

OWNERSHIP OF REFINERY BUSINESS IN CROATIA AND POLAND AS A FACTOR IMPACTING NATIONAL ENERGY SECURITY¹

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Abstract. The paper gives an analysis of changes in the refinery business ownership structure in two “new” EU members: Poland and Croatia, after their shift to market based economy. The key area of analysis refers to the state control over refinery assets as a tool of national energy security. Refinery sectors in both countries are presented focusing on their respective strengths and weaknesses. Changes in ownership structure of three major players: INA, LOTOS and PKN ORLEN are reviewed in order to establish how they affected sustainability and development of these entities. The paper takes into account not only the interests of Poland and Croatia, but also refers to Hungary, Czech Republic and Lithuania. The analysis was performed with regards to the general trends and expectations in the European refinery sector. Our conclusions indicate that state control over key refinery assets represent a valuable tool for energy policy and, in cases when lost, it has to be compensated by other measures. If refining capacity is left unchecked and uncontrolled energy security of the country is easily threatened. This situation often leads to an almost paradoxical situation where the energy security of individual EU member countries can easily be in conflict with the overall EU energy security policy and guidelines.

Keywords: refineries, energy security, oil industry, corporate ownership

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1. Introduction

Croatia and Poland are two countries formerly counted among socialist ones, who represent in many terms somewhat opposing cases. Croatia had been a part of Yugoslavia when the communist system collapsed and its road towards independence was more complicated since not only the system had to be changed but a new sovereign country created (even though Croatia had enjoyed a level of autonomy within Yugoslavia). Poland has officially been an

independent state since the end of the WWI thus entered the transition process as an sovereign entity. Croatia is a relatively small country, with population barely exceeding 1% of the total EU and almost all other parameters on similar level. Poland is by far the biggest of “new” EU members and the sixth most populated state within the organisation. Although, as a relatively poor country, it still accounts for nearly 3% of the total EU GDP. In terms of factors traditionally enlisted as shaping national security Poland is, comparing to the European average, quite resourceful, lacking only oil. On the contrary Croatia is gifted with significant hydropower, potential for

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renewables, sun and wind, as well as limited offshore gas deposits but has limited fossil fuels reserves. What the former gains in terms of resources, it gives away logistically. Poland has been traditionally supplied with oil (and gas) from Russia and the whole pipeline system has been constructed to serve this import direction. Moreover, having as land neighbours only socialist countries it was left with a very few competitive supply options – the only important gate was Gdansk oil terminal created in 70s. Croatia is located in close neighbourhood of Italy and Austria enabling a fast and affordable conjunction to the EU oil and gas pipeline systems. It could also take advantage of the fact that the Mediterranean Sea is a vivid area of oil trade with both important producers (Libya, Algeria) and consumers (France, Italy) as well as a part of the route from the Persian Gulf via Suez Canal and Gibraltar to Northern Europe and North America.

Regarding the refinery business, both countries share a common feature: they are hydrocarbons importers with a primary aim to serve local markets. Poland claims to be the first country territory to process oil, created the first refinery and had been an important player till the WW II with five refineries, that are still operational, built before it and several others destroyed during the war. Since at that time Poland and Croatia were both part of the Austro-Hungarian Empire, both countries may share the claim. Croatia also counts itself among pioneers, with refinery in Rijeka built in 1882. The fall of socialist system has left Poland with two sizable refineries, in Płock and Gdansk, both of them constructed after the WW II, which served as foundations of two national oil companies: PKN Orlen and Lotos (Schoeneich 2000). Croatia was left with two much smaller units in Rijeka and Sisak, being a part of its national oil company: INA. Polish distinctive advantage comes from a size of the local market combined with lack of any direct competition in the vicinity. Some of the closest refineries: Mažeikių in Lithuania as well as Litvinov and Kralupy in the Czech Republic are controlled by PKN Orlen. In addition, geographically Poland represents a logistic heaven: prominently a flat country, densely populated, shaped according to a dream of supply chain manager. With the territory of over 300,000 sq. km, the longest distance between major cities is 900 km. Croatia, on the contrary is a much smaller market, with refineries in Bosanski Brod (Bosnia and Herzegovina) on its border and Trieste (Italy) 100 km away from Rijeka and several

other plants not much further. On top of that, from the geographical point of view, it represents a logistic challenge, sparsely populated and with area smaller than 1/5th of Poland has the same distances between most distant major cities. The difficulties of connecting over 1200 islands and islets as well as numerous mountains do not need to be mentioned. Final advantage for Poland is that the Polish government maintains close control over the both oil companies running refineries while the Croatian one sold INA to MOL, leaving a 45% stake there company but having almost insignificant influence on the company policies.

All of the above mentioned differences and similarities offer an opportunity for scientific research on the refinery business ownership structure as a factor shaping energy security of various small and medium-size countries.

2. Definitions of energy security and role of refinery business

Security of supply implies that customers have access to energy at the time they need it, with the predefined quality. The most comprehensive definition of energy security has probably been given by Kalicki and Goldwyn (2005) as: “*assurance of the ability to access the energy resources required for the continued development of national power*”. Building on the above given description and interpreting it one can indicate the following criteria of energy security:

- prices of fuels available must be stable and reasonable,
- supply chains must be secure, eg. capable to resist minor interruptions,
- diversified in a way that no one such dominant source of fuels exists that its one sided actions could cause major disruptions of supplies or alternation of commercial terms,
- plentiful so a long term sustainability is secured,
- accessible not only to the country in consideration but also to its allies and partners.

Threats to national energy security are commonly divided into two following categories:

- **physical**, when a disruption in supply from one or more sources cannot be smoothly compensated by deliveries from alternative directions,
- **economic**, when a given country has to accept higher than market based prices of fuels or other unfavorable commercial provisions.

As each EU country should take care of its own security of supply this is also regulated on the level of Union by the EU Directive 2009/119/EC which contains an obligation to maintain minimum stocks of crude oil and/or petroleum products.

Main measures derived from Directive are (EU 2009):

- EU Member has to establish an independent and non-profit central stockholding entity (in case of Croatia it is an agency called HANDA, in Poland is ARM).
- Member must maintain a total level of oil stocks corresponding to 90 days of average daily net imports or 61 days of average daily inland consumption. The least prevails.
- Oil product for combustion equals crude oil equivalent by multiplying quantity with factor 1.2.

There are five points regarding security of supply approach within the EU framework, well corresponding with the above presented Kalicki, Goldwyn guidelines, called 5 “A’s” (Jensen 2013):

- **Availability:** availability and physical existence of sufficient energy sources; giving priority to domestic energy resources,
- **Accessibility:** access to cross-border interconnectors, domestic infrastructure, storage facilities and supply routes with sufficient capacity and non-discriminatory access,

- **Affordability:** prices for energy supply and transport services shall be transparent at reasonable costs,
- **Acceptability:** exploration and exploitation must be environmentally sound and taking into account sustainability,
- **Adaptability:** ensuring of technical integrity (codes and standards) and quality of energy (physical and chemical composition) among interconnected energy systems.

Oil has traditionally been, and will continue to hold this position for a foreseeable future, a most important single primary energy source, challenged only by coal (Figure 1). Despite all attempts to limit the role of fossil fuels in future energy mix all available forecasts give oil a very important role in satisfying world’s energy needs (Figure 2) (Baublys *et al.* 2014). Since crude oil is basically unusable in modern world without being processed to final products the refinery business plays as important role as a factor of energy security comparable with access to oil deposits. Moreover, the most promising application of gas, the third global primary energy source imply use of refinery based technologies such as GTL (Gas to Liquid) and growing importance of biofuels which need to be processed in refineries like plants, will only enhance importance of the refinery business through breaking it’s over hundred years dependence on one feedstock – crude oil (Figure 3).

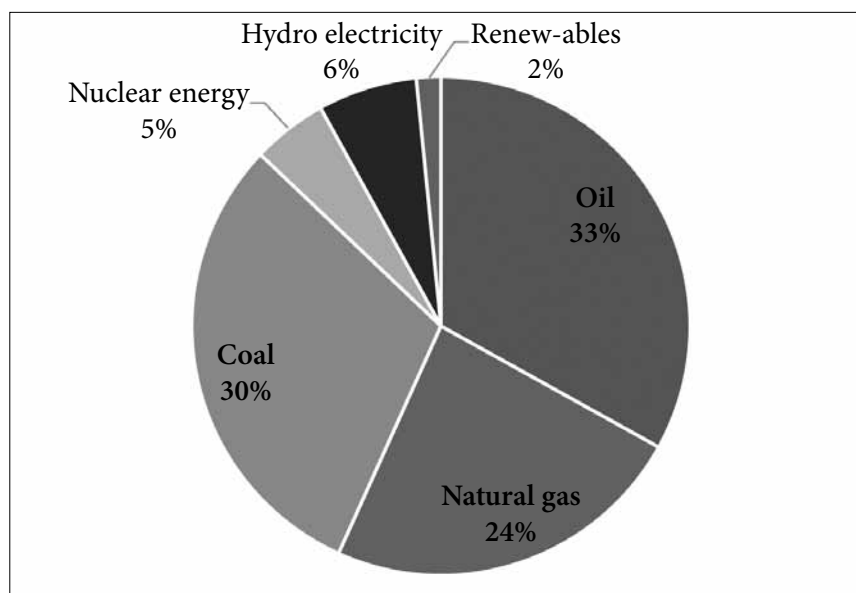


Fig.1. Global primary energy sources (2011)

