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TRENDS AND PARADOXES IN THE LUBRICANT BUSINESS WITH SPECIAL FOCUS ON CENTRAL, EASTERN AND SOUTH EASTERN EUROPE

Abstract

The trend of significant changes in the lubricants and base oils business in the world continues. Consumption trends and lubricant and base oils demand as part of the global economic patterns and present crisis in the economy are non-uniformly distributed in the world lubricants markets so as in Croatia and the wider region. Within the region there are also big differences, and different influences on the lubricants market and development trends regarding lubricants quality level which differ from market to market. Special influence impose the world trends in terms quality level requirements for motor oils and other fluids for automotive applications.

The primary purpose of this work is clearly an attempt to present the key-driver trends that affect the quality as well the development and consumption of final lubricants in transport and industry, so as base oils by groups. Presentation and some specificity, diversity, and even paradoxes and mutual influence of the aforementioned markets are presented with estimates of consumption in the world focusing on most of the markets of Central, Eastern and South Eastern Europe.

Finally, the essential patterns and assessment of problems emphasize that the market will further affect the development of lubricants market in the wider region.

Introduction

Each business needs to be evaluated for short term or long terms effects since without these kinds of analysis it would not be possible to make plans considering appropriate activities. Constant changes of market circumstances, especially in the time of economic collapse and recession, add to reduction of reliability and authenticity check no matter how appreciated and expert the assessors are. Accordingly, the most recent assessment which relates the same period and area is always better and more accurate than the one that was done 6 or more months ago. In this sense the assessment of trends and consumption in this paper needs to be considered.

Estimated lubricant consumption in the world, 2001-2012

Three independent marketing companies came up with three different assessments made at different times, but for, more or less, the same period. Here we need to emphasize that the estimated consumption by the Fuchs company does not include marine oils, while an optimistic assessment by SBA was made before the global economic crisis started. The assessment made by Kline & Co was certainly the most accurate one since it was made at the beginning of 2009 at the time the crisis reached its pinnacle. If we put aside the other two more optimistic assessments, then the harsh reality estimated by Kline & Co is shown in the Figure 1.

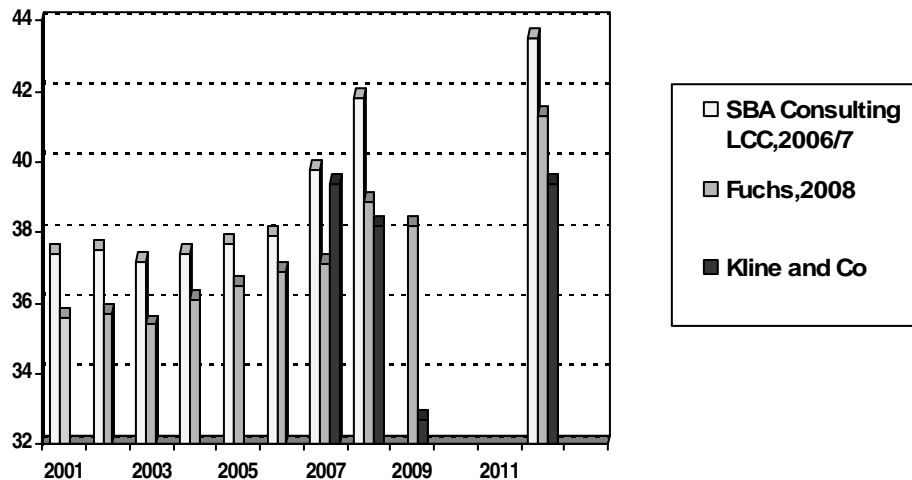


Figure 1: Estimated global demand of finished lubricants, 2001-2012

According to this estimated demand of lubricants, as it seems now, it can hardly reach the ideal level from 2007 of 39,4 million t which went down to 38,2 million t in the fourth quarter of 2008 (the beginning of the crisis). That is a decline of approximately 3%. The aforementioned company estimates the additional decline of 15,4% by the end of 2009 when compared to 2008 or 17% when compared to 2007. Expressed in tons that stands for extremely low consumption level of 32,7 million t. Evidently, as it is shown in the Figure 2, the greatest consumers are countries in Asia, Oceania and North America followed by European countries.

Contrasts and paradoxes of lubricant market – diversified consumption increase and decrease

The evident decline in consumption of 17% by the end of 2009 has been unevenly distributed across different regions in the world and it shows different trends of its

increase and decrease in consumption. It has been estimated that the lowest decline in consumption (around 4%) is in Asia and Oceania. It has been estimated that South America is facing somewhat higher decrease of around 9%. In 2009 in North America the decrease of 11% is expected as well as the decrease of 16% for Eastern Europe, specifically some Russian speaking countries.

