ENERGY CRISIS & OPPORTUNITIES

why it may become worse before it gets better

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EXECUTIVE SUMMARY

- Energy markets are potentially facing its most severe supply crisis since the 1990 Gulf War
- Fully avoiding fossil-fuel investments out of ESG consideration is impractical because oil, gas and coal still account for about 80% of the world's energy consumption
- A transition to renewables is not happening overnight – in fact, oil demand is expected to grow over the next decade before it begins a slow, inexorable decline
- There are several supporting factors for higher, sustained energy prices
- A structural under-investment in new energy supply is leaving inadequate production capacity to meet the increasing need for electricity and infrastructure
- Capex must increase dramatically and sustainably to maintain and grow global oil and gas production
- Profitability of the oil and gas sector is record high and free cash flows are expected to increase from $340bn in 2021 to over $550bn this year
- E&P companies are only weighted at 4% in the S&P 500 index, but generate 7% to 8% of the net income
- Energy continues to be the cheapest sector on all valuation metrics and are currently discounting oil prices in the range of $50/bl vs. spot prices of over $100/bl
- There has been a fundamental change in how oil and gas companies are approaching the investment allocation process, favoring shareholder returns over investment in growth of production
- Results show that most oil and gas majors are repositioning themselves as renewable energy producers
- We think, the energy sector will be at the heart of the solution to climate change

The world is currently short on all forms of energy. While renewable power generation as well as the energy transition is dominating the discussion, the world still depends heavily on fossil fuels – and is expected to do so in the short to medium term.

The oil and gas sector was probably one of the most unloved sector in the past decade, mainly due to poor shareholder returns and ESG considerations of investors. During this time, the companies cleaned up their business strategy and are healthier than ever – producing record cash flows and maintaining capital discipline, while also improving on the ESG front.

Even though the oil and gas industry was one of the best performing sector last year, investors are still heavily underexposed. The companies are currently having record margins and rewarding their shareholders with dividends and share buybacks like never before.

The current energy market situation should not only be seen as a crisis, but as an opportunity.

Looking a few months back, oil seemed to be a very good investment. What has changed?

The energy sector still offers a huge investment opportunity, now more than ever before. However, the oil market is potentially facing its most severe supply crisis since the 1990 Gulf War. In these most uncertain times defined by war in Ukraine, Covid-19, and an overall wobbly economic and financial market backdrop, volatility is very high. This has been demonstrated by more than $30/barrel (bl) price swings in the span of a week or so. However, we speak a lot with commodity traders and they all say that physical markets are tight. For more than a year, we have been highlighting the high and persistent level of backwardation in many commodity markets as evidence of scarcity. While this scarcity premium has softened from its most acute in 2Q22, it remains historically elevated. Goldman Sachs says commodity markets appear to hold irrational expectations, as prices and inventories fall together, demand beats expectations and supply disappoints. Saudi Arabia's energy minister Prince Abdulaziz bin Salman has also indicated that there is a disconnect between futures prices and fundamentals, and that OPEC+ could cut production, bringing the OPEC+ floor back in play. This probably suggests that there is a desire to defend oil prices to stay above the level of $90/bl. However, low spare capacity continues to weigh on OPEC's ability to deliver on its quotas. Further to that, with Saudi saying that its long-term max production capacity being only 13mboe/d, the world is increasingly looking for incremental barrels. However, public operators are not moving to accelerate activity levels in a hyper-inflationary environment, and service providers are not investing in additional capacity, as supply chain and a lack of access to capital are increasingly barriers to entry.

What will happen to oil markets if we have a recession?

History shows that oil demand growth was negative in only 10 years since 1965. Equally, the oil demand decline was limited even during recessions. In the short term oil demand would fall, this is undoubted. Recent US data has suggested that economic weakness is starting to impact oil demand. However, this would only be transitory, though, because as soon as the recession will abate we will be right back where we are today – with record-high demand and record-low investment into production development. Some analysts think that the pullback along with continued cost inflation will put additional pressure on supply, ultimately prolonging the duration of the current commodity super cycle.

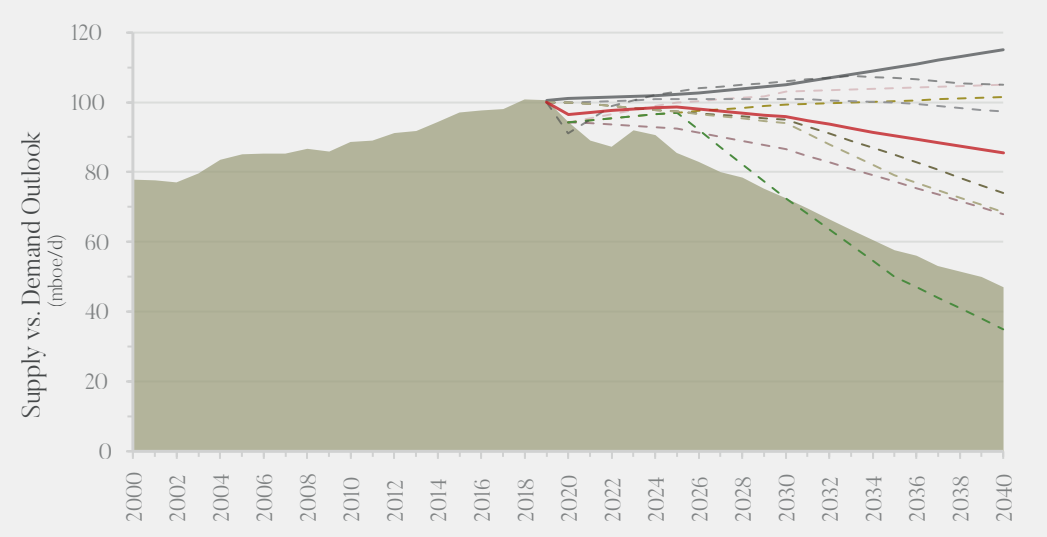
How does inflation and higher interest rates affect the energy sector?

