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Big Oil and the Energy Transition

By Dolf Gielen, Brooke Bowser, and Morgan D. Bazilian

Climate pledges are on the rise as businesses and governments seek to boost their public images and support the environment. Oil and gas, which make up nearly 55% of global energy consumption, is under particular pressure to reduce emissions.

According to a recent report by the United National Environment Programme, the expected 2030 fossil fuel production outlined in government plans will be more than twice the amount of what would be consistent with limiting warming to 1.5°C.

The International Renewable Energy Agency (IRENA) recently analyzed how seven of the largest publicly traded energy companies' clean energy strategies, goals, and investments measure up to the level of action required to limit the rise in global temperatures to less than 2°C. Achieving this goal will require a vast energy transformation centered on renewable energy, energy efficiency, and increased electrification. Of the companies analyzed, five are based in Europe (BP, Eni, Equinor, Shell, and Total SE) and two are based in the United States (Chevron and ExxonMobil).

Big energy companies that have traditionally focused on oil production are seeking to reposition themselves within the energy industry by making commitments and investing in renewable energy and low-carbon technologies. Researchers at the Payne Institute for Public Policy at the Colorado School of Mines have been carefully monitoring these changes, and published a broad review on how both large, private energy companies and national oil companies (NOCs) are engaging with these strategies.

One motivation to adopt such low-carbon strategies is that oil and gas are no longer as profitable as they used to be. Ignoring the energy transition and climate change is not an option for these companies, if they wish to have a role in the future energy system. The COVID-19 pandemic brought historic lows and even negative oil prices. Many big energy companies' earnings fell by billions of dollars in the first half of 2020, and the profit margin of Shell, BP, and Eni all fell by over 50%. Oil and gas prices and demand have since rebounded, but as COVID-19 demonstrated, these prices are sensitive to changes in demand. Shell's 2021 average stock prices are still over $20 less than the average in 2018. Shareholders and investors have become less interested in placing money in an industry with an uncertain future. Recently, an activist investor publicly urged Shell to split into multiple companies to separate its oil and gas business from its renewable energy business. This follows growing pressure from activist shareholders urging Shell, BP, Chevron and ExxonMobil to make climate-conscious decisions.

To appease the varying demands of shareholders and help ensure their own future, big energy companies are diversifying their income and investments. Many of these companies have developed natural gas divisions and some are moving into electricity. Additionally, offshore oil and gas operations could be converted to support renewable energy technology, such as offshore wind. Big energy companies have already been investing in liquid biofuels, renewable gas, and carbon capture, utilization, and storage (CCUS) for years. Each of these technologies may be useful in sectors that remain difficult to decarbonize.

Each company has developed a different approach to the energy transition, and IRENA's report indicates a significant difference in responses of U.S.- and Europe-based companies. U.S. companies seem to be taking a "business-as-usual" approach with a continued focus on fossil fuels. They are predominantly targeting CCUS and efficiency improvements to reduce their operational emissions—although these strategies are rapidly evolving.

The five companies reviewed by IRENA based in Europe have announced emission targets and expanded their strategies beyond oil production to invest in clean energy technology. They are reinventing themselves as energy companies rather than mere oil companies. BP adopted this process early when it rebranded to "Beyond Petroleum" back in the early 2000s—although there was limited impact to the company and many now view it as an example of greenwashing. BP and Equinor are focusing on diversifying their portfolios by investing in renewable energy, hydrogen, and electric vehicle (EV) infrastructure. Other companies, such as Shell, Eni, and Total SE, have been investing in the trend toward electrification by acquiring companies or forming strategic partnerships along the electricity supply chain. By 2030, Total SE plans to shift its sales mix to 30% oil, 50% gas, 15% electricity and 5% biomass and hydrogen.

Even amidst business risks, national oil companies, unlike the independent and private sector companies in IRENA's report, are generally less likely to make drastic shifts to renewable energy. While they are responsible for more than 85% of global oil production, national operations are often state-owned and managed directly by governments. Changes for these companies will primarily be

driven by policy rather than the business concerns influencing private sector companies. These national economies are more heavily reliant upon the income of oil exports, and additional factors of political stability, regulatory quality, and the rule of law make navigating the transition more challenging.

There are a few of aspects to consider when measuring the ambition of energy companies' emission reduction goals. Companies can set their targets while only considering emissions due to production (Scope 1 and 2), or they include all the emissions that accrue during both production and final use of the oil (Scope 1, 2, and 3). By limiting their scope, companies exclude the emissions released when the customer uses the oil—a significant omission considering this final-use stage makes up 85% of the sector's total emissions.

Intensity-based targets (such as those made by Chevron, ExxonMobil, Shell, and Total SE) describe an amount of emissions per unit of energy. Using this framing, energy companies can increase the share of low-carbon energy or carbon sinks to achieve their targets without actually cutting oil production. Absolute targets (like those of BP, Eni, and Equinor) refer to the total emissions and therefore imply oil production emissions must also be reduced.

Chevron and ExxonMobil have announced short-term, intensity-based goals. Chevron is focusing on a 5-10% reduction in upstream oil emissions by 2023, and ExxonMobil is looking to reduce its operational emissions 15-20% by 2025. New government initiatives, such as the U.S. Methane Emissions Reduction Action Plan, will likely also affect the plans of these U.S.-based companies.

Eni has a goal of a 30% reduction in operational and end-use emissions by 2035, but its long-term target is to cut 80% of emissions by 2050. Equinor, Total SE, Shell and BP all have goals to reach net zero emissions by 2050. Total SE's net-zero goal only covers its European emissions, and it has a 60% reduction target for its global emissions. BP's net-zero target excludes 29% of its production completed with a partner company. It also only plans for a 50% reduction of emissions due to the oil and gas that is extracted by other companies but processed and resold by BP.

Measuring the actual impact is even more difficult. A former BP CEO recently expressed concern about the gap between companies' targets and the plans to deliver on them. Global Climate Insights announced that Shell will actually increase its emissions by 4% by 2030—despite a Dutch court ruling that Shell must decrease emissions by 45% by 2030 and Shell's own 2035 target to reduce operational and end-use emissions by 50%.

While these companies make pledges, they are continuing to make large investments in fossil fuels. The International Energy Agency (IEA) has reported there is no need for investment in new fossil fuel supply to reach net zero emissions by 2050, and under IEA's scenario, energy companies would experience a significant decline in oil and gas production. For some big energy companies, such as Shell, Chevron, and Eni, production would decrease by at least 50%, and most shale oil companies' production would fall by over 80%. Many NOCs would also require significant reductions, likely creating a strain for their national economies. At COP26, the US and 19 other countries pledged to

stop financing fossil fuels abroad. Many consider this a win for the climate, but it does highlight issues of inequity as developed countries continue to finance and even subsidize domestic fossil fuel production.

According to IRENA, some investments in oil and gas are still required to overcome the high natural depletion rate of oil and keep some level of production, but big energy companies are currently making much lower investments in renewables compared to their ongoing investments in fossil fuels. IRENA's roadmap focuses on a robust energy transition (including no additional fossil fuel production) to reach net zero by 2050 and provide a greater likelihood of meeting the 1.5°C target, but the uncertainty of political efforts and industry action to move the world along this trajectory makes confident investing and strategizing difficult.

There are more opportunities for these companies to play critical roles in the move to a low-carbon economy. Companies that do not adjust to make progress may eventually be edged out of business. Unfortunately, the lack of standardization and transparency does not make the process of comparing companies easy, and a considerable amount of work will be required to develop more effective public tracking of these rapid changes.

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