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Worldwide Winter Diesel Fuel Quality Survey 2016

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Infineum Worldwide Winter Diesel Fuel Quality Survey 2016

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Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 - Contents

Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – introduction

Introduction

The Infineum Worldwide Winter Diesel Fuel Quality Survey provides the petroleum refining and distribution industries with a comprehensive view of the quality of automotive diesel fuel in the marketplace. To allow international trends to be tracked, 335 fuel samples were collected from 50 countries for the winter 2016 Survey. In the northern hemisphere samples were collected during the deep winter months of January and February. However, in the southern hemisphere sampling was undertaken in mid-2015, when true winter-grade samples were available.

To be representative of the diesel purchased by consumers, the samples were collected from retail service stations. As a general principle, one sample is obtained to cover the production from each refinery or region in a given country. Infineum uses its knowledge of local exchange agreements and distribution systems to select appropriate sample collection points, which minimises the possibility of taking multiple samples from a single refinery. For the larger diesel consuming countries, this procedure results in samples that represent a reasonable average of the overall quality. However, for smaller countries or specific producers, spot sampling over a short period of time can only provide a snapshot of production quality, with data derived from only one or two samples. This can make it more difficult to evaluate trends.

Analysis

The analyses applied to each sample are those Infineum considers to be of most interest to diesel producers, marketers, distributors and consumers. They cover areas including national specifications, exchange specifications and performance parameters. A degree of standardisation has been applied so that diesel from all the countries sampled can be compared and the data analysed as a single set. However, this standardisation means that not all national specifications are reported.

Wherever possible, industry standard test methods have been used and in-house test methods avoided. This means that the data published accurately reflect the results that could, or would, be generated by organisations within the petroleum industry. When considering this data, in particular when comparing the various test results with the national specifications, it should be noted that a number of the tests have quite wide reproducibility bands. In addition, very little repeat testing has been conducted to determine compliance or otherwise with specifications.

Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – introduction

Test methods

The majority of testing was carried out at quality accredited laboratories in the UK, Japan and China using the test methods below.

Density	IP365 / JIS K 2249
Kinematic Viscosity	ASTM D445 / JIS K 2283
Sulphur Content	ASTM D2622 / JIS K 2541-6
Cetane Number	IP498
Cetane Index	ASTM D4737 / ASTM D976 / JIS K 2280 -5
Pour Point	ASTM D5950 / JIS K 2269
Distillation	ASTM D86 / JIS K 2254
Cloud Point	ASTM D5772 / JIS K 2269 / ASTM D2500
CFPP	IP309 / JIS K 2288
HFRR	ISO 12156-1 / JPI-5S-50-98
Wax Content	Differential Scanning Calorimetry
LTFT	ASTM D4539
FAME Content	EN14078
Rancimat	EN 15751 (mod)
Solid Point	GB/T 510-1983

Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – key facts

The 2016 Infineum Winter Diesel Fuel Quality Survey (WDFQS) provides a snapshot of the quality of diesel fuel collected from retail stations from around the world in the deep winter months.

335 Samples collected

50 Countries

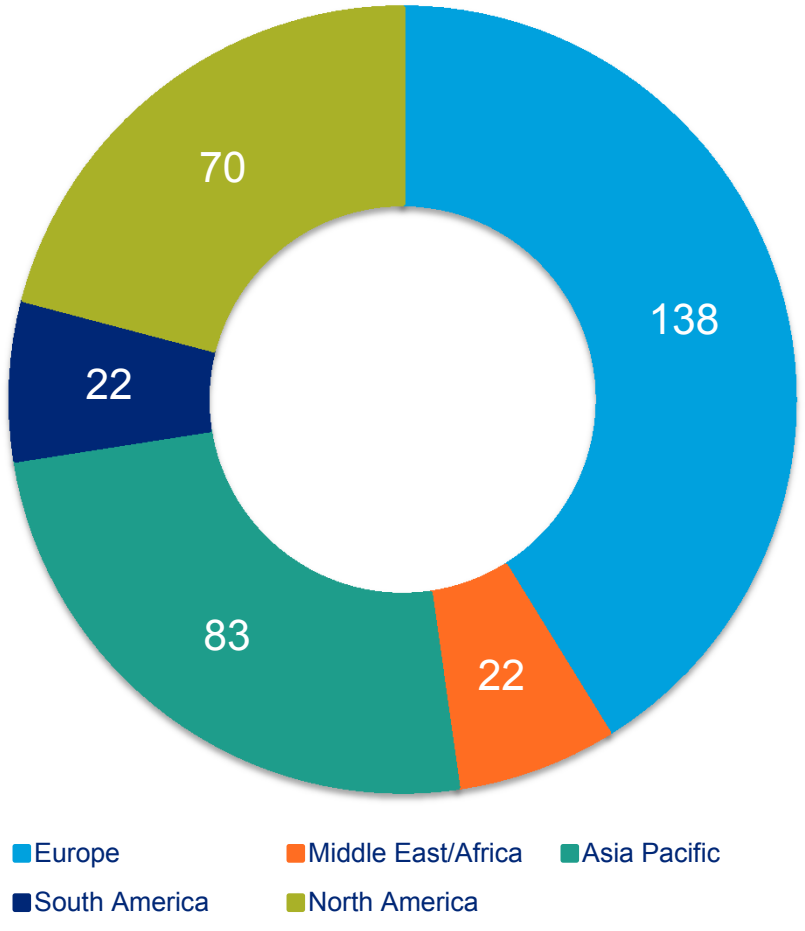
33 Parameters measured

9,336 data points analysed

Fuels Technologists from Infineum have been tracking the trends in diesel fuel quality in this biennial Survey since 1985*, providing the industry with a comprehensive picture of the global changes.

Sample collection

There have been changes in sampling in 2016, which have been in response to the shift in refining capacity that is moving to developing countries in Asia and the Middle East. Fewer samples were collected in Europe compared with 2014. But, with the inclusion of 26 samples from China, the Asia Pacific data set in the full Survey is much larger than two years ago.



* Prior to 1999, work was undertaken by Paramins (the additives division of Exxon Chemical Company), which together with Shell Additives (a division of The Shell Petroleum Company Ltd and Shell Oil Company) formed the Infineum joint venture.

Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – key findings

Sulphur continues to fall

There continues to be a general global downward trend in sulphur levels.

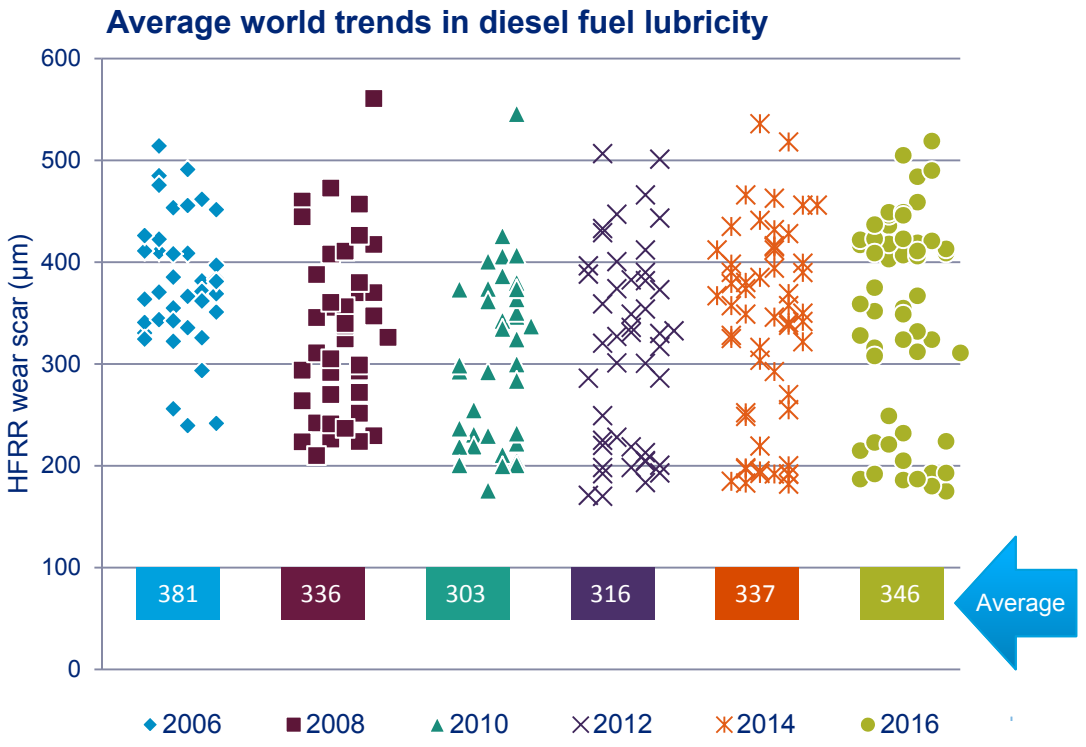
Only two of the 50 countries sampled had retail diesel fuels containing more than 1,000 ppm sulphur.

Countries where fuel samples contained >100 ppm sulphur		
Country	Max S level (ppm)	Mean S level (ppm)
Indonesia	2690	1973
Kuwait	1610	1575
Bahrain	324	324
Oman	345	315
Saudi Arabia	451	279
Malaysia	367	269
Argentina	431	223
Qatar	376	191
India	261	147
Brazil	332	87
China	286	63
South Africa	262	54

98% of the samples collected in Europe and all of the 70 North American samples contained less than 10 ppm sulphur.

Lubricity levels off

The downward trend in global average wear scar diameter, reported in previous years, has levelled off and remains stable, or is slightly increasing globally.



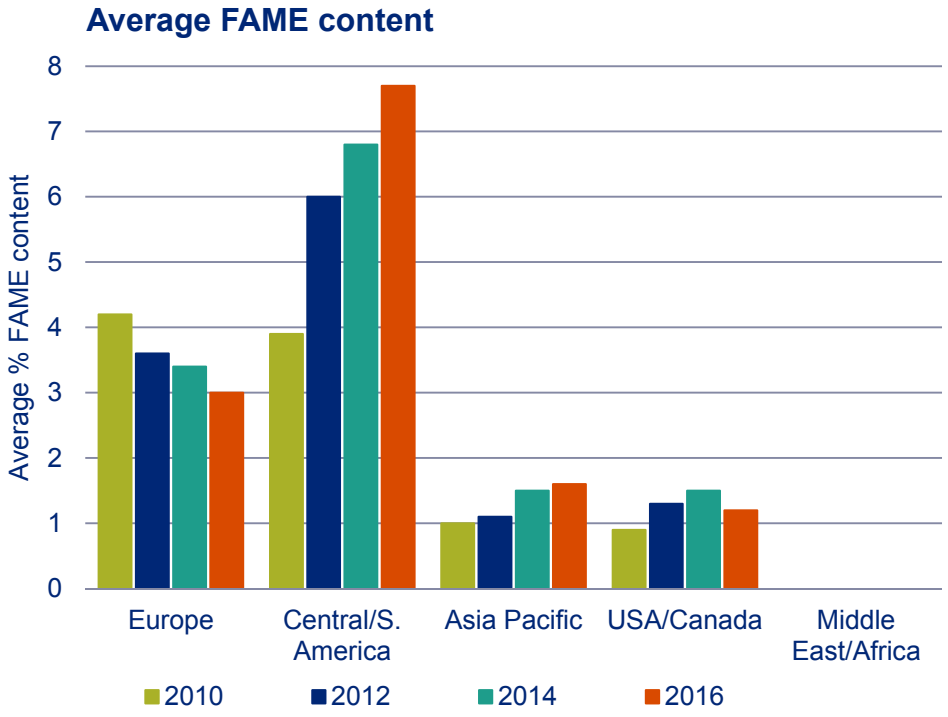
The downward trend in global average wear scar diameter has levelled off

Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – key findings

FAME content

The Survey reveals a mixed picture for diesel fuel fatty acid methyl ester (FAME) content globally:

- Continued backing off of FAME in Europe
- Significant increase in FAME content in Latin America
- Slow increase in FAME content in Asia Pacific
- Slight reduction in FAME content in North America
- No FAME in The Middle East and Africa



Mixed picture for global FAME levels

First sign of HVO

This year's Survey shows the first definite signs of hydrogenated vegetable *oil* (*HVO)* used as a renewable diesel fuel in Europe (particularly in Sweden and Spain) and also in the US.

This is especially relevant in Europe where the EN15940 specification for paraffinic diesel fuel made from synthesis or hydrotreatment has been approved and will be published by the end of 2016. It establishes requirements and test methods for paraffinic diesel fuels for use in diesel engines and aims to encourage the use of HVO, gas to liquid (GTL) and biomass to liquid (BTL) fuels.

Read on for the Infineum interpretation of the 2016 Winter Diesel Fuel Quality Survey.

Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – the trends

Growth in the demand for diesel fuel is being driven by a number of factors, including the expansion of passenger car and commercial vehicle fleets. While a slight drop in demand could be expected in the mature markets of Europe and North America from 2020, significant demand increase is expected in China and the wider Asia Pacific region – driven by strong growth in the road transportation sector. In addition, the use of diesel fuel in the marine bunker sector to meet tightening sulphur emission reduction targets will also drive demand.

In the next five years, it is estimated that over seven million barrels per day of new distillation capacity will be added globally, with over 60% coming from the Middle East, China and Asia Pacific.

These new capacity additions combined with changing demand patterns will influence diesel trade flows and increase the global movement of diesel fuel. As such, in a world of low oil prices and uncertainties about how soon the shale oil revolution in the US will pick up again, refiners must look for ways to maximise the production of middle distillate fuels that meet the quality requirements of the markets experiencing the most growth.

However, these opportunities come hand in hand with a number of challenges:

- Determining which are the most attractive markets to target.
- Maximising the production of on specification diesel, and producing the right fuels for each market.
- Meeting the national standards, which vary the world over for almost every parameter including: sulphur, FAME %, cold filter plugging point (CFPP), cetane, aromatics and lubricity.
- Understanding specifications, pipeline restrictions, off taker requirements, exchange agreements and tax incentives of the final destination market.
- Assessing the most cost effective way to produce on specification fuels.

The 2016 WDFQS highlights the variation in fuel quality that can be found from country to country and, in some cases, from filling station to filling station within the same country. In addition, it gives a broad picture of how refiners are managing to address some of the key industry challenges. However, the increase in the global movement of fuels means it is becoming harder to identify the source of the fuel and therefore draw firm conclusions from the data.

In the next five years, it is estimated that over seven million barrels per day of new distillation capacity will be added globally.

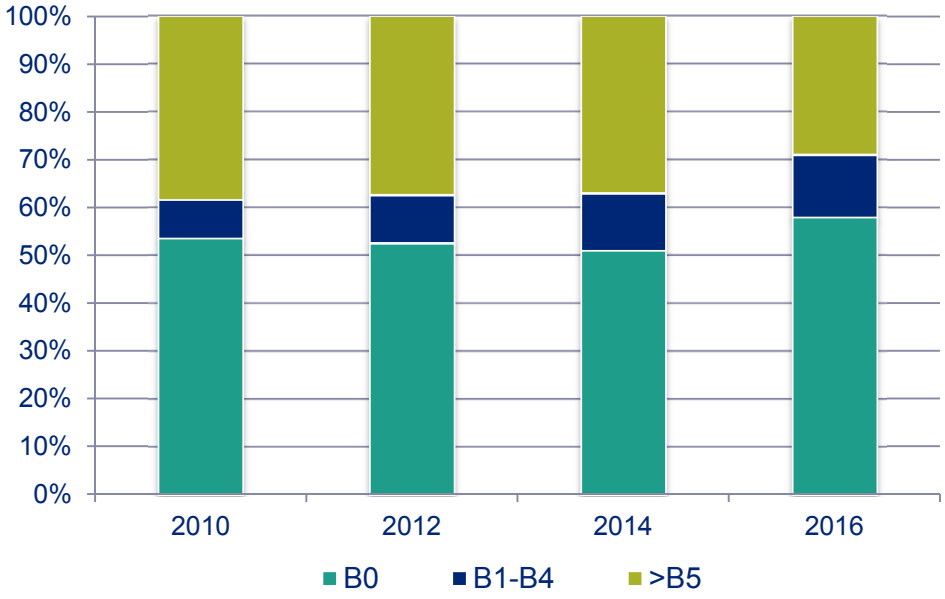
Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – the trends

FAME use

On a global level in the 2016 WDFQS a higher percentage of samples contained no FAME (B0) than in 2014. In addition, where FAME is used, there are a lower percentage of samples with FAME levels over B5.

However, as has been noted in previous Surveys, the trends in the use of FAME vary widely on a regional basis.

