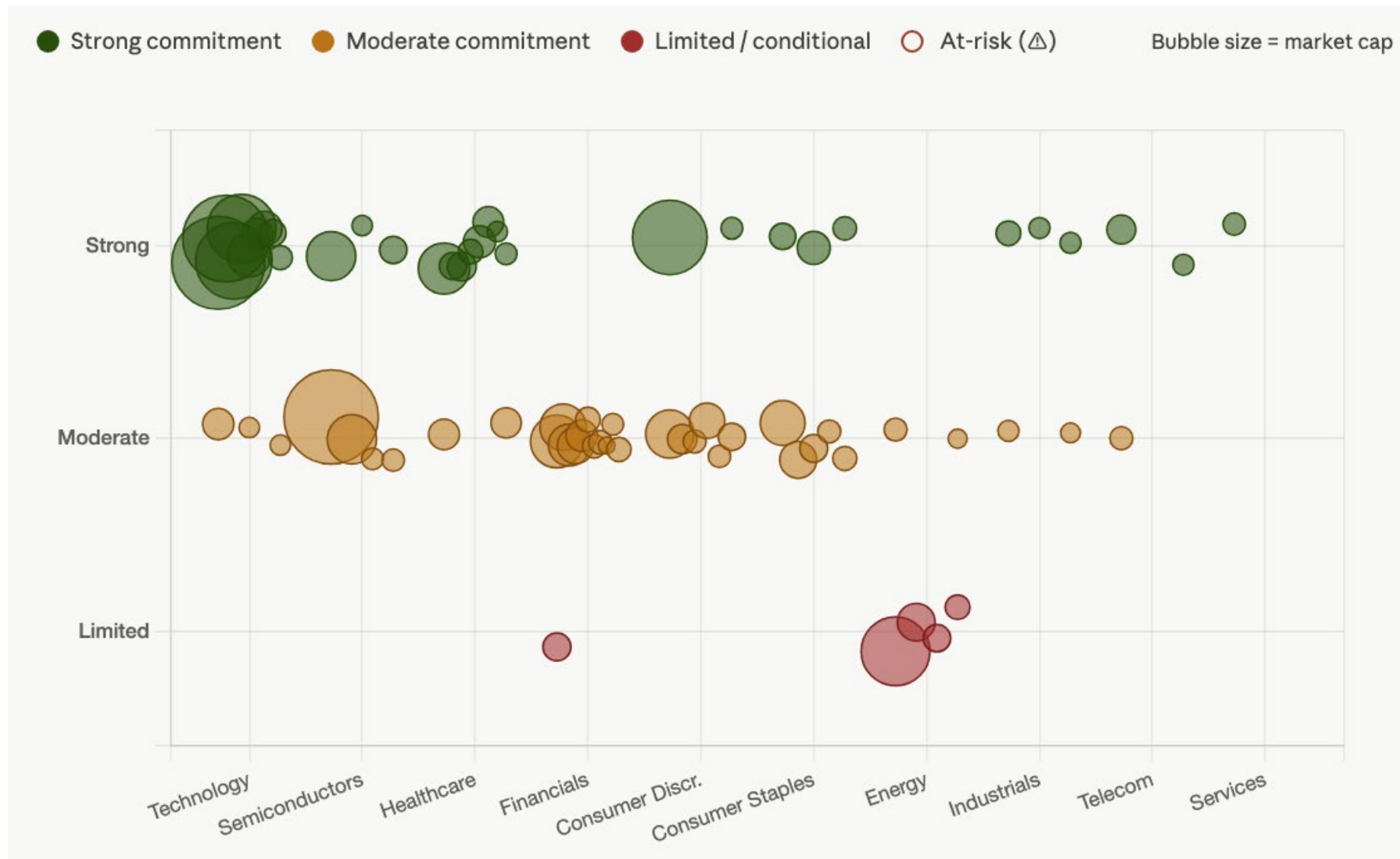
## Key Takeaways

Reductions spread out over decades – not immediate

Under P4, no substantial reductions until 2030

All reach net zero more or less by 2050 although P4 has substantial reduction beyond net zero

# Top 100 Global Companies With 73 Evaluated \$31 Trillion in Capital, 51% Strong, 37% Moderate



# Top 100 Key Takeaways

## Energy is the critical gap

All major oil and gas companies exclude Sc.3 (product combustion) â€” which represents 80-95% of their actual emissions. \$3.8T in capital has only conditional or intensity-based targets.

