KPMG

cutting through complexity

Georgian National Investment Agency

Chemical Sector Research
Lubricating Preparations
lubricants

April 2015

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Our findings, observations and/or recommendations are those that we could reasonably derive from the procedures or scope of services performed. The specific procedures performed were agreed with Georgian National Investment Agency (the Client) and were performed by us as set forth in the Report.

Our work was carried out solely based on the publicly available research data.

We have indicated within our Report the sources of the information presented and have satisfied ourselves, so far as possible, that the information presented in our Report is consistent with other information which was made available to us in the course of our work in accordance with the terms of the Contract. We have not, however, sought to establish the reliability of the sources by reference to other evidence.

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References to 'KPMG Analysis' in this Report indicate only that we have (where specified) undertaken certain analytical activities on the underlying data to arrive at the information presented; we do not accept responsibility for the underlying data.

General overview

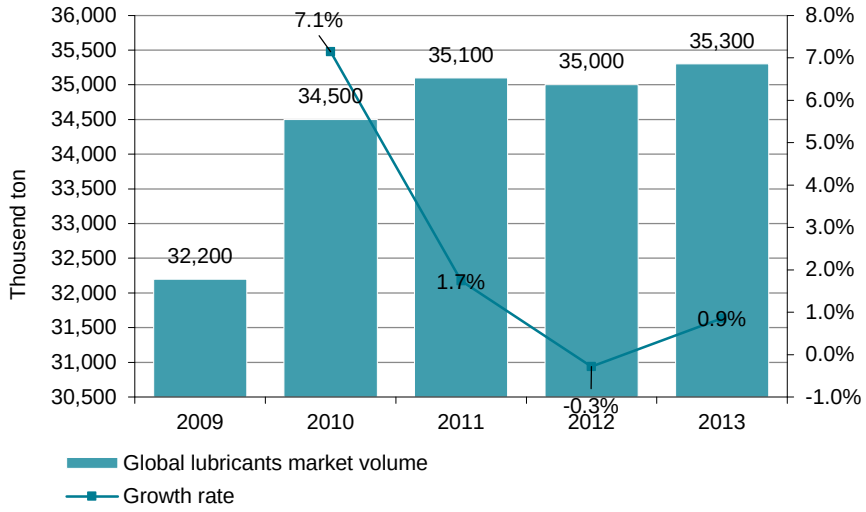
The global lubricants* market registered a volume of 35.3 million tons in 2013

Lubricant is a substance which is capable of reducing the friction between two surfaces which are sliding over each other. Today, lubricating oil is the most commonly used lubricant because of its wide range of possible applications.

Lubricating preparations are used for metallic surfaces, as well as for processing textile, leather and furs. The application of oils, greases and other material having lubricating properties to textile, skin and leather takes place in a number of the steps ordinarily practiced in the production in varying grades. A typical example is the process known as oil tannage, in which vegetable and mineral oils are drummed or otherwise introduced into the limed and bated hides and are relied upon as the chief tanning agent.

The two basic categories of lubricant oil are mineral and synthetic, notwithstanding of the purpose of the use. Mineral lubricants are refined from naturally occurring petroleum, or crude oil. Synthetic lubricants are manufactured polyalphaolefins, which are hydrocarbon-based polyglycols or ester oils. Mineral lubricants are the most commonly used because the supply of crude oil has rendered them inexpensive; moreover, a large body of data on their properties and use already exists. Textile, leather and fur treating lubricants in their composition are based on synthetic lubricants or low crude oil containing lubricants (<70%).

In the recent years there has also been a trend to manufacturing bio-based lubricants. These are an attractive alternative to conventional petrobased lubricants due to a number of their physical properties including: renewablility, biodegradability, high lubricity and high flash points. However, biobased lubricants have not still replaced petrobased lubricants due to their higher cost, and thermal instability and limited temperature applications. Therefore, this type has not been included in our survey.



Source: FUCHS PETROLUB

The global lubricants* market registered a volume of 35.3 million tons in 2013 with CAGR of 2.3% between 2009 and 2013. The global lubricants market is estimated to be worth of $140.5 billion in 2013 and is projected to reach $162.3 billion by 2019. It is growing with a CAGR of 2.5% between 2014 and 2019.

** Including all types of lubricants, containing more, equal and less than 70% of petroleum oil*

General overview

Mineral lubricants* is the largest segment of the global lubricants market.

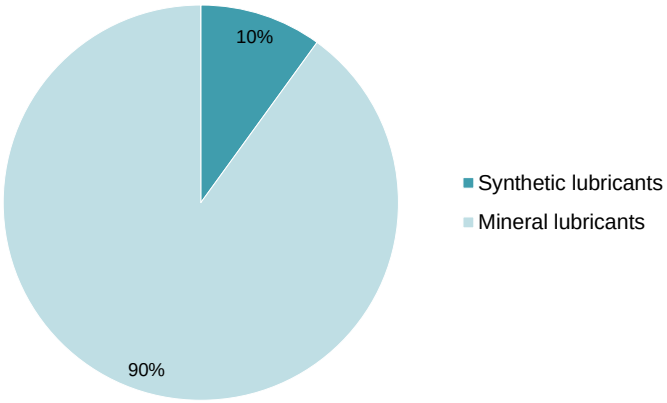
Markets of Asia-Pacific and the Middle East & Africa together accounted for over 50.0% of the total lubricants* market in 2013

The stringent environmental regulations have fueled the demand for synthetic lubricants. Utilization of synthetic lubricants has increased in the automotive industry in the recent past for their superior properties. The use of synthetic lubricants accounted for around 10.0% of the total lubricants market in terms of volume. However their importance is growing as more and more applications demand.

