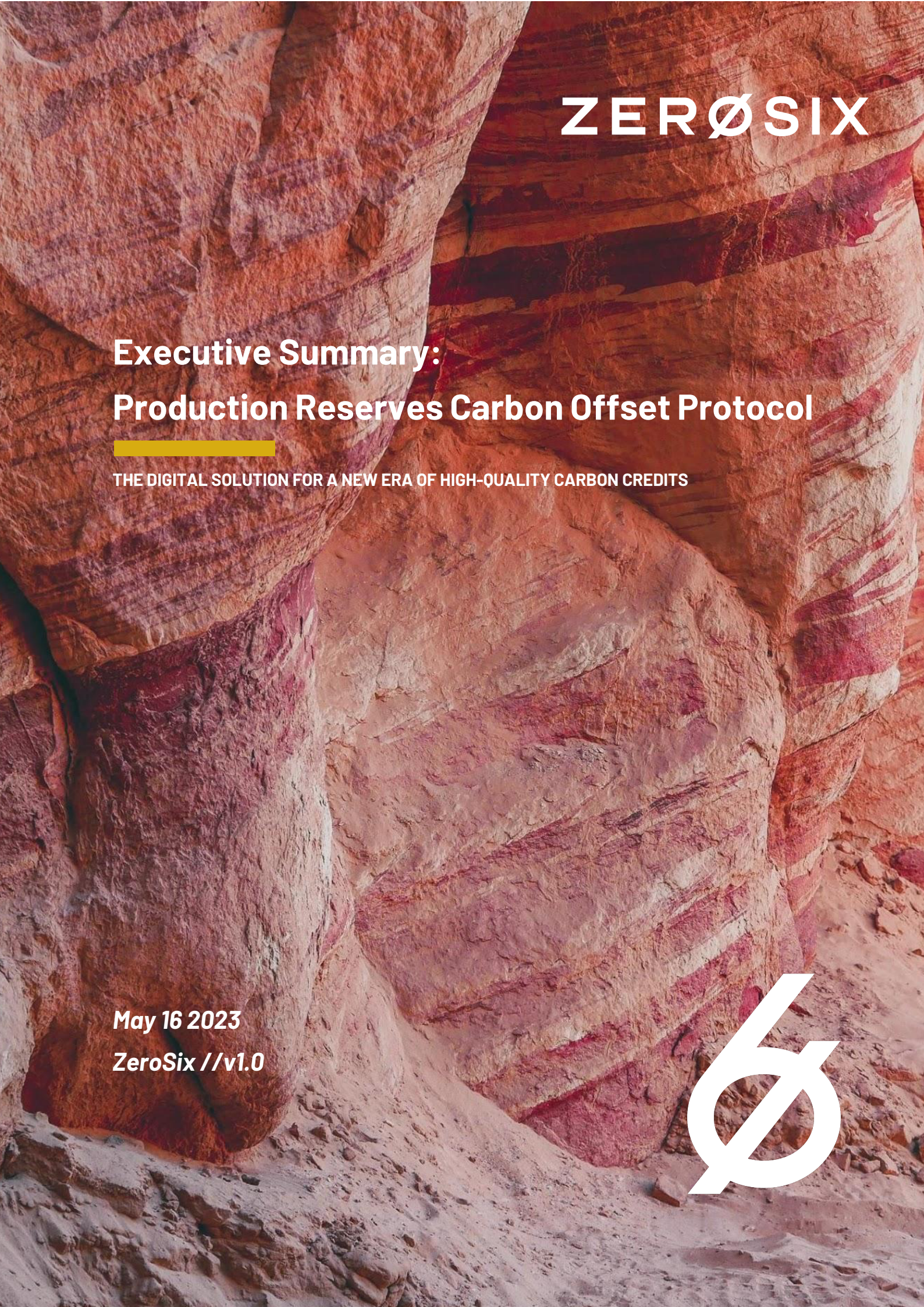


ZERØSIX

Executive Summary:
Production Reserves Carbon Offset Protocol

THE DIGITAL SOLUTION FOR A NEW ERA OF HIGH-QUALITY CARBON CREDITS

May 16 2023

ZeroSix //v1.0

We bring the world closer to net zero

In November 2022 at COP27, world leaders stressed that this decade is pivotal for climate action – the imperative is to ensure global warming remains below 1.5ºC. Over 80% of global CO_2 emissions are related to burning fossil fuels. Achieving a net-zero future by 2050, will require swift and committed action.

