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Assessing the Threat of the Energy Transition for Oil and Gas

July 2020

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Summary

- While most would agree that renewables are a long-term threat to hydrocarbons, there is less agreement on what constitutes long term. Energy transitions likely take longer than one might expect as coal demand exemplifies.
- Energy consumption and policy around the world vary significantly. While electrification and decarbonization are key themes in developed economies, it is easy to overlook the fact that approximately 3 billion people were dependent on solid fuels like wood, animal dung, charcoal, coal, or kerosene-fueled stoves for cooking in 2018.
- Sweden, which is at the forefront of the energy transition, is targeting carbon neutrality in 2045 – 25 years from now. Even European energy majors are targeting carbon neutrality by 2050 for their operations and oil and gas production.
- Electric vehicles (EVs) are a small portion of the vehicle fleet today, and their impact on oil demand will likely be modest for the next few years. Even if EVs represent 30% of all vehicle sales in 2030, the estimated oil demand impact of 4.2 million barrels per day appears moderate, especially after facing the severe demand shock of COVID-19.
- While government policy can help alleviate some of the challenges facing EV adoption, other issues may prove more difficult, such as obtaining secure supplies of minerals and finding solutions for recycling used EV batteries.
- Many people associate oil demand with cars because that is often their firsthand experience with oil consumption, but the reality is that passenger vehicles are not expected to drive the growth in long-term oil demand. Instead, petrochemicals are moving to the forefront as demand for plastic increases.
- For businesses focused on hydrocarbons, including midstream energy infrastructure, the threat of renewables and the energy transition is real, but it also often feels overstated.

Investors regularly ask for our views on the threat of the energy transition to traditional oil and natural gas companies, particularly with a view to midstream. The buzz around renewables has only increased given the release of Vice President Biden's clean energy plan calling for net zero emissions for the US by 2050. Furthermore, the historic stimulus package recently passed by the European Union requires spending to be in line with the goals of the Paris Climate Accord, and nearly a third of the spending is earmarked for battling climate change. Also in July, Apple (AAPL) committed to becoming carbon neutral across its business by 2030. With increasing momentum for carbon reduction targets and mounting support for renewable energy, where does that leave oil and natural gas companies?

As with many things, the first step in responding is to admit there is a problem facing the industry – yes, renewables are a long-term threat to businesses oriented around hydrocarbons. While most would agree that renewables are a long-term threat, there is not necessarily agreement on what constitutes long term – is it a decade? Twenty years? Fifty years? What technological breakthroughs will be required to facilitate a wide-scale transition? How will government policies impact the pace of this transition?

While the forthcoming energy transition raises more questions than answers, this piece addresses the threat of renewables for oil and gas, focusing on some of the key concerns for investors, specifically the implications for power generation and the threat of electric vehicles for oil demand. Carbon neutrality and net zero emissions are used interchangeably throughout.

Different markets have very different energy profiles.
To state the obvious, energy consumption and policy around the world vary significantly. While electrification and decarbonization are key themes in developed economies, it is easy to overlook the fact that approximately 3 billion people were dependent on solid fuels like wood, animal dung, charcoal, coal, or kerosene-fueled stoves for cooking in 2018. Sadly, an estimated 4 million people die prematurely each year due to household air pollution from these cooking practices and a lack of access to cleaner energy. To help address this health crisis, India has been distributing stoves and liquefied petroleum gases (LPGs include propane, butane, and isobutane) to low-income households since 2016. The program helped India become the second-largest LPG user globally, and in early 2019, government officials were projecting that LPG demand would increase by 34% to 2025 and by 80% to 2040. While other countries may be limited in replicating India's success with LPGs, the need for cleaner cooking fuels in developing countries could drive an increase in LPG demand for years to come.

On the opposite end of the energy spectrum, Europe is the frontrunner for the energy transition with some countries having defined targets for achieving net zero emissions. Leading the way, Norway's parliament approved a proposal in 2016 to achieve carbon neutrality by 2030. Norway's target, which was moved up from 2050, is impressive, but it also bears noting that more than 95% of Norway's electricity comes from hydropower. The country is expected to have to purchase carbon credits to achieve the 2030 goal given significant oil and gas production. Neighboring Sweden is targeting net zero emissions of greenhouse gases by 2045. For context, Norway and Sweden have populations of 5 million and 10 million, respectively. Furthermore, according to an International Energy Agency (IEA) report from April 2019, Sweden's total carbon emissions at that time had been static since 2013. Elsewhere in Europe, the United Kingdom is targeting net zero emissions in 2050, as is France – in line with the Paris Climate Agreement.

