

## Nyilatkozat a szakdolgozat státuszáról (nyilvános, bizalmas)

Alulírott Herpay Péter Gábor (Neptun kód WME0K8) a The Supply Chains of MOL Group and PKN Orlen and their Comparison című szakdolgozattal/záródolgozattal (továbbiakban mű) kapcsolatban az alábbiakról nyilatkozom:

- Kijelentem, hogy a mű BGE Dolgozattár repozitóriumába való feltöltésével más jogát nem sértem. Tudomással bírok arról, hogy az Egyetem a szerzői jogok meglétét nem ellenőrzi.
- Nyilatkozom, hogy a mű *(a megfelelő rész aláhúzendó)*
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  - a nyilvánosság számára hozzáférhető.
- Tudomásul veszem, hogy
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  - szerzői jogsértés esetén az érintett művet a Repozitórium adminisztrátora a Repozitóriumból haladéktalanul eltávolítja,
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## NYILATKOZAT

Alulírott **Herpay Péter Gábor** büntetőjogi felelősségem tudatában nyilatkozom, hogy a szakdolgozatomban foglalt tények és adatok a valóságnak megfelelnek, és az abban leírtak a saját, önálló munkám eredményei.

A szakdolgozatban felhasznált adatokat a szerzői jogvédelem figyelembevételével alkalmaztam.

Ezen szakdolgozat semmilyen része nem került felhasználásra korábban oktatási intézmény más képzésén diplomaszerzés során.

Tudomásul veszem, hogy a szakdolgozatomat az intézmény plágiumellenőrzésnek veti alá.

Budapest, 2020 év 12 hónap 06 nap



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# THESIS

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INTERNATIONAL BUSINESS ECONOMICS TRAINING PROGRAMME  
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# **THE SUPPLY CHAINS OF MOL GROUP AND PKN ORLEN AND THEIR COMPARISON**

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## INTRODUCTION

I have always been fascinated by oil companies since I was a child. I was continuously checking the price when we passed by each service station, day by day, and I wanted to know their differences. I was even wondering how this industry is working. What are the elements of this oil business? When I was thinking about choosing a topic for my thesis, this was my first idea, looking for the details. Since MOL is a Hungarian multinational company in the oil industry, I could not resist writing about the company. After reading of MOL, it is one of the largest oil companies in Eastern and Central Europe. I knew I have to introduce the company's total system, which is the supply chain of MOL.

As I was getting into the details, I found another company that is considered large in the Central European area, the Polish PKN Orlen. The ORLEN Group is involved in the whole supply chain of the oil industry as well, which showed the similarity to MOL. After considering the topic, I decided to choose to compare the MOL Group and ORLEN Group. For comparison, in my opinion, the Value Chain Analysis with the elements of Porter's Five forces are indispensable to examine a massive industry like this one. These factors resulted in the main research question: Are the supply chain segments of MOL Group and PKN Orlen similar? It is important because, as a Hungarian citizen who lives in an East Central European small country with a giant company like MOL. PKN Orlen is also showing competition for MOL in countries, which also means they are close to each other. Moreover, I have always been interested in this segment, and I find it really interesting; how these segments to support and supplement each other. Basically, these branches are dependent; however, small-sized oil companies are involved in only one segment, which can be Upstream or Downstream. First of all, in the dissertation, I am introducing the oil industry, as it is crucial to know how it works and even has the background knowledge to understand these companies' functionality. As far as I am concerned, the oil industry is always described by the characteristics of the supply chain; it is the reason why I am also using the features of the supply chain.

Generally, in the oil industry supply chain consists of three segments; Upstream, Downstream, Midstream. However, there are some exceptions where there are more, for example, in the cases of both companies I am analysing. Supermajor companies are involved in all segments of the oil industry; those companies usually have over USD 100.000.000 market capitalization; they are often international companies these companies, as the name refers, super large, for example, British Petrol; Royal-Dutch Shell, Chevron. Major companies have a

market capitalization between USD 10-100.000.000, they are also international companies and most likely involved in all the segment of the supply chain, MOL Group and PKN Orlen Group is categorised here. The third category, considering the size of an oil company, are the independent companies involved in only one segment of the oil supply chain; these firms typically do not have over USD 5.000.000 in retail sales. In the petroleum business, the Upstream is involved in Research and Development, Midstream in transportation and warehousing between Upstream and Downstream, and Downstream is dealing with the refinery and retail. Oil is frequently suggested as the economy's lifeblood due to its importance in everyday life and the international economy. There is even a specific currency for petroleum, the petrodollar, which is basically United States Dollar paid to oil-exporting nations in exchange for the commodity.

Widely known, the oil industry is one of the biggest industries in our present in terms of dollar value- Generating hundreds of billions of dollars, which means this sector is an international, multi-billionaire dollar industry. For many nations, petroleum is generating a significant part of the GDP. The power and the value of this industry are so enormous that oil is also known as the 'black gold.' In terms of revenue, this branch generates \$3.3 trillion annually (IBIS World, 2020). This material is one of the most wanted and most significant commodities in the World. The reasons why oil will be dominant will always be more cars, trucks, and 83% of the World just started to consume oil. (Clemente, 2015) The petroleum industry consists of hydrocarbon exploration by petroleum geologists; transportation (pipelines, oil tankers); storage, refinery, where crude oil is transformed into refined oil products; production of petrochemicals retail; sales and services. Without any doubt, the largest produced products in the petroleum industry are gasoline, diesel, and kerosene; however, there is much more other output that the businesses are producing, for example, petrochemicals, fertilisers, solvents, plastic, and other oil-related products. Just similar to other commodities, the oil price is also highly affected by supply and demand. The supply is mainly depending on the location, and the Organization of the Petroleum Exporting Countries has a significant effect. Demand is mainly controlled by the consumption of gasoline, diesel, and kerosene. As a raw material, Petroleum is an important material for many actual products for people's lives. As I have suggested, In the first place, I am describing the features of the oil industry's supply chain segment, and I will introduce the activities of the MOL Group and ORLEN Group.

In the following research, I will be finding answers for specific questions regarding the oil industry itself, regarding the MOL Group and its supply chain, about the PKN Orlen and its supply chain, and concerning the two companies' similarity, competitiveness. How can the



supply chain of the two Central and Eastern European oil giants', MOL and PKN Orlen, be characterised? What are the similarities and differences between their supply chains? How can their competitiveness be described?

In my thesis, the First Chapter gives an overview of the main characteristics of the three supply chain segments of the oil industry in general to provide knowledge of how this industry works. The Second Chapter will describe features and analyse the Hungarian MOL Group's supply chain, while in the Third Chapter, you will read about characteristics and analysis of the supply chain of the Polish PKN Orlen. The Fourth Chapter is about the methodology and the usage of the analysis tools. Finally, the Fifth Chapter compares, deeply analysing and assessing the two oil giants' supply chains.

# OVERVIEW OF THE THREE SUPPLY CHAIN SEGMENTS OF THE OIL AND GAS INDUSTRY

## Upstream

This kind of production refers to those required to acquire material to create an entirely new output type. Upstream does not do anything with the raw materials. Just simply extract them. It is the most complex branch of the oil and gas industry. This business segment is also known as Exploration and Production (E&P) because it consists of searching for, extracting, drilling, and producing crude oil. These are firms that are looking for a location where they are doing drilling procedures. Globally, there are approximately 40.000 oil locations, and 6 million people are working in the upstream branch (Johnston, 2018). It is categorised as a high risk, high investment capital, and length because it takes time to locate them and how deep they should drill them. Other main questions are how to manage, how to construct, and how to operate them to reach the best return on investment with the lowest risk. (EKT INTERACTIVE, 2014). The upstream oil industry is a high financial investment risk, with a high return on investment. This branch is highly regulated.

### **We can differentiate three types of regulation approach in the upstream segment of the oil industry:**

#### **Command and control approach:**

It can be defined as the direct regulation in an industry or activity that states what is permitted and illegal (Brío, 2016). In practice, the Government is commanding the companies to reduce the pollution of the given task they are practising in the oil fields. They are also controlling these pollution regulations in order to make the environment a better place to live. These regulations also include a level of pollution cleaning activities for active businesses. The administrations have been initiated standards for these kinds of activities and enforcement regulations, for example, civil penalties, criminal sanctions, and injunctions. (Arinaitwe, 2013)

#### **Market-based regulatory approach:**

This approach uses marketing and financial-related instruments, considering the price, markets, and other kinds of economic variables, to provide a cost-efficient and effective solution for the firms to eliminate, reduce and minimise their environmental pollution. Market-based tools are

secondary governing instruments, which affecting participants' response by replacing their economic incentive arrangement. Market-based instruments are taxes, emission trading, removal of perverse incentives, liability rules, deposit-refund. (Görlach, 2013) On the other hand, there are environmental taxations in existence. For example, environmental taxes are added to those goods or services directly traced to the production's environmental pollution. Arthur Cecil Pigou introduced this environmental taxation idea first. This is one of the reasons why this taxation is also referred to as Pigouvian taxation. (Prah & Hofmann, 2016)

#### **Voluntary agreements approach:**

It is an approach where operators, industry groups adopt and measure to improve the environmental protection standards in the oil extraction segment, arrangements among the corporate, states, and non-profit sectors not required by an act that strives to enhance the ecological conditions natural resource utilisation. In environmental policy, in agreements on environmental protection performance and public programs, companies can participate. The operators agree on environmental agencies' standards by deciding on the common ground between oil businesses and governments. Luckily, the voluntary agreements' approach is getting increasingly popular among firms. Nevertheless, there is another way of thinking regarding this approach. Different factors impact efficiency, for example, the distribution of the trade power, the measure of the environmental menace. (Arinaitwe, 2013)

## **Midstream**

This sector is the connection segment between upstream and downstream companies and operations, which involves:

**Gathering:** This is the first step in the midstream segment, the process by which midstream businesses are gathering oil and gas from upstream companies to move them to downstream firms.

**Processing of natural gas:** The second step, where all the oil and gas liquids are being processed, and then they are being stored and transported to the downstream segment—the first phase of the processing sequence in the field processing sequence. First, the estimation of the production percentage of petroleum, gas, and water is generated from the tank. Then, separating the oil, gas, and water from one to the other. Next, they are removing contaminants to make the crude for sale. It is where the next sequence, the storing is coming.

**Storing of oil and gas:** Before the oil is being transported downstream, Midstream companies storing them. Another critical factor is that it has a considerable impact on the quality of the oil. Here, the midstream firms have to ensure the energy security of the stored material. They have to avoid the disruption of the supply downstream.

**Transporting:** Transportation of petroleum is mainly depending on the distance, where it has to be transported. In the short-range, oil can be transported by trucks. In a medium-range, it can be transported by rail or barge. Rail transportation cost is higher than the pipeline method. In long-range tankers and pipelines are the only solution to be transported. Pipeline transportation can be network-bound or grid-bound transportation. Transportation by tankers allows the companies to transport crude oil internationally and enables them to deliver a significantly more enormous amount at once. (Extractives Hub, 2020) Midstream is separated from both the upstream and the downstream because it is known for low capital risk. In transportation, there is a little chance to have losses in capital investment. Also, all of the assets are usually adequately insured. Midstream mainly depends on the healthiness of the upstream because they are the suppliers, and there is a considerable need for the adequate, continuous operations and deliveries of the reserves. (Davcheva, 2019) The gathering and processing segments in the Midstream are considered free of commercial regulations; however, the distribution and movement are highly regulated. (EKT INTERACTIVE, 2015)

## **Downstream**

This sector is providing the closest relationship to the customers. This production process is using the gathered materials from the upstream and transforms them into finished products; these companies are responsible for purifying and converting the crude oil to commercial products such as gasoline, diesel, kerosene, asphalt, heating oil, petrochemicals, so forth. ( STI GROUP, 2013) They have a direct connection to the customers; the downstream segment mainly uses economic elements; for example, retailing, wholesaling, distribution, these functions are providing the right, precise on-time-delivery to their customers. So, their key sectors are:

**Oil refining:** There are three steps to this process

*Separation:* Modernistic disconnection requires piping crude petroleum within hot boilers. The resulting fluids and steam are discharged in distillation sections. Every refinery has aerial distillation systems, while numerous mixed refineries may have vacuum distillation units.

*Conversion:* The next step of the refining is conversion. Heavier, low-value distillation portions are treated into lighter, higher-value outputs like gasoline. Fractions from the distillation units are being transformed into streams, ultimately converted into final goods.

*Treatment:* The final step, where refinery experts are carefully mixing various streams from the processing unit to make adequate final output, such as gasoline. The gas blend is determined by the number of the octane level and the vapour pressure level. (U.S. Energy Information Administration , 2019)

### **Refiners:**

Known global refining, multinational companies are like **British Petrol**, American **Exxon Mobil**, American **Chevron**, and the British - Dutch-owned **Shell**.

Known European refining companies are Hungarian **MOL**, Polish **PKN Orlen**, French **Total**, and the Russian **Bashneft**.

Examples of independent refining companies that do not have any upstream operation are American **ConocoPhillips**, American **Anadarko Petroleum Corporation**, **Marathon Oil**, and the Spanish **Repsol**. (Exarheas, 2019)

**Product Marketing:** The oil industry is a margin business, mainly realising the profit by deducting the crude, refinery, and additional expenses from the realised price from the final product they are selling. In downstream marketing, it is also described as a classic marketing type. The marketers use well-known marketing tools, such as brand building, advertising, price, product, promotion, place, and adequate communication with customers using face-to-face, public relations trade show methods. With these techniques, marketers are improving the service level that they are providing to the customers. They are also improving their existing goods or services by communicating with the customers. (Woods, 2016)

**Distribution:** The logistics network has a considerable impact on the supply chain of the downstream segment in the oil industry because they distribute the oil and gas to various locations, where they will be sold. In developed countries, everybody is in contact with the downstream. Transportation is similar to the midstream branch; trucks, pipelines, and vessels are also moving the products.

