FuelsEurope

REFINING PRODUCTS FOR OUR EVERYDAY LIFE

STATISTICAL REPORT
2016

Editor: John Cooper

Printed in Belgium - Designed by www.morris-chapman.com

FuelsEurope

REFINING PRODUCTS FOR OUR EVERYDAY LIFE

STATISTICAL REPORT
2016

FuelsEurope

REFINING PRODUCTS FOR OUR EVERYDAY LIFE

FuelsEurope

#FuelsEurope

www.youtube.com/fuelseurope

www.fuelseurope.eu

Foreword

Verified and reliable data is essential to support economic and political analysis. In this respect FuelsEurope Statistical Report 2016 aims at providing a comprehensive set of statistics about the refining industry that will be used by all stakeholders. This 3rd edition, with a new look and user-friendly format provides the most up-to-date information based on currently available data about the sector.

The latest 2016 edition contains data on global energy markets, oil products demand and international trade flows, fuel specifications, prices and margins, close integration with petrochemical sector as well as the environmental performance of the EU refining industry.

A side navigation as well as the colour coding aim at helping our readers browse effortlessly through the document. Each colour corresponds to a specific theme making browsing between subsections user-friendly. We hope that you will find this Report useful.

- **Oil & Energy**
- **Oil Products**
- **Prices and Margins**
- **Refining**
- **Marketing Infrastructures**

John Cooper
Director General

SAVE MORE than FUEL

10 TIPS TO HELP YOU DRIVE MORE EFFICIENTLY AND REDUCE EMISSIONS

Keep your car well serviced and check the oil level regularly.

Correctly maintained cars can operate more efficiently and help reduce CO_2 emissions.

Check your tyre pressure every month.

Under-inflated tyres can increase fuel consumption by up to 4%*.

Remove unnecessary weight from your boot or back seats.

The heavier the car, the harder the engine has to work and the more fuel it consumes.

Close your windows, especially at higher speeds, and remove empty roof racks.

This will reduce wind resistance and can lower your fuel consumption and CO_2 emissions by up to 10%**.

Use air conditioning only when necessary.

Unnecessary use increases fuel consumption and CO_2 emissions by up to 5%**.

Start driving soon after starting the engine and turn off the engine when stationary for more than one minute.

Modern engines enable you to just get in and go, thus reducing fuel consumption.

Drive at reasonable speeds and above all, drive smoothly.

Every time you accelerate or brake suddenly, your engine uses more fuel and produces more CO_2.

When accelerating, change up gears as early as possible.

Higher gears are more economical in terms of fuel consumption**.

Try to anticipate traffic flow.

Look at the traffic as far ahead as possible in order to avoid unnecessary stopping and starting within the flow of traffic.

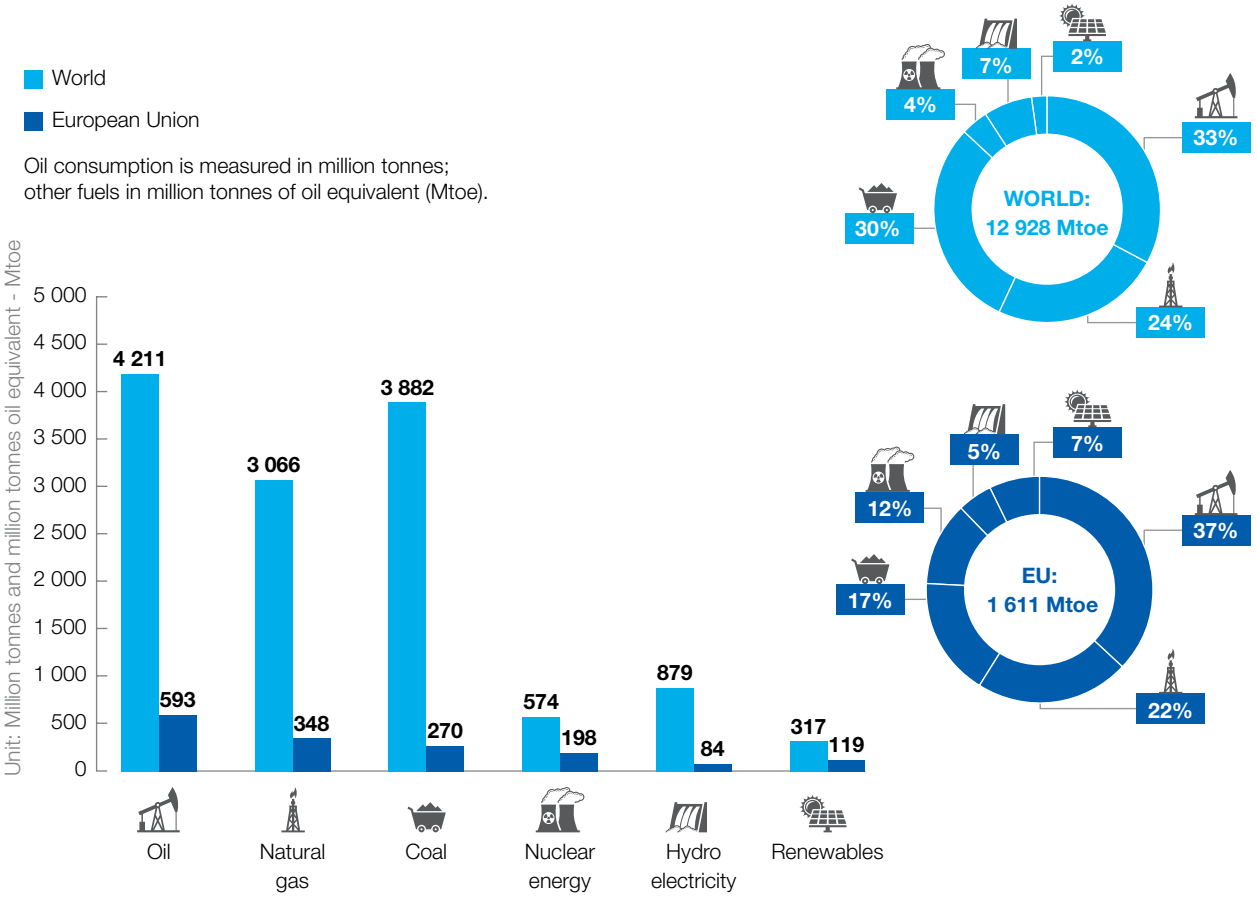
Consider car sharing for work or leisure.

You will help reduce congestion and fuel consumption.

*** International Energy Agency ** European Commission**

FIG.1 WORLDWIDE ENERGY CONSUMPTION BY FUEL TYPE IN 2014

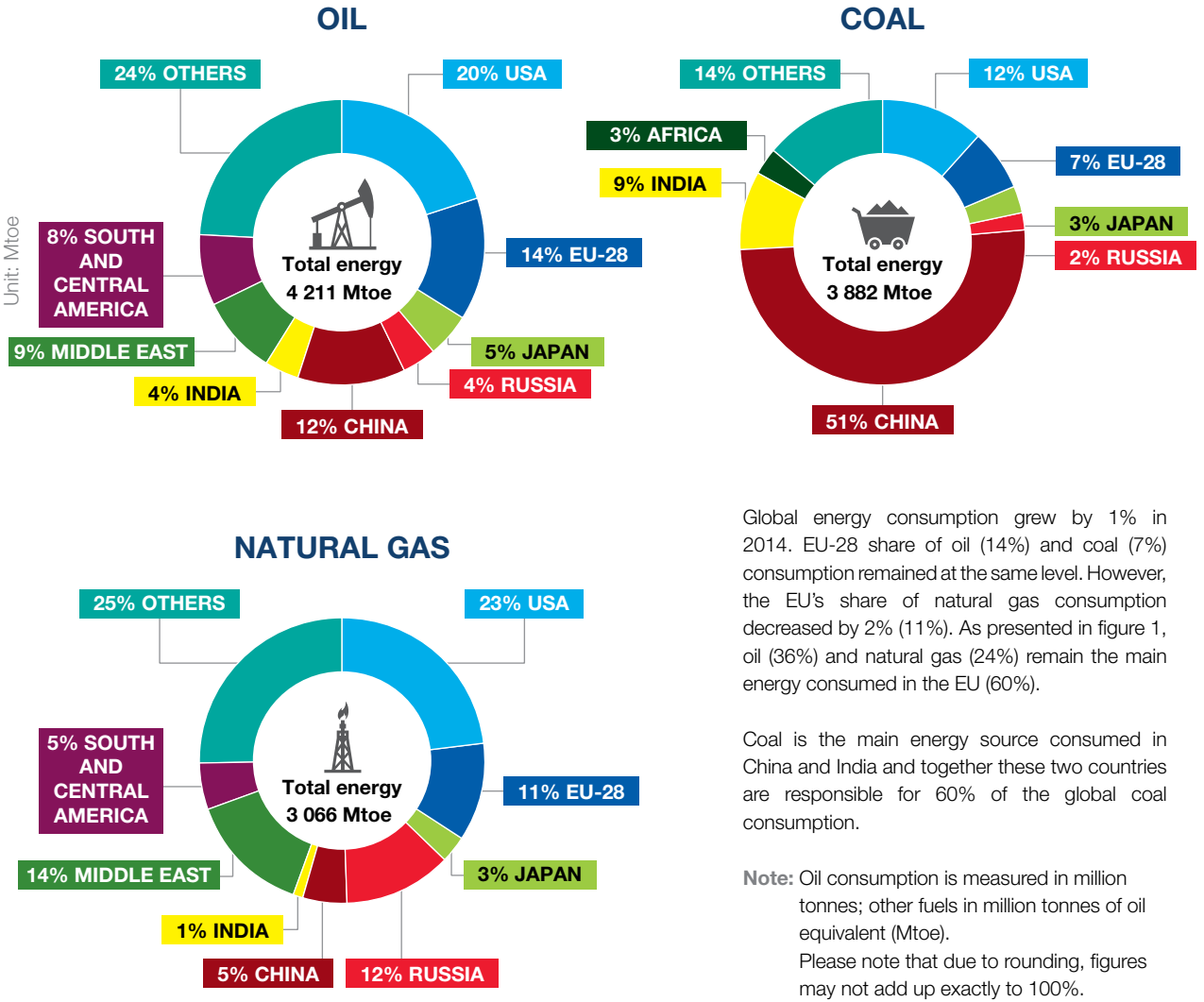
Source: BP Statistical Review of World Energy 2015



Oil, natural gas and coal remain the dominant source of energy fuelling the global economy (together 86%). Oil remained the main energy source globally. The overall share for renewables, including hydro electricity remains small (9%). The EU, unlike other major economies, has a higher share of nuclear (12%) and renewables and hydro (12%) in its energy mix.

FIG.2 WORLDWIDE ENERGY CONSUMPTION BY REGION IN 2014

Source: BP Statistical Review of World Energy 2015



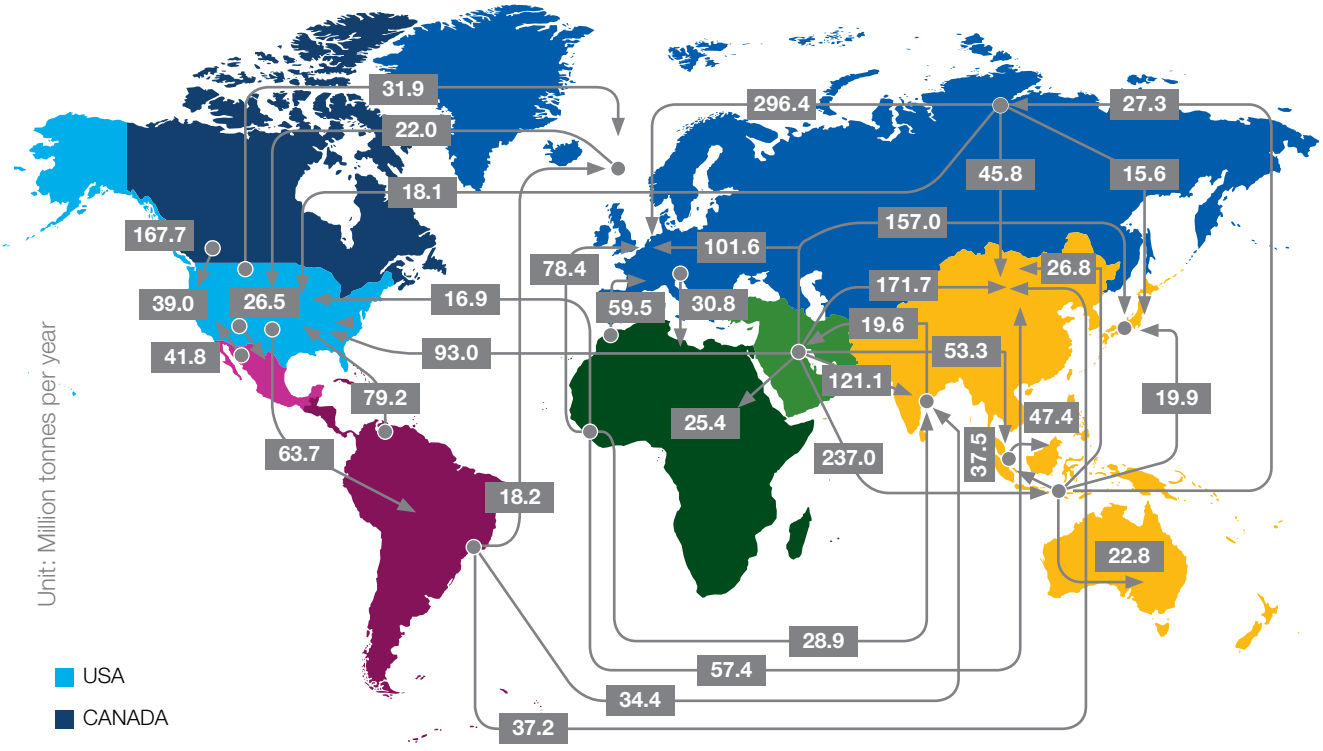
Global energy consumption grew by 1% in 2014. EU-28 share of oil (14%) and coal (7%) consumption remained at the same level. However, the EU's share of natural gas consumption decreased by 2% (11%). As presented in figure 1, oil (36%) and natural gas (24%) remain the main energy consumed in the EU (60%).

Coal is the main energy source consumed in China and India and together these two countries are responsible for 60% of the global coal consumption.

Note: Oil consumption is measured in million tonnes; other fuels in million tonnes of oil equivalent (Mtoe).
Please note that due to rounding, figures may not add up exactly to 100%.

FIG.3 WORLDWIDE CRUDE OIL MOVEMENT IN 2014

Source: BP Statistical Review of World Energy 2015

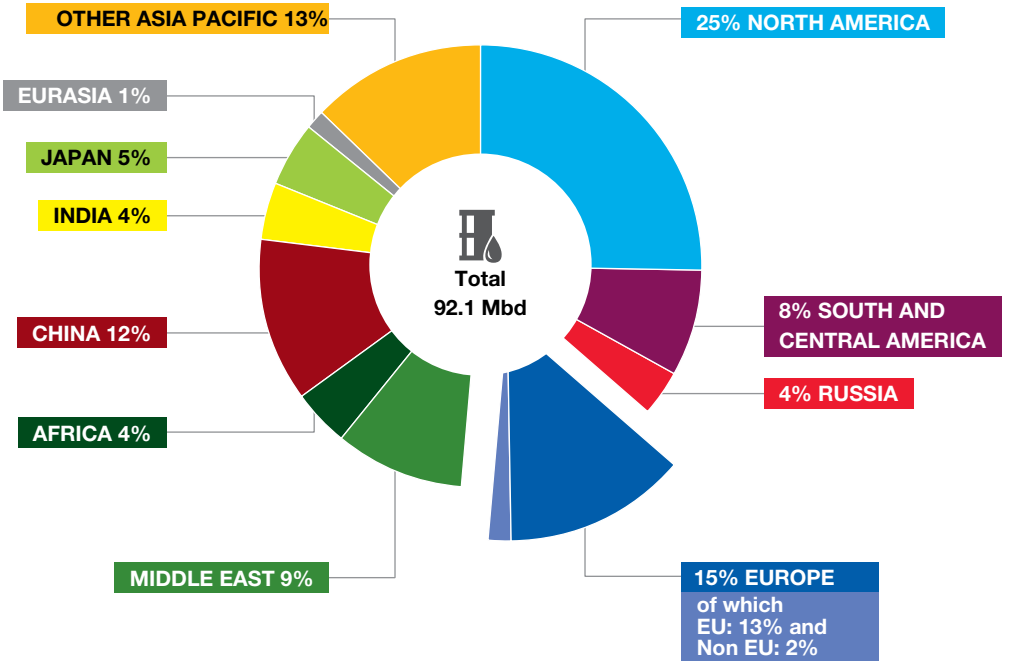


Crude oil is an internationally traded commodity with trade flows taking place all over the world.

There are two open and transparent markets - crude oil and refined products - within which the European refining industry operates.

FIG.4 WORLDWIDE REFINED PRODUCT DEMAND AVERAGED 92.1 MILLION BARRELS PER DAY IN 2014, WITH EUROPE ACCOUNTING FOR 15%

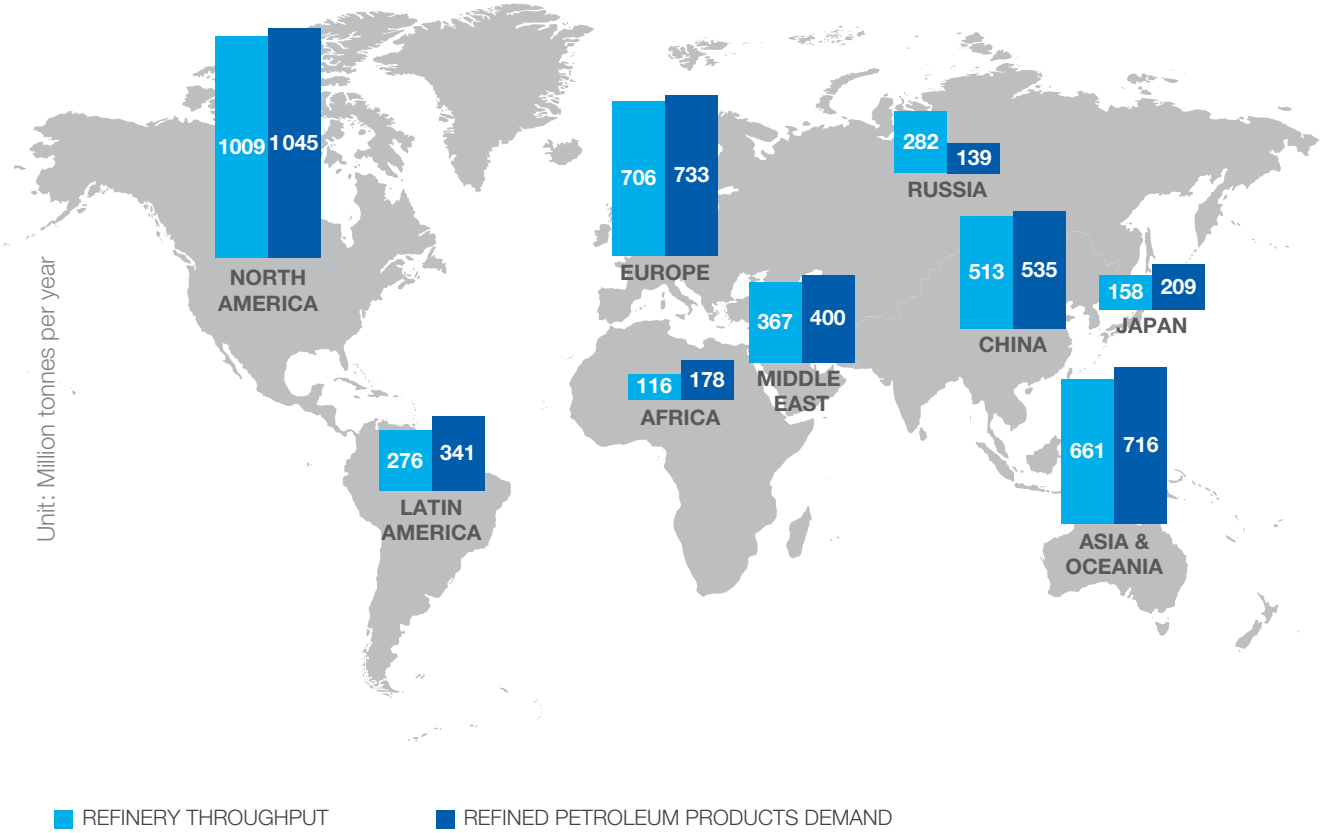
Source: BP Statistical Review of World Energy 2015



Global demand for oil refined products increased from 91.3 million barrels per day in 2013 to 92.1 in 2014. Although the European market is declining, it still remains the second largest in the world (15%) behind North-America (25%). China, Middle East and Africa noted a major growth, between 2.8 and 4.2% in demand for refined products.

FIG.5 WORLDWIDE REFINING SUPPLY/MARKET DEMAND BALANCES IN 2015

Source: Wood Mackenzie



The refining supply/market demand balance shows that most of the regions are dependent on imports to meet market demand. Russia has a positive trade balance which provides Russia in particular a key role in supplying demand from other regions.

Relatively balanced product demand and refinery throughput in the EU hide a large surplus of EU gasoline production and a significant shortage of diesel and jet production.

FIG.6 EU TOTAL OIL DEMAND AMOUNTED TO 610.3 MILLION TONNES IN 2015

Source: Wood Mackenzie

Unit: Million tonnes per year

COUNTRY	Mt/y	COUNTRY	Mt/y
Austria	12.5	Italy	59
Belgium	28.9	Latvia	1.7
Bulgaria	4.0	Lithuania	2.4
Croatia	3.0	Luxembourg	2.8
Cyprus	2.6	Malta	2.6
Czech Republic	9.2	Netherlands	44.4
Denmark	7.2	Poland	24.9
Estonia	1.5	Portugal	11.1
Finland	9.1	Romania	9.8
France	80	Slovakia	3.8
Germany	116.3	Slovenia	2.4
Greece	12.9	Spain	61.1
Hungary	6.6	Sweden	12.9
Ireland	6.7	United Kingdom	69.9
EU TOTAL	**610.3**		
Norway	9.8		
Switzerland	11.3		
Turkey	38.1		
TOTAL NO + CH + TR	**59.2**		
TOTAL	**669.5**		

EU
NON EU

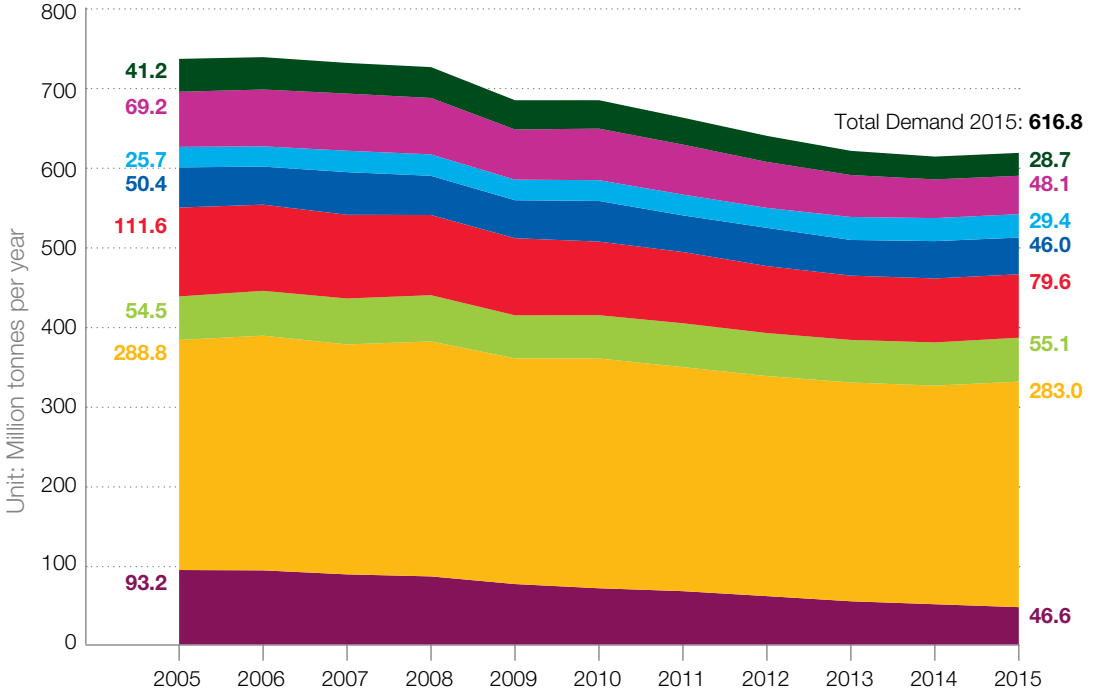
EU-28 total oil demand amounted to 610.3 Mt for 2015, representing a slight decrease of approximatively 1% compared to 2014.