Source: Own calculations based on: BP (2012)

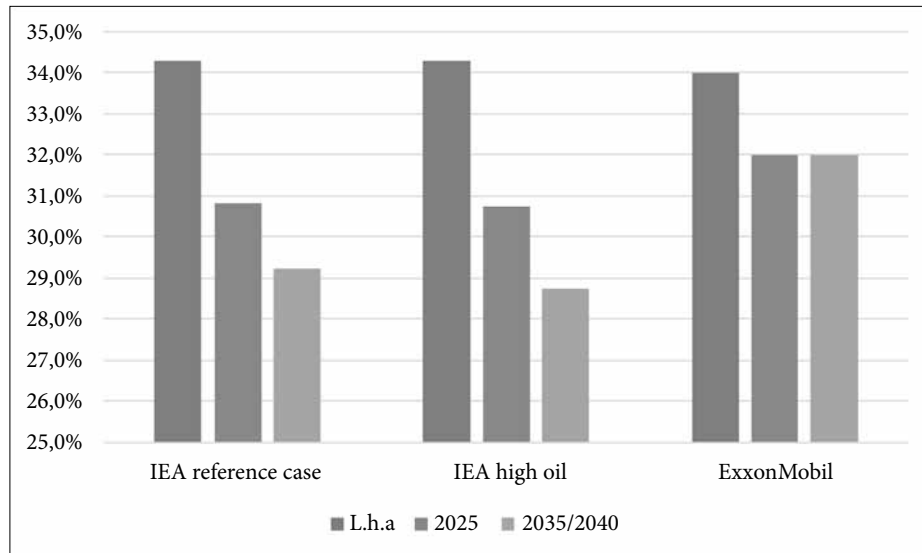


Fig. 2. Oil (conventional liquids) share in the global primary energy mix - selected projections

Source: Own calculations based on: U.S. Energy Information Administration (2010), ExxonMobil (2012)

Liquids supply by type

Millions of oil-equivalent barrels per day

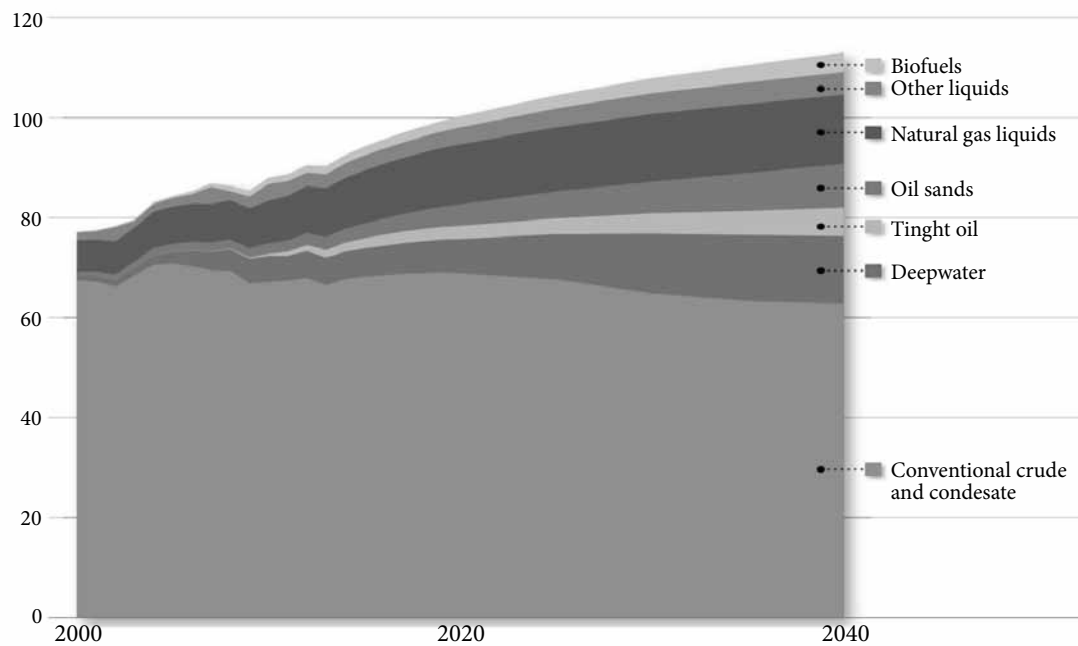


Fig. 3. Projection of refinery feedstock by ExxonMobil

Source: ExxonMobil (2012: 38)

It is a well-established fact that oil deposits, especially commercially attractive ones are rare product of nature. However it is hardly noticed, at least beyond industry related circles that refineries, even if they are man-made have become equally rare. Global number of operating refineries is commonly estimated at round 700 and remains quite stable over the last twenty years (Purvin & Gretz, Inc. 2008). On top

of that there is a strong dependence on a diminishing number of key technologies providers, without whom any construction of a new, economically viable, plant is unfeasible. The set of most frequently listed companies capable to supply complex technology solutions is usually limited to Exxon/UOP (UOP being an arm of Honeywell), Chevron/Lummins, Shell Global Solutions International B.V., Kel-

logg Brown & Root Inst. (Houston, USA), Stone & Webster Inc. (Boston, USA) and a very few smaller players, usually with competences only in selected processes.

Resulting from the above mentioned facts is a growing role of refinery business in building energy independence. But this role has to be properly defined. A physical presence of an operating plant on the national territory is a precondition and shall not be underestimated. Only an operating plant can serve as an effective source of challenges defining needs for innovations, then can offer a testing platform for solutions and provide key feedback information. For numerous reasons the ability to have the same kind of access as the refinery host country is only theoretical (barriers include physical proximity, language issues, access to information issues, emergencies). The physical presence of refinery is a necessary but definitely not a sufficient condition. It has to be complemented by the access to new technologies allowing a profitable production of a required product portfolio. This can be achieved in various ways with the most obvious and difficult to follow is the US, which hosts all key technology players in the industry. Countries less privileged have to use more sophisticated tools, description of which goes beyond the scope of this article.

Unfortunately, as it is to be outlined below energy security doctrine of Poland hardly recognizes the above mentioned issues while taking traditional approach to this notion with focus on primary energy sources and electric energy. In Croatian policy the refinery sector is given extensive coverage.

3. Development of a Croatian state policy towards the refinery sector

3.1. The Croatian refinery sector after gaining sovereignty

Oil and oil derivatives are the main energy source in Croatia and this will remain at least for the next decade. Along with the existing oil consumption of around 1.000kg per capita, Croatia is close to the developed European economies in total energy consumption. It is estimated that the average growth of the liquid fuels consumption in the final energy consumption will equal around 0,9% per year and that, despite all measures of energy efficiency and the

replacement of liquid fuel, the consumption in 2020 will stand around 4,3 millions tons. In line with this projections Croatia has adopted the following guidelines for oil and natural gas sector (Jensen 2013):

- using the remaining indigenous oil reserves, condensates and natural gas;
- efficient consumption of oil, oil derivatives and natural gas that could slow down the growth rate of consumption of these energy sources, and diminish dependence on imports and improve supply security;
- accelerated modernization of domestic refineries;
- exploration of own oil and natural gas findings and the use of new technical and technological solutions to advance exploitation, increase exhausting and increase gained oil and natural gas reserves;
- securing new supply directions for oil (and natural gas) by participating in international projects;
- securing compulsory oil and oil products stocks;
- creating a favourable legislative-regulatory framework for the efficient functioning of an open natural gas and oil market

3.2. Croatian energy security policy regarding the refinery sector

When looking at the Croatian oil supply security a couple of things are essential. Croatian oil sector has a significant import dependency; its own production satisfies only 19% of its crude oil needs (Ministry of Economy - Republic of Croatia 2014). There is a prolonged negative trend in the coverage ratio since the Croatian oil fields are mature.

Regarding diversity of suppliers and import countries Croatia has high diversity mainly due to the JANAF pipeline. Furthermore, Port of Omisalj, connected to Rijeka refinery, can receive oil tanker securing the diversity of supply. In 2013 Croatian refineries processed several types of crude oils from multiple supply regions including Black Sea, Caspian, Mediterranean and West Africa (INA, 2014). On the other hand, Druzhba pipeline allows Croatia to import Russian export blend crude oil from Hungary. The JANAF pipeline system was built as an international crude oil transportation system from the port and terminal of Omisalj to both local and foreign refineries in Eastern and Central Europe. The JANAF system, which has a total storage capacity of 1.54 mil m³ for crude and 0.1 mil m³ for oil products, consists of the crude oil handling Omisalj Terminal, with the storage oil tank farm of 1 mil m³ and 0.06 mil m³

for oil products; 622km of pipelines; three oil handling terminals in Sisak, Virje and Slavonski Brod with storage tank farms.