## Ranking the largest oil-producing, consuming countries, and the largest oil companies

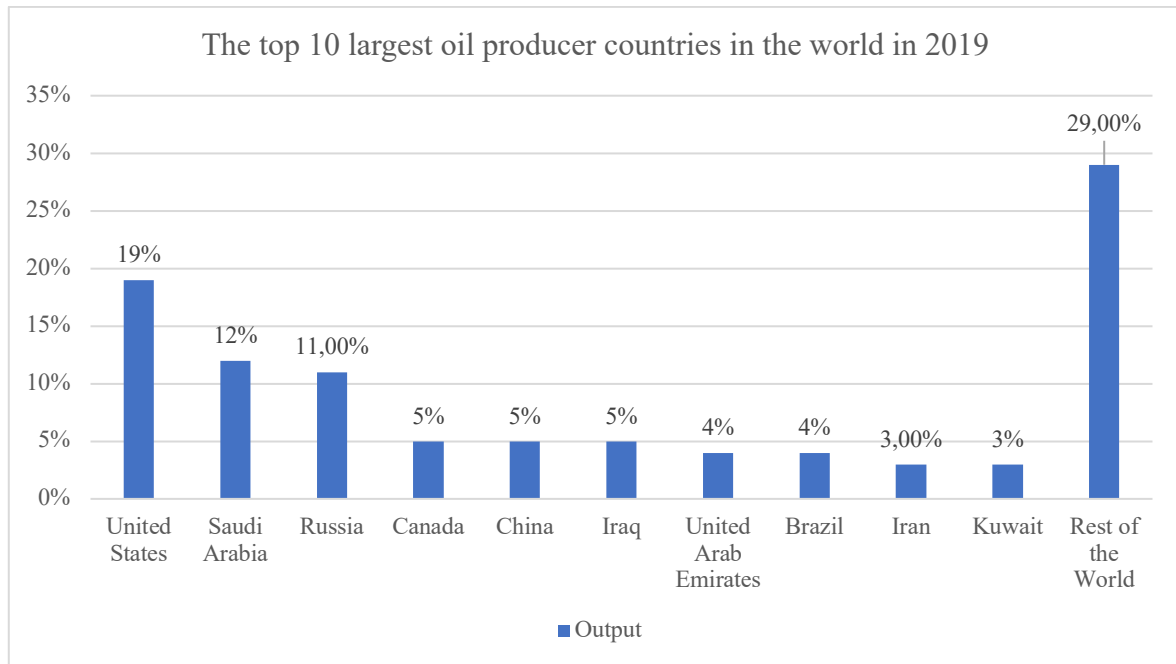


Figure 1: The top 10 largest oil producer countries in the World in 2019

Source: (U.S. Energy Information Administration, 2020)

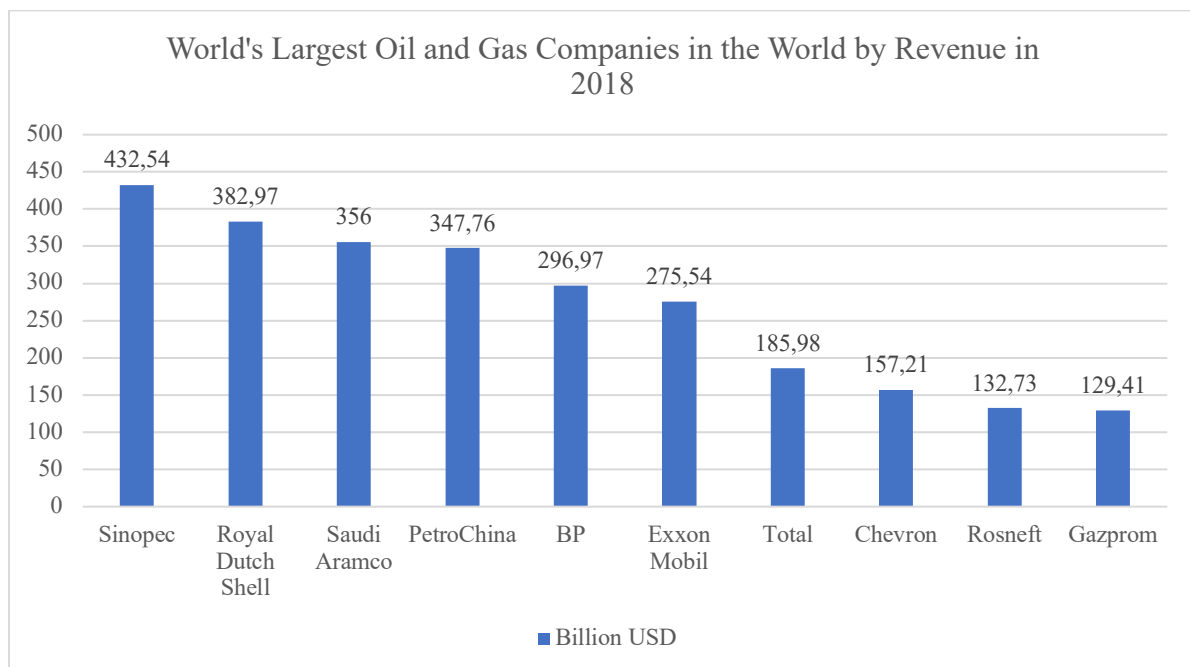


Figure 2: World's Largest Oil and Gas Companies in the World by Revenue

Source: (Reuters, 2020)

As shown on this chart (Figure 1), on average, the top 10 oil producer countries produce 71% of crude oil on the planet Earth, which means the rest of the World only has the remaining 29%. Which is making the competition among countries, corporations even higher. On top of that, the United States of America produced 19% of the total oil in the World, which is around 19,51 million barrels. The 2nd one is Saudi Arabia, where 12%, approximately 11,81 million barrels of crude oil was produced in 2019. In the 3rd place, there is Russia, where they are producing 11% of the crude oil, 11,49 million barrels in 2019. As both charts represent, they are connected. Exxon Mobil, Chevron (Figure 3) are American companies. Also, Shell has oil reserves in American fields, and BP, a British company, is acquiring 25% of its oil from the USA, and many more companies are getting the oil from them. Sinopec and PetroChina are Chinese, and Saudi Aramco is a Saudi Arabian company. The Rosneft and the Gazprom are Russian companies with reserves in Russia.

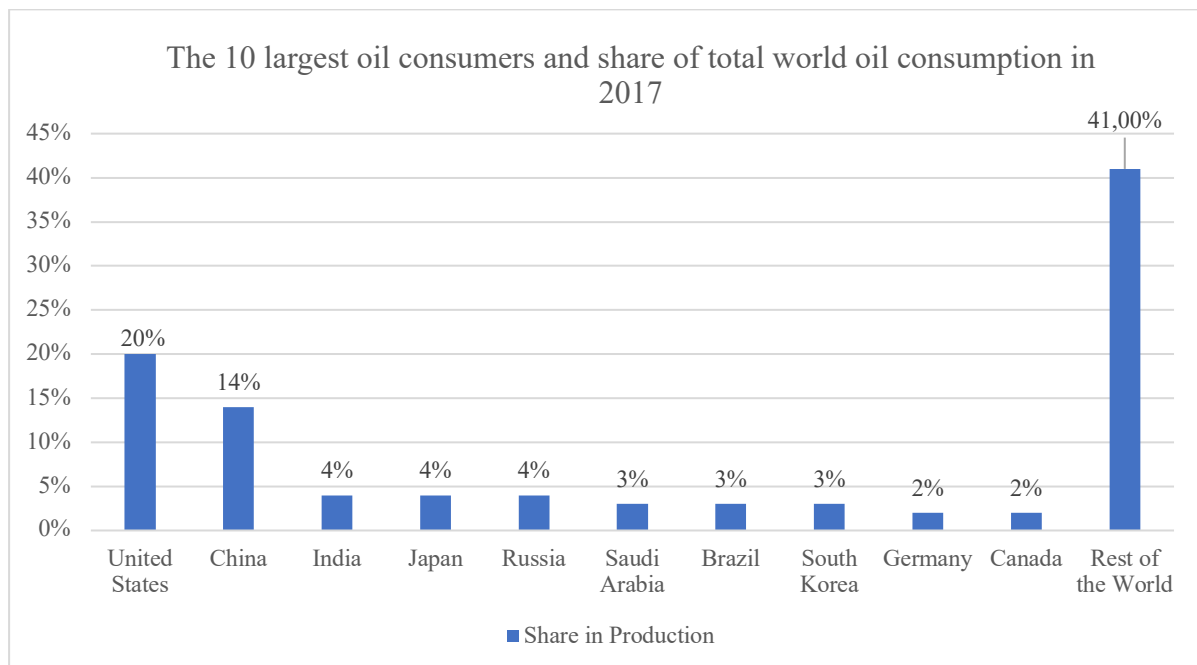


Figure 3: The ten largest oil consumers and share of total world oil consumption in 2017

Source: (U.S. Energy Information Administration, 2020)

According to the U.S. Energy Information Administration, the USA is the top oil-consuming country, where 68% of the consumption is the transportation, 26% is industrial, 3% residential, 2% commercial electric power is consuming the remaining 1%. The most common petroleum product is gasoline, which was approximately 45% of the consumption. (U.S. Energy Information Administration, 2020)

# HUNGARIAN OIL AND GAS PUBLIC LIMITED COMPANY

## (MOL)

### Background and overview of the MOL

MOL is one of the largest oil companies in Central Europe. The company has operations in many countries in Europe and outside of Europe. The first Hungarian oil refinery was created in 1882, in Fiume. In 1933 Fanto United Hungarian Mineral Oil Factories Co. was established. Following the event, in 1938, the MOART oil exploration and production company was established. In 1948, The Hungarian oil and gas industry was nationalised; in 1957, the OKGT, National Crude Oil and Gas Trust, was founded. With merging these seven predecessors, OKGT companies after the transition, the MOL, in Hungarian, also known as Magyar Olaj- és Gázipari Nyrt., was founded on 1 October 1991, and the whole Hungarian hydrocarbon industry was integrated into the company. It was a milestone in the Hungarian oil industry back in the late XX. century. It has currently grown as the market leader in each of its activities in Hungary, and it has even expanded to the largest multinational company in Eastern and Central Europe. They are beating out the Austrian OMV and the Polish PKN Orlen. MOL is involved in all of the oil industry's supply chain segment, including the upstream, Midstream, and downstream. (Funding Universe, 2005) Its revenue in the year 2019 was 5.266.735.000.0000 HUF, which is approximately 17.333.500.000 USD (The Wall Street Journal, 2020). They have operations in over 30 countries with more than 26.000 employees.

The firm has over 270.000.000 barrels of oil reserves and producing 111.000 barrels of oil each day. MR. Zsolt Hernádi has been the Chief Executive Officer since 11 June 2001. The company is active in the upstream segment, which is the exploration and the production of crude oil, with a different joint-venture in Siberia. The midstream part of MOL's supply chain is consists of transportation and storage. In the downstream, they are mainly involved in refining, retailing, and wholesaling. Retailing and wholesaling include most of Hungary's extended gas station network, including over 500 stations across Hungary. MOL Group acquired the Slovakian Slovnaft in 2000; in 2003, they obtained the Croatian INA. Following 2003, in 2004, MOL procured Shell's service station network in Romania. The upstream segment of the MOL Group is currently operating in more than 13 countries. In 13 states, they are involved in oil and gas exploration and production assets; in 8 countries, they are operating production activities. They



are engaged in gas midstream, with an approximately 6.000 km long high-pressure pipeline system across Hungary. The corporation’s downstream part runs four refineries and two petrochemical plants in the combined supply chain in Hungary, Croatia, and Slovakia. The company has over 2000 service stations across the European continent and making more than 1.000.000 transactions each day. Their consumer services are retailing and mobility. (MOL GROUP, 2020)

### The ownership structure of MOL in June 2020:

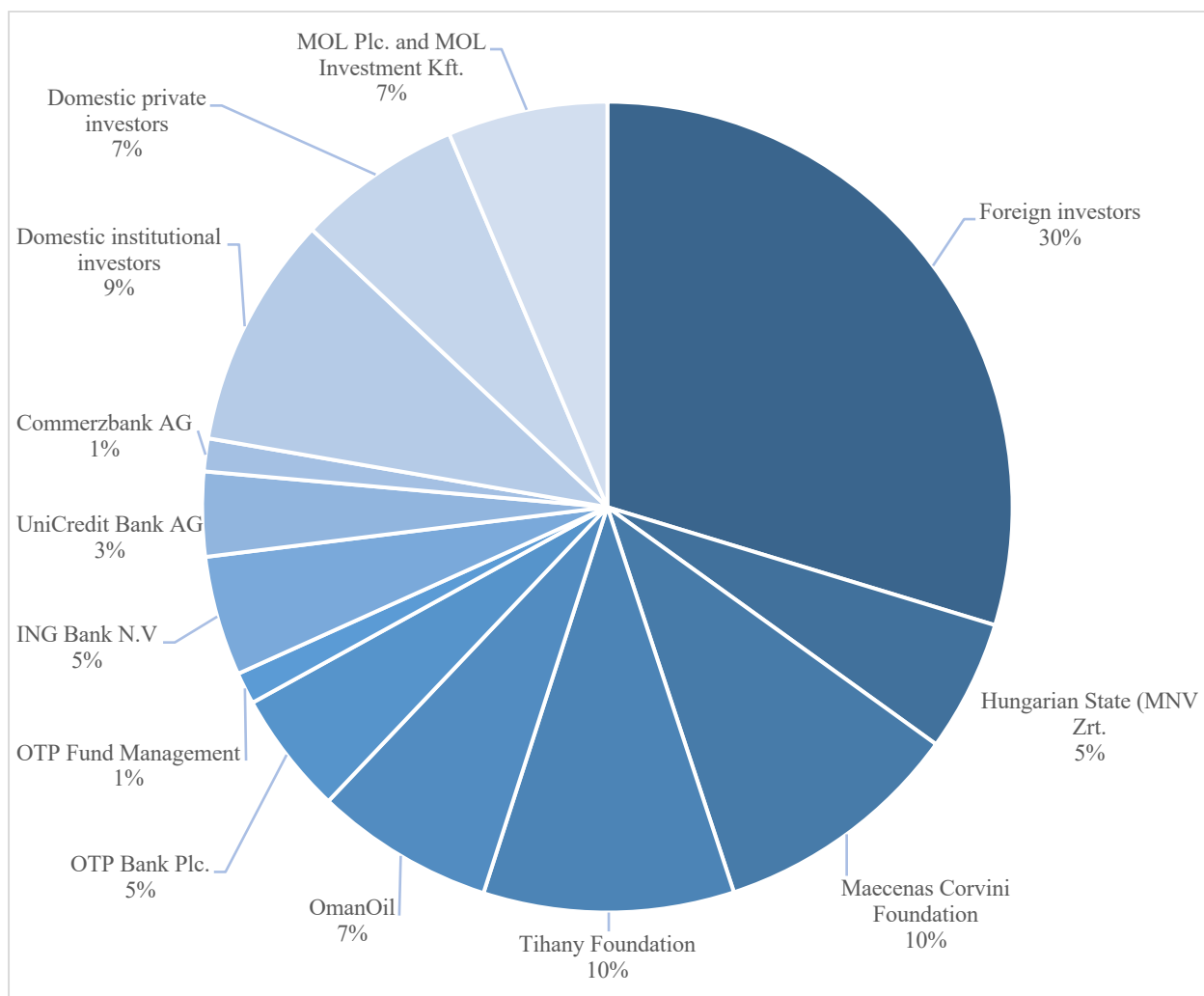


Figure 4: Ownership structure of MOL in June 2020

Source: (MOL Group, 2020)

According to the website of the MOL, the company’s share capital is worth approximately up to HUF 102,428,682,578 (which is approximately USD 332,398,282.98,

exchanged in accordance to the rate of October 2020), including 819,424,824 pieces are registered as 'A' series share with a face value of 125 HUF, and 578 pieces 'C' series are registered with a face amount of HUF 1,001. Only one 'B' series piece is recorded, which gives the owner voting preference with a par value of HUF 1,000, which entitles the holder thereof to preferential rights as specified in the present Articles of Association. Exclusively, the Hungarian Government is the only shareholder, has the 'B' series. Their largest shareholder is the Hungarian Government, with 25,2% (in Figure 4 many named shareholders are the hand of the Hungarian Government), 9,8% treasury shares, that MOL is holding, 7% the Oman Oil Budapest, OTP Bank Hold 4,9%, the rest are mainly Foreign Investors. (MOL Group, 2020)

## **The Three Supply Chain Segments, and the Innovative Solutions of MOL**

### **Upstream**

As I have already mentioned in the introduction of the upstream, this segment is mainly involved in Research and Development, and extraction, drilling, and production of crude oil. As can be seen, MOL is highly involved in upstream, representing the company's extension. The firm is also striving for expansion in the oil market. With over 80 years of oil and gas exploration experience and production, the company is asserting 13 countries and production ventures in 8 countries. The company is engaged in sustainable operations of upstream. Their goal is to minimise Health and Safety Executive (HSE) disturbances and defend the ecosystem by discharging spills, reducing greenhouse gases, and partaking in the Zero Flaring Initiative of the World Bank. According to MOL's annual report, in 2019, they performed a strong year considering the upstream segment. The daily production had reached the stability of 111.000 barrels of oil. The unit production cost of a barrel of oil was approximately USD 6, which is considered efficient with USD 1,100,000,000 carbon capture and storage earnings before interest, taxes, depreciation, and amortisation (EBITDA). For MOL, upstream is the most profitable supply chain segment. In 2018 their production upstream divided into three groups, extracting crude oil, natural gas, and condensate in the Thousand Barrels of Oil Equivalents Per Day (MBOEPD) unit. The crude oil was 52% of their production, the natural gas was 40%, and the condensate was 8% of their production. Their reserves in 2019 measured in the unit of million barrels of oil equivalent (MMBOE), similarly as the production 47% was crude oil, 45% was natural gas, and 8% was condensate of the

reserves. (MOL Group, 2020) As I have already mentioned, the company's upstream branch is active in exploration and production assets in 13 countries and eight countries with production activities.