Most EU Member States recorded a decrease in demand. While the major EU Member States such as Germany (-1.04%) and the UK (-1.91%) recorded only a small decrease, smaller EU Member States such as Slovakia (-6.17%), Luxembourg (-5.34%) and Hungary (-4.76%) faced the biggest fall in oil demand.

Note: Please note that due to rounding, figures may not add up.

FIG.7 DEMAND HISTORY OF OIL PRODUCTS IN THE EU

Source: Wood Mackenzie

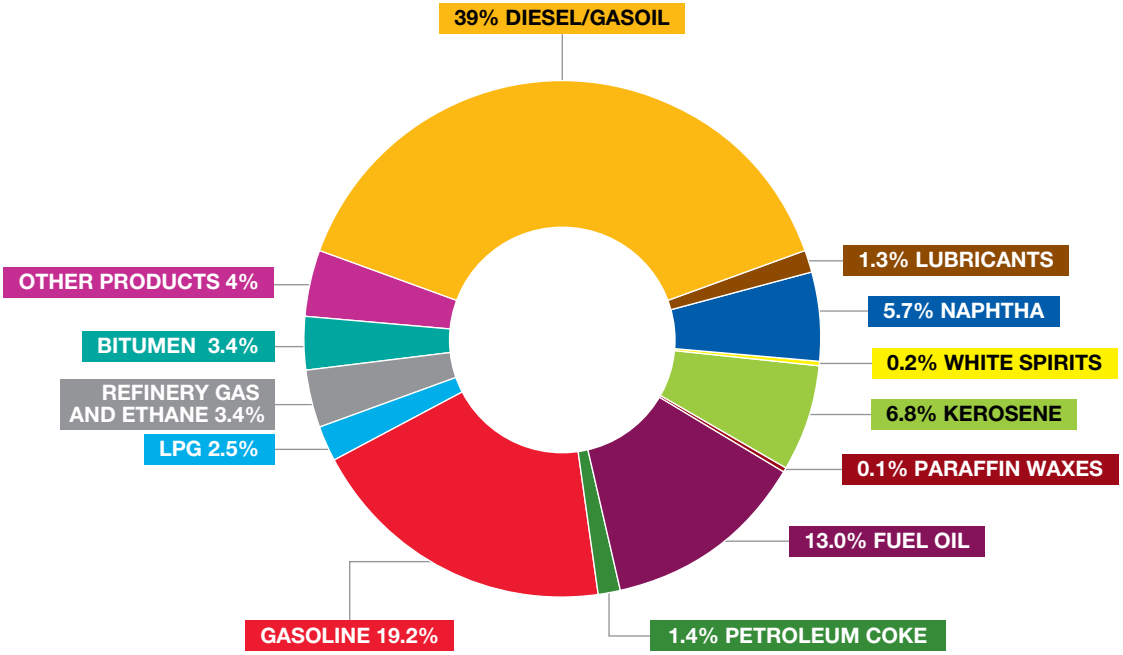


Since 2009, we can observe a downward trend for oil products demand in the EU. Over the past 6 years, overall demand has declined by 8%. The downward trend is mainly driven by the decrease in fuel oil and gasoline, whilst gasoil and kerosene decreased insignificantly.

- FUEL OIL
- DIESEL/GASOIL
- JET/KEROSENE
- GASOLINE
- NAPHTHA
- LPG
- OTHER PRODUCTS
- REFINERY FUEL & LOSS

FIG.8 AVERAGE REFINERY OUTPUT BY PRODUCT TYPE IN OECD EUROPE IN 2013

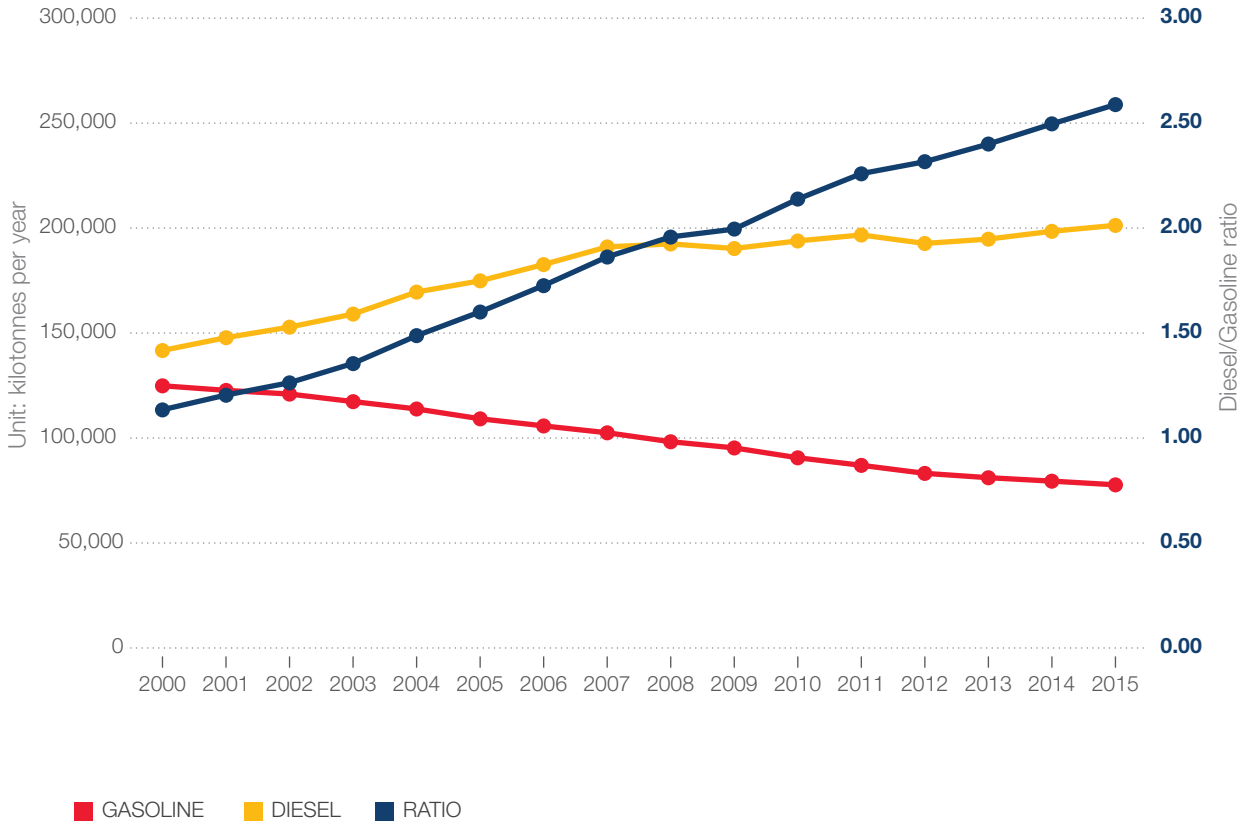
Source: OECD



A wide range of products, from transportation and industrial fuels to chemical feedstock, are produced from crude oil. EU refineries also produce many specialty products such as bitumen for road construction and roofing, lubricants for transport and industry, petroleum coke for the metal industry as well as waxes, solvents and other specialised products. Fuels for transport represent the biggest share of the production.

FIG.9 ROAD FUEL DEMAND IN THE EU

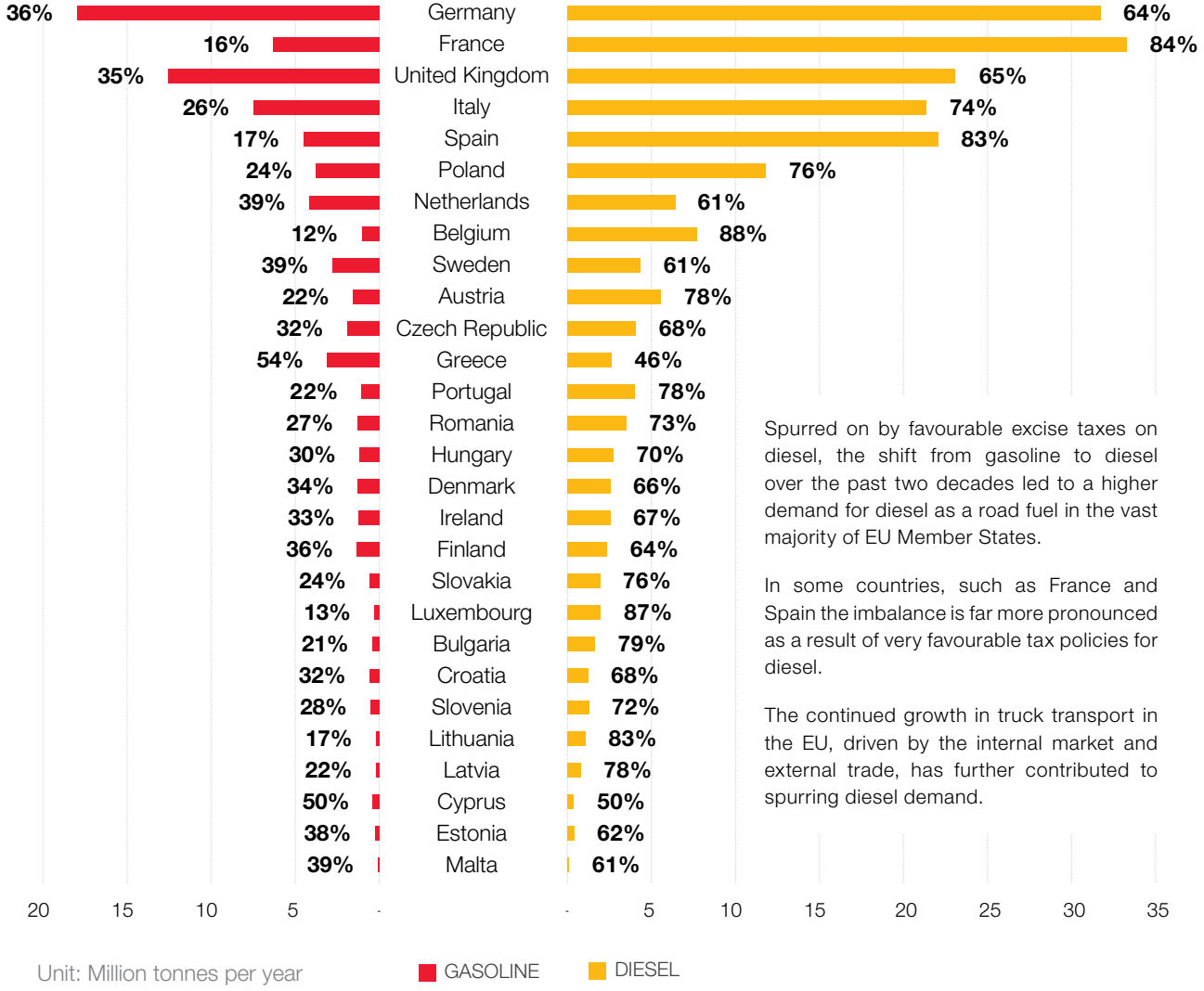
Source: Wood Mackenzie



The tax-incentivised dieselisation trend has significantly contributed to a fundamental change in the EU road fuel demand structure. The shift from gasoline to diesel began some 25 years ago and led to a major demand decline as well as a shortage of diesel production in the EU. Gasoline demand continues to decline while diesel demand is on the rise, currently reaching a 2.6 demand ratio in 2015.

FIG.10 ROAD FUEL DEMAND IN THE EU BY COUNTRY IN 2015

Source: Wood Mackenzie



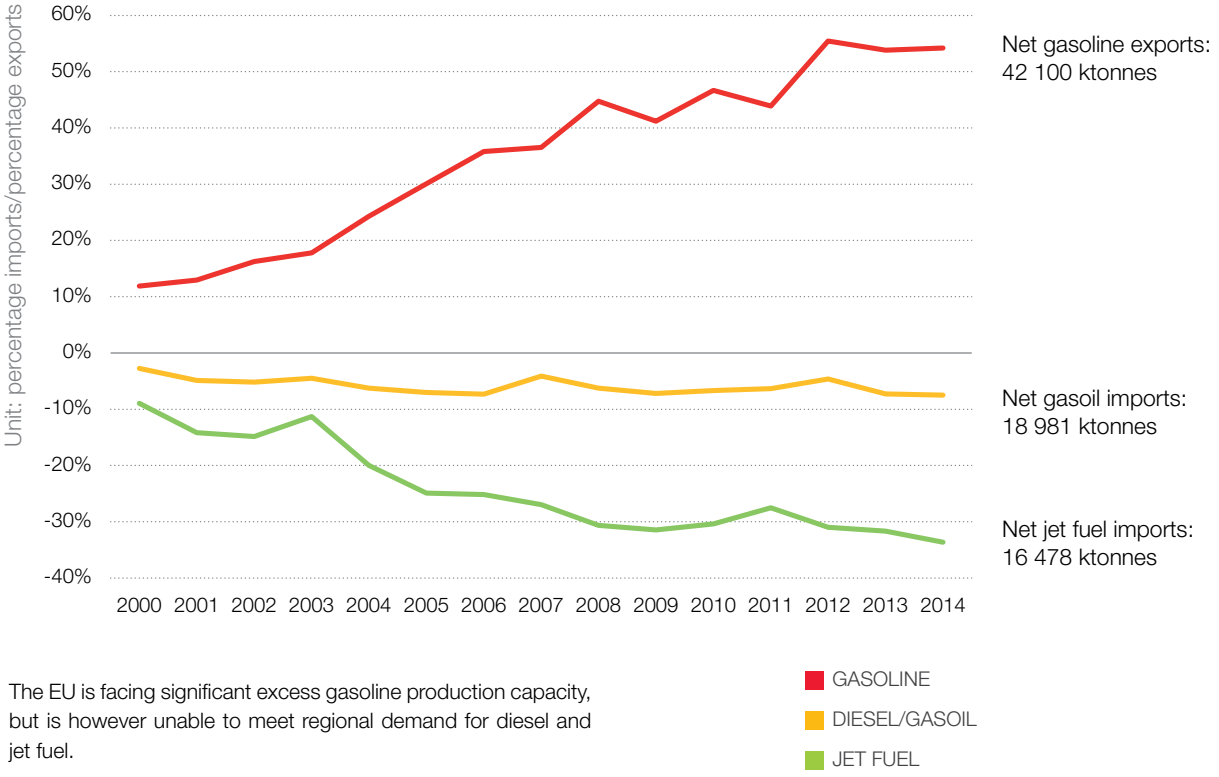
Spurred on by favourable excise taxes on diesel, the shift from gasoline to diesel over the past two decades led to a higher demand for diesel as a road fuel in the vast majority of EU Member States.

In some countries, such as France and Spain the imbalance is far more pronounced as a result of very favourable tax policies for diesel.

The continued growth in truck transport in the EU, driven by the internal market and external trade, has further contributed to spurring diesel demand.

FIG.11 NET TRADE FLOWS FOR REFINED PRODUCTS DEMONSTRATE THE TREND OF GROWING GASOLINE SURPLUS AND DIESEL / GASOIL / JET FUEL DEFICITS

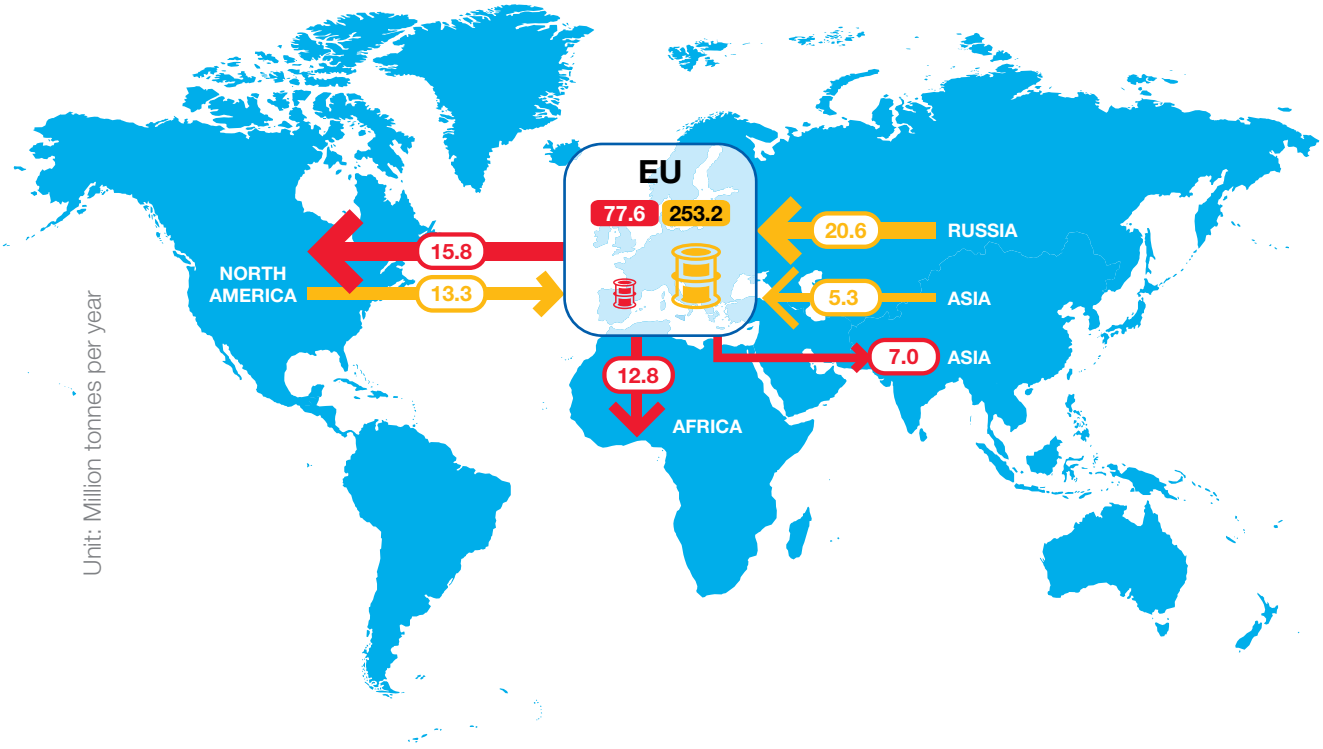
Source: Eurostat



The EU is facing significant excess gasoline production capacity, but is however unable to meet regional demand for diesel and jet fuel.

FIG.12 MAJOR GASOLINE AND DIESEL/GASOIL TRADE FLOWS TO AND FROM THE EU IN 2014

Source: Eurostat



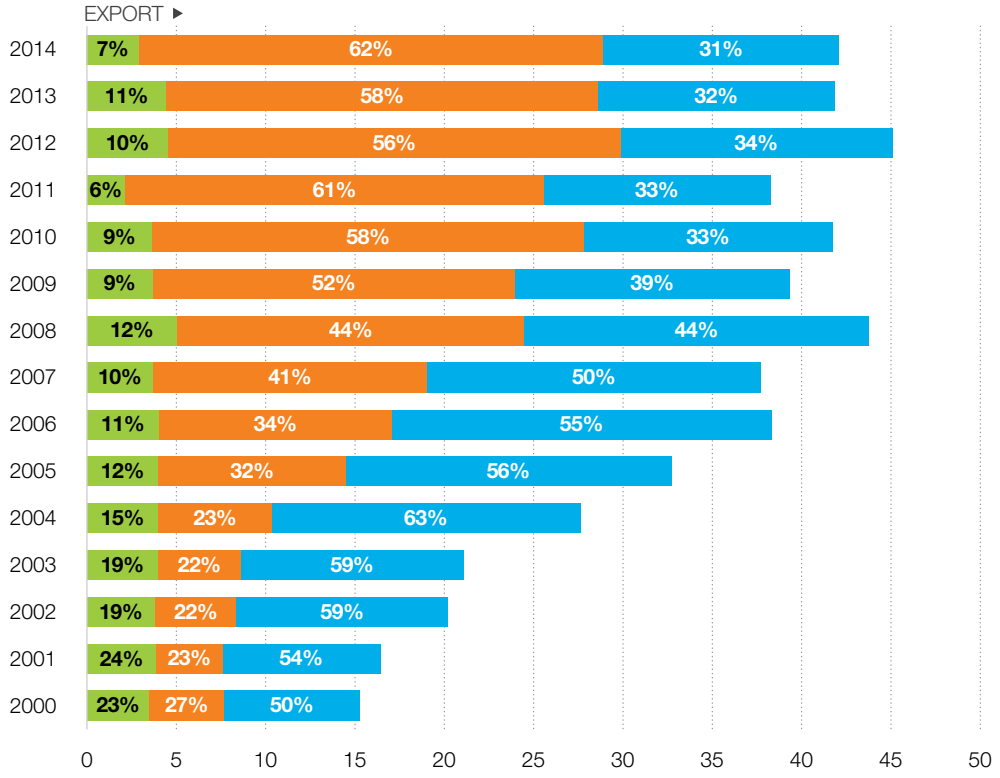
The major trade flows to and from the EU are a result of the gasoline/diesel imbalance demand in Europe. As a consequence, significant excess gasoline production capacity needs to be exported, while, to meet regional demand for diesel and jet fuel, Europe became heavily reliant on other countries for import, especially Russia, the Middle East & USA.

North America was the traditional market for exporting gasoline surplus but the recent shale oil revolution and cheap energy enabled US refiners to increase their supplies for their internal market and compete on other export markets with EU refiners.