With regards to mandatory oil stocks Croatia is in compliance with EU Directive through HANDA – Croatian compulsory oil stocks agency. In regard to the security of supply of petroleum products the most important factors are refineries which operate within a favourable geographical position allowing the Croatian oil industry the possibility to optimize and extend the crude basket from the world crude market. Croatian refineries satisfy all EU quality standards, which was accomplished by partial modernization in the last few years. Access to the Mediterranean market increases the sales potential and the purchasing flexibility of crude, semi-finished and finished products. Key competitive advantages of Croatian geographical location and possession of refineries include:

- Rijeka Refinery's Mediterranean access and Sisak Refinery's centralised location enable a high level of market coverage and maximise crude selection and optimization possibilities.
- access to domestic and foreign crude oil and natural gas sources.
- developed logistic connections between the refineries and depots, including the possibility to transport products by road, rail, sea, river and pipeline which ensures flexible, safe and efficient market supply.
- synergies and joint optimisation of two production sites, continuously improving refining yields by increasing the utilization of key conversion units and optimizing the use of fuel components.

Rijeka oil refinery (Urinj) is located at the northern part of the Adriatic Sea, 12 km south of Croatia's main harbour Rijeka. It is the shortest and most convenient connection with central Europe and the Mediterranean. In Rijeka INA has a road, railway, marine and pipeline infrastructure for supply and shipment of goods, crude oil and petroleum products. Rijeka oil refinery is connected by a sea pipeline with the port and petroleum terminal in Omisalj, on the island of Krk. Capacity of Rijeka refinery is 5,1 million tons per year (Ministry of Economy - Republic of Croatia 2014). The refinery processes domestic petroleum (produced by INA) in addition to the Russian oil imported through southern part of the "Druzhba" pipeline. Crude oil can also be supplied from the Mediterranean Sea by the JANAF pipeline.

In 2011 Rijeka Refinery completed the first phase of the modernization project. The first phase included three facilities: Mild hydrocracking, Hydrogen unit and Desulphurization plant (Claus) as well as numerous supporting facilities and installations. Hydrocracking of heavy hydrocarbons yields lighter products, and hydrodesulphurization of these lighter products yields EURO V fuels. In July 2011, the reduction station for natural gas was installed enabling natural gas to be used as fuel in the Rijeka Refinery.

The oil refinery in Sisak is a continental refinery, located 50 km south of Croatian capital, Zagreb. It is at the intersection of roads, railways and river routes, close to the domestic oil fields. The oil refinery in Sisak is a complex refinery with specifically selected technology. It covers about one million square meters of warehouse space, with modern installations for product shipment, a river harbour with four docks for oil supply and the shipment of derivatives. Capacity of Sisak Refinery is 2,2 million tons per year. (Ministry of Economy-Republic of Croatia, 2014). The refinery processes domestic petroleum (produced by INA) in addition to the Russian oil imported through the "Druzhba" pipeline. Crude oil can also be supplied from the Mediterranean Sea by the JANAF Pipeline. As a part of refinery system development three plants have been completed: desulphurization plant (Claus) the hydrodesulphurization of FCC gasoline plant and Isomerization plant. In September 2007 the Claus plant was started in order to reduce H₂S and SO₂ from the refinery fuel gas. In 2009 FCC gasoline plant was put into operation and Isomerization plant in 2011. Refinery has the possibility of production of diesel fuels with bio component from mid-2013 and in September 2013 a system of additional wastewater treatment was put into operation. In April 2014, installation of new coke chambers was carried out at the Coking plant.

Rijeka refinery has a Nelson complexity index (NCI)²

² Nelson complexity index (NCI) is a measure of the secondary conversion capacity of a refinery relative to the primary distillation capacity. It was developed by Wilbur L. Nelson in the 60' and 70'. The NCI assigns a complexity factor to each piece of refinery equipment based on its complexity and cost in comparison to crude distillation, which is assigned a NCI of 1.0. The complexity of each piece of refinery equipment is calculated by multiplying its complexity factor by its throughput ratio as a percentage of crude distillation capacity. Adding the complexity assigned to each piece of equipment determines a refinery's NCI complexity. Besides indicating the investment intensity or cost index of the refinery NCI also indicates the refinery's potential for value addition to crude oil. A higher NCI means a higher cost of the refinery and higher value of refined products.

of 9.1 and Sisak refinery a NCI of 6.1. Compared to the US and EU averages the complexity index of Rijeka refinery is already quite high since the US refineries have a NCI of 9.5 and Europe's average NCI is 6.5. MOL's other two active refineries in Hungary and Slovakia have a NCI of over 11.

The joint capacity of two refineries surpasses the domestic demand for petroleum products which was 3,4 million tonnes in 2012. Despite of this surplus potential Croatia is a significant exporter and importer of petroleum products, i.e. in 2012 import was 1.2 million tonnes and export was 1.6 million tonnes (Croatian Bureau of Statistics, 2013). Table 1 presents the production mix and output of Croatian refineries in 2012 and 2013:

Table 1. Croatian refinery production, in period 2012-2013

Refinery production	2012		2013		change
	kt	%	kt	%	
LPG	236	6,7%	209	6,4%	-11,4%
Motor gasoline	1.135	32,1%	1.068	32,6%	-5,9%
Diesel	1.334	37,8%	1.268	38,7%	-4,9%
Heating oil	181	5,1%	193	5,9%	6,6%
Kerosene	97	2,7%	109	3,3%	12,4%
Naptha	61	1,7%	27	0,8%	-55,7%
Fuel oil	440	12,5%	419	12,8%	-4,8%
Bitumen	26	0,7%	38	1,2%	46,2%
Other products*	23	0,7%	(56)	-1,7%	-
Total	3532		3274		-7,3%

* Benzene-rich cut, liquid sulphur, coke, motor oils, industrial lubricants, base oils, spindle oil, waxes, blend gas oil "M", atmospheric residue, intermediaries,...

Source: INA (2014)

From the production data it is visible that the one of the main challenges of Croatian refineries is the high yield of unprofitable output mix, especially the share of fuel oil products in total production (13%) which can only be eliminated/reduced by further modernization. In 2013 the average crack spread on fuel oils, the most important loss carrier, was -234\$/t which had a strong negative impact on profitability of INA's downstream business.

Although Croatia has a domestic oil and gas sector, the share of imports is increasing and new energy sources have to be encouraged in order to increase domestic production and self-sufficiency. Discovery

of new hydrocarbon resources in the Adriatic Sea can only benefit the energy security of the country but even with successful exploration, given the Croatian legislature, complex bureaucracy and interest groups, full commercial production cannot be expected to come online before 2025. Due to the long duration of setting up commercial production government must also focus on short term decisions and utilization of current assets while maintaining security of supply and sustainability of the existing energy system. On the positive side, Croatia has a well-developed energy infrastructure (oil, gas and electricity) with many interconnections with neighbouring countries. However, in the future, infrastructure will require investments in renovation/modernization and replacement of inefficient and ageing plants.

3.3. Strategic importance of Croatian national oil company INA

INA is a medium-sized European oil company with the leading role in Croatian oil business and a strong position in the region. INA Group consists of several subsidiary companies wholly or partially owned by INA which is a joint stock company owned by the Hungarian oil company MOL (49.08%), the Republic of Croatia (44.84%) and institutional and private investors (6.08%). Its shareholders equity amounts to HRK 9 bln (\$1,636 bln) and capital is divided in 10 mil ordinary shares which are traded on Zagreb Stock Exchange while Global Depository Receipts are traded on London Stock Exchange. INA was established in 1964 through the merger of Naf-tapljin (company for oil and gas exploration and production) with the refineries in Rijeka and Sisak. In 1990, INA became a state-owned company and in 1993 a joint stock company. The first stage of privatization, when MOL became INA's strategic partner by purchasing 25% plus one share, was completed in 2003. Seven percent of shares were transferred to the Croatian Defenders' Fund in 2005. After selling 7% shares to former and current INA employees, ownership structure of the company has changed over time and now less than 50% of shares are state owned. With respect to these events, the Croatian Government and MOL have signed the First Amendments to the Shareholders Agreement. In October 2008, MOL's voluntary public takeover offer to INA's shareholders was finalized and MOL increased its share to 47, 16%.

Outside Croatia, INA manages an international upstream portfolio. Exploration and Production business segment is engaged in exploration, development and production of oil and natural gas in Croatia and abroad. INA is currently operating in Angola and Egypt while operations in Syria are temporarily suspended until the “force majeure” circumstances ceases. INA has been involved in E&P activities in Egypt since 1989 and currently holds interests in four development concessions in the Western Desert and one exploration concession in Nile Delta of Egypt. The biggest part of INA’s foreign investments during the last few years was focused on Syria, where it participated in exploration and production activities on Jihar and Palmyra fields with peak production in 2011. In February 2012 Croatia adopted EU sanctions towards Syrian Arab Republic, hence INA declared “Force Majeure” for Hayan and Aphamia licences. By declaring Force Majeure, INA suspended all its petroleum activities in Hayan and Aphamia block and recalled all its local and expatriate employees. Proven reserves in Aphamia and Hayan fields are 35.8MM boe and daily production in 2012 stood at 3,1 mboe. Croatian government, along with a number of EU countries, officially supports the “Friends of Syria” rebel group created to overthrow the Syrian government. At the moment, 3 years into the Syrian war, it is becoming obvious that Syrian government will prevail and is constantly gaining ground, a reality which can also be detected in the reconciliatory tones between Europe and Syria. Ironically, while supporting and even training jihadist groups in Syria, US and Europe are now facing the same enemy in the form of ISIS (Islamic state of Iraq and Syria) which brings us to an anecdotal situation where the enemy of my enemy is my friend. Due to ISIS growing strength and a serious threat it poses to the whole Middle East; US, Syria, Iraq and Iran are now fighting the same enemy and hence there is a visible de-escalation between US on the one side and Syria and Iran on the other (Guardian 2014, Reuters 2014, VOA 2014). Under the new circumstances, and driven by the realpolitik pragmatism, it is possible that US, Europe and Syria will come to a mutual understanding which, in the energy sector, will result in the entry/return of the oil majors in Syria. Under that, very probable, scenario oil companies from the small countries that were vocal in their aggressive stance towards Syria will bear all the negative economic consequences while the oil majors will be

spared. Given the Croatian government’s public support for the rebel/jihadist groups, primarily through sanctions and political pressure on the Syrian government but also through supplying weapons to such groups in Syria there is a very realistic danger that the Croatian government committed a very grave mistake which will almost certainly result in INA losing the Syrian oil concessions.