Naturally, commodities can be a good inflation hedge and have outperformed during Fed rate hiking cycles. However, for the commodity producers we see clearly a cost inflation emerging all over the supply chain. Especially equipment lead times in the supply chain and labour bottlenecks restrict the ability of operators to bring additional rigs and frack spreads into the operation. However, the energy sector is a direct input into every segment of the economy and a natural hedge against geopolitics and inflation.

Fossils, while still needed for many years from now, seems to be a major source of power for longer than many thought.

Global demand for crude oil today is around 100 million barrels per day. To put that in perspective, it is equivalent to about 6'400 Olympic-size swimming pools that every day need to be filled with oil. One every 14 seconds. That is an enormous number. Important is not only that demand is growing over the long term, but also that it will continue to grow for quite a long time. People who imagine that in a few years no crude oil will be needed are being naïve. The world is not just London or Los Angeles. It is above all China, India, Africa, and Latin America. Per-capita energy consumption in those countries is only a fraction of what is consumed by the wealthy West, but these people, too, aspire to substantially raise their living standards. Increased entitlement to consume energy is of course connected with this aspiration, and oil and other fossil fuels will play an irreplaceable role in meeting that demand. And that's not even to mention all the other products produced from crude oil and natural gas ranging from fertilizers and plastics to even medicines. The demand for oil is certainly going to continue to grow. Indeed, most analysts agree that oil demand will grow through 2030. Even the IEA in its most recent World Energy Outlook conceded that the world remains far off of a "net zero" trajectory, and the "Announced Pledges" of world governments to date do not translate to a meaningful decline in oil demand until after 2030.

By 2030 ~5mboe/d of oil demand will be substituted, mostly form increasing Electric Vehicle (EV) penetration. However, some scenarios show that total demand in 2040 could still be roughly in line with where it was in 2019. This is because transitions do not happen overnight. In fact, oil demand is most likely to continue to increase over the next decade before it begins a slow, inexorable decline.



Sources: IEA World Energy Outlook 2021, BP World Energy Report 2022, OPEC World Oil Outlook 2021, BMO Oil Demand to 2040
Design of the Scenarios in appendix.

- Supply
- IEA Pre-crisis
- BP Business-as-usual
- IEA Stated Policies Scenario (STPS)
- IEA Delayed Recovery Scenario (DRS)
- OPEC Accelerated Policy and Technology case (APT)
- BP Rapid
- BP Net Zero
- IEA Sustainable Development Scenario (SDS)
- BMO Net Zero 2050
- Average

What about natural gas?

Gas markets are also tight, mainly in Europe. Russia cut exports to Europe to multiyear lows this summer supplying less than a third of normal volumes and there's no clarity on further moves. Europe is filling its gas reserves for the winter through alternative supplies (LNG imports YTD up 70% from 2021 levels) but also demand destruction. However, estimates of the scale of demand destruction or substitution vary considerably. Nevertheless, European gas storage facilities are about 75% full. Despite the cuts, the pace of refilling is at average levels thanks to alternative supplies. There is a high probability that Europe reaches its goal of filling storage to 80% by the end of October, traditionally the start of the heating season. Yet, electricity prices jumped in Germany to >€600/MWh for the first time ever. The current price is >1'000% higher than the €41.1/MWh 2010-2020 average. High prices are likely to persist because in a case of a cold winter creating high gas demand, Europe has limited ability to increase its current flows from non-Russian sources and the there is still the threat that Russia could shut off its remaining flows at any moment.

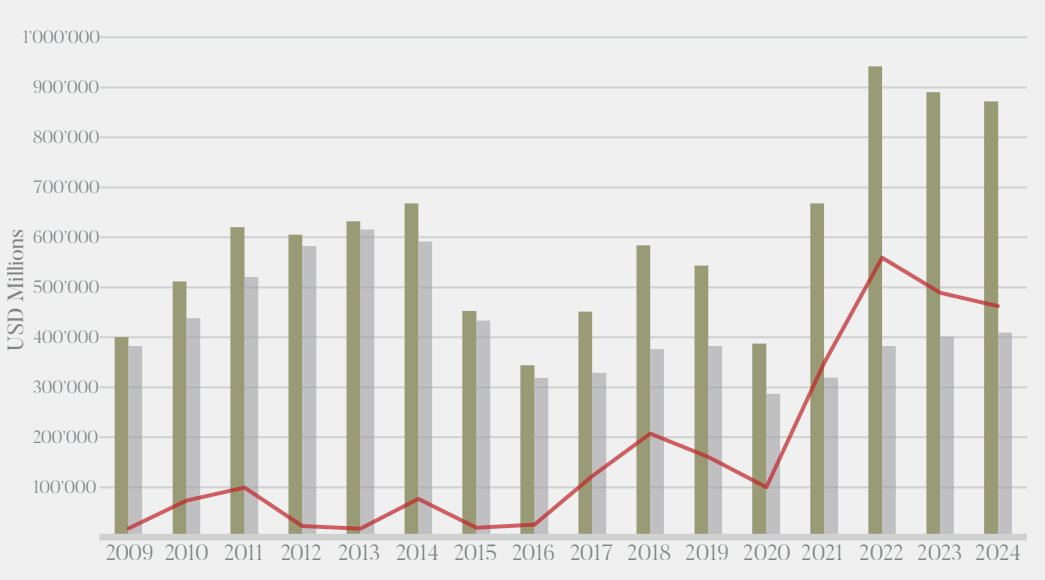
What does an energy fund manager look for, when investing in commodity companies? What's the appeal?