- GASOLINE DEMAND IN 2014
- DIESEL/GASOIL DEMAND IN 2014
- MAIN GASOLINE TRADE FLOWS IN 2014
- MAIN DIESEL/GASOIL TRADE FLOWS IN 2014

FIG.13 EU GASOLINE TRADING BALANCE:
USA IS A KEY EXPORT MARKET FOR THE EU

Source: Eurostat



Note: Please note that due to rounding, figures may not add up exactly to 100%

Unit: Million tonnes per year

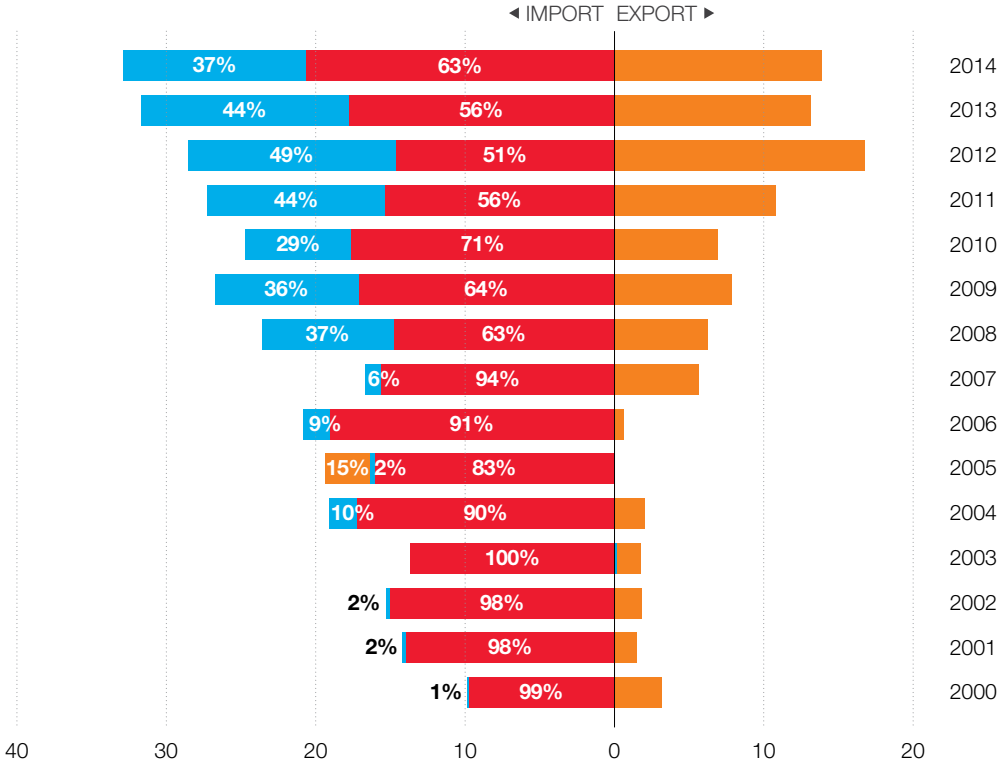
EUROPE NON EU
REST OF THE WORLD
USA

The US was the traditional export market for the structural EU gasoline surplus. The recent shale oil boom has decreased export opportunities to the US and forced EU refiners to find other markets, primarily Africa and Asia.

The EU gasoline surplus in 2014 has decreased by 1% versus 2013. Comparatively, the share of the US has decreased from 44% of the total exports in 2008 to 31% in 2014.

FIG.14 EU DIESEL/GASOIL TRADING BALANCE: RUSSIA IS A LEADING EXPORTER OF GASOIL TO THE EU

Source: Eurostat



Note: Please note that due to rounding, figures may not add up exactly to 100%

Unit: Million tonnes per year

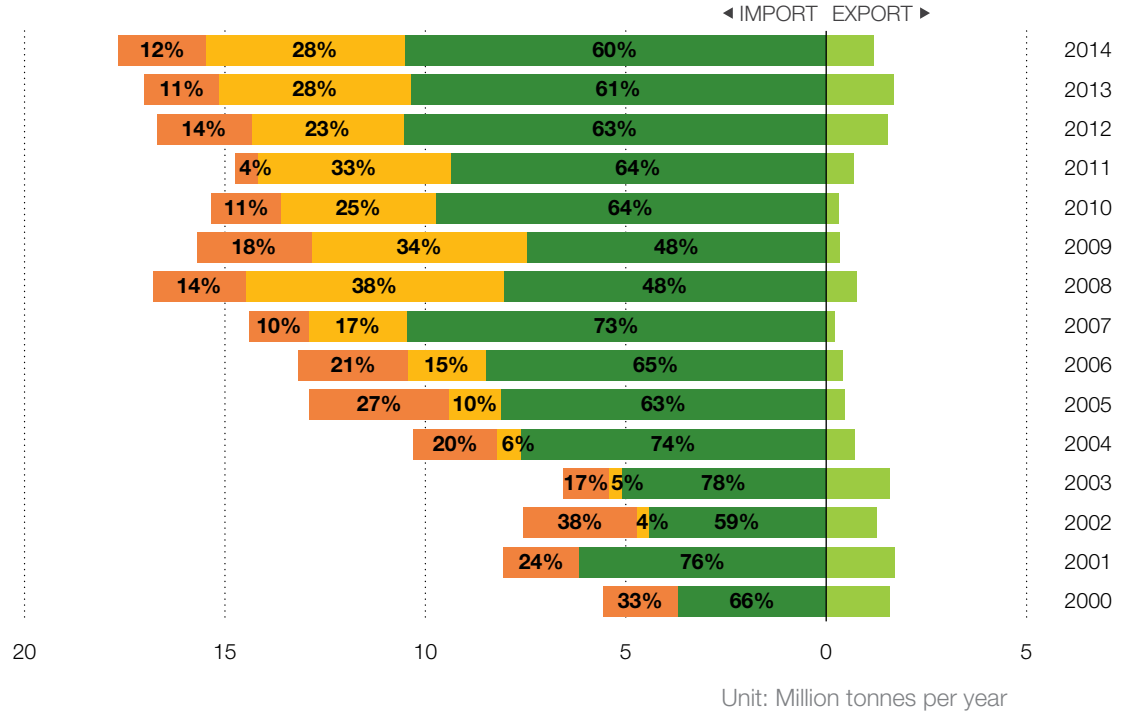
NORTH AMERICA
RUSSIA
REST OF THE WORLD

After a significant increase of imports of gasoil from the US between 2008 and 2013, Russia recovered some of the lost shares in 2014 to remain the leading exporter of gasoil to the EU. This continued dependence of the EU on imports of gasoil is the result of the diesel/gasoline imbalance that the EU has faced for many years.

FIG.15 EU JET FUEL TRADING BALANCE:

MIDDLE EAST REMAINS MAIN JET FUEL SUPPLIER FOR THE EU

Source: Eurostat

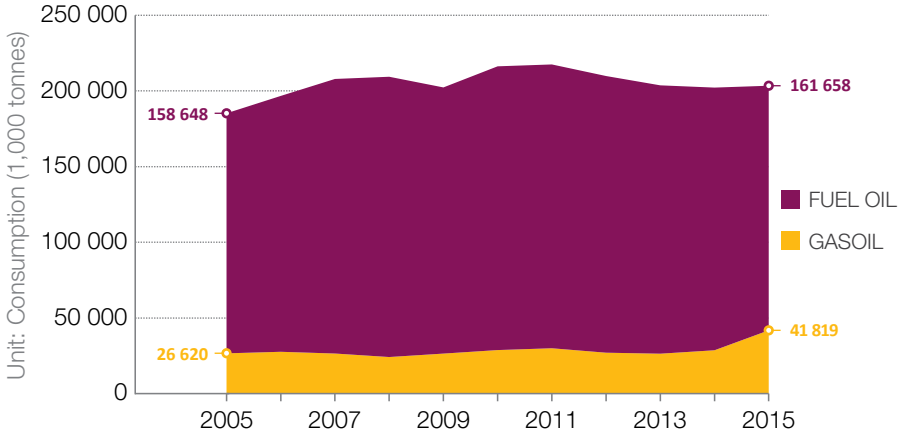


There is a growing EU dependence on jet fuel imports originating mainly from the Middle-East.

Note: Please note that due to rounding, figures may not add up exactly to 100%.

FIG.16a GLOBAL MARINE FUEL CONSUMPTION

Source: Wood Mackenzie

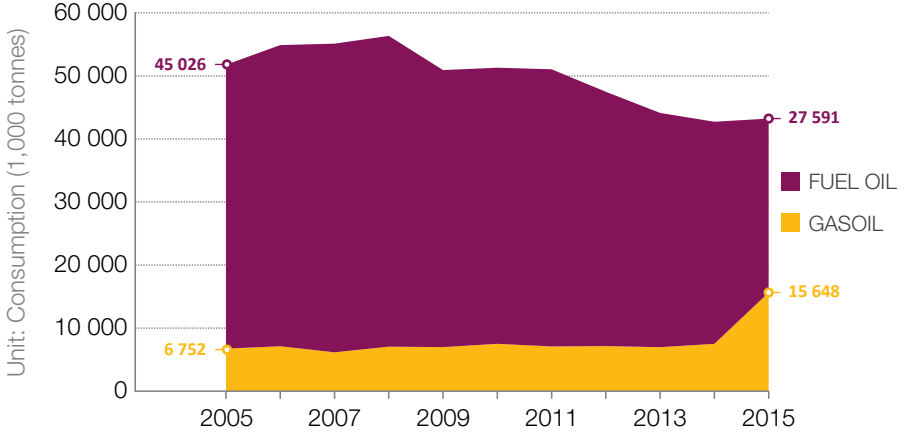


The global demand for marine fuel is mainly met by fuel oil (85%) while gasoil only represents 15% of the market.

The new limits for sulphur content of marine fuels could drastically change the market with a massive demand for low sulphur distillates, requiring major refinery investments.

FIG.16b MARINE FUEL CONSUMPTION IN THE EU

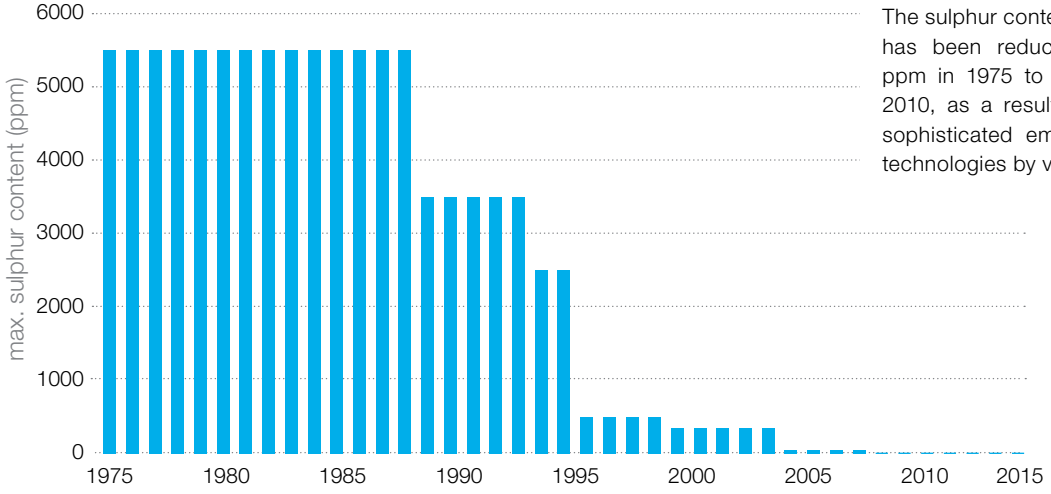
Source: Wood Mackenzie



The past year saw a rise in marine gasoil consumption at the expense of fuel oil. Switching to LNG or using scrubbers are alternatives to meeting the new International Maritime Organisation (IMO) emissions limits.

FIG.17a EU ROAD DIESEL SULPHUR SPECIFICATIONS

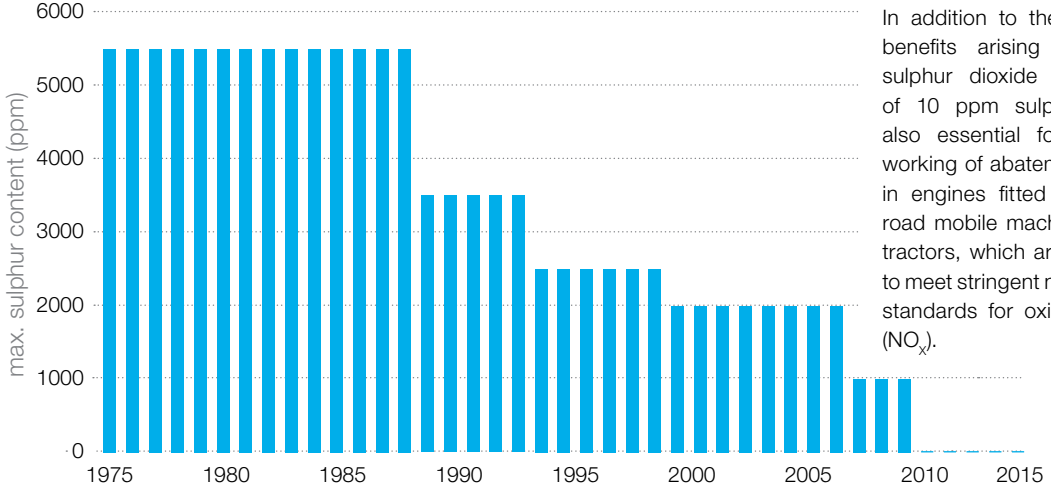
Source: PFC Energy



The sulphur content of road fuels has been reduced from 5500 ppm in 1975 to sulphur free in 2010, as a result of the use of sophisticated emissions control technologies by vehicles.

FIG.17b EU OFF-ROAD DIESEL SULPHUR SPECIFICATIONS

Source: PFC Energy

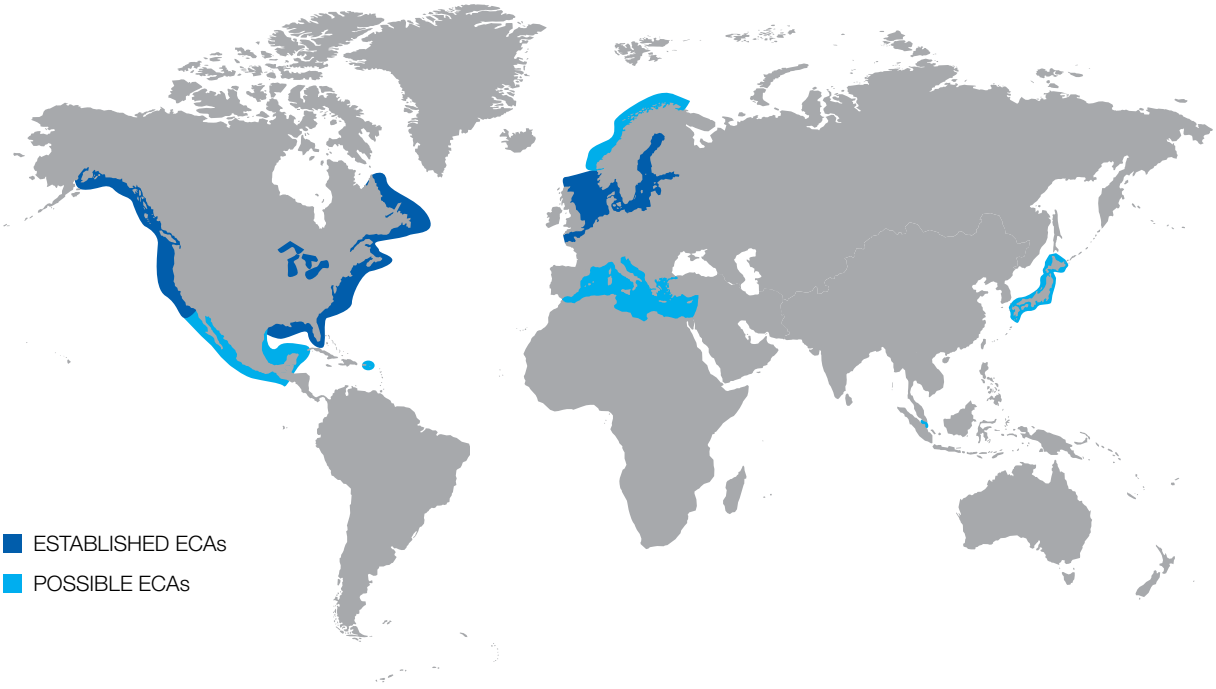


In addition to the environmental benefits arising from reduced sulphur dioxide (SO_2), the use of 10 ppm sulphur gas oil is also essential for the effective working of abatement technology in engines fitted in newer non-road mobile machinery, including tractors, which are manufactured to meet stringent new EU emission standards for oxides of nitrogen (NO_x).

FIG.18 MARINE FUEL SULPHUR SPECIFICATIONS

SULPHUR EMISSION CONTROL AREAS (SECAs)

Source: European Commission

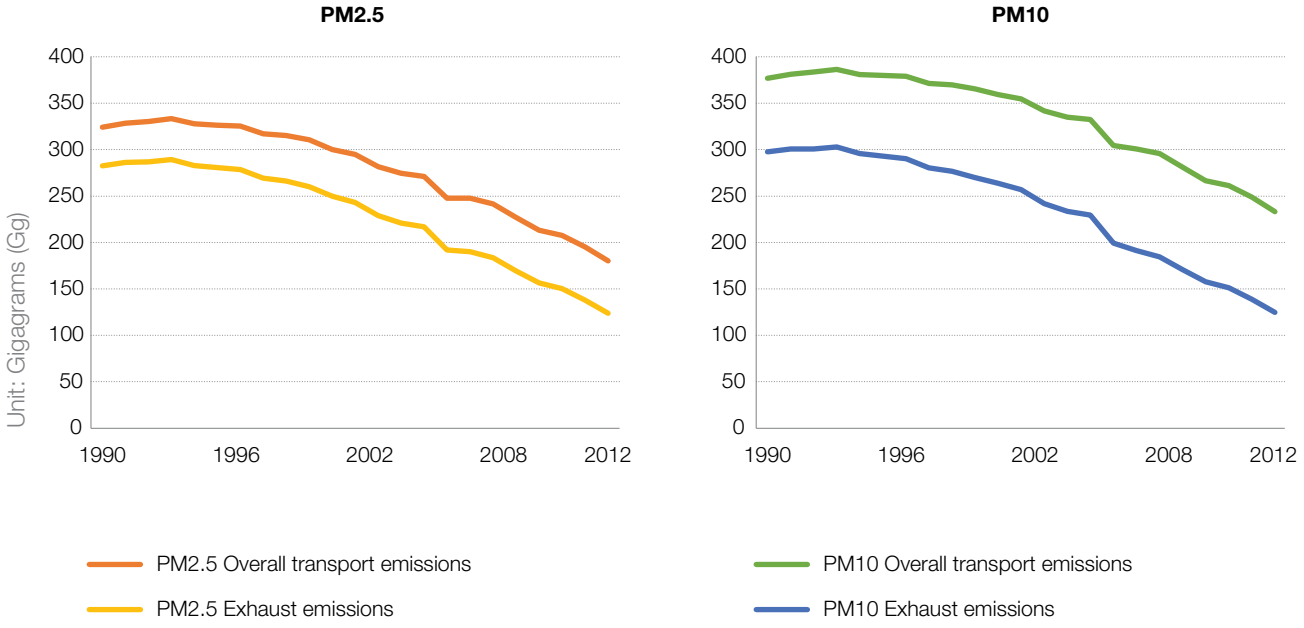


Limits for the sulphur content of marine fuels in SECAs:
1% until 31 December 2014
0.1% since 1 January 2015

Since January 2015, all vessels in the Emission Controlled Area (ECA) of the Baltic Sea, North Sea, English Channel and waters 200 nautical miles from the coast of US and Canada, had to reduce their sulphur emissions to 0.1%. Vessels are required to use either a distillate, an alternate fuel or install a scrubber that removes sulphur from the exhaust after combustion.

FIG.19a PM EMISSIONS FROM EXHAUST IN THE EU REDUCED BY OVER 50%

Source: European Environment Agency

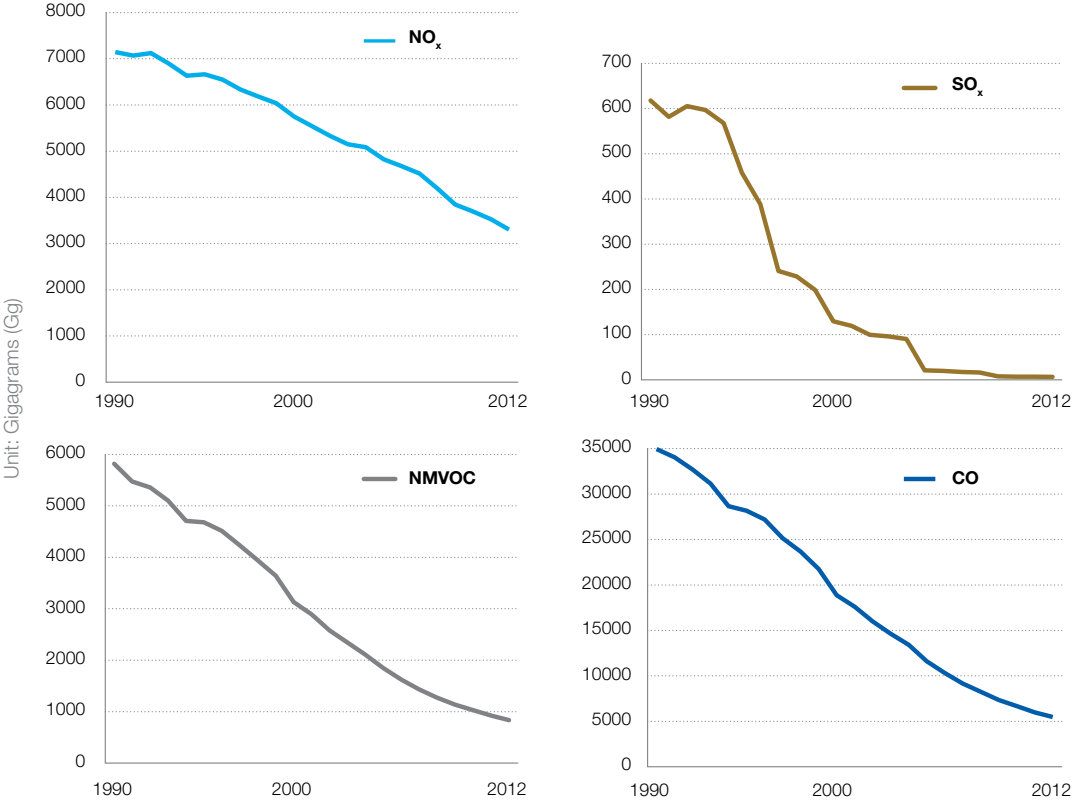


PM emissions are continuously decreasing as the result of cleaner diesel fuel, advanced engines and effective emissions control technology.

With the EURO6 standard, modern road vehicles with diesel engines are using highly efficient filters that remove over 99.9% of the number of PMs.

