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Discussion-Opinion-Editorial

Will Pandemic and Inflation Upend Transition from Oil and Gas Economy to Electric Vehicle and Hydrogen Economy to Net Zero Economy?

Part-1

The Background

Over the last century, several studies mentioned that the oil and gas (O&G) industry would end due to the exhaustion of resources. And a peak oil scenarios has always been painted. However, with the increase in technology and reduction in production costs, new O&G reservoirs as have been found, and advances in technology have made possible the exploration of O&G at large depths on land and sea. These efforts could allow the maintenance of an O&G based economy for hundreds of years. The O&G industry has grown from producing 10 million barrels per day in 1950 to a maximum of 101 million barrels per day in 2018, a number that was expected to fall to 95 MB per day in 2021 due to the COVID pandemic. The Ukraine crisis that at least for the short term, suddenly changed the producer-consumer relationships across the world, is expected to get back old balance once the crisis is over, or is it?

The Coronavirus disease 2019 (COVID) pandemic as well as the common public's disenchantment with mobility using oil and gas has distorted and impacted the capital valuation of O&G companies around the world. For example, ExxonMobil that has been for several decades the main O&G Company, reached a maximum valuation in 2014 with 103.83 USD (XOM index) per share, which fell to 47.89 USD per share in January 2021. In 2007, four of the top 10 companies with the highest market value were oil companies. Today, the major oil companies' market values are far from the leading positions that they once were. On the other hand, energy storage companies, such as Tesla, have seen their capital value rise more than tenfold in 2020. But as this piece is being written, the Tesla share price is at about 650 USD.

The Lethargy

Before the COVID pandemic, O&G companies made a limited investment in sustainable technologies possibly slowing the implementation of renewable energy sources that could one day replace those in the O&G industry. These companies used to invest only around 1% of their revenue in renewable generation projects as an attempt to improve the image of the company brand, selling itself as a "green company". However, given the rapid development of renewable sources of energy, the O&G industry is reducing its competitiveness and will soon join the energy transition or become irrelevant. Currently, the biggest threat to the O&G industry is the exponential rise in the valuation of battery electric vehicles (EV) companies, such as Tesla, the reduction in the price of battery costs and the rapid increase in battery storage capacity.

This rapid rise in investment in EV companies and battery production has raised alarms in the O&G industry, as 60% of their market is the transport industry, which is being replaced by EVs. Thus, after the COVID pandemic, the O&G industry has finally realized that if they do not invest in sustainable technologies, they will soon be out of business. For example, Norway and the Netherlands have decided to stop selling internal combustion engine (ICE) cars by 2025, Germany, India, France and UK by 2030. As a result, the O&G industry has realized that it will have to invest considerable amount of money in sustainability to remain an important player in the transport sector. Other important aspects that contribute to the interest of the O&G industry to invest in sustainable technologies are: (i) the global push to reduce CO2 emissions with the intent to halt global warming, (ii) the Nationally Determined Contributions (NDC) to reduce CO2 emissions and reach carbon neutrality, (iii) the introduction and maturation of carbon trading, and the (iv) green investment needs of O&G companies.

The O&G industry's best bet to adapt to a sustainable future is by investing in the H2 economy. Hydrogen has seen the highest increase in investment in sustainable technologies by the O&G industry for 2019 and 2020, with 108% . The interest of the O&G industry in the hydrogen economy exists because hydrogen is a fuel that uses an infrastructure similar to that of the natural gas industry, such as storage, liquefaction, regasification, transportation in gas pipelines and gas distribution.

In the case of the use of EV, not even filling stations would be necessary. Much of the O&G infrastructure developed over the last century would be abandoned. Furthermore, it would be the O&G industry that would have to pay for the enormous costs of decommissioning this infrastructure. The investment in H2 allows the O&G sector to use a large part of the existing infrastructure, technology and knowledge that apply to other fuels.

These scenarios show that peak oil consumption may arrive sooner than the world expects not due to the exhaustion of supplies but due to the need to reduce CO2 emissions, geopolitics and long-term cost reduction in other forms of transportation. This process can be exacerbated as automakers are planning to stop producing ICE cars altogether. For example, Volvo is shutting down the production ICE cars, Ford, Daimler, BMW and Volkswagen plan to produce up to 25% of their total production as EVs by 2025. Toyota plants to sell only H2 and battery EVs by 2050. The reduction in the production of ICE cars will ultimately increase the costs of ICE cars compared to EVs, which would speed up the fall in oil consumption.