## **Upstream in Europe**

*Hungary:* The operating company's name is MOL Plc. The headquarter is located in Budapest, with approximately 1000 employees. Hungary is a significant contributor to the company's cash flow generation. The Carpathian Basin provides the company's location for production and exploration, with an experience of 80 years. As it is known, the MOL is a Hungarian company and still one of the core countries for the company regarding reserves and production. By the end of 2019, MOL had 57.8 Million Barrels of Oil Equivalent in reserves and 37.8 Thousand Barrels of Oil Equivalents Per Day. Due to the improved, developed existing surface and infrastructure of this territory provides a good backbone for the efficient, sustainable operation of the production and exploration. The Hungarian subsidiary accounts for around 35% of the entire Group's hydrocarbon production, with the help of 950 wells. 75% of MOL Plc.'s total production is taking place in the country's South-East region. The firm is currently focusing on developing three other Hungarian parts: Somogy, Gomba, and Mezősas. However, the total exploration area is over 10,000 km<sup>2</sup>, mainly on the Western side of the country, including Zala Basins, Dráva, in oil production. In the Eastern part of Hungary, near the Romanian border, they are involved in gas production. In the field of production optimisation, the main goal is to develop the reserves and start utilising the remaining potential exploration. (MOL Group, 2020)

*Croatia:* In 2003, the MOL Group took over the Croatian INA, operating under the name INA d.d. The headquarter is located in the capital city of the country, Zagreb. Currently, the subsidiary has around 1100 employees. The Croatian part of the Group is also among the core countries in terms of reserves and production. These activities started back in 1960. At the end of the financial year of 2019, the firm had 102.4 Million Barrels of Oil Equivalent in reserves, and the average output was 33.9 Thousand Barrels of Oil Equivalents Per Day. Over 30 gas and 45 oil fields are currently in operation, where approximately 4500 exploration and development wells have been drilled with a total length of almost 7.000.000 meters.

Similarly, like in Hungary, there is a 4000 km pipeline network across the country, with around 1200 oil-producing wells. INA is nowadays decreasing its production from its mature field,

which is a problem. In 2014 they started to reverse it back with the help of production optimisation. INA also started offshore activities in 1998, in the Adriatic. The firm has been the individual owner and operator in this area since 2018. 25% of MOL Group's production occurs in Croatia, with the country's offshore and onshore production. (INA, 2020)

*Romania:* The MOL Group is active in Romania through its subsidiary, Panfora Oil and Gas S.R.L., with headquarter in Cluj-Napoca and five employees. They are focusing on exploring conventional hydrocarbon, the subsidiary involved in three kinds of research licenses issued by the Romanian Government. The company owns 30% of EX-1 and 20% of EX-5 licenses. These are licenses for the drilling in the area of Sand Hill PR. In EX-6, they have 100% interest. Currently, they are searching in these areas; the first drilling took place in 2020. However, no hydrocarbon was found. The exploration will continue. (Panfora, 2020)

*United Kingdom:* MOL Energy UK Ltd. has been working actively in the UK since 2004. Currently, the subsidiary has ten employees. By the end of 2019, the corporation had 24.6 Million Barrels of Oil Equivalent in reserves, and the average production was approximately 18.7 Thousand Barrels of Oil Equivalents Per Day. The firm is successful in its operations, and the production has been increasing significantly. Striving for improvement is essential for them; they are actively managing their assets, looking for investment opportunities, aiming at the generation of value. Production fields called Catcher, Burgman, Varadero are being produced with the help of a particular type of vessel called FPSO (stands for Floating Production, Storage and Offloading). Taking into consideration, Catcher is providing 60% of the company's oil production. Since the end of 2017, MOL Energy UK Ltd. has been unbrokenly extracting oil on these fields, and the production rate has been growing since then. Other fields are Scolty and Crathes, where production was restrained in 2018 due to an unexpected pipeline system problem. However, the area itself has outstanding attributes in terms of oil fields. This obstacle was unscrambled in 2019. Finally, in the future, the subsidiary focuses on maximising the value of its current assets by continuing to do the drilling while exploring and exploiting value-creating opportunities. (MOL Group, 2020)

*Norway:* MOL Norge AS was established in 2015 when MOL Group took over the Ithaca Petroleum Norge. The headquarter is located in Oslo with 30 employees. The firm is focusing on both operated and non-operated drilling systems in the segment of exploration. Territories of Norway are rich in oil companies' resources, giving a huge opportunity to grow for MOL. The company cooperated with local, strong companies to reinforce its position in the region and to have more opportunities to improve. At the beginning of 2020, MOL Norge discovered

a place near Stavanger, where they found oil and gas in diverse structures. Their goal is to keep the companies' cooperation, continue their discovery program, and continue the drilling in these areas. (MOL Group, 2020)

*Russia:* The corporation is functioning in Russia under the name of MOL-Russ LLC and BaiTex LLC. Over 150 employees, the headquarter is located in Moscow. In 2006 the Group purchased 100% of the BaiTex LCC; however, in 2014, they divested 49% of the shares to the Turkish TPAO in order to be able to enter a strategic relationship. At the end of 2019, the subsidiary had over 26.2 Million Barrels of Oil Equivalent in reserves. The daily production was around 4.9 Thousand Barrels of Oil Equivalents Per Day. The firm is mainly involved in the field development program in Russia; with the development plan, they managed to make a geological model for improving their location selection.

Additionally, 71 well workovers and drilled 17 wells in 2019, even infrastructure improvement is under process. Their aim is to maintain the development of infrastructure and drilling programs and continue the annual well reconstruction program. (MOL Group, 2020)

### **Upstream in the Middle East**

*Syria:* MOL Group's INA has been in operation in Syria since 1998. The company had been the only operator of Aphamia and Haya until 2012 when due to force majeure reasons, all of their activities have been temporarily suspended. (MOL GROUP, 2020)

*Iraq (Kurdistan):* Operating companies in Kurdistan are Kalegran Ltd., Pearl Petroleum Co. Ltd. MOL is the only owner of Kalegran; nevertheless, MOL owns only 10% of Pearl Petroleum Company. It was previously acquired from Crescent Petroleum and Dana Gas. Theirs headquarter located in Erbil with five employees. In 2019 the average daily production was 7.6 Thousand Barrels of Oil Equivalents Per Day with total reserves of 17 Million Barrels of Oil Equivalent in reserves (around 6,3% of the MOL Group's total reserves). Kalegran and Gulf Key Petroleum discovered Shaikan. This oil field is one of the largest oil fields in Kurdistan, currently gross of 35,000 barrels of oil are produced each day; however, there is a development project going on to increase the production to 55.000 Thousand Barrels of Oil Equivalents Per Day. With an extended pipeline network, they managed to discharge all transportation-related risks, including safety risks and costs. (MOL GROUP, 2020)

*Oman:* MOL Oman Ltd. was established in 2006 and had 75% of Block 66 with headquarter in Muscat and five employees. Currently, the Group is abandoning the area. (MOL GROUP, 2020)

## **Upstream in Asia**

*Kazakhstan:* MOL (FED) Kazakhstan B.V. subsidiary headquarter is located in Astana, with five employees. They have oil reserves of 23.5 Million Barrels of Oil Equivalent. The firm is in cooperation with KMG EP and FIOT. They are working together in the block of Fedorovskiy, which area is now under preparation for the ongoing Trial Production Project. It was a huge accomplishment in 2018; two key figures have made a commercial deal, the Gas Sales Agreement. MOL is the project's technical leader, and they founded solution together for the Engineering, Procurement, Construction, Commissioning. Next year, Kazakhstan Central Commission approved the Rozhkovskoye Field Development plan to develop and explore minerals. These activities are still active. (MOL GROUP, 2020)

*Azerbaijan:* The headquarter is located in Baku, with ten employees. In 2019, the company acquired a stake of 9,57% of the Azeri-Chirag-Gunashli oil field, a super-colossal oil field located in the Caspian-sea, from Chevron for USD 1.5 billion, that made MOL the third-largest stakeholder there. The largest operator of the field is BP. By acquiring almost 10% of the field, MOL could even increase its production by 20 Thousand Barrels of Oil Equivalents Per Day. Besides that, in April 2020, MOL also purchased a sufficient stake of 8,9% in the Baku-Tbilisi-Ceyhan pipeline, which is transporting the crude oil to the Mediterranean. (MOL GROUP, 2020)

*Pakistan:* The Pakistani subsidiary is one of the most important international branches of the MOL Group. Since 1999 the MOL Group has been the 100% stakeholder of the MOL Pakistan Oil and Gas Co. B.V. The headquarter of the subsidiary is located in the north of the country, in Islamabad, with over 400 employees. The Pakistani part of the Group had around 14.5 Million Barrels of Oil equivalent of reserves in 2019 (around 5,4% of the MOL Group's total reserves), and the production was approximately 8.1 Thousand Barrels of Oil Equivalents each day. Considering exploration and production in Pakistan is one of the largest in the segment of MOL Group's upstream. The subsidiary is one of the most important gases and LPG producers

in Pakistan and also has working affairs in 4 blocks. The MOL Pakistan has produced about 42.4 Millions of Barrels Oil Equivalent since 1999. (MOL GROUP, 2020)

### **Upstream in Africa**

*Egypt:* With 2.9 Millions of Barrels Oil Equivalent and daily production of 1.8 Thousand Barrels of Oil Equivalent, INA d.d. has authorisation in East Yidma, where they are the only operator, with other partners in the Western Desert of Egypt as a non-operator. East-Yidma is the deepest exploration well of INA, with a depth of 5.600 meters. The field development of non-operated assets is their primary activity. (MOL GROUP, 2020)

*Angola:* In Angola, also, the INA d.d. is the operating company, with reserves of 1.7 Millions of Barrels of Oil Equivalent and production of 6 Hundreds of Barrels of Oil per day. Since 1981 the subsidiary holds an interest of 4% in two non-operated blocks. (MOL GROUP, 2020)

### **Midstream**

As previously discussed, Midstream is the operation of gathering, storing, transporting the product from upstream to downstream, basically, a connection. MOL Group is also involved in midstream operation and domestically and internationally; however, the MOL itself is considering the logistics-related activities as part of the downstream due to the primary connection to this branch. The MOL's logistics division is called MOL Group Logistics DS, which is only involved in transportation and collaborates with several other partners across Europe. In 11 European countries, the logistics division consists of transferring, loading, packing, unloading, and handling the raw materials, work in process, and final products. They have over 2.300 direct labourers in the field of logistics. The section is also dealing with logistics support of national and international business activities. Due to the transportation of hazardous products, which could affect the environment's safety, its primary responsibility is to create a method to guarantee the logistics activities' unimpeachable flow.

**Regional Unrefined Petroleum Pipelines:** Pipelines are a network of large transportation of oil and gas, usually below the surface. The crude oil coming from Russia, the Mediterranean, Middle East, Asia, Africa is generally reaching the refineries by oil pipelines. These pipelines are FRIENDSHIP (Slovakia part, owned by Transpetrol; FRIENDSHIP I. (bidirectional-total

129km); FRIENDSHIP II.; ADRIA (Hungarian region); ALGYO; ADRIA-JANAF (12% owned by INA); Product Depot (pcs); PETROCHEMICALS; Feedstock and product pipelines; Ethylene (Kazincbarcika); Ethylene (Kalush); PRODUCT PIPELINE SYSTEM; MOL- 1,356 km; SN - 484 km; Porto Marghera – Mantova – 125 km.

**Product Pipeline:** When the crude oil is processed in the refineries, the work in process and the final output are delivered by pipeline across the European network. The MOL Group has three different product pipeline networks: In Hungary, the MOL is the owner, 1356 km long, connecting the refineries with MOL depots. In Slovakia, the MOL Group subsidiary, Slovnaft, runs a 484 km long pipeline network connecting refinery in Bratislava with depots in Klacany and Stozok and connecting to the CEPRO storage and pipeline network.

**Domestic Gas Pipelines:** MOL Group's subsidiary, FGSZ Földgázszállító Zrt. is the only operator of MOL's Hungarian pipeline-system. With an almost 6.000 km long high-pressure natural gas pipeline system, which works in regulated conditions and meets the European level's highest technological criteria. FGSZ is considered a reliable and efficient operator of the activity. The system is always being extended and improved, providing flexibility towards customers, distributors, and internal areas. The system has 25 entries and almost 400 exit points connected to the systems of Bosnia-Herzegovina, Croatia, Serbia, Slovakia, and Ukraine. The control centre of FGSZ's network is located in West-Hungary, Siófok.

**Boat and Scow Transportation:** Oil tankers vary in size; they can either be smaller or larger. Smaller vessels are usually transporting refined oil, despite the large one that is more often moving crude oil from upstream to Midstream or direct customers. The larger the vessel, the less the transportation cost of barrels is. INA handles the sea transportation of crude oil in Croatia. MOL Group operates three charging ports in the region of Duna, where the coast-side warehouses serve all the customers between the route of the Austrian Regensburg and the Romanian Giurgiu. This transportation method is relatively cheap. However, there are some disadvantages; for example, Duna's area is affected by the fluctuation of the water level and weather conditions a variable.

**Railway Transportation:** Oil can also be transported by trains equipped with special tankers. These tankers can hold a tremendous amount of oil and gas. Usually, after the oil extraction, they are charging these tank cars and being delivered to the destination (refineries, direct



customers, etc.) This transportation method plays an essential role in the MOL because these tankers can move this significant quantity of oil.

**Highway Transportation:** For oil transportation, another method is tanker truck; nevertheless, this way is more often used in downstream transporting refined oil to the customers or distribution locations (for example, to service stations). Like the train tankers, these trucks can also transport a massive oil and gas volume if many trucks are equipped with a tanker. Notwithstanding, trucks are generally used on short distances to carry refined oil. The company is shipping oil in 11 countries across the European zone (Hungary, Slovakia, Croatia, Austria, Bosnia, Czechia, Poland, Italy, Serbia, Slovenia, and Romania). The company is operating approximately 330 trucks. However, additionally, they are in contract with other logistics companies to extend their road transportation capacity.

**Warehousing:** In nine different countries, the Group has 40 terminals, with over the capacity of 1.800.000 m<sup>3</sup>. Moreover, some warehouses are connected to other company's warehouses through a pipeline system. (MOL GROUP, 2020)

### **Downstream**

Like other oil companies, for MOL's downstream is also playing a crucial role here; they are refining the upstream's crude oil, they are making the marketing to their, products and distributing their products. The value chain of MOL Group is involved in different kinds of business activities in the downstream part. Besides, they are holding a leading position in oil divisions in the Central European area. The company is refining the crude oil into refined products, then these products are being retailed for transportation usage and households (service stations), moved. For the retail market, the company sells refined products such as gasoline, diesel, aviation oil, etc. The company has four production sites, including three refineries. MOL's downstream has activities in 11 countries with 94.000 employees. Downstream's output is measured in a weight-based production measurement value, including Million Tonnes Per Annum, Kilo Tonnes Per Annum (year). In 2019, the company's downstream sector had sales of over 19.000.000 Tonnes Per Year and over 1.100.000 Tonnes Per Annum in petrochemical products. By now, the division has over a refinery capacity of 417.000.000 Barrels Of and a steam cracker capacity of 890.000 Tonnes Per Annum.