Samples containing FAME

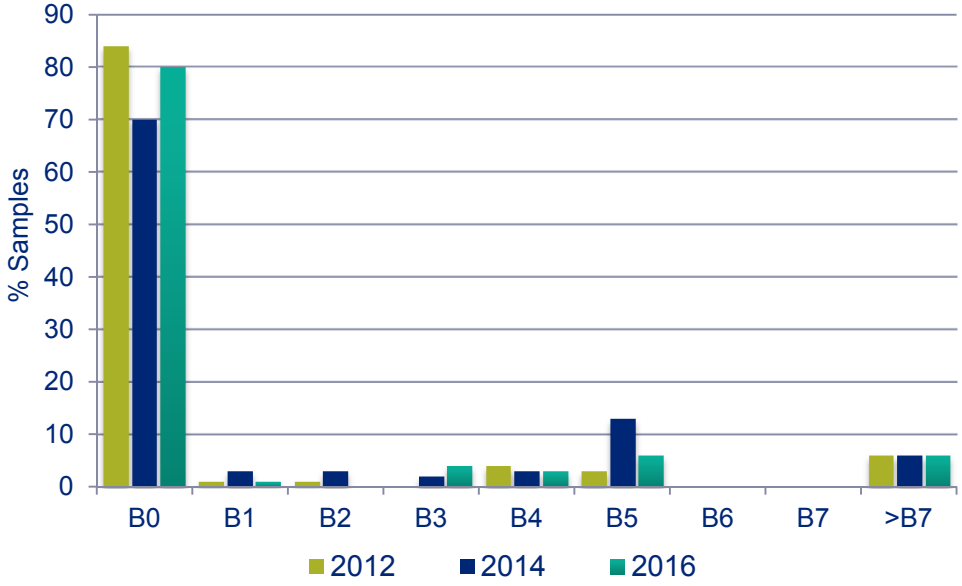


A higher percentage of samples contained no FAME

FAME in North America

A higher percentage of samples collected in North America in 2016 did not contain FAME – 80% in 2016 compared to 70% in 2014. In addition, over the same period, the percentage of samples containing B1-B5 fell from 23% to 14% while the percentage of >B7 samples remained the same, at 6%.

North America FAME content



A higher percentage of samples collected in North America in 2016 did not contain FAME

Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – the trends

FAME in North America (continued)

In the US, the total amount of biofuel that must be blended into transport fuels is regulated under the National Renewable Fuels Standard Program (RFS2). In the past three years the US Environmental Protection Agency (EPA) has increased renewable fuel volume requirements across all types of biofuels. Targets are now in place to 2018 that are expected to boost production and provide for ambitious yet achievable growth.

However, in the 2016 Survey a decrease in the FAME content of winter samples has been observed in the US.

Since FAME is a mandated annual (required volume obligation) RVO it is possible to meet mandates by increasing FAME use in summer and reducing, or even excluding, FAME use in winter. This practice may be evident in the Survey data, but cannot be confirmed, as summer samples are not collected.

Anomalies are observed in Illinois and Iowa, where some samples contained >11% FAME – well above the mandated levels.

Canadian Renewable Fuels Regulations require an average 2% renewable content in diesel fuel. However, biodiesel is not blended during the deep winter months so, as expected, none of the 13 samples collected contained FAME.

US FAME content and mandates

State sampled	Biodiesel mandate	Range of biodiesel present
Minnesota	5% in winter	3-5%
Massachusetts	5%	0-5%
Illinois	5%	0-11%
Indiana	2% in state vehicles	0%
Kansas	2% in state vehicles	0%
Louisiana	2% once production >10 million gallons	0%
Michigan	None	0%
Iowa	None	12%
New Jersey	None	0-4%
Texas	None	0-3%
Ohio	None	0%
Tennessee	None	0%
California	None	0-5%
Colorado	None	0-1%
South Dakota	None	0%
North Dakota	None	0%

Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – the trends

FAME in Europe

A reduction in the total percentage of samples containing FAME has been observed – from 73% of samples in 2010, to 63% of samples today. Over the same time period the average % volume of FAME used has also fallen from 4.2% to 3%.

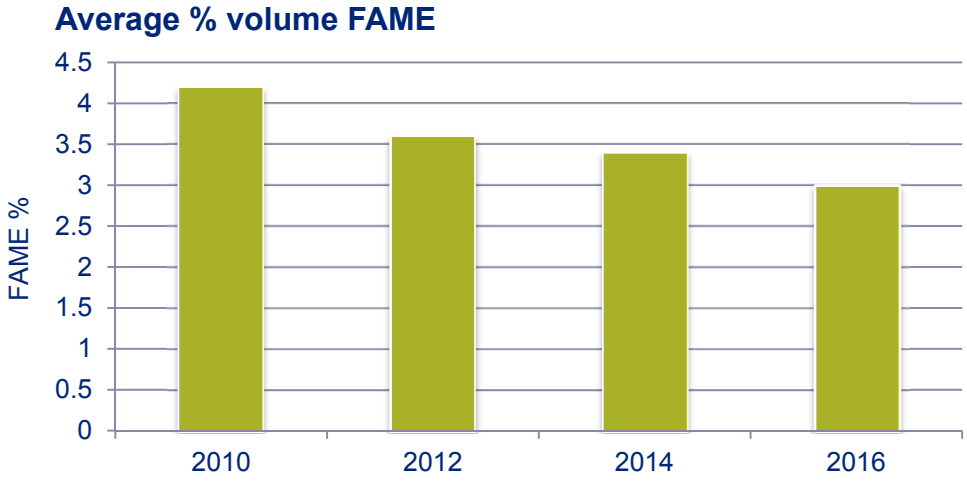
Samples from six countries did not contain FAME, and over the entire region there is a very mixed picture for FAME use.

Some countries had an increase in the number of samples containing FAME, while a continuing downward trend has been noted in others. However, the average volume of FAME blended has only increased in three countries over 2014 levels.

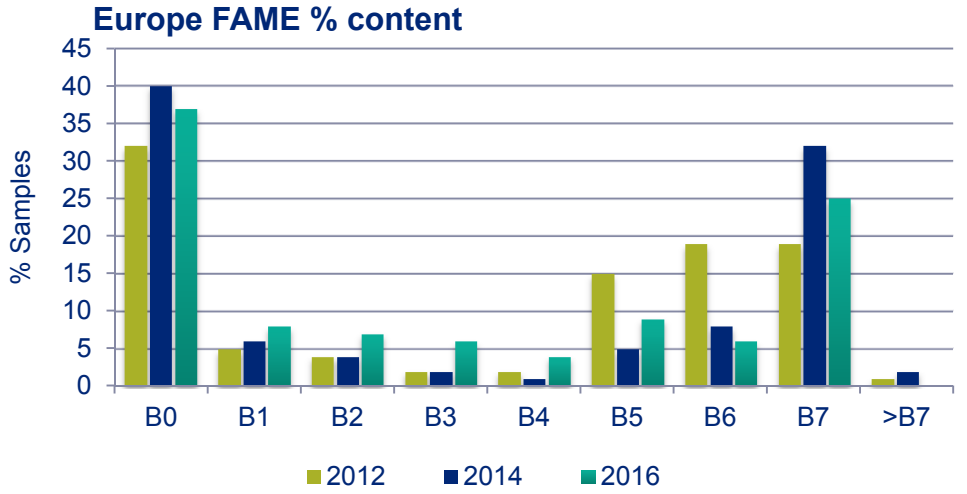
It should be noted that some of the changes observed could be down to sampling variations or to some of the refineries being converted to biofuel production.

As a general trend there is a backing off of FAME use, which could be attributed to a number of potential reasons:

- The EU directive limiting biofuels produced from crops means FAME could be replaced by alternative second-generation biofuels.
- There could be an increase in the use of used cooking oil in countries where it counts double towards renewable targets, which therefore reduces overall FAME consumption.
- The high cost of FAME and lack of explicit regulations mandating its use could be driving refiners to use a less expensive alternative to meet renewable targets.
- As tax credits are removed for FAME there could be a switch to alternatives such as HVO.
- Adverse reaction to operability issues, which some have attributed to FAME use.
- Seasonal use variations (more FAME may be used in summer) and the samples collected are all winter grades.



The percentage volume of FAME is steadily falling in Europe



In Europe there is a reduction in the percentage of samples containing FAME

Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – the trends

FAME in Europe (continued)

Clearly, the use of renewable fuels has a key part to play in meeting climate and energy targets and to moving to a competitive low carbon economy. In Europe, to ensure its 2030 targets are met, the European Commission has published a climate and energy framework, which sets three key targets:

- Cut greenhouse gases by 40%.
- Increase the use of renewable fuels to at least 27%.
- Improve energy efficiency by at least 27%.

The framework, which was adopted by EU leaders in 2014, is designed to boost the share of renewables to at least 27% of final EU energy consumption by 2030. However, the term “renewables” covers a wide range of sources including wind, solar, hydro, tidal, geothermal, and biomass, and there is little indication how this might affect the use of biodiesel in Europe.

In our view, European refiners will continue to seek alternatives to FAME unless its use is specifically mandated.

In addition, the Indirect Land Use Change (ILUC) Directive, which was reviewed in 2015, encourages a greater market penetration of second-generation biofuels, which have less impact on the food chain than first-generation biofuels (FAME). At present this is limiting the use of FAME in Europe.

FAME in Latin America

FAME use in Latin America is primarily driven by local mandates. Chile, where no mandate is in place, was the only country where samples did not contain FAME. Throughout the other countries sampled, Argentina, Brazil, Peru and Colombia, FAME levels ranged from 2% to 11%. In the future, biodiesel use could be expected to increase as more countries raise their mandates and voluntary blending ratios. In Brazil, for example, record soy harvests are spurring the soy and biofuels industries to encourage the government to increase blending levels from B7 to B10.

Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – the trends

FAME in Asia Pacific

Biodiesel was detected in samples from Indonesia, Malaysia, South Korea, Thailand and Australia – all of which have various levels of biodiesel mandate in place.

Although there was not a significant change in number of samples from Asia Pacific containing FAME, there was a big rise in FAME use in Indonesia and a slight increase in Malaysia. These trends are probably related to local specification changes. Indonesia introduced a B20 mandate in January 2016, switching up from B10. In the Survey, samples ranged from 8% to 21% FAME a range that could be indicative of refineries struggling to meet the target and/or the fact that the samples were collected during the transition to B20.

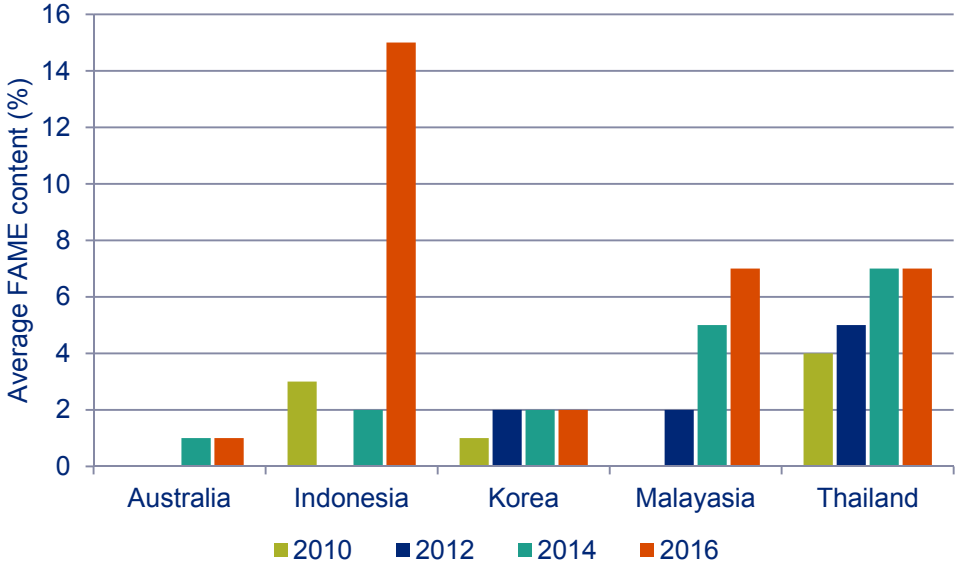
Malaysia has revised its FAME mandates from B5 to B7, which is reflected in the data.

In the 2014 Survey the first evidence of FAME use in Australia was reported. The volume of FAME blended into Australian diesel fuels is set at a state level, and at the time it was suggested that biodiesel use might rise if the Australian Government increased its commitment to renewable fuels through the Clean Energy Future Plan. In 2016, biodiesel is still only mandated in New South Wales and consequently no such increase has been observed.

No FAME was detected in samples from China and India – something that might be expected to change in future Surveys as both countries are expected to introduce voluntary blending targets for ethanol and biodiesel of 10 and 20% respectively.

In general terms, biodiesel use across the globe is driven by mandates and/or subsidies. Refiners select the most cost competitive solution to meet blend targets. However, quality concerns and operability issues may be driving the market away from FAME use, particularly in the winter months where quality may be more of a concern.

Average FAME usage and content in selected Asian countries



There have been increases in FAME use in Indonesia and Malaysia

Quality concerns and operability issues may be driving the market away from FAME use.

Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – the trends

Lubricity

Previous issues of the WDFQS have examined the trends in global average diesel fuel lubricity and an increase in average wear scar has been reported, which could have been attributed to a combination of the backing off of FAME use, the tough economic climate and variations in sampling. In 2016 there has been a continuation of this global average trend. However, it appears that this picture cannot be attributed to the inclusion of more Middle East samples, as had previously been suggested, since the same countries were included in this Survey as in 2014.

In 2014, 25% of the average results were above the Worldwide Fuel Charter (WWFC) recommendation of 400 microns (which applies to the top two diesel grades) and in 2016 that number has increased to 45%.

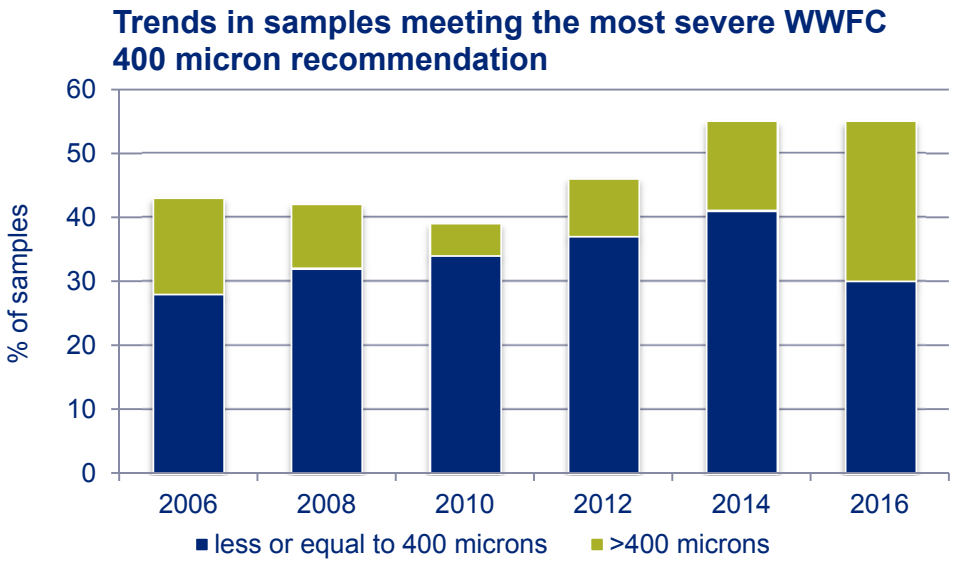
On examining the picture for samples meeting the WWFC 460 micron level the picture is unchanged from 2014 to 2016, with almost 94% of samples being below this limit.

Significantly more European countries are above 400 microns than in 2014, which may be a result of the reduction of FAME use in the region or an indication of less quality giveaway when additives are used to save cost.

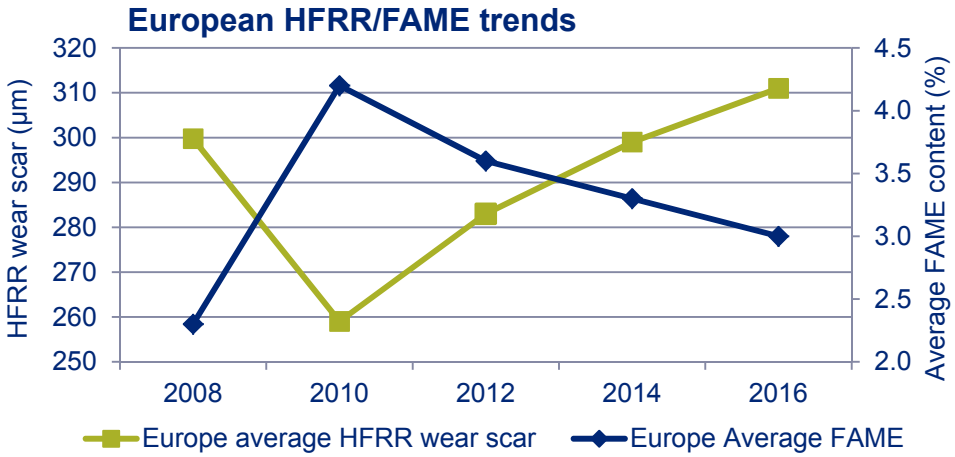
In North America a worsening picture for average lubricity has been observed in Canada, and in the East and Mid-West regions of the US.

