

# SAMANTHA (SAM) HOLROYD



## Chief Commercial Officer at ZeroSix

Samantha is an experienced energy industry executive with extensive corporate, financial, and technical leadership expertise. She has over 32 years of professional experience, including management and leadership roles in real asset operations, capital allocation and deployment, mergers and acquisitions, global consulting and advisory services, investment banking and private equity investment.

Sam is an independent board member of Chord Energy and Amerant Bank, serving on several committees including the corporate sustainability committee. She previously served on the board of SunTrust Investment Banking (now Truist), TPG (Sixth Street Partners), Denham Capital, EIG, and Shell.

Sam holds a B.S. degree in Petroleum Engineering from the Colorado School of Mines.

## Contact Me



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**19<sup>TH</sup> ANNUAL RYDER SCOTT RESERVES CONFERENCE**



# ZeroSix

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**We Bring the World Closer to Net Zero**

**Sam Holroyd**  
**Chief Commercial Officer**  
**ZeroSix**



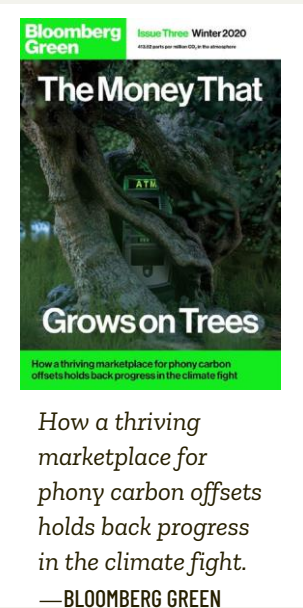
# On the road to a net-zero world...

## Carbon offsets are crucial

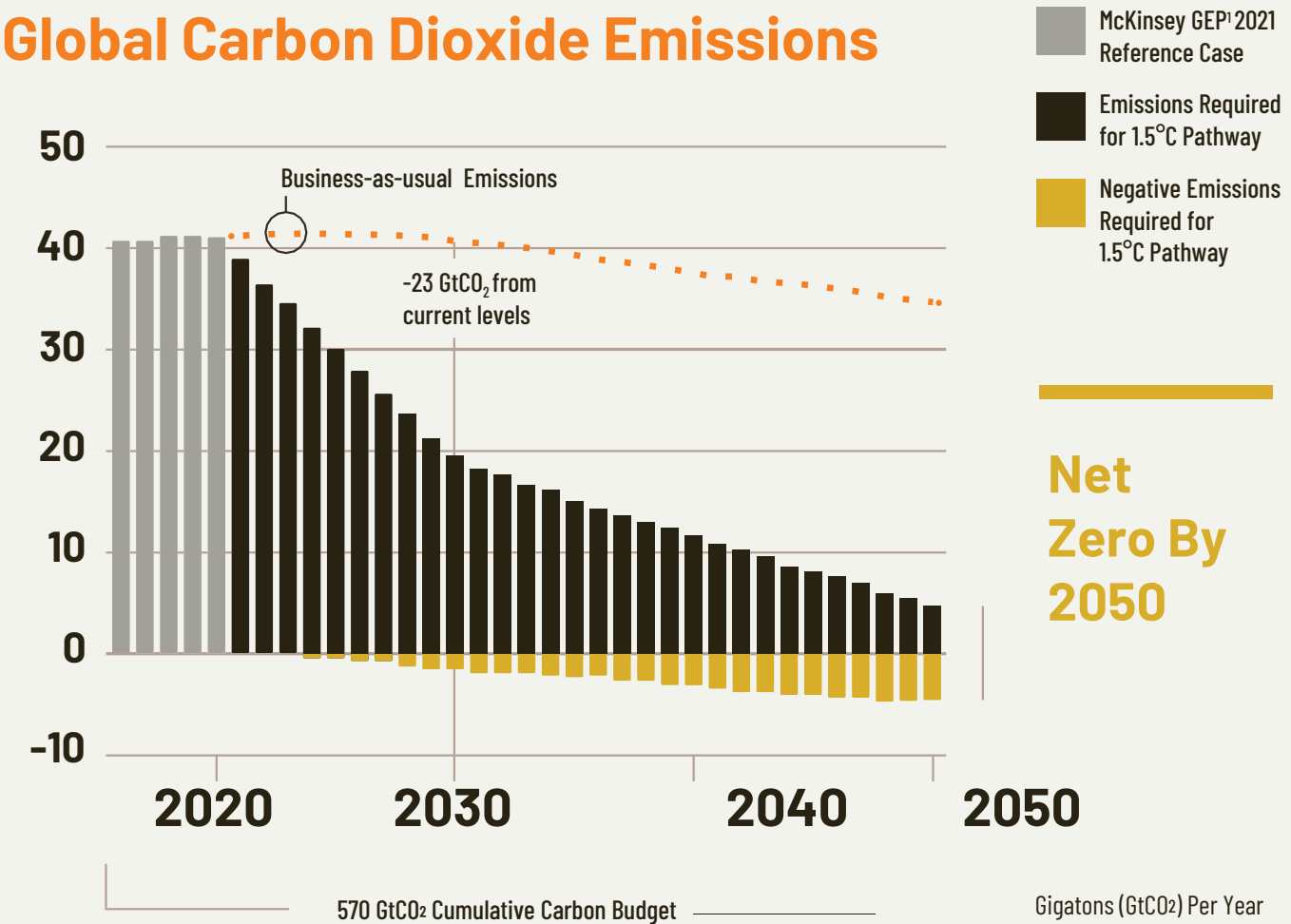
The world is looking for an additional 23 GtCO<sub>2</sub>e emissions reduction per year.....