**Production Sites:** The production sites are operating in Central European regions, where a complex network has developed. In total, the Group has a refining capacity of 20.900.000 Kilo Tonnes of Oil Annually and 2.200.000 Kilo Tonnes of Petrochemicals. As I have already mentioned, the petroleum industry is a high-margin business for the MOL as well. Thanks to the well-located Hungarian, Slovakian, and Croatian production sites and their well-equalised product-customer portfolio, the company can even make it better. Their products are considered to be of high quality, which makes the company attractive to its customers. Furthermore, their petrochemical goods are also meeting these quality standards. Currently, they have four production sites:

*Danube production site:* The production site has been operating since 1965. Where they have a production capacity of 8.100.000 Tons Per Annum and a daily capacity of 165.000

*Hungarian Tiszaújváros production site* is operated by the MOL Petrochemicals Co. Ltd. The production has been running since 1953; currently, 1100 people are working there. With a total refining capacity of 1.525.000 Tons Per Annum

*Slovakian Bratislava production site* is handled by Slovnaft Plc. The refinery has activities since 1957, and by now, they have ranked as one of the most extended refineries in Europe. The output capacity is 6.100.000 Tonnes Per Year.

*Croatian Rijeka production site* is located in Kostrena Municipality and run by INA d.d. With a capacity of 4.500.000 Tons Per Annum and 560 employees, the Rijeka production site is the most comprehensive refinery in Croatia.

**Sales:** As crude oil is being refined, it is also being forwarded to the markets, household, transportation, and industrial use. Moreover, the firm also produces petrochemical products that they are distributing worldwide. In the *Downstream integration of fuels:* The 1<sup>st</sup> step is the acquisition of crude; 66% of the crude is coming from Russia, 26% is coming from the sea, and the remaining 8% is their production. The 2<sup>nd</sup> step is the refining, then 85% of the refined petroleum is forwarded to the retail and the remaining 15% to the petrochemicals

**Petrochemicals:** MOL Petrochemicals Co. Lt. and SLOVNAFT, A.S. is holding a leading position in terms of petrochemical division in Central Eastern Europe. They are a part of MOL's downstream segment. MOL's petrochemical products are polymers, monomers, aromatics, aliphatics, maleic anhydride, sulphur, and pentane. The Group owns multiple decades of experience producing polymers in competing for quality for the synthetics industry,

which is vital for a wide range of industrial applications and a vast production number of consumer goods that are indispensable to our ordinary lives. (MOL Group, 2020)

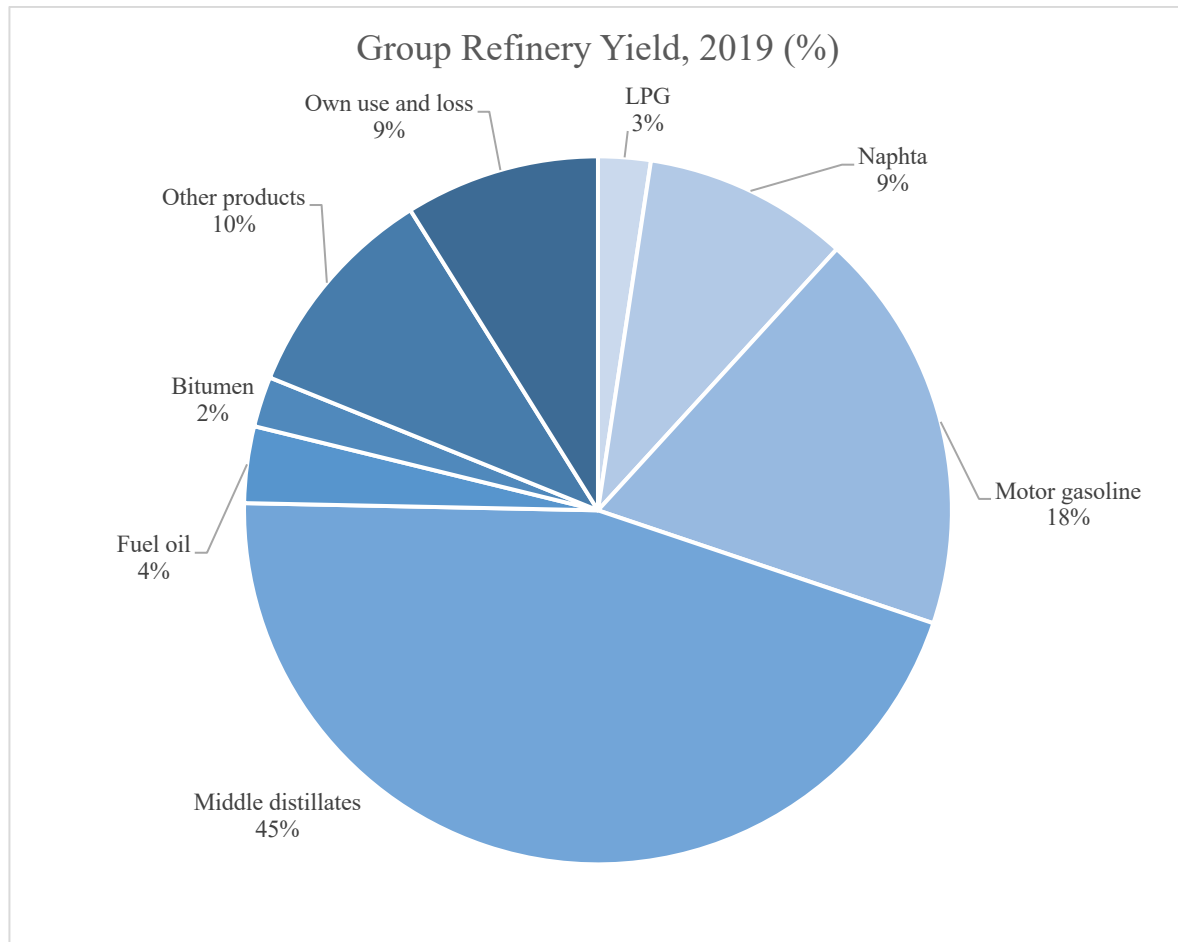


Figure 5: Group Refinery Yield, 2019 (%)

Source: (MOL Group, 2020)

**Refining products:** The main refinery product of MOL is motor fuel: gasoline and diesel; however, the corporation has a broader range of automotive fuels; they are mostly involved in all kinds of fuel products.

*Motor fuels:* The most common products for almost all oil companies, these are used for powering motor vehicles, mainly gasoline and diesel. MOL's high quality, a wide range of fuels, are produced to meet the European Standards.

*Kerosene:* Alias paraffin, lamp oil, or coal oil. A combustible hydrocarbon liquid derived from petroleum. Nowadays, it is primarily used for operating aircraft that are powered by a jet engine. It had been used for oil lamps in the past.

*Liquefied Petroleum Gas:* Also known as Autogas. A propane and butane gases mixture, which is kept under pressure in the liquidised form in containers. LPG is fuelling internal combustion engines and stationary applications, for example, generators.

*Fuel Oil:* Mainly used in power and gas industries, this type of fuel a liquid hydrocarbon with various sub-types. The Midstream is transporting it by vessel, railway, and on-road as well.

*Naphtha:* It is a flammable liquid and a mixture of hydrocarbon. Primarily is utilised as the feedstock of vapour crackers to generate monomers for petrochemical. For the production of plastics products and industrial chemical, ethylene and propylene are essential materials.

*Bitumen:* Most commonly known as asphalt. A form of petroleum, which is black, sticky, and highly viscous semi-solid or liquid, can be found naturally; nevertheless, it even can be a refined product. This product is principally utilised in road construction or reparation, waterproofing, even briquette production, or for the making of wrapping paper.

### **Innovations in Business and Services**

In my opinion, currently, MOL is mostly concentrating on the innovation segment, because they are trying to be as ground-breaking as possible, especially in the past few years. Moreover, the MOL had created an additional segment in their value chain in 2016, when MOL decided to create an entirely new business line model additionally to the three base oil industry ones due to the changes in the people's life habits and the fast change in technological development. These new innovations are not specific to the oil industry; however, these are mainly satisfying industrial customers and consumers' needs. The new segment of the company introduced is not straightforwardly related to the petroleum industry. They are more like a new, futural vision. The company is focusing on implementing a new, innovative solution to build its customer network. By now, MOL has 4.600 people working in the sector, a market leader in 60% of the network, and they are collecting more than 470 tons of used cooking oil at their stations, making over 1.000.000 retail transactions a day, and has six brands. Their brand, called MOL Limo, which is a car-sharing application, has over 53.000 users. For MOL, this sector is based on two dependence:

## **Consumer services:**

Due to the improvement of technology and electric cars' introduction, people's thinking has dramatically changed, which is redesigning the customers' demand. This is one of the reasons why MOL started to create entirely new circumstances and will improve it. However, in Central European countries, the fuel consumption is still showing a growing tendency, and according to their forecasts, it continuously will be until a point.

**Retail:** As previously mentioned, MOL Group operates over 2.000 service stations in the European countries; MOL is the direct service station operator in Hungary, Slovenia, Czech Republic, Serbia, Romania. MOL subsidiaries, INA and Tifon, are the operator in Croatia, INA in Montenegro, INA, and Energopetrol in Bosnia And Herzegovina. Slovnaft is handling the Slovakian service stations. On the Hungarian, Croatian, Slovakian, and Bosnian oil market, the MOL Group manages a heading role. In the Czech, Romanian and Slovenian markets, they are maintaining a premium role. MOL has always been endeavouring to produce sufficient quality fuel on the market. In 2017 they introduced MOL and INA gas stations the MOL EVO and INA Class exceptional class fuels, which overperformed the European Union standard quality in this class. This kind of fuel can clean the engine and remove remaining deposits; these attributes provide corrosion prevention.

Moreover, sustaining their powerful status on fuel retailing, MOL also improves its gas stations' services. They strive for more complex facilities to satisfy their customers' needs by expanding their grocery product offer. They introduced their own convenience brand: Fresh Corner, which is basically offering fresh groceries and ready-made food, including first-class coffees. Around 54.000.000 cup coffees have been sold on service stations. Since the Fresh Corner start, MOL managed to equip over 900 of its service stations with the brand.

Furthermore, MOL Group Cards has been introduced, which provides a cashless payment solution for fuel, fuel-related products, and services for their customers. Besides that, the card is giving a favourable resolution for the B2B segment. With the card, customers can easily manage their fuel-related expenses, and for European Union members, they can provide a VAT refund. By now, 11 countries are accepting the Group Card.

**Mobility Solutions:** Due to the increasing demand for mobility solutions in specific areas and fast transportation variation, MOL is always developing their mobility solutions. They are striving for the 1<sup>st</sup> in the segment by adaptation and innovation. Because of the digital

transformation improvement, they are advancing their technologies and expanding their capabilities in this field to meet customer requirements. Approximately 85.000.000 km has been used since the launch of the mobility solution.

*MOL Bubi:* Their first mobility solution was the introduction of MOL Bubi in 2014 with the Budapest Közlekedési Központ. It is a bike-sharing system, where people can rent bicycles through an electronic system. By now, there are 157 stations in Budapest. Due to the success in Budapest, in 2018, MOL subsidiary, Slovnaft introduced the Slovnaft BAJK in Bratislava

*MOL Limo:* In mobility solutions, the next step for the MOL was the introduction of the MOL Limo in Budapest, 2018. A car-sharing network, which provides a flexible solution for users who do not have a car or, for any reason, do not want to use it. Flexible solution because Budapest is divided into zones where people can find these cars, furthermore users do not have to take the vehicle back to the location where they picked it up. Initially, the MOL Limo was introduced with 300 cars in Budapest; however, due to the success, it was extended, and by now, there are 450 vehicles available; from the 450 cars, 150 are fully electric. Currently, two types of cars are available, fully electric and gasoline Volkswagen UP, and a more premium gasoline Mercedes A Class A200. The company is striving for the global expenditure of MOL Limo.

*Public Transportation:* MOL Group acquired the majority of the stake in 2002, established ITK Holding Plc. in 2008. ITK Holding is mainly focusing on public transportation solution. They regarded it as its vital mission to help the Government, local governments, multinational, small, and medium-sized enterprises transport with complete solutions. To further improve Hungary transportation, the firm is open to knowing and helping their cooperatives' purposes by involving their resources. The company strives to maintain its crucial position by meeting the various needs of Hungarian and international transport innovative solutions. By now, they are operating over 300 buses in Hungary. With the cooperation of Mercedes-Benz, they are developing high-end low-entry buses. Besides that, ITK is aiming at the continuous improvement of the service.

**Digital Factory:** The Digital Factory is driving the digital transformation of MOL Group Consumer Services by digitalising client intercommunications and in-house processes. By personalising consumer cooperations, the improvement of convenience, and the datafication of their internal processes. The Digital Factory system efficiently connects business expertise and professional know-how and leverages best-in-class technologies for information science, master data management, loyalty, customer relationship management, campaign management,

API integration, omnichannel, and payment capabilities. The firm strives in output-focused exercises to value our clients and our business through the agile way of working.

### **Industrial Services**

With the quality improvement of industrial services, MOL aims to develop its internal customers' quality and make better value, service, and product for their internal customers. Furthermore, the company is assigned to enlarge its industrial services portfolio progressively, intensify partnerships, and cooperate within these divisions.

- 1. Oilfield Chemicals and Technologies:** With Oilfield Chemical and Technologies foundation, their main goal is to build value in the Enhanced Oil Recovery segment, encouraged by the ascent of chemicals universal. MOL's main object is the utilisation of Research and Development results and to get to know the national oil market. Considering surface technology-related engineering solutions: firstly, to hydrate inhabitation, secondly, to remove selective sulphur. Sub-surface technology-related engineering solutions are advanced silica gel treatment, micro-emulsion treatment, nano-emulsion treatment, etc.
- 2. Group Oilfield Services:** These services are involved in drilling, pressure pumping, cementing, tubular handling, etc. MOL's oilfield service subsidiaries are Geoinform, Crosco, and Rotary; these companies are striving for the most cost-efficient operation and for the practising best consistent quality delivery while exploiting the potential synergies services that are compatible with the requirements of the company's Exploration and Production's operations in Hungary, Croatia, regionally, and globally. (MOL Group, 2020)

## Short Evaluation of MOL Group

As I suggested, MOL is a Hungarian based multinational oil company, which internationally acknowledged, with exciting history. The company generates a considerable amount of revenues compared to other Hungarian extensive firms; we can even state that the MOL is the largest company in Hungary. Comparing the company itself to the oil industry characteristics, MOL covers all the value chain segments that I have mentioned. The upstream operates in Europe, Asia, Africa, and the Middle East, with many employees. The crude oil and natural gas extraction are numerous, not only in Eastern and Central European countries, even internationally. They are also highly involved in Research and Development activities, which means MOL is facing a substantial financial risk; nevertheless, these projects are making an enormous return on investment. As for them, the MOL is involved in the downstream segment (taking into consideration the process of the crude oil downstream), which means they are their own purchaser in the case of crude oil and natural gas, besides the external upstream customers. The Midstream segment of the corporation also includes the named features of the branch. However, the company is categorising transportation as a downstream activity, even though it is an operation in the Midstream—the reason behind that they are advertising the advantages of transportation in retails, refineries, and customers. The Midstream in the oil industry is mainly the collection, transportation, and storage of unrefined oil and gas. Downstream likewise the upstream is considered extensive for MOL, with over 94.000 employees have developed production sites, well-structured sales system with the production of several types of oil-, and non-oil product. The whole value chain is covering the suggested characteristics of the oil industry. However, in contrast to it, they are categorising sub-segment into a different segment.

Additionally, they even announced an entirely new feature in the supply chain: Innovations in Businesses and Services. I would consider this branch as a half oil industry-related segment. However, If I had been strict, I would have sub-categorised the innovation segment as part of the downstream due to their downstream service and retail activities. In my opinion, MOL created this segment, because according to their website, they have initiated many new ‘innovations’ in the fields of retail and industrial services. However, without any doubt, the introduction of their mobility solutions is ground-breaking. Significantly, with the introduction of car-sharing applications, many companies are copying nowadays.