INA manages two crude oil refineries (in Rijeka and Sisak), lubricants production, a commercial wholesale network and a logistics network for storing and distributing crude oil derivatives to the market. The refined products are transported by road, sea, rail, river and pipeline utilizing owned and rented product depots. Main refinery products include Euro V quality gasoline and diesel, jet fuel, virgin naphtha, benzene concentrate, heating oils, several grades of fuel oil, sulphur, bitumen and calcined and green (regular) petroleum coke. INA has a significant domestic market but also key export markets like Bosnia and Herzegovina and Slovenia, while it is also present in Serbia, Albania, Hungary, Italy and the Mediterranean. During 2013 INA extended its crude basket by processing different light/heavy/low-mid sulphur crude oil types. The different crude grades were sourced from multiple supply regions - Black Sea, Caspian, Mediterranean and West Africa.

3.4. Future challenges and opportunities

Croatian government and MOL are at odds over the control of former national oil company - INA. As we pointed out earlier INA’s importance for Croatia is paramount both from the security and financial standpoint, since it is, by revenue, the biggest company in Croatia. The Croatian state has a 44,84% holding in INA but MOL has management control of the firm which the Croatian government wants back, especially as energy firm ownership has always been an important political issue. Besides the governance over the company the main point of dispute is the MOL’s plan to shut down both Croatian refineries which would be catastrophic for Croatia from several viewpoints: security, income, technology and human capital. MOL’s motives for the closure are understandable since in the last few years Croatia, Bosnia and Herzegovina and Slovenia have lost a total of 1,5 million tons of annual demand, which corresponds to 1/3 of the total capacity of the Rijeka refinery. Furthermore, MOL has already modernized

two refineries in Hungary and Slovakia, whose production can meet regional demand and modernization of Croatian refineries, in such circumstances and market conditions, does not make financial sense for MOL.

Under the original 2003 contract MOL undertook the obligation of modernizing both Rijeka and Sisak refineries, but so far it has not fulfilled all its obligations. It is evident that serious modernization in Sisak did not even get started. After the construction of the Claus facility, which started in September 2009 and was valued at \$24 million, it became clear that broad modernization will not continue since its costs are estimated at \$500 million. Although originally agreed between Croatian government and MOL there was always some doubt among professionals in Croatia about the sustainability of Sisak refinery. The same cannot be said about Rijeka refinery which was always seen as the main Croatian refinery with an excellent geographical position and logistics routes. After INA's good business results in 2010, work on the completion of the first phase of modernization of the Rijeka refinery intensified. The works officially began in 2005 and finished in February 2011, when the three new facilities were presented: hydrocracking and hydrodesulphurization (HC/HDS), sulphur recovery facility (Claus) and hydrogen generation unit. The total cost of the 1st phase was \$530 million, the same as the planned costs for the next phase of modernization. Unlike the first phase which was largely financed from Syrian oil profits, the second phase of the modernization was planned to be financed by MOL. Originally it was planned that the 2nd phase would be finished by the end of 2014. The 2nd has not even started yet and it is unknown when the end can be expected since the license agreement for the process design of a delayed coking unit, using Bechtel's (previously ConocoPhillips's) ThruPlus technology, was signed in February 2014. Besides the questionable beginning of the 2nd phase the completion of the 1st phase is also riddled with problems. After the completion of the 1st phase in 2011 out of the three constructed facilities, HC/HDS and Claus were not fully operational, and their later delays led to increased levels of pollution. The cause of this was the poor quality and only partly performed works on the installed equipment.

In today's global market and with current refining margins running the refinery without processing

heavy oil remains is not profitable. Instead of just being used as a fuel for the refinery process, heavy oil residues has to be used as a feedstock for the production of so-called white products, either gas (gasification facility) or petroleum coke (delayed coking facility). The choice between these two options proved to be difficult for both the Croatian government and MOL since the public prefers the gas production, but there is no local market for such a large amount of gas since HEP (national electricity producer) and other potential investors have not shown interest in building a gas facility near Rijeka refinery. This is not surprising since the spark spread in many parts of Europe is negative i.e. gas powered plants are losing money. On the other hand, while there is a market for petroleum coke, its potential production caused outrage among environmental organizations and local population.

Under the 2009 agreement with the Croatian government, MOL, without having a majority stake, took complete management control over INA. Croatia is dissatisfied with MOL as a partner since it did not fulfil its contractual investment obligations and modernized INA's refineries. It is also being blamed for the falling profits, as well as decreased production and capital spending in the previous years. What is more worrying for the Croatian side is the fact that MOL has fully modernized its Hungarian and Slovak refineries and is running them at full capacity while the Croatian refineries are not being modernized and are running at minimal levels. Accusations of corruption surrounding MOL's attainment of a controlling stake in INA in 2009 led to the imprisonment of Croatia's former Prime Minister Ivo Sanader for receiving a \$6.76 million bribe from MOL to help it get control of the company. Croatia started proving its allegations about MOL's bribery on August 11th 2014 in front of the International Chamber of Commerce (ICC) in Paris.

While MOL might eventually be forced to sell its stake if it cannot reach a workable deal with Croatian government on INA, it will try to avoid it. INA not only provides 20% of its operating cash flow and 40% of consolidated upstream production, but also gives MOL a strategic Balkan foothold, offers diversification across markets and access to Croatia's Adriatic ports. Croatia's mounting debts mean it can ill-afford to buy the stake back. With potential western refiners scaling down their operations, Rus-

sian companies are the most likely buyers. Russian ownership of such a strategic asset would probably be unacceptable for EU and US at the current time. Due to these circumstances Croatia finds itself in an impasse since it cannot afford to buy back INA, and even if it did, it does not have the capital to fully modernize the refineries, an undertaking of approximately \$2 bln. Originally the first 25% stake in INA was sold in 2003 because the government wanted to cover a gaping deficit and contain the growing public debt. In the meantime the price of debt for Croatia did not decline, the deficit got even bigger as well as the public debt. Furthermore the price that the MOL is unofficially asking for its stake in INA, \$2 bln, is effectively higher than it paid.

Over the last 11 years INA did not grow or prosper but instead it lost its Syrian oil fields, lost a significant part of the retail market and runs old refineries at the minimal capacity and negative margins. On the positive side, one extremely important geopolitical aspect that is often overlooked in the valuation of the company is INA's ownership of oil terminals and a refinery, with above average complexity, directly on the Adriatic coast. We can assume that exactly this aspect of INA is what is so attractive to Russian oil companies. For all of these reasons MOL is in no hurry to sell its stake especially since MOL cannot transfer its exclusive governance rights to a potential buyer. This makes INA a very valuable asset for MOL, but not a very lucrative one to sell since it cannot transfer its management rights to a new buyer. Theoretically, since MOL controls 49.08% of the company it could try a hostile takeover of INA but that would undoubtedly trigger a counter reaction from Croatia. Ironically, Hungary experienced a similar situation when Austrian OMV tried to take over MOL and finally Hungarian government stepped in with the famous Lex MOL and blocked the takeover forcing the Austrians out of MOL. In the extreme case Croatia always has the option of creating a similar Lex INA which would block MOL and eventually force it out. In such circumstances keeping the status quo is MOL's preferred strategy for as long as possible.

Biggest Russian oil company, state owned, Rosneft has shown interest in taking over MOL's share in INA as well as Slovenian oil company Petrol. Rosneft's plan would be to create a new vertically integrated oil company. A significant share of Petrol is owned by Slovenian banks and state funds which are

eager to unload some of their holding since they are in urgent need of cash due to Slovenian deteriorating economic conditions. United INA and Petrol would have a dominant role in the retail sector of Croatia, Slovenia and Bosnia as well a serious foothold in Serbia, Montenegro, Kosovo and Albania. As for the wholesale segment it could successfully compete in the Hungarian, South Austrian and North Italian markets. Such an ambitious plan would be beneficial for INA since it implies the survival and modernization of both Croatian refineries. Since Petrol does not pose any refining capacity its retail network would be supplied by INA's refineries. This would mean that INA is reclaiming its lost ex Yugoslavian market. Rijeka refinery, with its capacity of 5 mil t per year, could supply a large part of Slovenia, Croatian coast and other buyers in the Mediterranean. Its input would not change by much since it would continue to process Russian crude and heavy oil remains from technologically simpler Sisak refinery. Sisak refinery would continue to process higher quality, domestic crude and supply continental Croatia, Bosnia and Herzegovina, southern Hungary and Austria. Rosneft would use Petrol's big oil terminal in Koper as a logistics centre to supply Western Europe with its derivatives from the Black Sea Tuapse refinery.

