

A Work Project, presented as part of the requirements for the Award of a Master Degree in Management from the NOVA – School of Business and Economics.

An Oil Giant in a Changing Energy  
Sector

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A Project carried out on the Master in Management Program, under the supervision of:

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2021.12.17

## Abstract

Exxon Mobil is one of the largest companies in the world, but it is currently facing an existential risk. As the world continues to move towards greener energy sources, the company could soon find itself in a market where demand for its products is drastically diminishing. A growing number of investors and coalitions have drawn the company's attention to this phenomenon. However, the oil giant has so far refused to take decisive steps towards a cleaner future, as it intends to proceed with its initial strategy, where the focus is first and foremost on increasing production. In our research, we look at the implications of different future scenarios and how they affect the value of the company.

Keywords: Valuation, Finance, Exxon Mobil Corporation, Oil and Gas Industry, Energy Transition

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**EXXON MOBIL CORPORATION**

ENERGY

STUDENT: FERENC KRIZSA

**COMPANY REPORT**

9 NOVEMBER 2021

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**An Oil Giant in a Changing Energy Sector**

*Can Exxon Mobil get on the right track?*

- Based on our analysis, that resulted in a share price of \$62,45 we recommend investors to HOLD Exxon Mobil. As in addition to a capital gain of 1,8%, they can expect a 5,9% dividend yield, resulting in a total return of 7,6%.
- Exxon Mobil is currently facing an existential business risk. As new studies point out that no new oil and natural gas fields are needed. By current production most of the companies' reserves will be depleted by 2040.
- In extreme cases oil and natural gas demand are projected to fall by 76% and 57% respectively until 2050 as clean energy sources take over.
- As economies recover from the COVID-19 pandemic, oil and natural gas demand increases faster than expected resulting in oil prices over 70 USD/barrel, thereby favouring Exxon Mobil.

**Company description**

Exxon Mobil Corporation explores for and produces crude oil and natural gas internationally. Which it then transforms into petroleum and petrochemical products. Through the Upstream, Downstream and the Chemical segment.

**Recommendation:** HOLD

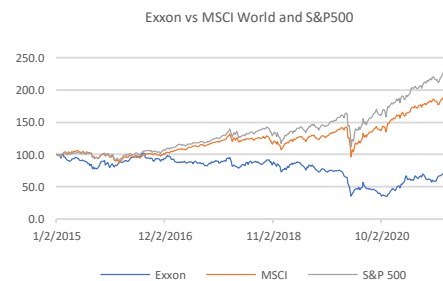
**Price Target FY22:** 62.45 \$

**Price (as of 17-Dec-21)** 61.37 \$

Bloomberg: XOM US Equity

52-week range (\$)	40.53-66,38
Market Cap (\$m)	260.533
Outstanding Shares (m)	4.233

Source: Bloomberg



Source: Bloomberg

(Values in \$ millions)	2020	2021E	2022F
Revenues	178.574	231.462	217.627
Upstream	14.549	21.922	20.858
Downstream	140.896	182.395	170.276
Chemical	23.091	27.115	26463
Corporate and Financing	38	30	30
Net Profit	-19.679	13.012	11.779
EPS	-4,65	3,07	2,78

Source: Exxon Mobil 10K and Analyst Estimates

**THIS REPORT WAS PREPARED EXCLUSIVELY FOR ACADEMIC PURPOSES BY FERENC KRIZSA, A MASTER IN MANAGEMENT STUDENT OF THE NOVA SCHOOL OF BUSINESS AND ECONOMICS. THE REPORT WAS SUPERVISED BY A NOVA SBE FACULTY MEMBER, ACTING IN A MERE ACADEMIC CAPACITY, WHO REVIEWED THE VALUATION METHODOLOGY AND THE FINANCIAL MODEL. (PLEASE REFER TO THE DISCLOSURES AND DISCLAIMERS AT END OF THE DOCUMENT)**

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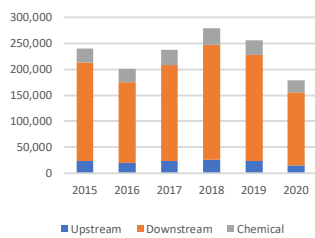
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- 72,000 employees
- ~4M OEBD of net oil and gas production per day
- ~5M barrels of petroleum product sales per day
- 21 Refineries
- 25M tonnes of chemical product sales yearly

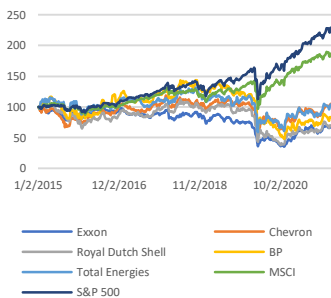
\*OEBD: Oil Equivalent Barrels per Day  
Source: Annual Report 2020

Figure 1: Revenue Composition (m\$)



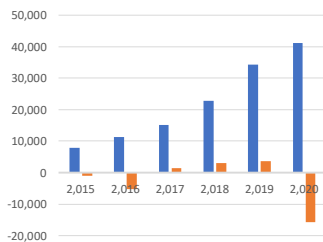
Source: ExxonMobil 10-Ks

Figure 2: Exxon's performance against Peers



Source: Bloomberg

Figure 3: Exxon's U.S. Upstream, Cumulative Capex vs. Cumulative Earnings, 2015-2020 (m\$)



Source: ExxonMobil 10-Ks

## Company Overview

Exxon Mobil Corporation was formed after a merger of Exxon and Mobil in 1999 and is currently headquartered in Irving, Texas. The company explores and produces crude oil as well as natural gas. Furthermore, it manufactures, trades, and transports crude oil, natural gas, petroleum, petrochemical, and a variety of speciality products world-wide. Its operations are divided into upstream, downstream, and chemical divisions. The upstream segment is responsible for the exploration and production of crude oil and natural gas. The downstream division manufactures and distributes products that were derived from crude oil and other feedstock, extracted mainly by the upstream segment. These products include industrial lubricants, wholesale fuels, marine fuels and lubricants, passenger and commercial vehicle lubricants, aviation fuels and lubricants as well as asphalt and bitumen. The third and final segment converts crude oil and natural gas into petrochemical feedstock. Which will later be used in packaging, clothing, electronic devices, tires, vitamin capsules and in several other products that are crucial for everyday life.

Exxon Mobil is currently the 33rd largest company in the world and one of the biggest oil majors based on its \$260 billion market cap, but it has nevertheless seen better days. In 2010 Exxon was the world's largest company with a market capitalization of around \$370 billion, while only having \$7 billion of net debt on their balance sheet. Back then the company was a key constituent of the Dow Jones Industrial Average index and had the highest possible credit rating of AAA. By contrast, its market capitalisation has now fallen to \$260 billion while its net debt has risen to an all-time high of over \$65 billion in 2020, which has since been reduced to \$52 billion. At the same time, it dropped out of the DJIA and got downgraded by credit agencies several times. Comparing Exxon's stock performance over the last five years with its peers, it is clearly visible that the company has significantly underperformed. With an annualized average return of -1,61% compared to its peer average of 2,91% and a Sharpe ratio of -0,09.

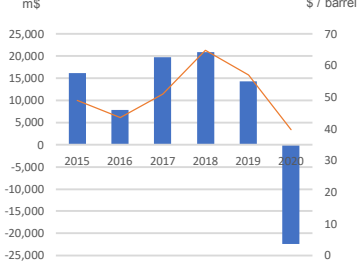
Many believe that the company's current bad situation is a result of their inappropriate strategy. Which consisted for many years of increasing spending in order to boost production. However, it seems that this strategy could pose even more severe risks for the company in the future. As fossil fuel projects, in which the company invests can take decades to deliver returns, by producing and selling products for which there might be a significantly reduced demand in the future.

**Figure 4: Oil price movement (\$/barrel)**



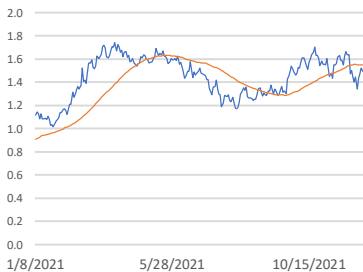
Source: Bloomberg

**Figure 5: Relationship between the company's earnings and oil prices**



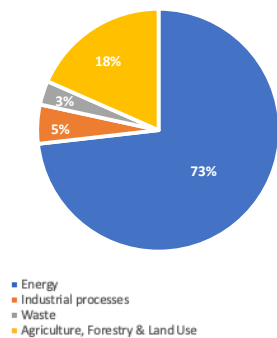
Source: ExxonMobil 10-Ks and Bloomberg

**Figure 6: U.S. 10-year Treasury yield with a 50-day moving average**



Source: Bloomberg

**Figure 7: Global greenhouse gas emissions by sector**



Source: Our World in Data

## Industry Overview

Current macroeconomic trends tend to favour Exxon Mobil. As economies recover from the COVID-19 pandemic and demand for crude oil and natural gas continues to increase. However, this demand growth is nonetheless higher than expected as such production is lagging behind. Causing oil prices to reach heights such as \$80 per barrel. Which specifically benefits Exxon as there is a strong correlation between the company's earnings and the price of oil. After a closer look at the variables a correlation coefficient of 0,74 was determined.