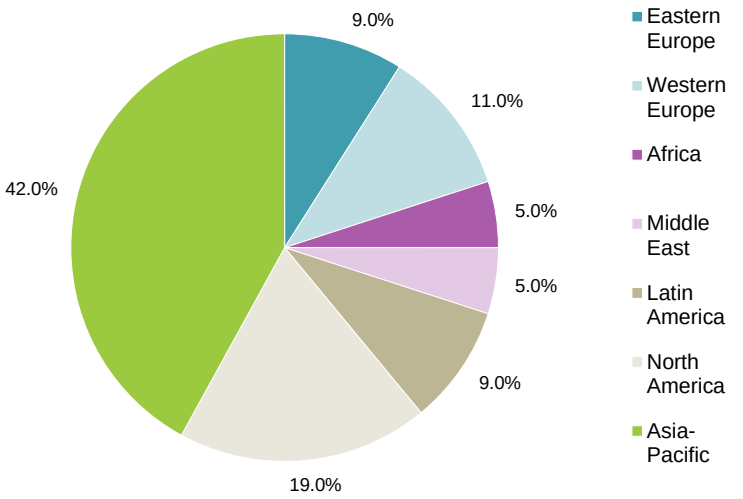
The lubricants find application also industrial machinery & equipment. The demand for lubricants is the highest from the transportation industry, which accounted for over 56.0% of the total market in terms of volume in 2013. The markets for lubricants in Asia-Pacific and the Middle East & Africa are witnessing the fastest growth. Together they accounted for over 50.0% of the total market in 2013.

Asian and Eastern European economic development and the subsequent increase in wealth have led to growing demand for lubricants (particularly higher quality lubricants). Since capital flow in Asia is still modest compared with European and North American levels, there is still a lot of upside for emerging markets.

Share of use of the types of the lubricants in 2013



Global lubricants* market segmentation in 2013



Source: FUCHS PETROLUB

** Including all types of lubricants, containing more, equal and less than 70% of petroleum oil*

Market overview – production, consumption and capacity

The market volume for 2014 is estimated at 38.6 million tons and is expected to grow to 42.8 million tons by 2019

The world market for synthetic lubricants base stocks is projected to grow at an average annual rate of around 3.5% per year on a volume basis to 2016.

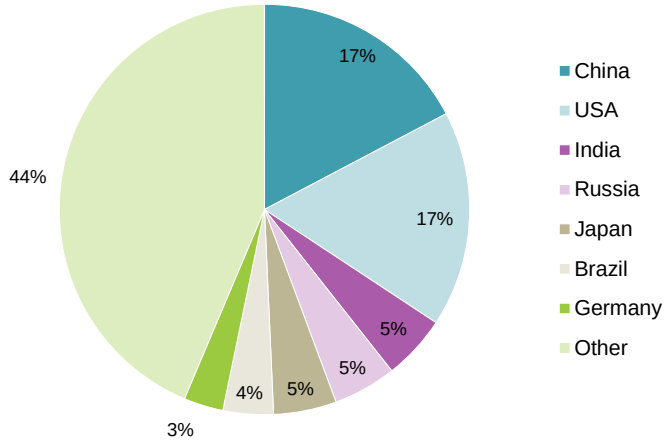
The lubricants* market registered a production volume of 35.3 million tons in 2013 with CAGR of 2.3% between 2009 and 2013. The market volume for 2014 is estimated at 38.6 million tons and is expected to grow to 42.8 million tons by 2019, with a CAGR of 2.1% between 2014 and 2019.

The lubricants* market is highly concentrated with top eight producing countries accounting for more than half of the total global production of lubricants. According to 2013 data China accounted for 17.3% of the global production capacity of lubricants followed by USA 17 % and India, Russia, Japan and Brazil having almost equal share.

The global lubricants* market was estimated to register a consumption of 37,9 million tons in 2013, and is poised to witness a CAGR of 2.1% between 2014 and 2019. The consumption is estimated to reach 42,7 million tons by 2019.

The world market for synthetic lubricants base stocks is projected to grow at an average annual rate of around 3.5% per year on a volume basis to 2016. Growth in synthetic lubricant base stocks is expected to continue at a low rate in Europe and Japan. In contrast, high growth rates are expected in developing countries including China, Other Asia and South America.