The ZeroSix protocol incorporates well-established standards and processes in the oil and gas industry for the purpose of retiring producing oil and gas assets in exchange for the highest quality carbon credits. This includes building upon a foundation of stringent regulations from the U.S. Securities and Exchange Commission (SEC) and other agencies. The protocol expands upon that foundation with further enhancements that strengthen the accuracy, additionality, and permanence claims associated with the carbon credits — all via an approach that also provides needed transparency and verifiability for voluntary carbon market (VCM) participants.

The protocol is publicly available at https://zerosix.co.

The ZeroSix protocol leverages existing regulations

The purpose of the Production Reserves Carbon Offset Protocol (protocol) is to:

- Describe eligibility criteria of offset projects
- Provide the methodology for quantification of the amount of carbon emissions avoided
- Detail the validation requirements of project documentation
- Describe the monitoring requirements
- Outline the process of project execution
- Describe the verification requirements to generate carbon credits.

The protocol leverages existing regulations, latest standards and best practices relevant to each component of the abatement project. This covers:

- Reserve volume calculations follow the long-established standards defined by the United States Securities and Exchange Commission (SEC). [1]
- Permanence requirements tied to the current regulations of carbon sequestration, primarily the California Air Resource Board's (CARB) Carbon Capture and Storage (CCS) protocol and the United States Environmental Protection Agency (EPA) Class VI permit requirements. [2][3]
- Execution of plugging and abandonment of oil and gas wells is strictly controlled and certified by the respective state oil and gas regulatory agencies.
- Land reclamation activities are strictly controlled and certified by the respective state oil and gas regulatory agencies.

And the ZeroSix protocol follows the ICVCM Core Carbon Principles

ZeroSix designed the protocol to adhere to the Integrity Council for the Voluntary Carbon Markets (ICVCM) Core Carbon Principles (CPP).

The Core Carbon Principles, developed with input from hundreds of organizations in the voluntary carbon market and launched in March 2023, set out fundamental principles for high-quality credits that create real, verifiable climate impact, based on the latest science and best practice. [4] The 10 Core Carbon Principles are:

1. Effective governance
2. Tracking
3. Transparency
4. Robust independent third-party validation and verification
5. Additionality
6. Permanence
7. Robust quantification of emission reductions and removals
8. No double counting
9. Sustainable development benefits and safeguards
10. Contribution toward net zero transition

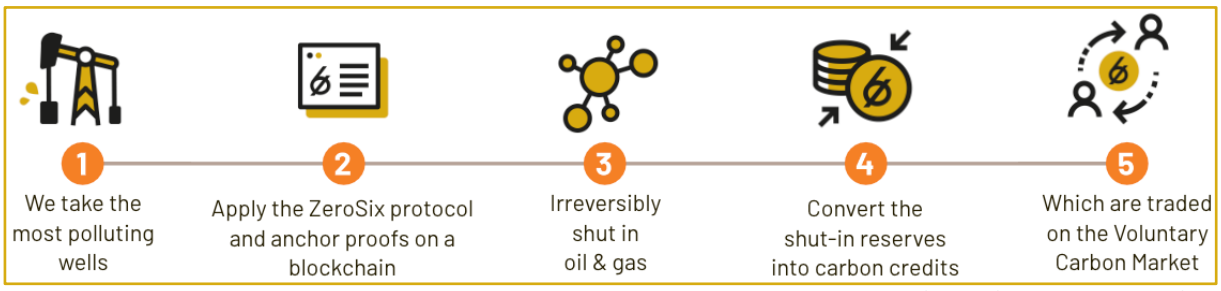
Our protocol is embedded in a digital solution that guarantees compliance and independent verifiability