## Healthcare leads on all dimensions

9 of 10 healthcare companies have SBTi-validated targets covering Sc.1-3. AstraZeneca, Roche, and Novartis are global benchmark-setters, with Sc.1&2 near-zero targets for 2026-2030.

## Finance targets are retreating

US banks (Wells Fargo, Goldman, JPMorgan) exited the Net-Zero Banking Alliance in 2024-25 and weakened financed emission targets. European banks (BNP, HSBC) remain committed but slower than planned.

Floresville  
Search by Project Name

Zoom to Location



# Wind Power



50km

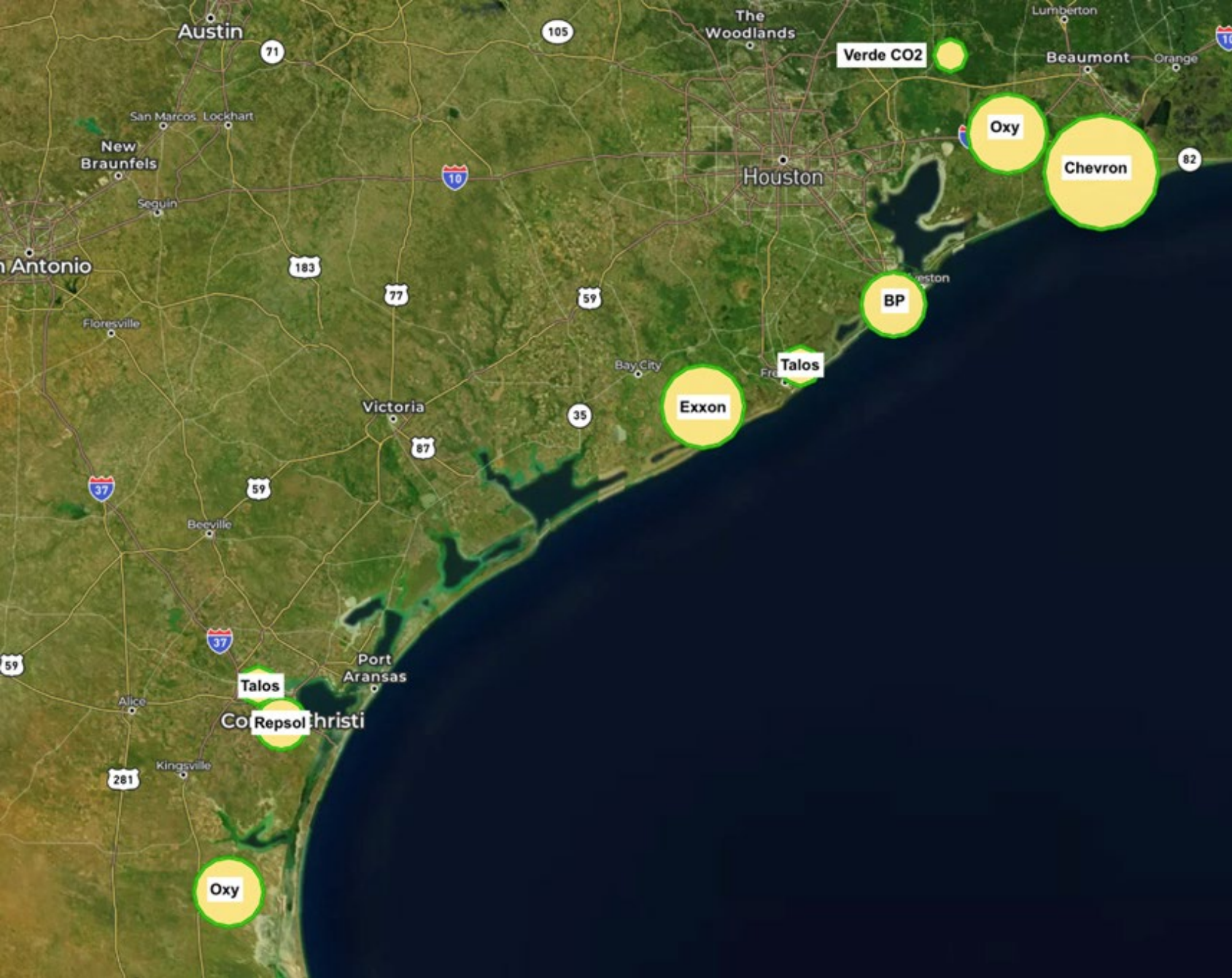
mapbox

Lat:26.3487 Long: -94.5395

© Mapbox © OpenStreetMap Improve this map © Maxar



**Hydrogen,  
Nuclear,  
and Direct  
Air  
Capture**



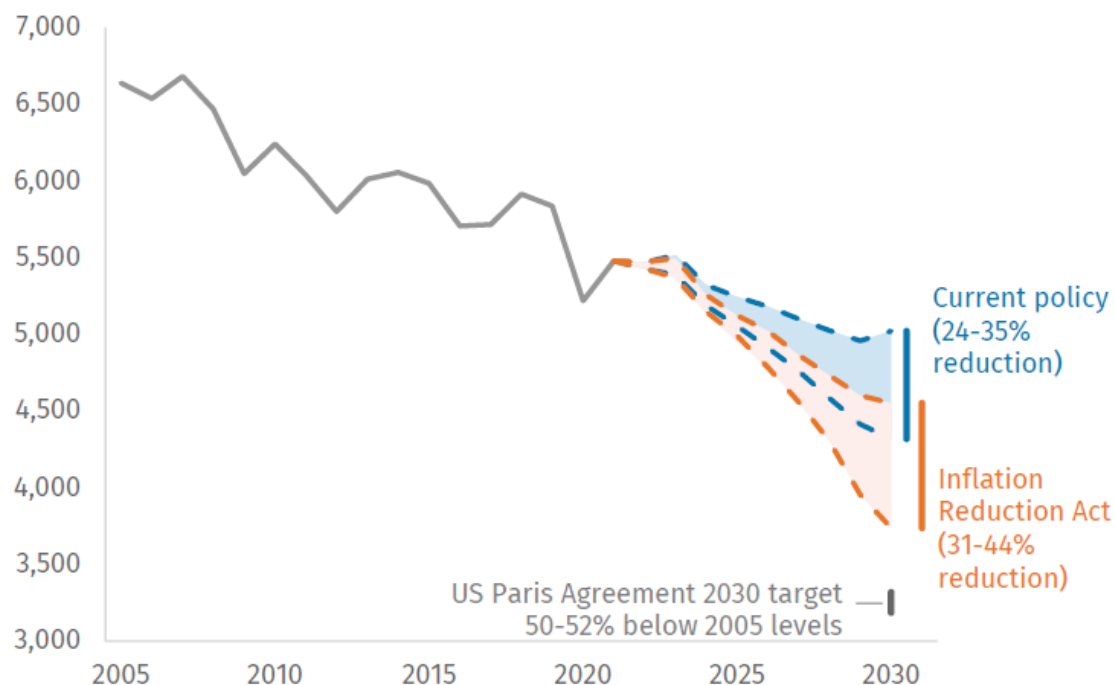
# Technological Carbon Capture and Underground Storage (CCUS)

