

FLIP SIDE

How stranded assets will give rise to stranded liabilities



Analyst Note

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About Carbon Tracker

The Carbon Tracker Initiative is a team of financial specialists making climate risk real in today's capital markets. Our research to date on unburnable carbon and stranded assets has started a new debate on how to align the financial system in the transition to a low carbon economy.

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Theron founded the ARO Working Group to provide an information clearinghouse of multi-disciplinary experts analyzing the financial risks to states, pension funds and others flowing from unsecured oil and gas asset retirement obligations.

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Key Findings

1. Laws require that oilfield assets must be properly “retired” at the end of their productive life to protect human health and the environment.
2. When assets become stranded due to excessive production costs, retirement costs are accelerated.
3. The costs to retire America’s idle and aging oil and gas infrastructure are already exceeding industry resources, and the energy transition will dramatically accelerate the shortfall by forcing the entire industry into premature retirement.
4. Oil and gas companies have no retirement savings, leaving governments and taxpayers to pick up any shortfalls.
5. Regulators are waking up to this reality, forcing companies to pony up more financial assurance for retirement, thereby increasing production costs and causing oilfield assets to become stranded sooner and more often.

By law oil companies must properly close wells no longer in use. Legally this is known as an Asset Retirement Obligation (ARO). Under a business as usual approach many of these retirement costs lie decades in the future.

The energy transition to a low carbon economy, which will shrink demand for oil, will accelerate this process – forcing companies to pay these costs years or decades ahead of schedule. Premature asset retirement could easily see costs and commitments rise from a reported \$87 billion to \$294 billion for the seven super oil majors alone.

The majors will continue to “de-risk” by selling late life assets and laying off asset retirement liabilities to less viable operators. Marginal producers who cannot shed the obligations will go bankrupt, pushing those orphaned liabilities to the state.

The problem for the industry is that regulators can see this slow-moving train wreck. In response, states are beginning to take action. Steps include increasing bond amounts to fund well closures and forcing companies to close wells that have been idle for years or even decades.

Introduction

Carbon Tracker's fundamental insight is that the oil and gas industry's growth plans do not fit in a low carbon world. As such there will likely be fierce competition to meet dwindling demand for hydrocarbons—making production costs a key indicator of future viability. Industry leaders agree.¹ The risk is captured in the term “stranded assets”. But there is a flip side to “stranded assets,” and that is stranded liabilities. Among those are the cost of retiring production infrastructure in accordance with environmental law and the risk that these liabilities will become stranded along with the assets.

Industry has a duty to pay these costs, but if they fail to, taxpayers must foot the bill.

Unlike most sectors, oil and gas companies are legally obligated to decommission their assets in accordance with environmental standards at the end of their productive lives. Accountants call these liabilities “asset retirement obligations” (AROs).

The industry's asset retirement costs have always been significant. Standard & Poor's reported that decommissioning and environmental liabilities amounted to 50% of European oil and gas companies' reported debt obligations in 2006. The industry has no retirement savings, but because the maturities of these obligations are typically spread over 60 to 80 or more years, investors have assumed they will be settled with future profits from operations on a pay as you go basis. The energy transition challenges that assumption and threatens to bring those costs forward in time.

There is a data gap, and it is material

Pulling asset retirement costs forward would be worse for oil and gas companies, but how much worse? The financial statements provide no easy answer. Why? Companies are not required to disclose the relevant information, and rarely do.

Let's start with the available information. AROs are mostly measured and reported at expected present value using credit-adjusted rates. Oil and gas assets are long-lived, spanning decades, and AROs do not mature until these assets are permanently retired. Therefore, discount rates matter a great deal. Credit spreads can range from a few percent to double digits, depending on how risky the company is perceived to be by the market.

To know how such widely varying discount rates impact a company's AROs, one would need to know the estimated timing and amount of the ARO cash outflows. Companies do not disclose this information. Nor do they typically report the discount rate used, the period of time over which costs are discounted, inflation assumptions, the weighting of cash flows over time, or the undiscounted ARO liability. As a result, investors cannot easily assess the financial risk of ARO acceleration.

Despite this, applying some simplifying assumptions to reported ARO estimates suggests ARO acceleration risk is material. As of 2018, the AROs of the seven super oil majors (BP, Chevron, ENI, Exxon, Shell, Total, and ConocoPhillips) totaled \$87 billion on a discounted basis—an estimated (by us) \$147 billion on an undiscounted basis.