The Voluntary Carbon Market (VCM) is critical in this transition

- In the Voluntary Carbon Market we need:
- (1) more carbon credits generated by
  - (2) higher quality projects that are
  - (3) fully transparent



## Global Carbon Dioxide Emissions

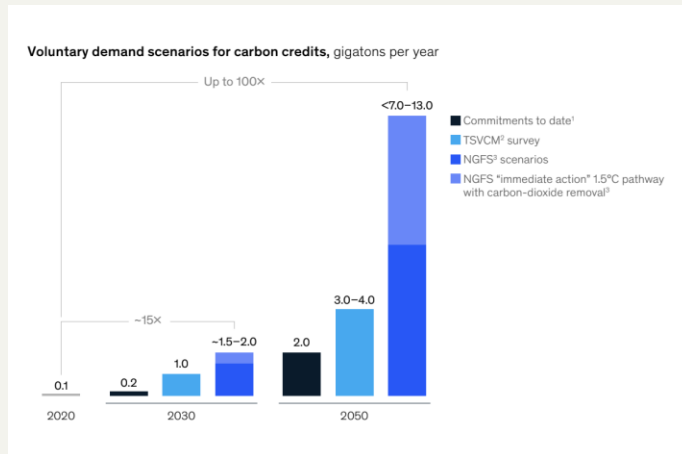


Net Zero By 2050



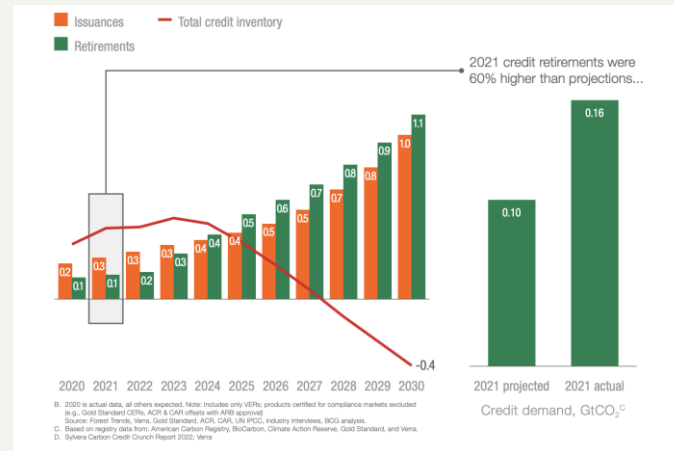
# The Voluntary Carbon Market is expected to surge