Main lubricant* producing countries 2013



Source: FUCHS PETROLUB

** Including all types of lubricants, containing more, equal and less than 70% of petroleum oil*

Market overview

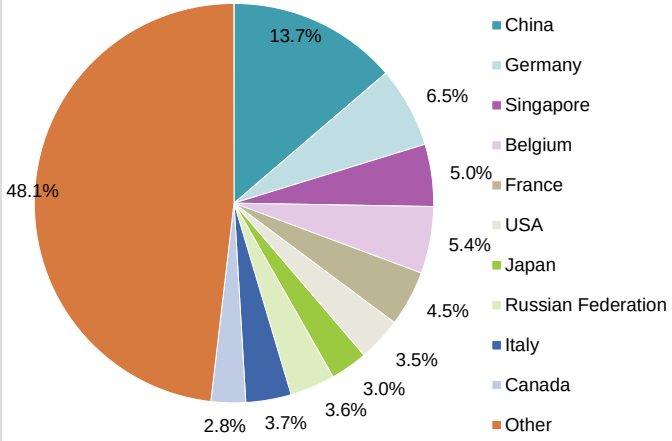
In 2013 top ten countries accounted for 51% of the world lubricants import

2013 top ten exporting countries accounted for 86.5% of the world lubricants exporting market

The import/export of the lubricants in the South Caucasus region was not significant, with export of only USD 130 thousand

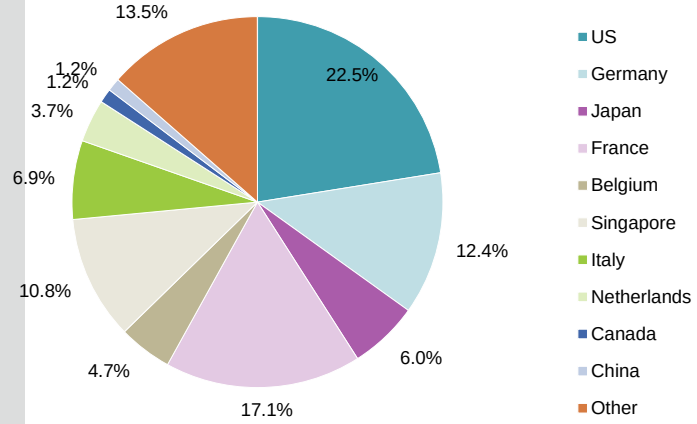
Note: import/export data includes all in-scope lubricants

Structure of the world lubricants import by countries in 2013



Source: ITC

Structure of the world lubricants export by countries in 2013



Source: ITC

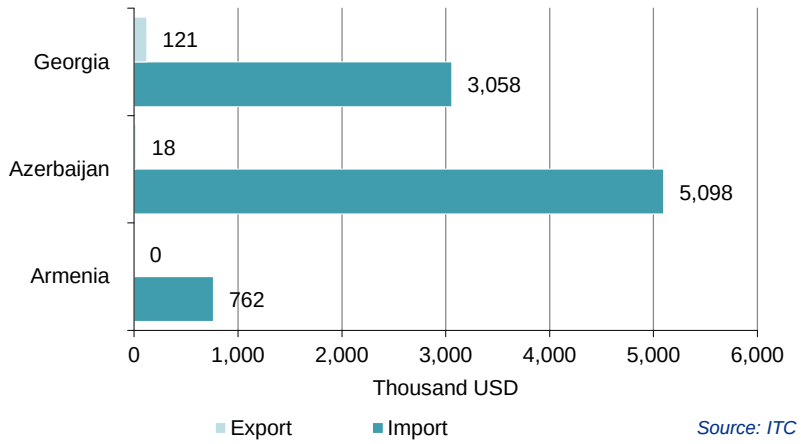
In 2013 top ten countries accounted for 52% of the world lubricants import. The value of the global import was USD 19.6 billion in 2013. China, Germany and Belgium had a share of 13.7%, 6.5% and 5.4% respectively.

Meanwhile in 2013 top ten exporting countries accounted for 86.5% of the world lubricants exporting market. The value of the global export was USD 18.4 billion in 2013. US, France and Germany were the top 3 exporters of lubricants with share of 22.5%, 17.1% and 12.4% respectively in the world export of lubricants.

In 2013 the import of lubricants in South Caucasus countries (Georgia, Azerbaijan and Armenia) was about USD 9.8 million, with Azerbaijan accounting for 57% of the region import.

The export of lubricants in South Caucasus was USD 130 thousand and Georgia was the main exporter of lubricants accounting for 87.1% of the total export of lubricants in the region.

Import and export of lubricants in South Caucuses in 2013



Source: ITC

Production Chain and profitability margins

The lubricants are produced based on the crude oils and synthetic oils

Large number of additives are used to impart performance characteristics to the lubricants.