¹ For example, Exxon has noted that in a 2°C scenario where supply exceeds demand, “the lowest cost of supply will be advantaged.” ExxonMobil, 2019 Energy & Carbon Summary (2019).

In effect, the range between \$87-\$147 billion represents what the company believes it will cost in the future, taking into account the time value of money, and what it might cost to settle all obligations today—a full range of possibilities. This represents between 8%-14% of the super majors' combined market capitalization.

The above assumes the undiscounted cost estimates are spot on. But are they? ARO estimates are generally prepared based on very limited information, as no detailed evaluation of retirement costs is done at project inception (it would be neither possible nor economically feasible). Applying a 2X multiplier to the data above, consistent with accuracy ranges on Class 5 estimates² yields a range of ARO acceleration risk between 8%-28% of combined market capitalization of the super majors.

ARO acceleration risk varies widely for different companies. To illustrate, the range for Exxon is 5%-20% of market cap. The range for ConocoPhillips is 12%-44%.

ARO acceleration risk may be far more material for small oil companies. The oil majors have a practice of spinning off or selling late-life assets to lesser producers. Take, for example, ConocoPhillips' 2019 year-end announcement of a reduction of \$2.3 billion in asset retirement obligations from closed and pending dispositions.³ Because of this, smaller producers are likely to have a higher relative proportion of matured AROs than the majors. Such late stage assets may have lower margins and be more susceptible to closure by market forces, resulting in retirement acceleration. By some strange karma, these liabilities may then boomerang back on the majors, if the smaller companies are unable to pay.

For example, under California law, the state can pursue previous operators for plugging and decommissioning responsibilities when the current operator defaults. Following the bankruptcy of Venoco in 2017, California called on ExxonMobil to plug and abandon Venoco wells previously operated by Mobil Oil Company. ExxonMobil ultimately agreed to plug and decommission 32 of the Venoco wells. Guarantor liabilities of this type are not recognized as liabilities on oil company balance sheets but may balloon as regulators pursue deep pockets to decommission a growing population of "orphaned" wells.⁴

Defaults will bear surprises for investors

The initial impact will be on equity holders. Would those levels of liability pose a threat to a company's debt holders? That depends on many factors, but a key one is the priority of those obligations in bankruptcy, where senior creditors have absolute priority over junior ones. Surely, one might assume, AROs are claims for environmental damage which would be treated as unsecured tort claims which are junior to debt holders. The problem is, AROs are not unsecured tort claims.

Under U.S. bankruptcy law, AROs are non-dischargeable obligations. They are often addressed by giving administrative priority to them—meaning they take priority over all unsecured claims and uncollateralized secured claims. Similar regimes exist in other jurisdictions. AROs follow the assets,

² See AACE International Recommended Practice No. 18R-97 - Cost Estimate Classification System at https://www.costengineering.eu/Downloads/articles/AACE_CLASSIFICATION_SYSTEM.pdf.

³ <http://www.conocophillips.com/news-media/story/conocophillips-reports-fourth-quarter-and-full-year-2019-results-announces-preliminary-2019-year-end-reserves-quarterly-dividend-and-increase-in-existing-share-repurchase-authorization-to-25-billion/>

⁴ <https://ccst.us/wp-content/uploads/CCST-Orphan-Wells-in-California-An-Initial-Assessment.pdf>

which means that a bankrupt company undergoing reorganization cannot continue operations or sell assets without the ARO albatross around its neck.

Moreover, regulators can demand and receive compliance with ongoing environmental obligations during the course of a bankruptcy proceeding. This forces subsequent reorganization plans to address these obligations in order to be approved by the court. The firm's financial creditors will be forced to make way for the ARO elephant in the room.

There's no 401(k)

Governments are creditors of last resort for AROs. If industry cannot pay, taxpayers will foot the bill for these "orphaned" wells.

One solution might be to have companies set aside cash for the inevitable settling of the AROs. But there is no sinking fund or retirement savings account established to cover these expenses—just the business-as-usual assumption that they can and will be paid from future profits on a pay as you go basis. Equivalent funds at the state level are typically exceeded by the existing inventory of orphaned wells.