## INCREASING DEMAND



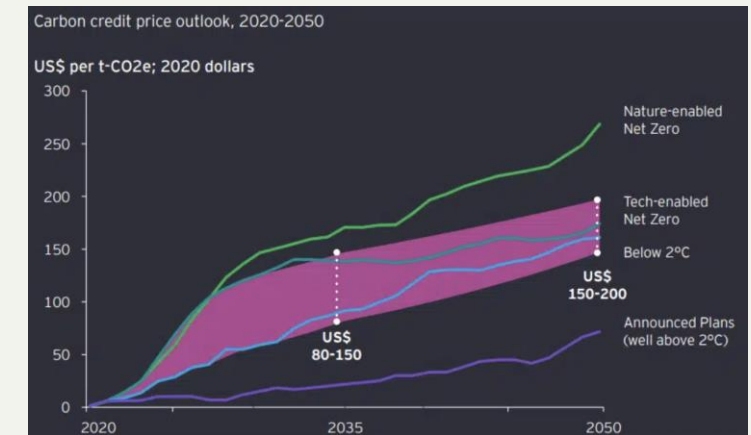
- More than 1/3 of large publicly traded companies have net-zero targets which cannot be met by avoidance and reduction alone
- Offsets through carbon credits are critical
- Conservative estimates are that demand for carbon credits will grow with a factor 15 towards 2030 and a factor 100 towards 2050

## SHORTAGE SUPPLY



- The supply of new carbon credits cannot keep up with the demand and the tipping point has been reached in 2022
- There is relative inelasticity in supply since projects need time to develop

## HIGHER PRICE



- The overall carbon price is expected to rise to 80-150 USD by 2035, up from 25 USD today
- a recent survey by BCG found that quality and locality of carbon credits are major differentiators for buyers

# ZeroSix powered carbon credits are accurate, additional, permanent & transparent



## ACCURATE

Based on SEC standard for calculating reserves, we can be certain about the CO<sub>2</sub> emissions avoided.

—  
*Two barrels of oil,  
1 tCO<sub>2</sub>e, 1 carbon credit*



## ADDITIONAL

When surfaced, the oil or gas would have been consumed with CO<sub>2</sub> emissions as a result .



## PERMANENT

Once oil & gas is shut in, this is forever.