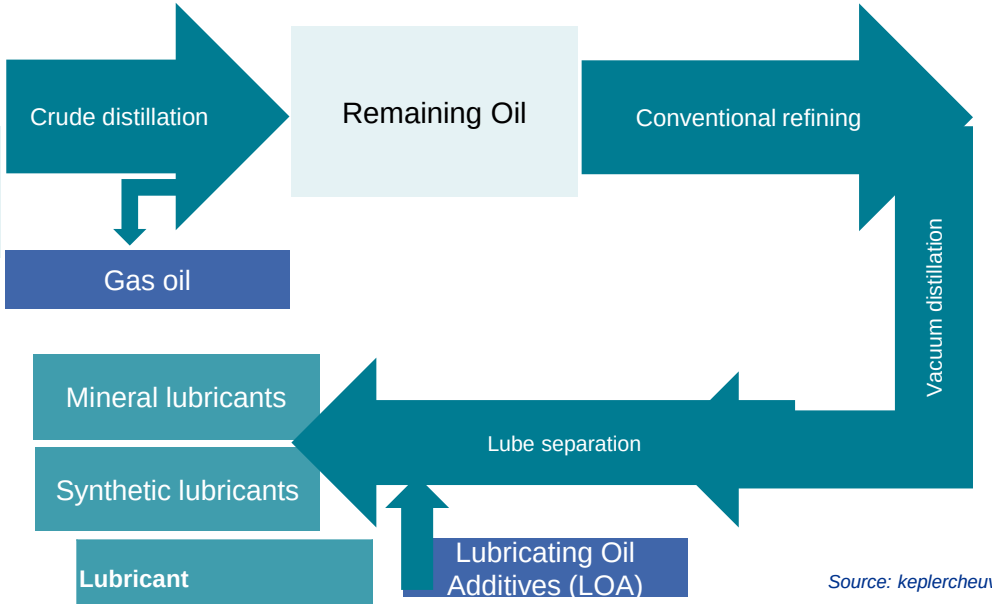
The main families of additives are:

- *Antioxidants*
- *Detergents*
- *Anti-wear*
- *Metal deactivators*
- *Corrosion inhibitors,*
- *Rust inhibitors*
- *Friction modifiers*
- *Extreme Pressure*
- *Anti-foaming agents*
- *Viscosity index improvers*
- *Demulsifying/Emulsifying*
- *Stickiness improver, provide adhesive property towards tool surface (in metalworking)*
- *Complexing agent*

Lubricant general production cycle general description

Crude oil (mineral)
Group1 (solvent refined)
Group 2 (hydrotreated)
Group 3 (hydrocracked)

Synthetic oils
Group 4 - Polyalphaolefin (PAO)
Group 5 - Esters and other compounds



Crude Oil	
P/E	14.5x
Return on Assets %	1.9%
Gross Margin %	7.8%
SG&A Margin %	4.2%
EBIT Margin %	2.0%
Net Income Margin %	1.4%

Synthetic Oil	
P/E	13x
Return on Assets %	5.0%
Gross Margin %	18.0%
SG&A Margin %	9.0%
EBIT Margin %	5.0%
Net Income Margin %	4.0%

Lubricant	
P/E	13.2x
Return on Assets %	2.1%
Gross Margin %	3.6%
SG&A Margin %	2.7%
EBIT Margin %	0.4%
Net Income Margin %	0.2%

Source: keplercheuvreux

The crude oil and the synthetic oils are used as base oils for the production of lubricants. The crude oil is formed from carbon 83-87% and hydrogen 11-14%. Polyalphaolefin oligomers (PAO) are commonly referred to as synthetic hydrocarbons. Polyalphaolefin (PAO) base fluids are synthesised from ethylene. Esters can be defined as the reaction products of acids and alcohols**.** Additives deliver reduced friction and wear, increased viscosity, improved viscosity index, resistance to corrosion and oxidation, aging or contamination, etc.

Water-based lubricants are produced for personal care purposes and are not used in automotive/industrial lubricants production.

In addition, there is a third type of lubricants – bio-lubricants which is extracted from the vegetable oils or synthetic liquids such as hydrogenated polyolefin, esters, silicones, fluorocarbons and many others. Due to its limited use, we excluded bio-lubricants from our study.

Price analysis

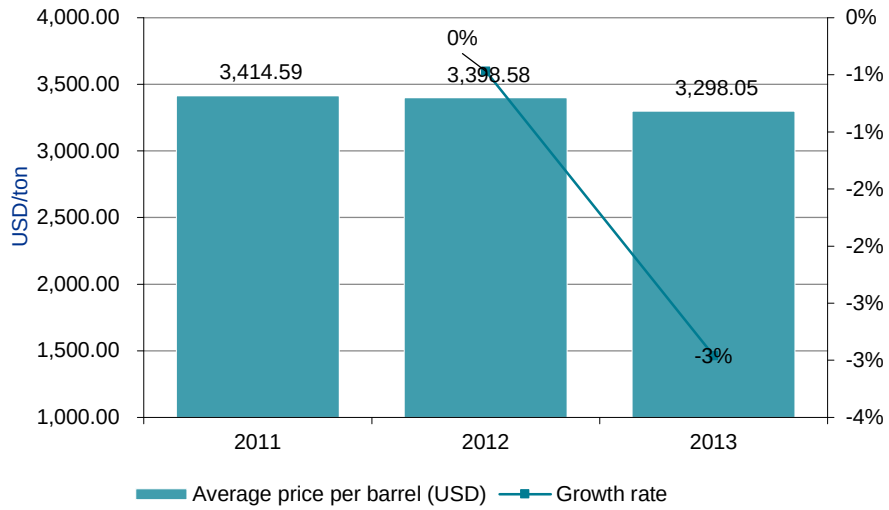
The average price of lubricating preparations/lubricants remained relatively stable during the period 2011-2013

Lubricants, notwithstanding of the type are highly volatile to commodity prices, especially to crude oil prices, which is the main component of the lubricant. The fundamental price drivers are supply, demand and price of raw materials.