Furthermore, as bond yields grow investors tend to focus on short-term profits, and favour stocks that can yield profits in the present. As returns in many years from now seem less attractive if the risk-free alternative of Treasury's provides a decent income. Therefore, investors are prone to turn from speculative growth stocks to companies like Exxon Mobil, which provide stable dividends and are able to benefit from the economic recovery in the short-term.

However, the long-term future of the company is not looking so bright. A major fall in demand is expected in connection with climate change and the regulations associated with it, as the world continues to shift towards greener energy sources. Today, climate change is playing an increasingly important role. As more and more people are experiencing the severe consequences of this phenomenon first-hand through unprecedented floods, forest fires and extreme weather changes.

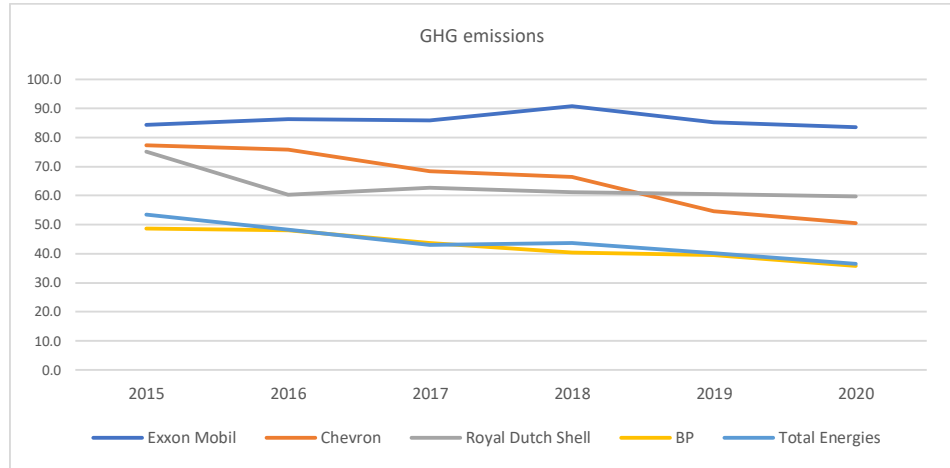
Unfortunately, the energy sector, and ExxonMobil in particular, is a major contributor to this crisis. As this sector is responsible for more than two thirds of the global harmful emissions, while ExxonMobil being the world's 5th largest producer of greenhouse gases. To shed light on how polluting the company truly is a comparison was carried out by comparing Exxon with its competitors in the same sector. The analysis is based on the Scope 1 and Scope 2 emissions of the companies, which are linked to the company's activities and are required to be reported annually. The two different scopes are defined as follows "Scope 1 covers direct emissions from owned or controlled sources. Scope 2 covers indirect emissions from the generation of purchased electricity, steam, heating, and cooling consumed by the reporting company." These two types of emissions were summed and broken down per unit of production. The results are disappointing for ExxonMobil. The company emits 83.5 thousand metric tonnes per 1 million barrels

produced. Almost twice as much as the average emission of its peers of 45.6 thousand metric tonnes for the same number of barrels produced.

*Peer Companies:*

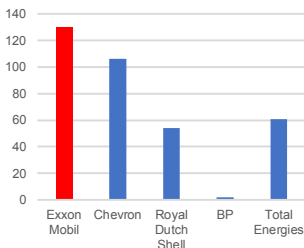


**Figure 8:** Greenhouse gas emissions in thousand metric tonnes per million barrels produced



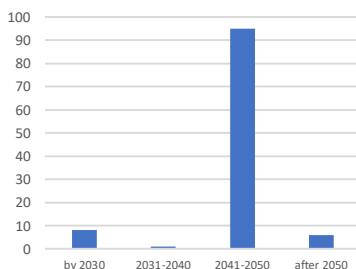
Source: Company Data, Bloomberg, and Analyst calculations

**Figure 9:** Methane emissions in 2020 in metric tonnes per million barrels



Source: Bloomberg and Company Data

**Figure 10:** Number of countries with net-zero pledges by target year

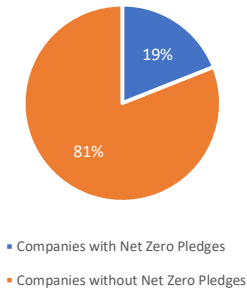


Source: Net Zero Tracker

Unfortunately, the company is also a leader in methane emissions. This gas is of particular importance within the greenhouse gases. Because, although it has a shorter lifespan than carbon dioxide, according to a report published by the UNECE (United Nations Economic Commission for Europe) its impact on global warming is 80 times greater than that of CO<sub>2</sub>. Sadly, ExxonMobil emits 22% more methane for a given unit than Chevron, the second largest methane emitter company in the group.

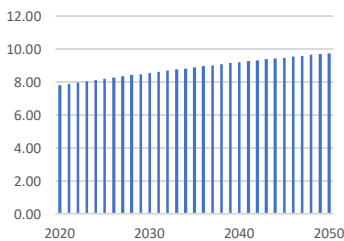
As people and regulators become more aware of the harmful impact of oil companies on the environment, and thus their central role in global warming, the need for urgent change becomes evident. Thus, it seems that people have finally reached a point where they are willing to take action in order to curb harmful emissions. We have seen numerous examples of this in the recent past. First of all, as a result of the UN Climate Change Conference (COP26) the Beyond Oil and Gas Alliance (BOGA) was formed. A coalition of governments led by Denmark and Costa Rica, with the aim of phasing out oil and gas production. Additionally, more and more countries are committing to net-zero emissions by 2050. A critical milestone that must be achieved to meet the goals of the 2015 Paris Agreement. That aims to keep global warming at 1.5 degrees Celsius above pre-industrial levels by 2100. Thus, it seems that change is finally on the horizon. However, in achieving this goal the energy sector and Exxon Mobil have a crucial role to play.

**Figure 11:** share of companies with net zero pledges within the 2000 largest companies based on revenue



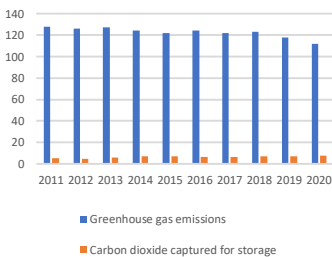
Source: Net Zero Tracker

**Figure 12:** Population growth from 2020 until 2050 in billions



Source: Worldometer

**Figure 13:** Total emissions vs Carbon captured (in metric tonnes)



Source: ExxonMobil 2021 Energy & Carbon Summary

Board of Directors
Michael J. Angelakis
Susan K. Avery
Angela F. Braly
Ursula M. Burns
Kenneth C. Frazier
Gregory J. Goff
Kaisa H. Hietala
Joseph L. Hooley
Steven A. Kandarian
Alexander A. Karsner
Jeffrey W. Ubben
Darren W. Woods

Several companies including oil majors have already pledged to reach net-zero emissions by 2050. Among these companies are Aramco and Chevron, peer companies to Exxon Mobil. Other European rivals like Royal Dutch Shell and BP are also taking serious action towards a greener future. Royal Dutch Shell is planning to cut back its oil production by 1%-2% every year. At the same time BP plans to increase its renewable energy output 20-fold while cutting its oil production by 40% until 2030. However, Exxon has not yet taken the necessary binding steps towards a net-zero commitment, but as the company announced on the 6<sup>th</sup> of December it aims to achieve net zero emissions from its working assets in the U.S. Permian basin by 2030.

The fact that Exxon Mobil has not pledged to any greenhouse gas emission reductions might be due to the fact that the company's view about the future is fundamentally different from its rivals and the most recent World Energy Outlook. Almost all parties involved agree that the world population is expected to reach 9.7 billion by 2050, with rising living standards and increased demand for energy. However, opinions differ widely on how this demand will be met.

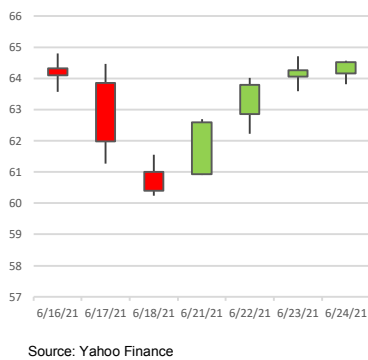
Exxon believes that oil and other fossil fuels will continue to play a dominant role in the upcoming decades despite climate change and regulations. In their opinion the energy transition has to take place slowly in order to avoid extreme energy prices and situations where demand is not fully met. Furthermore, it sees an opportunity in the fact that competitors might leave the market to pursue renewable projects leaving the door open for Exxon Mobil to gain extra market share in the oil and gas producing business. As such it intends to proceed with its original strategy to increase spending in order to boost production. According to the company's plan harmful emissions generated through its manufacturing processes would be offset, by their Carbon Capture and Storage (CCS) technology. Thereby, maintaining the possibility of reaching net-zero, without lowering their produced quantities. However, according to current data carbon removal technologies as of today are not an alternative to dramatically reducing emissions or an excuse to delay action, as this type of technology only captures a fraction of the total emissions at the moment.

Based on this the company's strategy seems fairly risky, as it has put all its eggs in one basket. If the demand for oil were to fall for any reason, the company would be headed straight towards disaster. Consequently, Exxon faced increasing pressure from investors requesting the company to mend its balance sheet, restrain fossil-fuel investments and return more cash to shareholders.