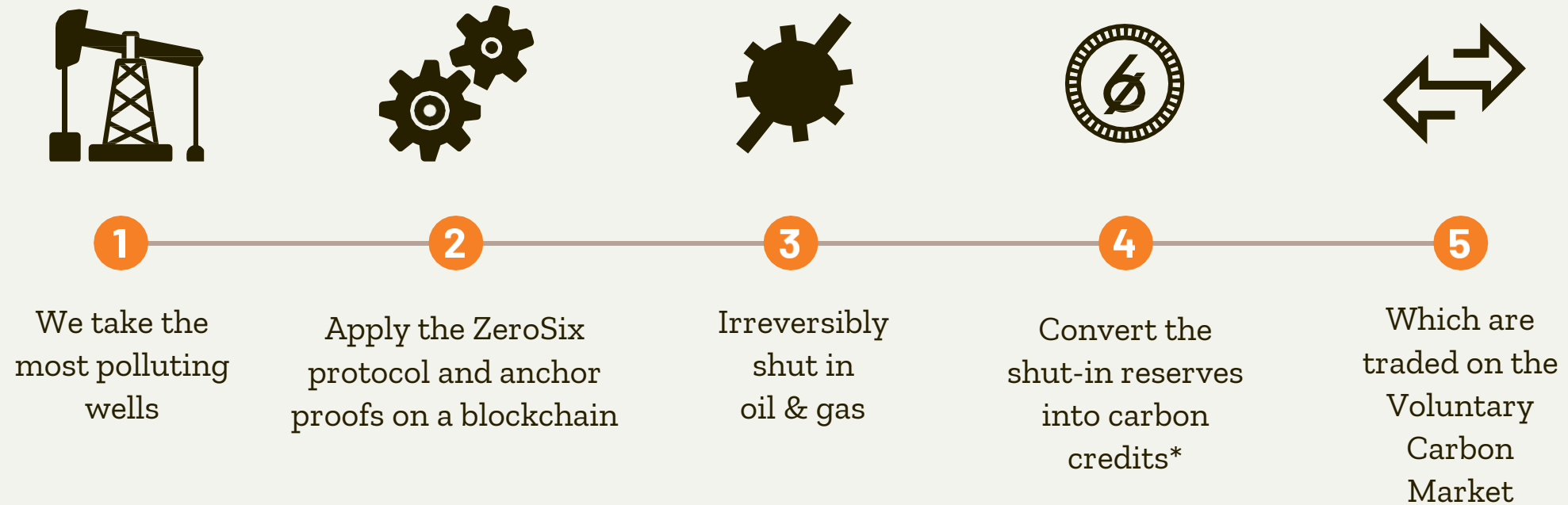


## TRANSPARENT

Anyone can verify the provenance.

# The ZeroSix blockchain-based solution creates independently verifiable digital carbon credits\* which provenance can be tracked all the way back to individual wells

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# Fuel Cycle Emission Sources

$$GHG_{Total} = GHG_{oil} + GHG_{refining} + GHG_{gas\ comb.} + GHG_{gas\ vent.} + GHG_{NGL}$$

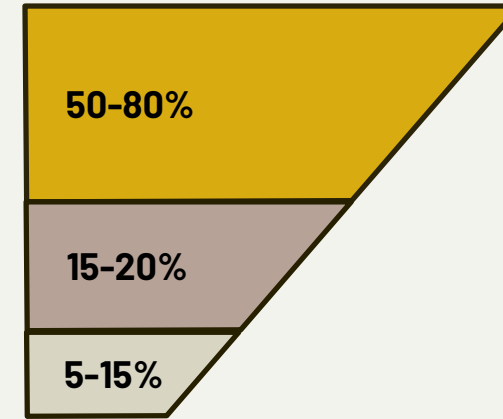
- Scope 3 Downstream end-use combustion

$GHG_{oil}$ ,  $GHG_{gas\ comb.}$ ,  $GHG_{NGL}$

- Scope 1 & Scope 2 Upstream Operational

$GHG_{gas\ vent.}$

- Scope 3 Refining -  $GHG_{refining}$



Fuel Cycle	Fuel Cycle Emissions	Scope 1	Scope 2	Scope 3
Downstream	65-80%			End-use of Produced Reserves
Refining	5-15%			Refining of Produced Oil
Upstream	15-20%	<b>Fugitive Methane Emissions</b> <b>Flaring</b> <b>Venting</b> Onsite Combustion Operating Producing Facilites	Purchased Energy Materials Aquired	<b>Fugitive Methane During Transportation</b> Transportation and Distribution Purchased Goods and Services Waste Capital Goods