It should be noted that, when looking at the global data, the average high frequency reciprocating rig (HFRR) levels are all below the North American 520 micron limit and only 7% exceed the European 460 micron maximum specification – none of which originate from the EU.

Less FAME and more second-generation biofuel use suggests that additives may increasingly be required to ensure that vehicle performance is not adversely affected.



More average results were above the WWFC 400 micron recommendation



European lubricity trends may be a result of the reduction of FAME use

Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – the trends

Sulphur

In Europe and North America very low sulphur limits for diesel fuels have been in place for some years. In the samples collected in 2016 sulphur levels ranged from <3 ppm to 15 ppm sulphur – even lower than reported in 2014.

The main area of interest in the Survey is the data from those countries that are still working towards the 'ultra low sulphur diesel' benchmark.

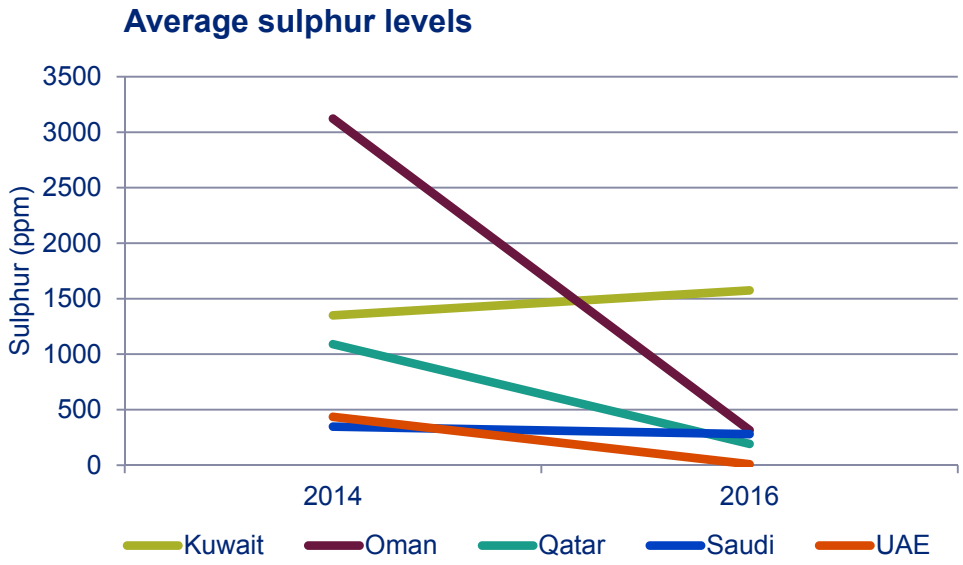
This year's sulphur-related headline is the huge drop in some of the Middle Eastern countries – particularly in Oman, Qatar and UAE compared to 2014.

These sulphur reductions are not only driven by internal requirements, but also by the need to export refined products.

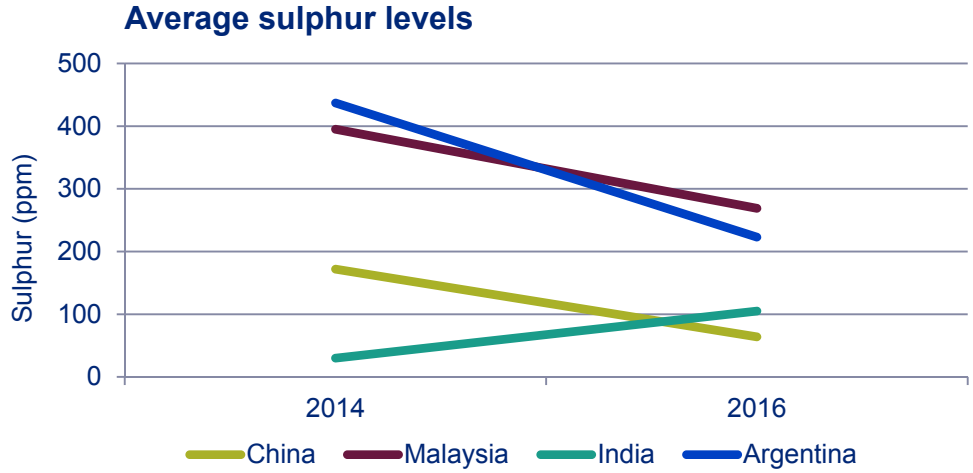
Ongoing modernisation projects in the region, which aim to meet lower sulphur requirements, are underway, with the goal of producing Euro 5 type fuels. Where these projects are already complete, 10 ppm sulphur diesel fuel is already being produced and this is reflected in the average sulphur values across the region. However, other refineries are still working towards this goal, which they should reach once the final projects are fully implemented.

Generally, the Middle East refineries are aiming to deliver low sulphur diesel, targeting the 10 ppm S / Euro 5 specification. However, the timeline for the completion of some of the projects is uncertain as they are reprioritised according to needs, the level of investment required and the trends of diversification toward export of refined products. In our view, by 2022 most of the Middle East should be producing and exporting 10 ppm sulphur diesel fuels.

In some of the countries where high National Standards for sulphur are still in place, there have also been sulphur reductions.



A significant reduction in sulphur has been observed in some countries



Slow reduction in sulphur continues in some countries

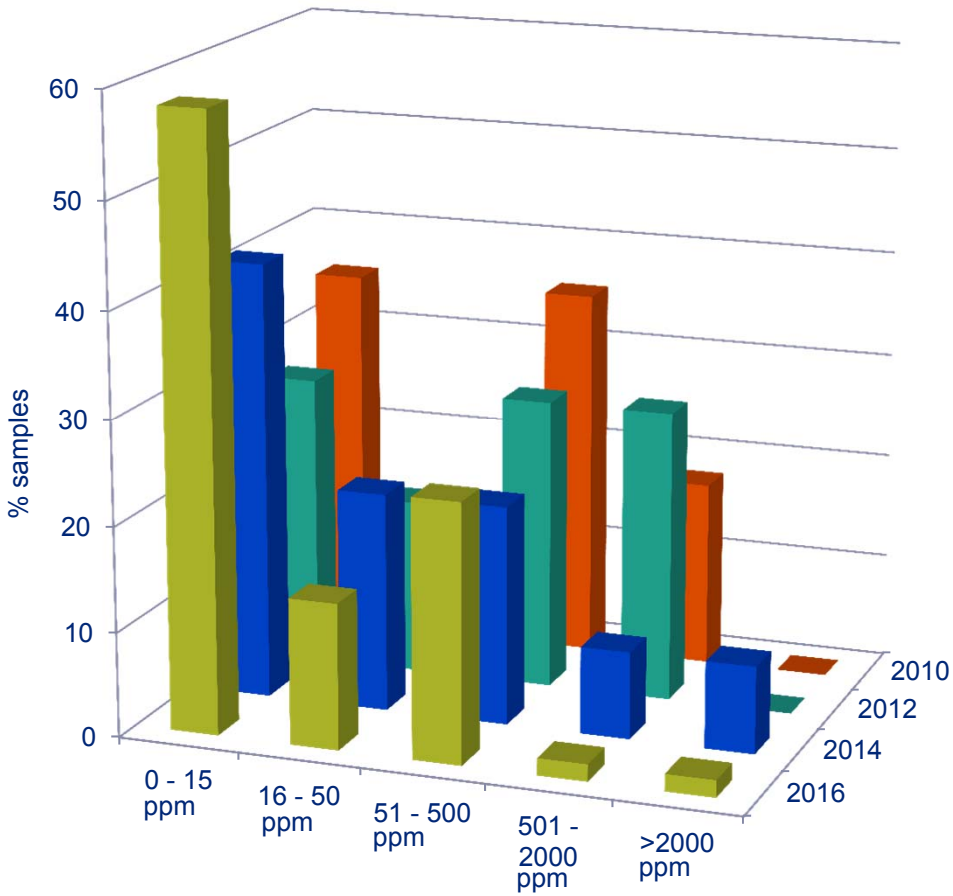
Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – the trends

In the southern hemisphere, with the exception of Argentina, average sulphur levels were below 70 ppm. A continued reduction has been observed in Argentina, where the average sulphur content in 2016 is 223 ppm.

Care must be taken in assuming that in all cases this is representative of the countries' entire diesel pool, because city diesel tends to be lower in sulphur than rural diesel, and sampling location may have a significant influence.

Despite this continued sulphur reduction, the chart shows that fuels containing high sulphur levels are still present in some countries – with Kuwait and Indonesia still selling diesel fuels with well over 1,000 ppm sulphur. However, significant progress has been made, with fewer samples containing over 500 ppm and more samples than in the previous Surveys containing 0-15 ppm sulphur.

Worldwide sulphur content (excluding EU and NA)



Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – the trends

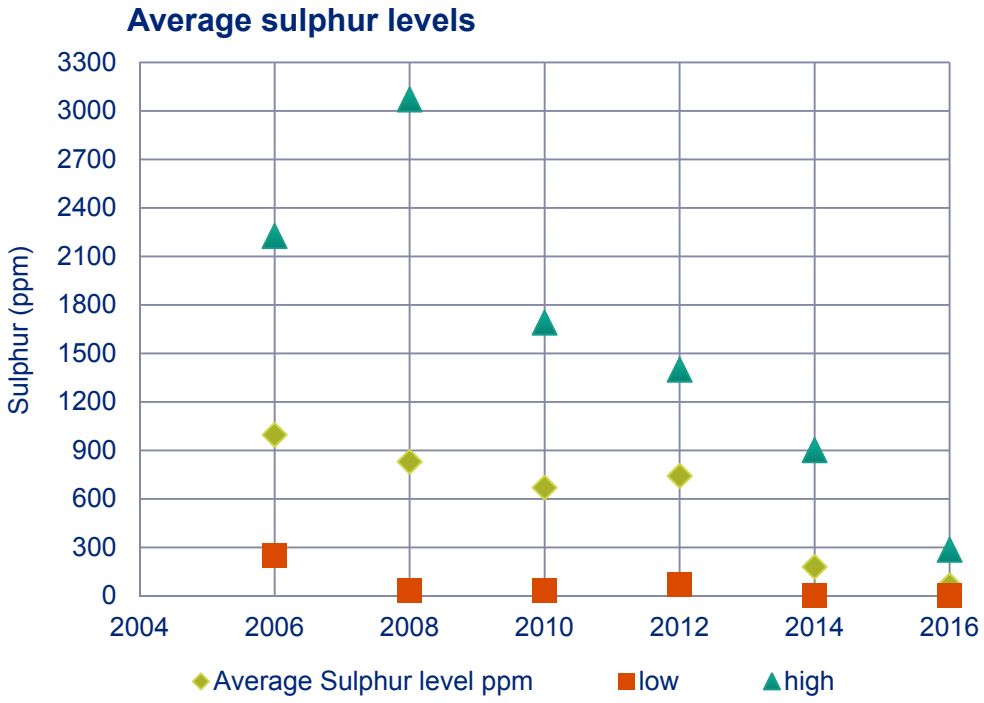
Sulphur in China

With a growing population of advanced passenger cars, China has been a region where fuel sulphur levels have been a concern. In the 2016 Survey there has been a continued reduction in fuel sulphur, although fuels with hundreds of ppm sulphur were still sampled.

However, the levels reported might not be representative of the entire country, as only a few of the samples were collected from rural areas, where fuels may have higher sulphur levels. Variation in sulphur content is a real concern, mainly owing to the fact that the performance of certain aftertreatment devices, such as diesel particulate filters, may be compromised if vehicles are fuelled with high sulphur diesel.

To curb pollution from the huge and growing vehicle population, China plans to further tighten emissions regulations and by 2017 targets equivalent to Euro V will apply nationwide. This means advanced aftertreatment technologies will be required, and their effective use will depend on the broad availability of diesel fuel with 10 ppm sulphur.

As emissions legislation drives the use of more advanced vehicle technology in all regions of the world, diesel fuel sulphur levels should continue to fall. In our view, proven lubricity additives will be required to ensure that vehicle performance is not adversely affected.



Sulphur levels continue to fall in China

Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – the trends

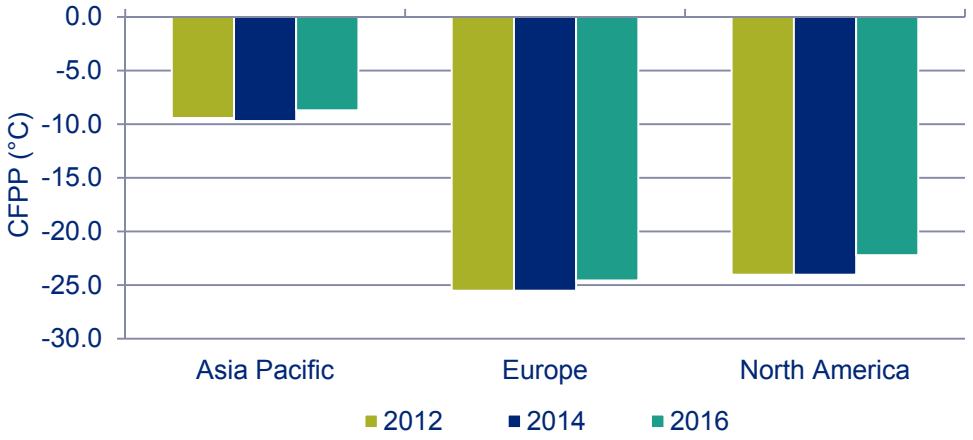
Cold flow

Northern hemisphere samples

The samples in the northern hemisphere show the cloud point (CP) and cold filter plugging point (CFPP) situation is mostly stable, which means that cold flow performance has been maintained.

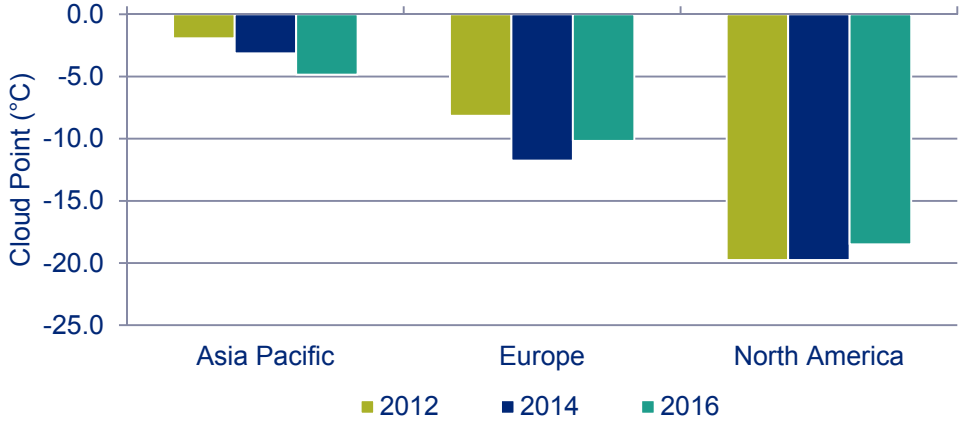
However, in Asia there does appear to be a regional drop in cloud points, which seems to be being driven by falling average cloud points in China, Japan and South Korea.

Average CFPP change per northern hemisphere region



CFPP is stable across the northern hemisphere

Average CP change per northern hemisphere region



A regional drop in cloud points was observed in Asia

Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – the trends

Southern hemisphere samples

In the southern hemisphere samples, the cloud point is generally lower in 2016 than in 2004. Since the last Survey, this phenomenon continues in South Africa and Peru, while the trend appears to have been no more than natural variability in Argentina and Brazil.

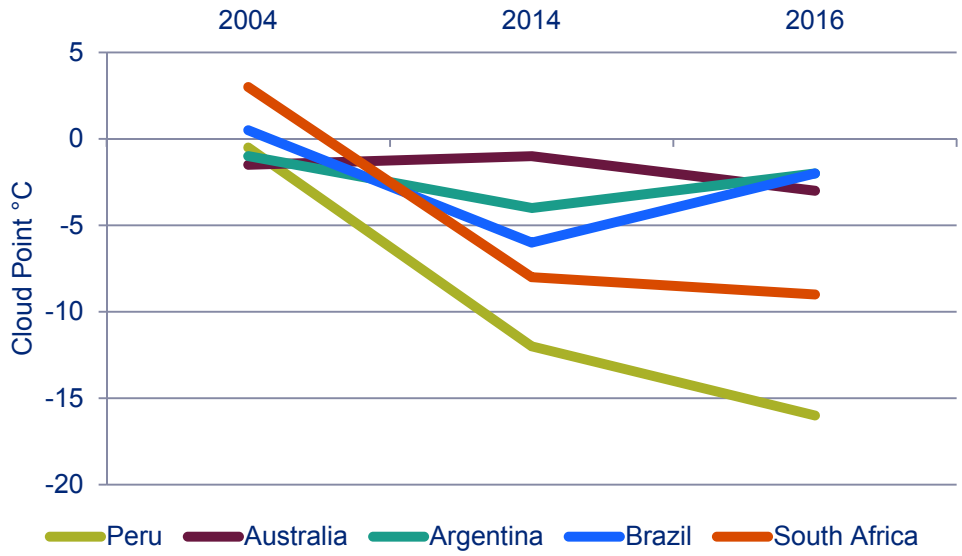
Potential causes of this reduction in cloud point include:

1. The need to reduce back-end distillation to facilitate sulphur reduction.
2. Increased use of imported diesel in some locations.
3. Specification changes.
4. Sampling variation.
5. Seasonal formulation differences.

