GOAL FUND
Gas and Oil Abandoned Land Restoration Fund

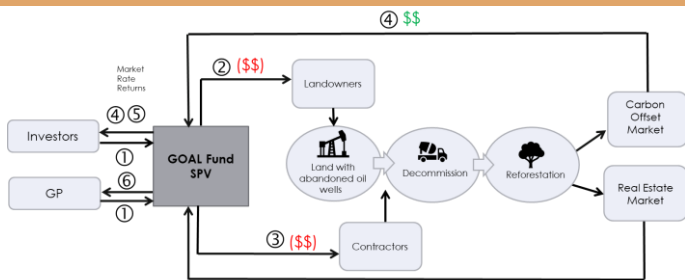| **Investment Thesis**	Address the environmental and policy issue of abandoned, unplugged oil and gas wells through an innovative financial structure that will generate financial, environmental, and social returns through land ownership and restoration. The GOAL Fund will utilize nature-based solutions to generate revenue and provide financial incentives to the private sector to tackle the environmental externality issue.

The Challenge

According to Environmental Protection Agency (EPA) estimations, there are roughly 3.2 million abandoned wells[1] across the United States. Approximately 65% of them are unplugged.[2] These unplugged wells are often associated with surface, soil, and groundwater contamination and methane leakage, posing substantial risks to the environment and human health. Since well plugging is a capital-intensive business, state governments struggle to decommission oil and gas wells with existing resources. Current financial assurances (i.e., surety bonds) only cover a fraction of decommissioning cost. For example, in the state of Pennsylvania, the maximum blanket bond level is set at $25,000, while an average decommissioning cost amounts to $48,000 per well.[3] The funding imbalance places a significant financial strain on the state, as well as an opportunity cost on landowners near wells. On the federal level, the Biden administration is planning to allocate $1.15 Billion to plug orphan wells as part of the Bipartisan Infrastructure Law. [4] However, the number of orphaned wells will likely climb given the cutbacks in oil and natural gas demand due more stringent climate policies in the upcoming decade. The Infrastructure Bill alone will not solve this problem. A long-term and profitable solution is needed.

Innovative Solution

In light of creating a long-term and scalable solution, we developed a Special Purpose Vehicle funded by impact-oriented investors (GOAL-Fund). Fund will be used to purchase the land of the oil and gas wells, plug the wells and restore the land via reforestation. Forestation and its proper management will allow the generation of the carbon credits and their subsequent sale in the Carbon Credit Market. Additionally plugging and restoring wells will lead to property value increase. The stated fund will allow us to not only generate returns to investors but also to create a positive, environmental impact.
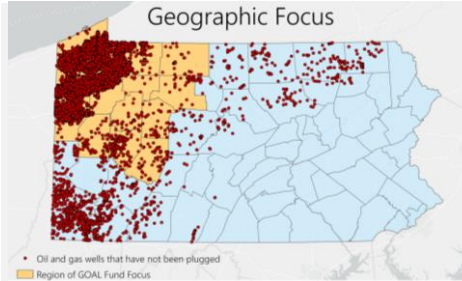
Fund Diagram

① Initial Investment in SPV.
② Purchase abandoned well sites.
③ Payment to contractors to decommission, restore land, and plant trees.
④ Selling carbon credits in the carbon offset market and receiving income for ~ 3 years.
⑤ Selling the land at an appreciated value.
④⑤ Returns to investors based on appreciated value and carbon credit income.
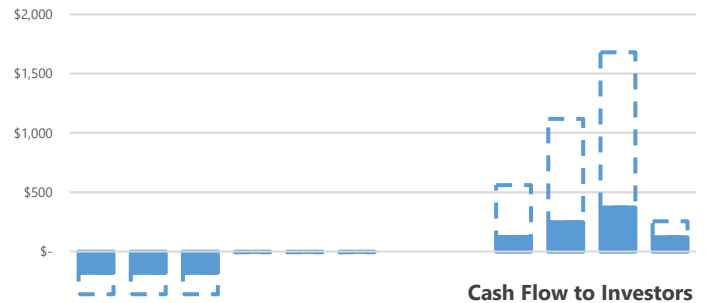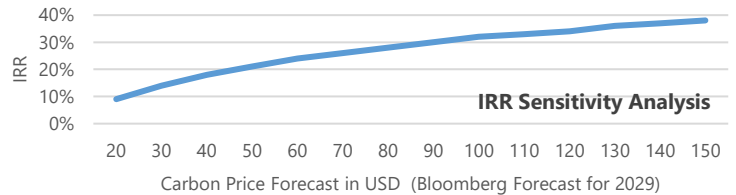⑥ Management fee and returns for GP.