Compliance with the protocol is controlled and digitally recorded using a blockchain-based decentralized application, the ZeroSix digital solution. The ZeroSix digital solution ensures:

- Aspects of project governance, including overall adherence to the protocol
- Project verification, with digital signatures from independent third-party verifiers
- Transparency, by publicly storing project documentation on the InterPlanetary File System (IPFS), which is an immutable and tamper-proof distributed file storage system
- Minting and distribution of the ZeroSix tokens
- Tracking and elimination of double counting.

The ZeroSix digital solution ensures all protocol steps are followed as intended, and all proofs and digital signatures are stored in an immutable and tamper-proof ledger. This removes the need for an intermediary to verify the status and validity of every carbon credit. This implementation also allows for full transparency.

The digital solution mints and distributes digital tokens once completion of all protocol steps has been verified. This token has a fungible and non-fungible component. The fungible component of each token always represents one metric tonne of CO_2 equivalent. The non-fungible component includes project provenance and well specific information, such as the source well location and key project dates.



Drilling deeper into the ZeroSix protocol and digital solution

ZeroSix project eligibility

The protocol is designed to keep oil and gas in the ground that otherwise would have been extracted and burned. ZeroSix pre-screens all projects before project owners progress to ceasing production and expending capital on these operations. To be considered eligible, a project owner must be able to:

1. Present their operator license issued by the respective state regulator and demonstrate an operating record without pending investigations or inquiries.
2. Present a valid third-party reserves report demonstrating economic reserves.
3. Ensure that independent VBB's can verify, according to the standards of the protocol, the quality of the information submitted for the quantification of the project reserves.
4. Provide proof of resource ownership of royalty owners.
5. Demonstrate that participation in the ZeroSix project can be achieved while adhering to all relevant regulatory requirements.
6. Establish and verify the additionality of claimed carbon volumes by showing a clear baseline of business-as-usual production forecast.
7. Provide suitable justification for permanence of retired reserves. This is achieved by providing relevant geological, petrophysical, and fluid property analyses.

Accurate credit volume quantification

Our aim is to help the world get to net zero by addressing the most important source of GHG emissions: fossil fuels. The lifecycle emissions from hydrocarbon production and use can be divided into three broad categories:

1. End-use emissions: Emissions that occur during the use of fossil fuel-based products, including the combustion of gasoline and diesel in vehicles, as well as the use of fossil fuel products for heating and electricity generation.
2. Upstream emissions: Emissions that occur during the production and extraction of hydrocarbons, including exploration, drilling, and transportation of oil and gas to the refinery or processing facility.
3. Refining emissions: Emissions that occur during the refining of crude oils into usable products (e.g. gasoline, diesel, jet fuel).

The ZeroSix protocol credits relevant portions from all three categories within a project.

1. End-use emissions

End-use emissions represent 65-80% of global fossil fuel emissions. [5]

The US Securities and Exchange Commission (SEC) has established guidelines to regulate the calculation and reporting of hydrocarbon reserves. These are used by companies for their annual reporting obligations and to comply with investor and market transparency standards. A third-party engineer qualified to prepare reserve reports according to SEC standards must provide the hydrocarbon volume quantification.

The reserves report also provides the basis for the additionality assessment. This assessment ensures that carbon offsets are an addition to reductions and/or removals that would have occurred in the absence of the project activity and without carbon market incentives. To be considered additional, the project must demonstrate that the GHG emissions reductions and removals associated with an offset project are above and beyond business-as-usual. The ZeroSix protocol credits the proved developed reserves of eligible projects as quantified by the reserves report. ZeroSix projects must satisfy these 3 additionality tests:

1) Regulatory Test: the proposed activity exceeds currently effective regulations.
2) Common Practice Test: goes beyond common practices in the oil and gas industry in the geographic region of operations.
3) Implementation Barrier Test: faces one or more implementation barriers.