# Plugging The Gaps – The Voluntary Carbon Market

FIGURE 1

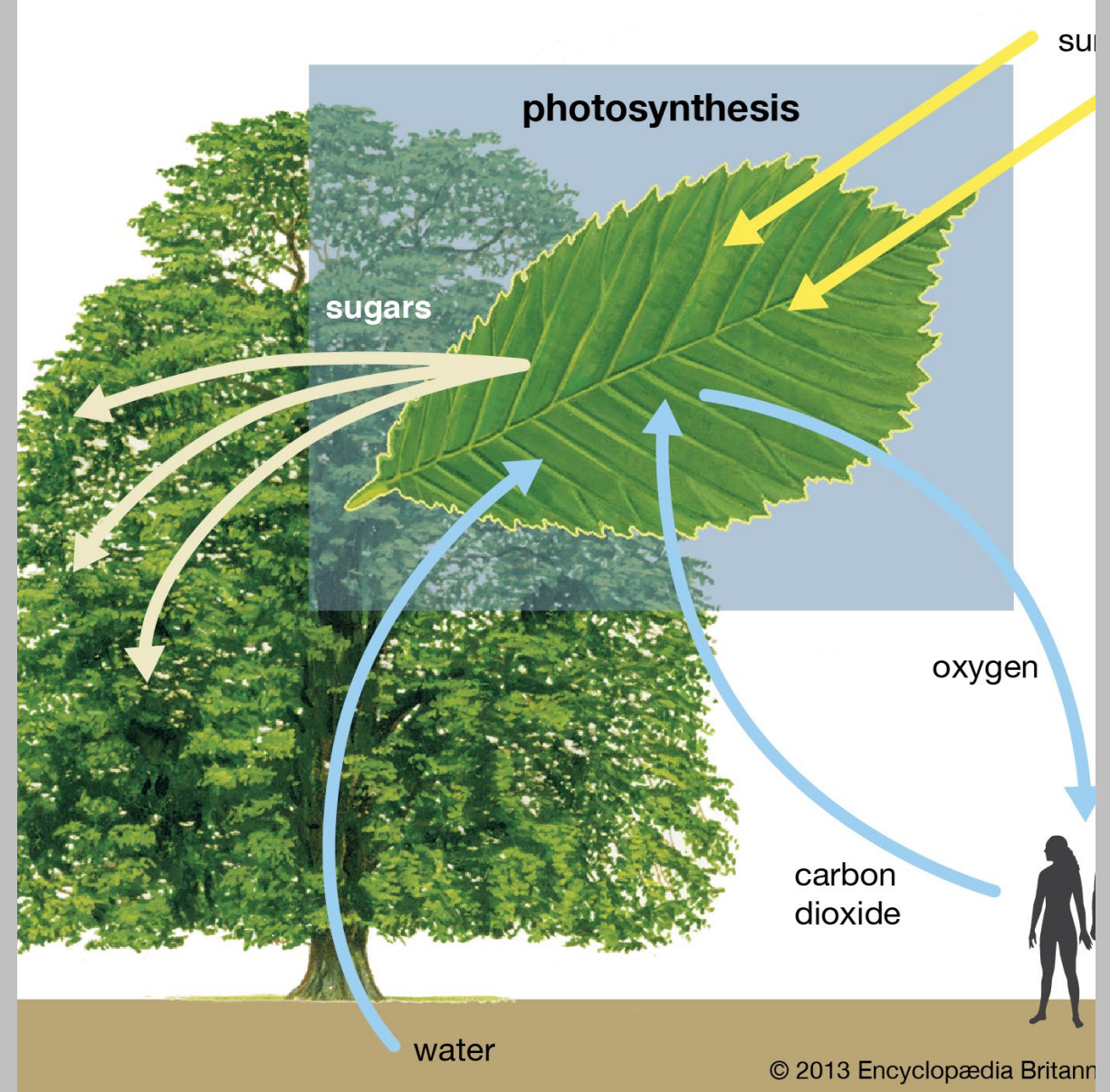