Key Assumptions

[1]Average Land Cost in Pennsylvania: $6,600 USD/acre [2] Average oil pad land size: 2 Acres [3] Average plugging and restoration time: 3 years [4] Average time for oak tree seedlings to mature: 4-5 Years [5] No. of oil wells purchased over a period of 3 years: 8221 (high priority wells)[6] Land Appreciation: 11% - 25% [7] Carbon Credit Price: 30 USD -50 USD

Geographic Focus

Oil and gas wells that have not been plugged
Region of GOAL Fund Focus

The GOAL Fund will initially prioritize decommissioning 8000+ abandoned wells in **the northwest region of Pennsylvania**, given the high density and risks of unplugged wells.

As of 2020, there are 27,972 documented abandoned wells in Pennsylvania, and up to 500,000 undocumented abandoned wells. Currently, the state government has only been able to plug six of these wells each year.[5] Due to the nature of data availability, we focused on documented wells from the Pennsylvania Department of Environmental Protection (DEP) database.

IRR Sensitivity Analysis — Carbon Price Forecast in USD (Bloomberg Forecast for 2029)

Cash Flow to Investors

	2024e	2025e	2026e	2027e	2028e	2029e	2030e	2031e	2032e	2033e	2034e	2035e
Upper end CF	($179)	($179)	($179)	($2)	($2)	($2)	$0	$0	$436	$872	$1,308	$136
Base-case CF	($179)	($179)	($179)	($2)	($2)	($2)	$0	$0	$124	$247	$371	$120

1	Total Addressable Market	USD 1Bn+
2	Target Capital Commitment	USD 540 Mn
3	Time Horizon	12 Years
4	Targeted Project IRR	14% to 21% (Gross)
5	GP Interest	USD 2Mn, Management Fee: 1.5% and 10%
6	Target Investors	World Bank, Impact-oriented investors, family offices and institutional investors
7	Asset Class	Special Purpose Vehicle and Private equity
8	Fund Size in each round	USD 180 Mn
9	No. of rounds	#3
10	Investment Criteria	1. Working on wells that are designated as high priority by DEP to generate environmental impact 2. Investing in sites that are conducive to restoration and highest generation of carbon credits. 3. Considering investing in wells that are clustered together to reduce cost and maximize returns

Environmental and Social Impact

The GOAL Fund commits to impact by interlinking its financial return with its environmental impact. The Fund has two primary impacts on the environment: 1) eliminating methane leakage from unplugged wells, and 2) carbon-sequestering from forestry on the reclaimed land.

Climate Action
In Pennsylvania, unplugged wells emitted 1012 g of methane per year, a greenhouse gas with 86 times the global warming potential of carbon dioxide. This represents about 8% of annual anthropogenic methane emissions in Pennsylvania. The EPA states that actual figures could be up to three times higher, due to incomplete data. **KPI: grams of methane emissions prevented**.