FIG.19b SINCE 1990 FUELS ARE GETTING PROGRESSIVELY CLEANER RESULTING IN SIGNIFICANT EMISSIONS REDUCTIONS

Source: European Environment Agency

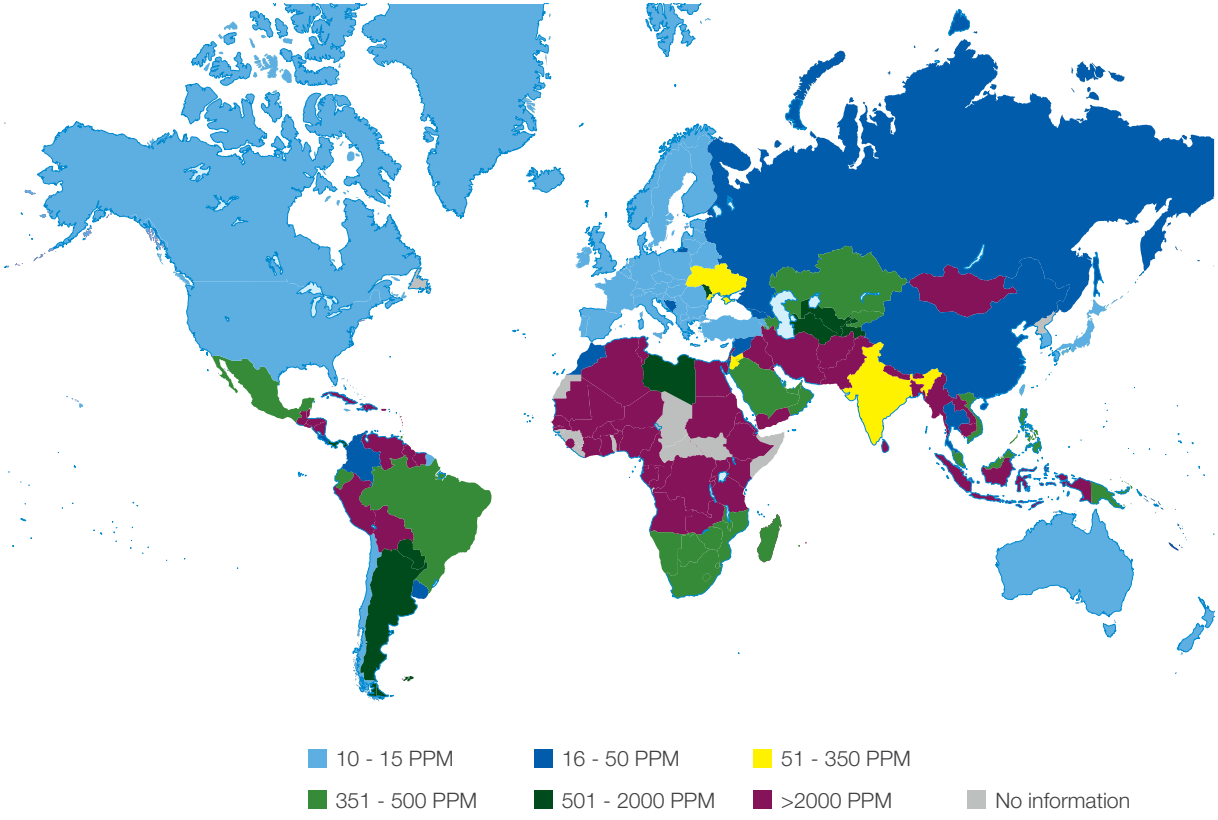


Since 1990 the refining industry has contributed to cleaner exhausts by today containing over 80% lower SO_X, NMVOC & CO, while NO_X emissions decreased by over 50%. These significant improvements are the result of the partnerships with the automotive industry aiming at improving the fuel-engine efficiency and leading to multiple environmental benefits.

NO_X - Nitrogen Oxides
SO_X - Sulphur Oxides
NMVOC - Non Methane Volatile Organic Compounds
CO - Carbon Monoxide

FIG.20 MAXIMUM ON-ROAD DIESEL SULPHUR LIMITS

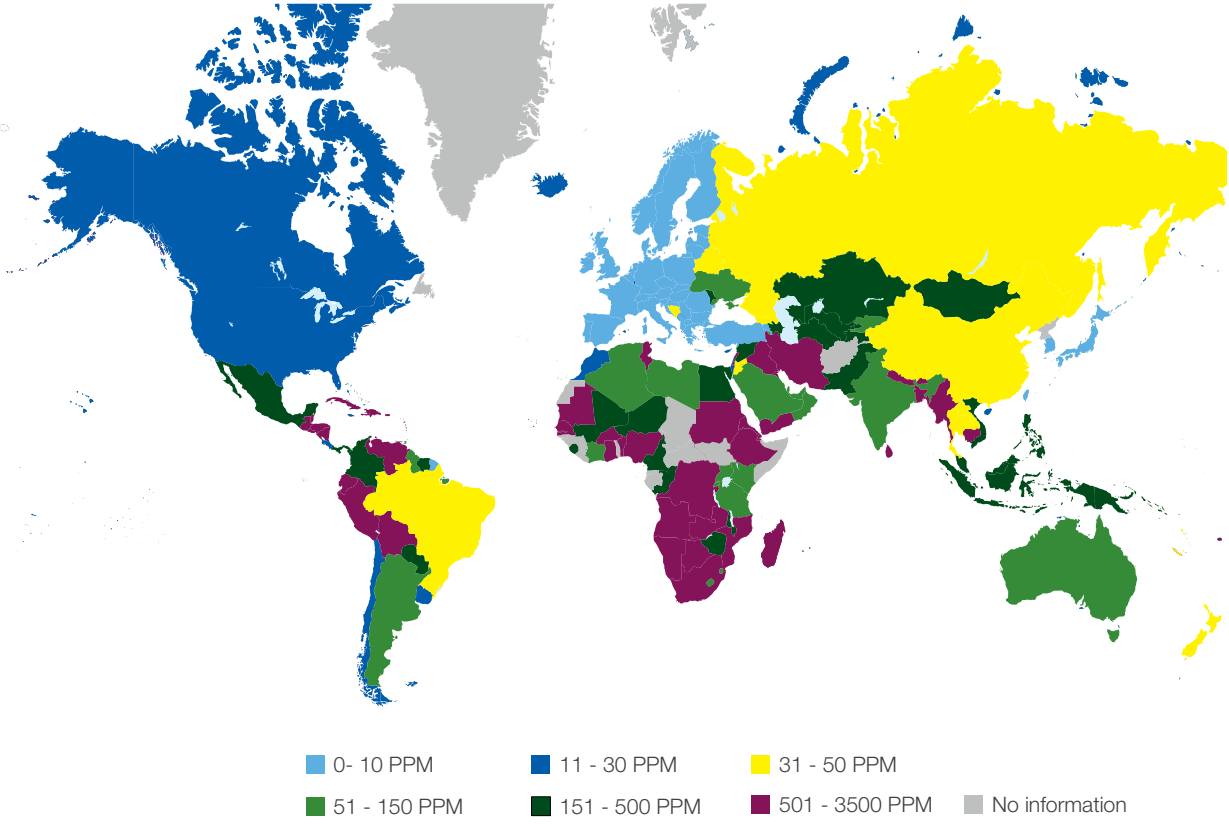
Source: Hart Energy Research and Consulting, 2015



Europe together with the USA, Canada, Japan, Australia and Chile apply the lowest (10-15 PPM) on-road diesel sulphur limits in the world. Countries may apply lower limits for different grades, regions/cities, or based on average content. Detailed information on limits and regulations can be found at www.stratasadvisors.com

FIG.21 MAXIMUM GASOLINE SULPHUR LIMIT

Source: Hart Energy Research and Consulting, 2015

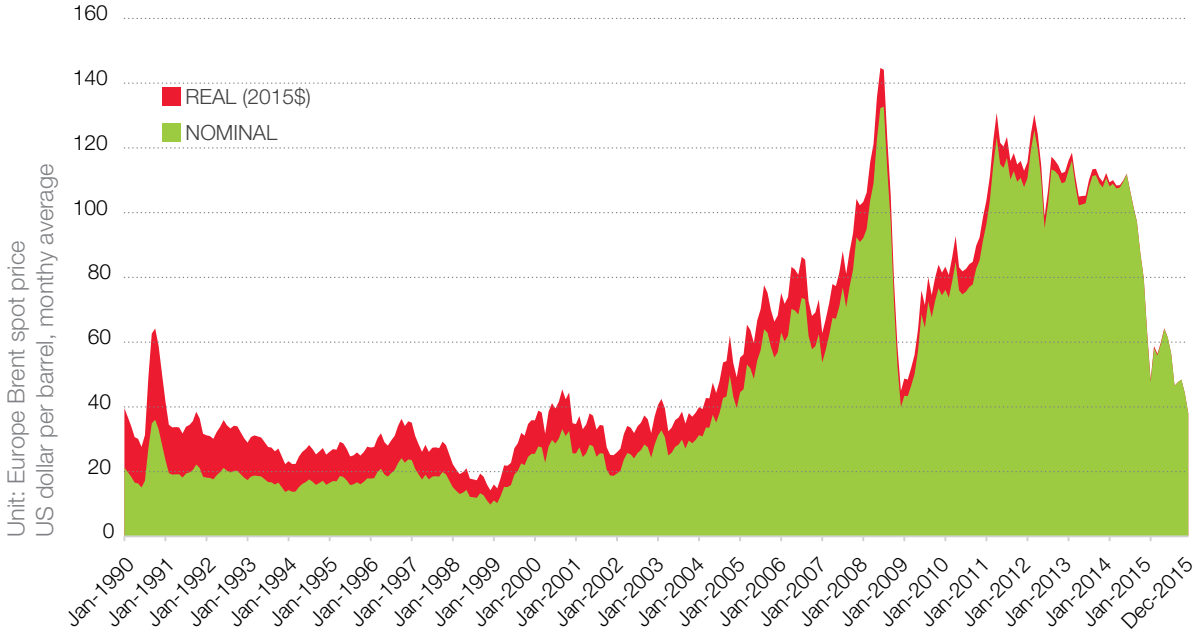


The EU has set the most stringent environmental specifications for sulphur in gasoline worldwide with a maximum level of 10 PPM.

Countries may apply lower limits for different grades, regions/ cities, or based on average content. Detailed information on limits and regulations can be found at www.stratasadvisors.com

FIG.22 CRUDE OIL PRICE EVOLUTION

Source: Energy Information Administration



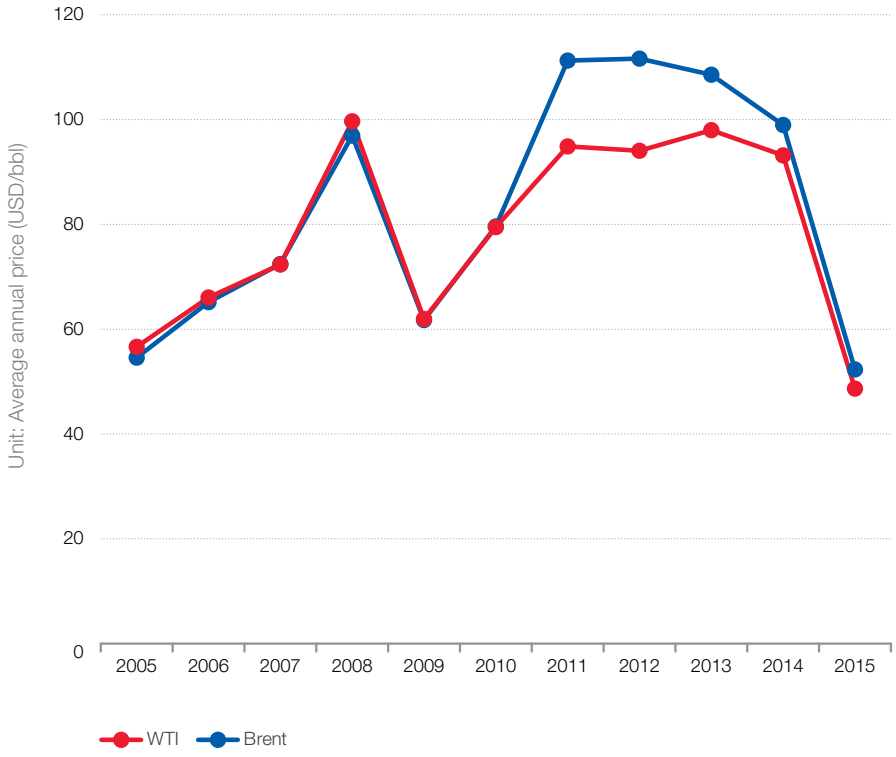
The EU Refining industry operates between two global, open and transparent markets: the market for crude oil and the market for refined products. The main benchmarks are priced in dollars.

The price of crude oil is set on international spot markets and reported by designated agencies. The price of oil is an important marker for the global economy and is closely watched by businesses and policy-makers.

After a decade of relatively low prices, oil started rising last decade, leading to peaks just before the financial crisis in 2008. In the summer of 2014, oil prices started to fall sharply reaching closing prices below 40 $ in December 2015.

FIG.23 BRENT V WTI

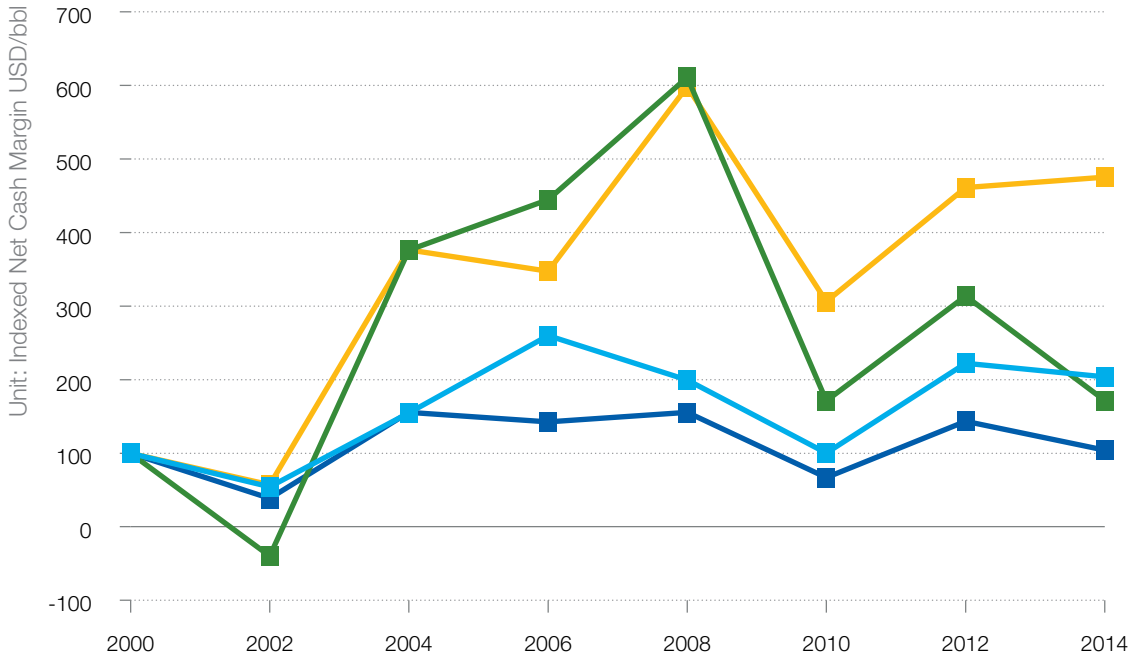
Source: Energy Information Agency (EIA)



Brent and West Texas Intermediate are two of the main crude oil benchmarks. Historically, these crudes, of similar quality, have traded at similar prices. Recent years saw Brent trade at a premium to WTI, meaning EU refiners generally faced higher costs, though this differential decreased last year. The lifting of the US crude oil export ban is one of the reasons that led to the narrowing of the spread between North Sea Brent and U.S. West Texas Intermediate.

FIG.24 REFINERS' NET CASH MARGIN ACROSS REGIONS

Source: Solomon Associates



Net Cash Margin in US $/bbl for all regions indexed relative to 100 in Year 2000

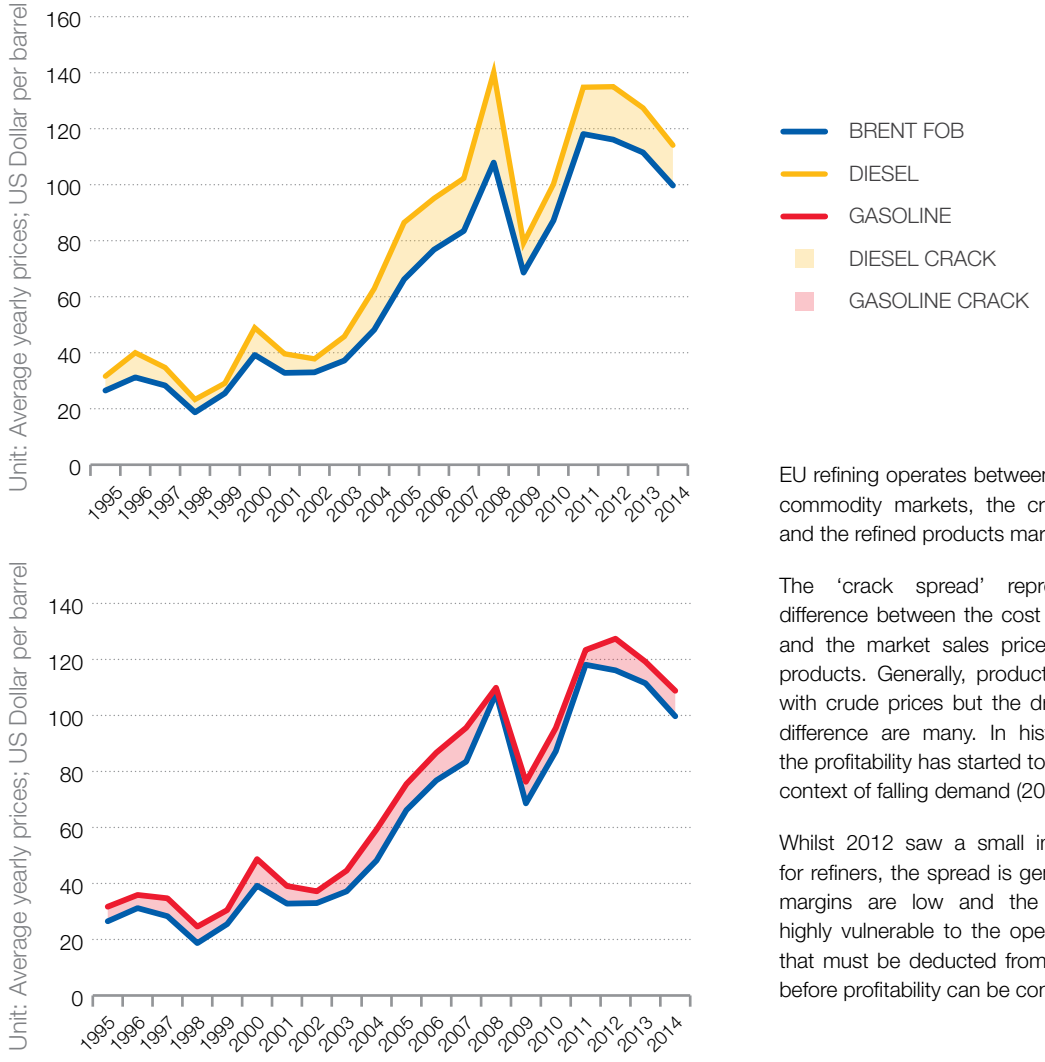
- EU - 28
- Korea/Singapore
- Middle East
- US Gulf Coast

After a great decrease for the net cash margin between 2008 and 2010, all the regions are now experiencing positive results. The EU remains however, behind the other regions and the gap with Korea/Japan and US Gulf Coast has grown further.

Whilst the data stops in 2014, preliminary results for 2015 show some strong improvement for EU refiners as a result of the big price decrease of crude oil.

FIG.25 REFINERS OPERATE BETWEEN TWO GLOBAL COMMODITY MARKETS: CRUDE MARKET AND REFINED PRODUCTS MARKET

Source: Wood Mackenzie & Argus Media



EU refining operates between two global commodity markets, the crude market and the refined products market.

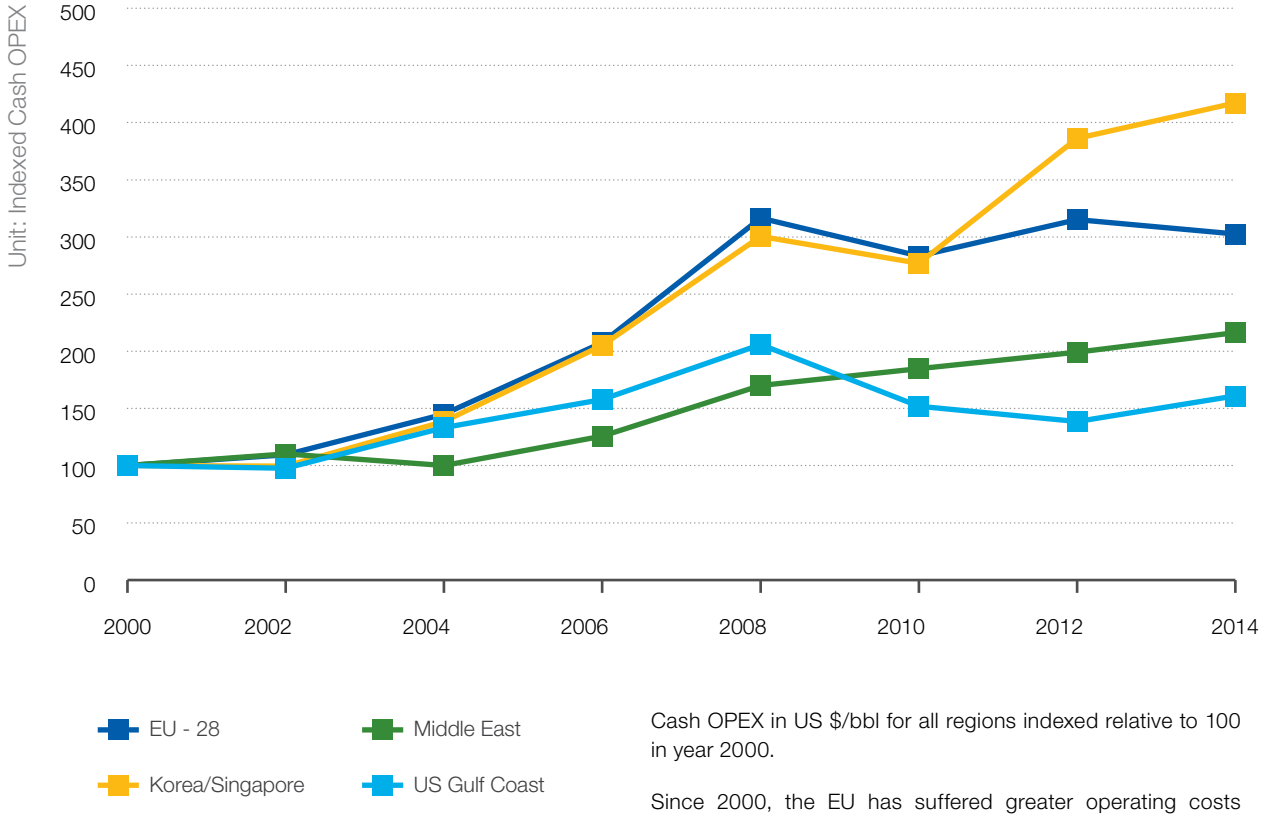
The 'crack spread' represents the difference between the cost of crude oil and the market sales price for refined products. Generally, product prices rise with crude prices but the drivers of the difference are many. In historic terms, the profitability has started to decline in a context of falling demand (2008).