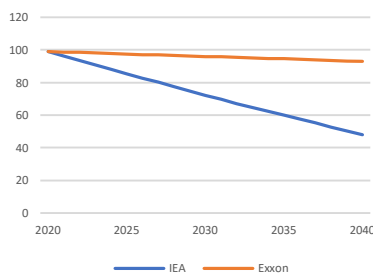
A small hedge fund called Engine No.1 has also drawn the company's attention, to the fact that its commitment to fossil fuels could be fatal, while it also belittled

Top Institutional Holders	
Vanguard Group	8,34%
Blackrock	6,34%
State Street Corporation	5,96%
Engine No.1	0,02%

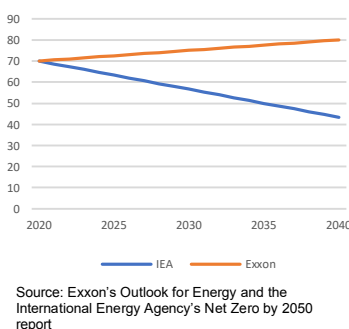
**Figure 14:** Stock movement around the announcement of the new board members



**Figure 15:** Oil demand projections until 2040 in million barrels per day



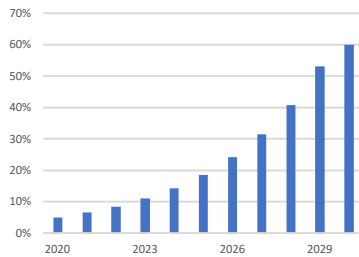
**Figure 16:** Natural Gas demand projections until 2040 in million oil-equivalent barrels per day



the company's drive towards a cleaner future. And the market proved them right. In a proxy war, investors voted three of the hedge fund's nominees to Exxon Mobil's board of directors. Gregory Goff, Kaisa Hietala and Alexander Karsner. All of them have valuable experiences in the energy sector and more importantly in renewable energies. Which the company really needed, as based on a report published by the Coalition United for a Responsible Exxon (CURE) no previous member of the board had relevant experience in the energy sector. Most of them were from different industries such as telecommunication, insurance or financial. Kaisa Hietala on the other hand one of the newly elected members already led a successful oil and gas company transition process. The main task of the new members will be to steer the company on a more climate-friendly path and help it through the energy transition. When analysing the company's stock performance with the Constant Return Model and the CAPM on the 21st of June, when Exxon officially announced its new board members an abnormal return of 3,5% (Constant Return Model) and 2,9% (CAPM) was observable in the company's share price. Indicating that even though the oil giant doesn't believe in change, the market does. According to one of the company's biggest investors BlackRock: "Exxon and its Board needs to further assess the company's strategy and board expertise against the possibility that demand for fossil fuels may decline rapidly in the coming decades, as was recently discussed in the International Energy Agency's (IEA) Net Zero 2050 scenario. The company's current reluctance to do so presents a corporate governance issue that has the potential to undermine the company's long-term financial sustainability". As a result, Exxon Mobil recently updated its corporate plans in which it announces increased investments in greenhouse gas emission reductions and disciplined capital investments.

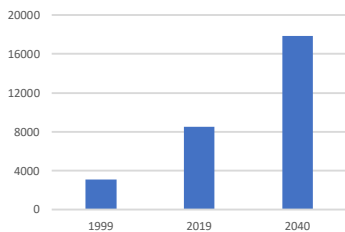
However, if the company wants to meet the Paris Agreement and thereby emit Net-Zero greenhouse gases by 2050, drastic changes are needed. Surprisingly according to a recent report from the International Energy Agency, no new oil and natural gas fields are required to meet future demand, beyond those already approved for development. In line with this finding, they forecast a significant fall in oil demand. The current 99 million barrels per day (mb/d) are expected to fall to 72 mb/d by 2030 and then to 24 mb/d by 2050. In contrast, Exxon projects an oil demand of 93mb/d by 2040. Which they say will require substantial investments to offset the natural decline and thus meet the projected demand. As for natural gas, the International Energy Agency forecasts that demand will fall from today's level of 70 million oil-equivalent barrels per day to 30 mb/d by 2050. A drop of about 57%. Exxon, however, believes that demand for natural gas will rise and projects a 14% increase by 2040, which would translate into a demand of 80 mb/d.

**Figure 17:** Electronic car sales as percentage of global car sales forecasted until 2030



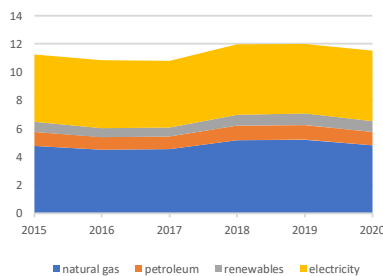
Source: International Energy Agency's Net Zero by 2050 report

**Figure 18:** Global air passenger traffic in billion revenue passenger kilometres



Source: Statista

**Figure 19:** US residential sector energy consumption by energy source from 2015-2020 in quadrillion British thermal units



Source: US Energy Information Administration (eia)

The difference between the two views stems from the fact that they have a very different vision about the development of the different sectors.

**Transportation:**

Exxon, for example, believes that demand for oil will grow in the transport sector as a whole. In light-duty transportation, they believe that the need for oil will fall somewhat compared to today, thanks to the spread of electric vehicles. However, the company believes that in heavy-duty transportation and aviation, on the other hand, demand for fossil fuels will increase considerably, since in these areas electric energy cannot be used for various reasons, such as range limitation or the slow development of infrastructure. While, according to the International Energy Agency, in order to achieve Net Zero emissions, the demand for oil, which is now very dominant in this sector, as it covers more than 90% of the transport sector's energy needs, will have to be drastically reduced. They estimate that this figure will be only 10% in 2050. Electricity will take over the dominant role from oil, and in cases where electricity has limited applications, such as aviation or shipping, biofuels will be dominant energy source.

**Residential and Commercial:**

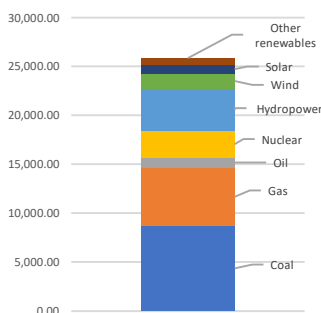
In this sector oil and natural gas is mainly used for heating, mostly in outdated homes. Compared to more modern ones where electricity is also used for heating, besides lighting and powering household appliances. For the residential and commercial sectors, Exxon expects the demand for oil and gas to remain unchanged. As it believes that new build houses will be equipped with a heating system, that is powered by electricity. Therefore, even though their forecast predicts the sector's increased energy needs they believe that this growth in demand will entirely be met by electricity. They think that any small reduction in oil and natural gas demand might be due to more efficient appliances and equipment. In contrast, the path to Net Zero emissions implies a significant decrease in fossil fuels. In their view, the overall energy mix of the sector will change, and electricity will not only meet the increased energy demand but will almost completely squeeze out oil and natural gas from the market. To an extent that fossil fuels will only account for 2% of energy demand. They plan to achieve this by retrofitting homes with electrically powered heating systems.

**Industrial:**

Based on Exxon's view energy demand in this sector will grow by 14% by 2040 due to a growing population and prosperity. They expect oil, natural gas, and electricity to meet the increased demand. In contrast, the International Energy Agency forecasts a stabilization in this sector, except for chemicals, where the

market is projected to grow by 30%. In their view, demand for products produced by the industrial sector in mature economies will eventually saturate. Demand at this stage is primarily due to the renewal and replenishment of stocks. However, they forecast that the energy mix in the sector will be completely transformed. The share of fossil fuels in energy use will fall from 70% to 30% by 2050. The amount of oil used in the sector will remain unchanged as increased demand for chemicals offsets the reductions in other areas. However, to achieve Net Zero emissions, electricity will have to displace coal and natural gas almost entirely. Where the required high temperatures for production cannot be achieved with electricity, CCS technologies can contribute to net-zero emissions.

**Figure 20:** Global electricity generation by source



Source: Our World in Data

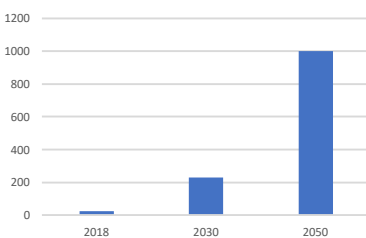
**Electricity and Power Generation:**

As we have seen above, electricity will play a major role in the future. Thus, the way this energy source is produced will gain major significance. Both Exxon and the International Energy Agency project considerable growth in this sector. The IEA predicts that the 23 230 TWh demand in 2020 could reach 60 000 TWh by 2050. Exxon predicts that, along with natural gas, there will be an increasing role for renewables such as wind, solar and nuclear. In contrast, the IEA predicts that the role of fossil fuels in this sector will almost entirely disappear. Clean energy sources will fully replace them.

