

Global Base Oil and Lubricants Trading Patterns

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- Locations of base oil manufacturing plants
- Locations of lubricant additive manufacturing plants
- Locations of lubricant blending plants
- Regional base oil trading patterns
- Lubricant manufacturing and manufacturers
- Regional lubricant trading patterns
- The future
- Summary and conclusions

World Base Oil Manufacturing Capacities, by Region, 1993 and 2022

Region	1993			2022		
	No of Plants	Capacity (000MT)	% Share	No of Plants	Capacity (000MT)	% Share
Western Europe	29	7700	16.3	17	6711	11.1
C & E Europe	35	12480	26.5	20	4644	7.7
North America	32	12315	26.1	18	13025	21.6
C & S America	14	3075	6.5	9	1835	3.0
Middle East	7	1660	3.5	15	5120	8.5
Asia	37	8220	17.4	61	28178	46.8
Africa	8	960	2.0	7	747	1.2
Oceania	4	720	1.5	0	0	0.0
Total	166	47130	100.0	147	60260	100.0

Share of Base Oil Manufacturing Capacity, by Company Type, 1993 and 2022 (000MT)

Region	1993			2022		
	Major	State	Indep.	Major	State	Indep.
Western Europe	4450	1190	2060	1995	0	4716
C & E Europe	0	12200	280	0	1167	3477
North America	5050	990	6275	4540	305	8180
C & S America	80	1745	1250	75	355	1405
Middle East	0	1660	0	700	2190	2230
Asia	890	3330	4000	4865	8063	15250
Oceania	540	0	180	0	0	0
Africa	150	650	160	0	415	332
Total	11160	21765	14205	12175	12495	35590

(Major oil company, State oil company or Independent oil company)



Main Base Oil Exporting Countries, 2022

Region	Country	Main Base Oil(s)
W Europe	France	I
	Germany	I
	Italy	I
	Netherlands	II
	Spain	I, III
	Sweden	V
C & E Europe	Russia	I, II, III
N America	Canada	II, III
	US	I, II, II+, V
Middle East	Bahrain	III
	Qatar	III
	Saudi Arabia	I, II
Asia	Singapore	I, II
	South Korea	II, III
	Malaysia	II, III

