

From carbon to Net Zero: the crucial role of oil services



- **Oil services companies are positioning themselves to help energy companies reduce their emissions and move into renewable energy.**
- **Following the decline in oil prices at the beginning of the Covid-19 pandemic, they acted to increase profit margins and reduce debt, putting them in a position to invest for the future.**
- **Oil services companies could offer investors a way to benefit from the transition.**

Within the giant energy industry, oil services companies have long been the unnoticed providers of critical amenities. They provide the equipment typically used for exploration and production, prospering when hydrocarbon prices are high and production is booming. Yet it's little noticed that they are also preparing to help facilitate the shift into renewables as oil and gas production is forecasted to decline over the next 30 years.¹

The International Energy Agency's (IEA) latest central scenario, which assumes governments meet existing pledges on climate action but do no more, sees demand for oil peaking before 2030, before then dropping to 55 million barrels per day by 2050 from about 100 million in

2023. As the mirror image of this decline, the IEA also forecasts total clean energy investment will reach USD 2 trillion by 2030.

For the oil services companies that are developing the technologies needed for the transition, this represents an opportunity to straddle old oil and new renewable energy – balancing the decline of the old industry with the boom of a new one.

That means oil services companies could offer a unique way to play the transition. Their share prices tend to be relatively highly correlated to the oil price. In fact, since its inception on 31 March 2023, the VanEck Oil Services UCITS ETF has rallied by approximately 14%, reflecting a rise in the oil price². Yet while the biggest names like Halliburton, Schlumberger and Baker Hughes earn most of their revenues from hydrocarbons today, they plan to shift into clean energy over time. That means their share prices could become more related to the rise of renewable energy, offering investors a practical way to bridge the energy transition. Nevertheless, investors should take the risks associated with fossil fuel-related assets into account when investing in oil services companies.

¹ Source: IEA, World Energy Outlook 2023 – <https://www.iea.org/reports/world-energy-outlook-2023>

² At time of writing, 27 November 2023

Oil and gas face an near existential challenge

If the IEA's central scenario is correct, the oil and gas companies with the highest cost of production will find little demand for their hydrocarbons. It should be noted that the recent mergers among major oil companies suggest that they might not concur with the extent of the decline, but few commentators would argue with the direction of travel.³

Against this backdrop, the oil and gas industry must shrink its carbon footprint. The IEA states that oil and gas operations account for nearly 15% of energy-related greenhouse gas emissions. The production, transport and processing of oil and gas emitted the equivalent of 5.1 billion tons of CO₂ in 2022, according to its calculations. Reports suggest that greenhouse gas emissions from oil and gas facilities are about three times higher than their producers claim⁴. Such under reporting would make things even worse than they appear.

Anticipating the shift to renewable energy, and under pressure from shareholders, some European energy companies have to varying degrees begun to shift to

green power. The shift poses a near existential threat to the industry – although it's conceivable that some lower cost producers will remain viable in 2050 – but also a set of unique opportunities.

Oil and gas companies are seeking to reduce Scope 1, 2 and 3 emissions – encompassing not just the Scope 1 emissions that they control but also the Scope 2 and 3 emissions that arise indirectly from their activities. Scope 1 emissions can be reduced by re-engineering production, processing and logistics. Typical measures include:

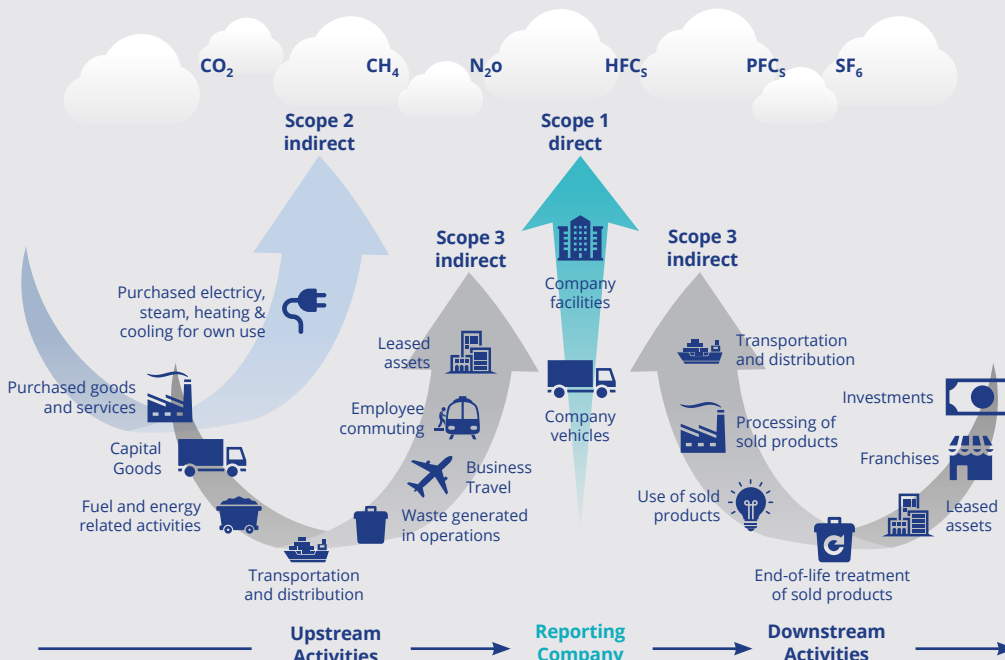
- Developing carbon capture usage and storage
- Improving energy efficiency of operations
- Eliminating methane leaks or other waste.

But Scope 3 emissions are oil and gas companies' greatest challenge. These occur across the company value chain and are connected with both upstream and downstream activities. With regards to these, entirely new technologies and solutions must be invented – for example through the use of green hydrogen – offering an opportunity for oil and gas companies, as well as oil services companies.

Oil and gas company emissions

The US Environmental Protection Agency estimates that global greenhouse gas emissions consist of 76% carbon dioxide (CO₂), 16% methane, 6% nitrous oxide (N₂O) and 2% from fluorinated gases. The fossil fuels industry is one of the largest greenhouse gas emitters: it is estimated that the oil and gas sector generates 42% of global CO₂ and 23% of the global methane emissions⁵. The reality of climate change means that these emissions must be cut for the companies to be viable in future.

Overview of greenhouse gas emissions protocol scopes and emissions across the value chain



What are Scope 1, 2 and 3 emissions?

These terms refer to the widely-used classification system for different carbon emissions, as described below.

Scope 1: Emissions directly issued by the company, for example from its own vehicles or facilities.

Scope 2: Indirect emissions caused by the production of energy used by a company.

Scope 3: All other indirect emissions that occur across the value chain and are outside of the organization's direct control. They can include, among others, emissions from usage of a company's products, waste disposal, transportation and distribution. Deloitte estimates that Scope 3 emissions represent on average 70% of the total emissions of a company.⁶

³ In October 2023, Chevron acquired Hess and ExxonMobil acquired Pioneer Natural Resources.

⁴ Oil and gas greenhouse emissions 'three times higher' than producers claim | Climate crisis | The Guardian

⁵ Source: McKinsey, The future of oil and gas is now: How companies can decarbonize | McKinsey

⁶ What are scope 1, 2 and 3 emissions? | Deloitte UK

Despite the ongoing challenges, there can be promising opportunities for energy companies during the transition to a decarbonized energy system. However, balancing reductions to fossil fuel production against the expectations of shareholders and consumers can be tricky, as shown by energy companies pulling back from their renewable energy programs in 2022 and 2023.

What do oil services companies do?