**Opportunities**

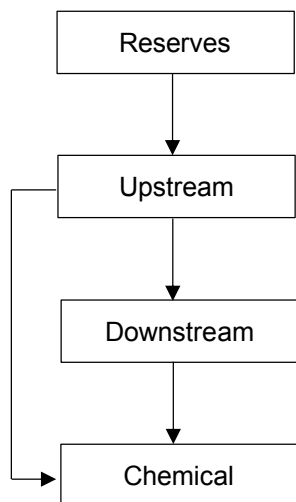
Despite many threats, the future also holds opportunities for Exxon Mobil. For instance, the installation of several offshore wind farms will be required to meet the increased demand for electricity. In doing so, the oil major could leverage the knowledge it has gained from its offshore projects. However, for the transition to be truly profitable for the company, swift action is needed to ensure that the company exploits the first movers' advantage. Furthermore, as mentioned earlier, the demand for different biofuels will increase in the future. By producing these, the company could, to a certain extent, offset the losses resulting from the reduction in oil and gas demand. However, this depends largely on the success of the different research and development projects in which the company is already actively investing. If they succeeded, they could become a leading producer in this field. Last but not least another major opportunity for the company is the Carbon Capture and Storage technology. If the technology becomes commercialized Exxon Mobil could gain a lot, as it has the resources to store large quantities of carbon underneath the earth in already depleted oil and gas reservoirs.

**Figure 21:** Global offshore wind installed capacity forecast in gigawatt



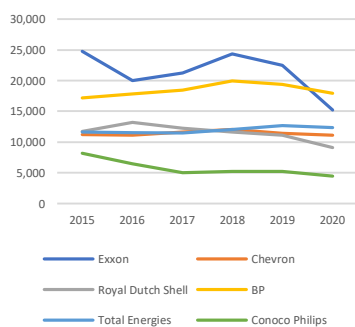
Source: Statista

## Reserves



In addition to the limiting factors mentioned above such as demand and regulation, there is another very important limiting factor which could have a major impact on Exxon’s future, namely its reserves. As oil and natural gas extracted by the Upstream segment serves as feedstock for all the products produced by the Downstream and the Chemical divisions. After oil has been extracted from the ground it is transmitted to a refinery. Where it is separated by distillation based on the different boiling points of its components. That is how Gasoline, Naphtha, Kerosene, Diesel and Heavy Fuel is obtained. Lighter liquids such as Gasoline and Naphtha require less processing compared to heavy fuels before they are ready for use. This is essentially the task of the downstream segment. However, to ensure that heavy fuel is not wasted it is further processed through a procedure called cracking. In which carbon molecules are broken into smaller chains. Creating ethylene, polyethylene and other products of the Chemical Segment. Another method to create the chemical products is through the cracking of ethane, which can be extracted from natural gas. Once we understand the how the company’s processes are linked to each other its exposure to its reserves becomes apparent. Since without the feedstock derived from the reserves the company could not continue to operate. It is commonly known that oil and gas reserves are finite, however exactly when they will be depleted is a subject of many debates in the industry. Nonetheless, a recent report that was published by the IEA clearly stated that no new oil and natural gas fields are required to meet future demand. Which means reserves may be depleted much sooner than previously expected. Simultaneously current reserves are becoming much more important.

**Figure 22:** Evolution of reserves in million oil-equivalent barrels



Source: Annual reports and Bloomberg

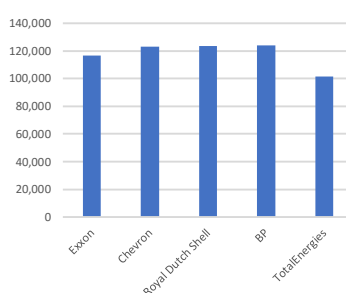
Compared to its peers Exxon Mobil has the second largest reserve after BP with 15 212 million oil equivalent barrels. However, if the company would not add to its existing reserves at current production levels most of its reserves would be depleted by 2040.

## Multiples and Peer analysis

Throughout our analysis we focused on three defining multiples. The Enterprise Value to Daily Production, the Enterprise Value to Reserves and the Enterprise Value to EBITDA.

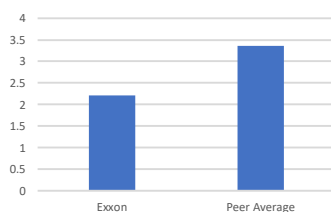
	EV/EBITDA	EV/MBOE/D	EV/Reserves
ExxonMobil (US)	9,7	85,2	21,1
Chevron (US)	9,1	83,1	23,0
Royal Dutch Shell (NL)	6,3	66,4	24,7
BP (GB)	5,6	41,0	7,9
TotalEnergies (FR)	5,4	58,4	13,6

**Figure 23:** Cumulative E&P Spending in m\$ between 2015 and 2020



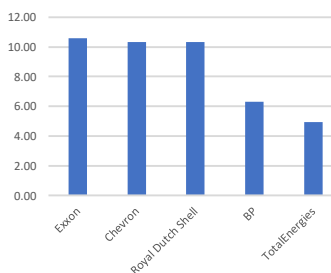
Source: the respective companies' annual reports

**Figure 24:** Exxon Mobil's Finding Cost versus Peer Average in USD/barrel



Source: Annual Reports

**Figure 25:** Average direct lifting costs of the companies between 2015 and 2020 in USD/barrel

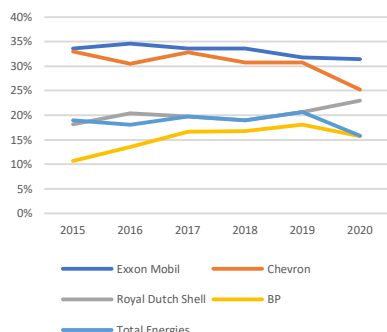


Source: Annual Reports

Based on these multiples it is clearly visible that U.S. integrated oil companies are trading at a premium compared to their European peers.

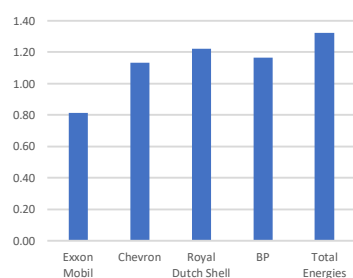
In order to find out what justifies the higher valuation, we carried out a thorough analysis of the oil companies. The analysis started with the companies' oil and gas producing activities. In the course of which we examined four aspects the total Exploration and Production (E&P) Spending, the Finding Costs, the Direct Lifting Costs and the Netback. Regarding the total E&P spending there was no significant difference between the companies. The cumulative spending over the investigated six-year time period between 2015 and 2020 is shown in Figure 23. As far as finding costs are concerned ExxonMobil is clearly outperforming its peers. As its average finding cost over the period of 2,21 \$/barrel is 33% lower compared to the second most cost-efficient company TotalEnergies. Finding costs were calculated by dividing the exploration costs (million \$) with the extensions and discoveries (million barrels). However, the relations between the companies change in terms of direct lifting costs. As ExxonMobil and Chevron the U.S. based companies have the highest costs in this area of 10,61 \$/barrel and 10,33 \$/barrel respectively compared to the average of their European counterparties of 7,19 \$/barrel. Direct lifting costs were obtained by dividing the production costs excluding taxes by the number of barrels produced. The same tendency is observed in the case of netback, which shows the gross profit per barrel, as ExxonMobil also underperforms according to this indicator compared to its competitors. Its peer average in this area was 24,13 \$/barrel compared to the company's 20,19 \$/barrel. These results may at first seem to go against the results obtained by the multiple valuation. However, this only reflects the cost structure of the company in the Exploration & Production segment. Since if we observe the Net Margins, we can conclude that Exxon Mobil dominated its competitors. Usually, companies tend to have high fixed costs coupled with lower variable costs, by the asset heavy nature of the segment. Nonetheless Exxon Mobil, as the only exception in the group accomplished that the majority of its costs are variable. Which could be beneficial in a situation like a pandemic. Where their costs could be significantly reduced in line with production, unlike the costs of competitors. However, in relation to the whole company the cost structure completely changes. Despite the fact that during

**Figure 26: Evolution of Gross Margin for the whole company**



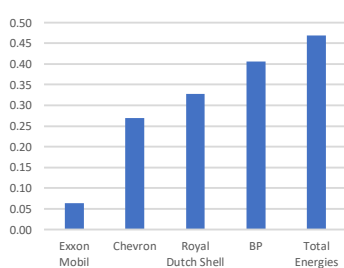
Source: Annual Reports

**Figure 27: Current Ratios of ExxonMobil and its peers**



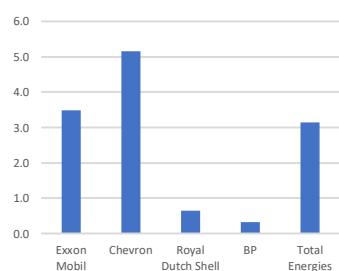
Source: Annual Reports

**Figure 28: Cash Ratios of ExxonMobil and its peers**



Source: Annual Reports

**Figure 29: Dividends per Share in \$**



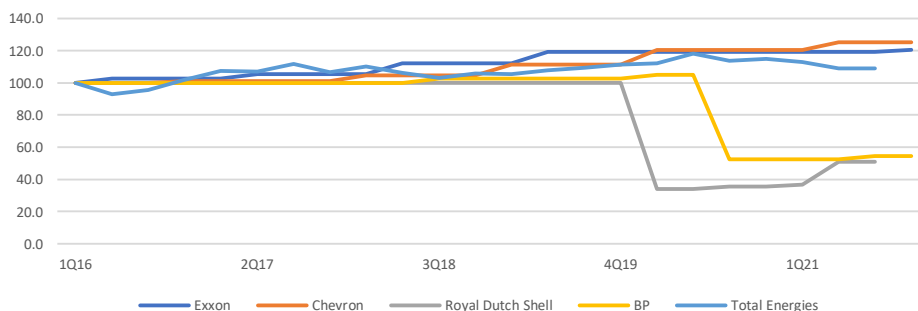
Source: Annual Reports

the analysis we discarded the year 2020 as the COVID-19 pandemic and one of impairments would have distorted the results. On this basis, on average 28% of the total costs of the investigated US based oil and gas companies were fixed. While the same figure for European competitors is only 14%. In case of a significant demand decline this could greatly increase the losses of the company.