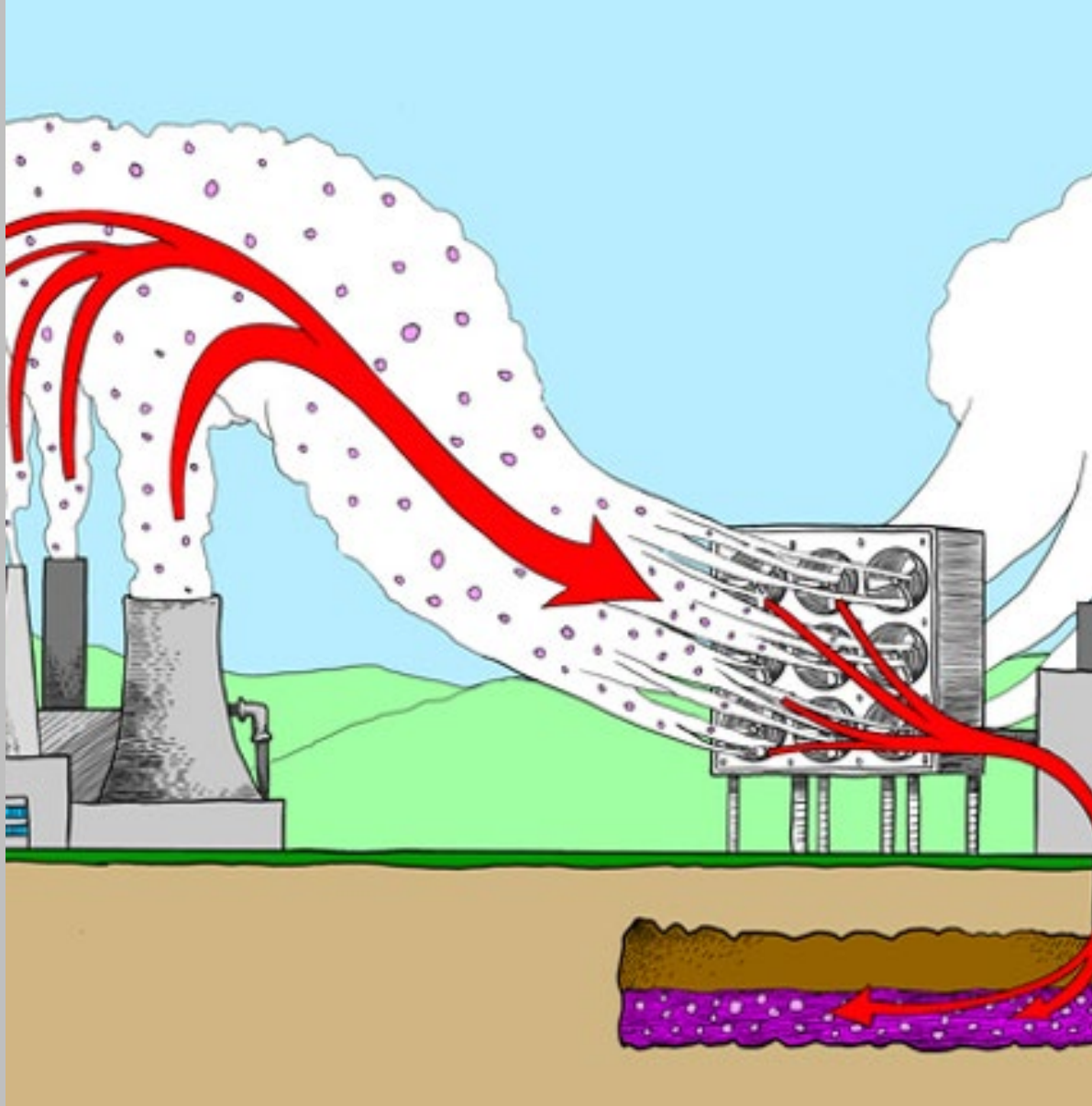
## US greenhouse gas emissions