The good thing about investing in commodity companies is that we don't have to focus so much on the product, generally speaking. In general, oil is oil, independently where you produce it. So you have a more or less homogenous product and we have real-time pricing on the market (spot price) and even one for the future (forward curve), where commodity producers could in theory hedge. This simplifies a lot the due-diligence of a company. We focus on the relative best producer considering different aspects of a company. We look into the asset quality of a company with operational metrics like production costs, reserve valuation, F&D costs, etc. that we take out from the annual reports and 10-Ks every year according to our definition. But we also look into other aspects of a company like valuation metrics, balance sheet, dividends, behavioural finance and ESG factors. Sustainability is an integrated part of the ICG investment process. This is done in a pragmatic sustainable way. This means considering sustainability criteria without losing sight for return. For all this we developed a quantitative and qualitative multi-factor model that help us identify companies with a relatively good track record in different key variables or so called "champions".

Oil and gas companies are making more money than ever – Do you expect it to be sustainable?

After structural underinvestment in oil and gas supply, combined with a robust demand and rapidly shrinking OPEC+ spare capacity, there are several supporting factors for higher, sustainable oil and gas prices. The average cash cost of listed E&P companies is below $20/bl and with oil prices of $100/bl, the free cash flow is huge. The total free cash flow generated by upstream for all the public E&P companies is expected to increase from $340bn in 2021 to >$550bn this year! This will be the highest value on record. Despite that, energy stocks are far from pricing in strong and sustainable outlooks for fundamentals and shareholder return. In our view, energy's earnings stream is worth more than the 2022E P/E of 6x which is a steep discount relative to long-term average of 16.5x since 1990. During 2013-2014 it traded at 13.5x when oil prices were at a similar level though profit margins were much lower and credit risk was higher. Interestingly, all publicly-listed energy companies have a combined market cap of $3tn, which is about Apple's market cap even though these companies collectively generate 5x higher free cash flow. The free cash flow yield of some smaller companies is so high, they could go private in less than 4 years. By the way, this would not be good for ESG but it's kind of ironic, isn't it? The coal industry nearly disappeared from stock markets and is now in private hands with most probably less ESG considerations as listed companies.

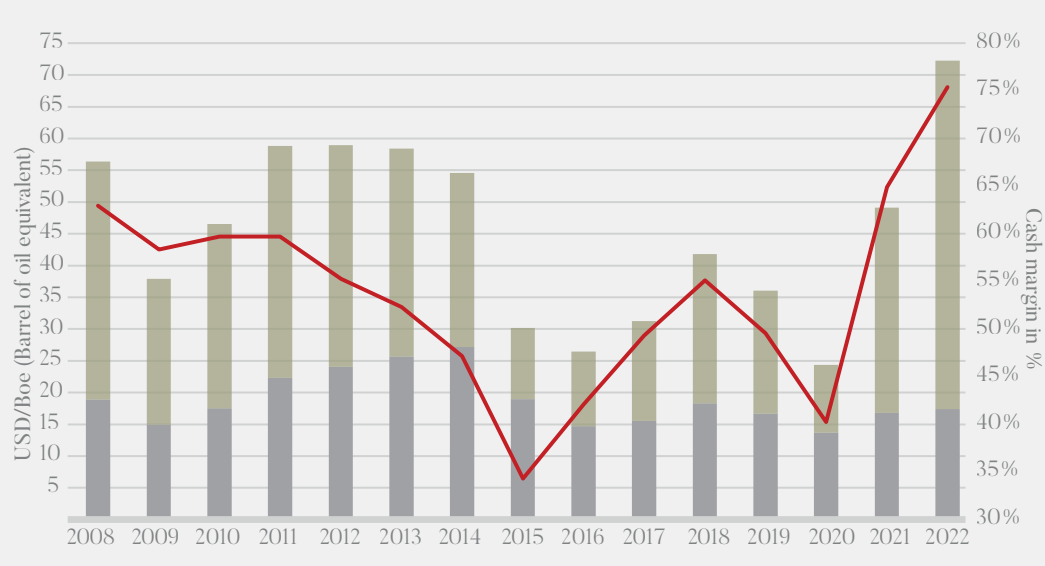
Cost deflation and the flexibility of the industry's business model was heavily underestimated – capital efficiency increasing strongly



Sources: Bloomberg, ICG database from >150 listed oil & gas companies (excluding Saudi Aramco)

Cash flow operations
Capex
Free cash flow

Oil and gas producers have currently lower costs and twice the cash margin than average, resulting in record margins



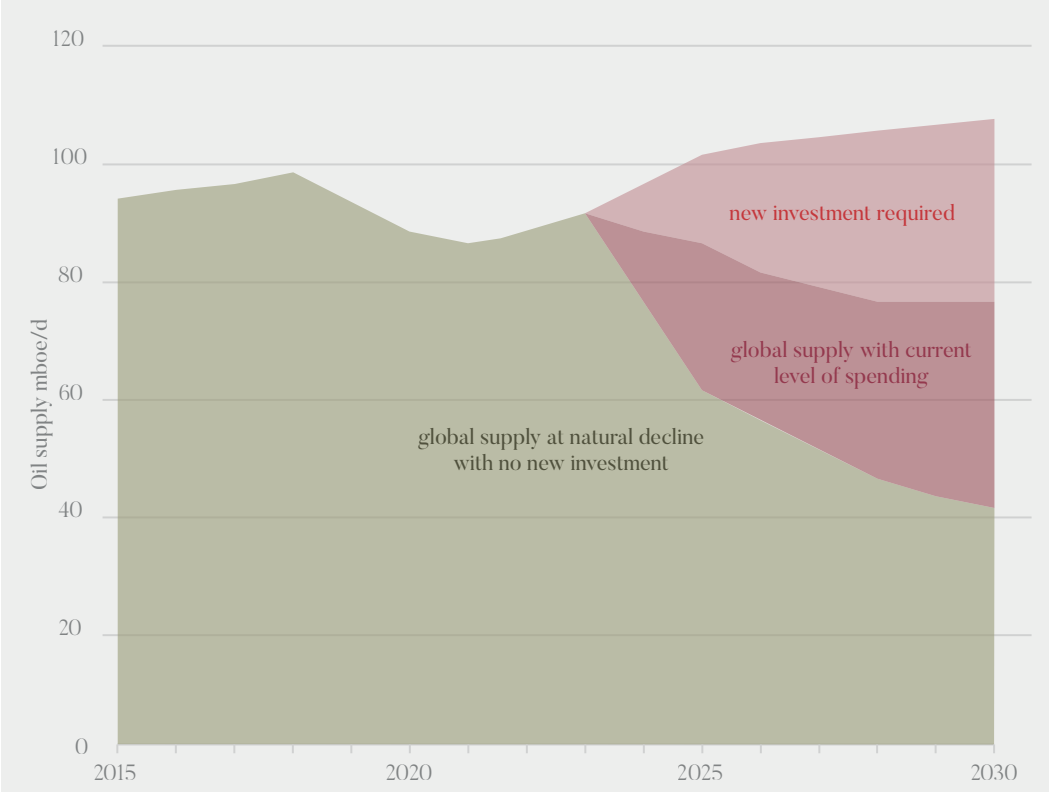
Sources: Bloomberg, ICG database from >150 listed oil & gas companies (excluding Saudi Aramco)