## Eligible Reserve Volumes



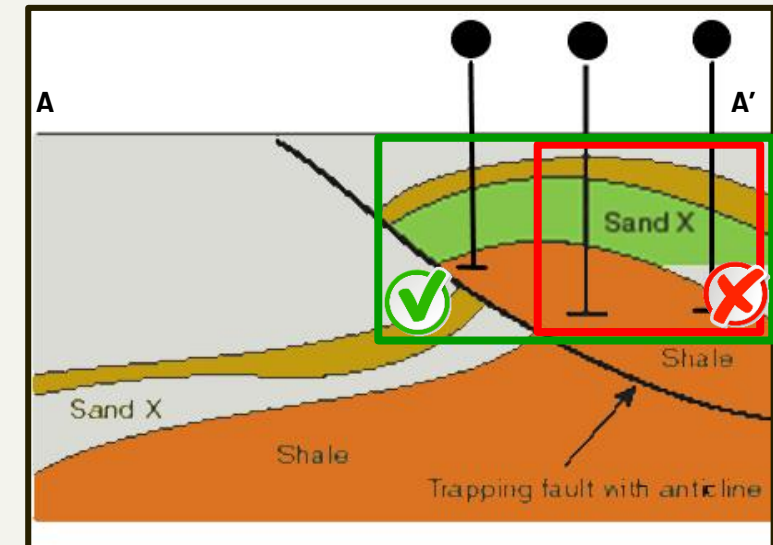
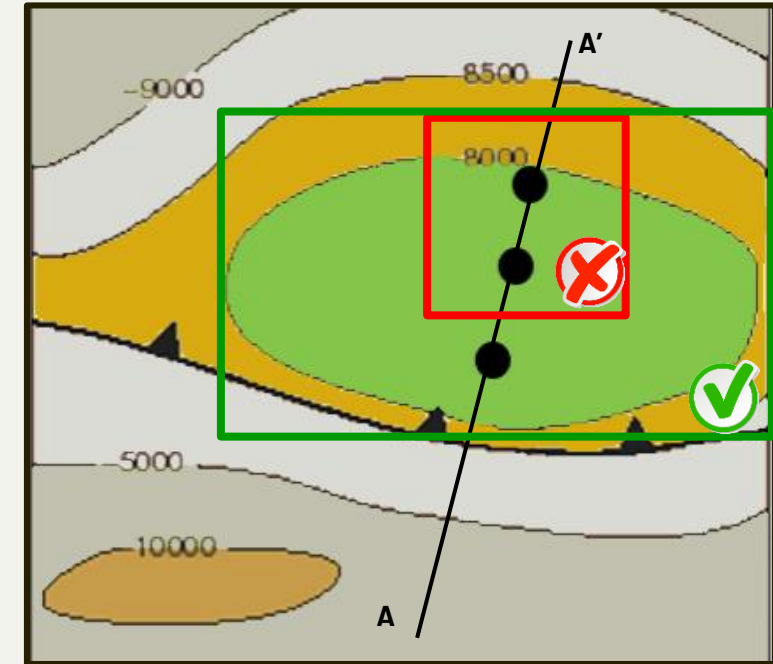
### Additionality – SEC PDP & PDNP Reserves

- Operational – Mechanically capable of extraction
- Financial – Economically Producing
- Regulatory – No regulatory mandate for abandonment

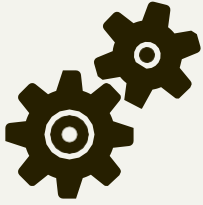


### Permanence

- Geologic – No Reserve Migration or Production
- Operational – No New Development
- Legal – Mineral Right Moratorium







# Carbon Content



Emission intensity tied to quality of product:

- Crude Oil °API

$$GHG_{oil} = [-0.9656 * °API + 458.95] * V_{oil}$$

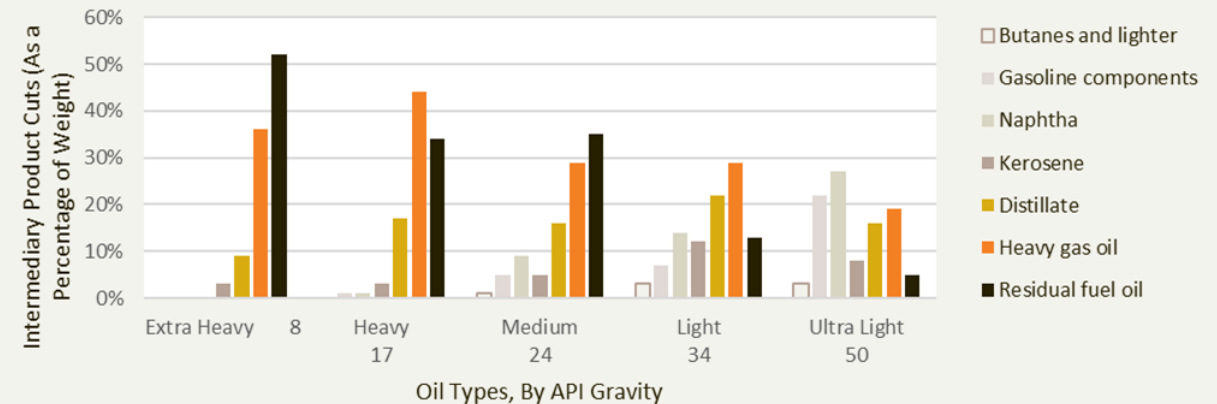
- Gas Heating Value Btu/scf

$$GHG_{gas\ comb.} = 52.91 * GHV * (1 - FE) * V_{gas}$$

- NGL C<sub>2</sub>-C<sub>5+</sub> Composition

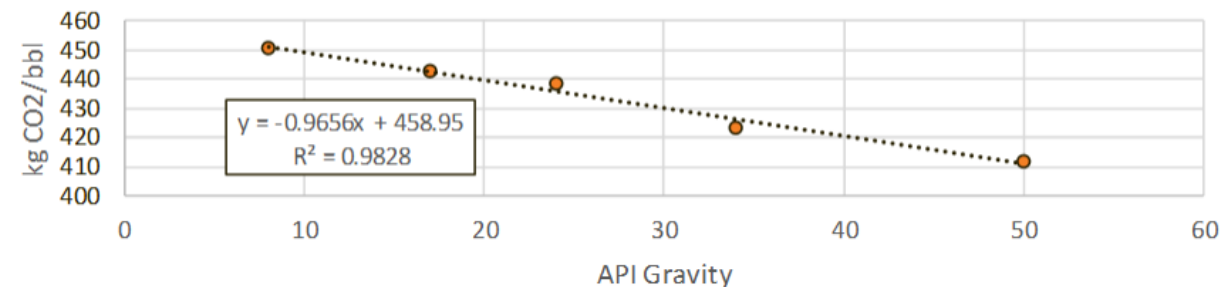
$$\begin{aligned} GHG_{NGL} &= [x_{ethane} * 170.1 + x_{propane} * 240.24 \\ &+ x_{butane} * 280.14 + x_{pentane+} * 323.4] \\ &* V_{NGL} \end{aligned}$$

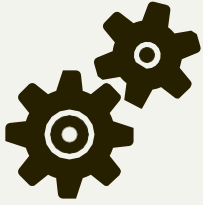
Potential Intermediary Products of Different Oils



Source: Crude Oil Quality Association, 2009, [www.coqa-inc.org/20091022\\_Villalanti.pdf](http://www.coqa-inc.org/20091022_Villalanti.pdf) and The Distillation Group, 1997. <http://home.earthlink.net/~villalanti/Crude.pdf>

CO<sub>2</sub> Emissions vs API Gravity





## Process Emissions



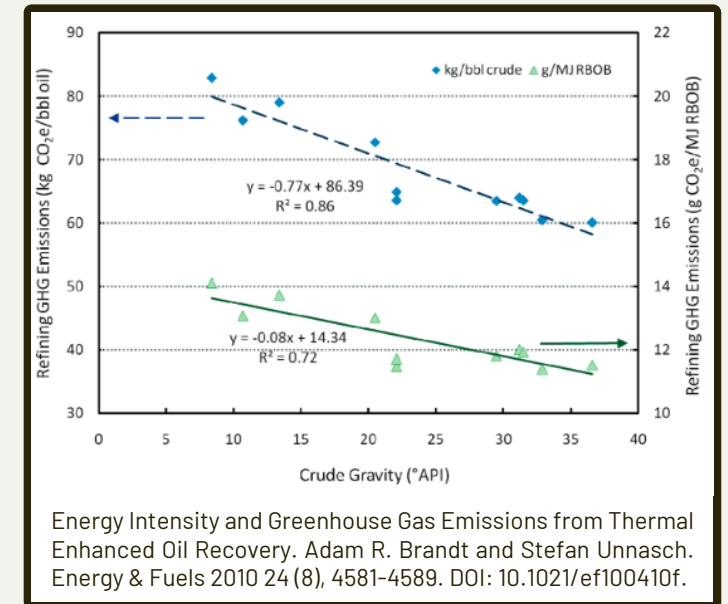
- Scope 1: Fugitive methane emissions (FE) during production and transportation