Regardless of the cause, refiners have managed to maintain consistent fuel quality, with all fuels remaining on specification.

The use of additives extends the cold flow performance across the spectrum of middle distillate fuels and ensures that diesel fuels not only meet specifications, but also are fit for purpose.

Average cloud point change since 2004



Cloud point is generally lower than in 2004 in the southern hemisphere

Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – the trends

Oxidation

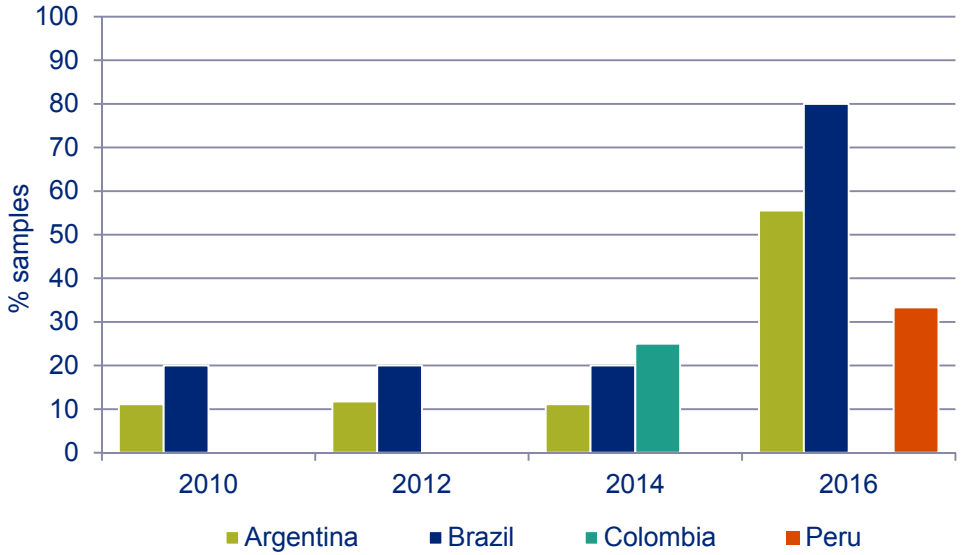
Previous Surveys had reported that a growing number of European fuel samples failed to meet the minimum Rancimat requirement for the EN590 diesel fuel specification at the time of testing. In the 2014 and 2016 Surveys this trend has not continued – with only 4% of samples in both years failing to meet the minimum Rancimat limit.

However, the 2016 Survey shows a significant worsening in oxidation stability in the samples from Argentina and Brazil and a reasonable percentage of samples from Peru were also found to have a Rancimat of less than 20 hours.

The cause of this trend is unclear, although it could be attributed to poor FAME quality or to a lack of antioxidant additive use. In certain circumstances poor oxidation stability can lead to higher levels of particulate matter in fuels, which has the potential to cause filterability issues.

Although it is not possible to attribute a cause, on examination of the filterability results, two samples from Argentina, both with Rancimat of less than 10 hours, failed to meet filterability targets.

% FAME containing samples with Rancimat of less than 20 hours



The cause of the worsening oxidation picture is unclear

Infineum Worldwide Winter Diesel Fuel Quality Survey 2016 – the trends

Looking to the future

The growing demand for diesel fuel in both land and sea transportation segments looks set to continue. With capacity increases expected in a number of regions, the export of diesel fuels will increase to meet demand.

Significant demand is expected from Asia, which presents the biggest opportunity for exporters. However, many Asian countries are also imposing more stringent legislation – for example tightening sulphur limits and, in some cases, increasing the use of renewable fuels.

The nationwide implementation of China V legislation in January 2017 is one example of tightening fuel specifications. This will have a huge impact on local refineries, some of which will require significant upgrades to their facilities in order to meet the demand for low sulphur fuels.

In a market that is shifting towards low sulphur fuels, the key challenge for refiners is how to maximise the production of diesel fuel that meets the quality requirements of the most lucrative markets, while still remaining profitable.

The International Maritime Organization's decision to lower the global sulphur cap for bunker fuels from 3.5% to 0.5% is expected to disrupt the heavy fuel oil (HFO) market and, as new demand requires further investments in upgrading residual products, it will have a significant impact on refiners around the world.

Improving refinery profitability by producing more on specification diesel from every barrel of crude and then producing the right fuel for the chosen market is more important than ever before. This is especially true for countries that want to export diesel fuels to more lucrative markets.

At the same time, OEMs are continuing to introduce enhancements to vehicle hardware to gain emissions reduction and fuel economy improvements. And, in a global market, OEMs expect fuels to deliver vehicle operability, no matter what the conditions.

All of these trends mean expert advice on specification requirements and proven additive technology are increasingly important to help fuel producers address the growing list of challenges facing the industry.

Expert advice on specification requirements and proven additive technology are increasingly important.

Worldwide summary

Mean data

Country	Austria	Belarus	Benelux	Croatia	Czech Rep	Denmark	Finland	France
No. of Samples	7	2	13	1	3	2	3	8
Samples containing FAME	5	0	5	1	3	1	0	8
Cloud Point, °C	-12	-8	-7	-6	-8	-10	-28	-7
LTFT, °C	-	-	-	-	-	-	-	-
CFPP, °C	-28	-30	-27	-19	-24	-23	-41	-22
Pour Point, °C	-29	-30	-33	-27	-27	-33	-38	-28
HFRR, µm	255	436	367	409	193	249	413	203
Wax Content @ 10°C Below Cloud, wt%	1.5	1.7	1.6	1.6	1.7	1.6	1.1	1.7
Rancimat, hrs	>25	>30	>30	>30	>30	>30	>30	>30
Sulphur, ppm	6	6	7	7	7	8	<3	6
Density @15°C, kg/m^3	834	828	834	828	839	838	808	835
Viscosity @ 30°C, cSt	-	-	-	-	-	-	-	-
Viscosity @ 40°C, cSt	-	-	-	-	-	-	-	-
Cetane Index $_{2\ Variable}$	54	53	51	52	51	54	57	51
Cetane Index $_{4\ Variable}$	54	54	51	51	50	55	59	50
Cetane Number	57	51	54	55	54	57	63	53
Distillation, °C IBP	173	175	160	162	179	167	171	162
T_{10}	210	207	195	190	204	219	200	193
T_{20}	226	221	213	205	218	240	212	210
T_{50}	273	261	261	255	266	283	247	261
T_{90}	334	329	332	331	333	334	301	333
T_{95}	347	345	348	348	345	348	316	346
FBP	355	354	357	359	354	356	328	355
% FAME	5	0	1	1	7	3	0	7

Mean data

Country	Germany	Greece	Hungary	Ireland	Italy	Lithuania	Norway	Poland
No. of Samples	24	2	1	1	14	2	2	4
Samples containing FAME	19	2	1	1	13	0	2	2
Cloud Point, °C	-9	-3	-11	-6	-5	-19	-25	-12
LTFT, °C	-	-	-	-	-	-	-	-
CFPP, °C	-28	-17	-29	-17	-17	-35	-37	-29
Pour Point, °C	-29	-18	-27	-24	-25	-32	-45	-32
HFRR, µm	258	205	308	403	292	407	215	418
Wax Content @ 10°C Below Cloud, wt%	1.5	1.7	1.3	2.0	1.7	0.9	1.3	0.9
Rancimat, hrs	>25	>20	>30	>30	>30	>30	>30	>30
Sulphur, ppm	6	5	8	8	7	5	6	7
Density @15°C, kg/m^3	834	834	840	830	834	832	829	826
Viscosity @ 30°C, cSt	-	-	-	-	-	-	-	-
Viscosity @ 40°C, cSt	-	-	-	-	-	-	-	-
Cetane Index $_{2\ Variable}$	53	53	51	52	52	47	49	54
Cetane Index $_{4\ Variable}$	53	52	50	52	51	47	49	53
Cetane Number	55	50	51	52	53	53	53	55
Distillation, °C IBP	169	163	169	163	165	162	165	161
T_{10}	205	199	203	200	200	193	193	196
T_{20}	221	218	220	216	215	206	206	213
T_{50}	267	269	268	260	263	243	244	259
T_{90}	332	335	340	330	337	304	314	331
T_{95}	346	350	356	345	352	324	327	348
FBP	354	359	363	352	361	338	335	358
% FAME	4	7	2	1	3	0	6	1

Mean data

Country	Portugal	Romania	Slovakia	Spain	Sweden	Switzerland	Turkey	United Kingdom
No. of Samples	3	4	1	11	5	7	2	15
Samples containing FAME	3	1	1	9	5	0	0	5
Cloud Point, °C	-4	-12	-6	-4	-31	-13	-4	-7
LTFT, °C	-	-	-	-	-	-	-	-
CFPP, °C	-10	-27	-31	-16	-35	-30	-18	-19
Pour Point, °C	-14	-32	-33	-18	-35	-28	-24	-24
HFRR, µm	232	352	175	355	223	419	421	349
Wax Content @ 10°C Below Cloud, wt%	1.6	1.6	1.4	1.5	2.4	1.4	1.6	1.6
Rancimat, hrs	>25	>30	>30	>30	>30	>30	>30	>30
Sulphur, ppm	7	<5	6	7	<3	7	4	8
Density @15°C, kg/m^3	840	838	841	839	810	831	828	840
Viscosity @ 30°C, cSt	-	-	-	-	-	-	-	-
Viscosity @ 40°C, cSt	-	-	-	-	-	-	-	-
Cetane Index $_{2\ Variable}$	53	49	51	52	59	51	58	50
Cetane Index $_{4\ Variable}$	53	49	50	51	63	51	59	49
Cetane Number	58	55	54	54	59	54	62	53
Distillation, °C IBP	176	162	178	159	185	163	156	164
T_{10}	218	202	210	199	218	196	211	201
T_{20}	238	218	224	220	230	213	237	219
T_{50}	279	258	270	271	258	256	284	265
T_{90}	340	323	336	339	297	317	342	330
T_{95}	357	339	350	356	307	337	358	346
FBP	366	348	358	366	323	349	366	358
% FAME	7	1	7	3	6	0	0	1

Mean data

Country	Ukraine	Australia	China	India	Indonesia	Japan – G2	Japan – G3	Japan – Sp G3
No. of Samples	1	4	26	3	3	23	1	2
Samples containing FAME	0	1	0	0	3	0	0	0
Cloud Point, °C	-14	-3	-12	-2	5	-6	-12	-18
LTFT, °C	-	-	-	-	-	-	-	-
CFPP, °C	-32	-7	-14	-3	2	-12	-16	-36
Pour Point, °C	-30	-8	-21	-6	-1	-20	-25	-40
HFRR, µm	422	324	426	459	224	375	505	484
Wax Content @ 10°C Below Cloud, wt%	1.2	4.0	-	2.0	1.9	1.0	1.5	0.9
Rancimat, hrs	>30	>30	>20	>30	>30	-	-	-
Sulphur, ppm	15	6	64	105	1973	7	7	6
Density @15°C, kg/m^3	840	833	833	830	853	832	816	813
Viscosity @ 30°C, cSt	-	-	-	-	-	3.70	2.58	2.19
Viscosity @ 40°C, cSt	-	2.80	4.04	2.41	3.31	-	-	-
Cetane Index $_{2\ Variable}$	52	54	51	53	51	56	56	50
Cetane Index $_{4\ Variable}$	53	55	50	51	49	56	56	50
Cetane Number	49	54	49	56	53	52	52	48
Distillation, °C IBP	161	174	171	135	160	-	-	-
T_{10}	228	218	209	180	213	218	186	174
T_{20}	242	235	223	207	240	239	203	186
T_{50}	272	272	259	262	294	278	252	230
T_{90}	335	328	320	337	349	330	318	315
T_{95}	353	344	337	356	365	344	333	335
FBP	363	353	350	365	373	358	347	355
% FAME	0	1	0	0	15	0	0	0

Mean data

Country	Malaysia	New Zealand	Singapore	South Korea	Thailand	Argentina	Brazil	Canada
No. of Samples	3	2	4	5	7	9	5	13
Samples containing FAME	3	0	0	5	7	9	5	0
Cloud Point, °C	10	-4	5	-11	9	-2	-2	-33
LTFT, °C	-	-	-	-	-	-	-	-37
CFPP, °C	7	-10	3	-29	5	-14	-7	-34
Pour Point, °C	5	-17	-2	-31	3	-13	-12	-45
HFRR, µm	221	359	342	311	187	193	180	446
Wax Content @ 10°C Below Cloud, wt%	4.0	1.8	2.6	1.1	2.9	1.9	0.8	1.0
Rancimat, hrs	>30	>30	>30	>30	>20	>20	15	>20
Sulphur, ppm	269	5	4	<5	30	223	70	6
Density @15°C, kg/m^3	845	845	837	826	838	847	842	838
Viscosity @ 30°C, cSt	-	-	-	-	-	-	-	-
Viscosity @ 40°C, cSt	3.45	3.51	3.73	2.55	3.38	3.10	2.78	2.12
Cetane Index $_{2\ Variable}$	52	52	57	55	55	51	50	45
Cetane Index $_{4\ Variable}$	53	52	58	54	56	50	49	44
Cetane Number	60	50	56	54	60	51	51	43
Distillation, °C IBP	172	174	178	138	176	159	147	162
T_{10}	227	229	224	182	222	205	203	192
T_{20}	247	248	247	207	243	229	227	206
T_{50}	285	281	296	267	287	284	269	241
T_{90}	345	337	359	342	348	347	336	301
T_{95}	361	352	373	361	365	366	356	318
FBP	369	361	379	375	370	373	367	330
% FAME	7	0	0	2	7	9	7	0

Mean data

Country	Chile	Colombia	Peru	USA – East	USA – Midwest	USA – West	Bahrain	Israel
No. of Samples	1	4	3	10	37	10	1	2
Samples containing FAME	0	4	3	3	9	2	0	0
Cloud Point, °C	-5	-9	-16	-13	-17	-12	-2	-2
LTFT, °C	-	-	-	-15	-20	-13	-	-
CFPP, °C	-8	-14	-21	-19	-22	-13	-3	-8
Pour Point, °C	-12	-12	-23	-25	-30	-21	-9	-12
HFRR, µm	324	192	187	328	406	449	449	437
Wax Content @ 10°C Below Cloud, wt%	1.3	3.5	1.4	1.8	1.4	1.9	2.6	2.4
Rancimat, hrs	>30	>30	19	>25	>25	>30	>30	>30
Sulphur, ppm	6	5	25	7	7	6	324	<6
Density @15°C, kg/m^3	839	846	831	844	843	830	834	833
Viscosity @ 30°C, cSt	-	-	-	-	-	-	-	-
Viscosity @ 40°C, cSt	2.88	3.23	2.38	2.51	2.56	2.67	3.65	3.39
Cetane Index $_{2\ Variable}$	52	53	51	48	48	53	58	56
Cetane Index $_{4\ Variable}$	51	52	51	47	47	55	60	58
Cetane Number	52	50	50	45	45	54	57	57
Distillation, °C IBP	159	166	163	162	164	172	149	184
T_{10}	208	220	191	202	205	213	237	224
T_{20}	228	244	207	220	221	226	257	242
T_{50}	271	289	258	263	259	261	292	284
T_{90}	337	334	327	323	322	322	347	344
T_{95}	354	345	340	339	339	338	357	359
FBP	364	353	348	348	350	350	366	365
% FAME	0	10	5	1	2	1	0	0

Mean data

Country	Kuwait	Oman	Qatar	Saudi Arabia	United Arab Emirates	South Africa
No. of Samples	2	2	2	4	3	6
Samples containing FAME	0	0	0	0	0	0
Cloud Point, °C	2	-5	-5	-4	-3	-9
LTFT, °C	-	-	-	-	-	-
CFPP, °C	1	-7	-8	-8	-7	-14
Pour Point, °C	0	-11	-8	-12	-7	-15
HFRR, µm	484	446	411	519	423	409
Wax Content @ 10°C Below Cloud, wt%	4.2	1.9	3.4	1.9	3.3	1.8
Rancimat, hrs	>30	>30	>30	>30	>30	>30
Sulphur, ppm	1575	315	191	279	8	65
Density @15°C, kg/m^3	839	832	830	826	828	826
Viscosity @ 30°C, cSt	-	-	-	-	-	-
Viscosity @ 40°C, cSt	4.93	3.08	3.22	2.73	3.49	2.70
Cetane Index $_{2\ Variable}$	58	55	57	55	59	54
Cetane Index $_{4\ Variable}$	65	56	60	56	63	56
Cetane Number	60	54	61	55	61	56
Distillation, °C IBP	213	175	188	177	198	177
T_{10}	268	214	236	207	243	213
T_{20}	283	232	252	222	258	228
T_{50}	311	277	281	266	287	263
T_{90}	351	343	333	338	338	329
T_{95}	362	361	351	355	352	349
FBP	369	370	362	364	362	360
% FAME	0	0	0	0	0	0