Net million metric tons (mmt) of CO<sub>2</sub>-e



Source: Rhodium Group. The range reflects uncertainty around future fossil fuel prices, economic growth, and clean technology costs. It corresponds with high, central, and low emissions scenarios detailed in [Taking Stock 2022](#). Under the central scenario (not shown), the IRA accelerates emissions reductions to a 40% cut from 2005 levels.

- Existing Pledges + IRA Leaves 20% to 45% gap in 2030
- Means nature-based market for **600 million to 1.5 billion tons of CO<sub>2</sub>e by 2030**



## Mitigation: Technology and Photosynthesis



# Nature-Based Carbon Credits

By 2050 will provide **4 to 8 billion tons** of atmospheric carbon dioxide drawdown beyond what we are doing today

Restoring and expanding ecological function



# Carbon Credits

## Carbon Credit

"Carbon credits are instruments that **monetize** quantifiable **reductions in greenhouse gas emissions** achieved by certified **climate action projects**."



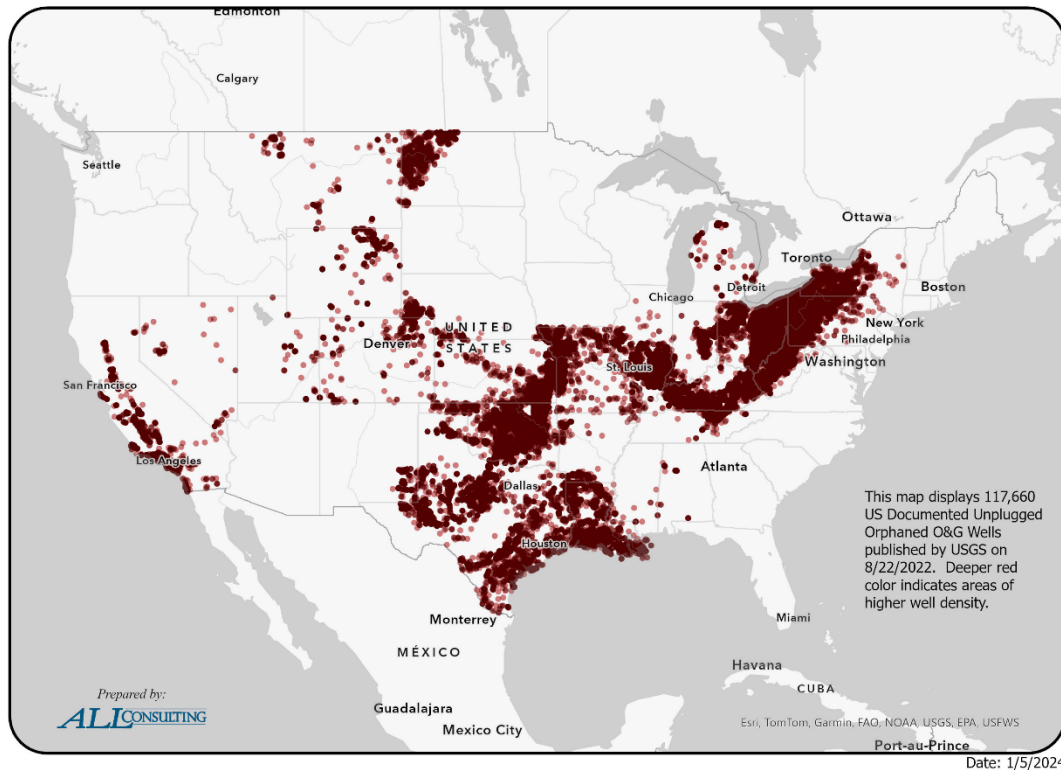
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1   
carbon credit

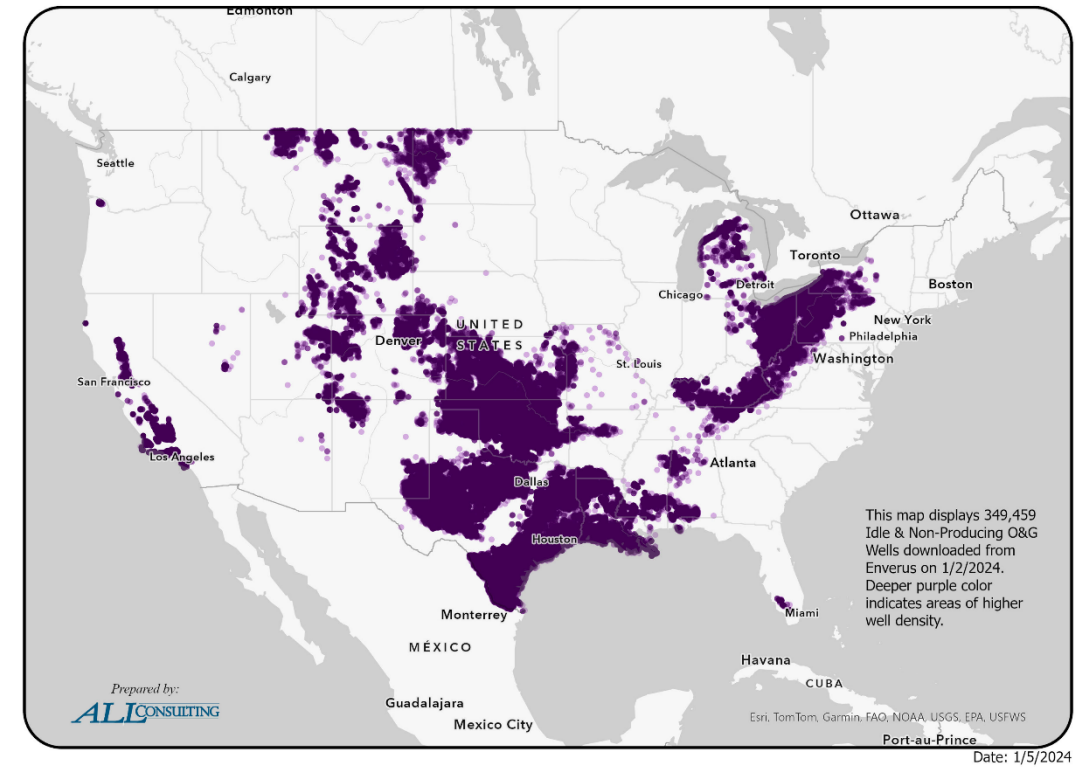
= 1 ton CO<sub>2</sub>e  
avoided / removed