Cash Costs $/Boe (LHS)
Cash Margin $/Boe (LHS)
Cash Margin in % (RHS)

Politicians want to impose more taxes on energy companies, what effects do you expect from it?

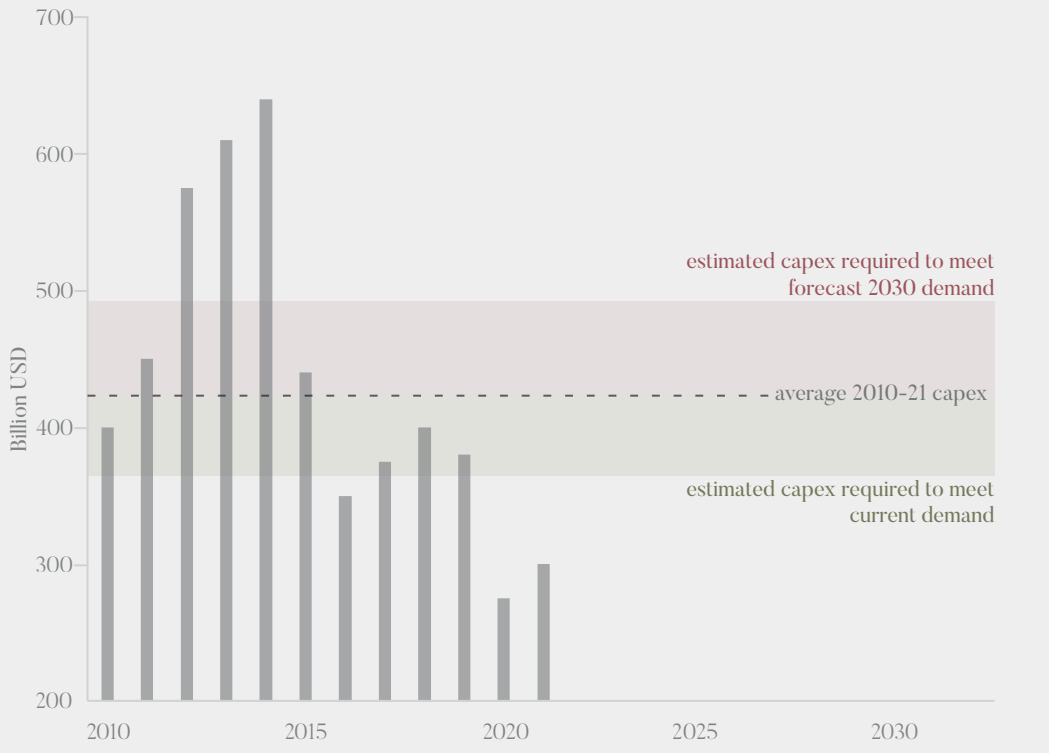
Politicians and various governments are making the whole situation still worse. They believe exorbitant profits are presently being made. It does not matter to them that in the preceding 10 years the entire sector has had problems even to earn back the costs of capital and a whole range of companies were even routinely losing money or went bankrupt. We need energy companies to invest more in new production, new infrastructure and renewable energy technologies. As a consequence of low returns and demonization of the industry, the conventional energy business continues to experience both a cyclical and secular depression in capital flows. The industry is inherently built on long-cycle projects. The Super Majors have replaced only 85% of their oil and gas reserves over the last decade. Without the ability or desire to make these substantial investments, the industry will struggle to meet growing global demand for energy over the next decade. Capital spending is roughly half of the average level of the past decade. Capex must increase dramatically and sustainably to maintain and grow global production of oil and natural gas. The consequences of ignoring the economic and physical realities of energy are starkly on display in Europe and in much of the developing world. We fear it is likely to get worse before it gets better.

To meet oil demand, substantial new investments are required to compensate for decline of existing fields