In Hungary there is a growing consensus that MOL will eventually sell its INA stake. EU and US would probably prefer that the buyer be a Western company but not a single one is interested in this acquisition since they are focusing on the fast growing Asian markets and upstream operations. The only ones that are strategically interested in the Balkan region are the Russian companies, mainly due to the direct access to Mediterranean and central Europe. Usually two Russian oil companies are mentioned as potential buyers, Rosneft and Gazpromneft (subsidiary of Gazprom). Gazpromneft is a less preferred one for Croatia since it owns a modernized refinery in Pancevo, Serbia and thus would close the Sisak refinery. A takeover by a Russian company would also have political consequences. EU is sceptical and careful about the expansion of Russian energy companies on the European market but at the same time Russia remains EU's biggest supplier of fossil fuels and in the next ten years there is no realistic chance of significantly changing this. EU realises this and is limiting Russian acquisition of key energy infrastructure such as pipelines, which could lead to formation of monopolies. Up till now the EU limitations that ap-

ply to pipelines do not apply to commercial activities and Russian companies own a significant share of refineries, oil terminals and retail networks across Europe. E.g. Rosneft together with BP owns Ruhr Oel and through it controls four refineries in Germany. It cooperates and has strategic partnerships with a number of Western oil majors, such as ExxonMobil and BP. BP even has a 20% stake in Rosneft, a fact that would surely be used by MOL, Hungarian and Croatian government in their defence from critiques that would be coming from Bruxelles and Washington in case Rosneft acquires MOL's stake in INA.

4. Development of Polish state policy towards the refinery sector

4.1. The Polish refinery sector after fall of communism

Poland claims to be a cradle of the refinery industry worldwide with Ignacy Łukasiewicz efforts in mid XIX century. The WWII changes left the country with five plants, three in the South-East and two in the Silesia region, with a combined capacity reaching hardly 2 million ton/year. During the communist times two new refineries were constructed and thus the industry geography was completely changed. The first one was located in Płock, on the famous Druzhba pipeline with initial capacity of 6 million t/year and became operational in sixties (the first VDU started production in '64). The second, constructed in 70s, is located in the harbour city of Gdansk. It became operational in '75 and had an initial capacity of 3 million t. These opening capacities have been constantly expanded. The two refineries served as fundaments for creation of two Polish integrated oil companies: PKN Orlen (in '99 under different name) and Lotos (2003). As an outcome of complicated, often politically driven processes these two companies acquired also a previously state owned retail gasoline distribution network called CPN (the major share was taken by Orlen) and all five remaining old refineries (Orlen bought Jedlicze and Trzebinia while Lotos: Czechowice, Gorlice and Jasło). Subsequent developments led to the total or partial closures of their crude oil processing capacities with the development of some specialized units (e.g. biodiesel, lubricants). The closures of southern refineries combined with expansion of two northern ones created a situation in which Poland now has two big refineries with a combined

capacity approaching 26 million t/year (Płock: 16,3 million, Gdansk 10 million), both of them relatively modern and competitive (Table 2). Płock has a NCI of 9.5 while Gdansk, after completion of the so called 10+ program NCI of 10.0.

Table 2. Polish refinery production, period 2012-2013

Refinery products	2012		2013		Change y/y
Total	24 865	100 %	23 885	100 %	- 3,9 %
Motor gasoline	4027	17,9%	4040	18,5%	+ 0,3 %
Diesel oils	10927	48,6%	10954	50,2%	+ 0,2 %
Fuel Oil	5842	26,0%	5397	24,7%	- 7, 6%
Asphalts	1701	7,6%	1 451	6,6%	-14,7%
Others	2368	10,5%	2043	9,4%	-13,7 %

Source: PKN Orlen and Lotos websites

Refineries are well supported by the crude and product infrastructure. There are three oil port terminals in Poland. The main oil port terminal is in Gdansk with a capacity of about 34 Mt/year. Gdansk Port is used primarily for exports of Russian crude oils transported there via Druzhba and Pomerania pipelines. But its nominal capacity surpasses all domestic needs. Additionally there are two small oil terminals for imports of oil products; Gdynia Port (with a capacity of 3,5 million ton annually) and Szczecin (1,5 million ton annually) (IEA 2011).

Albeit Poland is a net importer of crude based fuels with total deficit of 0,5 million t in 2013 its dependence is not significant. It imports mainly LPG and diesel (total import stands at around 5 million t) while export consisting of gasoline and fuel oil stand at 4,5 million t (POPIHN 2014).

At the same time both PKN Orlen and Lotos started a process of self-transformation from operators of refineries into integrated oil (and later gas) companies albeit they choose different paths. PKN Orlen has always considered itself a leader in Poland and swiftly disclosed ambitions to gain the same position in Central Europe. It early embarked on strong M&A activities. Acquisitions of Unipetrol in 2005 and Mažeikių Nafta in 2006 as well as taking over close to 200 BP petrol stations in Germany underlined this strategic choice. There were also other attempts which did not materialize: discussions about the merger with

Hungarian MOL, especially in 2002, and occasional proposals to takeover or merge with Lotos. These ambitions have been both politically as well as economically driven. Even geographically PKN Orlen is a tempting target for all political influences. It carries officially two headquarters: in Warsaw and Płock, the latter is located two hours' drive away from the capital but a balance of power has clearly shifted towards the former one. Top management tenure is defined by political constellations and usually changes after parliamentary elections. Parliamentary change marks the disruption of company policy since the new management feels obliged to announce all the mistakes of the preceding team and devise a new strategy and big projects. Only during the last few years did PKN Orlen, feeling the weight of peliphora of acquired assets and trapped into political tensions with Czech and Lithuanian governments started to pay more attention to efficiency of internal processes and quality of day to day management.

Lotos has always been in a different political and business situation. First of all it has been much smaller, making it an ideal takeover target, for PKN Orlen but also for other players. Its main refinery Gdansk initially had a capacity of only 6 million t/year which was considered too low for economic viability. Secondly, being located in Gdansk, it was more distant from Warsaw political circles. These two facts defined Lotos strategic goal: to grow internally in order to secure independence. Even if the company was forced to take over three small refineries this step was viewed as a compensation to government for protection against PKN Orlen hostile attempts than as tool to achieve any businesswise strategic objectives. In one case (Gorlice) when such an opportunity appeared, Lotos immediately pulled out. Consequently, Lotos flagship expansion program 10+, has not referred to any acquisition but to expansion and modernization of its refinery in Gdansk, which in 2013 achieved the capacity of 10 million t and significantly improved the product mix. Despite being smaller than PKN Orlen Lotos inherited some precious assets of which the key one is location. Gdansk is a harbour, connected by a local pipeline with the Druzhba near Płock. It has the advantage of capability to source crude from both preferred logistic channels in the industry: sea and pipeline. Consequently it can sell products directly to tankers.

The other advantage became clear with discovery of

oil deposits in Baltic shelf. These are not big reservoirs but the closest platform was located within eyesight from the refinery. More than a source of crude this venture created an opportunity to gain valuable experience in off-shore drilling and exploitation before entering distant, foreign areas. It gave Lotos a certain lead over PKN Orlen in upstream expansion. Lotos gained another advantage over PKN Orlen with a long tenure of its current CEO – Paweł Olechnowicz who got his position in 2002 and managed to maintain the leadership under five governments. This factor cannot be neglected since it has given the company certain continuity and immunity from direct political influence.

Recognizing the above stated differences the common factor for both Polish companies is that they are state controlled entities, pursuing their respective strategies independently from any direct foreign influence. It is also important to discuss briefly the issue on their prospective merger. There were and still are numerous voices in the industry circles supporting such idea, based on belief that a combined strength of PKN Orlen and Lotos would accelerate development of oil business in Poland and reinforced independence of such entity. In our opinion these arguments are not convincing and are actually contradicting the historical events and experience. First of all a hypothetical merge would not elevate the merged company to a higher rank nor would it bring any significant structural change. It would still be a 3rd tier integrated oil company with focus on downstream, not much different from PKN Orlen and Lotos alone. It is also hard to identify any business area in which such a company would become even a regional leader; beyond segments already dominated by these companies.

On the contrary, one can indicate several areas where PKN Orlen and Lotos independence has played in favour of both companies. First, promptly after transition to market economy both of them were exposed to a competitive environment even before foreign players built up their positions (infrastructure, petrol stations, brand awareness etc.). They had to learn how to compete with BP, Shell and several others that entered Polish market. Secondly, especially in case of Lotos they had to prove to their stakeholders that they are capable of developing without external assistance (foreign investor). The importance of this can be clearly seen when neighbouring coun-

tries with one national oil company are compared: Unipetrol (Czech Republic), INA (Croatia), Petrom (Romania), Slovnaft (Slovakia) could not secure their independence and are struggling to survive within structures of foreign owners. Their respective governments were convinced or wanted to believe that their future business prospects would be stable and secured in the hands of foreign owners.