# **POLSKI KONCERN NAFTOWY ORLEN (PKN ORLEN)**

## **Background and overview of the PKN Orlen**

Similarly, in the case of MOL Group, the PKN Orlen is also involved in all the oil supply chain segments; however, only by looking at the revenue we can definitely state that MOL is much larger than the Orlen. In 1944, in Poland, the State Bureau of Petroleum Product Sales was founded to save the remaining petroleum infrastructure that survived the Nazi occupation and start the oil distribution. In 1945 they renamed it to Central Office of Petroleum Products, which became an oil monopoly. Ten years later, they changed the name again to Central Board for Petroleum Products Trading CPN. In 1958 the name was reverted to CPN again. In 1998, the two companies, Petrochemia Płock S.A. and CPN S.A. Central Office of Petroleum Products, were fused by the Council of Ministers to create a domestic oil business. In the same year, the largest Polish oil companies created Petro Oil. Following year Petro Oil and Polish Oil Concern Capital Group (PKN S.A.) united, and on 7 September 1998, they established the PKN ORLEN. Nowadays, the company is in operation in Poland, the Czech Republic, Slovakia, Germany, Lithuania, and Canada. One of the largest Central-Eastern European oil companies. Their headquarter is located in the Polish city, Płock. In 2019, the company's revenue was PLN 111.000.000.000, which is approximately USD 29.000.000.000 (this value is covering all the incomes the organization is realising) (The Wall Street Journal , 2020). The current Chief Executive Officer is Daniel Obajtek. The company has over 22.000 employees; they won the award Top Employers Polska and the World's Most Ethical Company Award.

The PKN Orlen, by the end of 2019, had over 197.300.000 barrels of oil equivalent (there is no data available for the average daily oil production). With 2.679 service stations in Europe, we can state that the Orlen Group is one of the fuel market leaders in Central-Europe. The company is also involved in all segments of the oil industry's supply chain, including upstream, Midstream, and downstream. (ORLEN, 2019) In June 2004, they acquired 63% of the Czech UNIPETROL a.s. They have become the 100% owner of the company. In 2009 the company acquired 100% of the Lithuanian AB Mazeikiu Nafta, known as Orlen Lietuva, one of the largest Lithuanian companies. The firm has been in the presence of the German fuel market since 2003. By managing the ORLEN Deutschland GmbH with almost 600 service stations across the country, they maintain approximately 6% of the German retail market shares. Their

philosophy is keeping health and safety, producing the highest quality of output, hiring highly qualified staff, and maintaining advanced technology while being involved in sustainable development. The motto of the company is Responsibility, Progress, People, Energy, and Dependability. (ORLEN, 2020)

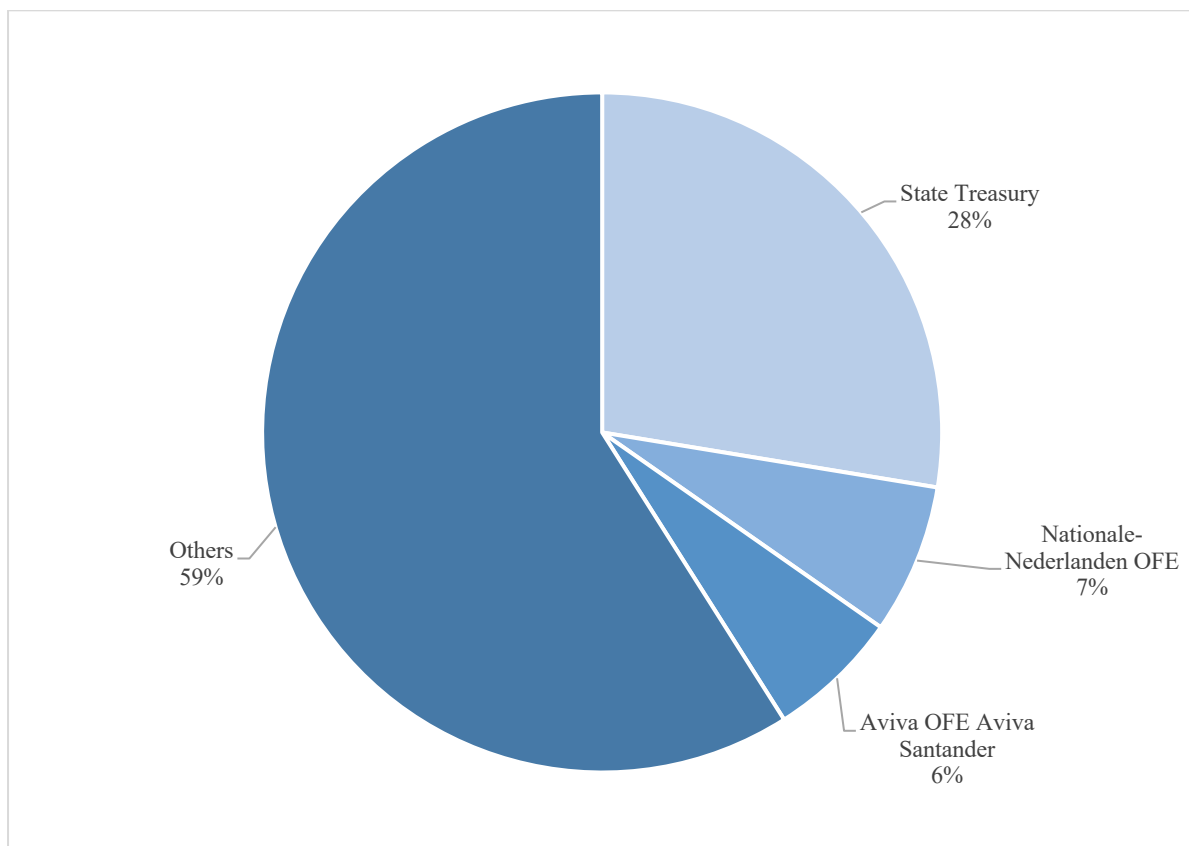


Figure 6: Ownership structure of PKN Orlen in March 2020

Source: (PKN Orlen, 2020)

### **The ownership structure of PKN Orlen in March 2020:**

The company's shares are listed on the Warsaw Stock Exchange Main List in the continuous trading system. As Figure 6 represents, 28% of the company is state-owned, the NN Group (large Dutch insurance company) has 7% in shares, 6% Aviva Santander (Polish insurance company), and the rest 59% is owned by many other firms, people, foundations, etc. It is very similar to the ownership structure of the MOL Group. According to the PKN Orlen's officially announced report, their share capital accounts for PLN 534,636,326.25 (which is approximately USD 139,575,527.54), divided into 427,709,061 shares with a value of PLN

1,25/piece. These shares are similar to the MOL's shares; they are issued in series 'A,' series 'B' and series 'C.' All of these shares were issued in 1999. 336,000,000 series 'A' shares, 6,971,496 series 'B' shares and 77,205,641 series 'C' shares are issued. However, all of the shares have the same power of the vote. (PKN Orlen, 2020)

### **The three supply chain segments of the PKN Orlen:**

#### **Upstream**

Like the MOL's upstream, PKN Orlen is also active in this segment's activities; nevertheless, their actions are smaller compared to the other one. The branch is entirely owned by the PKN Orlen, making the company one of the biggest oil firms involved in the upstream in Eastern and Central European regions. However, as it can be seen, the involvement upstream of PKN Orlen much less than the MOL; they are also motivated to expand their activities, by enlarging their reserves, creating new, innovative projects, and focusing on the most auspicious assets. PKN Orlen's upstream is extraordinarily active in Research and Development and production undertakings. By the end of 2019, the Group has over 186.3000.000 barrels of oil equivalent in oil and gas reserves and had a production of 17.200 barrels of oil equivalent per day. The objective is the development of their activities and, as I have already mentioned, the production of high-quality assets with the caring of the environment. The company is considering itself as socially responsible; they have developed ethical codes in order to be part of sustainable development. The sales structure in the Upstream division of the ORLEN Group was divided between Poland and Canada, where the Polish segment had 6%, and the Canadian had 94%. This means the upstream segment of PKN Orlen is mainly in operation in Poland and several provinces of Canada. (ORLEN Upstream, 2020)

#### **Upstream in Poland**

Poland is the homeland of PKN Orlen; ORLEN upstream is responsible for these projects and is involved in explores and produces from deposits of oil and natural gas. ORLEN obtained its first exploration field in 2007; since then they have continuously been growing. They started the drilling for oil and gas in 2011, and by now the ORLEN Upstream in Poland has become the leader in the exploration of hydrocarbon deposits with 26 licenses on a 17.000 square

kilometre area. By the end of 2015, the company managed to achieve 8.200.000 barrels of oil equivalent in reserves in gas. In this year as well, they were able to get new licenses, which led them to leave the less promising ones behind. The two new licenses were acquired from Deutsche Erdoel A.G., and they entered into a collaborative processes contract with PGNiG S.A. concerning eight licence areas in the Karpaty region, which is known as the Bieszczady project. Later that year, from the Ministry of Environment, they managed to acquire the license of Siennów-Rokietnica, which is located in the Province of Reszów. They also bought a 100% in stake FX Energy INC, which included seven production fields in Poland. (ORLEN Upstream, 2020)

## **1. Kraków Oil Province**

*The Bieszczady Project* is a shared investment with PGNiG SA, which includes seven grants in Poland's Podkarpacie province. The obligation carried out in this area aims at the Carpathian flysch dispositions, from the Lower Cretaceous to the Miocene. In the past, numerous hydrocarbon deposits were noted in the region of the *Bieszczady Project*. As a member of the procedures so far, seismic data have been collected, exploration wells drilled, and flow tests were made.

*The Karpaty Project* consists of 3 permission fields founded in the Carpathians, on the border of Małopolska and Podkarpacie. The site's geology has been wholly examined; the area is known to have a great history in the oil industry.

*The Miocen Project* embraces the Siennów-Rokietnica grant, situated in the south-eastern part of the Carpathian foredeep basin. The area is encouraging, taking into consideration the occurrence of natural gas is found in the Badenian and Sarmatian compositions.

## **2. Poznan Oil Province**

*The Sieraków Project* is the part of the previously mentioned cooperation with PGNiG S.A. It comprises two licence regions in Wielkopolska, close to the most extensive sediments of oil and natural gas found in recent times. The purpose of the plan is to analyse and thoroughly search the Upper Dolomite formations and extract the recently found oil and gas.

*Plotki Project* is the development of the Miłosław-5H well (on the Miłosław field), where the company conducted a construction and assembly work.

### **3. Gdańsk Oil Province**

*Edge Project* is a project where they made a study to develop a power generation project of Bajerze and Tuchola; these locations are rich in natural gas.

### **4. Lublin Oil Province**

*The Karbon Project* includes four licences in the provinces of Mazowsze and Lubelszczyzna. In the Lublin Basin, the geological activity focuses on the hydrocarbons gathered in the Carboniferous and Devonian ores. Orlen has drilled 14 wells in this area since the start of their activity. Moreover, in the antiquity, the Wilga, Minkowice, Mełgiew B, and Mełgiew A coats were documented in the permitted regions, proving the area's extraordinary nature. (ORLEN Upstream, 2020)

## **Upstream in Canada**

The company's upstream branch has been working actively in Albert province of Canada, North America, since 2013. In 2015 the ORLEN Upstream took over production assets in the fields of Kakwa, Alberta, from the company so-called Kicking Horse Energy. By the end of 2017, the Canadian part of the company had reached 141.000.000 Barrels of Oil Equivalent in oil reserves, and by the second quarter of 2018, the production had reached 17.100 Barrels of Oil Equivalent per day; even in 2015, the production capacity of the Kakwa region was 4.500 Barrels of Oil Equivalent daily. These outputs are including a vast portion of liquid hydrocarbons; as I have mentioned, it is crude oil and condensate. They are primarily using horizontal-, hydraulic drilling technologies. Considering the acquisition of Canadian territories, it was a massive risk for the company. The Canadian oil upstream activities are known as advanced, which is also an advantage for the ORLEN Upstream because the market offers decent accessibility to drilling pieces of equipment and expert labour in the segment. The ORLEN also has 10,7% shares in projects of construction of a liquefied natural gas export terminal on Canada's east shore (Nova Scotia province), Goldboro LNG, which is in an initial implementation part. Hydrocarbon exploration and production plans have been implemented for both organic extension and acquisitions. ORLEN Upstream's primary goal is to build an occupancy in the experienced and well-built upstream market, increase the company's asset plan, raise the production capacity from currently producing territories, and reinforce the status in Canada and obtain a space for more enlargement in North American markets. The core PKN ORLEN's Canadian resources are situated in regions of Alberta:

- *Kakwa* (Montney formation) is an assuring area in Alberta for the ORLEN Upstream; however, it is now under development. The work here concentrates on the Triassic Montney development. Including a massive volume of condensate, the main output in Kakwa is gas.
- *Ferrier Strachan* (Cardium formation) is one of the two leading operation areas for the Canadian part of the company. An impressive factor is that the combination of hydrocarbons is very different at this place, differing from gas with a slight amount of petroleum to oil with a proportionately small volume of gas.
- *Lochend* (Cardium formation) this location is found near the Calgary area, which is the Canadian portfolio framework. The structure of Cretaceous Cardium is incredibly encouraging on approximately two horizons of the deposit; the area is embracing a field of tens of square kilometres, where they are producing gas and light oil with gas.
- *Pouce Coupe* (Montney formation) is among those areas where the Canadian subsidiary started working first. The production here is carried out from the siltstone found in the Triassic Montney creation. The most crucial output in Pouce Coupe is the gas, including a small addition of fluid hydrocarbons.
- *Kaybob* (Dunveganformation) The sandy delta powders are the main drilling target in this area, which were placed here in the Cretaceous, creating a part of the Dunvegan Disposition. They have an outstanding reserve characteristic and a high percentage of petroleum in the whole amount secured.
- *Stoney Creek* is one of the most famous oil locations in the World; in the American continent, oil was found here first, the site can be found in both USA and Canada. It is located in New Brunswick.
- *Goldboro LNG*: At this location, Pieridae Energy is the operator, where the ORLEN Upstream owns 7.4% shares. It is located in the eastern part of Canada, where the operator is projecting to build an LNG terminal, which is now under preparation sequence; it will decide the project's future outcome. (ORLEN Upstream, 2020)

## Midstream

As previously referred, the logistics segment is categorised in the Midstream. However, PKN Orlen is also classifying the transportation to the downstream segment as the MOL Group does. The ORLEN Group also offers several kinds of transportation methods, and they are operating a well-developed infrastructure system, which is consisting of onshore and offshore handling depots, fuel pipelines, rail transportation, road transportation, and fuel terminals. I have already pointed out the characteristics of these methods in the part of MOL.

**Product and Crude Oil Pipelines:** The primary transportation method for raw materials and products are the company's pipeline. The company is also in contract with a third-party pipeline network provider. The total length of the firm's network in Poland, Lithuania, Czech Republic is approximately 3.700 kilometres. 2.100 kilometres of them are product pipelines, and the remaining 1600 kilometres are raw material pipelines. In Polish territories, the corporation uses 958 kilometres for fuel moving, and 620 kilometres are operated by Przedsiębiorstwo Eksploatacji Rurociągów Naftowych S.A., which is in contrast to the MOL is not a subsidiary of the parent company. The ORLEN Group operates the rest 358 kilometres. The product pipelines are connecting the areas of Płock – Ostrów Wielkopolski – Wrocław, 319 kilometres long and Wielowieś – Góra is 19 kilometres long. Przedsiębiorstwo Eksploatacji Rurociągów Naftowych S.A. is operating most of the crude oil pipelines in Poland with a length of 887 kilometres, and the PKN Orlen runs only 43 kilometres. It takes 48% of the transport structure in the country. In the Czech Republic, the firm is operating 1.741 kilometres of pipelines. ČEPRO runs 1100 kilometres of product pipelines, and MERO operates 641 kilometres of crude pipelines; it takes 50% of the transport structure in the Czechia. There is a 91 kilometres-long pipeline in Lithuania, which is connecting the Butinge terminal to the Mazeikai refinery. (PKN Orlen, 2020)

**Warehousing:** Currently, the company is handling 27 Polish facilities, with 2.700.000 square metres of storage capacity. In the warehouses, they are receiving, storing, dispatching, and handling fuels. The firm uses its own third-party depots as well. In Czechia, they are operating 17 warehouses, ČEPRO owns seven of them, another seven are owned by other third parties, and the ORLEN Group runs three of them. In Lithuania, there is only one depot, which is operated by the ORLEN Lietuva. ORLEN Deutschland has seven facilities; all of them are third-party owned. (PKN Orlen, 2020)

**Highway Transportation:** In Poland, trucks are moving 22% of the products and raw material; in Germany, the whole carriage is covered by trucks; in the Czech Republic, this percentage is 20%, and in Lithuania, this ratio is 4%.