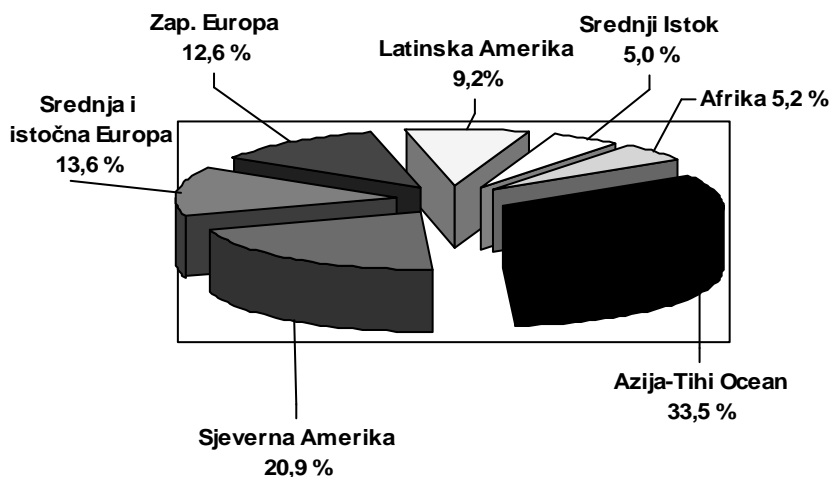


Figure 2: Estimated lubricant consumption by region, 2007

Still, the indisputable record holder is the region of a part of Eastern, Southern and South-Eastern Europe where different factors can result in consumption decrease of more than 25 %. For example, in Bosnia and Herzegovina, Macedonia, Croatia and Serbia it is more than 30 % and it sometimes even reaches up to 50 %.

The biggest decline is recorded in the area of industrial lubricants, especially when it comes to the consumption of metalworking fluids. The next category with decreasing consumption are motor oils for passenger cars, but it has to be noted that the consumption decrease is directly connected with a price of fuel so it varies depending on a region and a period when this price is more acceptable for economy and a final user.

From 2006 to the last quarter of 2008 there was a quite strong consumption increase of 5 %. On the other hand, Kline & Co estimated that the average decline in consumption in the world will be cca 17 %. Nevertheless, if we consider the situation according to the regions, then we dispose of significant information that the countries that cause this development or, in other words, lubricant consumption increase up to 30% are so-called BRIC countries: **B**razil, **R**ussia, **I**ndia and **C**hina. All the well known observers of economic movements agree that the economies of

the aforementioned countries will get ahead of G7 countries by the year 2050.

There has been a slight decrease and stagnation in the lubricant consumption in western Europe and North America in the period of 2006-2008. At the same time, in some countries of Central, Eastern and Southern Europe there has been an eight times bigger economic growth when compared to the economic growth in developed European countries. This fast, probably too fast development, was not uniform in certain countries and certain industrial sectors which also, to some point, influenced this phase of recession.

Particularities of global lubricating greases consumption for 2008

Total estimated lubricating greases consumption in 2008 was around 1,02 million tons which is cca. 2,6% of total global lubricant consumption. Due to the fourth quarter that is a decrease of cca. 2,2 % when compared to 2007. That is not much, but if we take a look at the structure or the distribution of consumption according to the types of lubricating greases, we can come up with some interesting facts. Currently, calcium conventional and complex greases make cca. 10% of the total amount. There has been a decline in consumption of 9,2% only in one year which is mostly taken by conventional calcium greases. This trend continues. Lithium conventional and complex greases are still dominant and their consumption is over 70,2%. Still, there is a slow trend of decline of 2,5% in a year.

Aluminum conventional and complex greases are not used a lot (cca. 4%), and their yearly decline in consumption is 3,5 %.

Still, the real record holder are greases based on thickener of polyurea type with notable 4% of consumption, with the consumption increase of 13,5% when compared to 2007. These greases are usually special greases of very high quality and they belong into a group of highly efficient and mostly high temperature greases. Of course, these greases are significantly more expensive when compared to conventional lubricants and other lubricating greases as well. The situation is very similar with special greases without the decline in consumption, but still also without any significant increase.

Specific trends of lubricant consumption on CEE markets

In 2005 lubricant consumption in the countries of former Yugoslavia was more than 145000 t. Despite global trends the decline in lubricant consumption was already by 7% in 2007 when compared to 2006. The main reason has been a painful transition and economic restructuring in these countries which is still in process. Along with closing of big factories owned by the state, there is also a strong trend of entering new technologies into industry and a great number of modern vehicles. It results in the use of new lubricants of better quality as well as the decline in consumption. So the existing trend was intensified by global economic crisis. In some of the countries such as Serbia and Croatia some industry branches are formally almost gone. No wonder that in these countries the decline in industrial lubricants consumption is over 50% and the total decline in lubricant consumption along with motor oils and

other lubricants for vehicles is more than 35% in some regions. In Croatia, which used to be in the second place in former Yugoslavia, the lubricant consumption of 24000 t is expected by the end of 2009. Serbia ingloriously tops the list with more than 40% of decline. The most optimistic prognosis for consumption is almost 30000 t for the year 2009 (as oppose to 55000 t in 2007).