A recent report from California estimates \$500 million dollar price tag for 5,000 wells alone—approximately \$100K per well. But this does not include an additional 67,000 marginal wells that are likely to close soon. The state has a small fund for these purposes, but it would easily be exhausted by the existing orphan well inventory.⁵

Another solution would be for companies to provide adequate financial assurance that reflected the true costs of closure. The regulations for doing so exist today, but it is universally recognized that current bonding schedules are insufficient to cover the true costs. For example, a recent report found that California has \$110 million in bonds securing more than \$9.2 billion in estimated plugging costs.⁶

Of course, industry opposes such solutions since it would likely lead to an increase in annual bond premiums and collateral demands from bond sureties. Indeed, some have argued that increasing bonding premiums would make existing wells uneconomic.⁷

But the risk that taxpayers will be left holding the bag is becoming increasingly difficult to ignore. Moreover, industry's argument calls into question why you would allow the oil and gas activity in the first place, if the project cannot pay for its eventual retirement.

⁵ California Commission on Science and Technology, "Orphan Wells in California: An Initial Assessment of the State's Potential Liabilities to Plug and Decommission Orphan Oil and Gas Wells."

⁶ California Commission on Science and Technology, "Orphan Wells in California: An Initial Assessment of the State's Potential Liabilities to Plug and Decommission Orphan Oil and Gas Wells."

⁷ <https://www.petroleumnews.com/pntruncate/771890741.shtml>

The energy transition will only compound the problem

The costs of retirement would be a concern even under a business as usual scenario; the U.S. shale industry has struggled to generate free cash flow making it fair to ask how those wells could fund their closure. But the size of the task is astounding: approximately 3.7 million wells have been drilled in the U.S. since 1859 and as of 2017, there were approximately 1 million active wells.⁸ The EPA estimates that, as of 2016, there were an additional 1.65 million inactive wells that had not been plugged and abandoned—and this excludes old wells.⁹

However, it is not hard to imagine a series of self-reinforcing feedback loops that would quickly complicate the ARO picture for a range of stakeholders. Sustained reduced demand for fossil fuels would lead to lower commodity prices and diminished demand and price forecasts. Lower sustained commodity prices might result in de-booking of reserves and an increase in the cost of credit where loans are based on proven reserve amounts. It would also lower revenues, likely translating into lower margins, reducing the cash available to fund AROs. If cuts are made to maintenance expenses, enhanced recovery or capital expenditures, cash would be saved in the short-term but future cash flows would be reduced. The useful lives of the assets will be shortened by both lower prices and lower overall recovery; this directly accelerates retirement timing and associated ARO costs.

Regulatory and legal costs (e.g., carbon taxes, costs to control fugitive methane emissions, climate litigation) could further impair profitability and increase breakeven points.

Within the firm, a financial and accounting feedback loop would build. Lower commodity price expectations and higher production cost forecasts will trigger impairment testing rules, likely leading to some impairments---Repsol's outlook shift to a "low-carbon" scenario wiped nearly 5 billion euros off its books. Lower expectations might also result in revised project sanction parameters, causing some marginal projects to become unlikely to be sanctioned.

Reduced net revenues would also accelerate the retirement of marginal, late-stage assets, bringing ARO costs forward.

In a turn of events that is paradoxical to all but trained accountants, earlier retirement increases not just the ARO *liability*, but also the carrying cost of the *producing asset*—since ARO estimates are capitalized as part of the asset. Higher carrying costs due to accelerating AROs will make asset impairments more likely, and more severe.

Those impairments will signal to investors and regulators that there is real financial risk. Investors watching this unfold would de-rate the industry as growth dwindled, shifting capital out of fossil fuels into other "growth businesses."

The domino effect

We would likely see the strongest in the industry "de-risk," with financially viable companies seeking to lay off liabilities to less viable ones. Marginal producers who cannot shed the obligations will go bankrupt, pushing those orphaned liabilities to the state. However that is not the end of the problem—that is the beginning of the end.

⁸American Geosciences Institute, "Abandoned Wells: What happens to oil and gas wells when they are no longer productive?" (2018).