**Rail Transportation:** They are moving 30% of the Polish products and raw materials, 30% in the Czech Republic, and 94% in Lithuania by train.

**Seaborne Trade:** As the Upstream segment is highly involved in Canada, there has to be a solution for transportation. I have already pointed in the case of MOL that the best way to transport oil on long-range is vessel transportation. The products are transported by scow are mainly; Heavy fuel oil, VGO, Kerosene, Gasoline 92 (US), Diesel oil, Bitumen, LPG, Heavy fuel oil, Isomerase, Sulfur, Propylene, Aviation Fuel JET A-1, MGO, MTBE. (PKN Orlen, 2020)

## **Downstream**

As I have mentioned before, PKN Orlen is also highly involved in the downstream of the oil industry. Likely to the MOL Group, they are operating in several European markets, in the mother country; Poland, Germany, Czech Republic, Lithuania, and Slovakia. The products of the company are being sold in 110 countries worldwide. By the end of 2019, the company's total production capacity was over 35.200.000 Tonnes. The total sales of the ORLEN Group were over 32.740.000 units.

### **Production Sites:**

*PKN ORLEN refinery in Plock*, with a production capacity of 16.300.000 tonnes annually, is one of the most developed production sites in Central Europe. On the side of petrochemicals, the site has a capacity of 1.080.000 tonnes yearly, 700.000 tonnes of ethylene, and 380.000 of propylene. There is also a capacity of 690.000 tonnes of terephthalic acid.

*ORLEN Lietuva refinery in Mazeikai* located in Mazeikai located in North-West of Lithuania, the largest refinery in the Baltic States with a production capacity of 10.200.000 tonnes a year. The refinery has the most advanced technologies meeting the current market's requirements; the active refining quantity is 8 million tonnes a year. To use the refining capacity more



efficiently, they are also treating other feedstock, for example, gas condensate and middle distillates. The production site has been operating since 1980.

*Unipetrol Group operates refineries in Kralupy and Litvinov.* Unipetrol is a Czech subsidiary of the PKN Orlen; by 2019 they had a production capacity of 8.700.000 tonnes a year. Moreover, the subsidiary is involved in the production of petrochemicals. Around 600.000 tonnes a year of polymers.

*Anwil is the single producer of polyvinyl chloride in Poland.* Their capacity is around 1.000.000 tonnes annually of nitrogen fertilisers, 200.000 tonnes yearly of sodium hydroxide and 400.000 tonnes of polyvinyl chloride. Currently, the production site is under development, and the production capacity is expected to reach 1.500.000 tonnes yearly by 2021. (PKN Orlen, 2020)

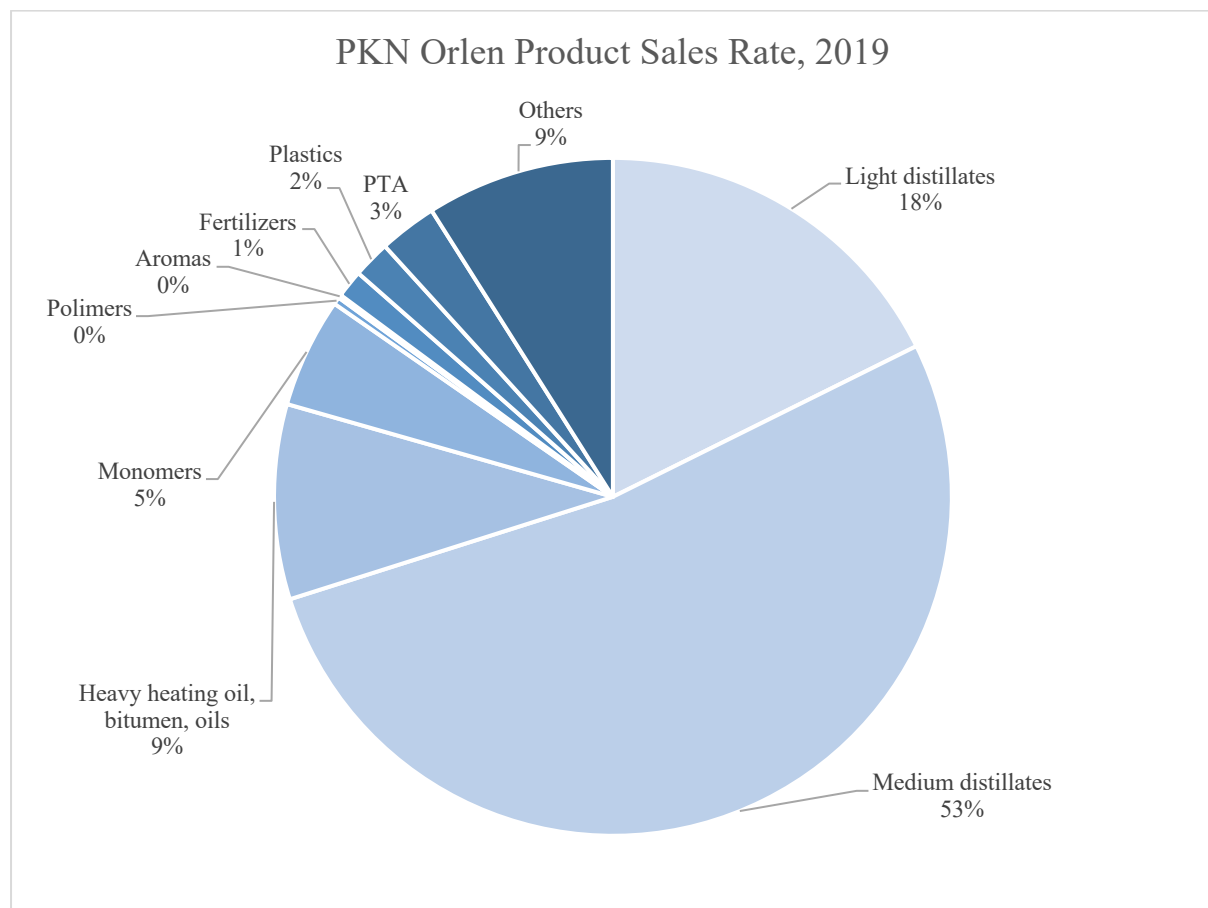


Figure 7: PKN Orlen Product Sales Rate, 2019

Source: (PKN Orlen, 2020)

**Petrochemical Products:** ORLEN Group is considered to be one of the most comprehensive petrochemical producing company in the Central European region; they are the only producer on the Polish market of the monomers and polymers. All of the petrochemical goods are accessible on the Czech and other markets. With several years of experience behind, they have adapted a production-system with high-quality output. (PKN Orlen, 2020)

**Refining Products/Sales:** As a downstream segment in the oil industry, the products are almost identical compared to other companies'. I have already cited the products in the case of MOL, and the main outputs are; gasoline, LPG, diesel, heating oil, kerosene, ethylene, propylene, bitumen etc. I also mentioned these products what they are used for in the case of MOL; their data is very similar. In contrast to the MOL, the information is given by sales, not in production. (PKN Orlen, 2020)

*Light distillates* are Gasoline, LPG. *Medium distillates* are Diesel oil, light heating oil, jet fuel. *Heavy fractions* are Heavy heating oil, bitumen, oils. *Monomers* are ethylene, propylene. *Polymers* are Polyethylene, polypropylene. *Aromas* are Benzene, toluene, paraxylene, ortho-xylene. *Fertilisers* are Canwil, ammonium sulphate, ammonium nitrate, other fertilisers. *Plastics* are PVC, PVC granulate. *PTA*. *Other* is comprising mostly saltwater, salt base, vacuum distillates, acetone, technical gases, ammonia, butadiene, glycols, phenol, caprolactam, caustic soda and sulphur, additionally, in value terms revenues from the sale of services of the segment and materials. The company's top products by revenue are diesel with 50.831.000.000 PLN (USD 13.408.020.000), gasoline with USD 6.459.690.000, heavy fuel oil USD 990.740.000, kerosene USD 1.090.720.000. (PKN Orlen, 2020)

**Consumer Services:** The company is operating 2.836 service stations across Europe; the primary market are Poland, Czech Republic, Lithuania and Germany. Another similarity to the MOL is that ORLEN provides many kinds of services over the fuel in their retail section, ORLEN Group's services and retails are considered highly valued. For years they have been known as the 'Most Valuable Polish Brand'. The firm's primary services are wholesaling, retailing and catering services, which is undergoing mainly at their service stations; end-to-end waste management, personal property security to protect the customers, the transportation control and continuously cleaning the facilities. The firm is also providing End-to-End construction and sustaining of fuel and LPG stations, moreover, they are promoting power service as well.

**Retail:** PKN Orlen's service stations are running under the names of; ORLEN in Poland and Lithuania, Bliska in Poland, Benzina in Slovakia and the Czech Republic and Star in Germany. Only on the Polish market, they are operating 1749 service stations, which is making the company inarguably the leading oil retailer in the country with a market share of 34,1%. Benzina runs 416 service stations on the Czech market, with an average flow of 2.600.000 litres annually, which is considered a leading position there as they have a 24,6% market share there. The ORLEN acquired 63% in stakes in Unipetrol A.S. The company has been the total operator of ORLEN Lietuva since 2004 in Lithuania, where they are operating 25 service stations with a market share of 4,7%, with an average flow of 3.900.000 litres annually. It is not a considerable number; nevertheless, as I have referred, they are primarily involved in the segment of refining here. Since 2003 the ORLEN has built a service station network, under the name of ORLEN Deutschland GmbH, or also known as STAR and operating over 585 service stations in Germany, which approximately contributes 6,6% of German's retail market, the average flow a station is 5.000.000 litres per year. They have a little presence on the Slovakian market with only ten service stations, with an average flow of 2.600.000 litres annually. (PKN Orlen, 2020) Just like the MOL, the company is also offering groceries, food, and beverages at their service stations and continuously improving the service. In 2019, they improved their food and beverage services known as Stop Café 2.0 and Poland, Orlen Drive. For example, in Poland, the number of new stations are expanded by 169. The ORLEN Group also introduced its cashless payment to improve the service quality on a regular basis. They launched the OrlenPay in 2018, to provide an innovative mobile payment system. The application allows the customers to pay for fuel directly at the pump, which makes the payment process easier and faster. Orlen announced the Efecta Fuel in 2019 to market, which is basically the Orlen version of the MOL EVO. The Efecta has almost the characteristics as the EVO, cleansing feature, that is protecting the engine and the fuel system of cars. In short words, their service stations are equipped adequately to serve every need of customers, including maintenance product, groceries and beverages.

**Mobility Solutions:** The Orlen group has also been working on mobility solutions; however, comparing to the MOL, it is in a developing stage. On 1 June 2017, with the collaboration of Traficar, they introduced cooperation. Traficar is an independent company from the ORLEN Group, not their subsidiary. For example, in cities, Warsaw and Kraków, the rental service is available, where people will be able to leave and rent cars on the mobile application of Traficar. The aim of the cooperation is the future growth of ORLEN's retail market and promotion of

Traficar's car-sharing system. PKN Orlen is also committed to implement a completely electric car charging network on all of their service stations, to also improve their retail segment. (ORLEN, 2019)

### **Short Evaluation of PKN Orlen**

The structure of the supply chain segments of PKN Orlen is very similar to the MOL's. ORLEN Group is also an internationally acknowledged multinational company on Central European and Polish markets and is suggested as one of the largest oil companies in Central Europe. The company is also generating a significant amount of revenue. With rich knowledge of the oil industry, PKN Orlen has also built a complex supply chain network. As I have pointed in MOL's case, the ORLEN Group is also covering all the segments of the oil industry's supply chain I introduced. They are highly involved in both Upstream and Midstream, and they also have Midstream activities I introduced.

Nevertheless, their official report is neither mentioning Midstream's involvement, and neither the transportation is also categorised to the Downstream. ORLEN Upstream has Upstream activities only in two countries; however, in my opinion, those areas are large. Moreover, covering all the activities that an Upstream segment has to, which also means that they are under high financial risk, the return on investment is also high. Considering the Midstream, as a company highly involved in both Upstream and Downstream, the firm must have activities in the third one. Without mentioning the Midstream, the firm is covering it, and its largest production site is located outside North America, Canada. From a distance between Europe and Canada, the only transportation option is the vessel. I have pointed they can carry a vast quantity of oil at relatively low compared to air transport. The organization has developed a complex Downstream branch, in which products are being sold in 110 worldwide. PKN Orlen its own supplier, deeming crude oil processing, like in the case of MOL. As discussed, the Downstream segment is mainly involved in Poland, Germany, the Czech Republic, and Lithuania. They have production sites to produce petroleum products and have a network of extensive retail.

Additionally, the firm is providing other services to improve the customer experience. The company has also been working on their own 'Innovations in Businesses and Services' as the MOL does. Without any doubt, PKN Orlen is very similar to the MOL, not only in the case of their supply chain segment, even in the case of the company vision.

## METHODOLOGY

In my opinion, Michael Porter's Five Forces Model is indispensable to analyse the two corporations' supply chain and their competitiveness. By using this method with value chain analysis, it is giving accurate information about their current situation on the market, and by using it on long-term, it can increase the profitability of the companies.

Porter's Five Forces is basically a framework, by which the market environment can be adequately analysed. With the standard potential opportunities, threats and risks can be determined. The model has five main points: a competitive rivalry is determining how many competitive companies are on the market in the given area and what is their main strength; the threat of new entries is defining how easy to enter to the market and what are the threats of these new companies; the threat of substitution is analysing how easily the main product in the market can be replaced with another one; the power of buyers is defining demand in the business and the strength of the customers, how can they affect the company. Power of suppliers is assessing the procurement part; how the suppliers are affecting the functionality of the company in the given market, what if there is a scarcity of the resource. It can be used in any branches of the economy, so as in the oil industry, which is also one of the largest markets in the World.

With the model, both companies' potential threat is analysed, in each of the six value chain segments, where the supply chain parts are divided to have an in-depth assessment:

1. The purposes of Porter's Five Forces in the oil industry have to be described in details to know what the potential threats and risks are in a specific area.
2. The potential threats in both the supply chain and the value chain branches are determined to have a clear vision, which threat where belong.
3. Those parts are analysed by different kinds of features.
4. The assessment, describing their potential risks and compare them if those are identical or nearly identical as in general, they are similar as both of them are on the same market.

I am taking into consideration the different kinds of influencing factors. What is the position of the company on the national and international market? Who and in what dimensions are competitive the market where they have activities? What is the additional value they can provide? Who are the main competitors on their market? In what dimension are they dependent on the suppliers? What are their main characteristics? What are their differences and similarities? Is the Five Force's model the same in for them as in the oil industry in general?

# COMPETITIVE ANALYSIS OF THE OIL INDUSTRY

## Michael Porter's Five Forces model of the Oil Industry

Michael Porter's five forces are among the best-known methods to identify competitive forces and analyse business strategy threats and opportunities. Using this technique is indispensable in the comparison due to the investigation of the similarity, potential threats in the market, the explanation of these companies' strategical approach, and identified five essential vital assumptions that can provide adequate analyses in the oil industry. These five assumptions are correctly describing the competitiveness and the threats of the petroleum market in each branch.