# Over 3.5 Million Idle & Documented Orphan Wells in the United States

USGS Documented Unplugged Orphaned O&G Wells



Idle/Non-Producing O&G Wells

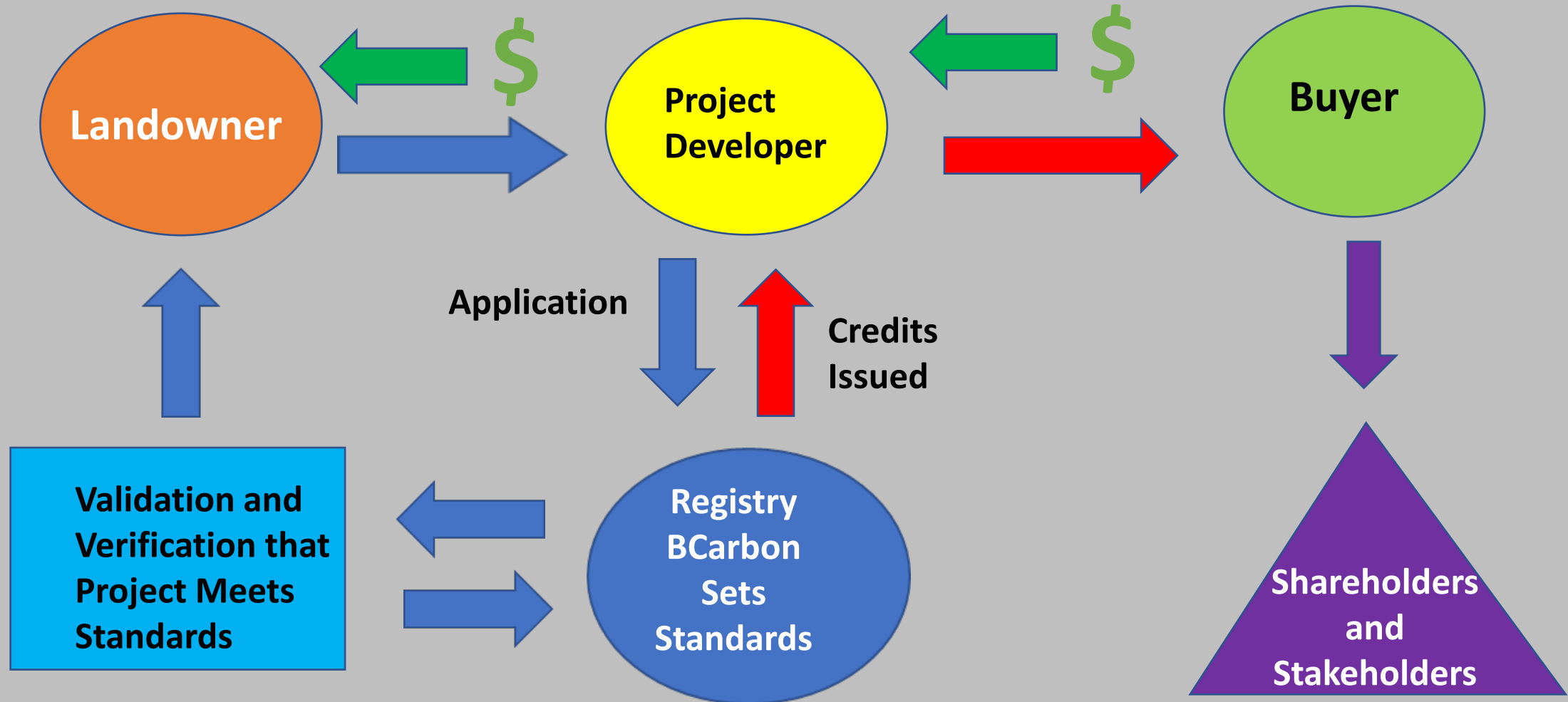


# Requirements for Methane Carbon Credits

- Not otherwise required by law
- Orphan wells not slated for plugging
- Idle wells not required to be plugged
- Credits can be issued by BCarbon under publicly vetted protocol  
<https://bcarbon.org/methane>
- Recent sale of 2 million tons at \$25 per ton