Sources: Saudi Aramco H1 2022 results, IEA World Energy Outlook

Capex is roughly half of the average level of the past decade



Sources: Saudi Aramco H1 2022 results, IEA World Energy Outlook

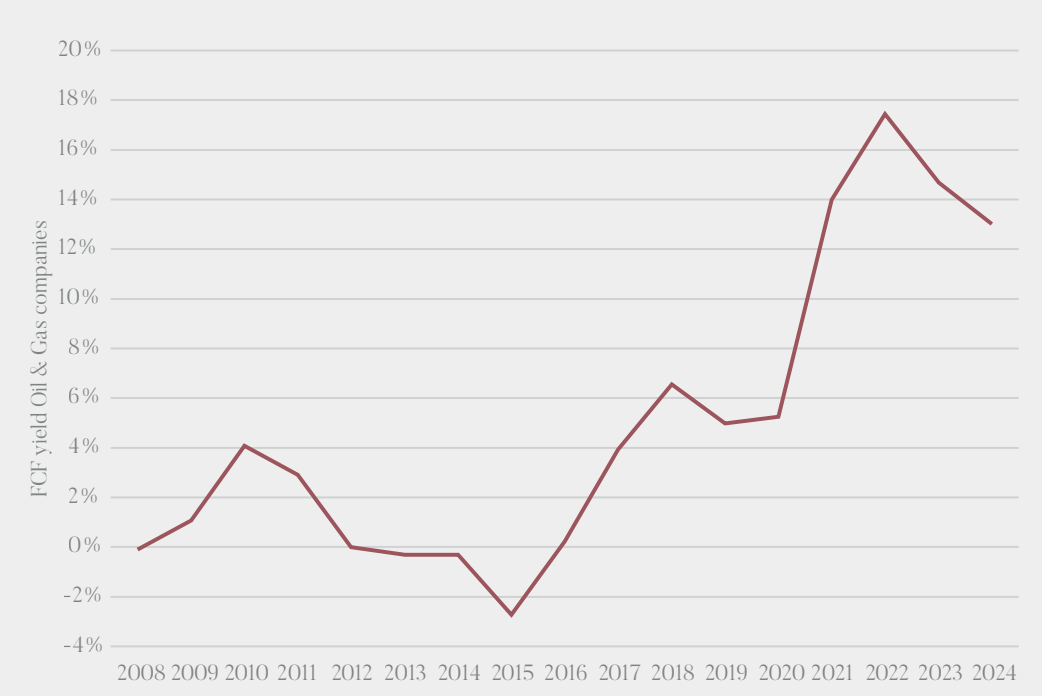
Is it too late to invest in energy companies?

Over the next few years, oil will continue to be an important factor of our economy and also a very good investment opportunity. It is also a good play or hedge if the green energy transition is not as fast as expected. Nevertheless, we remain convinced, as with commodities, natural resource equities should be part of a portfolio as the companies are in their best shape in history and valuation metrics continue to stay at attractive levels. Put energy into context with the S&P 500 Index where it is only weighted at 4% (vs. historical >10%) but it generates 7% to 8% of the net income. No wonder to us that Warren Buffett increased his energy exposure heavily this year making Chevron his 4th biggest position and buying a lot of Occidental Petroleum shares over the last few months.

What does the future look like for oil and gas companies?

The current upcycle is remarkable in that, despite the oil and gas price surge and robust cash flow generation, energy producer investment is only showing a modest uptick. This indicates that there has been a fundamental change in how oil and gas companies are approaching the investment allocation process. The companies become increasingly focused on shareholder returns. Of the $125bn positive cash flow of the big 6 Oil Majors (BP, Chevron, Equinor, ExxonMobil, Shell, TotalEnergies) last year, $66bn was spent on reducing debt and $54bn was paid out to investors. As a revenge of "old world economy" Exxon generated in 2Q22 more free cash than Alphabet and is #3 in the S&P 500 behind Apple and Microsoft. Chevron jumped up in the ranks with cash inflow to #5. Nevertheless, energy stocks remain broadly under owned. However, there is growing concern about ESG underperformance, resulting in many institutions starting to revisit their existing ESG frameworks and looking at different ways of softening ESG objectives all of which should translate to incremental equity flows into energy. After years of poor returns, the oil and gas companies are trying to woo investors by giving most of the extra cash they're making into share purchases and rising dividends. Therefore, we think this trend will be the main focus for the smaller producers. Recently Rick Muncrief, CEO of Devon Energy, said to the Financial Times "Unless we have shareholders that come in and say: look, we absolutely do not like these big dividends; we do not like your share repurchase programme; we want you to go back to a growth model (...) until we see that, I see no reason to change our strategy."

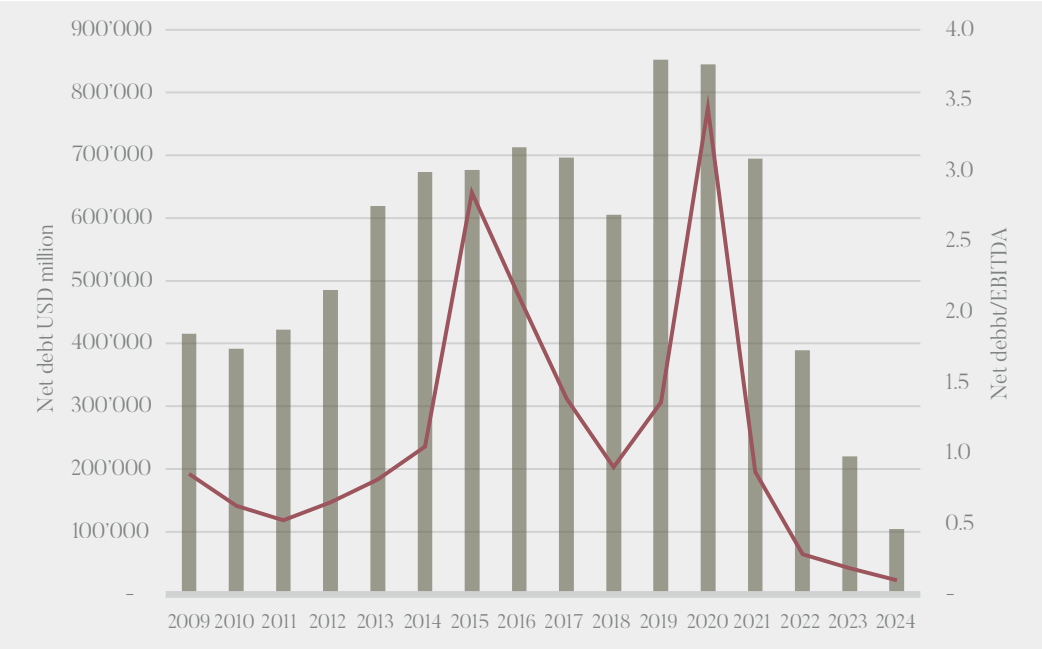
Shareholders increasingly demand that companies harvest cash flow and increase shareholder returns



Sources: Bloomberg, ICG database from >150 listed oil & gas companies (excluding Saudi Aramco)

FCF Yield Oil & Gas

Balance sheets to become healthier than at any point in history $700b of debt will be paid back in the next few year



Sources: Bloomberg, ICG database from >150 listed oil & gas companies (excluding Saudi Aramco)

Net Debt (LHS)
Net Debt/EBITDA (RHS)

Will energy companies have to change their business model?