Just as the demand implications of India's LPG program should not be extrapolated to other developing countries, Norway's 2030 carbon neutrality target should not be extrapolated to all developed countries. Norway and Sweden are leading the clean energy transition, yet their timelines for carbon neutrality are 10 and 25 years away, respectively. Furthermore, carbon neutrality does not imply an abandonment of fossil fuels. Carbon neutrality requires emissions to be offset. Even traditional oil and gas companies are targeting net zero emissions with Europe-based companies leading the way. Lundin Energy (LUPEY), a Norwegian oil and gas producer, is targeting carbon neutrality in 2030, while Eni (ENI) aims to be net zero for Scope 1 and 2[1] emissions by 2040. Shell (RDS-A) aims to achieve net zero emissions by 2050, and fellow supermajor BP (BP) is targeting net zero emissions for its operations and oil and gas production by 2050. Considering that traditional oil and gas companies are targeting carbon neutrality in the 2030-2050 timeframe, similar goals for developed countries do not seem as threatening.

1 // Scope 1 includes emissions from operations, and Scope 2 includes indirect emissions from energy consumed.

Energy transitions take a long time.
In a world of instant gratification, it can be hard to appreciate how long a process can take, especially something with the scale of an energy transition. Coal provides a good example of this as it appears to be the most despised fossil fuel given its greater carbon intensity compared to natural gas or petroleum, but it continues to be widely used globally even as developed countries pivot to other energy sources. After a few years of annual consumption declines in the wake of the Kyoto Protocol in 1997, coal demand boomed – growing by 75% from 2000 to 2013 per the IEA.

Despite a seemingly widespread disdain for coal, demand appears largely steady on a global basis. Demand grew by 1.1% in 2018 as power generation from coal reached a new all-time high, with coal accounting for 38.5% of electricity generation worldwide. Prior to COVID-19, which reduced power demand broadly, the IEA was forecasting that global coal demand would rise slightly through 2024. With COVID-19 impacting demand for power generation and industrial use, coal demand is expected to decline 8% this year. The actual demand impact will depend largely on activity in major coal-consuming countries such as China and India. In short, reduced power demand from the pandemic is likely to drive a significant decline in coal demand this year, but otherwise, coal demand would probably have remained relatively steady.