The liquidity analysis that we conducted further aggravated the situation, as it revealed values that could be a cause for concern regarding Exxon Mobil. Its current ratio is well below 1, namely 0,82, compared to its peer average of 1,21. Meaning that Exxon's current liabilities are not covered by its current assets. Under normal circumstances until the company is able to generate cash it can operate perfectly fine. However, this liquidity position makes the company vulnerable to drops in demand. The same tendency can be observed in relation to the quick and the cash ratio. Where the company had below average ratios of 0,5 and 0,06 respectively.

The results so far did not support the higher valuation given by the multiples, therefore we continued the research and analysed the company's asset turnovers and returns on assets. In these areas the company performed well but not outstandingly in a way that would justify the multiples. However, one thing that makes US companies stand out from their European counterparts, thus justifying the higher valuation is their dividend policy. ExxonMobil and Chevron are paying the highest dividend rate among their peers, with \$3,49 and \$5,31 dividend per share. Furthermore, if we analyse the evolution of the dividends, it becomes clearly visible from an investors point of view that the dividends offered by the US companies are the most secure ones. As these companies are willing to take the necessary measures, in some cases even sacrifices, in order to protect the dividends and to cover their transactions with shareholders. As we have seen recently, when in 2020 ExxonMobil and Chevron, despite having negative earnings per share did not lower their dividend payments.

Evolution of Dividends



Source: Analyst Calculation

## Valuation

When valuing Exxon Mobil for a greater transparency the company's Income Statement as well as its Balance sheet was reformulated and broken down by its Upstream, Downstream, Chemical and Financing Segments. This allowed for a more thorough analysis of the capital needs and the revenues generated by each segment.

To accurately project revenues, production had to be forecasted first, but beforehand it was essential to estimate the evolution of the companies reserves. As these factors are heavily dependent on each other. In order to overcome the uncertainty of the future three possible scenarios were created. The Net Zero Case, the Intermediate Case and the Exxon Case. The Net Zero Case represents the future according to the International Energy Agency and it includes the necessary measures the company has to take in order to reach net zero emissions by 2050. In this case CCUS technologies were not considered. Since on the basis of current scientific views this technology is currently not a substitute for significant emission reductions. The Exxon Case represents the company's own beliefs about the future and projects an ideal vision for the upcoming periods. The Intermediate Case is exactly representing the middle ground between the two aforementioned scenarios. The main difference between these scenarios is the amount produced by the company based on the different demands in each scenario and the price at which the company can sell its products, which also depends to a large extent on the demand. All of these scenarios were assigned with a probability, depending on the likelihood of occurrence. As a result, a 50% weight was given to the Net Zero Case, while the other two cases the Intermediate and the Exxon received a 30% and 20% weight respectively. The actual forecasted production volumes and prices, used for valuation purposes is the weighted average of these three cases.

Probability of occurrence	
Net Zero Case	50%
Intermediate Case	30%
Exxon Case	20%

Regarding the reserves the net zero case clearly states that no new reserves are required besides the ones already explored and approved for development. Therefore, in this case zero discoveries and extension were projected for the upcoming periods. On the other hand, for the Exxon Case exploration ceases after the next five years, as it becomes increasingly harder and harder to find new oil fields along with increasing costs that make new explorations unprofitable for the company.

Production was forecasted according to the demand projections issued by the companies until the depletion of the companies reserves. Based on the projected

production levels and reserves, Exxon’s reservoirs are expected to be fully depleted by 2047.

This also heavily effects the Downstream and Chemical segments, as a production decline in the Upstream segment eventually results in less available feedstock to their operations. Until the complete depletion of reserves leads to the shutdown of the different manufacturing processes. With declining refinery throughput, there is also reduced need for refinery capacity leading to continuous closures of refineries. The same applies to the chemical segment. Where, despite the growing need for its products, due to the scarcity of the available feedstock its output steadily declines. Thereby reducing capacity requirements as well.

As production and sales continuously declines in line with decreasing demand and depleting reserves, so does the company’s invested capital needs.

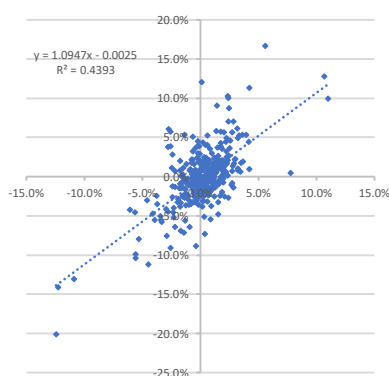
Based on our projections Exxon’s reserves will only be depleted in 2047, however the company ceases to operate as soon as 2033 with its assets being fully liquidated. As beyond that point the company becomes economically unviable. After 2033 the company is unable to generate positive earnings. While in 2035 its shareholders’ equity would have turned negative. Meaning that its liabilities would have exceeded its assets. Where investors would have had to finance the company, which they are not obliged to do.

For valuing the company, the Sum-of-the-Parts Valuation (SOTP) method was used. As due to the structure of the company and its four distinct segments this method was the most appropriate for the purpose. As it allowed us to analyse the contribution of each segment to the final Enterprise Value. Furthermore, as we also wanted to showcase the impact of the tax shield on the final value of the company, the Adjusted Present Value valuation method was applied within the SOTP to determine the value of the different segments and the tax shield.

To obtain the unlevered enterprise value the unlevered core free cash flows for each segment were discounted by the corresponding unlevered cost of capital. As the lifespan of the company is finite a Terminal Value was not applicable. As a consequence, the explicit horizon extended until 2034, when based on our projections the company ceases to exist.

In order to acquire the unlevered cost of capital first we had to determine the unlevered beta. To do so we regressed Exxon Mobil’s and its peers’ weekly excess returns against the relevant market’s weekly excess returns. In this case we took the MSCI World index as our proxy for the market as we thought that the investors investing in Exxon Mobil would be globally diversified. By excess returns we are referring to returns achieved by the companies and the index on top of the risk-

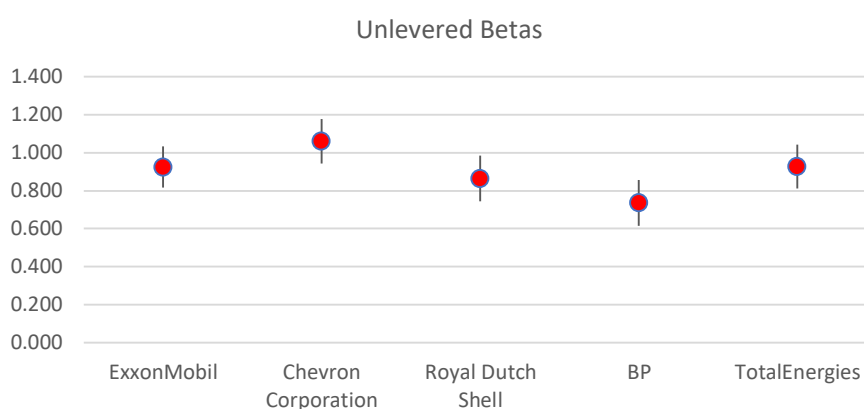
**Figure 30:** Regression of ExxonMobil’s weekly excess return against the market’s return



Source: Analyst Calculations

free rate, for which we used the treasury bill as a proxy. As a result of the regression the raw betas of the investigated companies were obtained. Which were then adjusted in order to receive a more forward-looking beta. As the number of observations was considerably high, namely 358, it reduced the standard error of the betas. Resulting in a narrower interval for the levered betas. These betas were afterwards unlevered based on the current capital structure of the companies. The obtained unlevered betas were very much in line with each other. As it is shown in the figure below.