As the energy mix of oil and gas is expected to shrink over the years, the industry is confronted with the question of whether they should try and at least partially reinvent itself as renewable businesses. While strategies vary, some bigger producers, mainly those called Oil and Gas Majors already aim to spend more on low-carbon solutions. Analysis show that most Oil and Gas Majors are progressively repositioning themselves in the energy industry, with investments, and commitments on further investments, in renewable energy solutions, energy efficiency, and other clean technologies as well as defining new or more ambitious emission reduction targets. Some analysts think, that Oil and Gas Majors could even have a competitive advantage in hydrogen, offshore technologies, electrification, liquid biofuels and carbon capture and storage (CCS). The energy sector as a whole was the second-highest producer of green patents! These alternative business opportunities could position the industry to be at the forefront of the quest for sustainable and inclusive growth as energy companies of the future. European Majors target to become significant clean energy producers (>160GW by 2050). We would not be surprised to see mainly the European Oil and Gas Majors as big utility companies in the future. So from Big Oil into Big Energy is realistic.

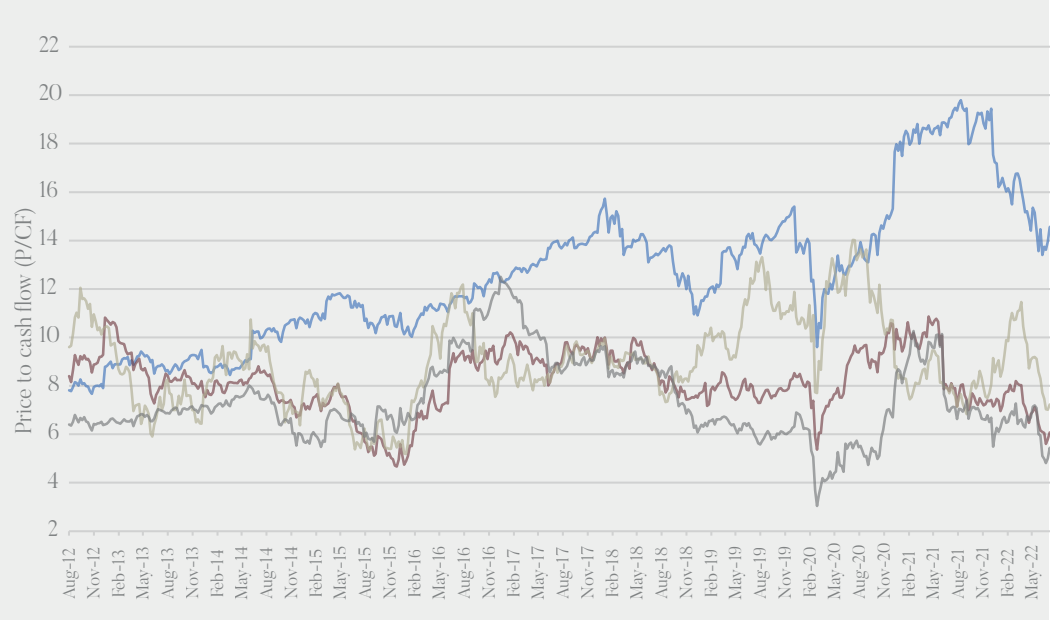
Companies	Renewable energy technology investments	Renewable energy targets
BP	Onshore wind, solar, biofuels EVs infrastructure, batteries	20 gigawatts (GW) by 2025 50 gigawatts (GW) by 2030
Eni	Solar, wind, hydrogen, EVs batteries and chargers, biofuels	15 GW by 2030 and 60 GW by 2050
Equinor (ex Statoil)	Solar, offshore wind, hydrogen EVs	4-6 GW by 2026 and 12-16 GW by 2030
Royal Dutch Shell	Offshore wind, hydrogen, biofuels Evs	Invest $3bn p.a. in renewable energy by 2030
TotalEnergies (ex Total)	Solar, wind, hydrogen, biofuels EVs, batteries and charges	35 GW of renewable electricity by 2025

Sources: Company Presentations

What sectors within are currently giving good returns? Is there anywhere from which one should stay away?

Energy continues to be the cheapest sector on all valuation metrics despite the relative strong performance over the last 2 years, especially after the recent correction. Energy is a deep value sector that is simultaneously improving on quality, growth and income factors, a rare combination. The sector should deliver strong capital return in practice with dividend yields of +4% and growing buybacks ($16bn announced YTD, +100% vs FY21), which is funded by >15% FCF yields. Indeed, analysts keep lifting earnings forecasts for energy companies at a fast pace, and the stock market is struggling to keep up. As a result, the Stoxx 600 Energy index is now the cheapest sector in Europe, with a record low forward P/E of 5x and trading at a historic discount relative to the Index of >50%. If you look into the price to cash flow chart of the S&P 500 Index vs. the energy sector this huge gap explains already a lot. While the S&P 500 price to cash flow (P/CF) increased over the last year, the one of the natural resource space declined. This means that the prices of the stocks of the S&P500 increased more than their cash flow. However, the cash flow of the natural resource space increased much more than their share price. And this after a strong price performance already. Energy stocks are discounting oil prices in the range of $50/bl vs spot prices of $100/bl. We think, that investors should probably avoid those producers that are heavily hedged. US oil and gas companies have reduced hedges for 2022 to 35% of total oil output as they seek to benefit from rising oil prices. Otherwise, we don't like companies with high debt, high costs and a high valuation.