Companies in the oil services industry work in the following fields:

- **Drilling services** – activities related to the drilling of wells, including drilling fluids management, directional drilling and well construction.
- **Oilfield services** – providing services to companies after a well is drilled. This includes oil pumping, well stimulation techniques (such as hydraulic fracturing or fracking), and ongoing well monitoring and maintenance.
- **Drilling and Oilfield equipment** – providing the hardware necessary for hydrocarbons extraction, like drilling rigs, bits, pumps, compressors, pipes, safety equipment and others.
- **Offshore services** – catering to companies that extract hydrocarbons in marine environments, providing them with vessels, subsea field management and rig construction and maintenance.
- **Analytics** – helping oil and gas producers to model drilling operations, conduct seismic surveys and monitor the state of reservoirs.

The role of oil services companies in decarbonization

Oil services companies are adapting their expertise to become specialist enablers of the energy transition, effectively helping in the decarbonization of the energy industry. Indeed, oil and gas companies may not have the in-house resources to decarbonize their activities and move into renewable energy. Just as they rely on oil services companies in their traditional activities, so too they may need to do so in the new world.

Often projects related to decarbonization and renewable energy are highly complex so that specialized knowledge is needed. Oil services companies are well positioned to provide it and are growing their presence in this field. Through internal research and development, innovation, acquisitions and partnerships, they are quickly building portfolios of businesses that they regard as crucial for the future.

One of the world's largest oil services companies, Schlumberger, grew its transition technologies portfolio by 30% in 2022 and is projecting that it will cross the \$1bn threshold in terms of revenues in 2023⁷. Another industry giant, Baker Hughes, in 2022 received orders worth \$400mn in the field of new energy sources and invested \$556mn in research and development, signaling its strong commitment to innovation⁸. Finally, the oil services company NOV Inc. reported in 2022 that 4% of its revenues (~\$340mn) were already coming from renewables⁹.

Energy industry decarbonization

The most direct way for oil services companies to influence greenhouse gas emissions is by designing more carbon- and methane-efficient production technologies in drilling, reservoir management and oilfield management.

This could reduce emissions occurring as a result of drilling activities, as well as energy generation necessary to operate the machinery. During testing, drilling and production companies might choose to emit the resulting excess gas into the air. Some of the more common practices include flaring (controlled burning) or venting (direct release to the atmosphere), which release methane into the atmosphere. On the other hand, methane can also form during the drilling process or leak unintentionally. Oil services companies produce equipment to detect and mitigate methane emissions, including sensors, analytics tools, flare gas recovery systems, compressors and leak-proof hardware. They also provide solutions to decarbonize the hardware by replacing and electrifying the oilfield equipment. At the same time, techniques like enhanced oil recovery help to maximize oil recovery from existing reservoirs and decrease the need to drill further wells.

As well as emissions mitigation, many of the leading oil services companies are working on carbon capture, utilization and storage (CCUS) solutions. Carbon capture normally comprises of three stages:

1. Capture: CO₂ is captured at its source, typically from large point sources such as power plants, cement factories, steel mills and other industrial facilities. There are different methods of capture, including post-combustion capture (after burning fossil fuels), pre-combustion capture (before burning) and oxy-fuel combustion.

⁷ Schlumberger website, Investor relations section

⁸ Baker Hughes website, Investor relations section

⁹ Nov website, Investor relations section

2. Transport: Once captured, the CO₂ needs to be transported from the capture site to a location suitable for storage.

3. Storage: The captured CO₂ is stored in geological formations, such as depleted oil and gas fields, deep saline formations, or other underground reservoirs. The stored CO₂ remains underground in secure geological formations, effectively removing it from the natural carbon cycle. This storage process is known as carbon sequestration.

Carbon capture technologies are a natural extension of oil services companies' range of services. As demand for less carbon-intensive sources of energy grows, it might force oil and gas companies to look at oil service providers for ways to reduce their footprint.