Worldwide Survey - Europe

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Austria

National standards and physical inspection data

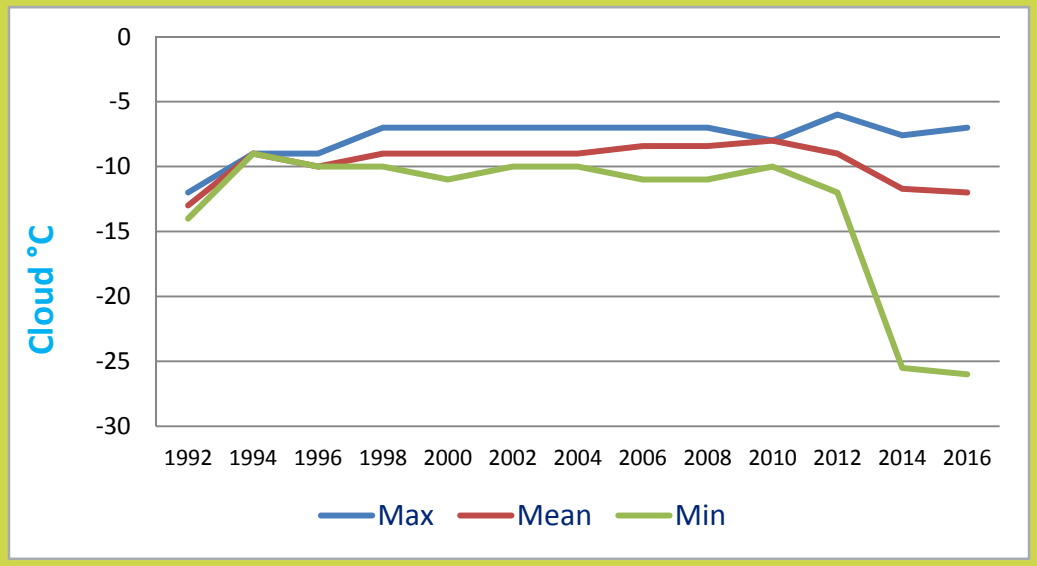
Europe

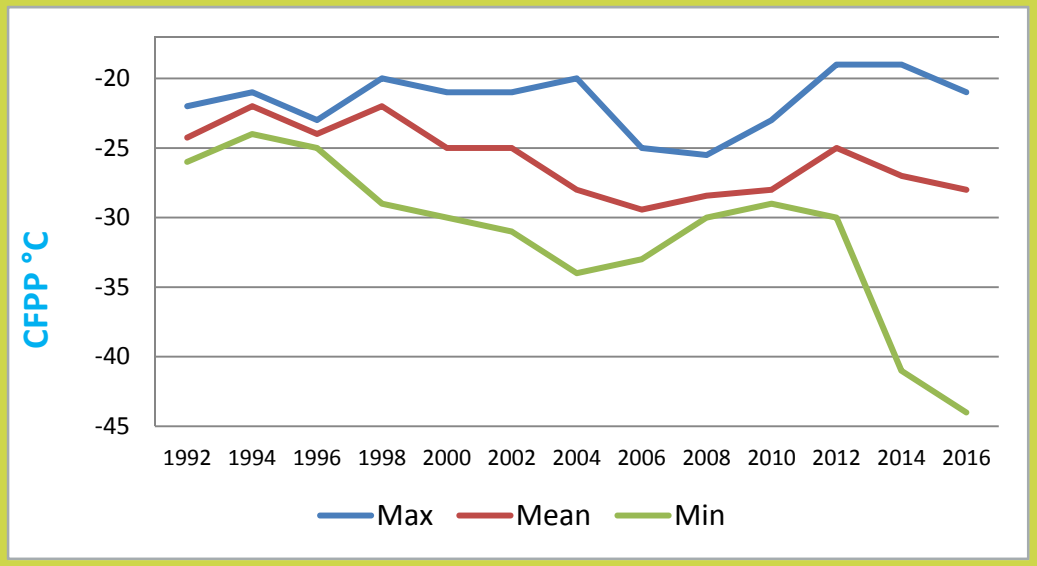
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600084	DIES 1600085	DIES 1600086	DIES 1600087	DIES 1600088	DIES 1600089	DIES 1600090
Cloud Point, °C		**-7**	**-12**	**-26**	-9	-26	-7	-10	-10	-8	-12
CFPP, °C	-20 (max)	**-21**	**-28**	**-44**	-22	-44	-21	-30	-33	-24	-27
Pour Point, °C		**-24**	**-29**	**-39**	-27	-39	-24	-27	-30	-27	-30
HFRR, µm	460 (max)	**427**	**255**	**179**	183	427	201	194	186	179	417
Wax Content @ 10°C Below Cloud, wt%		**1.8**	**1.5**	**1.0**	1.7	1.0	1.7	1.7	1.2	1.8	1.5
Rancimat, hrs	*	**>30**	**>25**	**4**	>30	>30	>30	4	>30	>30	>30
Sulphur, ppm	10 (max)	**8**	**6**	**<3**	8	4	8	5	6	8	<3
Density @15°C, kg/m^3	820 - 845	**838**	**834**	**830**	834	830	838	834	832	834	837
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-	-	-	-	-
Cetane Index $_{2\ Variable}$		**56**	**54**	**51**	52	55	53	55	51	54	56
Cetane Index $_{4\ Variable}$	46 (min)	**60**	**54**	**50**	51	56	52	56	50	53	60
Cetane Number	51 (min)	**64**	**57**	**52**	53	61	57	60	54	52	64
Distillation, °C IBP		**213**	**173**	**160**	160	167	167	174	167	164	213
T_{10}		**254**	**210**	**192**	192	210	203	218	196	199	254
T_{20}		**265**	**226**	**209**	210	231	222	227	209	218	265
T_{50}		**291**	**273**	**256**	267	273	273	280	256	271	291
T_{90}		**337**	**334**	**330**	337	331	334	336	330	337	331
T_{95}	360 (max)	**350**	**347**	**341**	349	350	346	348	343	350	341
FBP		**361**	**355**	**348**	361	359	356	354	352	357	348
% FAME	7 (max)	**7**	**5**	**0**	7	0	7	7	7	7	0

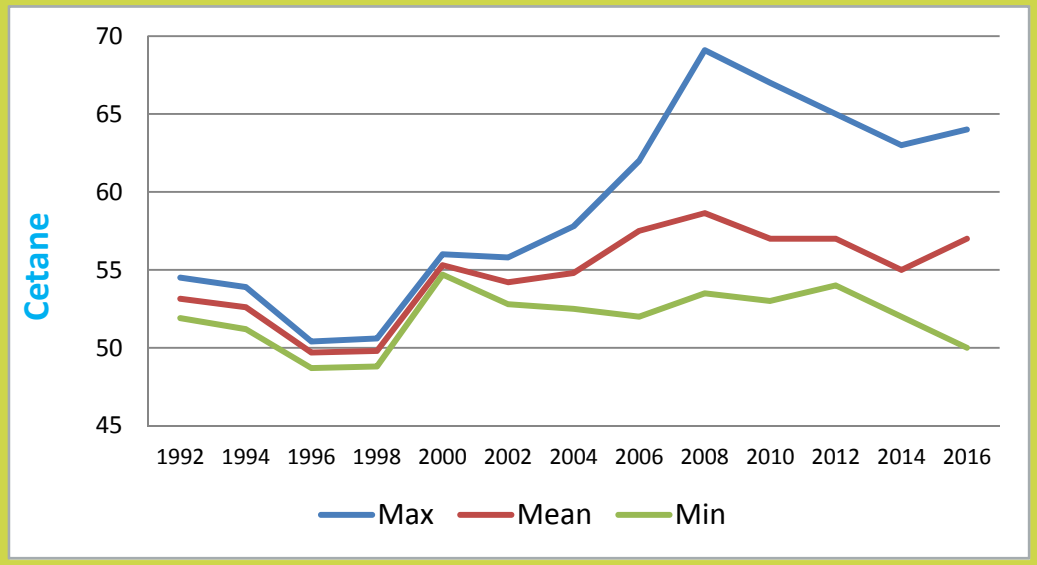
*20 hours min for diesel containing FAME above 2 % V/V

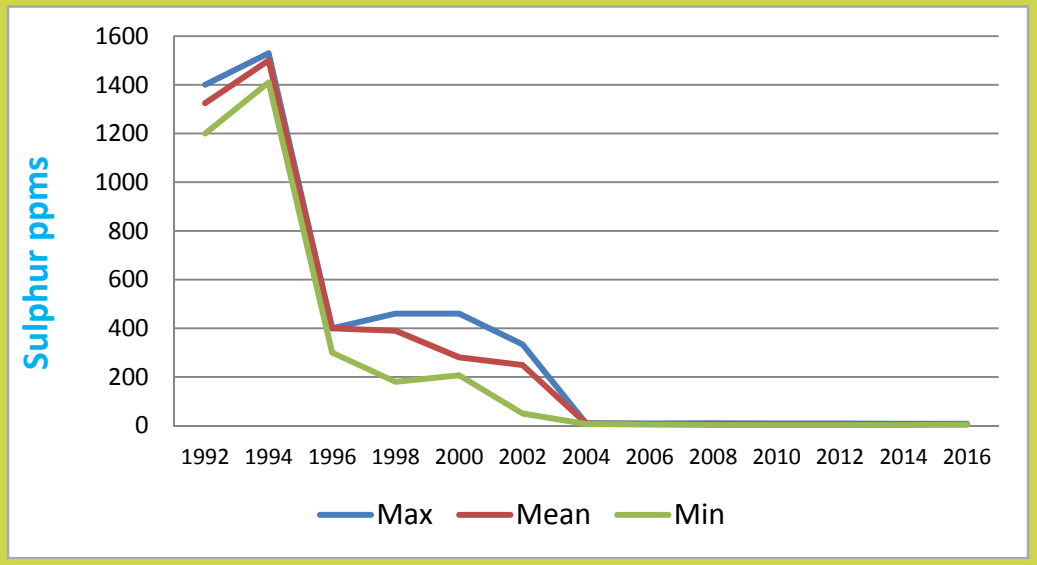
Austria

Europe









Belarus

Europe

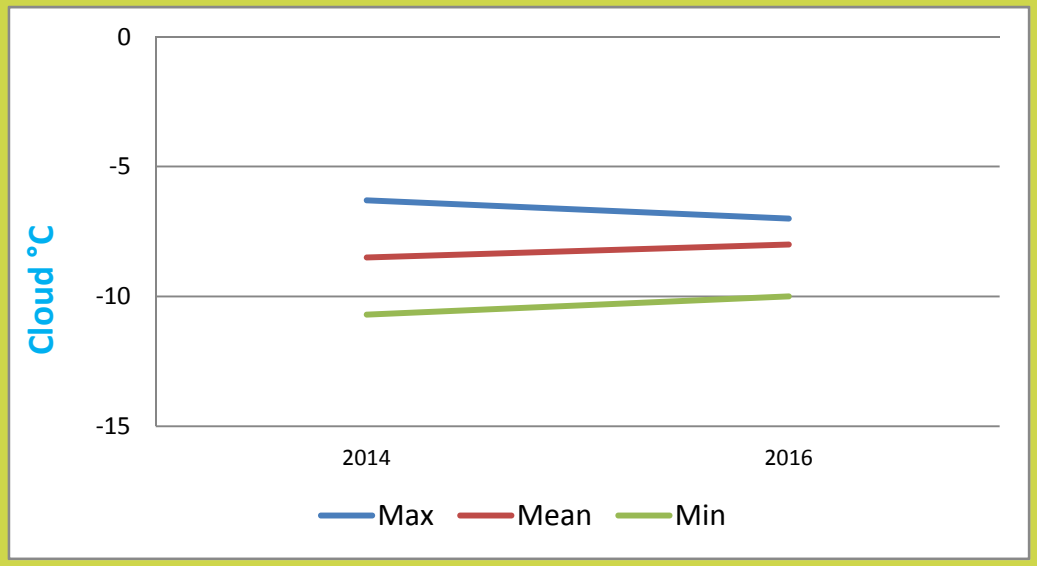
National standards and physical inspection data

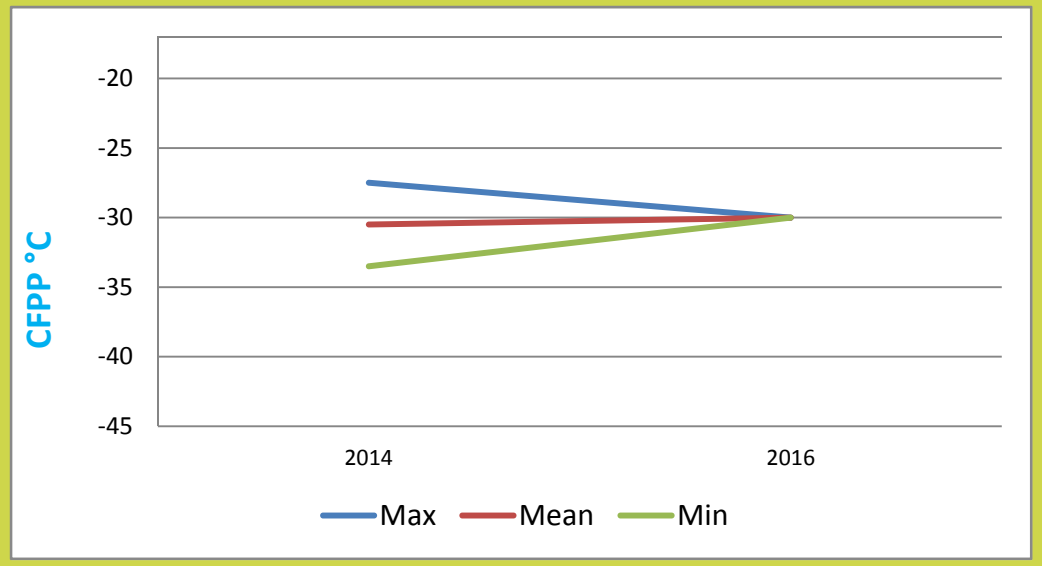
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600230	DIES 1600233
Cloud Point, °C		**-7**	**-8**	**-10**	-10	-7
CFPP, °C	-20 (max)	**-30**	**-30**	**-30**	-30	-30
Pour Point, °C		**-27**	**-30**	**-33**	-33	-27
HFRR, µm	460 (max)	**462**	**436**	**411**	462	411
Wax Content @ 10°C Below Cloud, wt%		**1.7**	**1.7**	**1.6**	1.6	1.7
Rancimat, hrs	*	**>30**	**>30**	**>30**	>30	>30
Sulphur, ppm	10 (max)	**7**	**6**	**6**	6	7
Density @15°C, kg/m^3	820 - 845	**829**	**828**	**827**	829	827
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-
Cetane Index $_{2\ Variable}$		**53**	**53**	**53**	53	53
Cetane Index $_{4\ Variable}$	46 (min)	**54**	**54**	**54**	54	54
Cetane Number	51 (min)	**51**	**51**	**51**	51	51
Distillation, °C IBP		**179**	**175**	**172**	172	179
T_{10}		**209**	**207**	**205**	205	209
T_{20}		**221**	**221**	**220**	220	221
T_{50}		**262**	**261**	**260**	262	260
T_{90}		**329**	**329**	**328**	329	328
T_{95}	360 (max)	**345**	**345**	**344**	344	345
FBP		**356**	**354**	**353**	353	356
% FAME	7 (max)	**0**	**0**	**0**	0	0