The valuation of natural resource companies is record low



Sources: Bloomberg

S&P 500 INDEX
Bloomberg World Mining Index
NYSE Arca Gold Miners Index
MSCI World Energy Index

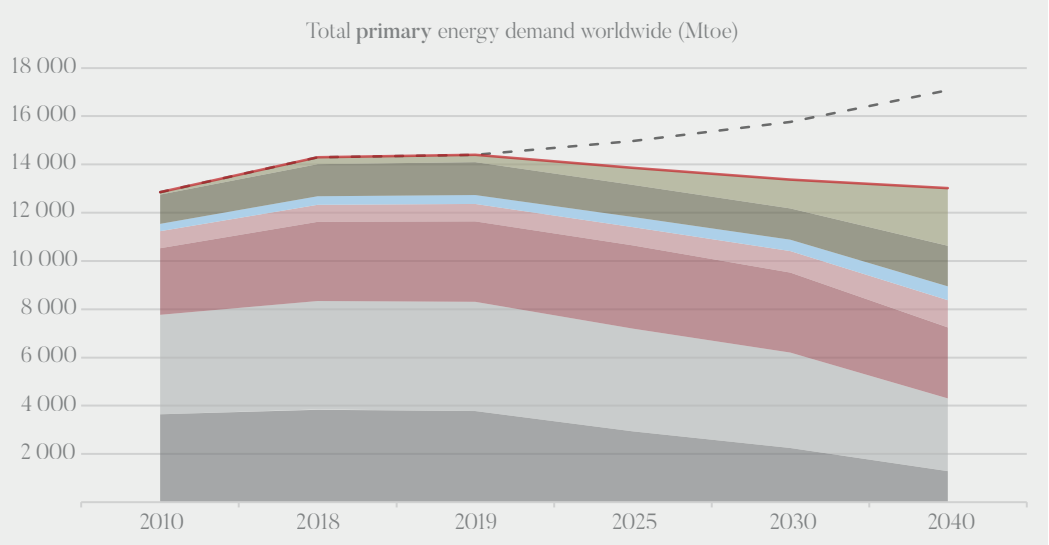
What is the solution for high energy prices?

Right now we have a crude oil Brent price of around $100/b after a lot of downside scenarios happened. A market crash, recession fears, an oil demand decline in China because of a Zero-Covid policy, record high release of US Strategic Petroleum Reserves and increasing OPEC production put a ceiling to the oil price recently. After all that, crude was still around $100 though - is this high? Let's put high prices into context. We had prices as high as $125/bl this year and is nominally near its all-time high. The previous peak of $140/bl was reached in the summer of 2008. However, if we look at that oil price in real terms, which means after adjusting for inflation, the peak reached in 2008 would in today's dollars correspond to a price of around $200/bl. That's double the price we have today. However, we are sorry to say that, but the solution for high prices are even higher prices probably. At the end this is the single strongest incentive for innovation and finding new solutions or substitutions. Historically, we nearly always found a solution to our problems and also today, we are convinced that some genius around the world will finally make some groundbreaking innovation sooner or late for this new energy order to happen. The oil crisis of 1973, where the oil production was cut on the back of the OPEC oil embargo and oil prices quadrupled, forced the developed world to examine energy use and efficiency, encouraging accelerated innovation and research into renewables. Indeed, from the mid-1970s to the mid-1980s government programs in many countries invested funds in alternative sources of energy, such as solar, wind, geothermal and nuclear. This was one of the most important milestones in the history of renewables. From a crisis into a new opportunity.

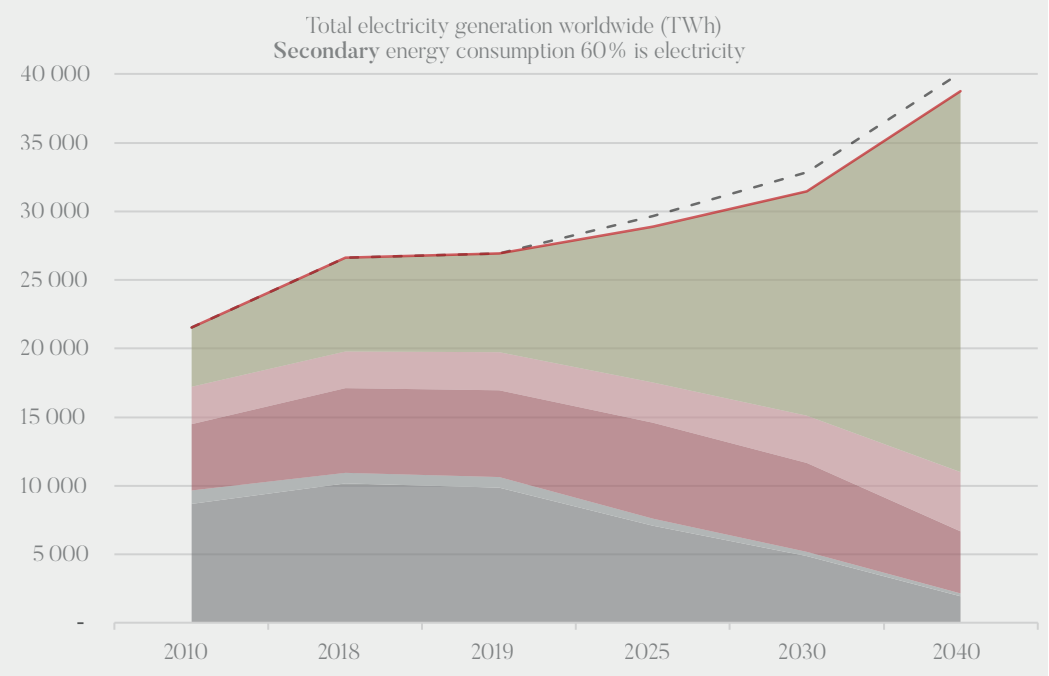
What do you mean with new energy order?