The price of the products is also dependent on the production technology used, from distillation to lube separation, which may significantly influence on the cost efficiency of the production. The higher the efficiency of the technologies used, the lower the processing cost and the waste of materials will be.

The average prices remained relatively stable during the period 2011-2013, by to USD 3,298.05 per ton, that is by 3 % during in 2013 compared to 2012. These include prices for Lubricating preparations, antirust or for treating textiles, leather containing less than 70% crude oil (see slide 13 for additives prices).

Lubricants Price dynamics



Source: Allthatstats.com

Market overview – Top 20 Productions

Top 20 lubricant producers based on 2013 production volume (000 ton)

1	Shell	5,000
2	Exxon Mobile	4,700
3	BP	2,400
4	Chevron	1,800
5	PetroChina	1,600
6	SinoPec	1,200
7	Lukoil	1,100
8	TOTAL	900
9	Fuchs	700
10	Nippon Oil	600
11	Idemitsu	500
12	Valvoline	500
13	Conoco Ph	500
14	PetroNAS	500
15	CPC	500
16	PETRAMINIA	400
17	PDV SA	400
18	RepSoil	400
19	SK Corp	300
20	Indian Oil	200

Source: IFA

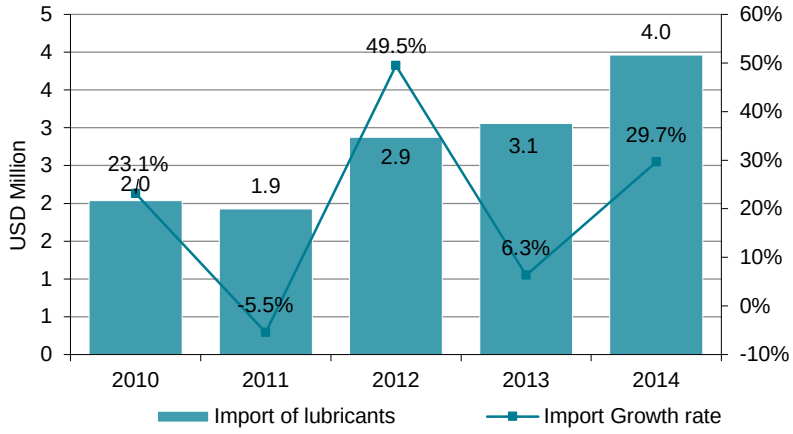
Note: Top 20 companies ranking is based on the FURCHS PETROLUB data

** Including all types of lubricants, containing more, equal and less than 70% of petroleum oil and lubricating oil additives*

Georgia – lubricants import

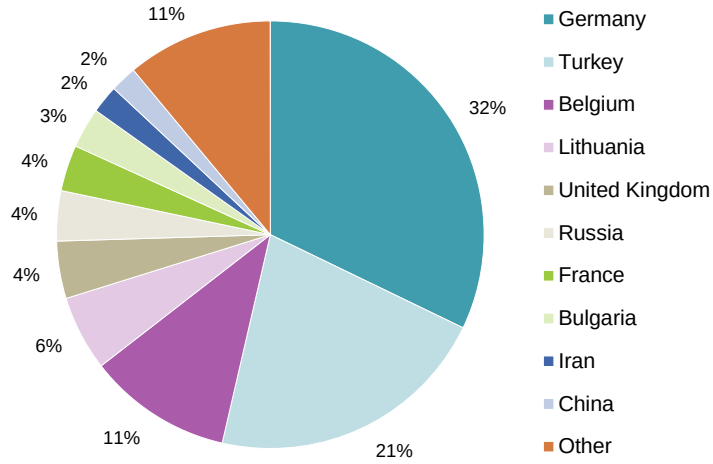
In 2014 Georgia imported USD 4 million of lubricants

Import of lubricants in 2010 - 2014



Source: ITC

lubricants import structure by countries, 2014



Source: ITC

In 2014 the import of lubricants in Georgia increased by 29.7% and was USD 4 million. During 2010 – 2014 the lubricants import recorded 18.1% CAGR.

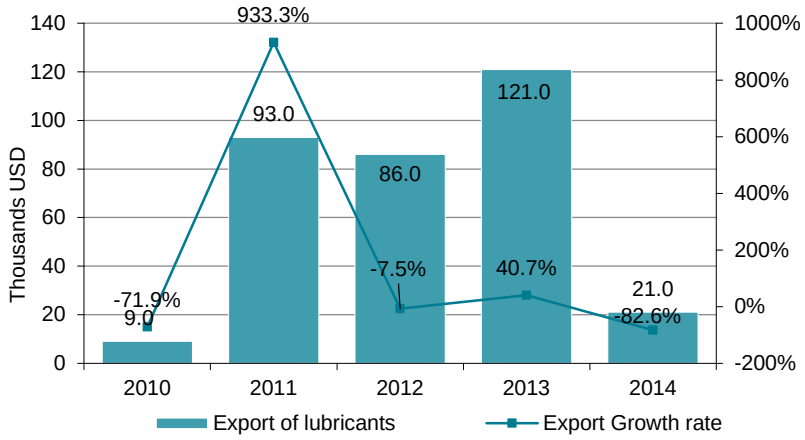
In 2014 Germany accounted for 32% of the total import of lubricants to Georgia. Turkey was the second largest exporter of lubricants to Georgia accounting for 21% of the import.