**Figure 31: Unlevered Betas**



Source: Analyst Calculations

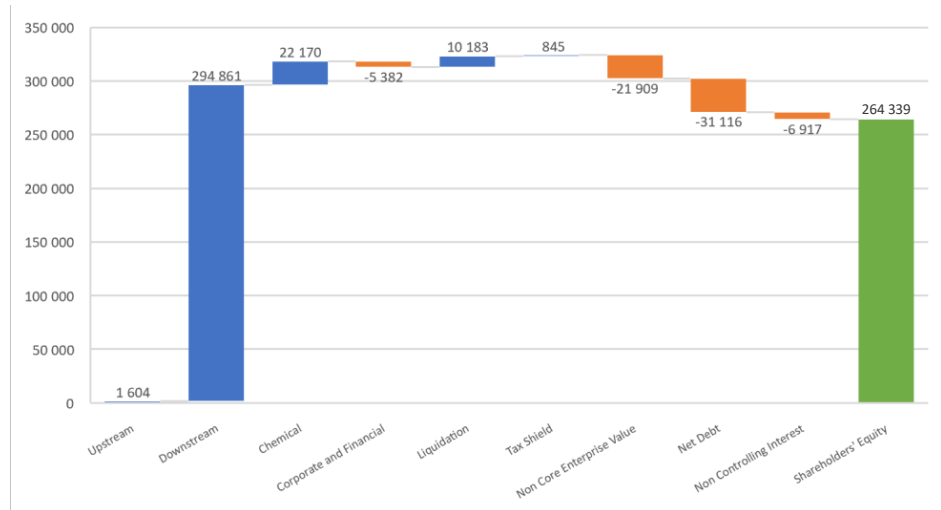
The unlevered beta for Exxon Mobil was eventually received as the average unlevered beta of all considered companies.

To acquire the unlevered cost of capital the CAPM formula was applied. To which a 5,5% Market Risk Premium was used, based on the findings of McKinsey, which it obtained through historical statistical analyses. For the risk-free rate, we used the 10-year US Treasury Note with a return of 1,43%. This calculation resulted in an unlevered cost of capital of 6,39%.

The obtained unlevered cost of capital was used to discount the free cash flows generated by each segment, thereby determining the value of the Upstream, Downstream, Chemical and Corporate and Financial segments. The results are summarized in Figure 31. We then determined the liquidation value by subtracting all liabilities from the company's assets at the liquidation date and discounted it by the unlevered cost of capital to get the present value of the liquidation. This resulted in a value of \$10 183 million. Subsequently, the value of the tax shield of \$845 million was obtained by likewise discounting the cash flows generated by it at the unlevered cost of capital. The sum of the parts resulted in a core levered

enterprise value of \$ 324 281 million. For which in order to get to the Shareholders Equity the value of the non-core business had to be added, while subtracting the net debt and the non-controlling interest. For these values book values were used. The obtained shareholders equity value was \$264 339. Which after dividing it by the number of outstanding shares resulted in a share price of \$ 62,45.

**Figure 32: Sum-of-the-Parts**



Source: Analyst Calculations

# Appendix

## Financial Statements

Exxon Mobil Consolidated Balance Sheet									
In \$m	2015	2016	2017	2018	2019	2020	2021 Q1	2021 Q2	2021 Q3
<b>Assets</b>									
Cash and cash equivalents	3 705	3 657	3 177	3 042	3 089	4 364	3 515	3 465	4 768
Notes and accounts receivable - net	19 875	21 394	25 597	24 701	26 966	20 581	24 755	28 540	29 516
Inventories									
	12 037	10 877	12 871	14 803	14 010	14 169	13 740	14 711	15 087
	4 208	4 203	4 121	4 155	4 518	4 681	4 617	4 564	4 520
Other current assets	2 798	1 285	1 368	1 272	1 469	1 098	1 568	1 562	1 664
<b>Total current assets</b>	<b>42 623</b>	<b>41 416</b>	<b>47 134</b>	<b>47 973</b>	<b>50 052</b>	<b>44 893</b>	<b>48 195</b>	<b>52 842</b>	<b>55 555</b>
Investments, advances and long-term receivables	34 245	35 102	39 160	40 790	43 164	43 515	44 181	44 774	45 641
Property plant and equipment at cost less accumulated depreciation and depletion	251 605	244 224	252 630	247 101	253 018	227 553	224 641	223 012	218 795
Other assets including intangibles - net	8 285	9 572	9 767	10 332	16 363	16 789	16 753	16 661	16 697
<b>Total Assets</b>	<b>336 758</b>	<b>330 314</b>	<b>348 691</b>	<b>346 196</b>	<b>362 597</b>	<b>332 750</b>	<b>333 770</b>	<b>337 289</b>	<b>336 688</b>
<b>Liabilities</b>									
Notes and loans payable	18 762	13 830	17 930	17 258	20 578	20 458	18 185	15 293	12 966
Accounts payable and accrued liabilities	32 412	31 193	36 796	37 268	41 831	35 221	41 017	45 780	47 257
Income taxes payable	2 802	2 615	3 045	2 612	1 580	684	948	1 165	1 633
<b>Total current liabilities</b>	<b>53 976</b>	<b>47 638</b>	<b>57 771</b>	<b>57 138</b>	<b>63 989</b>	<b>56 363</b>	<b>60 150</b>	<b>62 238</b>	<b>61 856</b>
Long-term debt	19 925	28 932	24 406	20 538	26 342	47 182	45 137	45 319	43 639
Postretirement benefits reserves	22 647	20 680	21 132	20 272	22 304	22 415	21 835	22 082	21 060
Deferred income tax liabilities	36 818	34 041	26 893	27 244	25 620	18 165	18 113	18 511	19 008
Long-term obligations to equity companies	5 417	5 124	4 774	4 382	3 988	3 253	3 279	3 038	3 060
Other long-term obligations	21 165	20 069	19 215	18 094	21 416	21 242	21 155	20 545	20 559
<b>Total liabilities</b>	<b>159 948</b>	<b>156 484</b>	<b>154 191</b>	<b>147 668</b>	<b>163 659</b>	<b>168 220</b>	<b>169 669</b>	<b>171 733</b>	<b>169 182</b>
<b>Equity</b>									
Common stock without par value									
	11 612	12 157	14 656	15 258	15 637	15 688	15 884	16 006	16 104
Earnings reinvested	412 444	407 831	414 540	421 653	421 341	383 943	382 953	383 922	386 952
Accumulated other comprehensive income	-23 511	-22 239	-16 262	-19 564	-19 493	-16 705	-16 090	-15 586	-16 696
Common stock held in treasury									
	-229 734	-230 424	-225 246	-225 553	-225 835	-225 776	-225 773	-225 771	-225 771
Noncontrolling interests	170 811	167 325	187 688	191 794	191 650	157 150	156 974	158 571	160 589
ExxonMobil share of equity	5 999	6 505	6 812	6 734	7 288	6 980	7 127	6 985	6 917
<b>Total equity</b>	<b>176 810</b>	<b>173 830</b>	<b>194 500</b>	<b>198 528</b>	<b>198 938</b>	<b>164 130</b>	<b>164 101</b>	<b>165 556</b>	<b>167 506</b>
<b>Total liabilities and equity</b>	<b>336 758</b>	<b>330 314</b>	<b>348 691</b>	<b>346 196</b>	<b>362 597</b>	<b>332 750</b>	<b>333 770</b>	<b>337 289</b>	<b>336 688</b>

Exxon Mobil Consolidated Statement of Income									
In \$m	2015	2016	2017	2018	2019	2020	2021 Q1	2021 Q2	2021 Q3
<b>Revenues and other income</b>									
Sales and other operating revenue	239 854	200 628	237 162	279 332	255 583	178 574	57 552	65 943	71 892
Income from equity affiliates	7 644	4 806	5 380	7 355	5 441	1 732	1 473	1 436	1 670
Other income	1 750	2 680	1 821	3 525	3 914	1 196	1 22	363	224
<b>Total revenues and other income</b>	<b>249 248</b>	<b>208 114</b>	<b>244 363</b>	<b>290 212</b>	<b>264 938</b>	<b>181 502</b>	<b>59 147</b>	<b>67 742</b>	<b>73 786</b>
<b>Costs and other deductions</b>									
Crude oil and product purchases	130 003	104 171	128 217	156 172	143 801	94 007	32 601	37 329	39 745
Production and manufacturing expenses	35 587	31 927	34 128	36 682	36 826	30 431	8 062	8 471	8 719
Selling general administrative expenses	11 501	10 799	10 956	11 480	11 398	10 168	2 428	2 345	2 287
Depreciation and depletion (includes impairments)	18 048	22 308	19 893	18 745	18 998	46 009	5 004	4 952	4 990
Exploration expenses including dry holes	1 523	1 467	1 790	1 466	1 269	1 285	164	176	190
Non-service pension and postretirement benefit expense	0	0	0	1 285	1 235	1 205	378	162	146
Interest expense	311	453	601	766	830	1 158	258	254	214
Other taxes and duties	30 309	29 020	30 104	32 663	30 525	26 122	6 660	7 746	7 889
<b>Total costs and other deductions</b>	<b>227 282</b>	<b>200 145</b>	<b>225 689</b>	<b>259 259</b>	<b>244 882</b>	<b>210 385</b>	<b>55 555</b>	<b>61 435</b>	<b>64 180</b>
<b>Income (loss) before income taxes</b>	<b>21 966</b>	<b>7 969</b>	<b>18 674</b>	<b>30 953</b>	<b>20 056</b>	<b>-28 883</b>	<b>3 592</b>	<b>6 307</b>	<b>9 606</b>
Income tax expense (benefit)	5 415	-406	-1 174	9 532	5 282	-5 632	796	1 526	2 664
<b>Net income (loss) including noncontrolling interests</b>	<b>16 551</b>	<b>8 375</b>	<b>19 848</b>	<b>21 421</b>	<b>14 774</b>	<b>-23 251</b>	<b>2 796</b>	<b>4 781</b>	<b>6 942</b>
Net income (loss) attributable to noncontrolling interests	401	535	138	581	434	-811	66	91	192
<b>Net income (loss) attributable to ExxonMobil</b>	<b>16 150</b>	<b>7 840</b>	<b>19 710</b>	<b>20 840</b>	<b>14 340</b>	<b>-22 440</b>	<b>2 730</b>	<b>4 690</b>	<b>6 750</b>