⁹ https://www.epa.gov/sites/production/files/2018-04/documents/ghgemissions_abandoned_wells.pdf

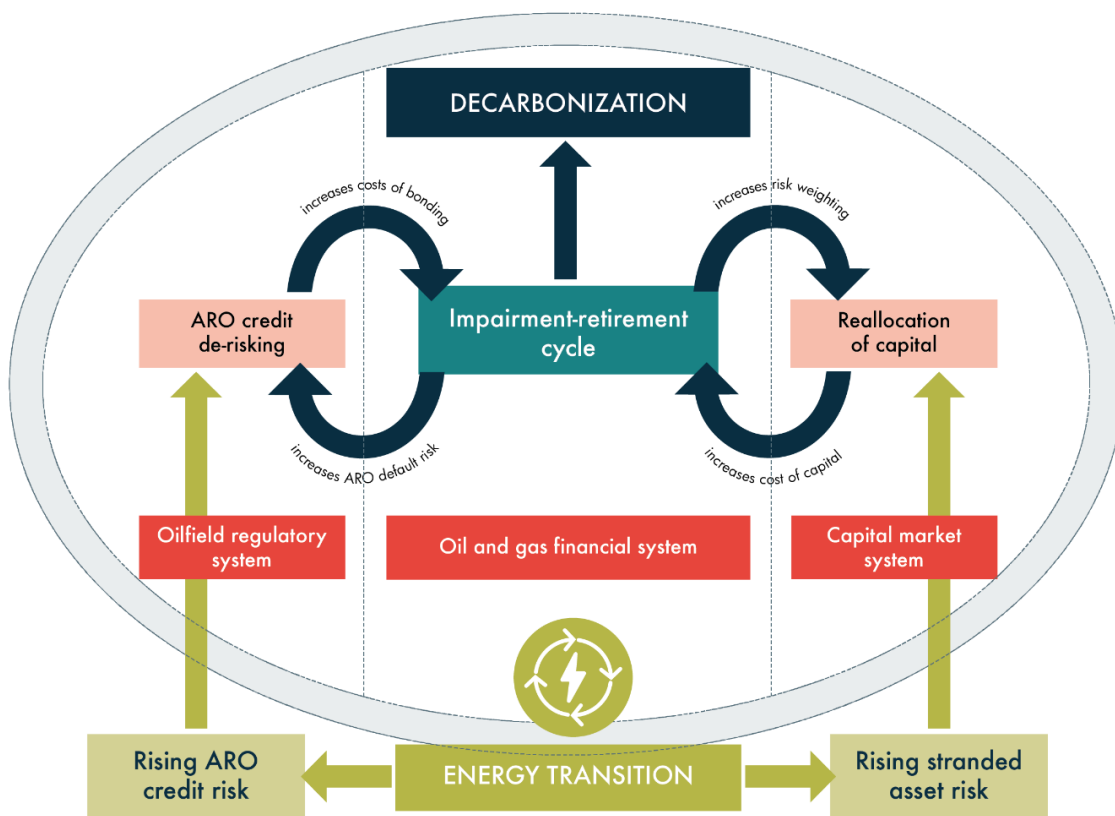
Regulators, faced with mounting costs, will seek to staunch the bleeding by pushing those costs onto remaining operators. What would the industry regulators do in response? It is not hard to imagine—they would seek to de-risk by:

- Prohibiting the current practice of “suspending” wells for years and decades without initiating decommissioning
- Increasing bonding amounts to minimize cost shifting
- Prohibiting transfers to marginal players
- Conditioning new permits on remediation of existing abandoned wells

Legislatures may get in on the act by requiring joint and several and predecessor/successor liability. Precedents for these abound in other areas of environmental law and offshore oilfield abandonment regimes.

In effect, all of the above will raise costs for the industry—either through actual cash outlays to regulators, or through the premiums and collateral they must post to obtain third party financial assurance. Increased costs will eat into margins and reinforce the feedback loops described above.

FIGURE 1 ARO ACCELERATION



The above scenario is easy to imagine but the reality is, it is already happening. That includes even in traditionally conservative American states like Alaska and North Dakota—where the only thing more loathsome than taxing industry is taxing the public to pay to clean up after industry.

For example, in Alberta, Canada, the Auditor General is looking into whether the government has measures in place to adequately deal with orphaned wells and related environmental liabilities, which it has characterized as a “huge area of risk” for the government. The number of wells that have been orphaned—and thus become the province’s responsibility—has increased five-fold in the

past five years alone.¹⁰ Those figures do not include the thousands of wells owned by a handful of oil and gas companies that are currently in receivership. Those that remain unsold will become Alberta's albatross.