As a consequence of different factors Poland has two national oil champions, however small in global terms, but independent and capable to pursue their own strategies without being forced to accommodate to decisions coming from foreign headquarters. Although PKN Orlen and Lotos are key players in Polish refinery and oil & gas industry other entities in this sector include:

- a) PERN “Przyjaźń” S.A., a state owned company, which is an operator of the network of crude oil pipelines as well as storage facilities. The Druzhba and the Pomeranian are the main pipelines for Russian deliveries. These two pipelines supply Russian crude directly to the refineries at Płock and Gdansk as well as to Naftoport (oil terminal in Gdansk) for exports and transit volumes to German refineries at Schwedt and Spargau. The Polish branch of the Druzhba pipeline is composed of two main sections. The eastern section spans from the Belarus border in Adamowo to Płock, with an annual, nominal capacity of cca 43 million t. The western section of the Druzhba pipeline links Płock to the German border in Schwedt with a capacity of 27 million t. The Pomeranian pipeline is a local connection between Gdansk and Płock. In the direction from Gdansk to Płock, it has the capacity of 30 million t and 22 million t in the opposite direction. Another important asset in its portfolio is OLPP - the largest Polish storage company with a chain of 19 fuel storage depots where gasoline, diesel, light heating oil, biocomponents and aviation fuel are stored. The total storage capacity of the depots amounts to 1,8 million m³. OLPP also owns tanks with diversified capacities, the largest of which have capacities of 32 000 m³. PERN owns 67% of the Naftoport’s shares (the rest is held by PKN Orlen, Lotos and others) and 100 % of the OLPP S.A (International Energy Agency 2011).
- b) PGNiG is known as a gas system operator but also has an almost monopolistic position in domestic landlocked hydrocarbon exploitation.

Since Poland has significant gas deposits and small oil component PGNiG has been viewed as a gas company. Its crude output used to account for cca 2 % of total domestic needs but in 2013, due to new fields coming online, output jumped to over 1 million t/year, surpassing 4 % of the total demand. Although from 2005 it is a publicly listed company the State Treasury holds 72,4% of shares.

In summary, all four components of the Polish oil&gas industry remain under state control. Even though there are some notable drawbacks to this approach state ownership has been the key reason that these companies can be regarded as the pillars of the Polish energy security.

4.2. Polish energy security policy regarding oil refineries – clash with the neighbours

In case of Poland a special law was stipulated (April 10th 2007), under the Energy Law, which defines terms for energy policy creation *as well as rules and requirements for enterprises involved in fuel and energy supplies*. Articles 12 through 15 empower the Minister for economic affairs to prepare and provide the parliament with a state energy policy, including security issues, with at least 20 year time horizon. The currently binding document from 2009, covering the period till 2030 indicates that shareholdings in key energy companies should be used to promote energy security. It also states that current holdings in key oil&gas companies should be maintained, although none of the companies is mentioned by name. Another regulation, defining key enterprises for national security, mentions only PERN. The refinery business is not mentioned as the focus is given to crude oil supply and reserves. The new document, from August 2014, covering period till 2050 repeats the same view, or lack of one, on the refinery segment. Despite official negligence for the contribution of the refinery sector to Polish energy security it has to be said that unlike the official statements real actions regarding PKN Orlen and Lotos ownership structures point to the conclusion that the policy-makers are aware of the importance of state control over these two companies.

It is worth mentioning that PKN Orlen, as a result of M&A activity, became an important player in terms of energy security for two other countries: Lithuania and Czech Republic. These two acquisitions exposed

PKN Orlen, and also, indirectly, Polish government to completely new challenges. It is now obvious that they were not well prepared for such a situation. Acquisitions of Unipetrol in 2005 and Mažeikių Nafta a year later were at that time outstanding deals for Polish companies. Even now they represent top Polish FDIs. Poland used to be a FDI host country and frequently dealt with problems pertinent to the ones experienced by Czech and Lithuanian partners. Moreover Poles had to act simultaneously on various areas: political, legal and business; none of which being their strong point. On the political level it was primarily misled by favorable climate in both countries, overseeing numerous expectations from hosting governments and societies. It also undervalued the ability of the business stakeholders to play hardball protecting their own interests.

In case of Unipetrol the fact that its two big refineries were operated as a joint venture (Ceska Rafinerska) with oil majors proved to be a significant burden. Unipetrol has the 51% share but in practice it entered a very complex operational framework of agreements in which it found itself formally on equal terms to other partners but given disadvantages in managerial competences and experience the Polish company was the weakest player. Partners were not hostile to PKN Orlen but protected their interests well, while deeming an exclusive duty of partners' directors to do the same. As the nominally major shareholder PKN Orlen was viewed by the Czech side as primary responsible for the Ceska Rafinerska sustainability and growth. Only after 9 years, as a result of a painful and costly process all minor shareholders have been bought out. Minority shareholders also represented a problem for Unipetrol (PKN bought and owns only 63% of shares) as well as in some other cases (e.g. Paramo operating two small plants in Kolin and Pardubice). Restructuring processes implemented by PKN Orlen, although necessary and similar to ones introduced by many other investors, were another source of disappointment. PKN Orlen was disappointed due to the length and less than satisfactory results. Czech stakeholders were disappointed because of social pains and lack of big investments compensating job losses. All of that lead to a political campaign initiated by some political forces in the hosting country demanding even the renationalization of Unipetrol. Even though such initiatives failed additional pressure was put on PKN Orlen.

Lithuanian investment proved even more troublesome. The Lithuanian government viewed Mažeikių Nafta, the only refinery on its territory and by far the biggest country manufacturing plant as its jewel. So, when with bankruptcy of Yukos in 2006, it was put on sale, facing a threat that another Russian company, even more loyal to Kremlin, would purchase it, Lithuanians strongly favoured PKN Orlen. The Polish company, according to Mr Chalupiec, its CEO that time, wanted to strengthen its position vis a vis Russian crude suppliers by becoming their biggest client by volume. If the transaction succeeded, relations with Lithuanian and Russians should have been settled. Unfortunately Poland failed to achieve this. Not surprisingly Russian took an obstructive attitude, cutting crude oil supplies in 2007. Although very reluctantly, an exasperated PKN Orlen even hired an investment bank, to look at possible options for selling its stake in the refinery. However the likeliest buyer would be one of the Russian oil companies. Sensing PKN Orlen's weakness, the Russians have been signaling a valuation level of \$1.5 billion for the refinery leaving PKN Orlen with an embarrassing loss. Deterioration in Polish-Lithuanian bilateral relations was also imminent. Due to these factors PKN Orlen retained its share.

Although Russian opposition was expected PKN Orlen was surprised by some actions undertaken by Lithuanian partners. As pipeline deliveries were cut the crude had to be supplied via Klaipeda terminal and then by rail. This shortest route was soon made non-operational due to unscheduled modernization lasting up to the date of the article. PKN Orlen had to utilize longer routes incurring higher costs since rail tariffs are distance based. Its attempt to get control over the oil terminal has not been successful either so far.

Mažeikių refinery, although having the capacity of 10 million t/year cannot be considered as modern and efficient. It requires considerable investments to exploit its advantage: good geographic location in the interior of the country, far from competing plants. In view of the above indicated difficulties it is very unlikely that any expensive investment will be carried out in the foreseeable future.

Poland has been quite successful in maintaining state control over its refinery business. All drawbacks of this strategy have, up till now, been minor. The biggest challenge came from the PKN Orlen foreign

investments. It exposed Polish government (and the PKN management board) to energy security issues of other countries and in the process acquiring part of the responsibility. So far this process was not very successful since none of stakeholders feels satisfied with the outcomes. On the other hand the options of disinvesting are extremely limited.

4.3. Selected attempts to change ownership schemes of PKN Orlen and Lotos

Both PKN Orlen and Lotos have been subjected to various political games. Disputes regarding their governance and ownership structure stem from the fundamental differences on the desired role of the state and lack of clear strategy. Unfortunately, development programs have not been based on an in-depth analysis of the markets but rather driven by the short-term political needs. On top of that even the proclaimed programs and their realization are sometimes quite divergent. The most famous, alleged, case of such dichotomous plans to sell both oil companies took place during 2002-2005. In 2002, Jan Kulczyk, at the time, the richest Pole proposed to the Prime Minister Leszek Miller that they could merge Lotos with Orlen and sell them both. Although without formal authorization, (Andrusz, Bartyzel 2004) Kulczyk met in October 2002 with Wagit Alekpierow, the chief of Lukoil, in London and tried to conclude the transaction (Kennedy 2006). When information about this attempt became public it caused a public outrage and lead to the formation of a parliamentary investigative commission in charge of "Orlengate". Under such circumstances both ideas: merger of two Polish oil companies and the sale of state's holdings became impossible.

In 2007, the government led by Jarosław Kaczyński introduced a new strategy (officially called policy) for the oil sector based on assumptions that Lotos and Orlen could not be sold or merged (Ministry of Economy - Poland 2007). The rationale for such decision was based on a threat that at least one of them could be purchased by Russian oil giants. In 2008, a formally liberal and market oriented government formed by Donald Tusk announced a four-year privatization plan aimed at selling 740 companies. However, the plan did not foresee further privatization of oil refiners PKN Orlen SA and Grupa Lotos SA. The government would sell only a part of its shares in PGNiG, in order to allow the company's

employees to float their 15% stake on the WSE (The Treasury held a 84,75% stake in PGNiG). The employees who hold 15% were not allowed to sell their shares till further privatization of PGNiG (The PB Interim Report 2008).