Exxon Mobil Consolidated Statement of Comprehensive Income									
In \$m	2015	2016	2017	2018	2019	2020	2021 Q1	2021 Q2	2021 Q3
<b>Net income (loss) including noncontrolling interests</b>	<b>16 551</b>	<b>8 375</b>	<b>19 848</b>	<b>21 421</b>	<b>14 774</b>	<b>-23 251</b>	<b>2 796</b>	<b>4 781</b>	<b>6 942</b>
<b>Other comprehensive income (loss) (net of income taxes)</b>									
Foreign exchange translation adjustment	-9 303	-174	5 352	-5 077	1 735	1 916	149	423	-1 625
Adjustment for foreign exchange translation (gain)/loss included in net income	-14	0	234	196	0	14	0	0	0
Postretirement benefit reserves adjustment (excluding amortization)	2 358	493	-219	28	-2 092	3	168	-47	184
Amortization and settlement of postretirement benefits reserves adjustment included in net periodic benefit costs	1 448	1 086	1 165	931	582	896	378	215	196
Unrealized change in fair value of stock investments	33	0	0	0	0	0	0	0	0
Realized (gain)/loss from stock investments included in net income	27	0	0	0	0	0	0	0	0
<b>Total other comprehensive income (loss)</b>	<b>-5 451</b>	<b>1 405</b>	<b>6 532</b>	<b>-3 922</b>	<b>225</b>	<b>2 829</b>	<b>695</b>	<b>591</b>	<b>-1 245</b>
<b>Comprehensive income (loss) including noncontrolling interests</b>	<b>11 100</b>	<b>9 780</b>	<b>26 380</b>	<b>17 499</b>	<b>14 999</b>	<b>-20 422</b>	<b>3 491</b>	<b>5 372</b>	<b>5 697</b>
Comprehensive income (loss) attributable to noncontrolling interests	-496	668	693	174	588	-743	146	178	57
<b>Comprehensive income (loss) attributable to ExxonMobil</b>	<b>11 596</b>	<b>9 112</b>	<b>25 687</b>	<b>17 325</b>	<b>14 411</b>	<b>-19 679</b>	<b>3 345</b>	<b>5 194</b>	<b>5 640</b>

# Cash Flow Map

In \$m	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
<b>NOPLAT Upstream</b>	-15 443	-17 385	-14 831	-18 546	-19 221	-39 925	-19 557	-18 187	-16 885	-15 538	-14 147	-12 711	-11 386	-10 100	-8 833	-7 583	-6 389	-5 104	-3 408
Depreciation	14 528	19 176	16 704	15 281	15 467	41 350	17 054	15 781	14 448	13 054	11 599	10 083	8 597	7 129	5 680	4 248	2 836	1 539	801
Gross Cash Flow Upstream	-915	1 791	1 873	-3 265	-3 754	1 425	-2 502	-2 406	-2 437	-2 484	-2 548	-2 628	-2 789	-2 971	-3 153	-3 335	-3 553	-3 565	-2 607
Change in PP&E	11 258	21 091	9 652	17 572	12 055	5 432	4 143	2 263	318	-1 693	-3 770	-4 987	-6 283	-7 566	-8 835	-10 067	-10 310	-9 944	
Change in Operating cash	-39	40	17	-24	-86	74	-11	-6	-6	-6	-6	-5	-4	-4	-4	-2	-10	-4	
Change in Notes and accounts receivable	277	555	-346	117	-579	383	-83	-47	-46	-45	-43	-42	-34	-33	-32	-19	-77	-346	
Change in Inventories	-891	713	38	379	481	-457	-417	-237	-230	-223	-216	-210	-170	-165	-160	-96	-385	-1 735	
Change in Trade payables	25	-424	259	-312	810	-498	93	53	51	50	48	47	38	37	36	21	86	389	
Change in asset retirement obligations	461	538	602	823	33	1 249	747	782	817	853	889	871	860	850	839	828	760	433	
<b>Operating Free Cash Flow Upstream</b>	-9 301	-20 640	-13 486	-22 309	-11 289	-6 684	-6 878	-5 245	-3 390	-1 485	470	1 537	2 622	3 728	4 822	5 782	6 371	4 642	
<b>NOPLAT Downstream</b>	32 814	35 682	43 675	51 144	51 916	37 353	46 720	43 587	41 651	39 773	37 951	36 183	34 469	33 035	31 638	30 277	29 519	26 794	15 075
Depreciation	1 667	1 517	1 541	1 574	1 506	2 388	1 626	1 555	1 525	1 496	1 467	1 438	1 410	1 393	1 375	1 358	1 340	1 230	700
Gross Cash Flow Downstream	34 481	37 199	45 216	52 718	53 422	39 741	48 346	45 142	43 177	41 269	39 418	37 622	35 879	34 428	33 014	31 635	30 859	28 025	15 776
Change in PP&E	775	2 685	1 290	4 564	5 598	-4 110	606	1 119	1 097	1 075	1 054	1 032	1 152	1 141	1 131	1 087	-250	-6 465	
Change in Operating cash	-334	292	368	-164	-641	415	-121	-74	-72	-70	-68	-66	-55	-54	-52	-29	-107	-461	
Change in Notes and accounts receivable	1 996	4 139	-996	1 362	-4 031	1 371	-948	-582	-565	-549	-532	-516	-430	-419	-409	-230	-835	-3 605	
Change in Inventories	-422	683	1 336	-253	-73	-504	-363	-223	-215	-210	-204	-198	-165	-160	-156	-88	-320	-1 380	
Change in Trade payables	437	-3 102	200	-3 115	5 998	-2 182	1 062	653	634	615	597	579	482	470	458	257	936	4 041	
<b>Operating Free Cash Flow Downstream</b>	34 747	40 519	50 521	51 028	32 890	53 355	44 906	42 285	40 393	38 557	36 776	35 048	33 444	32 036	30 664	29 861	28 599	23 645	
<b>NOPLAT Chemical</b>	517	2 131	2 602	1 548	1 451	1 534	1 861	1 828	1 857	1 866	1 858	1 858	1 892	1 917	1 942	1 966	1 986	1 871	1 094
Depreciation	1 667	1 517	1 541	1 574	1 506	2 388	1 626	1 555	1 525	1 496	1 467	1 438	1 410	1 393	1 375	1 358	1 340	1 230	700
Gross Cash Flow Chemical	2 184	3 648	4 143	3 122	2 957	3 922	3 486	3 383	3 362	3 325	3 296	3 302	3 310	3 318	3 324	3 326	3 302	3 102	1 795
Change in PP&E	2 671	4 257	2 008	2 215	3 052	-1 074	725	1 170	1 147	1 124	1 102	1 080	1 080	1 170	1 159	1 118	-64	-5 566	
Change in Operating cash	-20	33	37	-50	-43	40	-7	0	0	0	0	0	0	2	2	2	2	-17	-107
Change in Notes and accounts receivable	516	545	-293	-17	-151	8	-51	1	1	0	0	0	0	15	15	16	13	-135	-837
Change in Inventories	113	514	563	-553	-142	-7	-85	1	1	1	1	1	1	25	26	26	21	-226	-1 402
Change in Trade payables	-188	-373	179	-203	386	-114	57	-1	-1	-1	0	0	-17	-17	-18	-14	-151	938	
<b>Operating Free Cash Flow Chemical</b>	556	-833	627	1 566	819	4 633	2 744	2 211	2 214	2 200	2 194	2 222	2 103	2 122	2 139	2 186	3 393	8 768	
<b>NOPLAT Corporate and Financial</b>	-531	-548	-527	-667	-640	-676	-656	-656	-656	-656	-656	-656	-656	-656	-656	-656	-656	-656	-656
Depreciation	824	863	845	879	849	892	859	859	859	859	859	859	859	859	859	859	859	859	859
Gross Cash Flow Corporate and Financial	293	315	318	212	209	216	203	203	203	203	203	203	203	203	203	203	203	203	203
Change in PP&E	988	1 004	829	894	848	816	859	859	859	859	859	859	859	859	859	859	859	859	859
Change in Operating cash	0.1	0.1	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Change in Notes and accounts receivable	1.2	1.5	-0.5	0.7	0.1	-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Change in materials and supplies	34	2	29	-2	56	-66	0	0	0	0	0	0	0	0	0	0	0	0	
Change in Trade payables	-1	-1	0	-1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Operating Free Cash Flow Corporate and Financial</b>	-707	-688	-646	-683	-688	-547	-656	-656	-656	-656	-656	-656	-656	-656	-656	-656	-656	-656	
<b>Operating Free Cash Flow</b>	25 294	18 357	37 016	29 602	21 732	48 756	40 115	38 595	38 561	38 616	38 783	38 151	37 512	37 230	36 968	37 174	37 707	36 399	
Non Core Result	-6 054	-9 805	-4 149	-15 375	-17 851	-17 792	-14 242	-14 242	-14 242	-14 242	-14 242	-14 242	-14 242	-14 242	-14 242	-14 242	-14 242	-14 242	
Non Core Invested Capital	-37 523	-31 358	-22 831	-19 249	-19 903	-6 590	-21 909	-21 909	-21 909	-21 909	-21 909	-21 909	-21 909	-21 909	-21 909	-21 909	-21 909	-21 909	
Change in Non Core Invested Capital	6 165	8 527	3 582	5 346	7 313	-15 319	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Non Operating Free Cash Flow</b>	-15 970	-12 676	-18 957	-23 197	-25 105	1 077	-14 242	-14 242	-14 242	-14 242	-14 242	-14 242	-14 242	-14 242	-14 242	-14 242	-14 242	-14 242	
<b>Unlevered Free Cash Flow</b>	9 324	5 681	18 059	6 405	-3 374	49 834	25 874	24 354	24 320	24 375	24 542	23 910	23 271	22 989	22 727	22 932	23 465	22 158	
Interest	-311	-453	-601	-766	-830	-1 158	-1 224	-735	-574	-558	-537	-512	-485	-454	-421	-384	-346	-306	
Tax Shield	109	159	210	161	174	243	257	154	121	117	113	108	102	95	88	81	73	64	
Change in Financial Debt	3 731	419	-3 983	8 840	18 675	-33 946	-9 867	-7 950	-7 387	-6 899	-6 506	-5 297	-4 062	-3 166	-2 270	-1 820	-1 676	338	
Net Change in Equity	-12 760	-5 710	-13 470	-14 589	-14 386	-14 921	-15 427	-15 950	-16 492	-17 052	-17 631	-18 230	-18 850	-19 490	-20 153	-20 839	-21 548	-22 281	
<b>Financing Free Cash Flow</b>	-9 324	-5 681	-18 059	-6 405	3 374	-49 834	-25 874	-24 354	-24 320	-24 375	-24 542	-23 910	-23 271	-22 989	-22 727	-22 932	-23 465	-22 158	