Methane global warming potential ( $\text{GWP}_{\text{CH}_4}$ )  $27.9 \times \text{CO}_2$

$$\text{GHG}_{\text{vent}} = 52.91 * \text{GHV} * \text{GWP}_{\text{CH}_4} * \text{FE} * V_{\text{gas}}$$

- Scope 3: Downstream refining of crude oil into intermediate and end-use products

$$\text{GHG}_{\text{refining}} = [-0.77 * ^\circ\text{API} + 86.39] * V_{\text{oil}}$$





## Digitized Transparency & Immutability

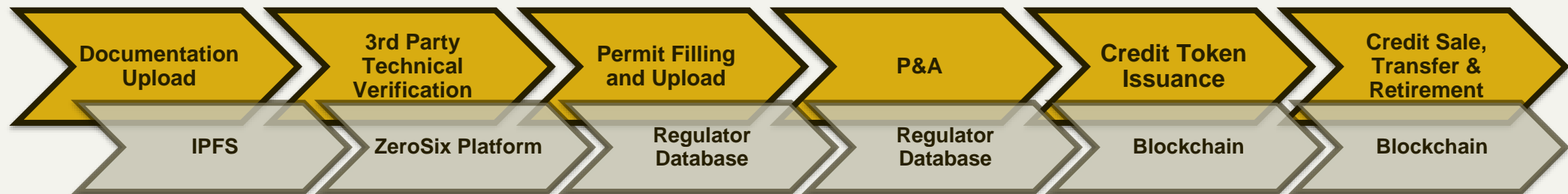


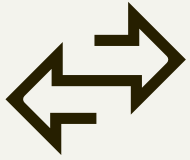
Regulated standards

- SEC Reporting
- State Oil & Gas Regulators – Permitting and Oversight: P&A, Land Reclamation, New Drill Permitting
- Technical Verifiers: State Engineer Licensing Boards and Accreditation Bodies

Embedded in an Immutable Decentralized Digital Framework

- Protocol executed through smart contracts & results in equivalent ERC-1155 tokens
- All documentation stored on open InterPlanetary File System (IPFS)