### Competitive Rivalry

Competition in the oil industry is considered very high and intense because the intention to compete against each other is relatively high. However, the oil and gas industry's competitive environment consisting of few strong companies, with huge market share (Figure 3) and many small companies, with low market share. Nevertheless, among strong competitors, there is no dominant one; they have a similar share in the market. (Zaidi, 2018) Large companies are facing increasing competition in the industry. Generally, oil companies earn a low return on investment, and the profit margins are challenging to hold due to the intense rivalry. There is a little, or there is no differentiation among their products. Almost all the petroleum companies are selling the same product, mainly the downstream's output and, additionally, gas stations can sell groceries. Growing in the market is very difficult. The possibility to grow is mainly possible in stealing customers from the other.

### The Threat of New Entrants

The circumstances that affect the latest firms to start oil and gas companies, particularly in the upstream division, face many challenges, making it almost impossible to enter the industry. Enormous first capital is required to enter this industry. This segment is costly and technical required. Considering the technical side, improved technology can increase productivity and cut expenses, thus making it hard for the new competition to run on the same cost curve.

(Malik, 2018) High costs occur in acquiring a place where crude oil is found, high machinery costs, high drilling costs, and high labour costs. The National Oil Companies are controlling more than 90% of the proven oil and gas reserves, making it difficult for new companies in upstream to acquire territories in the field of extraction. It means there is scarcity in resources. Along with the entry difficulties, leaving the industry is also tricky because of the high leaving costs. For example, according to the article of Kenny Campbell and Rod Smith, in the United Kingdom, leaving from a settled platform will be around USD 2.000.000, whereas abandonment from a semi-submersible or powerful position in the drilling business can even be USD 10.000.000. (Kenny Campbell, 2013) here is also national and international (especially in the European Union) legislation that can affect the new companies' entrance into the industry. Also, oil and gas reserves are frequently found in war zone territories. Internal companies are always expanding regarding territories, markets, and so forth, massive ones, another threat. The major oil and gas firms can also improve their Research and Development budget, giving them the ability to enhance, improve their technologies, and expand. This approach will provide them with a rival advantage above new oil and gas corporations that momentarily join the industry. These factors are enormous advantages for existing oil companies since they could even charge higher prices and introduce better terms to increase their revenue. (Pitatzis, 2016)

### **The Threat of Substitutes:**

The threat of substitution is a challenge in every industry, as well in the oil industry. It can limit the profit and these organisation's value. Oil is not used for running cars; it is also used for producing plastic and other materials. There are several types of renewable energy alternatives for oil, such as solar-, wind-, geothermal energy, coal, and hydrogen nuclear energy. However, these resources sometimes are not reliable and facing difficulties due to the changes in weather conditions. The main change in the transportation industry is the introduction of those vehicles that can use electric energy instead of oil to run, which is a potential threat to the petroleum industry. However, these electric vehicles are potential substitutions to the oil-run vehicles, but gasoline and diesel will remain the primary fuel to travel. (Clemente, 2018) The main reason is the cost of electric vehicles. On average, they cost approximately USD 55.600 (plus VAT in Europe). Which is unaffordable for the average person. (CAR AND DRIVER RESEARCH, 2020) Whereas, by 2040, a long-range electric vehicle could cost around USD 22.000, though it is far from now. It means the transportation industry will remain dependent on the oil industry

for a while. To sum up, there are many alternatives to oil in transportation. Although it has a low threat concerning the substitution, people will most likely use more oil than electricity regarding transportation even though it is more likely to become a potential threat to petroleum.

### **The Power of Buyers:**

As in every industry, market costumers having the most significant impact, businesses would latterly be nowhere. Lack of buyers is always resulting in a decrease in profitability because they drive demand, leading to prices. However, in the oil industry, the prices are generally set globally, influenced by petroleum supply and demand. Oil is traded between the upstream and the downstream with the Midstream's help; however, as I have mentioned with a set, global price. This price is usually depending on the buyer's possession. (Zaidi, 2018) In this market, sellers have little chance to charge more money for their product due to the homogeneity of the oil, with only little quality differentiation, the petroleum is a commodity, and there are no significant differences among the oil companies' products, services, oil drilling methods. The power is mainly in the hands of buyers. They are looking for lower prices, although, as I have mentioned, there is a little difference between the prices as well.

### **The Power of Suppliers:**

The power of suppliers represents how much force do the suppliers have on the industry and the market. Considering the oil industry, the supplier is mainly extracting the oil, which means the upstream businesses are providing the raw material, and the downstream is buying it. The upstream segment has a considerable impact on the flexibility and the continuous flow of the industry. If one of them has a significant effect on its margin and volume, it holds substantial power. Reasons why the suppliers can have influence: scarcity in the product, there is no other option, lack of suppliers for good, switching cost is too high, the particular product is too important for the buyer. Oil companies have an extensive network of suppliers who provide them with the material, engineering, equipment, etc. It means that petroleum-producing countries are the leading suppliers. (Zaidi, 2018) However, there are big companies that are fully involved in the oil business. They are active in all the segments of the supply chain. These are the most important and the largest firms in the industry, such as Sinopec, Royal Dutch Shell, BP, Chevron, and Exxon Mobile (Figure 3). They can influence and control the market's gas prices due to their importance in all industry segments, which means their bargaining power



is significantly greater than the buyers. Besides these suppliers, nations have a significant impact on the sector. The Organization of Petroleum Exporting Countries owns 70% of the oil reserves in the World. (Pitatzis, 2016)

### **Value Chain Analysis of the Oil Industry**

As the oil industry is one of the largest industries in the World, which results in it is a very complicated segment, which has many components. That is why my description of both firms' supply chains is very detailed; it is vital due to the business's similarity in the oil industry. The differences are mainly in the supply chain's fragment parts as we are talking about two giants. The introduction of both companies is almost as critical as the details of the supply chain company, due to the description of the main characteristics are being compared. Those parts describe the background, main territories, the company's size, the primary source of revenue, their involvement in the market, and so forth. The most important fact that the main topic is the supply chain structure of the two companies. Determining the market is the essential element in this case due to the variation of the supply chain parts. As I have already suggested several times, the oil industry's supply chain has three main features; Downstream, Midstream, and finally, Upstream. The in-depth analysis of the three segments is indispensable to define each of these oil companies' Value Chain; which has five primer components and other additional ones that are crucial for the analysis of oil companies:

- Inbound Logistics, where the companies are receiving, warehousing, and controlling the inventory. In the oil industry supply chain, it is part of Midstream and basically covers all its activities.
- Operations: transformation raw material into final products. This part is related to the Upstream, mainly the refineries' task, which is one of the Upstream's most critical activities, as this the process where crude is refined to final, petroleum-related products.
- Outbound Logistics, where the companies are getting the finished products to the customer. It is related to both Downstream and Midstream, as this process involving transportation and retail at service stations.
- Marketing and Sales, where the main objective is to make the customers purchase a particular product. Associated with Downstream, and a crucial part in the whole company's work as this segment introduces, advertising, and reporting the organization's performance.

- Service, those activities needed to maintain the company's value and attract customers. Also connected to the Downstream, for oil companies, this can be both an additional feature, for example, groceries at services stations, and a vital element as the petroleum products have to be retailed.
- Procurement, an extra component in the analysis, is an essential one as this the process by which the companies are acquiring the raw materials, solely related to the Upstream activities, and the most important one.

Value Chain and Supply Chain are similar to each other; however, I chose to define the companies in the aspect of Supply Chain because the oil industry is primarily divided into its characteristics. In the part of the analysis, in my opinion, the Value Chain Analysis is better due to the more detailed steps, where I can quickly analyse and compare both companies. It was introduced by Michael Porter like the Five Forces were, this is a unique method to describe the given companies' strategy. As I have already mentioned in the Introduction and the Competitive Analysis of Oil Industry part, I am also using the methods of Porter's Five Forces because it is a simple, but the robust process to analyse these companies' power on the market. The main objective is to compare the Supply Chain segment of both companies and to know whether they are alike or not. Each firm has been described in detail by using official information from its website, annual reports, and articles. For this analysis nor I could do any surveys because it is not related to market research, neither social experiments, even the three main segments, are too broad to be analysed in this way. Nor could I do interviews due to the privacy of confidential information inside the companies. Multinational companies cannot provide any kind of information outside of the business, neither with a confidential agreement. My main question in the dissertation, whether these two organizations are similar, so I tried to use similar sources for each of these firms. The best data for this analysis can be found on the official website, as those are the most accurate information that can be found. In the case of the MOL Group, I managed to find several kinds of incredibly detailed reports. Furthermore, their annual report contained the latest possible information that can be found without using illegal sources. Collecting information for PKN Orlen was similar; most of the information can be found on their official websites; however, their annual report is more informative than the MOL's, as this report is distributing data regarding. The comparison is executed in 3 main parts. I am comparing the general information and the company's size, the ownership structure, and the five aspects of the value chain with Michael Porter's Five Forces's help.

# COMPARISON OF MOL GROUP AND PKN ORLEN USING PORTER'S FIVE FORCES MODEL

## Comparison of the General Characteristics and Size of MOL Group and PKN Orlen

In terms of background, both of the companies are similar, looking back at long past. They were founded by the integration of many oil companies after the Transition; nevertheless, the MOL was created right after the Transition, but the ORLEN Group, in its current form, was founded in 1998. Both of the firms are making a significant amount of revenue each year; however, according to the report of The Wall Street Journal, MOL Group's total revenue (including Cost of Goods Sold, Gross Income) was approximately USD 17.333.500.000, and according to the same journal, the total revenue of PKN ORLEN was around USD 29.000.000.000. Which shows a high difference; the revenue of ORLEN Group is greater than the MOL's. Considering this differentiation, we can state that the ORLEN Group is a multinational company larger than the MOL Group, but this is not the answer to the main question. MOL Group has over 26.000 employees worldwide, including all segments of the supply chain; the PKN Orlen has around 22.000 workers; these numbers also show the difference in size. Considering the year 2019, MOL Upstream has a total of 270.000.000 barrels of oil equivalent in reserves and daily production of 111.000 barrels of oil equivalent. PKN Orlen has 197.000.000 barrels of oil equivalent in reserves and an average daily production of 18.200 barrels of oil equivalent. The MOL reserves are more significant by 37,1% than the PKN Orlen. The Downstream segment of MOL has 2.000 service stations across Europe; however, PKN Orlen is operating 2.679, which is 34% more than the MOL's. Both of the companies are highly involved in all the segments of the oil supply chain, and they are trying to expand as much as possible alongside the penetration of new and new markets, not only in their neighbouring countries, even all across Europe. For example, in the case of MOL, the company acquired the Croatian INA, the Slovakian Slovnaft, so forth. PKN Orlen took over the German Star, got the majority of stakes of the Czech UNIPETROL, and so on. It is not only expenditure in their retail, Downstream segment, but it is also affecting the size of the whole organization and all the segments of the supply chain. Like those companies, many of those companies that they purchased were involved in all the supply chain segment—taking into

consideration the INA's offshore and onshore Research and Development activities or their retail segment in the area of Croatia.

### **Comparison of the Ownership Structure of MOL Group and PKN Orlen**

As you have seen, I made two charts of both firms' ownership structures using the latest official data (For MOL Group: Figure 4 and for ORLEN Group: Figure 6). Another fact that is proving that MOL is larger than PKN Orlen. The Hungarian company's share capital accounts for USD 332,398,282.98, and the Polish company's accounts for USD 139,575,527.54. This means MOL worth 2,38 times more than PKN Orlen in shares. These shares are the same type, 'A,' 'B' and 'C' series; each type of shares has a different value. The ownership structures are similar to each other; in both these companies, the local government is holding a big proportion, shares are mainly 'B' series shares, which is giving them the preferential right (28% in ORLEN and 25,2% in MOL). In the case of MOL, another large shareholder is the OTP Bank and its subsidiaries, which is also a large Hungarian commercial bank. In the case of PKN Orlen, huge insurance companies are major shareholders, for example, the Dutch Nationale-Nederlanden OFE. In both cases, there are many small shareholders, and these shareholders are detailed in the case of MOL, however, in the case of PKN Orlen, it is not. I can state that their ownership structures are similar, considering the proportion of shares held by the governments and the many small companies related in both cases. Shares of the MOL are listed on both, Budapest Stock Exchange and Warsaw Stock Exchange; the ORLEN Group shares are solely listed on Warsaw Stock Exchange.

### **Values Chain Comparison with Michael Porter's Five Forces**

#### **Procurement:**

As I have mentioned, it is an extra element of the Value Chain analysis, an additional component in the analysis. However, a very important one is how the companies acquire the raw materials, solely related to the Upstream activities, and the most important one. Both companies are highly involved in Upstream with several decades of experience. Their actions are also similar; however, the size of the MOL Upstream is much bigger than the size of PKN

Orlen. The numbers of oil reserves prove it; MOL Group has over 270.000.000 barrels of oil equivalent, the PKN Orlen has 197.000.000 barrels of oil equivalent.

Additionally, the MOL's daily production reached 111.000 barrels of oil equivalent and the output of PKN Orlen. An average is 19.000 barrels of oil equivalent a day. This fact also confirms the difference in their sizes. MOL Upstream is involved in drilling in 13 countries all across Europe, the Middle East, Asia, and Africa. These sites are usually totally owned by MOL, but there are some locations where they are only shareholders. It is in contrast with PKN Orlen; they have Upstream activities in only two countries; one of them is their homeland, Poland, the other one is in Canada. They are their only owner of these undertakings. Crude oil will always be a wanted material, as it is the base material of many products, and not only for the fuel.

There will always be a massive demand for it, even though considering transportation turning to electric. Nevertheless, this will not be a huge threat for a while. There is a little chance to have new entries, not only in this segment, in the whole supply chain of the oil industry, as it is costly to enter the market. Even more, the Upstream is incredibly regulated, so new entries have to receive different kinds of permissions to start the activities. Most of the areas where both MOL and PKN Orlen (Canada and Poland) are working are shared areas; they are not the only owner. In many places, other companies are doing too. As I have said, they also have to get authorisation to work there. The competitive rivalry is incredibly high; the most significant threats are the giant multinational oil companies, like British Petrol or Royal-Dutch Shell, as they work with more capital and have more permissions to work on areas. They will be a threat if they are expanding. Their buyers, in most cases, are themselves, as they supply their Downstream segment, where the crude is being refined and retailed. However, especially bearing in mind MOL, they provide other companies that are either involved solely in Downstream or companies producing other oil-related products.

Conversely, a shortage in crude oil or gas could happen for a company if their locations are running out of oil, or they are not permitted to work in the given area anymore, and so on. It is mainly a threat for PKN Orlen, as the company is not drilling oil in many countries. As the MOL has operations in many countries, it is not as vast a risk as to the ORLEN. On the Eastern and Central European markets, gasoline and diesel will keep their domination on the fuel market compared to Western European countries, which means they will always have potential buyers for the final output. These factors state the MOL Group's Procurement segment is similar to the PKN Orlen's, but not identical. Despite the services, MOL's

procurement segment is more remarkable than PKN Orlen's; they have more operation sites with greater capacity.

### **Inbound Logistics:**

As I have already suggested in the part of Methodology, this is the process where companies are receiving, warehousing, and controlling the inventory, which means this is the segment that connects Upstream and Downstream; this is the Midstream. Warehousing is another key activity in Midstream; depots can either be owned by the company or by a third-party company. PKN Orlen is operating 45 warehouses in Poland, Czech Republic, and Lithuania. On the Polish market, 27 depots are owned by them; on the Czech, 14 stockrooms are operated by third-party companies and three by them. In Lithuania, they only have one. MOL has a total of 40 warehouses, and those are the property of the company.