# The Voluntary Carbon Market



**Buyer Must Defend Purchase to Shareholders and Stakeholders**

**Issues  
Regarding  
Nature-Based  
and Methane  
Abatement  
Carbon Credits**

**Market Price**

**Yield Per Project**

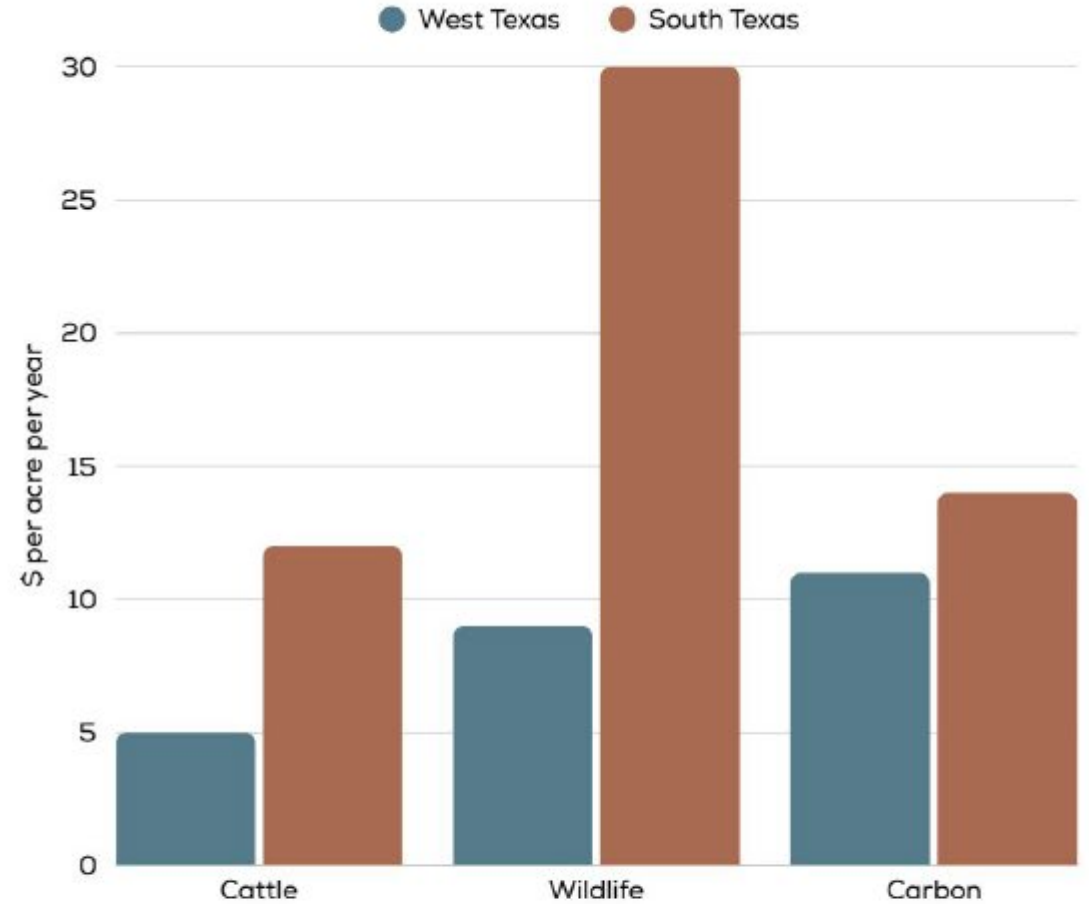
**Cost To Develop**



# HOW CARBON MARKETS ARE PAYING RANCHERS ACROSS TEXAS

*By: James Clement*

Published Date: October 2025



[www.earthoptics.com/news-insights](http://www.earthoptics.com/news-insights)

# What Does 4 to 8 Billion Tons of Carbon Credits Mean?

4 billion tons @\$100 per ton = \$400 billion per year

Assuming 50% goes to landowner, increased cash flow of \$200 billion per year

4 billion tons = 2 billion acres, or approximately total land area of United States

Globally, there about 18 billion acres of agricultural and forested land



*Evolution Out of  
Chaos*

**A Better System  
Will Emerge**

**Thank You**

**[blackbur@rice.edu](mailto:blackbur@rice.edu)**