Geothermal energy

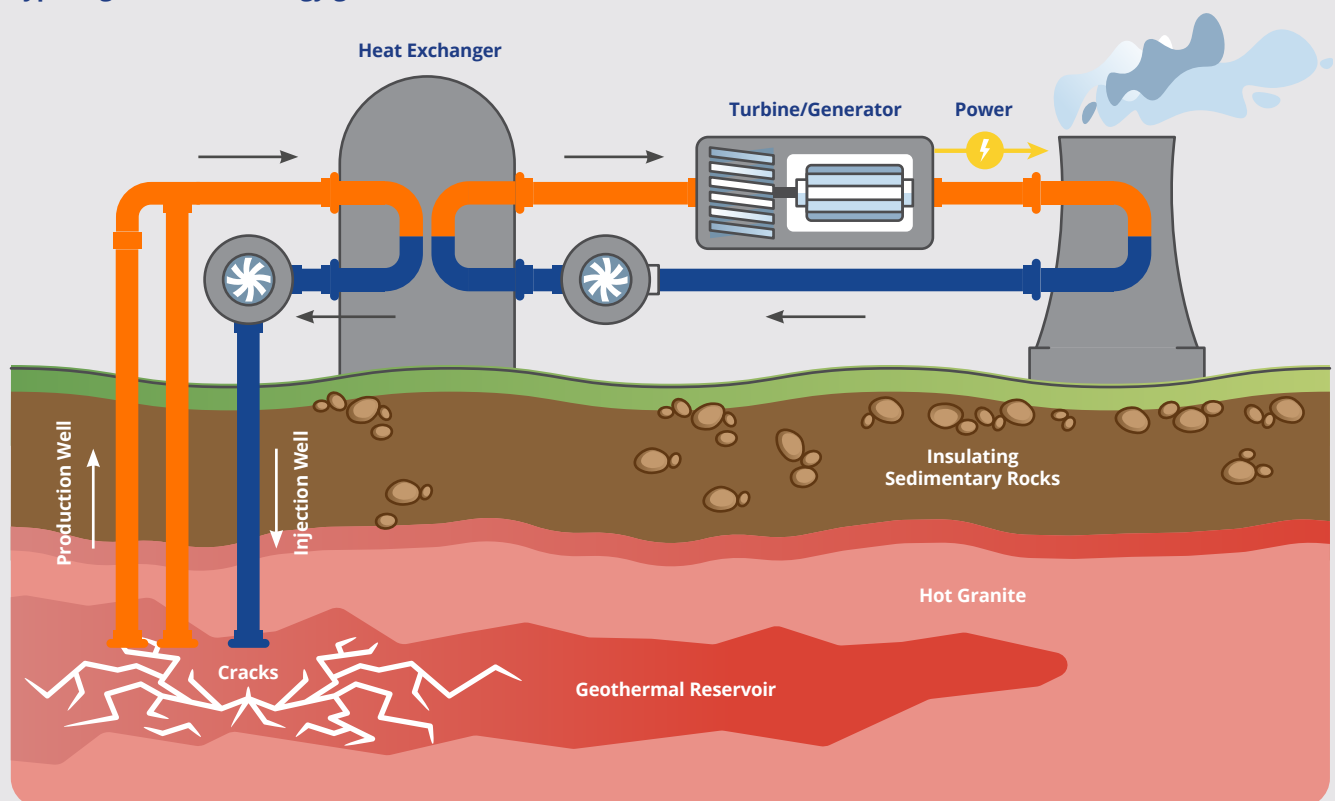
In a race towards carbon neutrality, geothermal energy has largely been driven to the sidelines. However, this might soon change, as governments around the world are starting to appreciate its consistency, reliability, relatively small carbon footprint and high thermal efficiency. For example, the government of Vienna has already started testing a 3,000-meter-deep reservoir to the east of the city,

and the city's utility provider plans to build its first geothermal 20MW power plant in 2026. What's more, last year Germany's economy ministry announced a target of 100 new geothermal projects by 2030, targeting output of as much as 10 TWh of underground geothermal energy.