# Production

	Total Production (million barrels)						
	2015	2016	2017	2018	2019	2020	2021
Exxon Mobil	1 495	1 483	1 455	1 399	1 442	1 377	1 377
Chevron	957	949	996	1 069	1 116	1 128	1 128
Royal Dutch Shell	1 078	1 342	1 337	1 338	1 338	1 239	1 239
BP	1 196	1 201	1 296	1 344	1 380	1 271	1 271
Total Energies	857	897	937	1 013	1 100	1 051	1 051

## Valuation

In \$m	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Operating Free Cash Flow Upstream @ Ru		-6 878 6,39%	-5 245 6,39%	-3 390 6,39%	-1 485 6,39%	470 6,39%	1 537 6,39%	2 622 6,39%	3 728 6,39%	4 822 6,39%	5 782 6,39%	6 371 6,39%	4 642 6,39%
	<b>1 604</b>	8 584	14 378	18 687	21 366	22 262	22 148	20 942	18 552	14 917	10 088	4 363	
Operating Free Cash Flow Downstream @ Ru		44 906 6,39%	42 285 6,39%	40 393 6,39%	38 557 6,39%	36 776 6,39%	35 048 6,39%	33 444 6,39%	32 036 6,39%	30 664 6,39%	29 861 6,39%	28 599 6,39%	23 645 6,39%
	<b>294 861</b>	268 804	243 702	218 888	194 324	169 971	145 788	121 663	97 405	72 967	47 770	22 224	
Operating Free Cash Flow Chemical @ Ru		2 744 6,39%	2 211 6,39%	2 214 6,39%	2 200 6,39%	2 194 6,39%	2 222 6,39%	2 103 6,39%	2 122 6,39%	2 139 6,39%	2 186 6,39%	3 393 6,39%	8 768 6,39%
	<b>22 170</b>	20 843	19 964	19 027	18 042	17 002	15 867	14 779	13 602	12 333	10 935	8 242	
Operating Free Cash Flow Corporate and Financial @ Ru		-656 6,39%	-656 6,39%	-656 6,39%	-656 6,39%	-656 6,39%	-656 6,39%	-656 6,39%	-656 6,39%	-656 6,39%	-656 6,39%	-656 6,39%	-656 6,39%
	<b>-5 382</b>	-5 070	-4 738	-4 385	-4 010	-3 611	-3 186	-2 733	-2 252	-1 740	-1 196	-616	
Liquidation Value @ Ru													21 420 6,39%
	<b>10 183</b>	10 834	11 527	12 264	13 048	13 882	14 769	15 713	16 718	17 786	18 923	20 133	
		21420											
Tax Shield @ Ru		154 6,39%	121 6,39%	117 6,39%	113 6,39%	108 6,39%	102 6,39%	95 6,39%	88 6,39%	81 6,39%	73 6,39%	64 6,39%	54 6,39%
<b>Value Tax Shield</b>	<b>845</b>	745	672	598	523	449	376	305	236	170	108	51	
<b>Levered Core EV</b>	<b>324 281</b>												
<b>Non Core EV</b>	<b>-21 909</b>												
<b>Net Debt</b>	<b>-31 116</b>												
<b>Non Controlling Interest</b>	<b>-6 917</b>												
<b>Shareholders' Equity Value</b>	<b>264 339</b>												
Outstanding Shares (in million)	4233												
<b>Implied Share Price</b>	<b>62,45</b>												

## References

- ExxonMobil. (2019). *Outlook For Energy: A Perspective to 2040*. Irving.
- ExxonMobil. (2021). *Updated 2021 Energy & Carbon Summary*. Irving.
- Engine No. 1. (2021). *Reenergize ExxonMobil*.
- International Energy Agency. (2021). *Net Zero by 2050 - A Roadmap for the Global Energy Sector*.
- Matthews, C. M., & Glazer, E. (2021). Exxon Considers Pledging 'Net Zero' Carbon by 2050. *The Wall Street Journal*.
- Herbst-Bayliss, S. (2021). Investor group faults new Exxon board members on climate transition plan. *Reuters*.
- Jacobs, J., & Raval, A. (2021). Defeats for Big Oil mark 'sea change' in climate battle. *Financial Times*.
- Brower, D., & Jacobs, J. (2021). Exxon faces 'existential' risk over fossil fuel, activist investor warns. *Financial Times*.
- Mackenzie, M., & Nauman, B. (2021). BlackRock pushes companies to adopt 2050 net zero emissions goal. *Financial Times*.
- CNBC. (2021, November 9). *Can Exxon Mobil Actually Reduce Its Climate Emissions?* Retrieved from Youtube: <https://www.youtube.com/watch?v=YQvILwnQef0>
- McCormick, M. (2020). ExxonMobil racks up a third straight loss as pandemic dents demand. *Financial Times*.
- Brower, D. (2020). Why ExxonMobil is sticking with oil as rivals look to a greener future. *Financial Times*.
- Valle, S., & Hampton, L. (2021). Oil executives take to conference stage to rebut harsh portrayal on climate. *Reuters*.
- Koller, T., Goedhart, M., & Wessels, D. (2020). *Valuation - Measuring and Managing the Value of Companies*. New Jersey: Wiley.
- BlackRock. (2021). *Vote Bulletin: ExxonMobil Corporation*.
- Mackintosh, J. (2021). Tesla vs. Exxon Is the Perfect Recovery Bet. *The Wall Street Journal*.
- International Energy Agency. (2021, October 13). *World Energy Outlook 2021: Launch Event*. Retrieved from Youtube: <https://www.youtube.com/watch?v=rnum4VH6sh0&t=467s>
- ExxonMobil. (2021). *2021 Investor Day*.
- Ritchie, H., & Roser, M. (n.d.). *Emissions by sector*. Retrieved from Our World in Data: <https://ourworldindata.org/emissions-by-sector>
- Net Zero Tracker. (n.d.). *Net Zero Tracker*. Retrieved from Net Zero Tracker: <https://zerotracker.net>
- World Population. (n.d.). Retrieved from Worldometer: <https://www.worldometers.info/world-population/>
- Use of energy explained - Energy use in homes*. (2020). Retrieved from eia: <https://www.eia.gov/energyexplained/use-of-energy/homes.php>
- JADC. (2021, October 27). *Air passenger traffic from 1999 to 2040, by region*. Retrieved from Statista: <https://www-statista-com.eu1.proxy.openathens.net/statistics/622444/air-revenue-passenger-kilometers-by-region/>
- Ritchie, H., & Roser, M. (n.d.). *Electricity Mix*. Retrieved from Our World in Data: <https://ourworldindata.org/electricity-mix>
- IRENA. (2021). *Installed offshore wind capacity worldwide from 2018 to 2050, by region*. Retrieved from Statista: <https://www-statista-com.eu1.proxy.openathens.net/statistics/1085660/offshore-wind-installed-capacity-projection-globally-by-region/>

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<b>Buy</b>	Expected total return (including expected capital gains and expected dividend yield) of more than 10% over a 12-month period.
<b>Hold</b>	Expected total return (including expected capital gains and expected dividend yield) between 0% and 10% over a 12-month period.
<b>Sell</b>	Expected negative total return (including expected capital gains and expected dividend yield) over a 12-month period.

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