In other countries the average decrease is between 15% and 25% and only in 2012 we can expect the consumption similar to the first half of 2007. Perhaps it would be more realistic to say that the increase of 15% is expected by 2012 when compared to the low consumption in 2009. The total estimated consumption in the aforementioned countries of former Yugoslavia for 2009 is shown in the Figure 3. These 85000 t when compared to 240000 t at the peak of Yugoslav economic system at the end of 1989 seems very disappointing.

There is a similar situation in Romania. Still in 2006 the estimated consumption was about 140000 t. By the end of 2008 it's been estimated to maximum 95000 t, which stands for a decrease of 35%, and now maximum 75000 t are expected, so another decrease of "only" 20% and some more. In Bulgaria the decline in consumption of only 17% is expected.

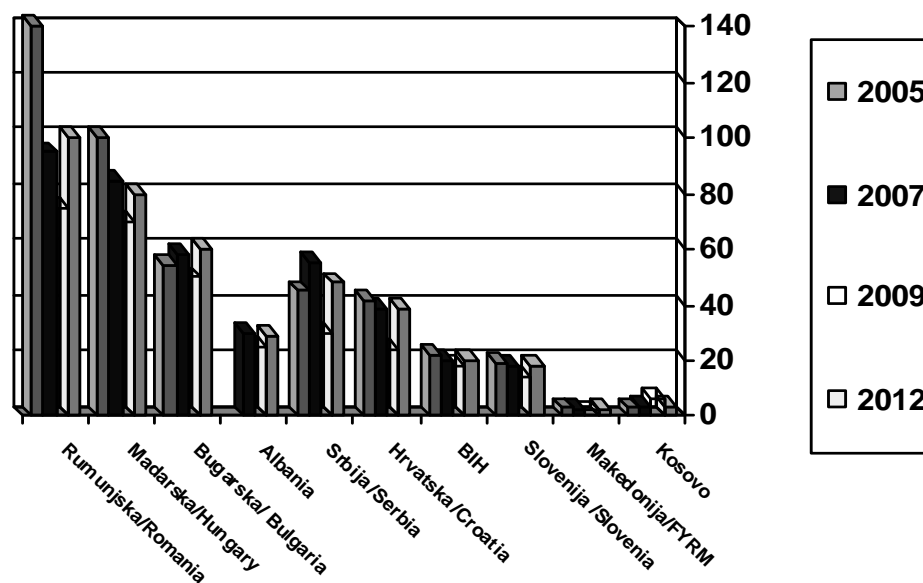


Figure 3: Lubricant demand trends on CEE markets

As far as Hungary is concerned, we also expect the decline in consumption of 25% in 2009. Just for the record, in the period between 1997 and 2003 there has been

the decrease of 45%. Some analysts claim that this constant and huge trend of decrease is not only a result of the global crisis, but also a consequence of too fast and uncontrolled or uneven development of economy branches and the economy transition in some countries.

A special case is the micro-market of Kosovo with the consumption increase of almost 6000 t (2,5 times more than before) based on information provided by official institutions. A number of vehicles and transport rate on that market have certainly increased, but still most of these lubricants are re-exported inspite of additional tax (excise) being paid. Anyway, the total lubricant consumption in the markets of Eastern, Central and Southern Europe will not be more than 315000 t. It can be assumed that the greatest lubricant consumers among the countries outside of the European community will be former SSSR countries.

Contrasts and paradoxes of lubricants and base oil market

The terms and requirements for lubricant demand are constantly changing. The current economic crisis has significantly influenced the decrease of lubricant and fuel consumption which is a consequence of decline of vehicle production industry. Still, it is very hard to estimate how fast the consumption will recover or be stabilized in the upcoming period. It is evident that lubricant supplies are slightly increasing, but on the other hand a slight price increase of lubricants and base oils is expected.