Whilst 2012 saw a small improvement for refiners, the spread is generally tight- margins are low and the industry is highly vulnerable to the operating costs that must be deducted from the spread before profitability can be considered.

FIG.26 EU CASH OPEX

OPERATING YEARS 2000 - 2014

Source: Concawe

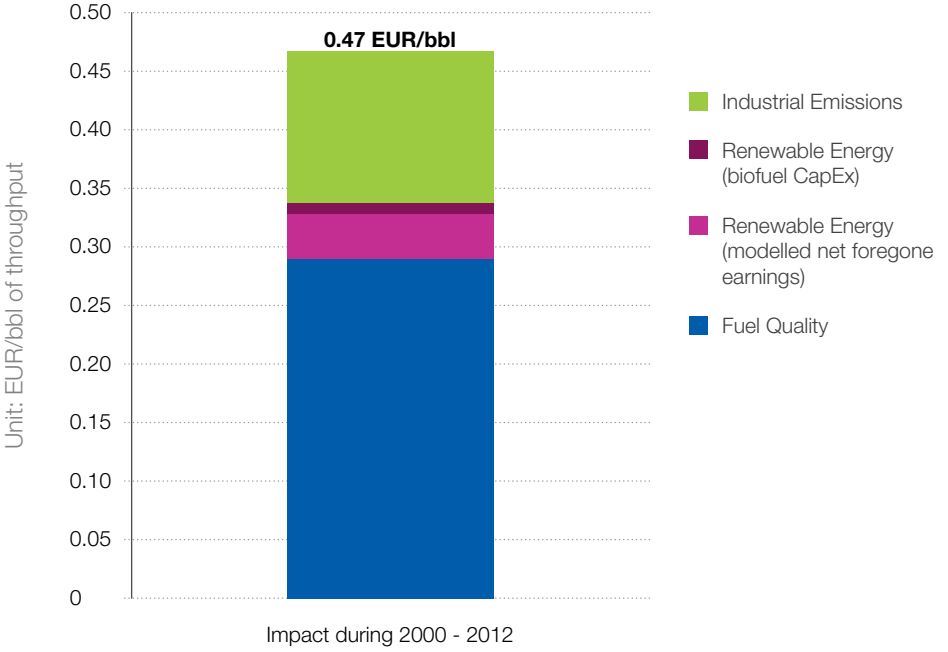


Cash OPEX in US $/bbl for all regions indexed relative to 100 in year 2000.

Since 2000, the EU has suffered greater operating costs than the Middle-East and the USA, putting it at a competitive disadvantage. In recent years the US Gulf Coast has seen operating costs fall, largely due to cheaper gas from unconventionals.

FIG.27 AVERAGE ESTIMATED QUANTIFIABLE IMPACT OF THE LEGISLATION ON EU REFINERIES DURING 2000-2012 BARREL OF THROUGHPUT

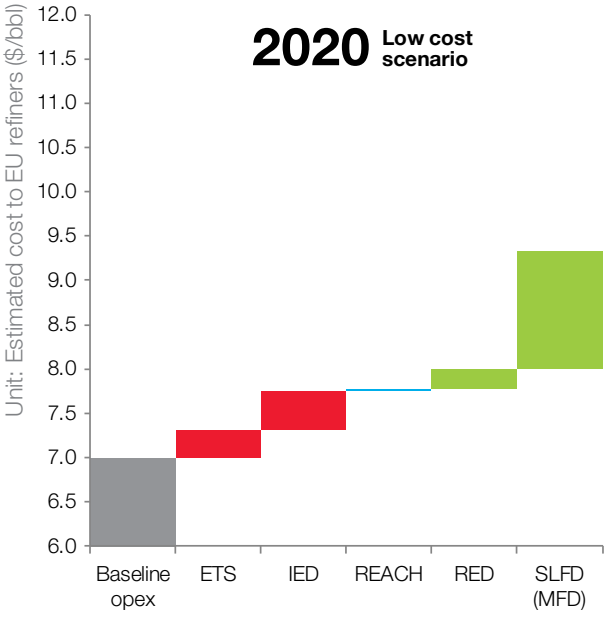
Source: European Commission, Sectoral fitness check for the petroleum refining sector

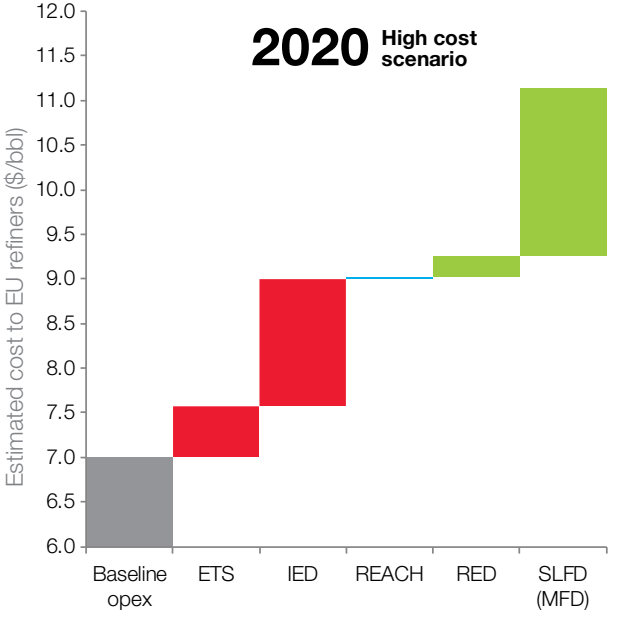


The Commission Fitness Check concluded that refiners suffered additional costs of 0.47€ per barrel due to EU regulation from 2000 to 2012, accounting for a quarter of the sector's decline in competitiveness versus regional peers. The European Commission Refining Fitness Check was published in December 2015 after almost three years of analysis.

FIG.28 CUMULATIVE COST IMPACT OF EU LEGISLATION IN 2020

Source: Concawe





This chart provides an estimation of the cost burden likely to be imposed on EU refineries over the period 2010 to 2020 as a result of a number of EU legislative and implementing acts. It shows the cumulative impact in a low and high cost scenario, expressed in dollars per barrel of refinery intake. These estimated costs impacts should be seen in the context of the EU refining net margin not exceeding 3$/bbl in the past years (source: IEA Oil Market Report).

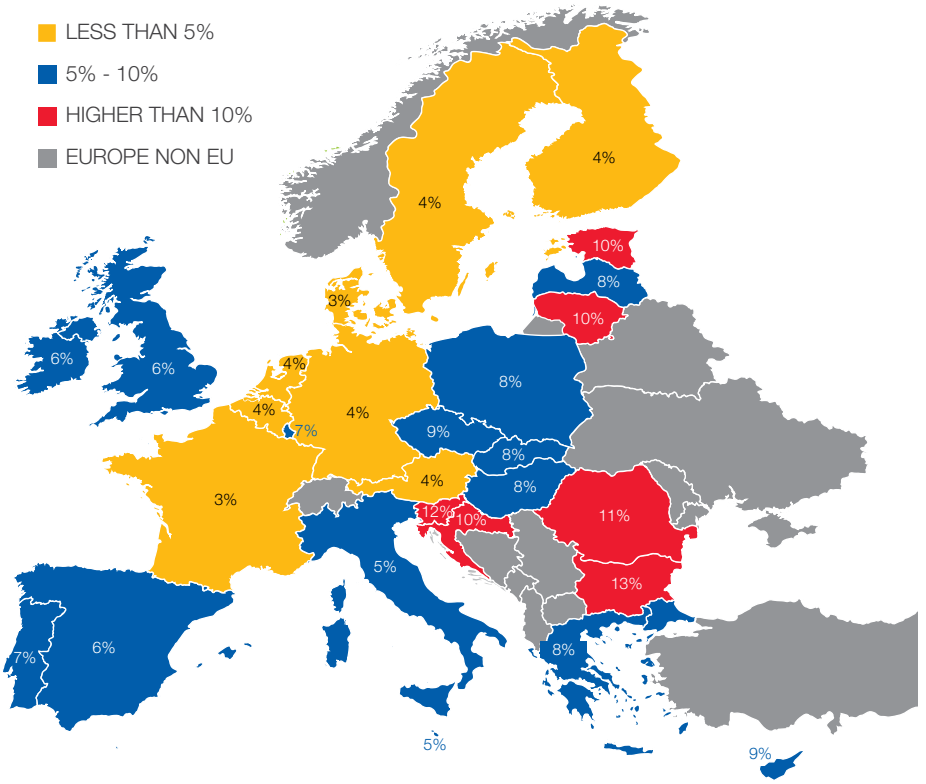
The legislation under consideration has the potential to significantly increase the operating costs of the EU refining industry, thereby impairing its competitive position relative to other world regions where similar legislation is not enacted or is enforced at later dates.

ETS - Emission Trading Scheme (2009/29/EC)
IED - Industrial Emission Directive (2010/75/EC)
REACH - Registration, Evaluation, Authorisation & Restriction of Chemicals (Regulation 1907/2006)
RED - Renewable Energy Directive (2009/28/EC)
SLFD - The Sulphur in Liquid Fuels Directive (1999/32/EC)
OPEX - Operating Expense

For EU ETS, 'low cost scenario assumes 16.5 €/t CO_2, high cost scenario 30 €/t CO_2.

FIG.29 FUEL TAXES MAKE A SIGNIFICANT CONTRIBUTION TO MEMBER STATE NATIONAL INCOME

Source: Eurostat and Wood Mackenzie



COUNTRY		SHARE
BG	Bulgaria	13%
BE	Slovenia	12%
RO	Romania	11%
EE	Estonia	10%
HR	Croatia	10%
LT	Lithuania	10%
CZ	Czech Republic	9%
CY	Cyprus	8%
LV	Latvia	8%
PL	Poland	8%
SK	Slovakia	8%
HU	Hungary	8%
EL	Greece	8%
PT	Portugal	7%
LU	Luxembourg	7%
IE	Ireland	6%
ES	Spain	6%
UK	United Kingdom	6%
MT	Malta	5%
IT	Italy	5%
NL	Netherlands	4%
AT	Austria	4%
DE	Germany	4%
SE	Sweden	4%
BE	Belgium	4%
FI	Finland	4%
FR	France	3%
DK	Denmark	3%

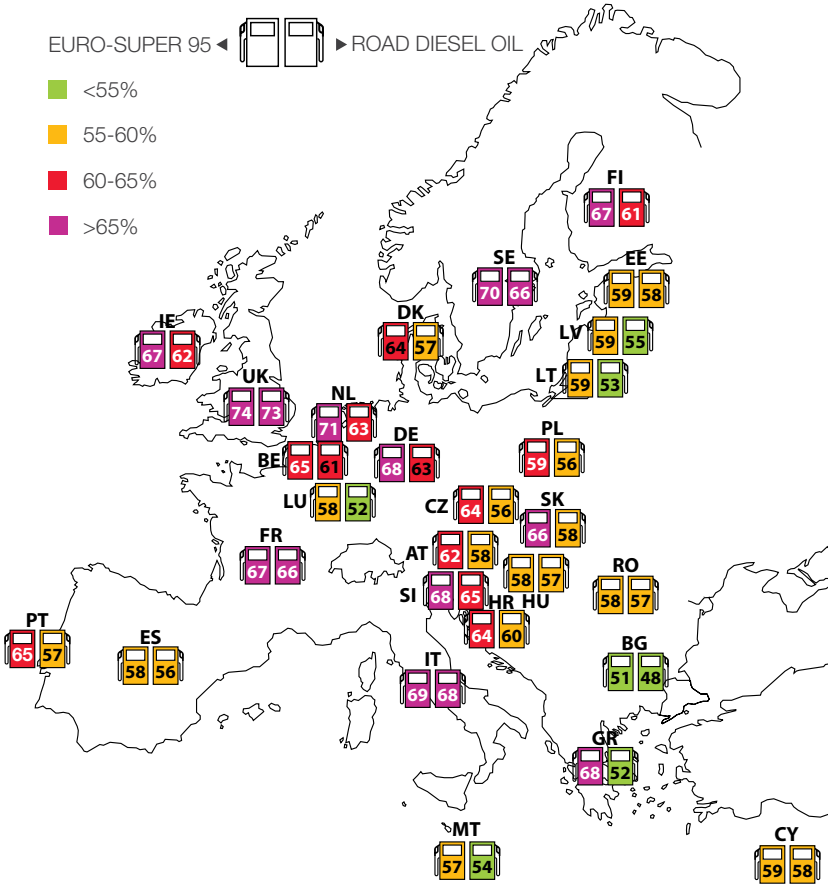
Taxes on fuels contribute on average to 7% of Member State tax revenue. This significant contribution to Member State revenue has to be put in perspective with the subsidies given to many competing alternatives to oil. This demonstrates that replacing petroleum products by these alternatives would have severe consequences for Member States income.

Figures are based on 2014 tax revenues.

FIG.30 TOTAL TAXATION SHARE IN THE END CONSUMER PRICE

Source: European Commission

EURO-SUPER 95	
COUNTRY	%
United Kingdom	74
Netherlands	71
Sweden	70
Italy	69
Greece	68
Germany	68
Ireland	67
France	67
Finland	67
Slovenia	66
Slovakia	66
Belgium	65
Portugal	65
Denmark	64
Czech Republic	64
Croatia	64
Austria	62
Cyprus	59
Lithuania	59
Latvia	59
Poland	59
Estonia	59
Romania	58
Hungary	58
Spain	58
Luxembourg	58
Malta	57
Bulgaria	51



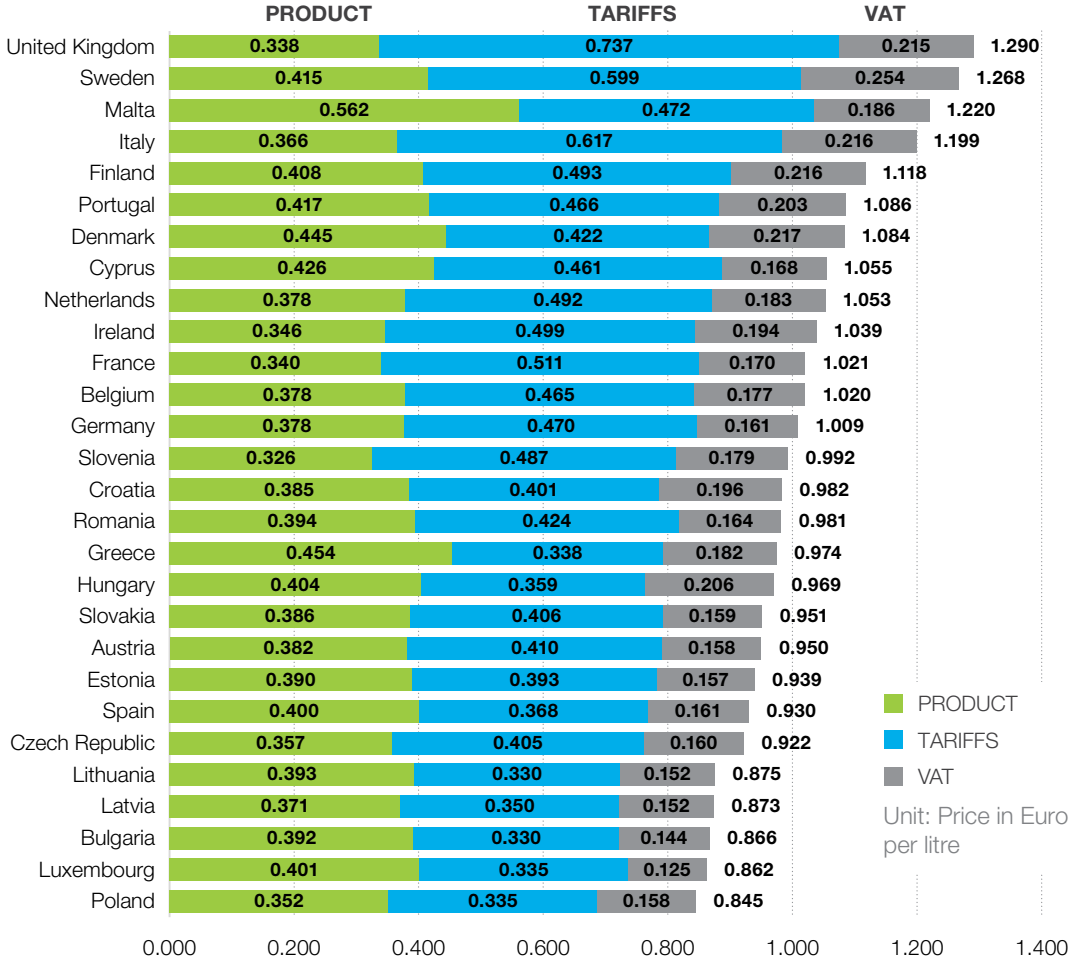
ROAD DIESEL OIL	
COUNTRY	%
United Kingdom	73
Italy	68
France	66
Sweden	66
Slovenia	65
Netherlands	63
Germany	63
Ireland	62
Finland	61
Belgium	61
Croatia	60
Slovakia	58
Austria	58
Cyprus	58
Estonia	58
Portugal	57
Denmark	57
Romania	57
Hungary	57
Czech Republic	56
Spain	56
Poland	56
Latvia	55
Malta	54
Lithuania	53
Greece	52
Luxembourg	52
Bulgaria	48

The price at the pump is driven to a large degree by tariffs and taxes and, on average, over half the cost of fuel at the pump represents taxes. The taxes on gasoline are generally higher than for diesel. This differential tax treatment has driven a demand shift over the past 20 years. Fuels taxes contribute substantially to Member State revenues.

Note: Share at January 2016

FIG.31 BREAKDOWN OF AUTOMOTIVE DIESEL PRICES ACROSS EU (FEBRUARY 2016)

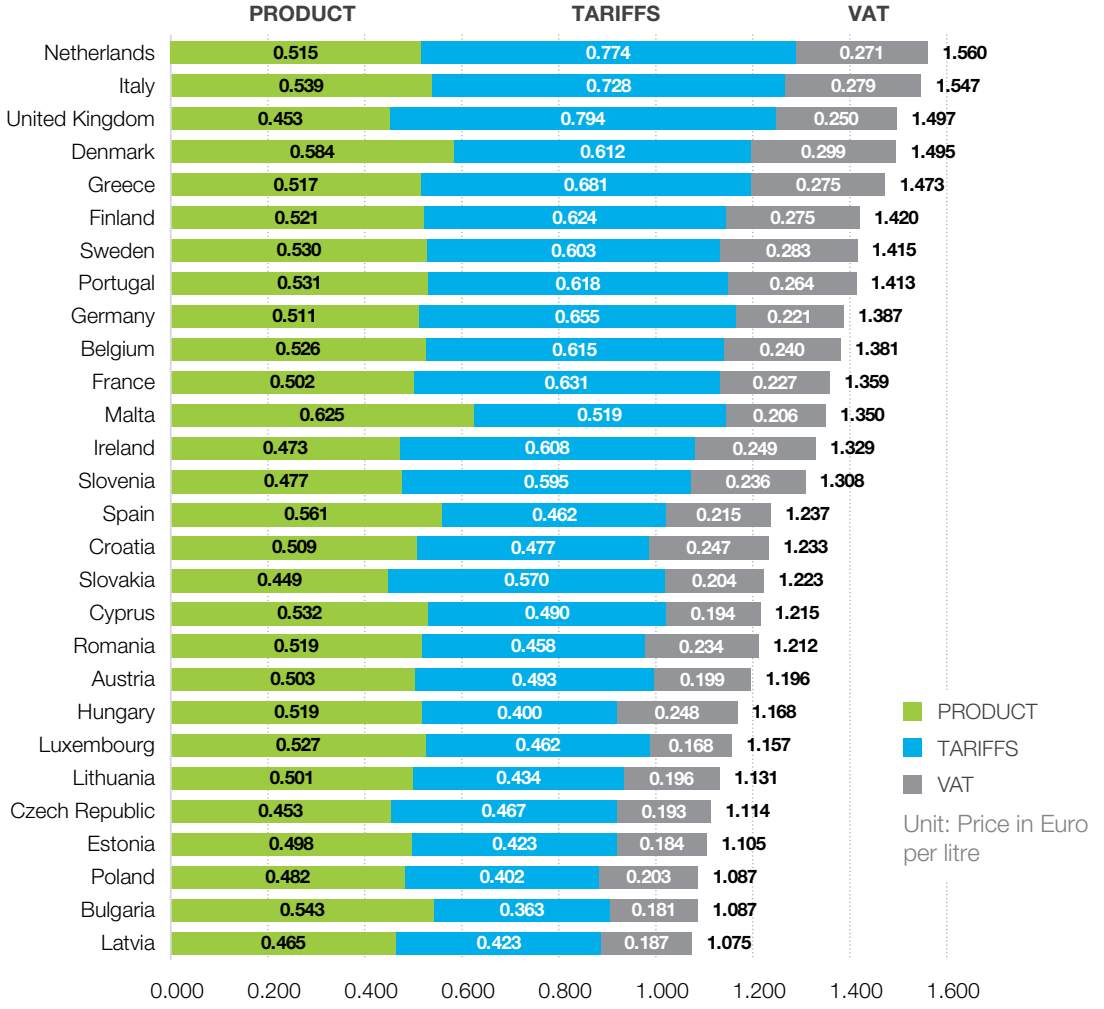
Source: European Commission



In most EU Member States gasoline prices are generally higher than diesel prices due to the higher tax element. Only a fraction of the price paid at the pump contributes to the refiners' income, the remainder represents taxes, the biggest share, the purchase of the crude and the distribution and marketing costs.

FIG.32 BREAKDOWN OF AUTOMOTIVE GASOLINE PRICES ACROSS EU (FEBRUARY 2016)

Source: European Commission



In most EU Member States, gasoline prices are generally higher than diesel prices due to the higher tax element.

Only a fraction of the price paid at the pump contributes to the refiners' income, the remainder going to Member States and the purchasing of the crude oil.