The energy system is being redefined after the challenges of the last few years. In this new energy order, there is a renaissance of “old” industries, because the digitalization of the “new” world needs a lot of resources. The structural underinvestment in the “old” economy due to a decade of poor returns, particularly in energy where ESG issues have further reduced investment, leaving inadequate production capacity to meet the increasing need for electricity and infrastructure. We still live in a material world. Energy is the bedrock of modern civilization. Fossils resp. crude oil, natural gas and coal make up 80% of our primary energy consumption today. They are too important to be ignored if we want to get a smooth energy transition and bridge the gap between now and a renewable future. Fact is that renewables today are only responsible for 20% of our primary energy consumption. Of course, we all want to change or invert this relation but the energy transition is not done from today to tomorrow. A transition takes a lot of time to do investment and change or improve our whole energy infrastructure. We are way behind schedule, as we all know. According to JP Morgan, energy demand is expected to exceed supply by 20% and would require $1.3tn of incremental capital to close the gap by 2030. Therefore, energy investment needs to rise 45% to $2.7tn annually by 2030 to meet the energy demand. Even so, if we reduce primary energy consumption worldwide, there is a substantial increase in electricity need worldwide. Electricity is responsible for 60% of our primary energy consumption and this need is only going up. Even the most conservative assumption estimates that the electricity consumption is going to go up by 40% in the next 20 years. Here is where hopefully the biggest part will come from renewables and this will help to reduce emissions worldwide.

Energy is the bedrock of modern civilization. Fully avoiding fossil-fuel investments is impractical because oil, gas and coal still account for about 80% of the world's energy. We may reduce primary energy consumption worldwide, but there is an enormous increase in electricity need worldwide



Sources: IEA World Energy Outlook 2020



Sources: IEA World Energy Outlook 2020
Design of the Scenarios in appendix.

- Coal
- Nuclear
- Other renewables
- Oil
- Hydro
- Energy demand (STPS)
- Natural gas
- Bioenergy
- Energy demand (SDS)

How does this change play out when it comes to ESG considerations?

There is no doubt that the energy transition presents a major go-forward challenge for the oil and gas industry, but it is not going to culminate overnight. We think, the energy sector has to be at the heart of the solution to climate change. Fossil fuel divestment, in our view, stands as a permanent negative call on an industry that may be more dynamic and innovative than some market observers expect. As the CEO of Shell recently said, the revenues generated by the oil and gas business is financing the investment in renewables. The energy sector as a whole was the second-highest producer of green patents! Investors who sell their shares pass up the opportunity to engage with management and use their leverage as long-term shareholders to push for ESG improvements, including energy transition plans. This is real ESG impact, we would say. However, about 1'300 institutions across the capital markets have committed to fossil fuel divestment. The issue of fossil fuel divestment in some ways has become politicized and may pose difficult questions for fiduciary investors if the sector continues to outpace the market. However, with antienergy constraints likely loosening given increasing ESG performance pressure and with many reconsidering how to define ESG, we expect a positive impact to energy equity. Interestingly, forward-looking fossil fuel producers will play a "critical" role in decarbonizing the world economy, BlackRock CEO Larry Fink said in his annual letter to CEOs. Fink emphasized that divesting from fossil fuels, as many endowment funds such as Harvard University have done, won't drive the world toward low carbon.

CONCLUSION

The topics of energy crisis and energy transition will accompany us for some time to come and always provide an occasion for exciting discussions.

Investors should give some thought on their ESG frameworks, as oil and gas companies today are not the same anymore as a couple of years ago.

This current energy crisis is offering opportunities to reposition investors' portfolio to a sector where a real impact can be achieved as we think the oil and gas companies will be at the very heart of the energy transition, while being rewarded with phenomenal shareholder returns in the foreseeable future.

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Design of the Scenarios (appendix to p.8 and p.23)

IEA stated policies scenario (STPS)
This scenario reflects all of today's announced policy intentions and targets, insofar as they are backed up by detailed measures for their realization.

IEA delayed recovery scenario (DRS)
This scenario reflects a prolonged outbreak of the pandemic with continued periodic confinements and other restrictive measures by governments.

OPEC accelerated policy and technology case (APT)
This scenario estimates a faster penetration of available energy-efficient technology in various oil-consumption sectors, without assuming any new technological breakthroughs.

BP rapid
This scenario is based on a series of policy measures, led by a significant increase in carbon prices, such that carbon emissions from energy use fall by around 70% by 2050.

BP net zero
This scenario cumulative CO2e emissions are between the 75th and 90th percentile of the range of 1.5°C IPCC scenarios.

IEA Sustainable Development Scenario (SDS)
This scenario estimates that a surge in clean energy policies and investment puts the energy system on track to achieve sustainable energy objectives, including the Paris Agreement, energy access and air quality goals.

BMO net zero 2050
This scenario is more aggressive than the IEA SDS scenario including a higher hydrogen and EV penetration (90m by 2040) and outright bans on the use of ICE vehicles.

Analysis, data and papers from the following organizations were used for this document: UBS, BMO, Black Rock, BCA, Scotiabank, Goldman Sachs, Credit Suisse, Cantor Fitzgerald, Deutsche Bank, JP Morgan, Pilgrim Global, Greenmantle, Man, RFS, Vltava Fund, Bloomberg, IEA, Rapid Transition Alliance, EIA, BP World Energy Outlook, OPEC World Oil Outlook, Wikipedia, WSJ, FT, ARTE Doku "Öl. Macht. Geschichte" and Independent Capital Group's internal database.

For questions about a specific dataset, please contact research@independent-capital.com.

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