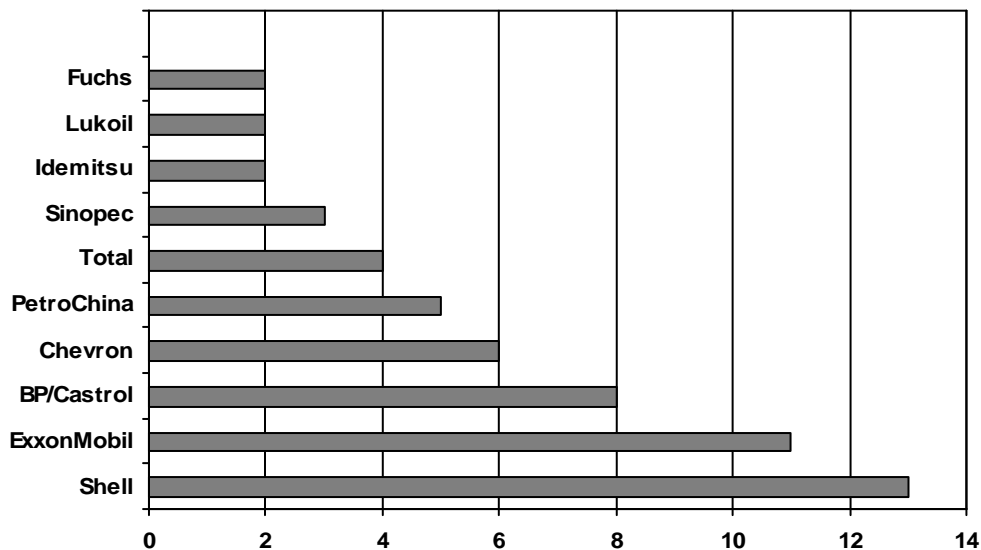


Figure 4: Lubricant demand trends on CEE markets

All the manufacturers of lubricant additives and lubricants vindicate that by increased production costs and original prices of raw materials.

In spite of the crisis and all the problems already mentioned, there is an announcement of new capacities and investments in the base oil production of groups II, II+ and III in the period from 2010 to 2013, along with already announced investments such as plants of base oils such as Formosa Petrochemicals-Taiwan, Petramina-SK Indonesia, Petronas-Malasia and Chevron-Pascoula.

Furthermore, Lukoil has announced the capacity increase of plants in Tafnet and Volgograd, as well as in the Middle East and East by Bapco-Neste, Takreer-Neste-OMV, Caspian Oil. Optima group from Bosnia and Herzegovina, which has recently started the production of group II, continues to increase their capacities. When the lubricant market is concerned the fact is that 56% of global lubricant market, that is about 21,8 million t of estimated 38,2 million t in 2008, is held only by 10 great lubricant manufacturers.

It is shown in the Figure 4 that the leading companies are still Shell, ExxonMobil, BP/Castrol, Total, Chevron and Fuchs. Nevertheless, new companies such as PetroChina, Sinopec, Idemitsu and Lukoil have been on the market for a while. For some of them the situation will certainly be changed soon. Selling percentages for 2008 are shown in the Figure.

Trends and influences of new technologies on automotive lubricant industry in the next 5 years

While pursuing key influences and global business environment of automotive industry in the last ten and more years we can undoubtedly conclude that these influences and trends bear huge and direct consequences on the development of lubricant formulations and generally on global lubricant business. We can name few crucial influences and trends:

- The strongest influence on lubricant quality and development will be a requirement for constant improving of fuel economy.
- Constant and growingly more stringent requirements for the protection of the environment, especially the reduction of exhaust gases emission. The most important requirement in the upcoming period is the reduction of CO₂ content; the current requirement, which is already very stringent, of maximum 160 mg/ to 130 mg/km. The deadline is the end of 2015.
- The requirement for increased use of alternative fuels. Current modern engines and lubricant formulations have to be compatible with new diesel fuel with extremely reduced sulphur content and with 5% of biodiesel, sometimes already with 10%, in a blend. These fuels are labeled with ULSD Fuels /B05 or ULSD/B10 (Ultra Low Sulphure Diesel). It is recommended for the automotive industry, as well as for lubricant formulators, to adjust their engine designs/lubricant formulations for the use of ULSD/B30.

- Dramatically influential is a constant demand of extending the recommended drain period by some OEMs. It is a well known fact that an extended drain period is shortened by adding biodiesel. In practice the very use of 10% biodiesel content in diesel can split the existing drain period in half. It seems to be "an impossible mission".
- Based on everything said here the influence of engine design development and exhaust gases aftertreatment system is very important. The requirements for aftertreatment system have been increased. T-GDI, DPFs stand out among several new systems (Table 1).
- Base oils and additives will need to comply with even more stringent requirements for performance characteristics which will be defined by automotive industry (OEM).