Oil services companies are uniquely positioned to contribute to geothermal energy. They possess drilling capabilities, knowledge of reservoir engineering, and experience in managing sub-surface operations. Geothermal energy entails a set of challenges and technical difficulties that only experienced players can withstand. Temperatures can reach up to 400 degrees Celsius in wells with extremely high pressures, making cutting-edge hardware and software necessary to operate. These skills are transferable to geothermal energy projects, where drilling deep wells is crucial to tap into hot rock formations. Additionally, reservoir management practices from the oil industry can be adapted for efficient extraction of geothermal fluids, contributing to the overall development of geothermal resources.

For decades, oil services giant Halliburton has been active in the US geothermal energy sector, providing completion tools, logging, horizontal pumping systems

Typical geothermal energy generation scheme





and cementing. This continues in California and Nevada, where increased demand for renewable energy has sparked a resurgence in legacy geothermal field expansion. Halliburton has more than 70 years of experience in geothermal energy exploitation, providing integrated services that encompass the whole lifecycle of a site. From sub-surface analysis and testing, to well construction and completions and production, Halliburton has developed an industry-leading framework.

Offshore wind

Oil services companies engaged in offshore oil and gas drilling possess expertise and technologies that are valuable for the offshore wind industry. Offshore drilling often takes place in challenging environments characterized by rough seas, high winds, storms and extreme temperatures, and therefore requires a high degree of expertise and specific equipment. Companies such as NOV Inc and TechnipFMC excel in the installation of subsea infrastructure, including pipelines, control systems and foundations: capabilities that are directly transferable for the installation of wind turbines, subsea cables and other components of fixed and floating offshore wind farms. Extensive geological survey expertise and seabed analytics capacities can be critical for selecting suitable locations for offshore wind farms and designing robust foundations.

Hydrogen

Due to their expertise in working with natural gas, oil services companies can play a role in the emerging hydrogen industry, particularly in the production and distribution phases. Oil services companies may leverage their expertise in process engineering, plant construction and operations to facilitate the development of hydrogen production facilities. They are well-versed in managing complex supply chains and possess knowledge in transporting and handling fluids, including the areas of

pipeline infrastructure, storage solutions and transportation modes. They can also support the development of a hydrogen infrastructure that includes production plants, electrolysis capacities and distribution centers. Companies involved in the offshore wind industry provide subsea infrastructure solutions for production and delivery of “green” hydrogen.

One of the leaders in the field is Tenaris, which leverages its experience in high-pressure environments to create hydrogen storage systems capable of working at pressures of up to 1,000 bar for industrial and transportation applications. Its gas pipeline know-how has enabled it to create solutions for hydrogen transportation. Baker Hughes is another company with significant capabilities in the field, helping utility companies to future-proof their infrastructure. It has designed and successfully tested NovalT16 turbines that can burn gas blends of up to 100% hydrogen.

Critical minerals

Schlumberger is using its geological and chemical expertise to make the lithium mining process more sustainable and efficient. Traditionally, lithium is produced using a process called lithium brine extraction, which is more economically effective than hard rock mining. The process starts when the brine is pumped into evaporation ponds, where water evaporates to leave behind concentrated lithium. This comes at a severe environmental cost, as it requires large amounts of water, and can therefore exacerbate water stress and impact local ecosystems. It is also quite slow, often taking several months to concentrate the brine to the desired lithium concentration. What’s more, the slow extraction rate may limit the ability to rapidly scale up lithium production to meet increasing demand. Schlumberger has developed a new advanced direct lithium extraction technology, which consumes 85% less water than current extraction

methods and allows lithium to be extracted in a matter of weeks instead of months.¹⁰ It also helps to maximize the value of lithium-rich resource bases, reducing the need for further exploration and the footprint needed to maintain lithium production level.

Improving Fundamentals

As they embark on their own adaptation to the energy transition, oil service providers have solid fundamentals. They are benefiting from the strength of the oil price in a

world of constrained capacity, as their share prices tend to have a relatively high correlation with fluctuations in the price of crude. However, at the same time they have improved profit margins following actions taken during the Covid-19 hiatus in economic activity that sent oil demand and prices sharply lower.