SAVE MORE than FUEL

BECOME A FUEL-SAVING CHAMPION

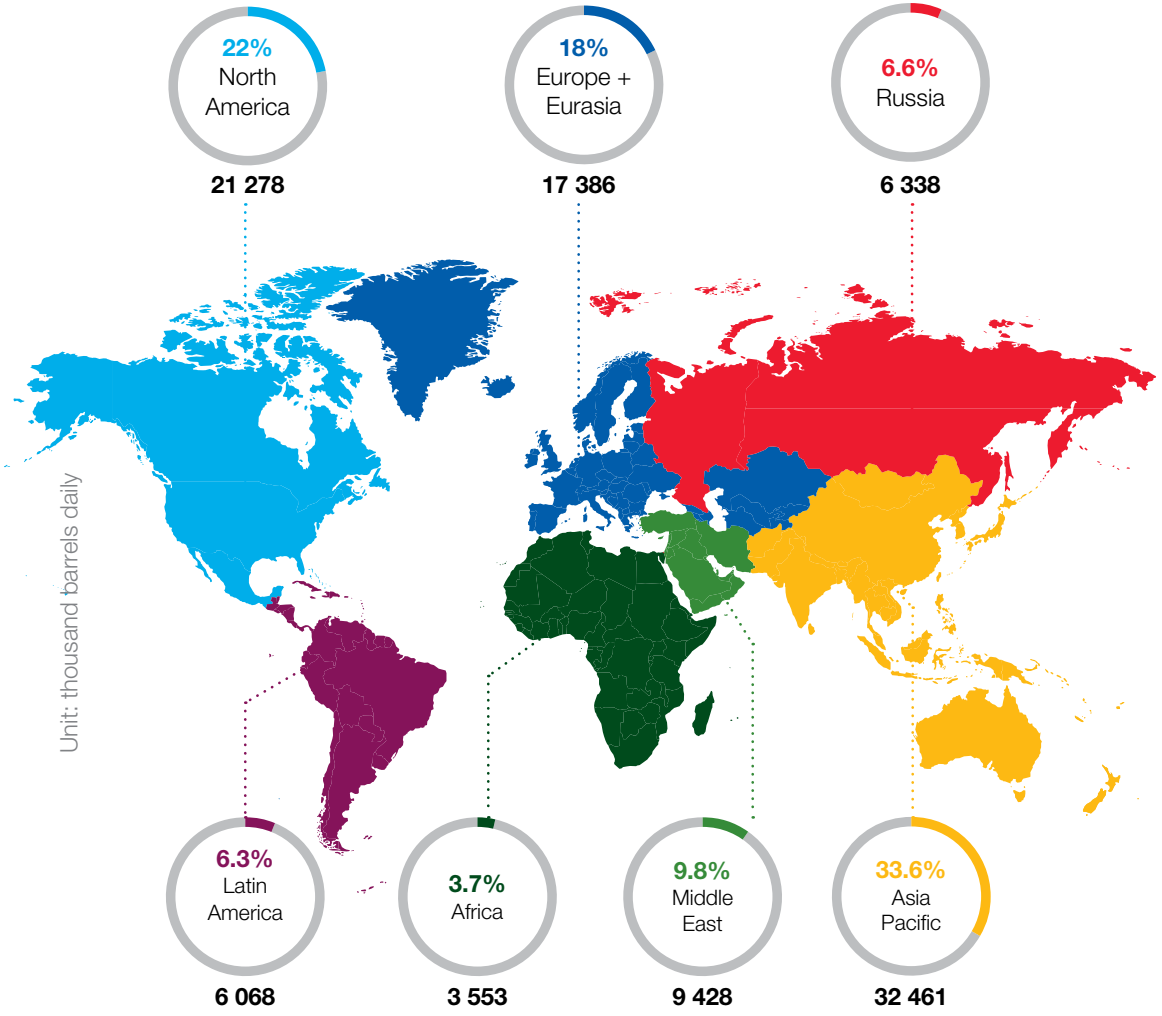
10 TIPS

TO HELP YOU DRIVE MORE EFFICIENTLY AND REDUCE EMISSIONS

FuelsEurope

FIG.33 GLOBAL REFINING CAPACITY AS OF 2014

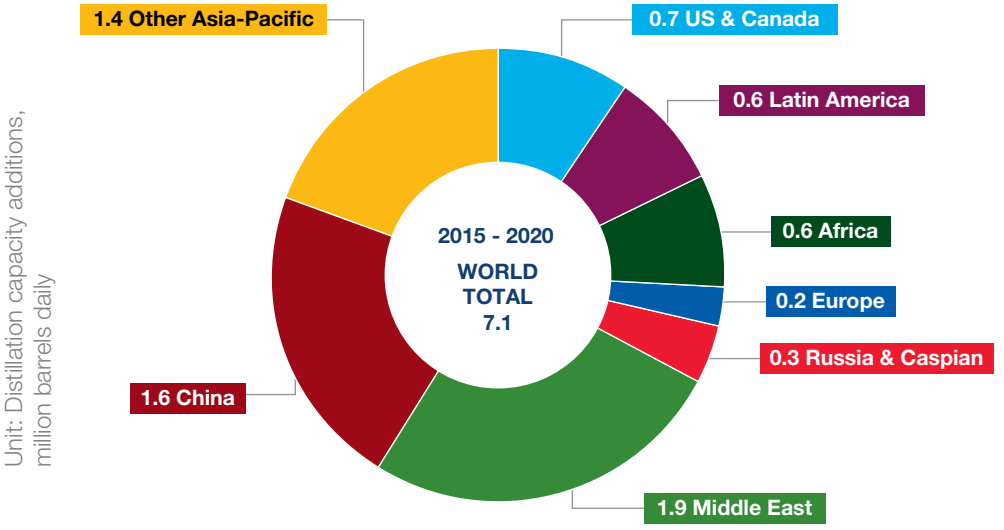
Source: BP Statistical Review of World Energy 2015



Refining is spread around the world and is a truly global business. The share of Europe and Eurasia refining has decreased from over 19% in 2012 to 18% in 2013 but still remains the third largest refining region.

FIG.34 INVESTMENT IN REFINING SECTOR PER REGION

Source: OPEC World Oil Outlook 2015

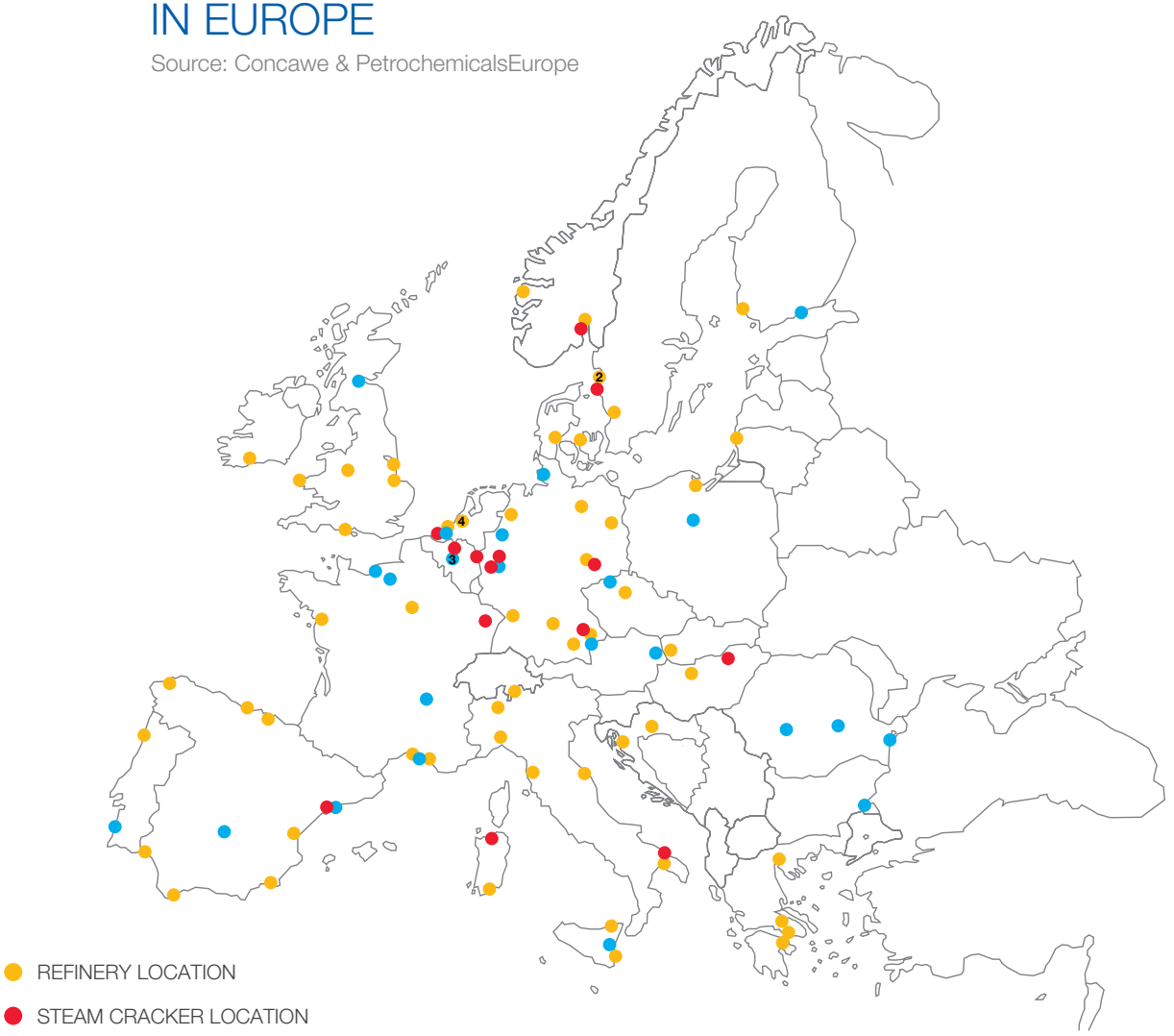


Note: Please note that due to rounding, figures may not add up

	US & Canada	Latin America	Africa	Europe	Russia & Caspian	Middle East	China	Other Asia-Pacific	World
2015	0.3	0.1	0.0	0.0	0.1	0.4	0.0	0.4	1.3
2016	0.3	0.1	0.0	0.0	0.0	0.2	0.2	0.2	1.0
2017	0.1	0.1	0.0	0.0	0.0	0.1	0.6	0.3	1.2
2018	0.0	0.1	0.0	0.1	0.0	0.3	0.4	0.1	1.2
2019	0.0	0.1	0.2	0.0	0.0	0.5	0.3	0.2	1.4
2020	0.0	0.1	0.3	0.0	0.1	0.4	0.0	0.2	1.1
2015 - 2020	0.7	0.6	0.6	0.2	0.3	1.9	1.6	1.4	7.1

FIG.35 REFINERY/STEAM CRACKER SITES IN EUROPE

Source: Concawe & PetrochemicalsEurope



A large number of refineries are integrated with or located very close to steam crackers that produce products for the petrochemicals industry.

Such interconnections show how refining is an intrinsic part of the industrial value chain and provides the basis for advanced high value products.

FIG.36 83 MAINSTREAM REFINERIES WERE OPERATING IN THE EU, NORWAY AND SWITZERLAND AT THE END OF 2015

Source: Concawe

COUNTRY	Number of refineries
Austria	1
Belgium	3
Bulgaria	1
Croatia	2
Czech Republic	2
Denmark	2
Finland	2
France	8
Germany	11
Greece	4
Hungary	1
Ireland	1
Italy	9
Lithuania	1
Netherlands	6
Poland	2
Portugal	2
Romania	3
Slovakia	1
Spain	9
Sweden	3
United Kingdom	6
EU TOTAL: Refineries = 80	
Norway	2
Switzerland	1
TOTAL NO + CH: Refineries = 3	
TOTAL: Refineries = 83	

EU NON EU

Threshold >50 kbbl/d or 2.5Mt/a

At the end of 2015, there were 83 `mainstream` (capacity above 2.5 Mta) refineries in the EU, Norway and Switzerland. In addition, there were 22 small or speciality sites.

FIG.37 EU, NORWEGIAN AND SWISS FUELS MAINSTREAM REFINERIES HAD 685 MILLION TONNES OF PRIMARY REFINING CAPACITY IN 2015

Source: Concawe; Oil & Gas Journal

COUNTRY	Refining capacity	COUNTRY	Refining capacity
Austria	10.4	Ireland	3.6
Belgium	37.1	Italy	81.1
Bulgaria	5.8	Lithuania	9.5
Croatia	8.5	Netherlands	63.5
Czech Republic	7.9	Poland	22.6
Denmark	8.5	Portugal	16.2
Finland	13	Romania	12.4
France	69.8	Slovakia	5.3
Germany	101.2	Spain	74.6
Greece	23.3	Sweden	19.8
Hungary	7.7	United Kingdom	64.3
EU TOTAL: Refineries = 665.9 million tonnes per year			
Norway	16.2		
Switzerland	3.2		
TOTAL NO + CH: Refineries = 19.4 million tonnes per year			
TOTAL: Refineries = 685.3 million tonnes per year			

EU NON EU

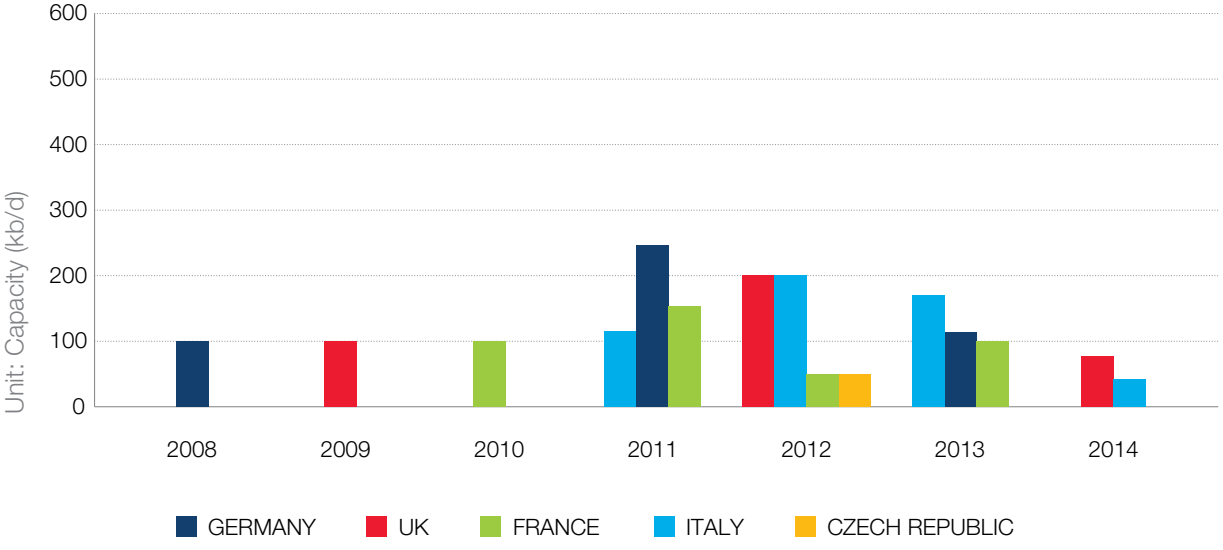
Threshold >50 kbbl/d or 2.5Mt/a

The 83 refineries operating in the EU-28, Norway and Switzerland had a primary refining capacity of 685 million tonnes in 2015. As a result of additional refinery closures, the capacity has decreased by some 15 million tonnes compared to 2014.

Note: Refining capacity is expressed in million tonnes per year. Numbers may not add up due to rounding.

FIG.38 REFINERY CLOSURES IN EUROPE

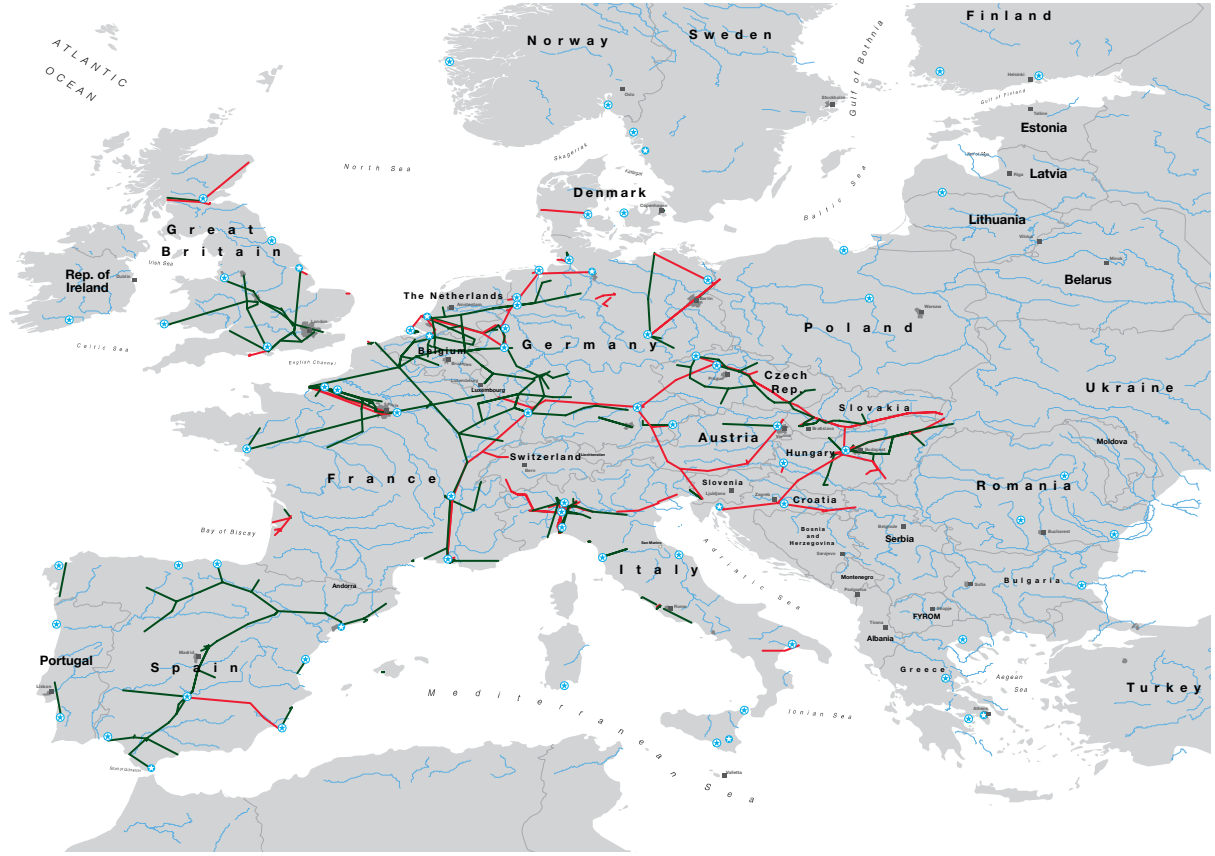
Source: Concawe / IEA



Since 2008, out of some 100 refineries that were operating in Europe, 17 were closed. Most affected countries by the closures are Italy, France and the UK.

FIG.39 OIL PIPELINES - MAP OF EUROPE

Source: Concawe



REFINERY IN OPERATION

TWO OR MORE REFINERIES IN OPERATION

PIPELINES: IN OPERATION OR STAND BY

CRUDE OIL

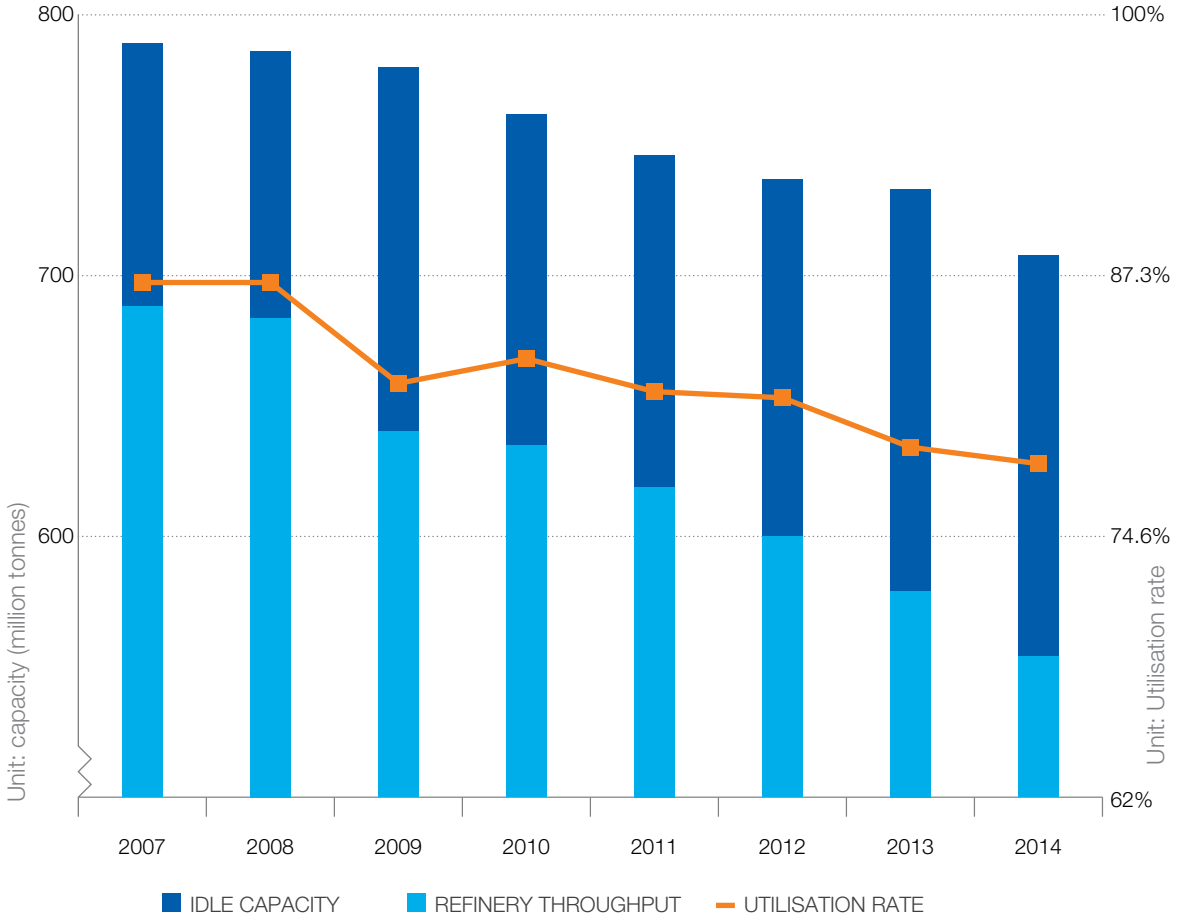
OIL PRODUCTS

Pipelines are a long-established, safe and efficient mode of transport for crude oil and petroleum products. They are used both for short-distance transport (e.g. within a refinery or depot, or between neighbouring installations) and long distances.

An extensive network of cross-country oil pipelines in Europe meets a large proportion of the need for transportation of petroleum products.