Alberta's Energy Regulator officially puts the provinces liability at CAD\$58 billion, but internal documents have indicated that in a worst-case scenario, those liabilities would reach \$260 billion.¹¹ The Alberta Liability Disclosure Project conducted a bottom-up analysis and estimates total liability (abandoned and producing wells) closer to (CAD\$100 billion).¹² Anything in that range would be a staggering cost when compared to the \$1.6 billion in liability security the government has collected.

Some states have seen the writing on the wall

Alaska has raised its per well bond from \$100K to \$400K and set the maximum blanket bond (an amount that might cover an unlimited number of wells) at \$30M, ignoring a substantially lower industry proposal of \$12M.¹³

Alaska is also looking to stop the transfer of assets from those with the financial capital to pay to those who do not. For example, it is scrutinizing BP's \$5.6 billion proposed transfer of oil and gas assets to Hilcorp. In the past, many states have simply required the filing of a one-page transfer or ownership. Not here. Alaska has obtained an economic consulting firm to examine Hilcorp's ability to pay under various scenarios, scrutinizing the financial assurances, and conducting downside financial analysis and ability to pay.¹⁴

Similarly, in several months North Dakota will begin to require that all "idled" wells must be closed within seven years, stopping the practice of ceasing production but not retiring the assets.¹⁵

North Dakota Oil and Gas Division Assistant Director Bruce Hicks has noted that the abandoned well problem "is starting to get out of control." He has noted that companies with "junk" wells have tried to unload them to other operators, resulting in "a tremendous liability [to the state]."¹⁶ The state is now prohibiting this practice unless the purchaser acquires a single-well bond "in an amount equal to the cost of plugging the well and reclaiming the well site."¹⁷

Colorado's citizens are looking to tackle the problem on the front end, with a ballot proposal to condition drilling permits on obtaining bonds worth \$270,000—a substantial increase from \$20,000.¹⁸ It is likely that any financial assurance provided for such clean-up will have to be backed by substantial cash collateral—in a world transitioning away from oil and gas, oil field equipment is not likely to be sufficient.

¹⁰ <https://www.theglobeandmail.com/business/article-albertas-auditor-general-launches-probe-as-province-struggles-with/>

¹¹ <https://globalnews.ca/news/4617664/cleaning-up-albertas-oilpatch-could-cost-260-billion-regulatory-documents-warn/>

¹² <https://www.theglobeandmail.com/opinion/article-alberta-ignores-the-ticking-time-bomb-of-orphaned-oil-and-gas-wells-at/>

¹³ <https://www.alaskajournal.com/2018-10-17/regulators-air-draft-plan-increase-well-bonding-amounts/>

¹⁴ <https://www.documentcloud.org/documents/6548890-Corri-Feige-Letter-to-Lawmakers-11-12-19.html>

¹⁵ Page 8: <https://www.dmr.nd.gov/oilgas/C27828.pdf>

¹⁶ https://bismarcktribune.com/bakken/as-abandoned-oil-wells-climb-regulators-consider-ways-to-stop/article_58c39a16-73a1-5592-ba5f-fc7c9c50cbcd.html

¹⁷ Page 10: <https://www.dmr.nd.gov/oilgas/C27828.pdf>

¹⁸ <https://www.cpr.org/2020/01/07/despite-prop-112s-loss-colorados-fracking-foes-are-back-with-6-new-ballot-measures/>

Conclusion

We believe that stranded asset retirement obligations will not just be a byproduct of distress, but a driver of it—indeed, this is already happening. A small oil and gas producer, Southland, recently filed for bankruptcy, citing “significant plugging and abandonment” obligations as one of the items that precipitated the bankruptcy.¹⁹

Given this, Carbon Tracker in conjunction with partners Eratosthenes and the ARO Working Group will be focusing this year on the risk of ARO acceleration arising from the energy transition. We will be looking at the risk that stranded assets will give rise to stranded liabilities. We will also be looking at the flip side—the real possibility that a growing recognition of stranded liabilities will speed the realization of stranded assets.

¹⁹ <https://media.bizj.us/view/img/11589006/southland-first-declaration.pdf>

Disclaimer

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