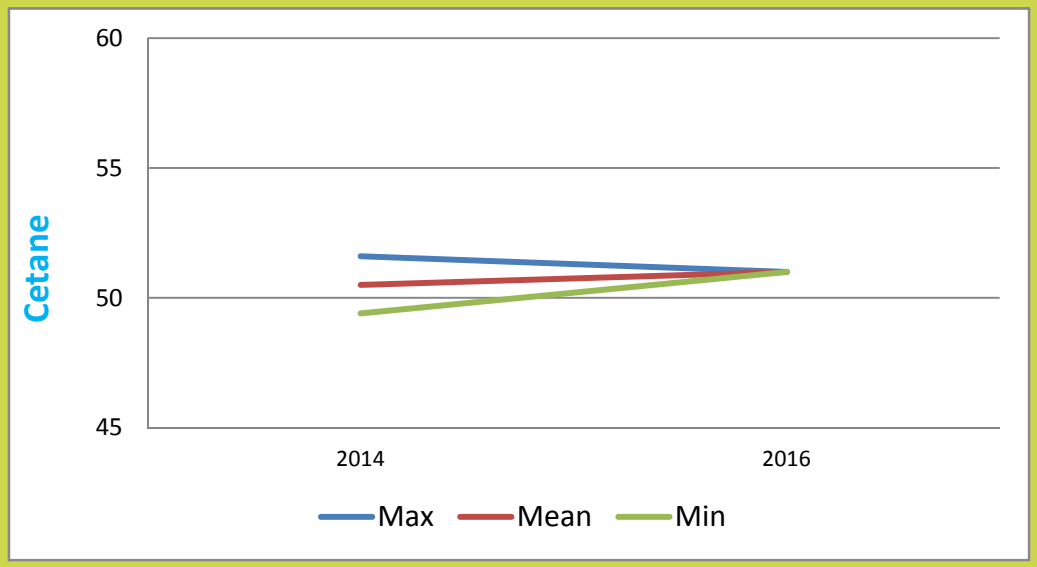
*20 hours min for diesel containing FAME above 2 % V/V

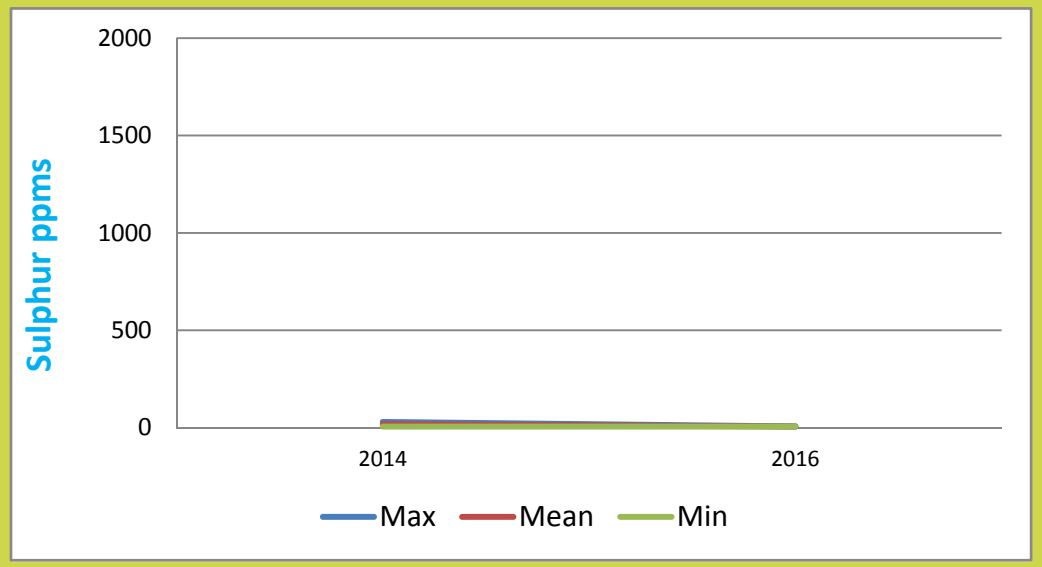
Belarus

Europe









Benelux

National standards and physical inspection data

Europe

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600239	DIES 1600687	DIES 1600699	DIES 1600700	DIES 1600701	DIES 1600702	DIES 1600703
Cloud Point, °C		**-6**	**-7**	**-8**	-8	-7	-7	-8	-8	-6	-6
CFPP, °C	-20 (max)	**-23**	**-27**	**-30**	-26	-30	-26	-27	-25	-28	-24
Pour Point, °C		**-24**	**-33**	**-42**	-24	-36	-36	-30	-30	-39	-42
HFRR, µm	460 (max)	**424**	**367**	**189**	416	351	375	415	419	406	418
Wax Content @ 10°C Below Cloud, wt%		**2.0**	**1.6**	**1.0**	1.7	1.2	1.2	2.0	1.9	1.0	1.6
Rancimat, hrs	*	**>30**	**>30**	**>30**	>30	>30	>30	>30	>30	>30	>30
Sulphur, ppm	10 (max)	**8**	**7**	**5**	8	6	6	7	7	5	6
Density @15°C, kg/m^3	820 - 845	**841**	**834**	**829**	833	841	839	832	829	833	832
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-	-	-	-	-
Cetane Index $_{2\ Variable}$		**54**	**51**	**47**	54	47	48	52	54	49	53
Cetane Index $_{4\ Variable}$	46 (min)	**54**	**51**	**48**	54	48	48	51	53	49	51
Cetane Number	51 (min)	**57**	**54**	**50**	57	53	53	54	50	52	54
Distillation, °C IBP		**170**	**160**	**154**	170	160	162	154	155	166	156
T_{10}		**212**	**195**	**181**	212	203	204	181	188	197	186
T_{20}		**233**	**213**	**202**	233	217	217	202	209	210	206
T_{50}		**271**	**261**	**251**	271	254	255	262	265	251	264
T_{90}		**335**	**332**	**328**	329	334	333	328	335	331	334
T_{95}	360 (max)	**351**	**348**	**343**	346	351	351	343	349	351	350
FBP		**363**	**357**	**353**	356	360	359	354	356	363	359
% FAME	7 (max)	**3**	**1**	**0**	0	1	1	0	0	2	3

*20 hours min for diesel containing FAME above 2 % V/V

Benelux (continued)

Europe

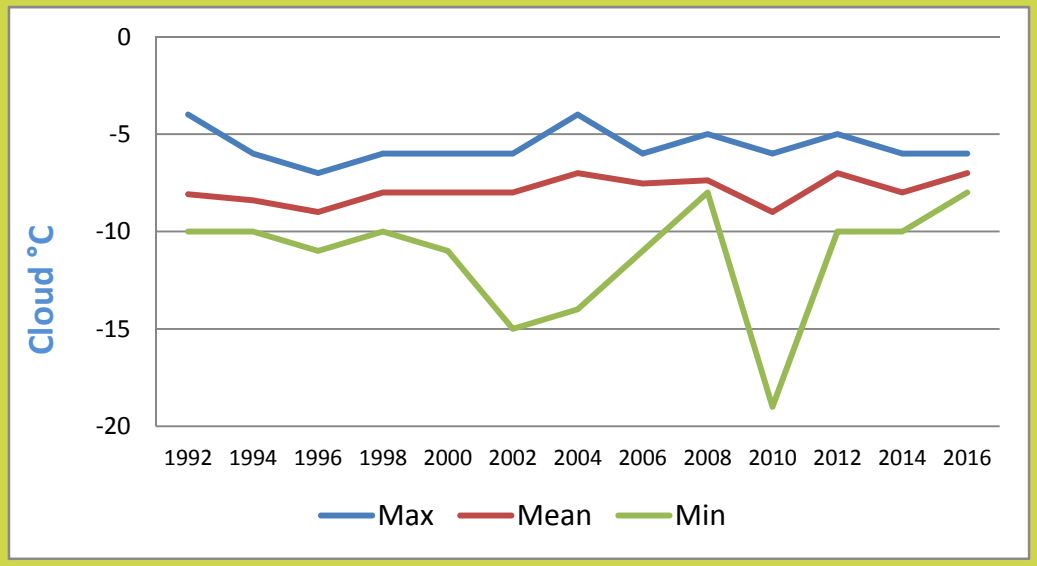
National standards and physical inspection data

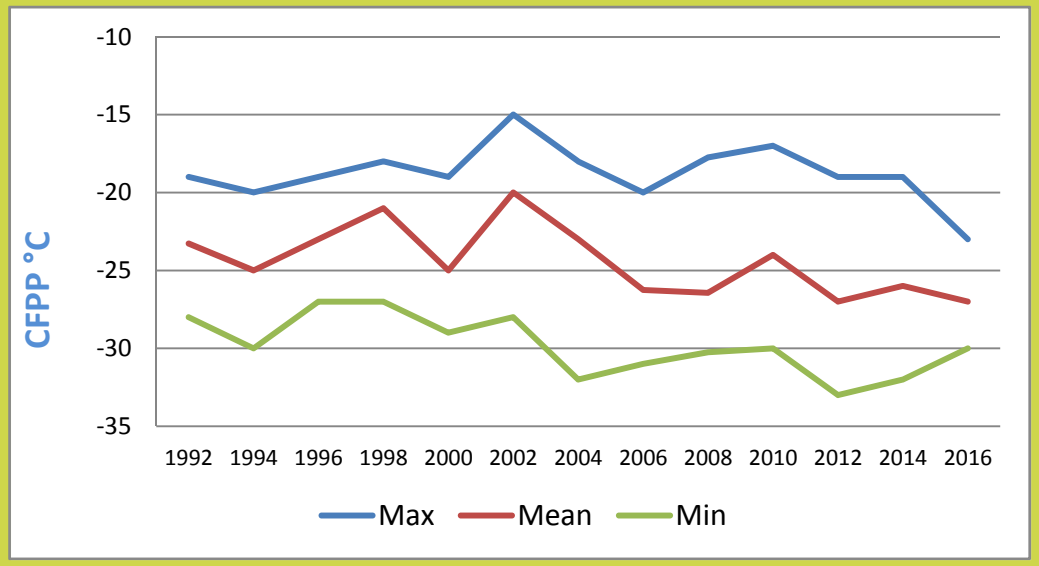
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600704	DIES 1600705	DIES 1600706	DIES 1600707	DIES 1600708	DIES 1600709
Cloud Point, °C		**-6**	**-7**	**-8**	-7	-8	-7	-8	-7	-7
CFPP, °C	-20 (max)	**-23**	**-27**	**-30**	-29	-30	-26	-29	-23	-27
Pour Point, °C		**-24**	**-33**	**-42**	-33	-36	-36	-27	-39	-24
HFRR, µm	460 (max)	**424**	**367**	**189**	424	402	382	361	216	189
Wax Content @ 10°C Below Cloud, wt%		**2.0**	**1.6**	**1.0**	1.8	1.5	1.5	1.7	1.9	1.9
Rancimat, hrs	*	**>30**	**>30**	**>30**	>30	>30	>30	>30	>30	>30
Sulphur, ppm	10 (max)	**8**	**7**	**5**	7	6	6	7	8	8
Density @15°C, kg/m^3	820 - 845	**841**	**834**	**829**	834	835	838	834	833	832
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-	-	-	-
Cetane Index $_{2\ Variable}$		**54**	**51**	**47**	51	50	49	53	52	53
Cetane Index $_{4\ Variable}$	46 (min)	**54**	**51**	**48**	50	49	49	53	51	52
Cetane Number	51 (min)	**57**	**54**	**50**	53	53	52	53	56	56
Distillation, °C IBP		**170**	**160**	**154**	157	160	160	168	155	154
T_{10}		**212**	**195**	**181**	190	196	200	211	182	189
T_{20}		**233**	**213**	**202**	209	214	215	230	204	210
T_{50}		**271**	**261**	**251**	262	256	258	270	263	266
T_{90}		**335**	**332**	**328**	331	330	333	331	328	332
T_{95}	360 (max)	**351**	**348**	**343**	346	349	349	349	344	346
FBP		**363**	**357**	**353**	357	357	357	358	353	354
% FAME	7 (max)	**3**	**1**	**0**	0	0	1	0	0	0

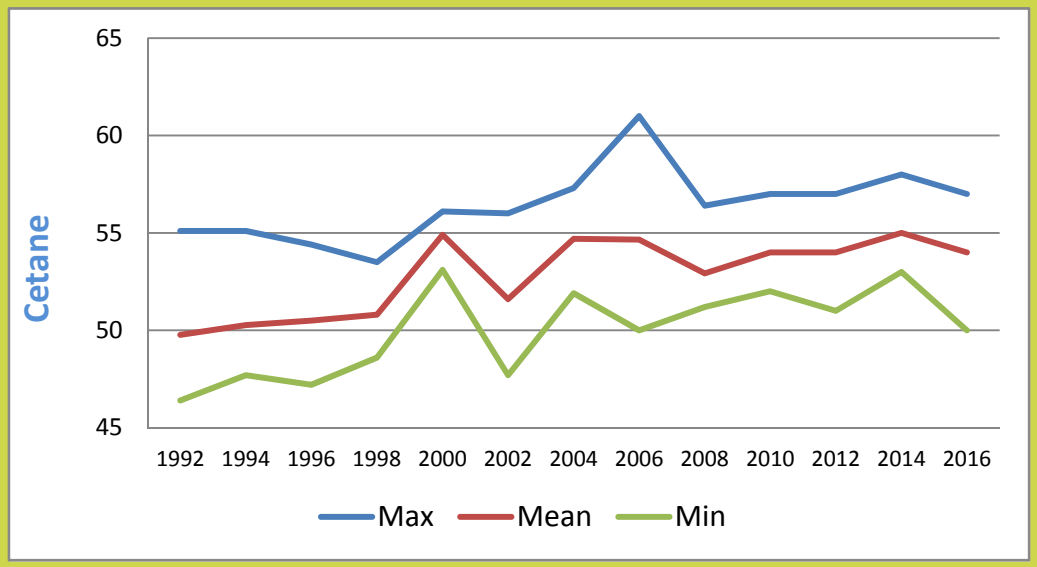
*20 hours min for diesel containing FAME above 2 % V/V

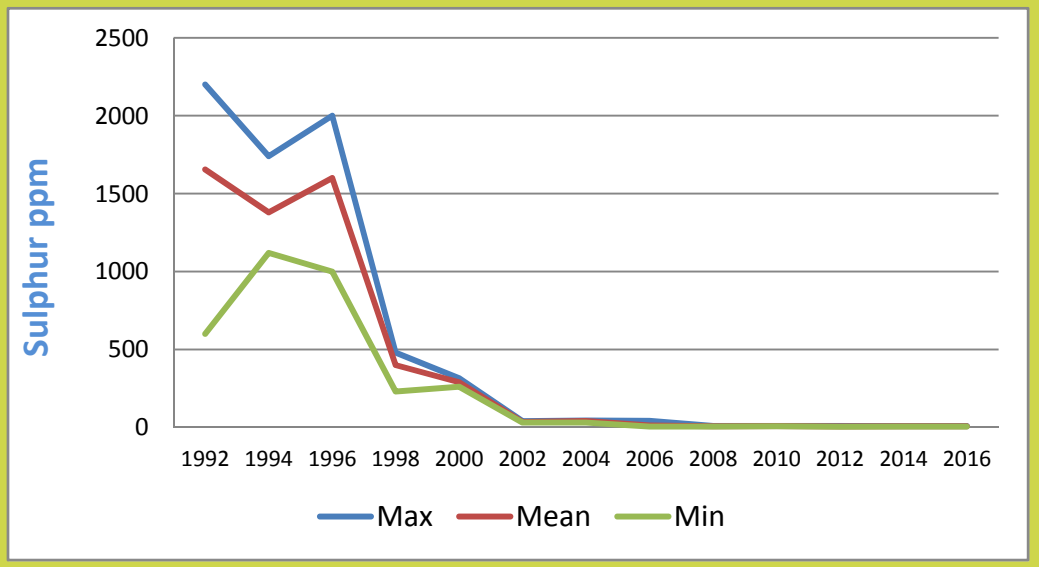
Benelux

Europe









Croatia

Europe

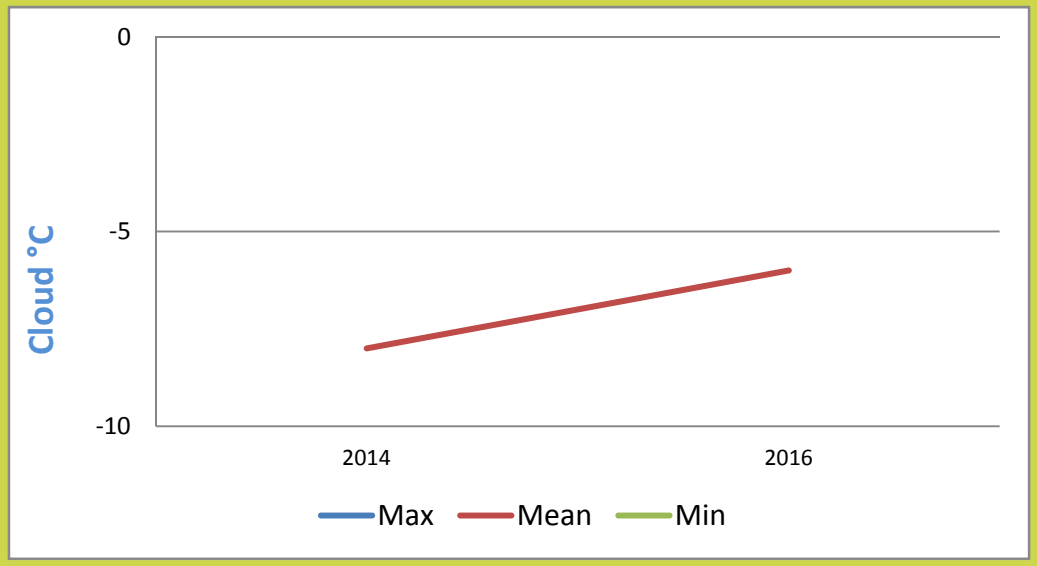
National standards and physical inspection data