FIG.40 CAPACITY AND UTILISATION OF EUROPEAN REFINERIES

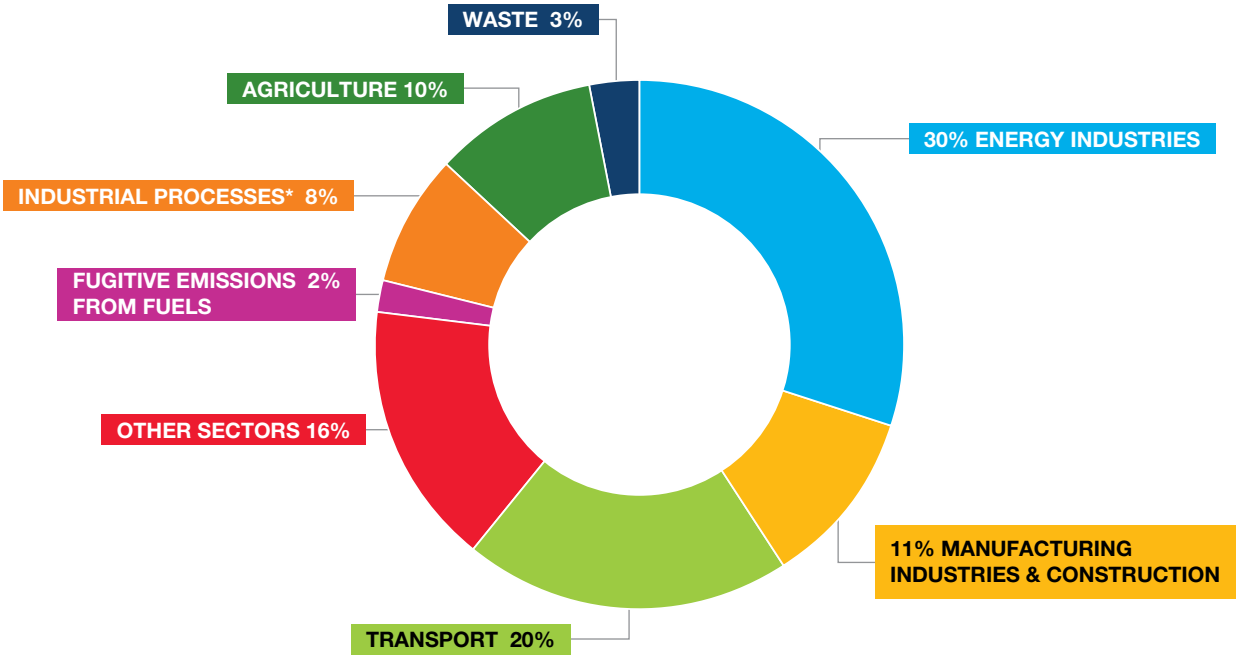
Source: BP Statistical Review of World Energy 2015



Since 2007, the utlisation rate of EU refineries has continuously dropped from 87% to a lowest of 78% in 2014. This continued decrease in demand and evolution of market demand (increasing diesel/gasoline imbalance) forces European refiners to adapt to these market forces. A utilisation rate of 85% is normally required for efficient economic operations.

FIG.41 GHG EMISSIONS BY SECTOR IN THE EU IN 2013

Source: European Environmental Agency

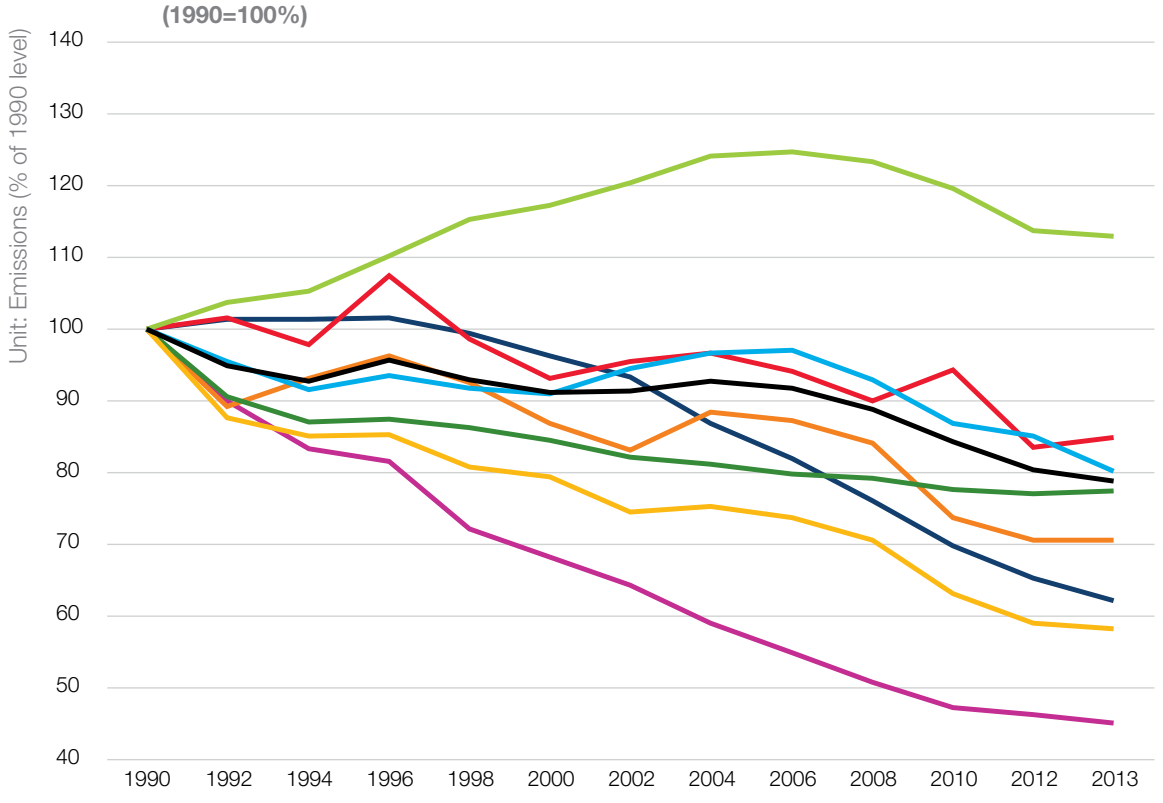


***NOTE:** This sector includes by-product or fugitive emissions of greenhouse gases from industrial processes. Emissions from fuel combustion in industry are reported under Energy.

Energy and manufacturing industries account for 41% of GHG emissions in the EU. Transport, supplied around 90% by oil refined products, generates 20% of EU GHG emissions.

FIG.42 CO_2 EMISSIONS TREND BY SECTOR

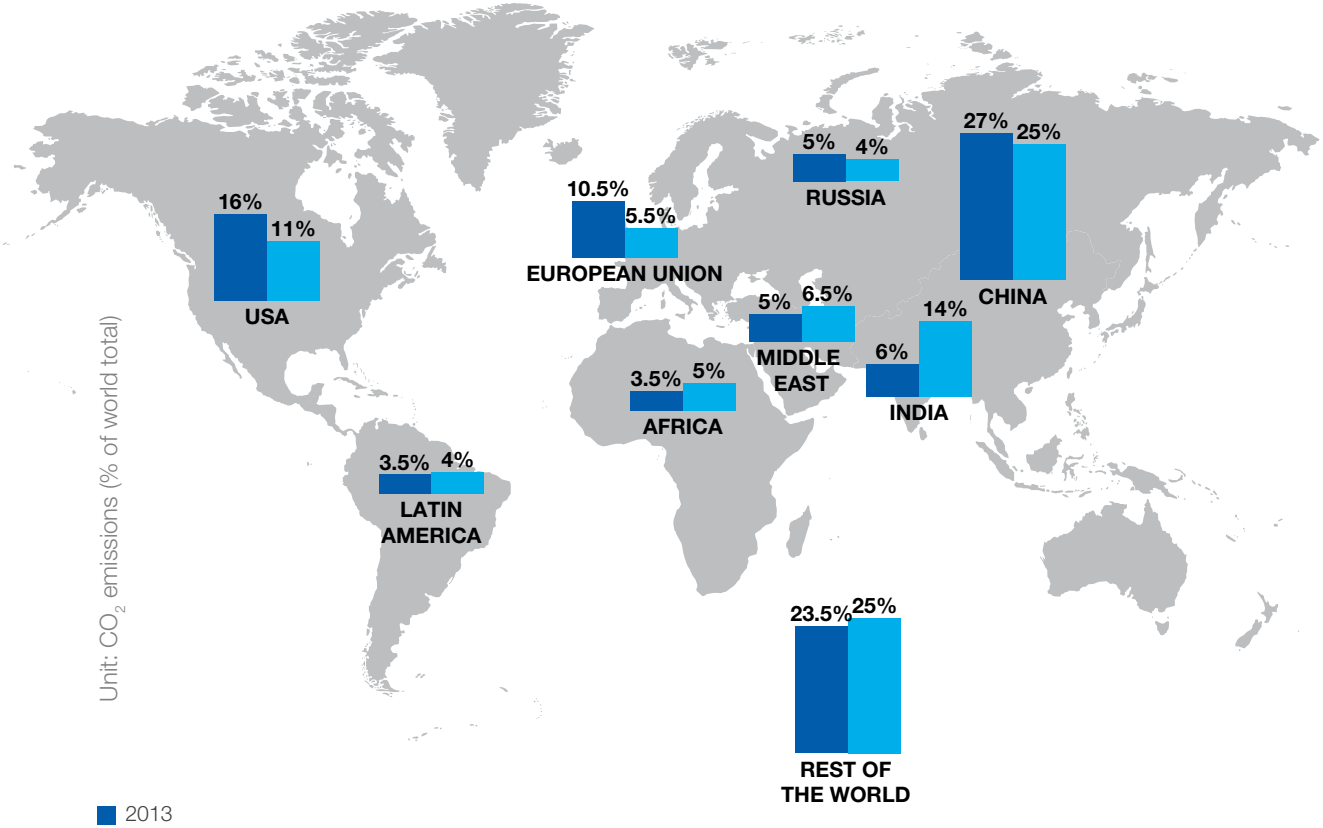
Source: European Environment Agency



CO_2 emissions per sector have generally all been declining since 2007. Industry (processes and manufacturing) CO_2 emissions decreased sharply over the period 2007-2012 and are now between 30% and 38% below the 1990 levels. CO_2 emissions from transport have also been steadily decreasing since 2007.

FIG.43 DECLINING EU SHARE IN GLOBAL CO_2 EMISSIONS

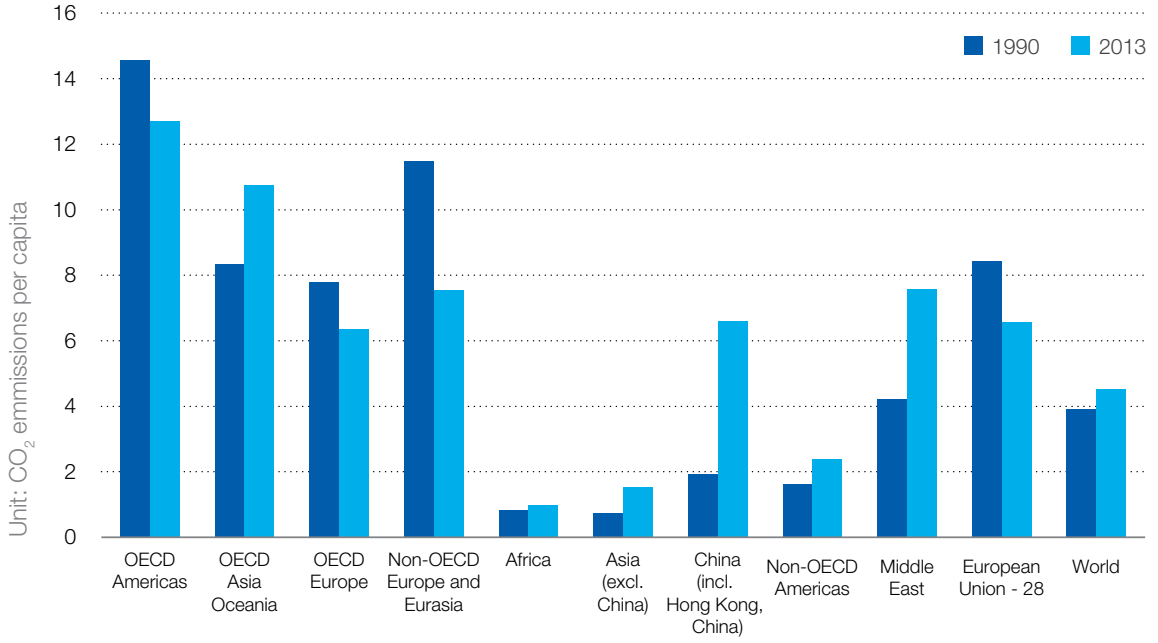
Source: IEA, WEO 2015



In 2013, the EU accounted for 10.5% of global CO_2 emissions and is expected to account for only 5.5% by 2040.

FIG.44 CO_2 EMISSIONS PER CAPITA/REGIONS

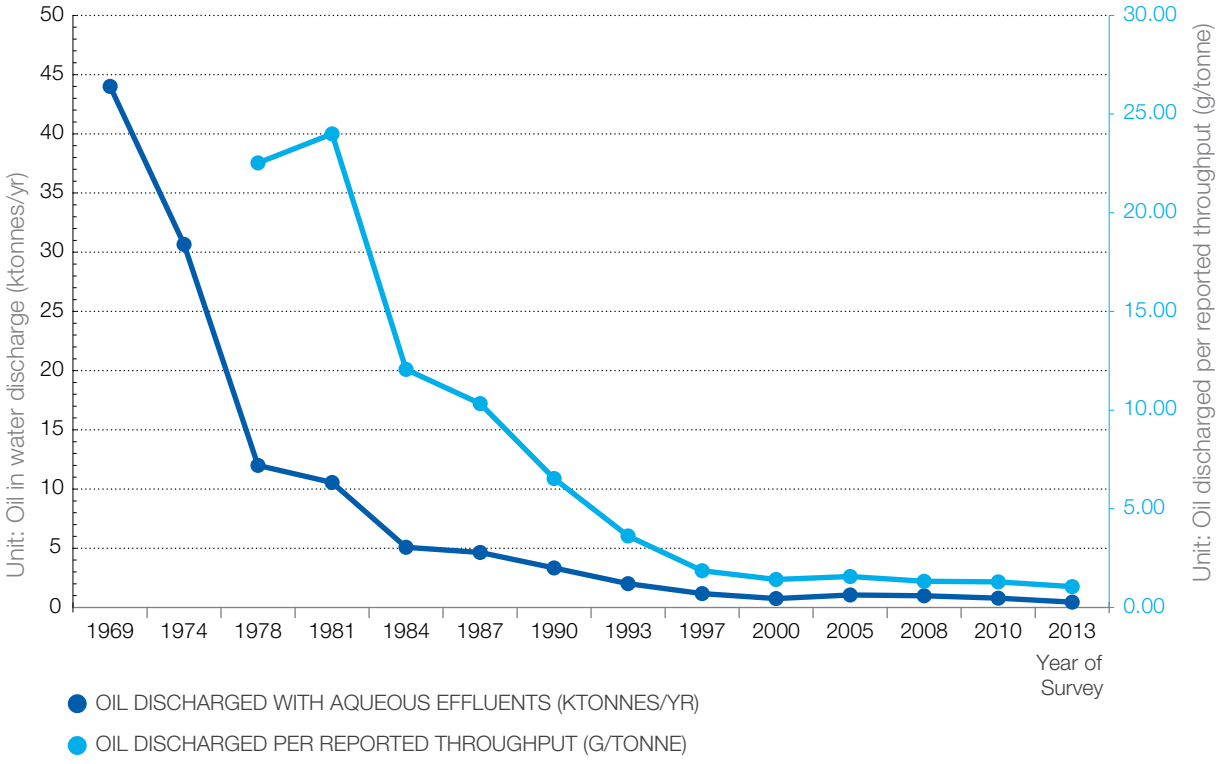
Source: IEA, WEO 2015



CO_2 emissions per capita/regions have globally increased during the period 1990 – 2013 by around 11%. During this period, only OECD Americas, OECD Europe and Non-OECD Europe and Eurasia have recorded a decrease in their CO_2 emissions.

FIG.45 QUALITY OF REFINERY WATER EFFLUENT: OIL DISCHARGED IN WATER

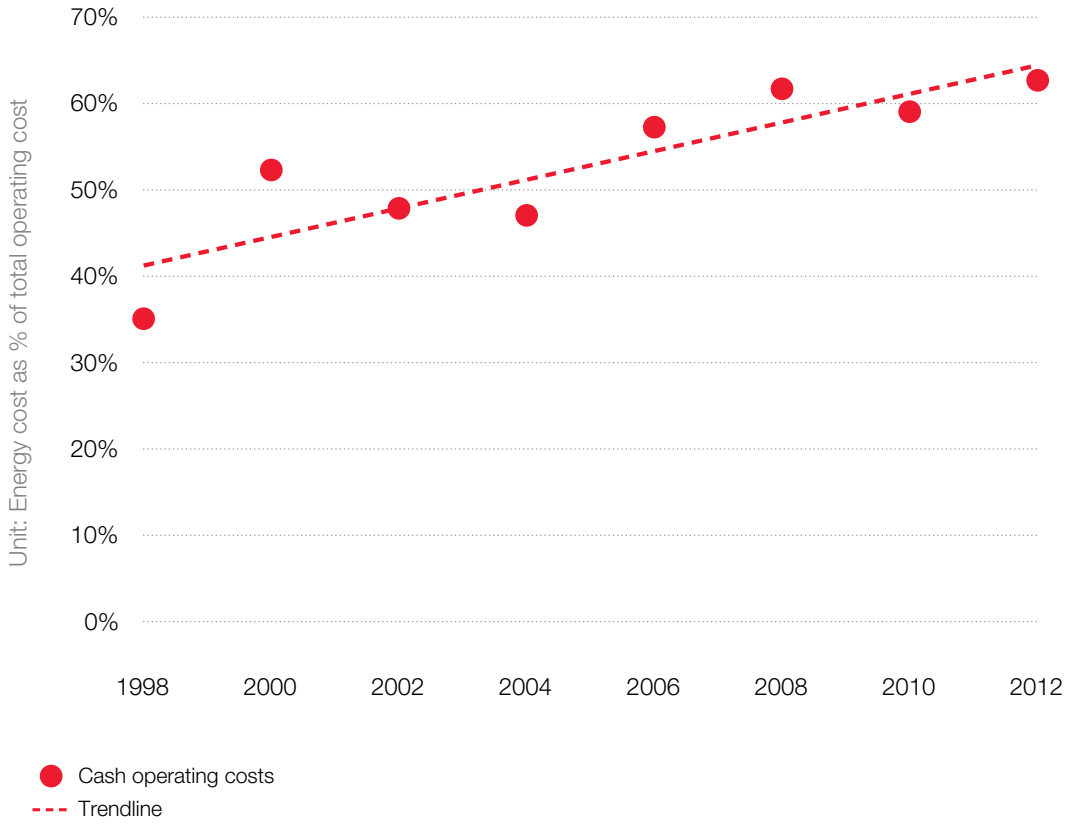
Source: Concawe



Over the years, the EU Refineries have significantly improved the quality of refinery water effluent. The amount of oil discharged in effluents from reporting installations continued to decrease to extremely low levels – both in terms of the absolute amount discharged and the amount expressed relative to the volume of feedstock processed (throughput) and the refining capacity of the installations.

FIG.46 EU REFINERIES' ENERGY COST
AS PERCENTAGE OF TOTAL OPERATING COSTS

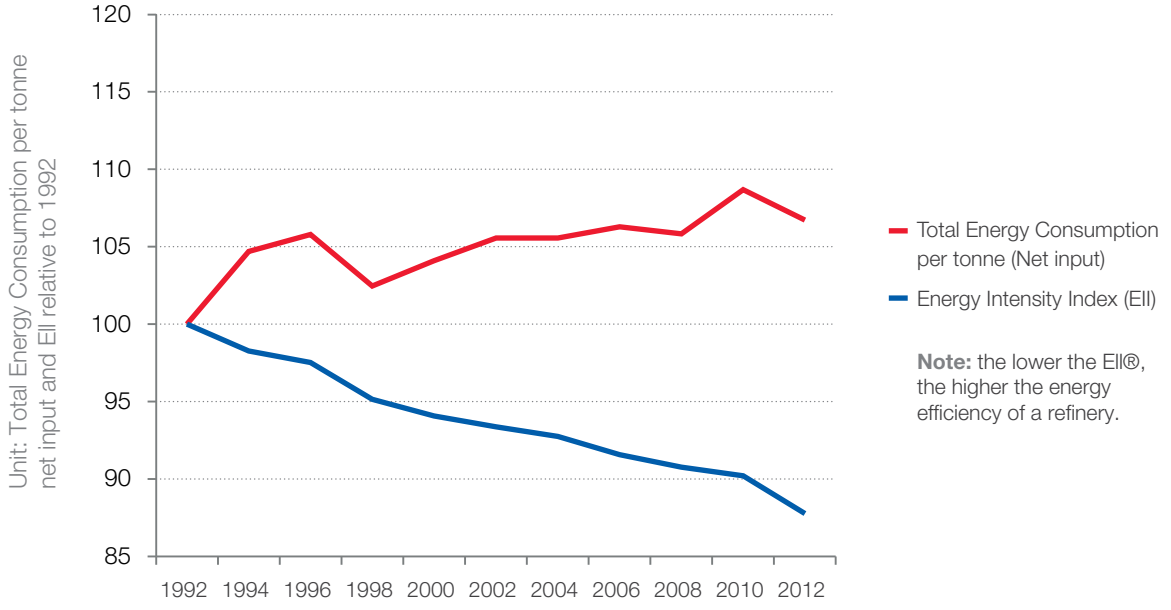
Source: Concawe



The share of energy costs has continuously increased over the past 20 years to reach over 60% of the total operating costs in 2012. Despite strong records in energy efficiency gains and a leading position in this field, European refiners suffer a strong competitive disadvantage resulting from these high energy costs.

FIG.47 EU REFINERIES' ENERGY CONSUMPTION AND EFFICIENCY TRENDS RELATIVE TO 1992

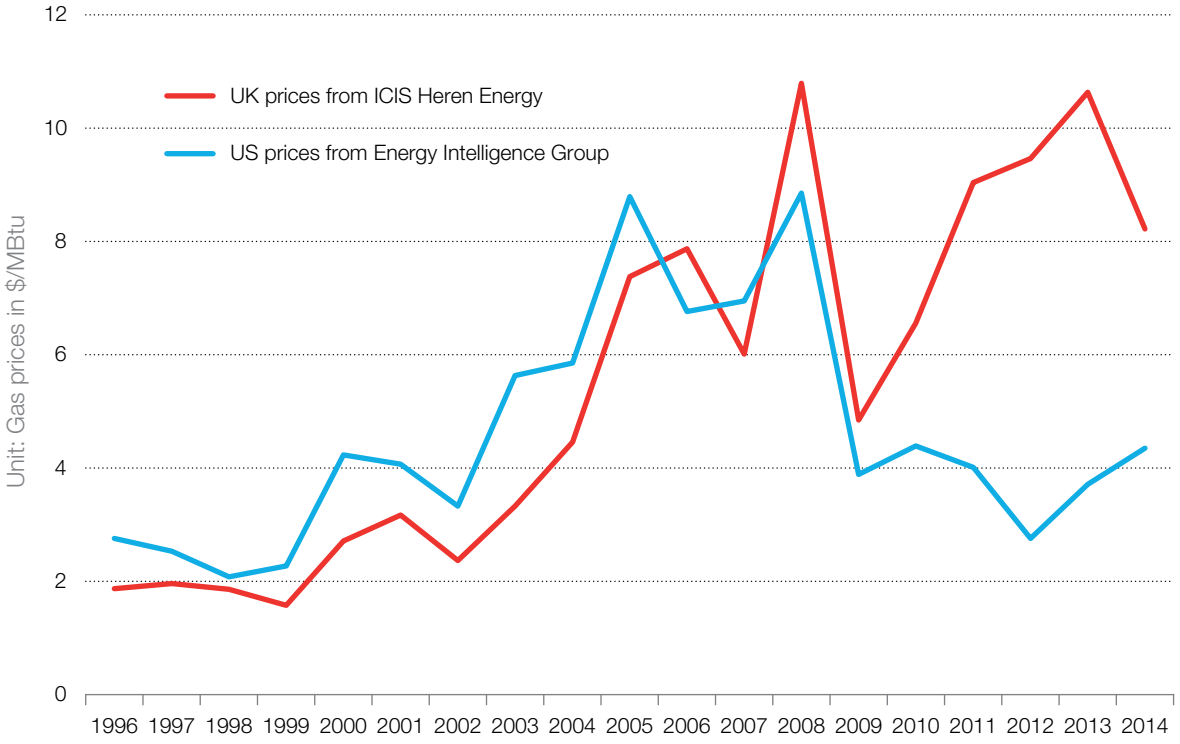
Source: Solomon Associates



The index shows that EU refineries have improved their energy efficiency by about 10% over the past 20 years. This improvement was achieved despite more energy intensive refinery operations to produce cleaner fuels in line with legislative requirements and to meet shifts in market demand. The corresponding annual energy saving is roughly equivalent to the total annual average energy consumption of four large EU refineries.