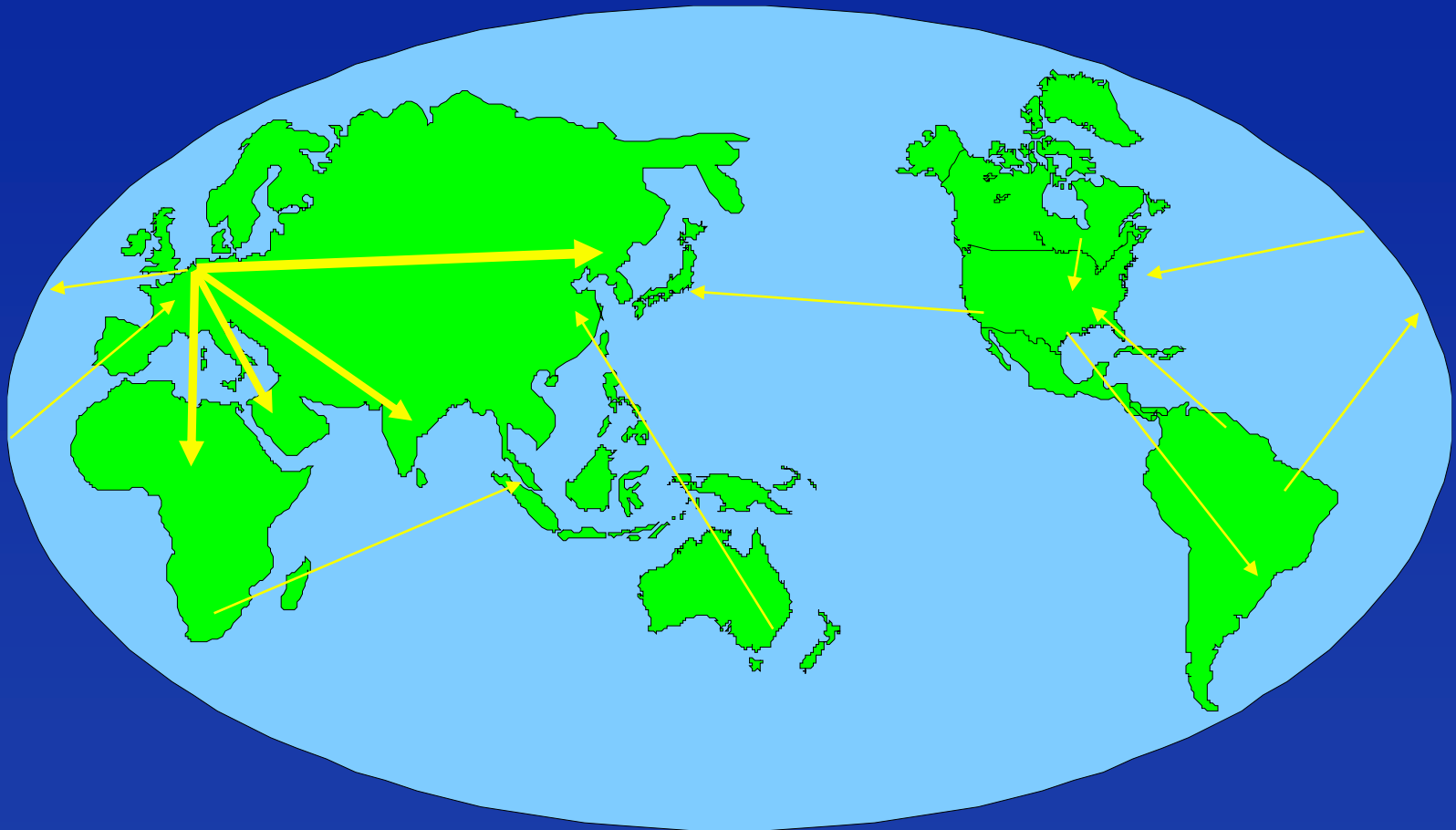
Main Base Oil Importing Countries, 2022

Region	Country	Main Base Oil(s)
W Europe	Belgium	II, III
	Germany	II, III
	Netherlands	III
	UK	II, III
C & E Europe	All countries	I, II, III
N America	Canada	II, III
	US	III
S America	All countries	I, II, III
Asia	China	III
	India	I, II, III
	Singapore	III
	Other countries	I, II, III
Africa	All countries	I, II, III
Oceania	All countries	I, II, III

Regional Base Oil Trading Patterns, 2022

Export Region	Import Region	Main Baseoil(s)
W Europe	C & E Europe	III, V
	C & S America	I, III, V
	Middle East	I, III, V
	Asia	I, III, V
	Africa	I, III, V
C & E Europe	W Europe	I, II, III
N America	W, C & E Europe	II, II+
	C & S America	I, II, II+
	Africa	I, II
C& S America	W, C & E Europe	V
	North America	V
Asia	W Europe	II, III
	C & E Europe	II, III
	N America	II, III

Global Base Oil Trading Pattern, 1995



Global Base Oil Trading Pattern, 2005



Global Base Oil Trading Pattern, 2011



Global Base Oil Trading Pattern, 2022



Main Lubricant Additive Exporting Countries, 2022

Region	Country
W Europe	Belgium
	France
	Germany
	Netherlands
	Switzerland
	US
N America	
C&S America	Brazil
Asia	Singapore

Main Lubricant Additive Manufacturing Locations, 2022

Company	Country	Company	Country
Lubrizol	US	Afton	US
	UK		Belgium
	France		UK
	Belgium		Singapore
	Germany		India
	Netherlands		China
	Spain		Mexico
Infineum	UK	Oronite	US
	France		France
	Germany		Singapore
	Italy		China
	Singapore		Brazil
	Brazil		