The government changed its position on PKN Orlen an Lotos privatization and in 2011/2012 tried to sell Lotos. Due to market turbulence in Europe no binding bids were submitted. Government subsequently claimed to examine the potential for a domestic merger between Lotos and other companies, including Orlen and gas monopoly PGNiG (Conroy 2012). Finally, as officially expressed, the decision was made to wait for a more favourable environment. Simultaneously there was a strong social campaign, especially in Gdansk, aimed at preservation of status quo. Over 100,000 signatures were collected and the threat of referendum became real. Since Gdansk was one of the key regions for governing party (Mr Tusk himself lived there) selling Lotos in spite of such strong popular resistance was probably considered politically too risky.

Due to the substantial free float of PKN Orlen shares and turbulent internal politics attempts to take over PKN Orlen or buy government's stakes are probably considered by bigger companies, especially in Russia. Occasionally information about such plans appears in the press. One of such cases prompted the main opposition party - Law and Justice to propose the merger of Lotos and Orlen, strengthening state's control over PKN Orlen (at the expense of diluting its position in Lotos). Alleged Russian attempts failed (or were not serious at all) and the interest for such merger disappeared. It seems that, at the moment, all key political parties accept the status quo as the desired state. One of the reasons why the issue of oil companies' privatization was dropped from the political agenda is the lack of prospective buyers. It became clear that the only serious buyers can come from Russia. This has always been a serious obstacle, but with the recent developments in Ukraine, any political party considering the sale of Polish oil companies risks broad public outrage.

4.4. Future challenges and opportunities

Poland, as oppose to Croatia, does not have such immanent problem like the INA – MOL relationship. This allows Polish government to form an unhindered, long term view of its refinery sector, based

on its own understanding of national interests. There are several key issues regarding Polish refinery sector which will shape its future:

- a) plans regarding possible merge between PKN Orlen and Lotos,
- b) government's ability create a viable long term vision for both companies and to secure professional management capable of creating and implementing corresponding strategies,
- c) Polish government's and PKN Orlen's ability to revalue the importance of foreign investments on its energy security,
- d) PKN Orlen's ability to rehabilitate its foreign assets (especially Unipetrol and Mažeikių Nafta),
- e) both companies' ability to expand upstream activities.

Regular rumours about the possible takeover of Lotos by PKN Orlen left a mark on Lotos. Lotos' management had to prove itself to the major stakeholder and this led to several positive outcomes. Awareness that a political configuration may someday change in a way that will disregard business conditions and realize someone's *idée fixe* constantly weighs over managers' heads. Another related issue refers to the relationship between management of state owned enterprises and governments. Logically in such a case governments have a major responsibility. First of all they have to express clearly their expectations towards company management. It is quite common that politicians take a passive attitude claiming that management boards are professional bodies responsible for strategy preparation and execution. This is a misconception since in a well-managed private company the owner defines the fundamentals of company's culture and strategy. Certainly managements have a say but their role is mostly advisory. Secondly, government has to support PKN Orlen in relation to other governments, by taking an active role in policy formulation and implementation. It has to recognize the host country's principles of their energy security but at the same time secure Polish interests. Thirdly, governments have to secure an adequate level of managerial capabilities, if necessary, even by hiring foreign managers for selected posts. This argument applies especially to the upstream activities. This is definitely the most complex and challenging part of the oil business and one failed project may at worst bankrupt the whole company.

5. Future of the European refinery sector

Up till 1990s Europe was, alongside North America, one of two global centres of refinery industry. Creation of European economic zone, first under EEC and then under EU and the relaxation of trade and investment barriers under GATT or mutual agreements allowed for growing concentration of oil&gas companies in the developed countries while relative backwardness kept companies from OPEC countries at bay (Uberman 2014). The peak of this dual dominance was reached, when a string of so-called mergers of elephants created a group of 6 supermajors: 3 coming originally from US (ExxonMobil, Chevron, ConocoPhillips) and 3 from Europe (BP, Royal Dutch Shell, Total) but all landing with assets on both sides of Atlantic (Coll 2012; Yergin 2011).

Aside from the above mentioned developments, for the last 40 years European refinery sector has faced both internal and external unfavourable trends. Starting from 1973 it faces a slow but constant decline in terms of volume demand. For this reason completely new plants have been rarely constructed. Many European refineries built 30 to 40 years ago, using less sophisticated technology than their Asian, Middle Eastern and American counterparts are now at a disadvantage. With a smaller scale, oriented towards lighter, sweeter crude oils, producing an excess of gasoline, and with strict labour laws and high wages, most European refineries have suffered a structural erosion of their margins. The size of the newly constructed plants has fundamentally shifted the scale and location of the new, high quality, price setting units outside Europe. Operators from these regions enjoy a number of key advantages, including new equipment, cheap labour, large capital reserves and rapidly growing local demand. On top of that European refiners are subject to the most stringent and thus costly environmental legislative requirements putting them in additional disadvantage (Soeting 2012). All of this led to the weakening of Europe's attractiveness for global oil&gas companies. It is worth pointing out that after the fall of communism, when the majority of multinationals rushed to the Eastern Europe, motivated by the opening markets and competitive labour, oil&gas companies kept distant. With a notable exception of Shell and ConocoPhillips engagement in the Ceska Rafinerska and Shell's and BP's building petrol stations chains, oil majors made no significant investment in this area. The lack

of investments was not caused by a different view of relative attractiveness of emerging Europe. The real reason was the relative decline of Europe as a whole that discouraged ExxonMobil and others to invest even in the most attractive part of the continent.

EU refining restructuring is an ongoing process (totalling 1.8 million barrels/day since 2008) as EU refining activity remains low and, globally, refining margins continue to be weak as surplus capacity persists. EU net middle distillate imports surged in 2013 (averaging 1.3 mb/d, compared with 830 kb/d in 2012 and 1.1 mb/d in 2009). At present, in Europe, refining capacity of 683.000 b/d is for sale, and since 2009: 166.000 b/d has been downsized, 480.000 b/d has been bought by Asian companies, 1.419.000 bought by Russian companies, 921.000 b/d bought by others and 1.670.000 b/d shut down (Dušanić, 2014). Since 2007 Europe lost 15 refineries bringing the total to 86, with the highest number of closures taking place in France, where refining capacity has shrunk since 2008 by 30% to 1.4 million b/d. Additionally, approximately 15% of the remaining European refinery capacity (cca 2 million bbl per day) is expected to shut down till 2018 due to decreased demand for oil derivatives and increased competition from overseas. Majority of closures are likely to come from Italy, since over the last six year Italian capacity has shrunk by 10% compared to 15% in Germany and 22% in UK (Platts 2014).

Russia is a key supplier of refining products for EU market, followed by the US. Compared to refining sector in other parts of the globe, refining in the EU suffers from the very high operating costs, one of the most components of which, the energy costs, are among the highest in the world. NorthWestern Europe is especially vulnerable to these factors since the increased Russian production, which is midway through a major refinery modernization program designed to boost volumes of high-end products, primarily affects this region. It is expected that by 2016 additional 0,5 mil b/d of Russian diesel will appear in the NorthWestern Europe (EC 2014). Many European refineries were built in the 50' and 60' and are heavily geared towards gasoline production. But since the demand for gasoline continues to decline in favour of diesel, European refineries face a significant surplus of gasoline which is increasingly hard to sell on the continent or overseas as demand from the United States is also weakening. Furthermore the

price of West Texas Intermediate (WTI), benchmark for US oil, is continually lower than the Brent oil, a European benchmark, giving a comparative advantage to US refineries. At the same time, modern and massive refineries in the US, Middle East and Asia are successfully competing with the European refineries in the segment of diesel fuels, on the European soil. As they benefit from cheaper oil feedstock and lower energy costs (especially US with the low price of natural gas brought by the shale gas revolution that started in 2008), they are aggressively pushing out the regional refiners in Europe. Due to these factors diesel will continue to flow from the US to Europe for the foreseeable future. Due to increased European focus on energy efficiency and decreasing CO₂ emissions, the demand for oil in Europe is continuing to decrease at the same time when the competition from Middle East, Russian and US refiners, due to increased efficiency and lower energy costs, is increasing.

Demand for the oil products in Europe has slumped by 14% since 2008. One definite reason for the slump in the demand is the financial crisis which forced the EU economy into recession. In the macroeconomic literature the positive relationship and causality between economic growth and energy consumption has already been proven (for EU countries see: Vlahinić-Dizdarević, Žiković 2010; Žiković, Vlahinić-Dizdarević 2011). Industry analysts also add that the downward trend will continue with car industry developing more efficient engines. There are numerous sources of risks and additional costs for the European refinery sector but basically it is a combination of promoting alternative fuels, decreasing demand due to energy efficiency, fierce overseas competition, sluggish investment, extensive burden of health and safety worker conditions and finally - emissions legislation. A good indicator of the state of the European refining sector is the Euroilstock's report which shows that in June 2014 European refiners processed 11% less crude oil than in the previous year. Another blow to the sustainability of Europe's refining sector is the loss of its traditional export markets, especially Africa. Africa is important for the European refineries since it consumes a significant amount of fuel that is in serious decline in developed nations - gasoline. The Europe's main competitor on the African continent is the US especially since the US refineries are pushing their gasoline surplus to Africa at dumping prices. A negative trend is also visible

among the oil majors: French Total, Europe's largest refiner, after closing the Dunkirk refinery in 2010, is expected to further downsize its capacity in the 2015 (it cut 23% of its refinery capacity between 2006 and 2011 and aims to cut another 20% till 2017), Italian ENI is struggling between the credit rating agencies and unions, trying to increase refining margins and keep all the operations, Shell and BP have already sold a significant part of their capacity to independents, with some of them already going bankrupt (Platts 2014). ExxonMobil announce a billion USD investment in modernizing its European refineries, a move that would result in a number of regional refineries becoming obsolete.