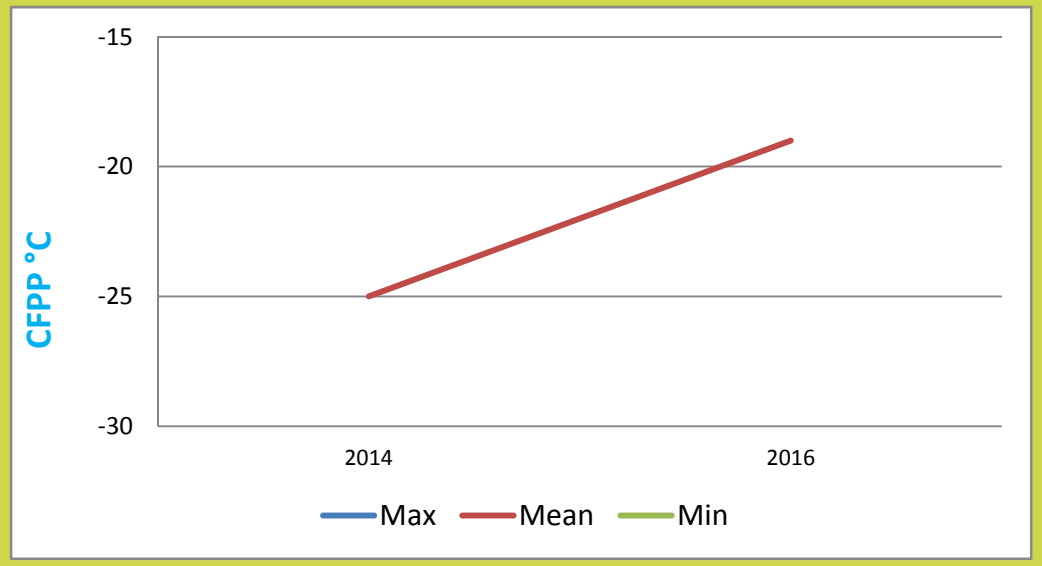
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600245
Cloud Point, °C			**-6**		-6
CFPP, °C	-20 (max)		**-19**		-19
Pour Point, °C			**-27**		-27
HFRR, µm	460 (max)		**409**		409
Wax Content @ 10°C Below Cloud, wt%			**1.6**		1.6
Rancimat, hrs	*		**>30**		>30
Sulphur, ppm	10 (max)		**7**		7
Density @15°C, kg/m^3	820 - 845		**828**		828
Viscosity @ 40°C, cSt	2.0 - 4.5		**-**		-
Cetane Index $_{2\ Variable}$			**52**		52
Cetane Index $_{4\ Variable}$	46 (min)		**51**		51
Cetane Number	51 (min)		**55**		55
Distillation, °C IBP			**162**		162
T_{10}			**190**		190
T_{20}			**205**		205
T_{50}			**255**		255
T_{90}			**331**		331
T_{95}	360 (max)		**348**		348
FBP			**359**		359
% FAME	7 (max)		**1**		1

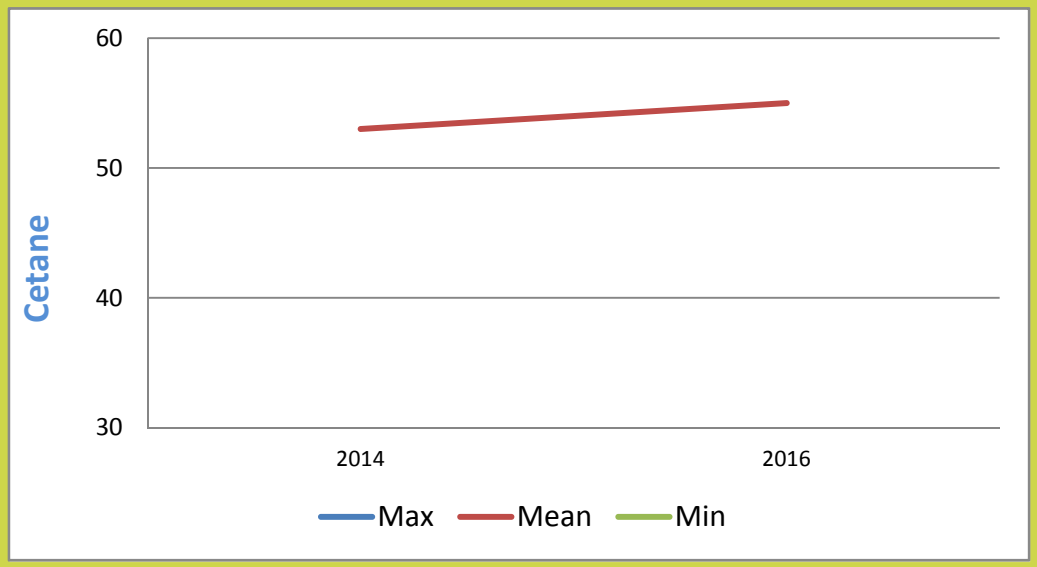
*20 hours min for diesel containing FAME above 2 % V/V

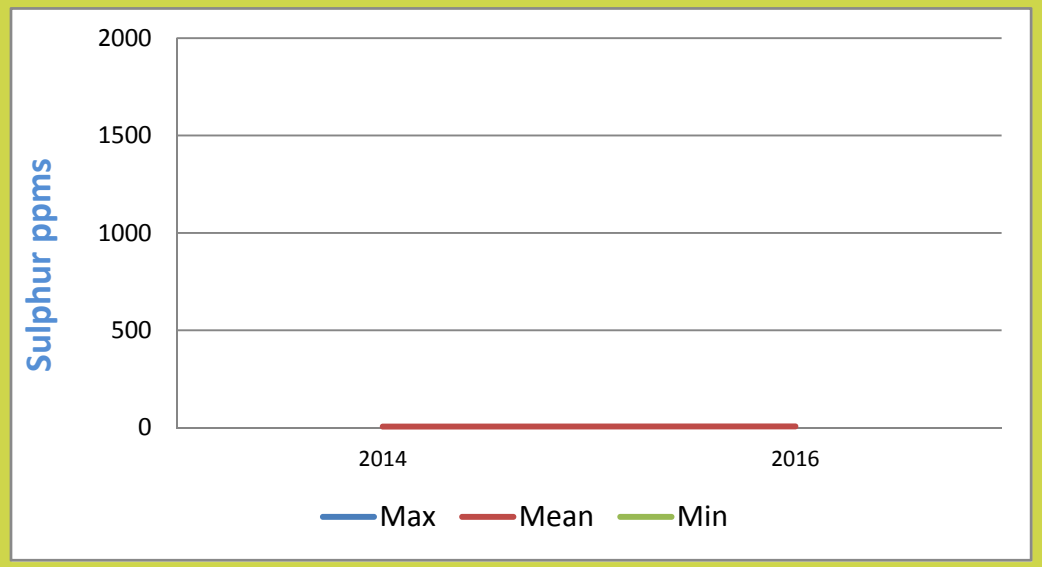
Croatia

Europe









Czech Republic

Europe

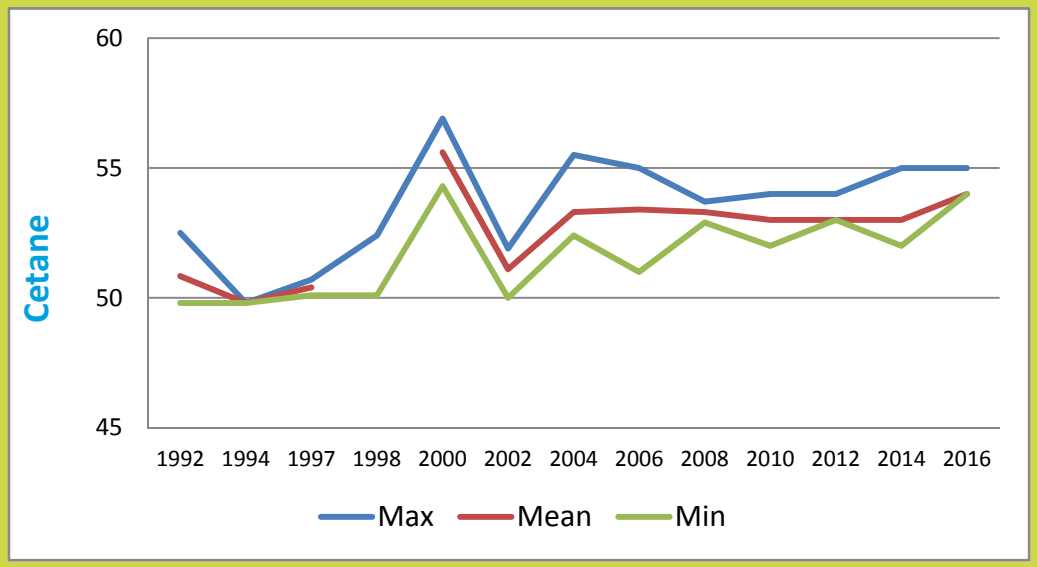
National standards and physical inspection data

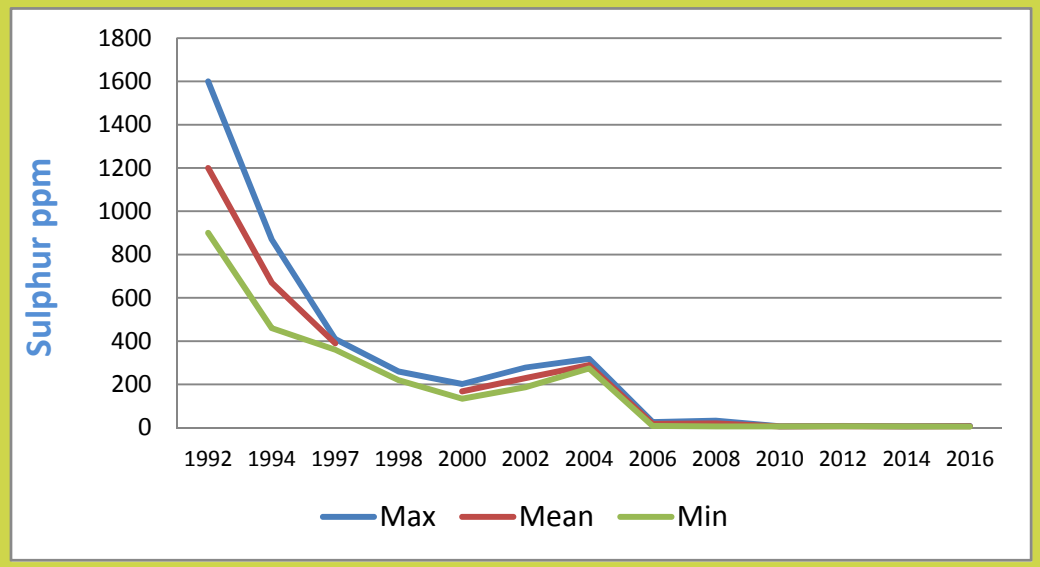
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600329	DIES 1600335	DIES 1600711
Cloud Point, °C		**-7**	**-8**	**-8**	-8	-7	-7
CFPP, °C	-20 (max)	**-22**	**-24**	**-27**	-24	-27	-22
Pour Point, °C		**-24**	**-27**	**-30**	-30	-27	-24
HFRR, µm	460 (max)	**196**	**193**	**189**	193	196	189
Wax Content @ 10°C Below Cloud, wt%		**1.9**	**1.7**	**1.4**	1.9	1.7	1.4
Rancimat, hrs	*	**>30**	**>30**	**>30**	>30	>30	>30
Sulphur, ppm	10 (max)	**8**	**7**	**5**	8	7	5
Density @15°C, kg/m^3	820 - 845	**839**	**839**	**839**	839	839	839
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-
Cetane Index $_{2\ Variable}$		**51**	**51**	**50**	51	51	50
Cetane Index $_{4\ Variable}$	46 (min)	**50**	**50**	**50**	50	50	50
Cetane Number	51 (min)	**55**	**54**	**54**	55	54	54
Distillation, °C IBP		**180**	**179**	**178**	178	178	180
T_{10}		**205**	**204**	**203**	204	203	205
T_{20}		**219**	**218**	**217**	217	219	219
T_{50}		**267**	**266**	**265**	267	267	265
T_{90}		**334**	**333**	**332**	332	333	334
T_{95}	360 (max)	**347**	**345**	**343**	343	346	347
FBP		**356**	**354**	**351**	351	355	356
% FAME	7 (max)	**7**	**7**	**7**	7	7	7

*20 hours min for diesel containing FAME above 2 % V/V

Czech Republic

Europe





Denmark

Europe

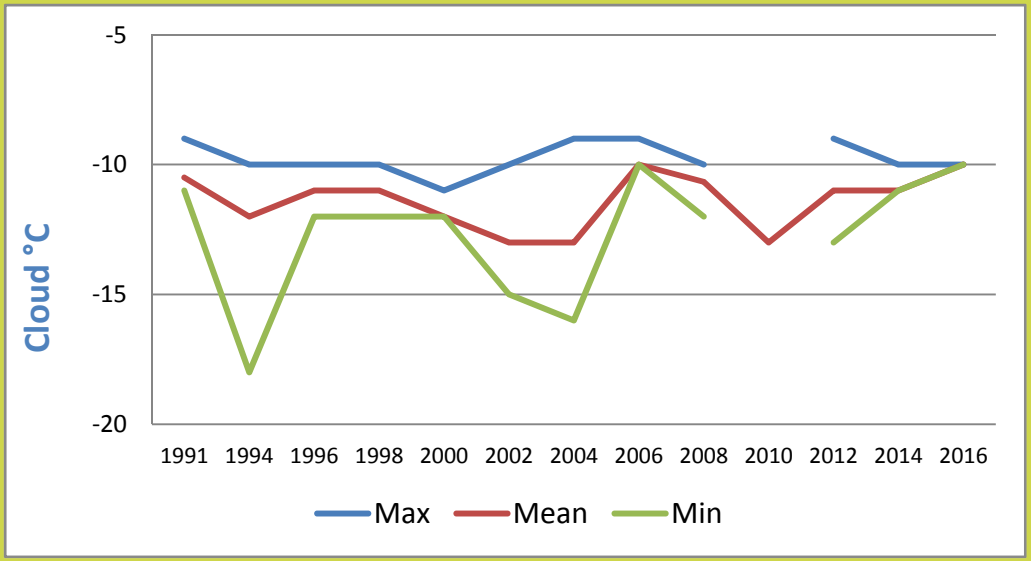
National standards and physical inspection data

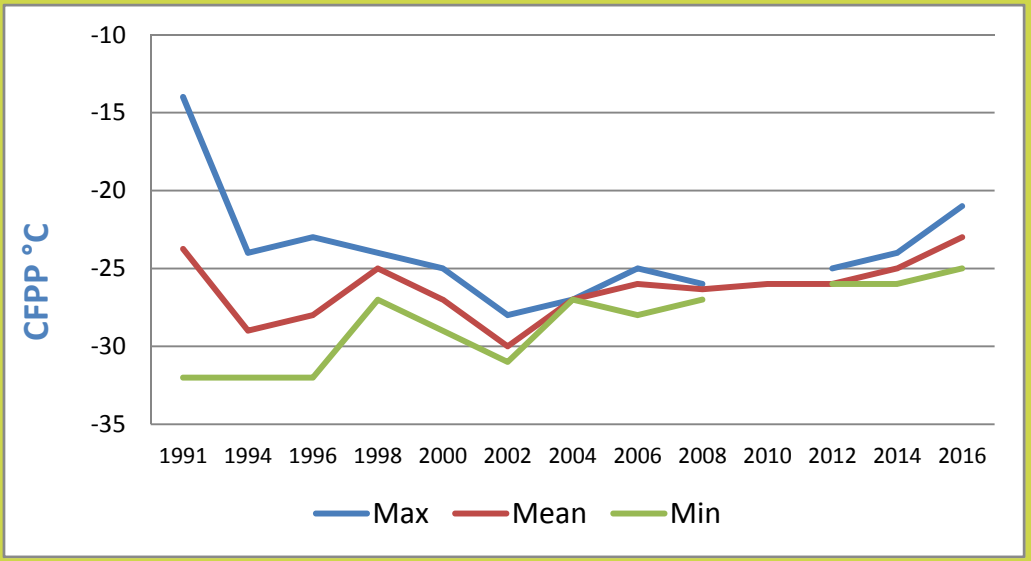
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600571	DIES 1600572
Cloud Point, °C		**-10**	**-10**	**-10**	-10	-10
CFPP, °C	-24 (max)	**-21**	**-23**	**-25**	-21	-25
Pour Point, °C		**-24**	**-33**	**-42**	-24	-42
HFRR, µm	460 (max)	**276**	**249**	**222**	222	276
Wax Content @ 10°C Below Cloud, wt%		**1.6**	**1.6**	**1.6**	1.6	1.6
Rancimat, hrs	*	**>30**	**>30**	**>30**	>30	>30
Sulphur, ppm	10 (max)	**9**	**8**	**8**	9	8
Density @15°C, kg/m^3	820 - 845	**845**	**838**	**831**	845	831
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-
Cetane Index $_{2\ Variable}$		**55**	**54**	**54**	54	55
Cetane Index $_{4\ Variable}$	46 (min)	**55**	**55**	**54**	55	54
Cetane Number	51 (min)	**59**	**57**	**56**	59	56
Distillation, °C IBP		**171**	**167**	**163**	171	163
T_{10}		**238**	**219**	**200**	238	200
T_{20}		**258**	**240**	**222**	258	222
T_{50}		**293**	**283**	**273**	293	273
T_{90}		**340**	**334**	**329**	340	329
T_{95}	360 (max)	**353**	**348**	**343**	353	343
FBP		**360**	**356**	**352**	360	352
% FAME	7 (max)	**7**	**3**	**0**	7	0