Table 1: Review of engine design types and aftertreatment system types

Tip konstrukcije motora (Engine design)		Sustavi za obradu ispušnih plinova (Aftertreatment system types)	
PFI	Port fuel injection gasoline	TWC	Three-way catalyst
GDI	Gasoline Direct injection	GPF	Gasoline particulate filter
T-GDI	Turbo charged GDI	EGR	Exhaust gas recirculation
IDI	Indirect injection diesel	DPF	Diesel particulate filter
DI	Direct injection diesel	SCR	Selective catalytic reduction
		DOC	Diesel oxidation catalyst

Most experts consider systems of particular modern vehicle parts to be extremely important. For example, the DOC system (Diesel oxidation catalyst) influences the oxidation process of hydrocarbons, soluble oil fractions and CO. The EGR system (Exhaust gas recirculation) reduces the temperature of combustion and collects NO_x gases prior to reduction. The SCR (Selective catalytic reduction) also reduces the content of NO_x gases and the DPFs system (Diesel particulate filters) is very important since it removes a lot of small particles, soot, deposit on filters and burns them.

From numerous papers and comments related to technical presentations, explanations and other information from this area we can conclude that these systems or requirements for their application are a model or a frame for the globalization of automotive industry, as well as for lubricant industry.

Trends of motor oils–influence on base oils

As it was already said, trends and global vehicle production business reflect on the lubricant business by their requirements for the quality of lubricants, for example motor oils being defined by OEM. We can say that two specifications prescribing minimal quality requirements include most of the requirements set by leading vehicle manufacturers, regardless of the fact that each of them has their own specific "in-house" tests or requirements. These two newest specifications are ACEA E9 and

API CJ-4. These specifications, and not them only, are dominated by the requirements for low contents of sulphur, phosphorus and sulphated ash (SAPS). In this sense the crucial requirement is for the maximum approved sulphur content of 0,4 % mas. Phosphorus content cannot surpass 0,12%, mas., while sulphated ash content has to be under 1,0% mas. Furthermore, it is required that the maximum Noack volatility is 13% vol. Lubricant and motor oil formulators are facing great problems since it restricts or completely reduces the possibility of using group I base oils which can not meet all these requirements.

Lubricant manufacturers are forced to use base oils of groups II and II+ which are adequate for formulating modern motor oils of SAE grade 15W-40 and 10 W-30; they also provide most of OEM approvals. As European OEM requirements are concerned, the aforementioned base oils are ideal for formulating modern motor oils SAE grade of SAE10 W-X and 5W X, which is also a very good solution for formulating oils according to the requirements of American specification GF-4 and GF-5.

Base oil manufacturers as well as additive manufacturers have already technically worked out the optimal blend combinations of groups II or II+ with group III which provide even better and safer results according to the specified requirements. Still, in a sense of commercial realization there is a problem of matching the price of group II with the price of group III.

Influence of REACH and requirements for protection of environmental and human health in CEE market

Another key factor influencing the lubricant business, especially in the markets of Central, Eastern and Southern Europe, is the REACH regulation (**R**egistration, **E**valuation, **A**uthorization and restriction of **C**hemicals). It disposes of very similar characteristics as in developed European countries.

REACH will primarily influence the lubricant business in the CEE in the following areas:

- Lubricant research and development costs will increase.
- Different industry branches will be more connected.
- For most industrial companies this will serve as one of the criteria for entering the European market.
- It will stimulate to use "green" lubricants or fast biodegradable lubricants.
- It will provide the primary goal, limitations in the use of some components and additives in lubricants.
- Growing influence of REACH will directly challenge the development of new formulations – special products.

New formulations – new development of lubricants

Based on various influences the lubricant formulators, primarily additive manufacturers, will direct their resources to the development and research of:

- development of additives with controlled and defined TBN value according to the application requirements,
- development of new types of detergent additives,
- selection and quality of base oils,
- further development of highly efficient antiwear additives as a replacement for conventional ZnDDP,
- development of new highly efficient antioxidants,
- development of new additives or additive packages for reducing soot,
- influence of new additives on seals.

On the other hand, lubricant formulators will have to be directed to:

- use of detergent additives with reduced sulphur and sulphated ash content,
- use of new base oil qualities,
- use of new types of antioxidants with reduced phosphorus and sulphur content,
- use of improved antiwear additives,
- use of improved dispersants,
- development and use of antioxidant and anticorrosion additives approved for the use in biodegradable lubricant formulations.

The crucial requirement is the reduction of sulphur and phosphorus in additives and final lubricant formulations. That actually means that there is a restriction or a prohibition of using conventional ZnDDP in formulations of modern motor lubricants since the evaporation of phosphorus from a conventional additive package (P) damages aftertreatment system and reduces the efficiency of a catalyst. Furthermore, the reason for restricting the use of conventional detergents and dispersants is that current detergents/dispersants cause the formation of sulphated ash, which also reduces the efficiency of a catalyst.

Conventional antioxidants in new additive technologies will be significantly reduced since current antioxidant types have too much of sulphur and phosphorus content which could damage catalysts.