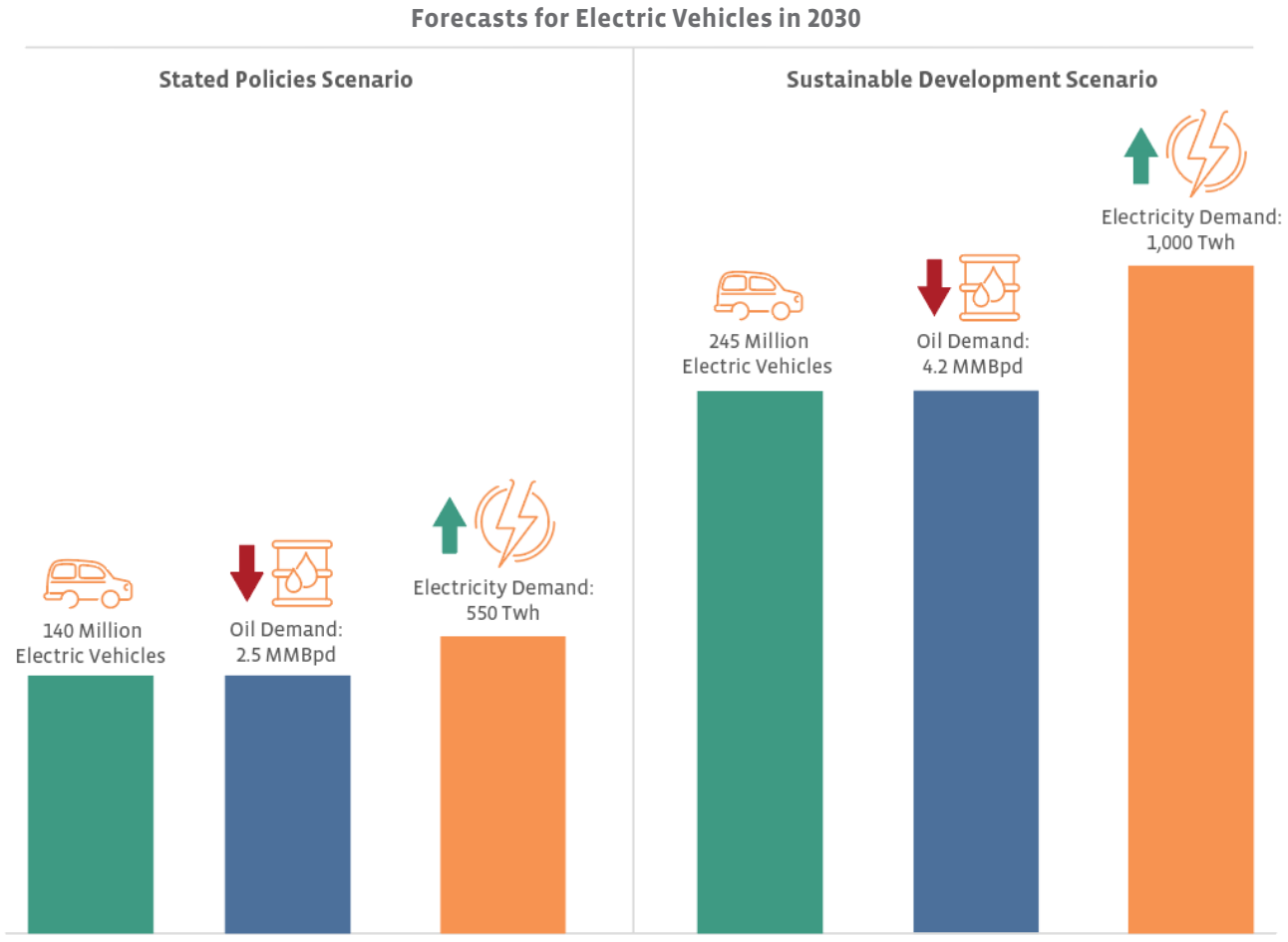
Temporary demand destruction from COVID-19 likely much worse than the energy transition.
The transition toward cleaner energy will be gradual, and different countries will move through this process in different stages. The shift will likely be much less severe than the shock experienced with COVID-19 where demand collapsed around the world at approximately the same time. Amid the overall demand decline driven by the pandemic, renewables (along with natural gas in the US) have gained share for power generation in Europe and the US as plants using fossil fuels were scaled back in favor of solar and wind capacity with lower costs (i.e. if overall demand is weaker, why use more coal capacity with an input cost compared to using freely available sunshine or wind assuming the power is available). However, challenges remain around the intermittency of wind and solar power. A recent study requested by the California Public Utilities Commission highlights the need for battery storage to make solar power more reliable. In that vein, California is working to expand its battery capacity to a little more than 900 megawatts (MW) by the end of this year. For context, California has about 80,000 MW of power generation capacity. Given challenges around intermittency and battery storage, natural gas power plants have often been depended upon to ensure reliable power supply.

Natural gas has long been labeled the bridge fuel of the energy transition given its cleaner characteristics, availability, and lowered price thanks to increased supplies of liquefied natural gas from the US and elsewhere. Even under the IEA's Sustainable Development Scenario, which assumes the goals of the Paris climate agreement are met, natural gas demand is forecast to grow to 2030, and 2040 demand is expected to be in line with 2019 levels. Given the prevalence of coal in the power mix, there is significant opportunity for power plants to switch from coal to natural gas, particularly in the US and Europe.

What about the threat of electric vehicles for oil demand?
In addition to the outlook for power demand, investors often express interest in the outlook for electric vehicles (EVs) and the implication for oil demand. EVs have been gaining traction among consumers and car manufacturers for quite some time. While there has been no shortage of excitement around Tesla (TSLA), traditional car companies are also embracing EVs. General Motors (GM) plans to have 20 electric models by 2023, and Volvo is targeting 50% electric car sales by 2025. Regulations are spurring EV adoption, and subsidy programs in various countries have also helped. The United Kingdom is planning to ban sales of new cars with internal combustion engines in 2035, and France is targeting a similar ban by 2040. The balance of this piece discusses the implications of EVs for long-term oil demand and the drivers of future demand growth aside from passenger vehicles.