Once the remaining technically and economically recoverable volumes have been established for oil, gas, and natural gas liquids (NGLs), their respective volumetric carbon intensity is established. The carbon intensity is determined by the chemical composition of each fluid and is directly calibrated by standard fluid property field measurements. [6]

2. Upstream Emissions

In addition to the scope 3 CO_2 emissions eliminated by preventing the combustion hydrocarbon reserves, there is also an associated abatement of methane release from production systems and/or leaks during transportation

to the downstream market. The published results of the Environmental Defence Fund (EDF 2012-2018) study concluded that the industry supply chain rate of fugitive methane emissions is 2.3% of total domestic gas production. [7] The research engaged 140 independent experts, from 40 different research institutions, across 16 rigorously executed projects, with support from 50 companies.

Methane is a more potent greenhouse gas than carbon dioxide. According to the latest IPCC AR6 report, the CO_2 equivalent global warming potential (GWP) of methane on a 100-year basis is 27.9 times greater than that of CO_2. [8] ZeroSix credits these abated fugitive methane emissions on a carbon dioxide equivalent basis using this conversion.

3. Refining Emissions

There are emissions originating from refining hydrocarbons. As such, direct emissions from refining crude oil into specific products are avoided by following the ZeroSix protocol. Because of the high degree of confidence of these scope 3 emissions, their inclusion is merited and therefore credited to the project owner upon successful project execution. Brandt, et.al. propose a linear relationship between crude oil gravity and refining GHG emissions, which is utilized to provide the basis for associated credits. [9][10]

Proof of permanence

Projects must demonstrate the permanence of avoided carbon emissions meet the requirements of the protocol. In the ZeroSix protocol there are three primary conditions for permanence:

- Geologic Permanence: Abandonment of the infrastructure and associated reserves remaining unproduced after completion of the project abandonment.
- Legal Permanence: Retirement of extraction rights by owners of the asset.
- Operational Permanence: Monitoring and notifications for any new activity in the project area.

The project owner must submit a report prepared by a recognized professional organization that includes a compilation of pertinent project permanence data. Additionally, the project owner secures a legally binding contract or legal protections against the future production of the retired resources within the project boundaries for a minimum of 50 years. This contract will be tied to the mineral ownership title, thus the current and any future mineral owner forgoes the right to extract the targeted resources in exchange for just compensation proportional to their royalty claim, or other compensation as negotiated with the project owner.

ZeroSix provides the assurance of operational permanence by monitoring publicly available data sources for future operational permit applications that could undermine a projects permanence.

Executing the project

The execution of the abandonment and reclamation activity will be specific to each project and must conform to the regulatory guidelines of the jurisdiction. The digital solution also requires proof notification and provision of information to local authorities that have authority over drilling activities. This enables such authorities to impose appropriate restrictions on subsequent drilling activities that may penetrate the project boundaries. The plugging and abandonment process varies by state and is specified by the respective resource governance organizations. The correct execution of this procedure is independently verified by the state oil and gas regulatory bodies, with proofs digitally anchored on the digital solution.

Verifying the project

An independent, state-accredited organization will verify the claimed emission volume abatement and credibility of the geologic permanence documentation of the project. The specific engineers working within these organizations will hold a current state engineering license in a relevant engineering discipline.

The third-party verifier will review all submitted documents pertaining to reserve volumes, carbon content and geologic permanence. Project documentation from state regulatory bodies at the well-level are also verified, including:

- P&A permit filling and acceptance
- State-level confirmation of plugging and abandonment completion
- Existing and enforced land, air and water reclamation and monitorization requirements by the appropriate regulator.

Each document will be verified independently through the ZeroSix digital solution, with the verifiers digital signature assigned when the protocol requirements are met. The digital solution allows verifiers to query concerns regarding the quality of the claims or documentation with the project owner. Once all verification is complete the digital solution invokes the smart contract to mint the project tokens.