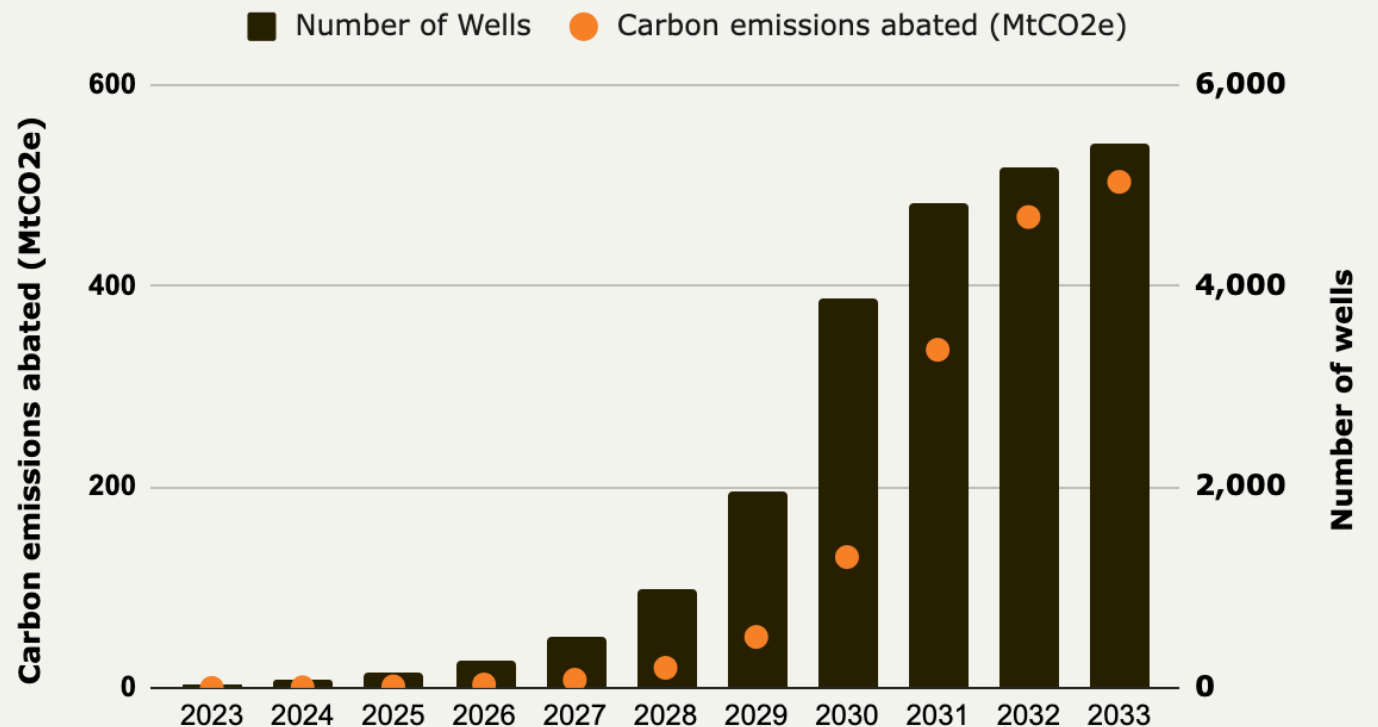




## ZeroSix Protocol can avoid 500 Megatonnes of CO<sub>2</sub>e emissions annually within 10 years

ZeroSix collaborates with operators and owners to make an INCREMENTAL impact to the Net Zero ambitions and absolute carbon reduction initiatives.

Number of Wells and Carbon emissions abated (MtCO<sub>2</sub>e)





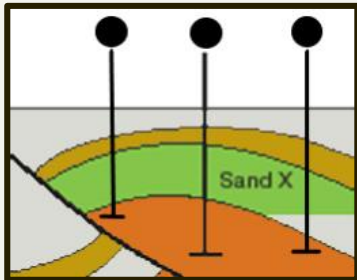
# But why stop there?

*We start with oil & gas credits and protocols for methane emissions and carbon capture are next*

- Due to the underlying principles the ZeroSix solution can be used by any carbon project and carbon markets.
- We start with Oil and Gas emissions after which other natural resource extractions are a logical follow-on
- But also scientifically measurable nature based solutions are very suitable for independently verifiable carbon credits generated through the ZeroSix tool

## Digitized Oil & Gas Protocols

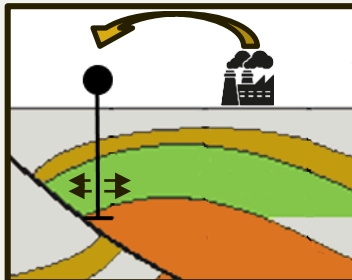
**P1:** Reserve Retirement



**P2:** Orphaned Well Clean-Up



**P3:** CCS Conversion



## Broader Digitized Carbon Solutions

Retirement of Resource Extraction



Scientific Nature Based Solutions



2Q 2023

3Q 2023

4Q 2023

2024+





# ZERØSIX

**A digital solution for obtaining and managing  
verifiable high-quality carbon credits**

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**Learn More**

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