Source: ITC

Georgia – lubricants export, production and consumption

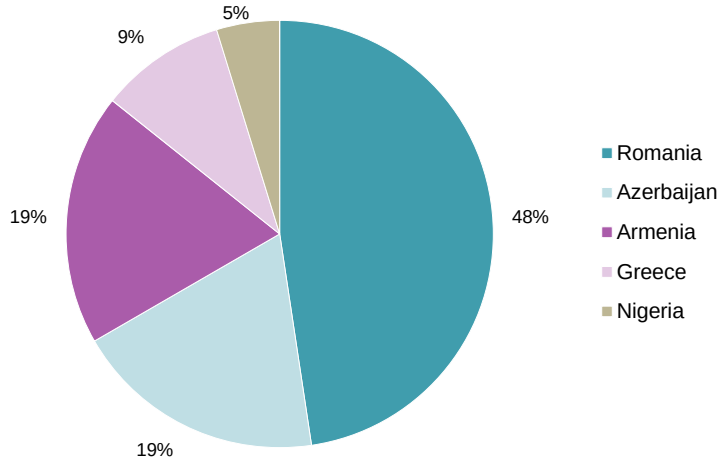
In 2014 Georgia exported USD 21 thousand of lubricants

Export of lubricants in 2010 - 2014



Source: ITC

Lubricants export structure by countries, 2014



Source: ITC

In 2014 the export of lubricants from Georgia decreased by 83% and was only USD 21 thousand. The main destination for the Georgian export of lubricants were Romania, Azerbaijan and Armenia.

The Georgian Statistics office does not report any information regarding the production and consumption (use) of lubricants in the country. In order to estimate the use (consumption) of lubricants by Georgia we made the following assumptions:

- ✓ The half of the net import (import minus export) of lubricants was consumed during the year of importation and the second half during the upcoming year.
- ✓ No domestic production operates or the volumes produced in Georgia, if any, are insignificant.
- ✓ We neglect the availability of inventory in the country.

Having all the above assumption made we estimated that in 2014 Georgia used (consumed) 1,519 ton of lubricants.

Source: ITC

Project pipeline

Below we presented some of the expansion projects expected in the near future in the region.

Company	Country	Investmnet	Capacity	Launch data	Other details
BASF	Germany	-	-	2016	New plant for polyalkylene glycol (PAG)-based lubricants.
Petrol Ofisi	Turkey	-	-	-	The company will use Turkey's largest production and filling facility in the field, Derince Technology and Production Center, to produce Chevron marine lubricants.
SKF	Czech Republic	-	-	2015	The company is expanding lubrication systems manufacturing facility in the Czech Republic
LLK-International (LUKOIL)	Kazakhstan	USD 100 million	100,000 metric tones	2017	The company planned to build a blending plant in the south of Kazakhstan by 2017. However the project may be stopped due to the ban on imports of crude oil components from Russia to Kazakhstan

Raw materials in the selected Region/Countries - Crude oil

In 2013 the world import of crude petroleum oil equaled to USD 1,618 billion.

Import of crude oil

Importers	Value imported in 2013 (USD thousand)	Quantity imported in 2013 (Tons)	Import price (USD)
World	**1,618,467,151**	**2,075,646,000**	**780**
Germany	74,284,138	91,388,708	813
Netherlands	52,163,977	63,201,586	825
Italy	46,462,095	57,467,112	808
France	45,627,941	55,587,971	821
Spain	45,308,060	58,583,900	773
United Kingdom	40,091,970	49,032,430	818
Belgium	28,484,159	36,137,415	788
Poland	18,048,934	23,134,843	780
Greece	16,052,194	19,193,103	836
Sweden	12,706,028	15,915,994	798
Other EU	**63,581,773**	**78,668,902**	**N/A**
Kazakhstan	2,839,859	7,497,985	379
Ukraine	630,280	761,058	828
Uzbekistan	250,368	299,435	836
Tajikistan	115,054	137,629	836
Kyrgyzstan	641	1,032	621
Georgia	2	-	-
Turkmenistan	1	-	-

Source: ITC

Export of crude oil

Exporters	Value exported in 2013 (USD thousand)	Quantity exported in 2013 (Tons)	Export price (USD)
World	**1,501,630,777**	**1,699,516,077**	**N/A**
United Kingdom	29,793,875	36,112,960	825
Netherlands	7,042,431	8,886,727	792
Denmark	4,915,203	6,000,228	819
Belgium	2,119,677	2,342,062	905
Italy	426,958	573,665	744
Poland	334,011	402,667	829
Greece	176,267	-	N/A
Other EU	**362,834**	**486,348**	**N/A**
Kazakhstan	55,221,442	68,158,350	810
Azerbaijan	20,244,053	24,855,868	814
Turkmenistan	72,552	86,701	837
Kyrgyzstan	1,036	2,423	428
Turkey	1	-	-