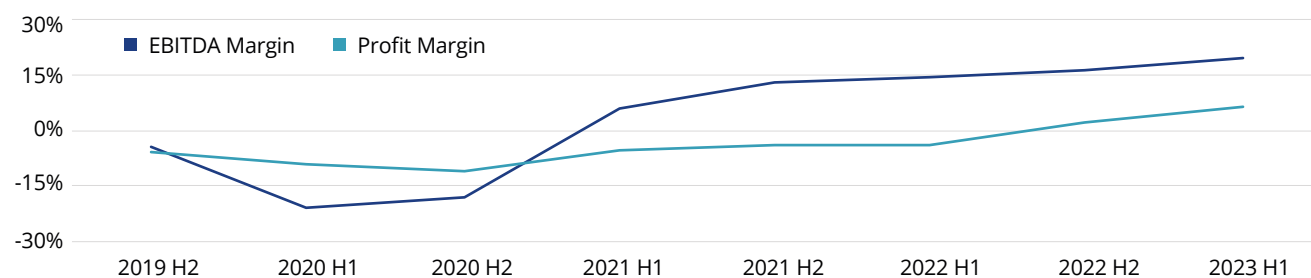
It's also notable that their finances are more robust following reductions in debt since 2020.

Oil services companies tend to display a relatively high correlation with oil



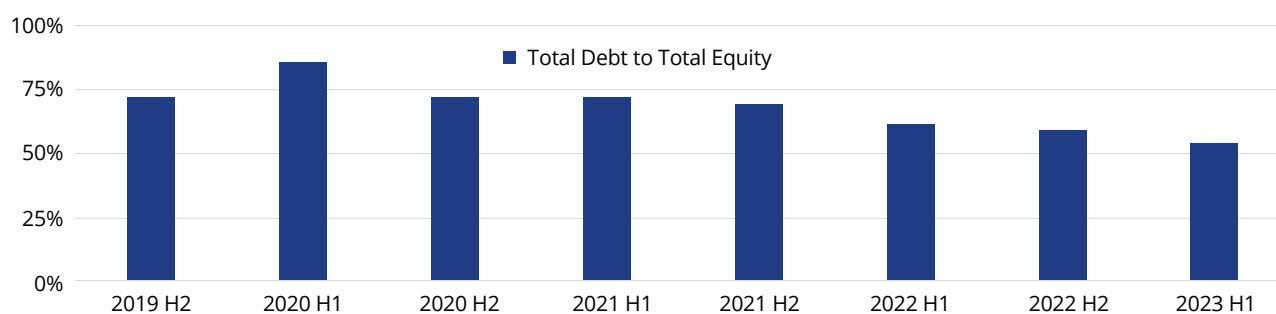
Source: Bloomberg, VanEck. Data from 30/06/2013 to 30/06/2023. Correlation calculated between the WTI Crude Oil and the MVIS US Listed Oil Services 25 Index.

Margins improved from the Covid lows



Source: Bloomberg, VanEck. Analysis based on the MVIS US Listed Oil Services 25 Index.

Debt reduction program



Source: Bloomberg, VanEck. Analysis based on the MVIS US Listed Oil Services 25 Index.

¹⁰ Source: Schlumberger

Conclusion

Oil services companies are poised to most probably be the unnoticed enablers of the energy transition. Just as they have provided services for extracting oil and gas for many years, they are actively positioning themselves to facilitate renewable energy generation. As they do so, their profit margins and finances are currently in good shape for the evolution that is to come. Through a vehicle like the VanEck Oil Services UCITS ETF, investors can gain exposure to the gradual energy transition from hydrocarbons to various forms of renewable energy. Before investing in the ETF, please take into account the risks of investing in the fossil fuels industry, risks of regulatory action and sector concentration risk.

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