ZeroSix project tokens

Once the tokens are minted they are transferred to a group of smart contracts for distribution using 3/3 quorum, signed by Project Owner, Verifier and ZeroSix. A portion of the project tokens will be transferred to the Supplier's digital wallet. The project owner is responsible for distributing proceeds to the appropriate royalty owners, as defined during project on-boarding. A second portion is transferred to ZeroSix as part of the fee for use of the digital solution. Lastly 1% is transferred to a buffer account which may be used to offset any unforeseen reversals at a future date. This is to maintain the integrity of issued credits globally, ensuring one token always equals one tonne of CO_2e.

ZeroSix defines the future of the energy transition

A carbon credit is only as good as the standard to which it is held. At its core the ZeroSix protocol results in a carbon credit which is an evolution beyond business as usual, setting a new standard for accuracy, additionality, permanence, and transparency.

In focusing on a new era of high-quality carbon credits—and starting with a focus on proved developed reserves—ZeroSix is bringing to market the right solution at the right time. It unlocks both the necessary role of carbon markets in closing the 23 Gt gap to 1.5ºC Paris targets and creates an economic incentive and clear pathway for oil and gas producers to leave reserves in the ground for Earth's carbon budget.

References

[1] US SEC, "Securities and Exchange Commission Modernization of Oil and Gas Reporting Final Rule," [Online]. Available: https://www.sec.gov/rules/final/2008/33-8995.pdf. [Accessed 16 04 2023].

[2] CARB, "California Air Resource Board 2018, Carbon Capture and Sequestration Protocol under the Low Carbon Fuel Standard," [Online]. Available: https://ww2.arb.ca.gov/sites/default/files/2020-03/CCS_Protocol_Under_LCFS_8-13-18_ada.pdf. [Accessed 11 10 2023].

[3] US EPA, "United States Environmental Protection Agency, Class VI - Wells used for Geologic Sequestration of Carbon Dioxide," [Online]. Available: https://www.epa.gov/uic/class-vi-wells-used-geologic-sequestration-carbon-dioxide. [Accessed 13 11 2023].

[4] ICVCM, "The Integrity Council for the Voluntary Carbon Market, The Core Carbon Principles," [Online]. Available: https://icvcm.org/the-core-carbon-principles/. [Accessed 10 04 2023].

[5] API, "Estimating petroleum industry value chain (Scope 3) greenhouse gas emissions," [Online]. Available: https://www.api.org/~/media/files/ehs/climate-change/scope-3-emissions-reporting-guidance-2016.pdf. [Accessed 11 05 2023].

[6] Department of Energy, "Department of Energy, GHG Emissions Factors Hub, Emission Factors for Greenhouse Gas Inventories," [Online]. Available: https://www.epa.gov/climateleadership/ghg-emission-factors-hub. [Accessed 11 05 2023].

[7] EDF, "EDF Methane Science Bridge," [Online]. Available: https://www.edf.org/sites/default/files/EDF-Methane-Science-Brochure.pdf. [Accessed 28 03 2023].

[8] IPCC, "IPCC AR6 Chapter 7 Supplemental Material," [Online]. Available: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter_07_Supplementary_Material.pdf. [Accessed 28 03 2023].

[9] A. R. B. a. S. Unnasch, "Energy Intensity and Greenhouse Gas Emissions from Thermal Enhanced Oil Recovery," [Online]. Available: https://doi.org/10.1021/ef100410f.

[10] K. A. F. D. C. D. Dan C. Villalanti, "High-temperature Simulated Distillation Applications in Petroleum Characterization," [Online]. Available: https://doi.org/10.1002/9780470027318.a1819.pub2.

ZERØSIX

Let's create a ZeroSix future together

info@zerosix.co

zerosix.co

US HEADQUARTERS

600 Travis Street, Suite 5050

Houston, TX 77002

FOLLOW US

@zerosixcarboncredit

@zerosixcarbon