Source: ITC

Crude oil prices, 2013

Dubai USD/bbl	105.47
Brent USD/bbl	108.66
Nigerian Forcados USD/bbl	111.95
West Texas Intermediate USD/bbl	97.99

Source: BP Statistical Review of World Energy, June 2014

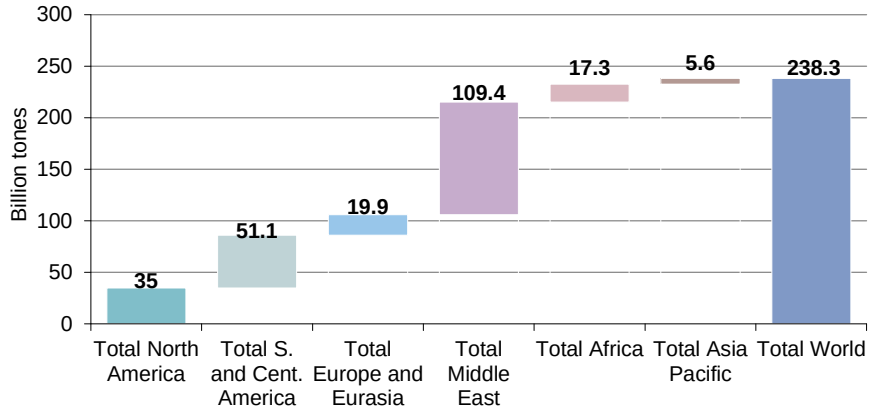
According to the BP "Statistical Review of World Energy Report", in 2013 the price of crude oil for the period of 2009-2013 presented by Dubai, Brent, Nigerian Forcados and West Texas Intermediate increased by the CAGR equal to 14.5%, 15.2%, 15.3% and 12.2% respectively.

Raw materials in the selected Region/Countries - Crude oil

In 2013 the value of total world proved oil reserves was equal to 238.3 billion tones, while the value of the total world refinery capacity was equal to 94,928 thousand barrels daily

In 2013 Venezuela had the biggest share in the total world proved oil reserves equal to 19.6% (46.6 billion tones), while US had the biggest share in the total world refinery capacity equal to 18.8% (17,818 thousand barrels daily)

World proved reserves of crude oil*



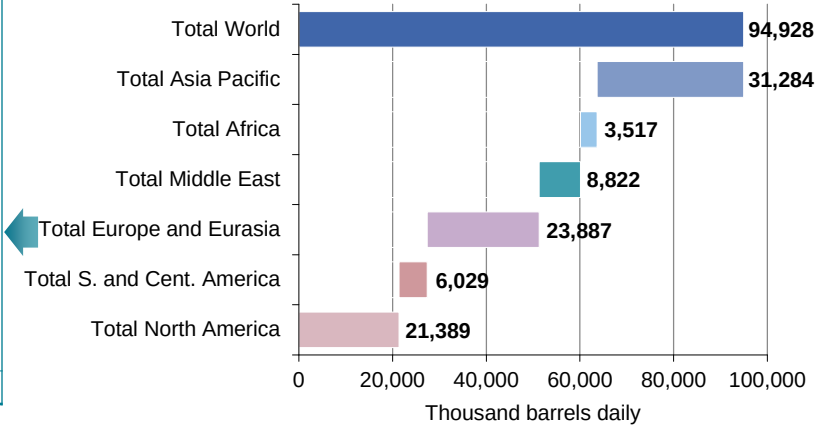
Europe and Eurasia proved reserves of crude oil*	
Billion tones	
Total EU 28	**0.8**
Denmark	0.1
Romania	0.1
Italy	0.2
United Kingdom	0.4
Total Central Asial	**4.1**
Turkmenistan	0.1
Uzbekistan	0.1
Kazakhstan	3.9
Total Other countries	**15.0**
Azerbaijan	1.0
Other Europe and Eurasia	14.0
Total Europe and Eurasia	**19.9**

Europe and Eurasia refinery capacities**	
Thousand barrels	
Total EU 28	**12,335.0**
Belgium	810
France	1,520
Germany	2,061
Greece	498
Netherlands	1,274
Spain	1,537
Sweden	434
Turkey	613
Italy	2,062
United Kingdom	1,526
Total Other countries	**11,551**
Other Europe and Eurasia	11,551
Total Europe and Eurasia	**23,886**

According to the "OPEC Annual Statistical Bulletin" in 2013 Ukraine had crude oil reserves equal to 395 million barrels. According to the same bulletin in 2013 Ukraine, Kazakhstan and Azerbaijan had refinery capacities equal to 879.8 thousand barrels per calendar day, 345.1 thousand barrels per calendar day and 399 thousand barrels per calendar day respectively.

According to the BP "Statistical Review of World Energy Report", in 2013 the oil reserves of Russian Federation comprised 63.8% (6,027 thousand barrels daily) of the total oil reserves of Europe and Eurasia proved oil reserves while the refinery capacities of Russian Federation comprised 63.8% (12.7 billion tones) of the total refinery capacities of Europe and Eurasia refinery capacities.