Each acre of trees we plant, meanwhile, will absorb 1,270 metric tons of carbon dioxide annually once mature. These calculations are based on the red oak, a tree commonly found and well-suited to northwestern Pennsylvania. **KPI: metric tons of carbon dioxide sequestered through forestry on lands we purchase.**

Clean Water and Sanitation
Abandoned wells may have degraded well casing that can allow oil, gas, or salty water to leak into freshwater aquifers. This is particularly a concern for unconventional (fracked) wells. In Ohio, a study found that 41 of 183 incidents of groundwater contamination were due to leakage from orphaned wells. **KPI: reduction in number of contaminate units in 1 million units of groundwater (ppm).**

Life on Land
The UN reports that the world has lost 100 million hectares of forest in the past two decades (2000-2020). For this reason, sustainable forest management is a global priority. The GOAL Fund will contribute to sustainable forestry by planting trees in a manner that contributes to sustainable biodiversity in Western Pennsylvania. **KPI: acres of trees planted**. This KPI is critical to both our financial and environmental thesis. We will consult with skilled foresters to ensure the quality of our actions in this space.

Good Health and Well-Being
Unplugged wells endanger human health through emissions of toxic air pollutants such as benzene, hydrogen sulfide, or volatile organic compounds. **KPI: reduction in micrograms per cubic meter (µg/m3) of these air pollutants.**

Additionality

Currently, oil and gas decommissioning in Pennsylvania is largely carried out by the State's Department of Environmental Protection. Even with an influx of capital from the Build Back Better bill, they still lack the capacity to address this issue at scale. We will plug wells that would otherwise not be plugged for perhaps decades – a critical time frame given the urgency of climate change. Additionally, our fund would be the only fund prioritizing nature-based solutions on the restored land, which will create additional impact from carbon sequestration.

Potential Public Private Partnership

Scalability

This model can be scaled and replicated across geographies such as Texas, Oklahoma etc.. There are more than 2.15 Mn unplugged oil wells in the US making the addressable market of 1Bn+ USD. Globally, this model can be applied to regions with ageing oilfields such as Southeast Asia, with a decommissioning market ranging from $30 billion to as much as $100 billion. Furthermore, there is a scope of modifying this model to incorporate restoration of land from industries such as mining sites, degraded landscapes and off-shore oil and gas wells.

Risk/Probability	Mitigation
Inability to generate carbon credit	Technical and environmental problems may prevent us from generating revenue through carbon credits. Risk can be mitigated through land appreciation, its sale/lease for alternative sustainable uses such as solar and wind energy.
Volatility of the Carbon Credit Market	Price for the Carbon Credits by 2029 will range anywhere from 50$ to 224$ per ton. As price fluctuation partially depends on market regulation, being involved in regulatory talks will be the key.
Quality of the Carbon Credits	Ensuring high quality of the Carbon Credits is directly proportional to its market price and legitimacy. Proper selection of management for the contractors will allow high quality of carbon credits and true impact.
Resistance of landowners to sell the land	Landowners may not want to sell, or expectation of the land price increase may discourage landowners from selling their land in a reasonable timeframe. To ensure successful implementation of the project, community engagement and stakeholder informational sessions on methane leakage will be critical.
Pace of the land appreciation	Plugging wells and restoring the land will allow an up to 25% jump in the property values, executing the sale in terms of its correct timing will allow maximizing profits.
Environmental Risk	Plugging the well incorrectly will present a further health hazard. Partnering with the right contractors will reduce associated risks.
Force-Majeure	Force majeure event, similar to pandemic could halt implementation of the project. Risk can be hedged via insurance.

Sources

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3.Ibid
4.Share Biden Administration Announces $1.15 Billion for States to Create Jobs Cleaning Up Orphaned Oil and Gas Wells, US Department of the Interior https://www.doi.gov/pressreleases/biden-administration-announces-115-billion-states-create-jobs-cleaning-orphaned-oil
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6.BloombergNEF: Carbon offset prices set to increase 50-fold by 2050, Edie, 2022 https://www.edie.net/news/9/BNEF--Carbon-offset-prices-set-to-increase-50-fold-by-2050/