2013 was one of the weakest years for the European refining sector in the recent decades, as refining margins sharply fell due to high crude costs and weak product demand. 2013 refining margins in Western Europe, at one point, dropped to a four-year low of \$10.6/t and refinery utilisation in the EU went down to only 78 percent. Looking at yearly averages refining margins fell to \$19,5/t in first half of 2014, down from \$23,4/t in 2013 and \$46,8/t in 2012 (Solomon Associates 2014). Besides the refineries with a high yield of gasoline, small, old and less complex plants and those in coastal areas such as Italy, that are easily accessible by sea, are the most vulnerable. A trend that is starting to form in Europe is the transformation of refineries into oil storage terminals/logistics centres that can be used for global trade.

EU refining trade body, Europe, estimates that there is around \$30 billion of investment already announced for EU refinery projects to 2020, but that another \$21 billion would be required to meet the changes in demand and new specifications. That \$51 billion total equates roughly to \$1/b on the refining margin in Europe, which is a huge amount since the normal margin ranges between \$0 to \$4/b. A lot of this investment is just to stay in business –there's no obvious return (Elliott 2013). The uncertainty surrounding the precise requirements of EU emissions and sustainability legislation has had a detrimental effect on new investments. The current investment framework does not always offer long-term perspective given that the refinery sector has long investment cycles. A coherent EU legislative framework with clear and demonstrated benefits for sustainability and competitiveness is needed to create a clear investment environment over time. Without a clear

and friendly framework it will be impossible to mobilize the capital which is required for modernization. If EU refiners want to remain key players in the international market, they have to become more competitive. This can be achieved by improving their efficiency in daily operations through investment but, again, the impact of EU legislation is critical in this perspective. The EU legislation includes the industrial emissions directive, which requires refineries to meet best available technology benchmarks, and the fuel quality directive, which sets targets for cutting greenhouse gas emissions from fuels. The refining sector is also impacted by EU legislation on renewables, emissions trading, strategic oil stocks, marine fuels, energy efficiency, energy taxation and chemicals.

Future of European refineries cannot definitely be viewed optimistically:

- it is a mature business with majority of generic products in its portfolio, exposing it to price competition,
- logistic burdens do not play in favour of European players since proximity of attractive markets is counterbalanced by distant crude sources,
- EU climate policy drives European refineries energy and environmental costs up to such extreme levels that traditional advantages coming from skilled workforce, advanced infrastructure and cheap capital cannot compensate for this.

It is true that the petroleum products are, at the moment, easily available and cheaper in the rest of the world and that by looking at only the economics, Europe can do without refining and all the problems and burdens connected to the industry. The problem is that the world is much more complex than this and cannot be explained just by classical economics. If more European refineries close, there are bound to be supply security ramifications. There is no doubt that having modern and adequate refining capacity helps Europe preserve its energy security and contributes to a healthier and sustainable economy in the long term.

Conclusions and further developments

The comparative analysis of Croatian and Polish refinery sectors evolution in last 20 years indicated clearly an importance of maintaining national ownership control over key players. Summarizing the Croatian INA's story the government followed an established recipe for the transition of an old social-

ist industrial enterprises into privately operated commercial businesses. Croatian government:

- found an industry investor from an amicable country,
- achieved a favourable price,
- negotiated clauses regarding investments in Croatian plants thus presumably assuring their further development,
- kept significant shareholdings while passing managerial control into “private hands”.

But the final result became a failure, for the reasons which now are obvious but at the time of the deal were usually fiercely rejected as representing “old fashioned” way of thinking. First of all one has to point out that the whole transaction was in fact not a privatization at all since MOL was a state controlled organization. Instead of becoming a purely business oriented company, creating additional value for its shareholders (like ExxonMobil or Shell to name a few), INA has become a joint-venture between Hungarian and Croatian governments, in which all the key decisions are made by the appointees of the former one. Unfortunately the recognition of a key difference between real privatizations and the transfer of ownership from one state owned company to another is uncommon even today. In Poland a sale of the national telecom TP SA to the state owned France Telecom (now rebranded to Orange) is still considered a privatization in nearly all statistics and official documents.

Secondly, the fact that Hungary and Croatia run quite good relations and are both EU members (although Croatia only recently joined it had been considered as an “obvious candidate” for a long time) did not provide any guarantee that they would share the same view on INA’s strategy and development. After all they are independent countries and have sovereign rights to define their energy policy according to their own beliefs. Such situation cannot be considered as unique since it resembles the problems the Czech Republic expresses in case of their national oil company: Unipetrol. Consequently it was very risky to assume MOL would pursue Croatian national interests. In fact they have followed their own, not against Croatia but simply in their own favour.

Thirdly, governments of post-communist countries have been very reluctant to recognize the fact that one cannot sell an asset and still control it, even in certain selected aspects. The buyer’s management al-

located investors’ money for the acquisition and is held responsible for the resulting financial consequences. Management’s primary obligation is to its shareholder not to the state that sold the asset. Governments have numerous tools to pursue their interests even without the ownership control but they are usually tacit and need to be developed over a long period. Unfortunately the post-communist countries have proven not to be skilled in such undertakings.

Fourthly, the Croatian government relied on the investments and development clauses of the privatisation agreement hoping that they will provide a framework securing INA’s position in the future. This practice has to be evaluated negatively in terms of costs and actual results. Such agreements had to be vague, even if a few projects could be defined precisely, since they refer to the mid- or long-term future. An effective control requires both substantial industry competences and flexibility. Both aspects play in favour of investors and against governments since the industry expertise is within enterprises. In developed market economies governments had been exposed to such challenges and already developed similar competences in their regulatory bodies or agencies. In communist countries, since governments had direct control over the enterprises they did not need it since companies’ experts were at the same time governmental ones. Privatization left governments empty-handed. Hence investors have usually been successful in avoiding obligations they were reluctant to fulfil without nominally breaching contracts.

Finally, INA became a good example of relativity of efficiency notion. MOL management took a comprehensive view of Croatian assets, evaluating projects in consideration of its complete portfolio of assets and markets served. Moreover MOL has always been aware of its responsibility to the government in Budapest. The MOL Group sells 18 million t of refinery products – a slightly higher volume than the capacity of Plock refinery, the key production asset of one of its direct competitors – PKN Orlen. Among industry experts there is a consensus that a minimal capacity allowing a fuel refinery (as opposed to so called speciality plant focusing on some sophisticated products, for example base oils) to be economically viable ranges between 10 and 12 million t/year. It clearly implies that MOL has room for only one such plant and Százhalombatta near Budapest is a definite favourite. Consequently, the efficient approach for

MOL does not include the modernization and development of Croatian units but actually the complete opposite; shutting down at least one of them while marginalizing the role of the other.

Poland initially took the same route as Croatia (and other CEE countries), creating commercial entities based on existing refineries, but from the beginning two differences appeared:

- two separate companies were created (more as an outcome of political tensions than as a result of any profound business analysis),
- the newly created oil companies did not have upstream activities.

Although both of them eventually went public and private investors (mostly financial institutions) acquired substantial shareholdings, the government has maintained a strict control over them. Even though they pursued different strategies with PKN Orlen expanding abroad (acquisition of Czech Unipetrol and Lithuanian Mažeikių Nafta) and Lotos focusing on capacity expansion in Gdansk and entering upstream activities, both managed to keep their national identity and pursued Polish national interests. Certainly these interests could be wrongly defined and inefficiently promoted but this is another story. The final outcome is definitely positive: there are two modern and sizable refineries in the country with a necessary distribution network run by companies which are actively expanding internationally while keeping a strong foothold domestically.

It is important to emphasize that the presented differences did not result, in case of Poland, from a carefully elaborated and executed long term strategy. The real reasons that prevented the sale of refineries are twofold. Firstly, almost for the entire period there has been a strong and visible opposition against privatization, forcing governments to justify the bigger sales. Since the oil companies present an attractive employment opportunity for government supported candidates the loss of control is highly politically unattractive. Secondly, the required price represents a serious hurdle. The political pressure forces any government to demand very attractive commercial terms implying that the compensation, especially in case of PKN Orlen, will have to be really high, exceeding the present market value of its share estimated at \$1,5 billion. Any potential buyer should multiply this amount by the factor of four since it would be forced to offer the same price to all the other shareholders.

This is a challenging price level for downstream assets in the declining European market.

State ownership of key energy assets should not be viewed as a sole requirement for an efficient energy security policy. It is just a tool, quite common, simple and powerful. Giving up this tool has to be carefully considered and compensating measurements must be made available as well as promptly implementable. It is especially difficult to achieve such competences in a mature business with declining production base. A voluntary contribution of foreign investor to national energy security should not be expected. This was a mistake made by the Croatian government in case of INA as well as Lithuanian and Czech in the PKN Orlen case. Not surprisingly the same approach was adopted by the Polish government authorizing both transactions and also causing substantial problems albeit different in kind.

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