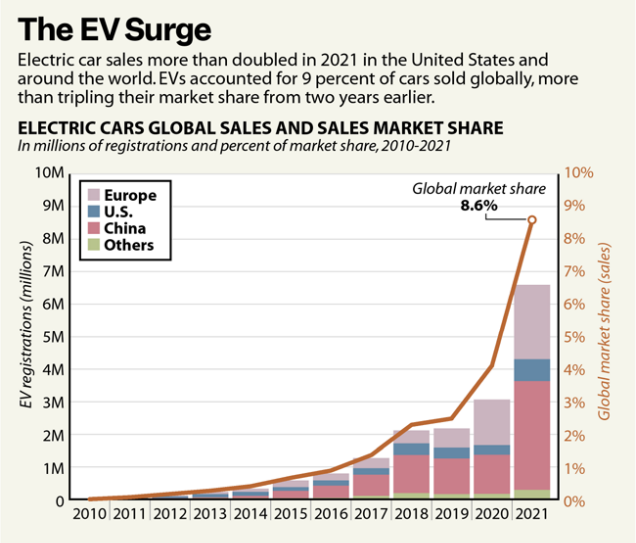
Ukraine Crisis

Following the escalating crisis between Russia and Ukraine and the military operations from February 24, 2022, geopolitical risk has soared and overshadowed financial markets, especially commodity markets. Higher geopolitical risk spiralled commodity prices already disturbed by supply interruptions from the pandemic. While strategic commodities such as crude oil and gold are highly sensitive to the effect of intensified geopolitical risk, the fact that Russia and Ukraine are two major producers and exporters of commodities such as crude oil, natural gas, wheat, and aluminium, has amplified the effect on commodity prices[1]. Besides these circumstances and facilitators, commodity investments are compelling under a potential economic turnaround, as indicated by the inverted US yield curve and aggressive tightening cycle by the Federal Reserve.

Amid such unprecedented conditions, soaring prices of these commodities can potentially contaminate other commodities, through the channels of financialization, higher cost of production and biofuel, and substitution effects, inducing higher volatility and ultimately intense volatility spillovers in the commodity markets. These effects could have implications for commodity portfolios, hedging strategies, potential divarication possibilities, and derivative pricing. They could also affect price stability and food security, and thereby represent a concern for policymakers given their adverse effect on the level of inflation, consumer spending, and ultimately economic activity. It is therefore, useful and highly informative for investors and policymakers to understand the dynamic risk spillovers in the commodity markets under the unprecedented war in Ukraine. However, the academic literature lacks evidence on the dynamics of interconnectedness of individual commodities belonging to various groups under the ongoing war in Ukraine and heightened geopolitical tensions between Russia and western countries.

Inflation contributed by climate change, fossil fuel use and greening

We expect three shocks. The first shock is linked to the costs of climate change itself, or "climate led inflation". As



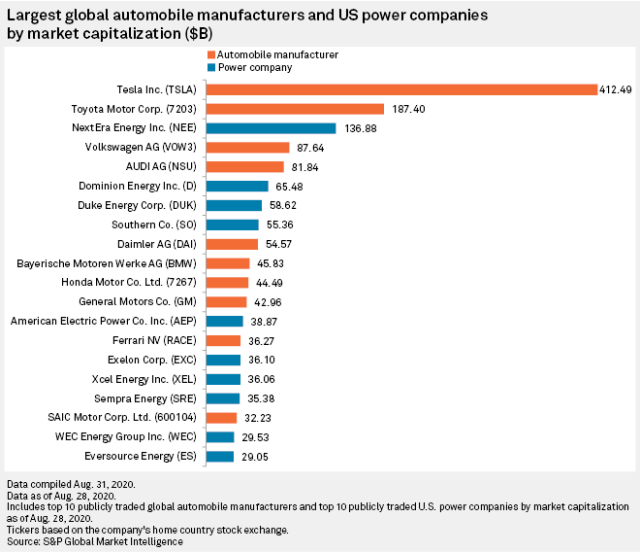


Figure 1. Top automakers by market capital. Tesla's market capital is higher than the following eight companies combined.

the number of natural disasters and severe weather events is rising, so is their impact on economic activity and prices. For example, exceptional droughts in large parts of the world have contributed to the recent sharp rise in food prices that is imposing a heavy burden on people who are struggling to make ends meet.

The second shock, "**fossil fuel use**", is to blame for much of the recent strong increase in euro area inflation. In February 2022, energy accounted for more than 50% of headline inflation in the euro area, mainly reflecting the sharp increases in oil and gas prices **Fossil fuel-led inflation** reflects the legacy cost of the dependency on fossil energy sources, which has not been reduced forcefully enough over the past decades. For example, In 2019 petroleum products and natural gas still accounted for 85% of total energy use in the euro area. The fight against climate change is one factor that is contributing to making fossil fuels more expensive, and hence their environmental damage more visible.

Greening-led Inflation: Many companies are adapting their production processes to reduce carbon emissions. But most green technologies require significant amounts of metals and minerals, such as copper, lithium and cobalt, especially during the transition period. Electric vehicles, for example, use over six times more minerals than their conventional counterparts. An offshore wind plant requires over seven times the amount of copper compared with a gas-fired plant. No matter which path to decarbonisation we will ultimately follow, green technologies are set to account for the lion's share of the growth in demand for most metals and minerals in the foreseeable future. Yet, as demand rises, supply is constrained in the short and medium term. It typically takes five to ten years to develop new mines. This imbalance between rising demand and constrained supply is why the prices of many critical commodities have increased measurably in recent months. The price of lithium, for example, has increased by more than 1000% since January 2020 (Slide 4, right-hand side). Export restrictions on Russian commodities may add to pressure on prices over the near term. These developments illustrate an important paradox in the fight against climate change: the faster and more urgent the shift to a greener economy becomes, the more expensive it may get in the short run.

(End of Part-1, to be continued in Part-2,References at the end of Part-2)