Lubricants Business Company Types, 2022

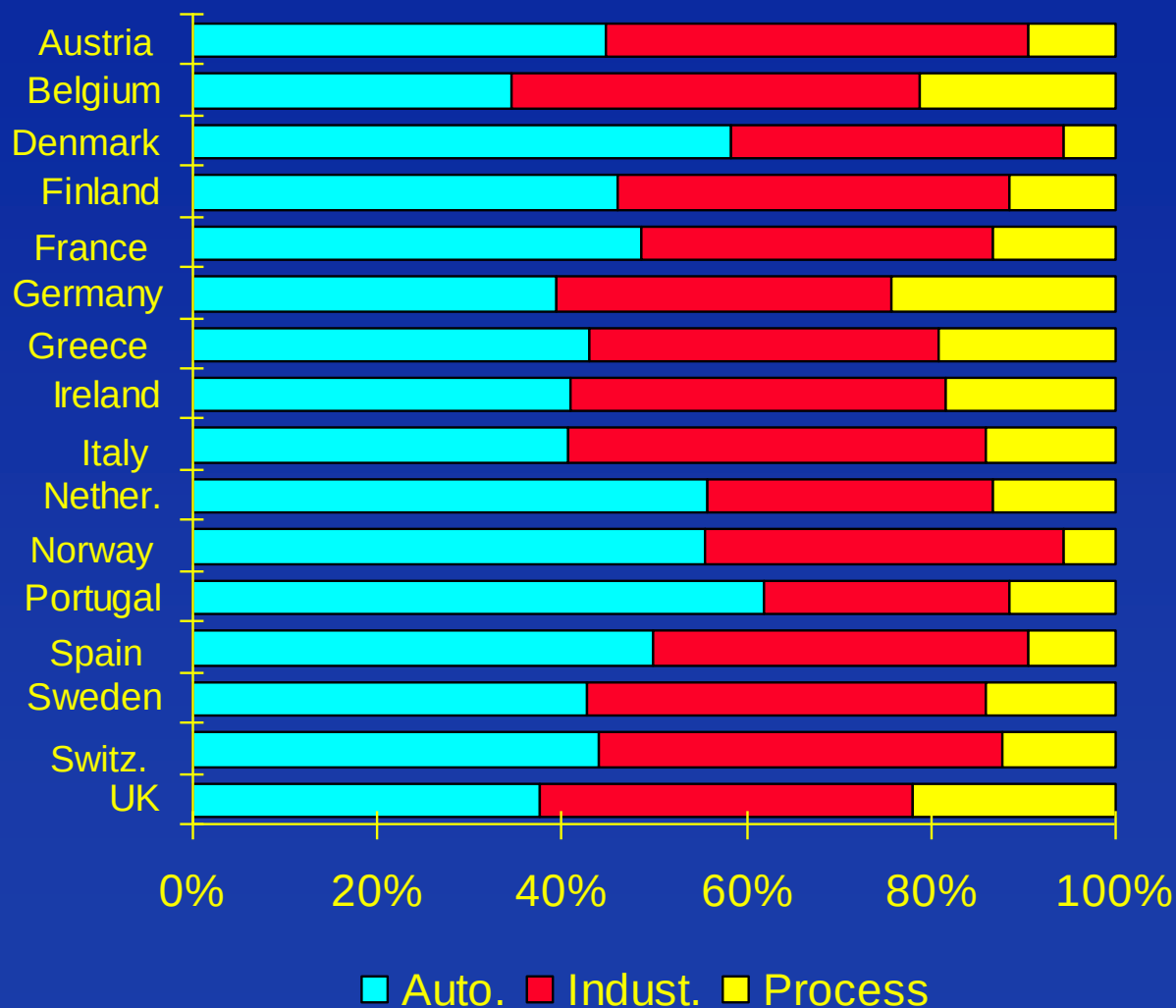
Group	Company Types	Number
A	Lubricant blenders and marketers*	>800
B	Mineral base oil producers	102
C	Re-refining companies	>60
D	Synthetic base oil producers**	99
E	Additive suppliers	35

* Worldwide, except the Russia, China and other CPEs.