New types of additives - ionic liquid salts

A great number of experts in their development laboratories deal with the problem of using different combinations of liquid salts which dispose of a very important characteristic-these salts do not crystallize due to their complex molecule structure. Still, it is said in the literature that 300 commercial varieties can already be found.

Crucial performances and use advantages in lubricant formulations when compared to conventional lubricants are:

- good lubrication,
- low pour point,
- low volatility,
- high boiling point or non-flammability,
- high thermal stability,

- stable structure,
- synergy with conventional additives.

Therefore, today new highly efficient lubricants are offered on the market:

- compressor oils,
- lubricants for high temperatures and special applications,
- gear lubricants,
- lubricating greases.

Still, these additives are not commercially used mostly because of its high price and small production series, but that can be changed overnight.

Trends, contrasts and requirements for base oils in Europe and the world

In the upcoming period groups II and III will be increasingly used in lubricant formulations, especially in Europe. One of the basic reasons for that are their significantly better viscometric properties as opposed to group I base oils. This especially relates to shear stability, lower dynamic viscosity with oil pumpability at lower temperatures at engine starting (CCS), high viscosity index and, of course, sufficiently high viscosity at high temperature (150°C) and defined shear rate of 10^6s^{-1} (HTHS). These oils have better purity, lower aromatic content and less sulphur, maximum 0,03% mas.

During 2008 the changing of the price of crude oil significantly influenced the profit reduction with base oil manufacturers all across the world. Already in 2008 and during 2009 the situation in this industry has been improved. The profit has grown in Asia, North America and Western Europe.

On the other hand, group I base oil production was closed by the end of 2008 and during 2009. The production of base oils of group II and III has not been interrupted, even some new plants were opened in 2009, which is certainly influencing further reduction of consumption of group I base oils. It has been estimated that by 2012 group III base oils will participate with more than 60% in formulations of passenger car motor oils, while the portion of group I base oils will be lower than 23%.

Naphthenic base oils (raffinate oils) need to be mentioned here since in 2009 there has been a growth of 13% of naphthenic raffinate production capacities (pale oil).

When compared to 2008, global growth of base oil production capacities was 1,4% (152,96 million L/day or 962 000 barrel/day). Still, when distributed into groups it looks different. Group II has grown by 12,0% and group III has grown by 33%. On the other hand, group I has decreased by 4% due to closing production plants, but still group I production capacity makes 62% of total base oil capacity. In the first 6 months of 2009, when compared to the same period in 2008, a decline in total global consumption of base oils of 25% has been recorded or only 4022,7 million L (5215,2 million L in 2008).

The decline in base oil consumption is evenly distributed across the regions in the world. On the CEE market the decline in consumption has been estimated to 10%.

In Western Europe it will fall down to 5% and in North America to 4%. Consumption growth of 4% is recorded in Japan and Korea, while Asia and Oceania hold the greatest growth of as high as 33%. Since estimated decline in base oil consumption is to some point, but simetrically, different from estimated lubricant consumption, it is evident that base oil industry operates with reduced capacities or it collects stocks, which is less possible.

According to information in "2009 Global base oil refining list" published by *Lubs&Greases* there are 76 refineries of mineral based base oils and 69 plants for production of non-conventional base oils of PAG (polyalkilen glycoles) type, phosphate esters, silicones, PIB, PAO and PIO. There has been a surprisingly fast growth of the capacities for paraffin oil refining. New capacities have been announced and registered producing 95700 barrel a day till 2013, and only 1 % of it is for group I base oils while the rest of the capacities (99%) of the plants produce group II, III and GTL base oils. In 2010 it is expected that a new refinery for naphthenic oil of capacity of cca. 11000 t/d.

New technologies of base oils XTL?

What are XTL base oils actually? These are base oils produced from alternative sources such as coal, hydrocarbon chemical blends, natural gas, vegetable oils, petroleum coke, city organic waste, etc. Nevertheless, three different types of base oils need to be differed. These are well-known group of GTL base oils and oil produced in gas-to-liquids technology, CTL base oils produced by coal-to-liquids technology from coal and BTL technology for the production of liquids from biomass. This technology is based on Fisher-Tropsch technology. Its advantage is that it can produce great amounts of fuel. Another final product can be high quality base oils which are classified as the so-called group III+ in amount of 10-20% when compared to original raw material and technology. Apart from that this technology can result in the production of by-products in the form of straight chain hydrocarbons C₈ (about 10% of total amount) which are excellent raw materials for group IV base oils (polyalfaolefines or PAO). Another by-product that can be obtained are quality Fisher-Tropsch waxes.

Big reserves of supplies adequate for GTL technology are available and they are already used in Russia and Qatar. It is logical that GTL fuel and base oil production is installed near large gas reserves due to high price of technology and transport. Currently, some projects have been slowed down due to global crisis, high price of a project and high gas price.