FIG.48 EVOLUTION OF GAS PRICES

Source: BP Statistical Review of World Energy 2015

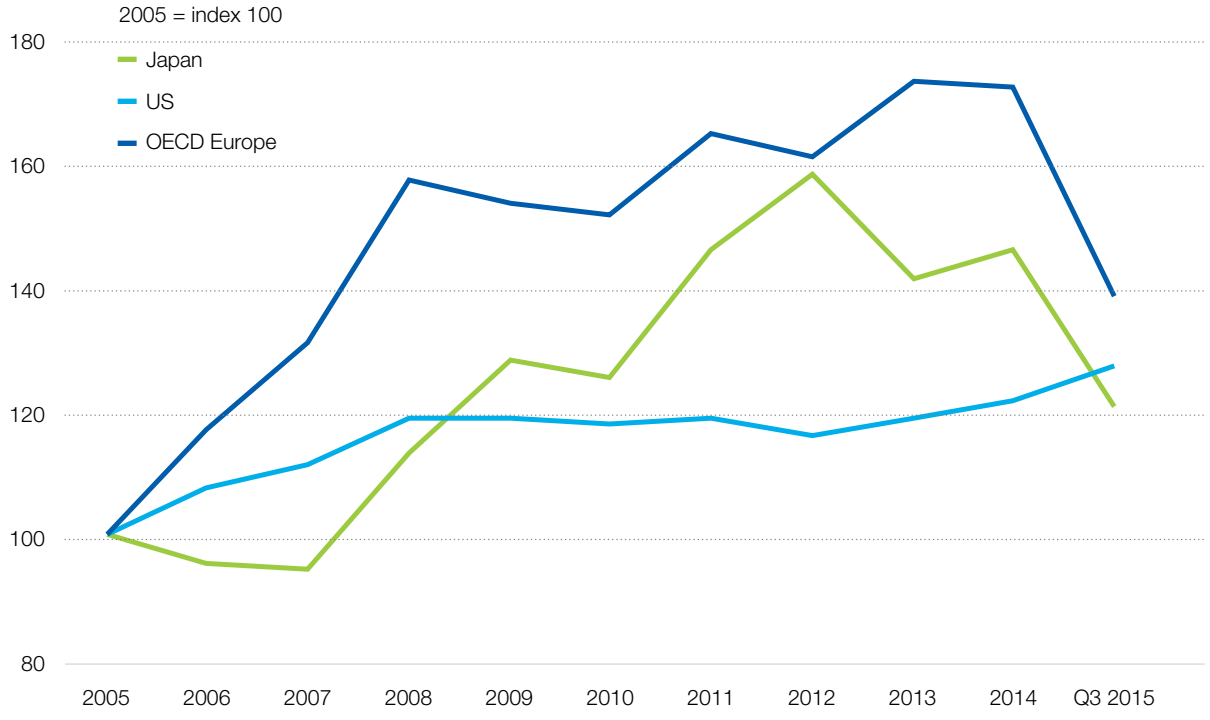


Since 2009, US industry gained a significant competitive advantage over EU industry as a result of shale oil revolution.

The 2014 prices in the UK were double the average US gas prices.

FIG.49 EVOLUTION OF END-USER ELECTRICITY PRICES FOR INDUSTRY

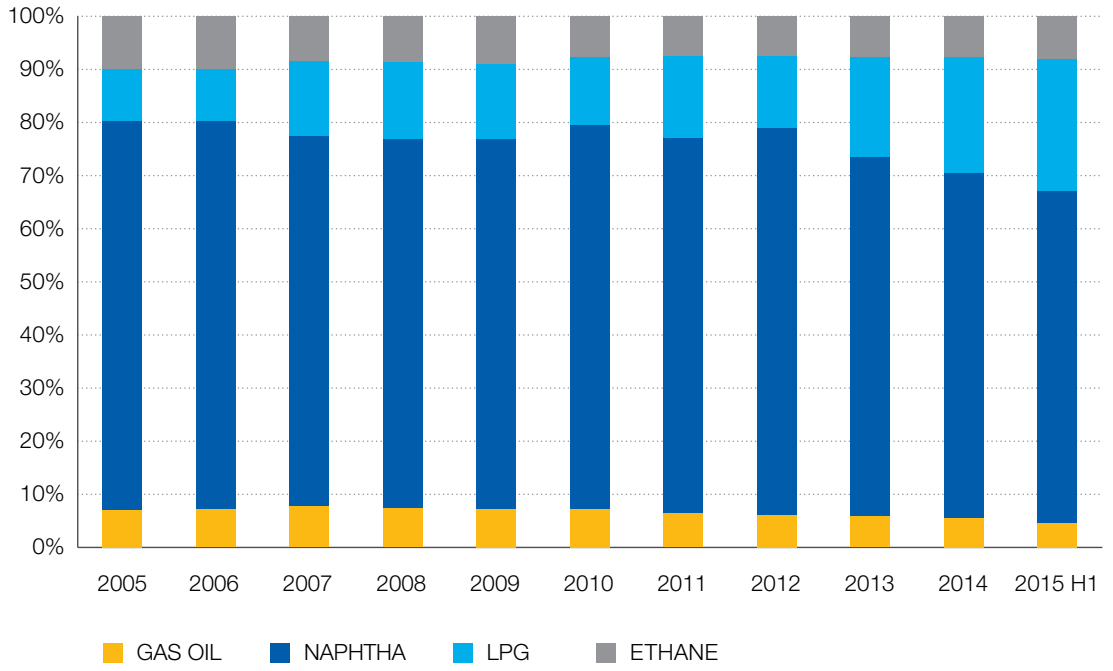
Source: IEA



Over the past few years US industry gained a significant competitive advantage as a result of low electricity prices. While European industry faced an 80% energy price increase between 2005 and 2014, the price of electricity for US industry only increased by 20% over the same period. Nevertheless, since mid-2014, EU electricity prices dropped as a result of lower crude and gas prices and the gap with US refiners has been significantly reduced. This situation is however, according to experts, due to remain overtime and the EU should face again higher electricity prices.

FIG.50 CHEMICAL INDUSTRY RAW MATERIAL USE

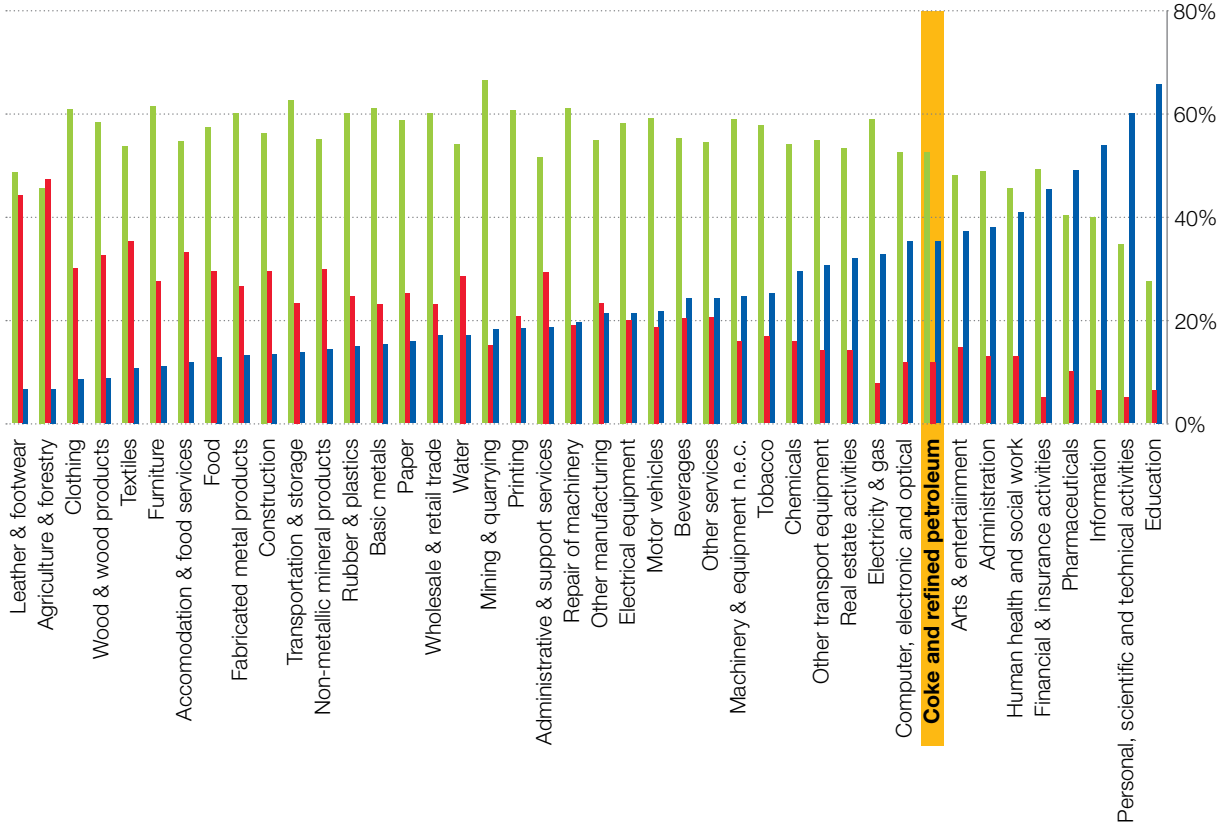
Source: ICIS/CEFIC



The EU refining sector is closely integrated with the petrochemical sector. A large part of the petrochemical feedstock relies on refined products, such as naphtha and petroleum gases.

FIG.51 SKILL AND KNOWLEDGE INTENSITIES (% OF TOTAL EMPLOYMENT)

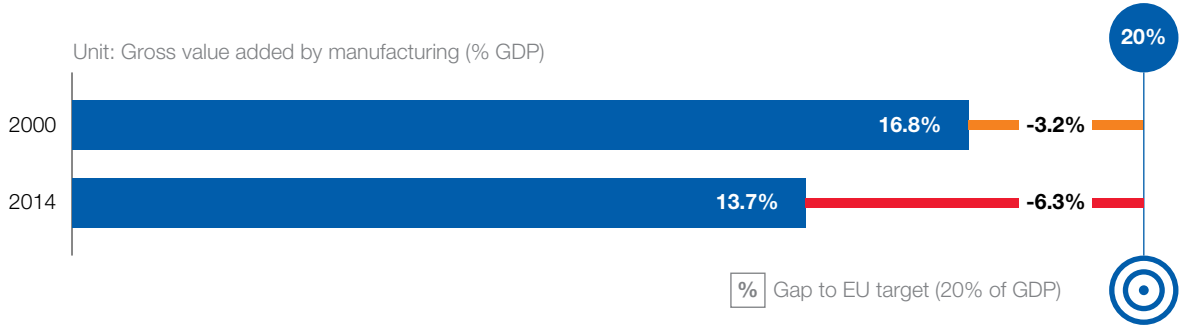
Source: European Competitiveness Report 2013



According to the European Commission's Competitiveness Report for 2013, the European refining industry employs one of the largest percentages of highly skilled workers of all manufacturing industries, just after the pharmaceutical industry.

FIG.52 RE-INDUSTRIALISATION OF EUROPE - 20% OF GDP COMING FROM THE INDUSTRY VS CURRENT SITUATION

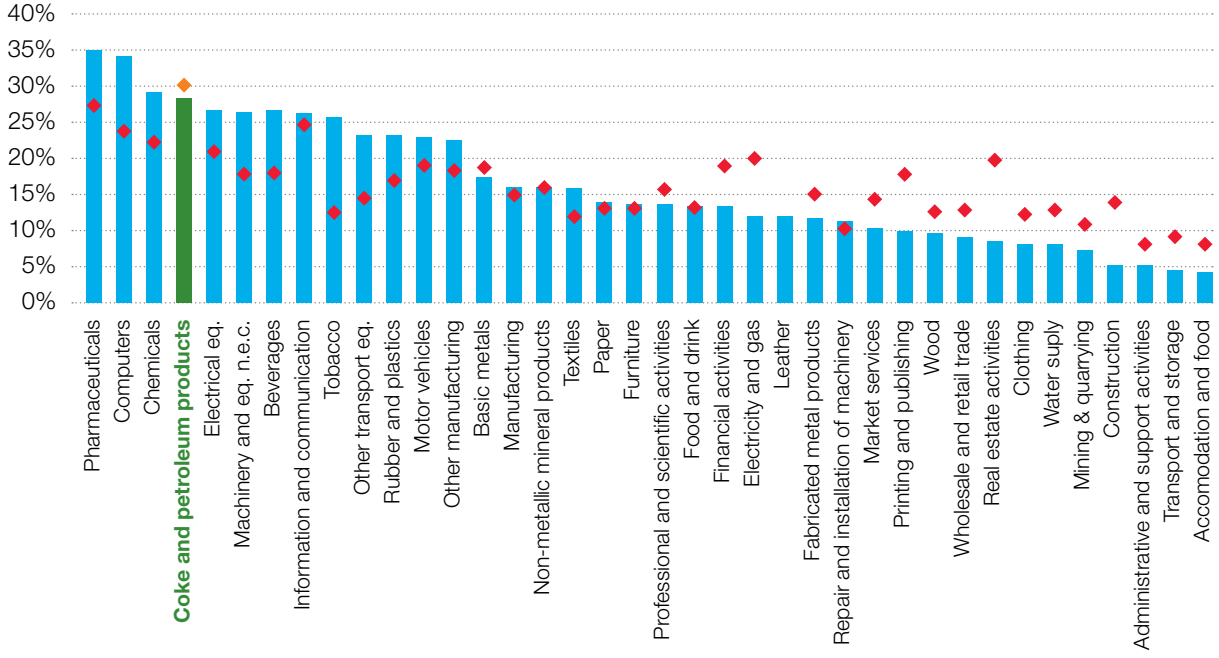
Source: The European Competitiveness Report 2014; ERT



Despite ambitious EU policy goals to foster re-industrialisation and increase the share of manufacturing in the EU's GDP, the Gross Value Added by manufacturing faces a continuous decrease in 2014 in Europe to as low as 13.7%, compared to the 2020 target set by the European Commission.

FIG.53 EU REFINING INDUSTRY # 1 PROCESS INNOVATION AND AMONG MOST INNOVATIVE INDUSTRIES FOR PRODUCTS

Source: European Competitiveness Report 2013



PRODUCT INNOVATION

PROCESS INNOVATION

COKE AND PETROLEUM PRODUCTS

PROCESS INNOVATION

According to the data presented by the European Commission in its annual Competitiveness Report, the EU Refining industry was the leading industrial sector in process innovation and among the top 4 for product innovation.

SAVE MORE than FUEL

10 TIPS

TO HELP YOU DRIVE MORE EFFICIENTLY AND REDUCE EMISSIONS

The way you drive is not only important for you, your families and others. It also matters to our environment.

The European Petroleum Refining Industry offers efficient driving tips to help you reduce fuel consumption and contribute to cleaner and safer life-styles. We hope you will find these tips helpful.

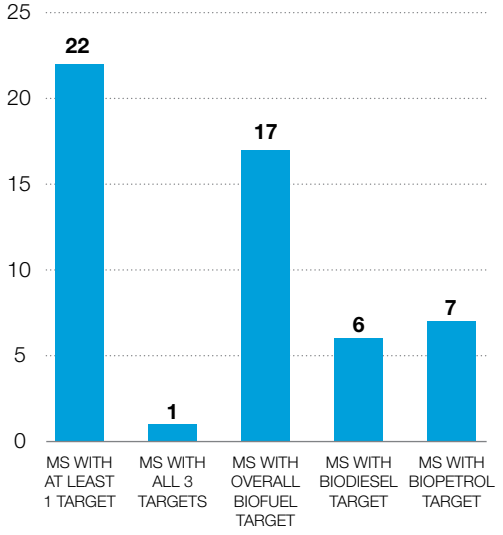
Discover our campaign by visiting:

www.SaveMoreThanFuel.eu

FuelsEurope

FIG.54 BIOFUELS BLENDING TARGETS BY COUNTRY

Source: National Legislation (NREAP), EEA, ePure, FuelsEurope



Unit: Percentage

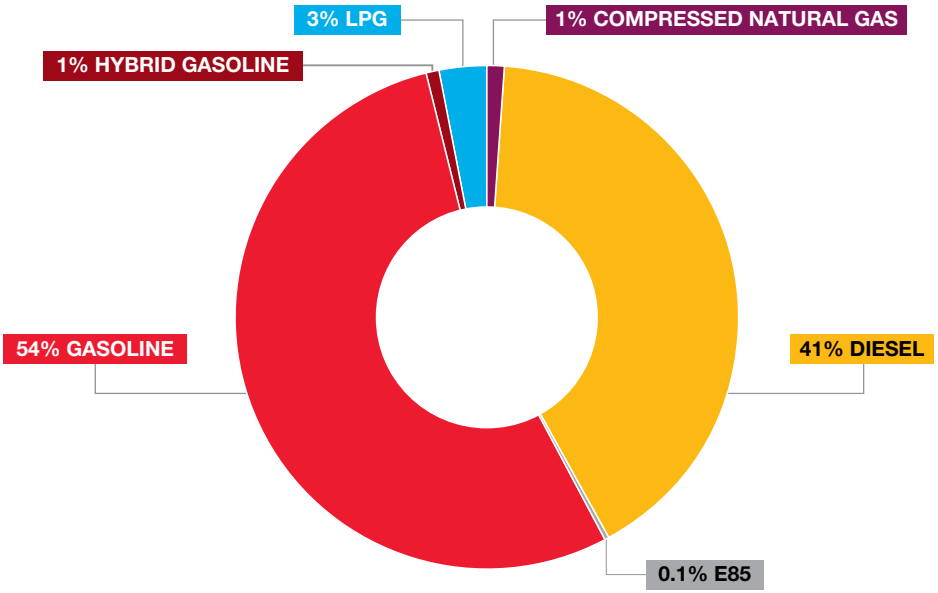
	Ethanol		Biodiesel		Overall	
	Mandate	E/V	Mandate	E/V	Mandate	E/V
Austria	-		-		-	
Belgium	-		-		-	
Bulgaria	7	V	6	V	-	
Croatia	-		-		5.6	E
Cyprus	-		-		2.4	E
Czech Republic	4.1	V	6	V	-	
Denmark	-		-		5.75	E
Estonia	-		-		-	
Finland	-		-		10	E
France	7	E	7.7	E	-	
Germany	-		-		-	
Greece	-		-		7	V
Hungary	-		-		4.9	E
Ireland	-		-		6	E
Italy	-		-		5.5	E
Latvia	-		-		-	
Lithuania	5	V	7	V	-	
Luxembourg	-		-		5.15	E
Malta	-		-		6.5	E
Netherlands	-		-		7	E
Poland	-		-		7.1	E
Portugal	2.5	E	-		7.5	
Romania	4.5	V	6.5	V	-	
Slovakia	4.6	V	6.9	V	5.5	E
Slovenia	-		-		7.5	E
Spain	-		-		4.3	E
Sweden	-		-		-	
United Kingdom	-		-		4.75	V

The European Commission is not planning to establish EU-wide targets for renewable energy nor for the GHG intensity of fuels used in the transport after 2020. Some Member States however enforce blending mandates for biofuels. These mandates often form part of national programmes to support agriculture, energy security or aim to contribute to carbon dioxide reduction.

Note: E = Energy
V = Volume
MS = Member State

FIG.55 VEHICLE MARKET PENETRATION IN THE EU

Source: Emisia/ACEA



Gasoline and diesel vehicles dominate the market in the EU. Despite tax incentives introduced by some EU Member States, the uptake of alternative vehicle technologies is still limited.

FIG.56 NUMBER OF PETROL STATIONS IN EUROPE
END OF 2015

Source: National Oil Industry Associations, FPS Economy, DG Energy

Unit: Number of petrol stations

COUNTRY	Number of petrol stations	COUNTRY	Number of petrol stations
Austria	2 641	Italy	21 000
Belgium	3 386 *	Latvia	625
Bulgaria	2 457	Lithuania	830
Croatia		Luxembourg	236
Cyprus	280 **	Malta	
Czech Republic	3 844	Netherlands	4 198
Denmark	2 007 *	Poland	6 600
Estonia	440 **	Portugal	2 735
Finland	1 889	Romania	2 080
France	11 269	Slovakia	929
Germany	14 531	Slovenia	547
Greece	6 127	Spain	10 947
Hungary	1 901	Sweden	2 970
Ireland	1 795	United Kingdom	8 494
EU TOTAL	**114 758**		
Norway	1 677		
Switzerland	3 461		
Turkey	12 904		
TOTAL NO + CH + TR	**18 042**		
TOTAL	**132 800**		

EU

NON EU

* Numbers for 2014

** Numbers for 2013

There were over 132,000 petrol stations in the EU, Norway, Switzerland and Turkey operating in 2015, fuelling some 230 million cars and over 30 million trucks on Europe's roads.

About FuelsEurope

FuelsEurope is a division of the European Petroleum Refiners Association, an AISBL operating in Belgium. This Association, whose members are all 41 companies that operate petroleum refineries in the European Economic Area in 2016, is comprised of FuelsEurope and Concawe divisions, each having separate and distinct roles and expertise but administratively consolidated for efficiency and cost effectiveness.

Members account for almost 100% of EU petroleum refining capacity and more than 75% of EU motor fuel retail sales.

FuelsEurope aims to inform and provide expert advice to the EU institutions and other stakeholders about European Petroleum Refining and Distribution and its products in order to:

- Contribute in a constructive way to the development of technically feasible and cost effective EU policies and legislation.
- Promote an understanding amongst the EU institutions and citizens of the contribution of European Petroleum Refining and Distribution and its value chain to European economic, technological and social progress.

FuelsEurope Members

FuelsEurope

Boulevard du Souverain, 165 I B-1160 Brussels I Belgium
Phone: +32 (0)2 566 9100 I Fax: +32 (0)2 566 9111

www.fuelseurope.eu