EVs gaining but still a tiny share of the auto market today.
While EV adoption is increasing, EVs remain a small part of the overall vehicle market today. In 2019, worldwide EV sales totaled 2.2 million – just 2.6% of global car sales. That means a lot of vehicles with internal combustion engines are continuing to be sold each year and will likely be on the road for years to come given a typical useful life for cars of around 12 years. In the first four months of 2020, the impact of COVID-19 drove total car sales down by about 9 million vehicles or by roughly one-third relative to last year according to a May IEA report. Similarly, EV sales saw year-over-year declines in China and the US but notably increased in Europe. The IEA forecast in May that 2.3 million EVs will be sold this year. These sales would bring the EV total globally to 10 million, representing approximately 1% of the total car fleet.

EVs are a small portion of vehicles on the road globally and have had a minimal impact on oil demand thus far – nearly 600,000 barrels per day or 0.6% of global demand in 2019. Of course, the concern for energy investors is how quickly EVs could lead to significant demand destruction. The infographic below summarizes the implications of EVs in 2030 under the two scenarios in the IEA's Global EV Outlook 2020 published last month. The Stated Policies Scenario (SPS) reflects current government policies, and the Sustainable Development Scenario (SDS) represents the goals of the EV30@30 Campaign to reach 30% sales share for EVs in all vehicles (except two-wheelers) in 2030. Under the SPS, EVs would achieve 7% market share in the global vehicle fleet in 2030.



*Excludes 2 and 3-wheelers. Includes ~46 million and ~74 million plug-in hybrid electric vehicles in the SPS and SDS scenarios, respectively. Includes light-duty vehicles, buses, and trucks. Not to scale.
Source: International Energy Agency, Global EV Outlook 2020. Design: Alerian

The two scenarios may be considered bookends of a range of possible outcomes. However, there is an element of execution risk in both scenarios, and clearly much could happen to change the global outlook in either direction. For example, the results of the upcoming US election could have implications for the rate of EV adoption in the US given Vice President Biden's plan to invest in 500,000 charging stations and bring back the EV tax credit. Trends in China and India also bear watching. If the SDS forecast materializes, the impact to oil demand of 4.2 million barrels per day (MMBpd) in 2030 seems manageable. Keep in mind that oil demand in 2Q20 was down 16.4 MMBpd year-over-year due to the impact of COVID-19 and is expected to be down 7.9 MMBpd for the year according to the IEA's July Oil Market Report. The 2030 threat of EVs seems modest by comparison, and the impact will be gradual, unlike the demand shock in 2020. For the next five years, the impact of EVs on oil demand is likely to be relatively insignificant. Of course, EVs will increase electricity demand as also shown in the chart, which has implications for power demand and the grid.

What challenges remain for greater EV adoption?

The often-cited knocks on EVs are range concerns, lack of charging infrastructure, and their costs. Governments are stepping in to help with the last two issues. In its historic stimulus package, the European Union was targeting two million electric and hydrogen vehicle charging points and had earmarked 20 billion euros to encourage sales of cleaner autos. France and Germany have recently announced increased subsidies for EVs. Meanwhile, China extended incentives for EVs through 2022, including tax exemptions for purchases of new EVs, and also committed to significant investment in charging infrastructure. Subsidies have proven effective in the past when it comes to supporting EV sales and may prove useful again, especially as the higher up-front cost of EVs may be less palatable when gasoline prices are relatively cheap.

While government policy can help alleviate some of the challenges facing EV adoption, other issues may prove more difficult. Clearly, there is an onus on auto manufacturers to roll out new electric models at reasonable costs, but there is some element of execution risk. For example, Volkswagen has delayed the rollout of its ID.3 electric model due to software challenges. A secure supply of minerals produced in an environmentally conscious manner can be another obstacle, with an EV having five times the mineral requirements of a traditional car. For example, TSLA has been looking for a source for sustainable nickel. BloombergNEF estimates that a nickel shortage could emerge as soon as 2023. The challenges around lithium and cobalt have been well documented, but other issues like the recycling of EV batteries are concerns as well. The burden to the grid and incremental electricity needs are also issues to be addressed. Vehicle-to-grid technology (EV batteries provide power to the grid) could help alleviate this burden during peak demand, but technological improvements and policy support are needed for these solutions to be realized. With the widescale rollout of a new technology, there are bound to be challenges, and these are a few examples.