As far as CTL technology is concerned, it starts to be built near great coal deposits. In India, China and the USA great companies such as Dow Chemicals, ExxonMobil and Sabic are largely investing in new technology since the raw material that are obtained provide the production of PAO at a lower, much more attainable price then the current price. This technology provides additional advantages since 5-25% of biomass can be used in a blend of original raw materials.

On the other hand, biomass treatment technology – BTL is mostly used in Europe,

but it has low efficiency and it cannot produce adequate base oils. This technology can use different raw materials, but that is a disadvantage when it comes to requirements for balanced production.

All these technologies have something in common. The critical point of the investment is the price of oil which should not be lower than 251 USD/t (40 USD/barrel). As it's shown in the Figure 5, the oil price has been acceptable after there have been many shocking situations recently. This limit was crossed by the end of I quarter of 2009, although some projects were stopped by that time. From that point towards the end of 2009 there has been a slight increase and it has come close to 400 USD/t.

Generally, in the last two years base oil manufacturers (of group I particularly) have reduced their profits, mostly due to reduced market demands or too large capacities in Europe or South and North America. As other groups of base oils are concerned, the consumption and the existing capacities in different regions in the world have not been equally distributed, too. During 2008 the price of base oils was extremely high; it might be the highest price ever. During 2009 this price met the expected and real outlines as it is shown in the Figure 5.

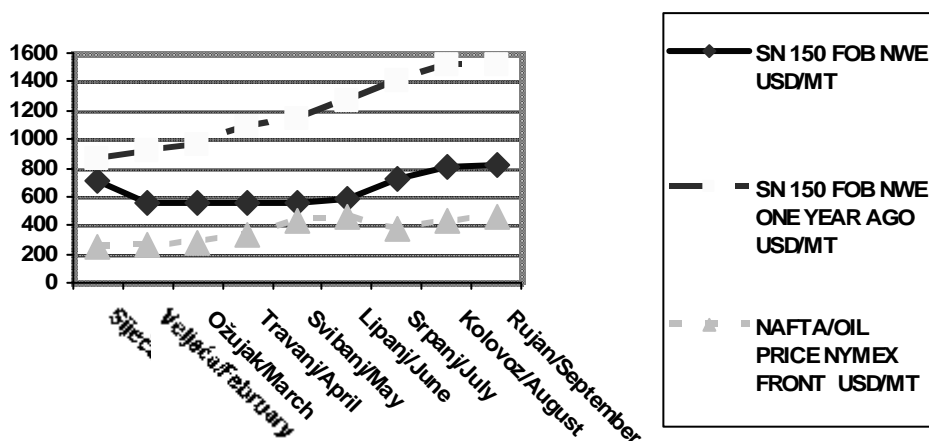


Figure 5: Base oil SN150 & Crude Oil Price correlation (2008/2009)

Consumption trends of 3 basic groups of motor oils till 2012

Top Tier motor oils comply with the requirements of Euro 4 or more and today they cover about 52% of motor oil market. The dominant viscosity grades of SAE 5W-30, 5W-50 make about 45% and lower viscosity grades of SAE 0W-30 and 0W-40 make about 7%.

It has been already said that the main reason for that is the development of new engine designs as well as aftertreatment systems. There are also more stringent

requirements in ACEA C Sequences and new OEM specifications which require increased application of groups II and III base oils and also base oils of groups IV and V. There are also requirements for middle and very low SAPS values and dynamic viscosity at 150°C at shear rate of 10^6 s^{-1} (HTHS), higher than 3,5 mPas. Since this trend is still on, increase of demand for this group of high quality motor oils is expected by the year 2012 and then it should reach 70% of total consumption and it will be obligatory first filling for all engines in vehicles.

The demand for the second group of higher quality motor oils, the so-called Upper Mainline, which has to comply with Euro 3 requirements for exhaust gas control is 30 % of total consumption. SAE viscosity grades of 10 W-40 and 15W-30 are dominating here. Such formulations cannot be produced without using group II base oils. This oil group is a must in vehicles with engine type T-GI (Turbo charged gasoline) DI (Direct injection diesel), where the quality level is required according to ACEA A/B Sequence, A3/B4 and A5/B5. This oil group is mostly used for vehicles which are up to 5 years old, and the expected decline in consumption of this oil group is 20% of total consumption by 2012. Current demand for conventional motor oils (Mainline) is around 18%. These oils usually mostly comply with Euro 2 requirements or lower and they are mostly used in vehicles which are older 10 years. These formulations use only group I base oils. By 2012 the demand for this group of base oils will be decreased to 10%.