** Polyalphaolefins, esters, polyisobutenes, polyalkylene glycols, phosphate esters, alkyl benzenes and silicones



Lubricants Use: European Country Variations



Sources: Pathmaster Marketing

Data for 2020



Main Lubricant Importing Countries, 2022

- Almost all countries have one or more lubricant blending plants, even if some of them are quite small
- It has been estimated that there are more than 1000 blending plants, world-wide
- Most mainstream lubricants are blended and packaged in the country in which they are sold
- A few, specialised lubricants are manufactured in a small number of countries, particularly in Western Europe and North America, and exported globally
- Marine lubricants are generally blended in larger ports, globally, and loaded directly onto ships



Bio-based Lubricants

- Base oils made from plant-based raw materials are currently manufactured in only a few locations and do not appear to be exported to many countries
- They are only made in relatively limited quantities, compared with Group I, II and III base oils
- Many are made using raw materials more usually used in manufacturing foodstuffs
- Lubricants made using bio-based base oils have been found to have lower carbon footprints than mineral oil lubricants, although they are not zero-carbon
- Many biodegradable lubricants are made using synthetic esters

Largest Lubricant Manufacturers, 2000 to 2020

Position	Company			
	2000	2011	2017	2020
1	Exxon	Shell	Shell	Shell
2	Shell	ExxonMobil	ExxonMobil	ExxonMobil
3	BP/Castrol	BP/Castrol	BP/Castrol	BP/Castrol
4	CNPC	Chevron	Chevron	PetroChina
5	Chevron	Total	Total	Sinopec
6	Pennzoil	PetroChina	PetroChina	Total
7	Total	Sinopec	Sinopec	Chevron
8	Lukoil	Idemitsu	Idemitsu	Fuchs
9	Idemitsu	Fuchs	Fuchs	Valvoline
10	Nippon Oil	Nippon Oil	JXTG Group	Idemitsu
11	Valvoline	Lukoil	Valvoline	TXTG Group
12	Fuchs	Valvoline	Lukoil	Hindustan
13	Indian Oil	Petronas	Petronas	Pertamina
14	Agip	Pertamina	Gulf	Indian Oil
15	Repsol	Indian Oil	Pertamina	Rosneft

Source: Fuchs Petrolube SE Annual Reports



Largest Base Oil Manufacturers, 2022

Company	World Market Share (%)
ExxonMobil	12.5
PetroChina	5.6
Sinopec	3.8
Chevron	3.8
S-Oil	3.4
Saudi Aramco	3.2
Shell	3.0
SK Corp	2.7
Ergon	2.4
CNOOC	2.2
GS Caltex	2.2
Eneos	2.1
Luberef	1.9
Others	49.4
Total	100.0



The Future: 1

- There is a large overcapacity to manufacture base oils, globally, but particularly in North America, the Middle East and Asia
- China and India have built, or are planning to build, numerous base oil manufacturing plants
- Both countries are aiming to become self-sufficient in base oil manufacturing
- Exports of base oils from Russia are likely to be redirected to Asia and Africa and away from Europe
- Countries that have exported base oils to China and India may need to find alternative destinations
- Central and South America and Africa are likely to continue importing all types of base oils

The Future: 2

- As greater volumes of higher quality lubricants are required, these are increasingly likely to be blended and packaged in local markets
- Base oils and lubricants made from renewable (plant-based) sources are likely to remain niche products, due to supply constraints and competition with foodstuffs
- Future growth with bio-based lubricants may need to come from using plant wastes as raw materials
- Oil and gas are going to be needed for the foreseeable future, to make lubricants, bitumen, petrochemicals waxes and other speciality products

Summary and Conclusions

- Base oils are widely traded and available from numerous sources
- Group II and Group III base oils are slowly replacing Group I base oils, except for brightstock
- Naphthenic base oils are likely to retain a market share of about 10 percent
- The use of synthetic base oils will continue to grow
- Lubricants are blended and packaged close to local and regional markets
- Specialist lubricants are exported mainly from Europe and North America
- The main lubricant consuming countries are likely to continue to be so