What is expected to drive future oil demand?

Many people associate oil demand with cars because that is often their firsthand experience with oil consumption, but the reality is that passenger vehicles are not expected to drive the growth in long-term oil demand. Perhaps growth could come from some developing countries as an emerging middle class bought vehicles, but the primary drivers of demand are expected to be petrochemicals, trucking, shipping, and airplanes. In its World Energy Outlook from 2019, the IEA forecast that oil demand from passenger vehicles would top out in the late 2020s, but the agency did not expect overall oil demand to peak before 2040 under the Stated Policies Scenario. One caveat to the late 2020 peak for passenger vehicle demand is the assumption that sports utility vehicles (SUVs) would moderate in popularity. If consumers continue to prefer SUVs, the result would be an incremental 2 MMBpd in 2040 oil demand, which would likely offset a good portion of EV-related demand destruction.

Setting aside transportation, petrochemicals are expected to be a significant driver of petroleum demand going forward driven by increased demand for plastics. Emerging middle classes in developing countries will likely want the same plastics that we take for granted but that add significant convenience to our daily lives. Even in the IEA's Sustainable Development Scenario in the 2019 World Energy Outlook, petrochemicals would spur an incremental 3 MMBpd in oil demand despite recycling rates improving from 15% in 2019 to 35% in 2040. Bans on plastic bags and increased recycling are anticipated to have little impact on oil demand. Petrochemical feedstocks – specifically naphtha, liquefied petroleum gases, and ethane – are expected to account for half of the growth in global demand through 2025 according to the IEA's Oil 2020 report from March. In recognition of this trend, midstream companies like Enterprise Products Partners (EPD) and Inter Pipeline (IPL) are expanding into petrochemicals.

Long-term projections for anything energy-related are difficult, but COVID-19 has further clouded the crystal ball for estimating future oil demand. Work-from-home trends may lead to permanent demand destruction from would-be commuters. Other areas of oil consumption, like shipping, may not see any lasting impact. Even international travel for pleasure or business will likely return with a vaccine. In short, projections made prior to COVID-19 should be viewed in context, but the extent to which COVID-19 has impacted the outlook for 2030 oil demand is likely debatable and possibly minimal.

What about midstream?

What are the implications of all of this for midstream energy infrastructure? The US is the world's largest producer of oil and natural gas with significant reserves. Increasingly, US energy is expected to be exported overseas to meet rising global demand. While growing energy demand is often associated with China and India, demand for oil and natural gas is also expected to rise in Africa in the coming decades. Midstream energy infrastructure plays a vital role in connecting energy production with local demand but also in facilitating exports. Setting aside prolific shale resources and improvements in drilling technology, US energy is able to compete on a global scale in part due to significant infrastructure advantages.

Bottom line

While many of us are focused on the green energy transition, it is easy to forget that the more urgent transition for many in the world is a shift away from using biomass for cooking or even securing access to electricity, which over 800 million people lacked in 2018. Renewables represent a long-term threat to businesses oriented around hydrocarbons, but the energy transition will likely take a long time as exemplified by enduring coal demand. Even those countries leading the charge toward carbon neutrality are targeting 2045 or 2050, which aligns with the timelines some oil and gas companies are targeting for net zero emissions.

There are a multitude of moving parts surrounding the future adoption of electric vehicles and the impact to oil demand, including government policies, infrastructure investment, mineral supplies, and technological developments to name just a few. Overall, the oil demand impact over the next few years does not appear needle moving. Even in a scenario with significant EV sales share in 2030, the oil demand implications look moderate. Going forward, petrochemicals are expected to lead the way for demand growth as oil demand from passenger vehicles peaks.

For businesses focused on hydrocarbons, including midstream energy infrastructure, the threat of renewables and the energy transition is real, but it also often feels overstated.

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