Trends in industrial lubricants market in Central, Eastern and part of Southern Europe

The current economic crisis just stimulated the constant trend of decline in consumption of industrial lubricants in this region (before 2007 it was 7% and in 2009 in some parts is more than 35%). This trend is more emphasized with conventional lubricants. On the other hand, the consumption of higher performance lubricants is slowly increasing. In this market sellers and manufacturers are constantly forced to reduce prices. Nevertheless, in some local markets new global or regional brands keep coming or smaller local lubricant manufacturers start their business.

Big local manufacturers are under great pressure and their resources and potentials of development and research of selling program and production are very limited. There is a great competition about getting smaller markets. These micro-markets are still in the process of restructuring. You can tell that by new consumers of different physiognomy, closing a great number of old factories and plants, constant ownership changes, organizing new associations among certain types of industry and, most of all, by new technologies.

Most financial experts for this region are optimistically estimating a certain kind of stabilization and a small increase by the middle of 2011 and a return to the level of consumption (from 2007) only by the end of 2012. It's been estimated that this new development is to be more moderate, slower, but more stable and more sustainable for longer period.

Key influences on quality trends of industrial lubricants

There is a positive trend of customers being oriented to multifunctional lubricants in metalworking industry, especially when it includes different metals, different metal working operations, new technology or complicated operating conditions. For very similar reasons the use of hydraulic oils of higher quality level is becoming more popular. In the metalworking industry that relates to hydraulic oils without additives based on ZnDDP and oils with improved detergency (HLP-D). When using non flammable oils such as HFC and HFD they tend to be of high quality, which includes better lubricity. There is a constant demand of oils for closed industrial gearboxes with higher performances. This especially relates to synthetic gear oils or gear oils with special additivation and broader range of application temperature even up to 180°C.

Special greases, especially high temperature greases, are coming more and more into use.

There has also been a small increase of lubricant use in food industry which, in some countries, reaches 5 to 10% of total market potential. Broader use of "green" fast biodegradable lubricants in CESEE depends on a level of consciousness and the use of appropriate legal regulations.

Conclusion - trends and paradoxes

From 2003 to 2007 the growth of global lubricant consumption was at the level of 0,5% a year.

From 2006 to 2008, without IV quarter, there was a very small increase in North America and a certain stagnation in Europe.

Due to the global industry crisis in 2009, especially in automotive industry, a dramatic decline in lubricant consumption of in total up to 9% does not come as a surprise.

The real decline is actually bigger and it was influenced by the constant increase in the period 1997-2009 in BRIC countries, which were responsible for the development and growth of about 30% when compared to the others.

In best case by the end of 2009 the consumption of lubricants will barely reach 32,7 million t, in some regions particularly, which means that the decline in consumption from 2007 to 2009 is not evenly distributed throughout the world.

In 2009 the supplies of final lubricants keep growing in the world, and this process will go on for a certain period.

During 2009 the prices of final lubricants were constantly growing at the level of 6-15% in the USA and Europe.

In spite of the global crisis from the beginning of 2009 to 2013 the construction of new capacities of group II and III base oils will be finished or continued in Far East and Russia.

Adversely, in 2009 the decline in consumption of group I base oils continues.

It is expected that starting from 2010 to 2015 the trend of profit increase will continue in base oil industry, particularly in the markets of Asia, North America and Western Europe.

From 2009 to 2010 there has been a small decline in additive consumption and in profits in additive industry.

In 2009 the lubricant consumption is decreased by 20-35% in the CEE market as a consequence of different conditions.

In 2009 the influence of REACH is quite evident not only in Europe, but also in the CEE market; especially in the entire chemical industry, which also includes lubricant industry.

New development and technology of engine design and aftertreatment systems still have the greatest influence on quality of automotive lubricants.

Trends of technology development influence the OEM and their users globalization by setting new and more stringent specifications for vehicles, equipment, industrial equipment as well as by lubricant quality regulations.

Group III base oils will be mostly used in formulations of personal cars motor oil (at least 60 % is expected).

Lubricant quality and new development of lubricant additives successfully follows all stringent quality requirements while introducing new technologies of vehicles and industry equipment as well as all the environmental protection standards.

A trend of moderate total growth of lubricant consumption and prices will be continued after 2010 (BRIC + stabilization in Eastern and Western Europe).

The level of total lubricant consumption from 2007 will be reached only in 2012.

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UDK	ključne riječi	key words
621.892	maziva	lubricants
.001.6	gledište industrijskog restrukturiranja i tehnološkog razvoja	industry restructuring and technology development viewpoint
.002.64	gledište svojstava produkta	product properties viewpoint
.002.237	gledište pooštrenja zahtjeva za kvalitetom	viewpoint of increasing quality requirements
380.134	tržišni razvoj i predviđanja	market development and forecast
338.974	gospodarska kriza	economic crisis
(4-11-12-191.2)	Istočna, jugoistočna i srednja Europa	East, Southeast and Central Europe

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