### **Outbound Logistics:**

Both Downstream and Midstream's activity distributes final products to service stations (oil companies' retailers), other retailers, and customers. After the crude oil is extracted, it is transported to the warehouses, where companies are storing, handling, and dispatching the crude. After that, they are transported to the Downstream, firstly to the refineries and from there to the retailers. Both PKN Orlen and MOL are incredibly involved in this segment, as they are active in all the supply component segments. This activity is vital for continuous flow. In transportation, competition and substitution are relatively high due to companies' variation on the market that can replace each other. Both companies are moving their raw materials or products using third-parties' services or on their own. PKN Orlen is in contract with third-party firms in the pipeline transportation segment; however, MOL's pipeline system is operated by their subsidiary. They both have a complex network of pipelines, as this transportation method is relatively cheap compared to other ones. The total length of the ORLEN Group's pipeline system is 7.748 km (including every pipeline they are using for conveyance). MOL Group operates an approximately 8.094 km long pipeline system (including crude-, product-, and gas pipeline systems). Considering the total length of both firms' pipeline systems, they are similar; nevertheless, 6.000 km of MOL's pipeline is used for gas transportation. PKN Orlen is involved only in the movement of raw materials and final output, which also shows their retail segment is more significant due to the vaster shipping of refined oil to the market. Another essential

transportation method for oil giants is the boat and scow transportation, where businesses can move a tremendous amount of oil at once at a relatively low cost. This method is critical, especially for the ORLEN Group, as most of their crude oil or heavy fuels come from Canada to Europe. They must provide a comparatively solution for shipping with these criteria. As MOL's Upstream activities are not found overseas, sea transportation is not as crucial for the ORLEN. However, the Croatian subsidiary, INA, is operating wells on the Adriatic-Sea; this transportation technique is a better solution as the company is capable of moving the crude more easily around the area of the sea. Additionally, the company has three charging points at Duna's regions, where they are also operating warehouses to serve customers more efficiently between Austrian Regensburg and Romanian Giurgiu. Each of the company is exercising scow transportation; however, as I have mentioned, it is more critical for the PKN Orlen because of the Canadian activities, which is far from Europe. For MOL, the Adriatic-Sea and Duna are allowing using this transportation method on relatively short-range to move their crude and output in a cost-efficiently way.

Highway transportation is usually used when the refined oil and final products are transported from refineries to distribution locations; customers by trucks are equipped with massive tankers. For both of the corporations is a fundamental transportation method as they are highly involved in the retail segment, and it is only useful in the short-range as this way is pricey. Usually, companies are operating their own truck logistics system or can be third-party. MOL is handling over 330 trucks across eleven European countries, and the firm is even in contract with other transportation companies; PKN Orlen is moving 22% of the products by truck in Poland, this rate in Germany is 100%, in the Czech Republic 20% and in Lithuania, this ratio is 4%. These data are representing how the MOL and ORLEN Group are involved in highway transportation. In both companies, it is a vital element for functioning of the retail.

Last but not least, railway transportation. A very similar transportation method compared to highway transportation, and their characteristics are also parallel. Trains equipped with giant tankers are moving the products, effective on short-range and playing a pivotal role, especially ORLEN Group. The establishment is moving 30% of their products and raw materials on the Polish market, 30% in the Czech Republic, and 94% in Lithuania. Vital for the MOL due to the capacity it can carry and able to move products. After analysing the given information, I can declare that their Midstream activities are also similar, for both of them all these transportation methods are essential. However, the PKN Orlen's Midstream capacity and operations are larger than the MOL's, which also suggests the ORLEN downstream segment is more outstanding.

## **Operations:**

Part of the Downstream, where refineries are transforming the crude oil into refined petroleum products, these are the production sites. Both firms are running production sites at different locations. However, comparing their capacity, PKN Orlen's is better by far; they have five production sites, the Polish Płock, Południe Group in Trzebinia, and the Lietuva refinery Mazeikiai, Anwil and the Czech Kralupy and Litvinov with over 36.000.000 Tons Per Annum of refining capacity. MOL has four sites; in Hungary, they have the Danube, Tiszaújváros production sites; in Slovakia, the Bratislava production site; and Croatia, the Rijeka production site with a total capacity of approximately 23.000.000 Tons Per Annum. Both of the companies are managing their sites efficiently, and they are well-located. However, the retail of PKN Orlen is demanding much more refined oil as they have more service stations than MOL by over 20%. Both companies' output is very high quality and demanded on their markets. Their refining products are mainly identical, and their main result, as I have suggested, Motor fuels; gasoline, diesel, and kerosene (MOL: 45%; PKN Orlen: 48%). As shown on their Refinery Yields (Figure 5 and Figure 6), their refining products rate is similar and very close to each other. If the numbers of the productions are not counted, their operations segments are highly parallel. Due to the needed demand in this segment, both of them face a potential threat of buyers' power, which is in direct connection with the retail because the retail is selling the final output they are producing.

Moreover, their other threat is suppliers' power, as this segment depends on the procurement and refining the crude oil or gas. The substitution risk roughly has the same affection as on procurement. The product that can replace the oil is electricity, which has not widespread in the Eastern and Central European regions yet. The threat of new entrance is relatively low as the entry is expensive on the market, which is additionally crowded.

## **Sales:**

Where the main objective is to make the customers purchase a particular product. Associated with Downstream, and crucial part in the whole company's work as this segment is introducing, reporting the performance of the organization. According to the 2019 report of MOL, their total crude product sale was 19.982 kilotons, this number is only including their sold output, so this does not include any other products that they are selling in retail (MOL



Group, 2020). This number in the case of PKN Orlen is much larger in their statement for 2019, 43.293 kilotons; however, this number contains the sales for the output, even the sales in the retail segment 9.817 kilotons (PKN Orlen, 2020). The comparable number is 33.476 kilotons, which is still much higher than the MOL's. The difference between their annual revenue can explain this; however, there is another reason for it. MOL sells a given amount of its crude oil from the Upstream directly to other companies that are only involved in Downstream, as this number includes the sales in Downstream.

However, the sales could be higher for MOL if they were refining more crude in the Downstream. The reason behind that is that they cannot refine the amount of oil that the company is extracting. As I have already mentioned, the Downstream segment of MOL is larger than PKN Orlen's; however, the downstream is much smaller. The refinery yield of 2019 on the website of MOL Group showed the up-to-date data in grouped or in little parts (Figure: 5), the PKN Orlen's Product Sales Rate (Figure 7) is showing the sold products mainly in groups. When I introduced the sales of PKN Orlen, I grouped all the products, so I am referring there. The MOL's refinery yield is representing the output the company made, not the sales results. However, this data is basically the same. The rates of the two firms are very similar; only the small fractions are fluctuating. Their main products are medium distillates, with 45% considering MOL and 53% considering PKN Orlen. The second product is the light distillates, which is generally motor gasoline, 21-18% (LPG is categorised here). The rest are many insignificant products, with a low ratio.

### **Services:**

In the case of oil companies, this segment is related to the Downstream. Moreover, highly connected to their retail, mainly their services towards customers on their service stations. It can be the variety of petroleum products, additional services such as groceries, little supermarkets, and restaurants on-site. MOL categorizes both the retail and mobility solution segment to the services, which action makes sense as it can also be a marketing tool and basically a part of the services. I am also categorising these segments in the case of ORLEN Group to make a better and more simple comparison. In the oil industry, services are the most competitive area since the entrance barrier is much lower than in other parts. Entry to Downstream is tough and pricey; Midstream, the division of transportation, warehousing, and companies that are only involved in it, are usually third parties. The power of buyers has the largest impact here, as the service stations directly connect with them. Hence, companies have

to provide good service innovations to satisfy the needs of customers. Both companies are strong in the retail segment, with over 2.000 service stations each across Europe. PKN Orlen's main competitors on the Polish market (where they are dominating, with 1784 service stations, if we are considering the brands) are independent stations, BP, Lotos, and Shell. On the Czech market, ORLEN subsidiary, Benzina is in the leading position with 416 service stations in the Czech Republic; however, their main competitor is MOL, the second major company on the market, with 304 locations. PKN Orlen German subsidiary, Star is facing an incredibly high competition as their market presence is relatively low, around 6%, with 585 service stations, the main competitors are the oil giants, Apal from BP, Shell, Total and ESSO. On the Lithuanian market, ORLEN is operating only 25 gas stations; however, as it is a small country, it is still 4,7% of the market. In Lithuania, they are mainly operating refineries. The exclusive dominator on the Slovakian market is MOL subsidiary Slovnaft, where they have a market share of 28% with 253 service stations. Their main competitors are Shell, OMV, and Lukoil, but their market share is only 21% together. The rest, 51%, are mainly local, independent service stations. As a Hungarian corporation, the MOL is obviously in absolute control (PKN Orlen does not have a presence), with 553 service station. The main competition for them is Shell and OMV. The presence of Shell in every countries' market is showing how large they are. On the Croatian market, the MOL subsidiary, INA, is also a market leader in Croatia. MOL, where the company has a market presence, is usually dominating there. PKN Orlen is the only market leader in Poland, even though, by far, they have little presence in the other markets, which results in higher competition on the market and a difference between them. Both of the company are striving to retail the highest quality products and services. Their main priority is to provide the greatest possible quality fuel on the market. However, the entrance of new companies is relatively high; the oil giants can easily expand due to the assets they have. As I suggested in the part of Consumer Services, this the reason why the MOL introduced the MOL EVO and INA Class, the PKN Orlen the Efecta Fuel. These energy sources are made from the highest quality oil, with top refinery procedures to reach a level where these fuels can run the vehicle more efficiently, clean the engine and remove the remaining deposits to prevent corrosion. Furthermore, their other important improvement on the service stations is the foundation of their own convenient brand, MOL's Fresh Corner and ORLEN's Stop Café 2.0. These services are continuously being improved. Both of the corporations are offering a wide range of groceries, ready-to-eat products, and beverages. They are managing this service almost identically; however, in my opinion, these days, this way of thinking is a vital element on every service station. Even more, the MOL Group and PKN Orlen announced their cashless payment

solutions, the MOL Group Cards, and the OrlenPay. With the card, people can easily manage fuel-related expenses and provide for the European B2B clientele VAT refund. Both businesses are uninterruptedly developing and expanding this service across Europe, and these loyalty cards can even be used at other firms' service stations. Last but not least, their mobility solutions, which are getting larger attention nowadays. In contrast with PKN Orlen, MOL is extremely engaged in this division. As I have already mentioned, the company has introduced a mobility solution in 2014, the MOL Bubi, with Budapesti Közlekedési Központ (BKK). Which is a bike-sharing system in Budapest, and the service has been available in Bratislava since 2018 under the name Slovnaft BAJK. Also, MOL has presented MOL Limo in 2018, which is their own care-sharing network across Budapest; by now, they have 450 cars on the streets. PKN Orlen is not involved in bike-sharing activities; however, in 2017, with the cooperation of Traficar, on their service stations, they are offering car-sharing service in Warsaw and Kraków. Despite MOL, the system is not theirs and not as developed as the MOL's. The Hungarian firm is also active in the production and operation of buses in Hungary to improve public transportation by acquiring ITK Holding in 2002. Another additional service from MOL that I know by personal experience confirms that the system is well-developed. In my opinion, considering the announcements of PKN Orlen will start improving their mobility solution services as on the current market an excellent opportunity for both the company and for the careless customers. I can state that the two companies' service and retail segment is almost identical in mobility solutions and service stations' distribution. MOL is in the leading position on more markets than the ORLEN Group, even though they have fewer stations because the Hungarian market is smaller than the Polish. These factors are resulting in the MOL has more potential risk and competition in those countries where the corporation is in existence. Getting closer to their direct services, I can state that it is the same in both cases. Both of them are offering equivalent goods and services. However, the ORLEN Group's revenue is larger because their service stations are located in more developed countries, and their numbers are more.

## CONCLUSION

After an in-depth analysis of the two oil giants, I can confirm I have found the proper answer for my primer question. With slight differentiation, the two companies' supply chain is incredibly similar. Both companies are highly involved in all the supply chain segments, bearing in mind the functionality of oil companies can be a reason for the solution. However, I did not build my research on this fact, I clearly investigated both of them' characteristics, and the results have been introduced in the part of the comparison. The variation of value chain analysis was better than the supply chain analysis. In this case, it has six different parts, even though that supply chain evaluations would have been only three. So, I was able to divide them into more elements to have a better understanding. It was effective because the downstream part was too broad. Overall, PKN Orlen is larger than the MOL Group; their revenue is significantly higher, by 71%, the reason because they are operating more service stations (by approximately 34%) and the whole Downstream segment is larger, so the Midstream is. However, MOL's Upstream is more developed. They have more operations. In many more places, MOL sells a significant amount of crude to other companies for less amount of money that they could make in the retail segment. The reason behind that, they cannot refine that quantity of crude oil, and the retail segment cannot sell them. As I have referred, their Procurement (Upstream) is very similar; the MOL has a greater capacity in extracting crude oil. MOL is working in more countries and or more sites than the PKN Orlen; however, a given amount of oil is sold directly from the Upstream and not forwarded to the Downstream. Inbound Logistics (Midstream), this phase clearly shows the larger size of the Downstream for PKN Orlen; the Polish company has more warehouses with greater storage capacity. Outbound Logistics, the given data also prove the leading position in the PKN Orlen's size, their pipeline system is more extensive, their highway transportation has more capacity to move products and raw materials, so the railway transport has. Both companies' Sales (Downstream) structures are very similar; for both of them, the medium distillates are dominating, following by light distillates, and the rest of the products are many other ones. However, as the fact that PKN Orlen is grander than MOL Group has been mentioned, the information available in Sales is also proving it. The Polish firm's Sales are greater by 29% than the Hungarian company's. Services are almost covering all the subdivisions of the Downstream. As I have suggested, by approximately 34%, PKN Orlen has more service stations than the MOL Group. However, most of the ORLEN's stations are located in Poland, where MOL is not operating any stations.

On the German market, ORLEN has a market presence of 6%, with 585 stations. In Lithuania, Orlen is mainly involved in refineries; this is why they are a small number of stations. On the Slovakian market, MOL is in absolute domination, even against the ORLEN. In Hungary, ORLEN does not run any service station, and MOL is in total control. The Croatian market is the same as the Hungarian. As the number of service stations of PKN on the Polish oil retail market is incredibly high, 67% of the corporation's total, the reason is given why they are not in domination in any other countries besides the Polish and Czech. MOL is mainly in a leading position in more markets because those markets are much smaller. The two companies' gas stations' services are very similar; they have the same way of thinking and similar product offer. However, the mobility solutions of MOL are way more developed than the ORLEN's. They have better technologies and more up-to-date services, such as their own bike-sharing and car-sharing services, public transportation involvement, and the production of buses. With the introduction and description of Michael Porter's Five forces in the oil industry, I managed to explain potential threats that can occur and where they cannot. In the Upstream segment (Procurement), there is a little chance for either of these threats; the entry is costly; the oil will always be needed. Electricity is the only substitution; however, not widespread, especially in the regions where they have activities. The power of suppliers depends on the resources and regulation where they have Research and Development activities, and there is a little competitive rivalry as few companies are capable of sustaining the Downstream operations. In the Midstream, Five Forces have a more significant effect; there is a greater risk of substitution, as many logistics companies can join in transportation, especially in little oil corporations. However, it is not relevant to the MOL Group and the ORLEN Group since they are operating their logistics systems. They also are in contract with other companies due to the massive number of products they transport to Upstream and Downstream's activities. In the Downstream, Porter's Five Forces have a moderate effect. Considering the MOL Group and the ORLEN Group, the power of suppliers primarily depends on the performance of the Upstream, as that division is providing the crude oil to them. The power of buyers having the most significant influence on the Downstream, as the retail segment is retailing their products and depending on the number of customers. Competitive rivalry is relatively high in the retail market because of the competition among brands. The threat of substitution is not a real risk yet, especially in the Eastern and Central European markets.

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