World refinery capacity**



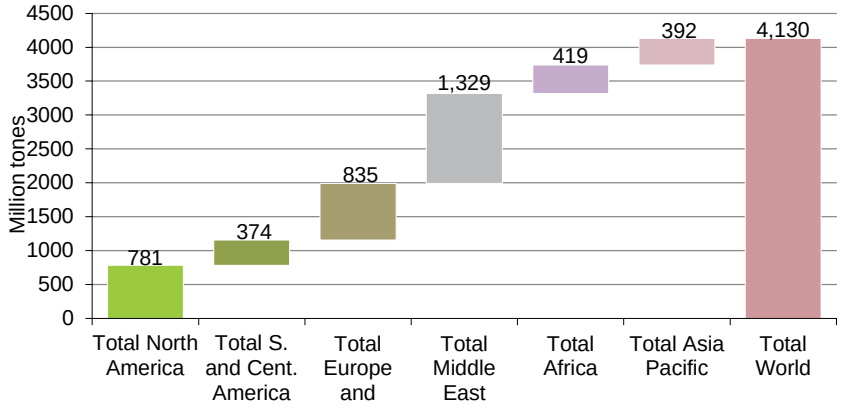
Source: BP Statistical Review of World Energy, June 2014
*Note: * Proved reserves of crude oil - Generally taken to be those quantities that geological and engineering information indicates with reasonable certainty can be recovered in the future from known reservoirs under existing economic and operating conditions.*
*** Atmospheric distillation capacity on a calendar-day basis.*

Raw materials in the selected Region/Countries - Crude oil

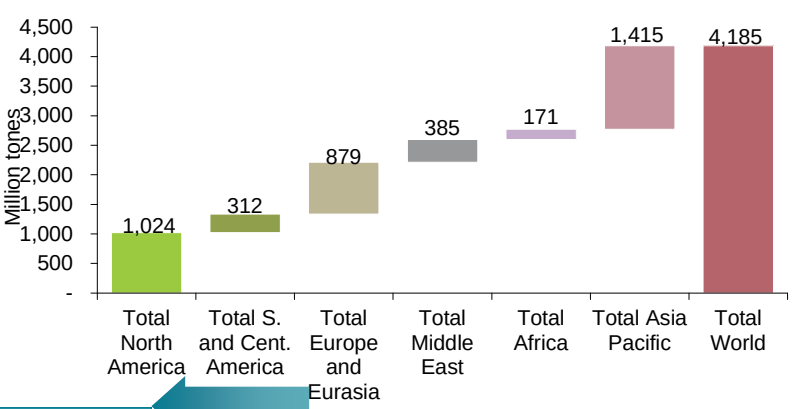
In 2013 the value of total world production of crude oil was equal to 4,130 million tones, while the value of the total world consumption was equal to 4,185 million tones

In 2013 Saudi Arabia had the biggest share in the total world production of crude oil equal to 13.1% (542.3 million tones), while US had the biggest share in the total world consumption equal to 19.9% (831 million tones)

World production of crude oil*



World consumption of crude oil**



Europe and Eurasia production of crude oil*	
Million tones	
Total EU 28	**59**
Denmark	9
Italy	6
Romania	4
United Kingdom	41
Total Central Asial	**98**
Kazakhstan	84
Turkmenistan	11
Uzbekistan	3
Total Other countries	**678**
Azerbaijan	43
Other Europe and Eurasia	634
Total Europe and Eurasia	**835**

Europe and Eurasia consumption of crude oil**			
Million tones			
Total EU 28	**589**	Portugal	11
Austria	13	Romania	9
Belgium	31	Slovakia	4
Bulgaria	4	Spain	59
Czech Republic	9	Sweden	14
Denmark	8	United Kingdom	70
Finland	9	**Total Central Asial**	**23**
France	80	Kazakhstan	14
Germany	112	Turkmenistan	6
Greece	14	Uzbekistan	3
Hungary	6	**Total Other countries**	**267**
Republic of Ireland	7	Azerbaijan	5
Italy	62	Ukraine	12
Lithuania	3	Turkey	33
Netherlands	41	Other Europe and Eurasia	217
Poland	24	**Total Europe and Eurasia**	**879**

Source: BP Statistical Review of World Energy, June 2014
*Note: * Includes crude oil, tight oil, oil sands and NGLs (the liquid content of natural gas where this is recovered separately). Excludes liquid fuels from other sources such as biomass and derivatives of coal and natural gas.*
*** Inland demand plus international aviation and marine bunkers and refinery fuel and loss. Consumption of bio gasoline (such as ethanol), biodiesel and derivatives of coal and natural gas are also included.*

According to the "OPEC Annual Statistical Bulletin" in 2013 Ukraine's, France's, Germany's, Netherland's and Turkey's production values of crude oil were equal to 43.7 thousand barrels daily, 16 thousand barrels daily, 51.8 thousand barrels daily, 21.6 thousand barrels daily and 46.2 thousand barrels daily respectively.

According to the BP "Statistical Review of World Energy Report", in 2013 the oil production of Russian Federation comprised 63.7% (531.4 million tones) of the total oil production of Europe and Eurasia oil production, while the consumption of Russian Federation comprised 17.4% (153.1 million tones) of the total consumption of Europe and Eurasia consumption.

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