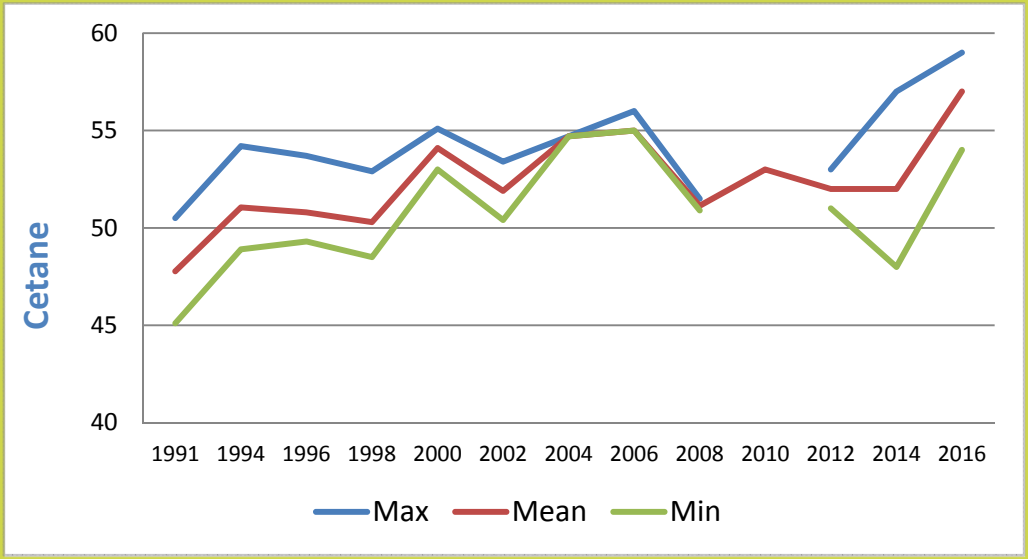
*20 hours min for diesel containing FAME above 2 % V/V

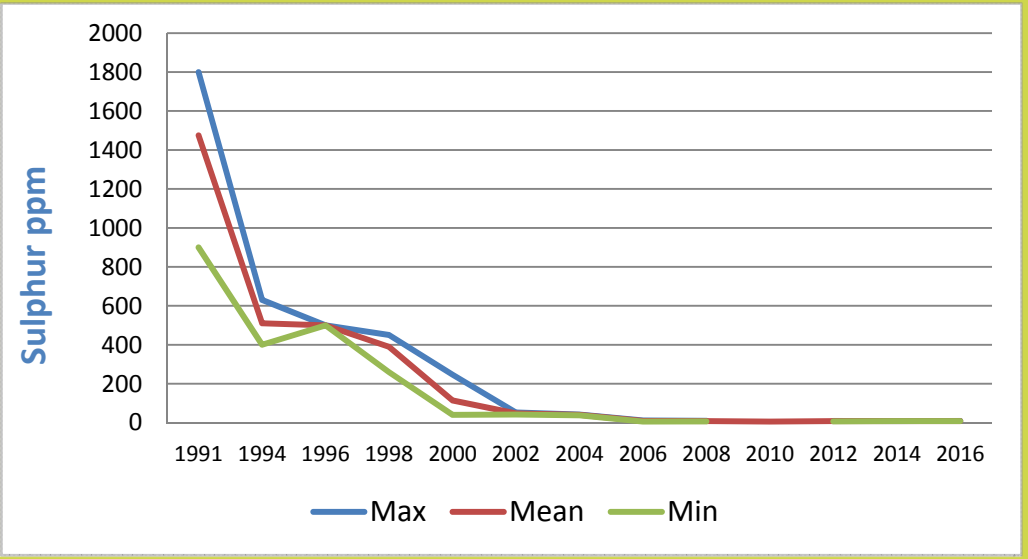
Denmark

Europe









Finland

Europe

National standards and physical inspection data

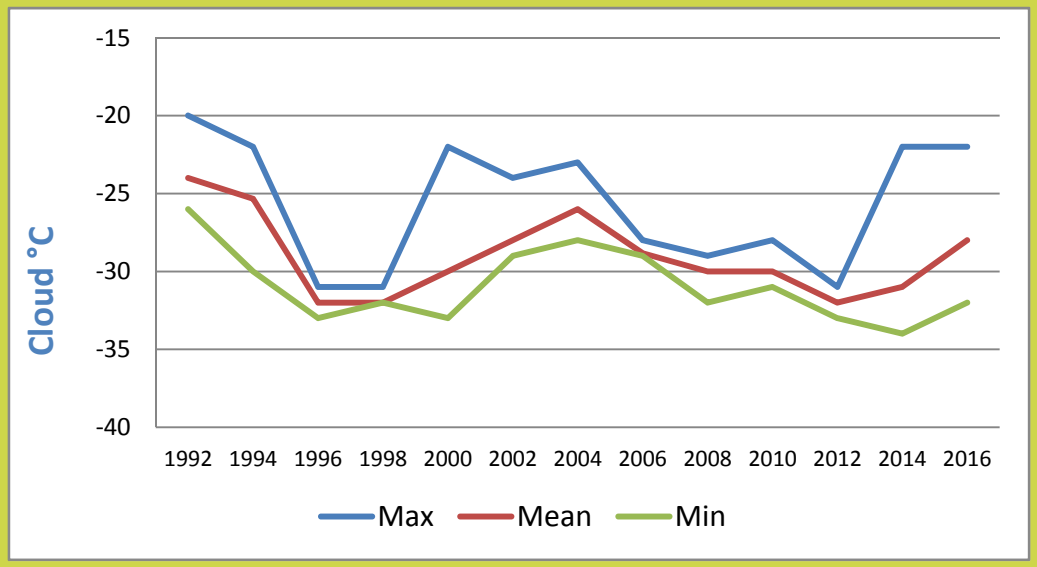
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600573	DIES 1600574	DIES 1600575
Cloud Point, °C	-29 (max)	**-22**	**-28**	**-32**	-22	-32	-29
CFPP, °C	-34 (max)	**-39**	**-41**	**-43**	-39	-40	-43
Pour Point, °C		**-36**	**-38**	**-39**	-36	-39	-39
HFRR, µm	460 (max)	**440**	**413**	**384**	440	384	414
Wax Content @ 10°C Below Cloud, wt%		**1.3**	**1.1**	**0.9**	1.0	1.3	0.9
Rancimat, hrs	*	**>30**	**>30**	**30**	>30	>30	30
Sulphur, ppm	10 (max)	**4**	**<3**	**<3**	<3	<3	4
Density @15°C, kg/m^3	800 - 840	**819**	**808**	**802**	802	802	819
Viscosity @ 40°C, cSt	1.5 - 4.0	**-**	**-**	**-**	-	-	-
Cetane Index $_{2\ Variable}$		**61**	**57**	**51**	60	61	51
Cetane Index $_{4\ Variable}$	46 (min)	**64**	**59**	**52**	62	64	52
Cetane Number	51 (min)	**66**	**63**	**58**	64	66	58
Distillation, °C IBP		**174**	**171**	**168**	169	174	168
T_{10}	180 (min)	**207**	**200**	**196**	198	207	196
T_{20}		**220**	**212**	**206**	211	220	206
T_{50}		**253**	**247**	**238**	249	253	238
T_{90}		**316**	**301**	**290**	316	290	298
T_{95}	360 (max)	**331**	**316**	**301**	331	301	316
FBP		**340**	**328**	**315**	340	315	330
% FAME	7 (max)	**0**	**0**	**0**	0	0	0

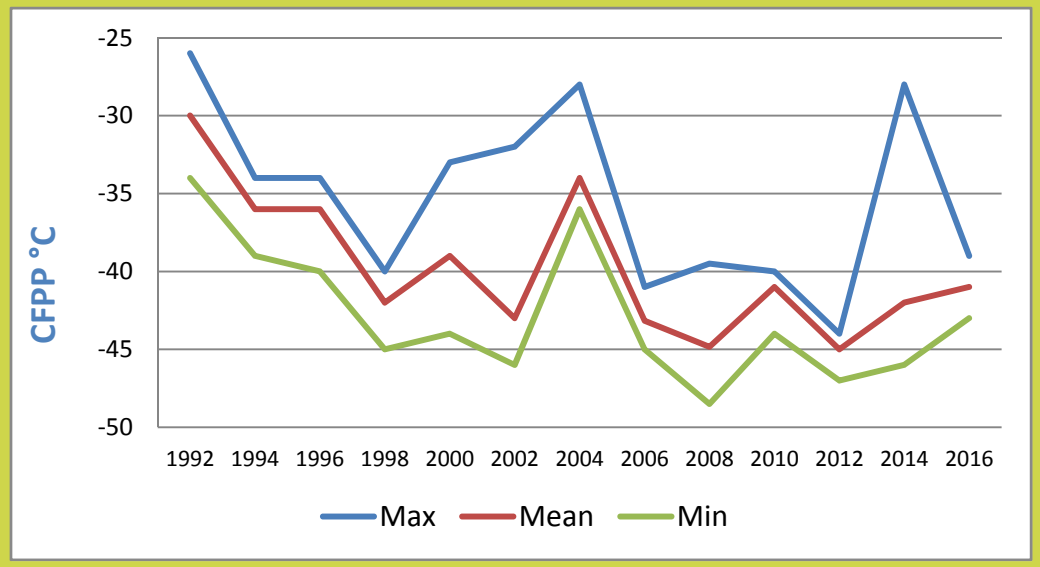
Specification shown is Reformulated Diesel, other specifications can also exist within Finland and may be represented within the data shown here

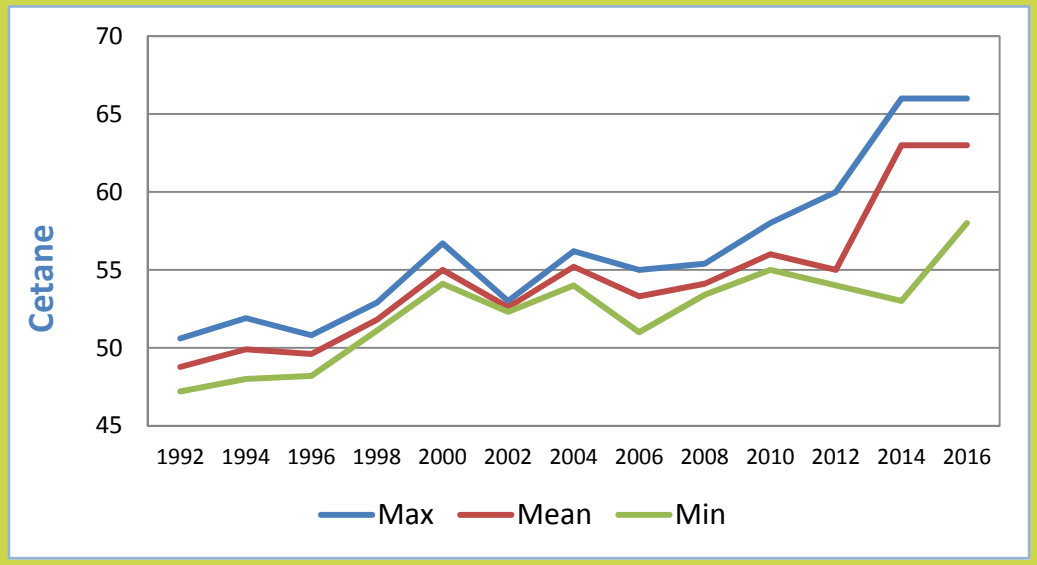
*20 hours min for diesel containing FAME above 2 % V/V

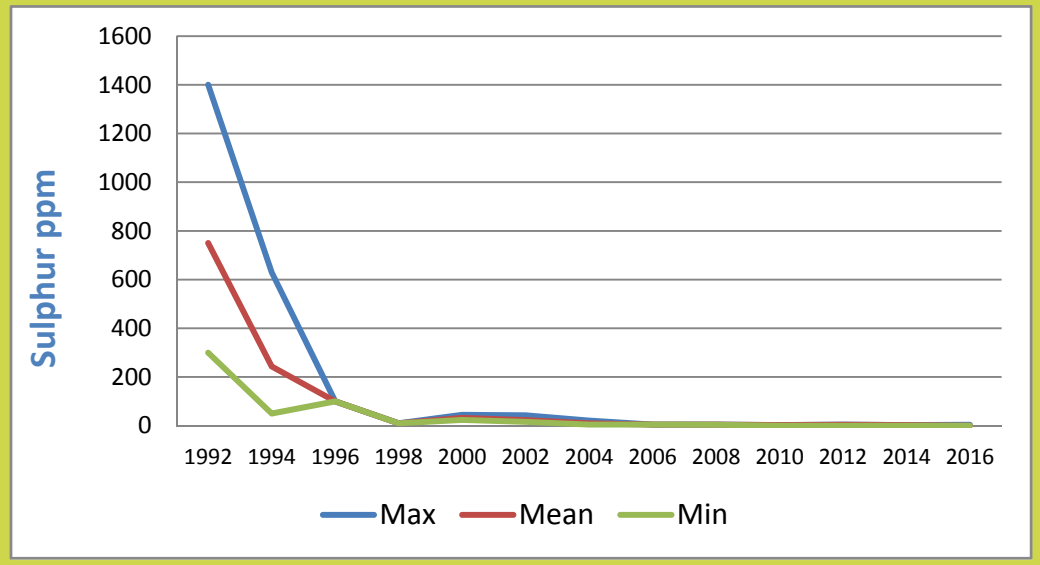
Finland

Europe









France

National standards and physical inspection data

Europe

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600677	DIES 1600679	DIES 1600680	DIES 1600682	DIES 1600683	DIES 1600684	DIES 1600685
Cloud Point, °C		**-5**	**-7**	**-10**	-5	-7	-5	-6	-5	-8	-10
CFPP, °C	-15 (max)*	**-16**	**-22**	**-30**	-17	-28	-19	-23	-16	-30	-21
Pour Point, °C		**-18**	**-28**	**-36**	-24	-30	-36	-36	-18	-27	-27
HFRR, µm	460 (max)	**219**	**203**	**185**	186	219	219	214	210	197	197
Wax Content @ 10°C Below Cloud, wt%		**2.1**	**1.7**	**1.3**	1.9	1.4	1.4	1.7	2.1	1.3	1.6
Rancimat, hrs	**	**>30**	**>30**	**>30**	>30	>30	>30	>30	>30	>30	>30
Sulphur, ppm	10 (max)	**7**	**6**	**4**	7	4	7	7	7	7	6
Density @15°C, kg/m^3	820 - 845	**844**	**835**	**826**	826	829	838	839	844	834	836
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-	-	-	-	-
Cetane Index 2 Variable		**56**	**51**	**48**	56	50	49	48	51	50	51
Cetane Index 4 Variable	46 (min)	**55**	**50**	**47**	55	50	48	47	49	49	51
Cetane Number	51 (min)	**56**	**53**	**50**	54	54	51	50	54	54	56
Distillation, °C IBP		**174**	**162**	**155**	156	158	160	159	155	161	174
T_{10}		**205**	**193**	**185**	189	185	189	188	198	189	203
T_{20}		**221**	**210**	**197**	210	197	205	203	220	203	219
T_{50}		**274**	**261**	**250**	270	250	256	254	274	256	263
T_{90}		**338**	**333**	**331**	338	331	333	332	334	334	333
T_{95}	360 (max)	**351**	**346**	**345**	351	345	346	345	347	348	345
FBP		**358**	**355**	**351**	358	352	354	356	355	356	351
% FAME	7 (max)	**7**	**7**	**7**	7	7	7	7	7	7	7

*Specification for Gazole-Hiver, Grand-Froid is -20°C

**20 hours min for diesel containing FAME above 2 % V/V

France (continued)

National standards and physical inspection data

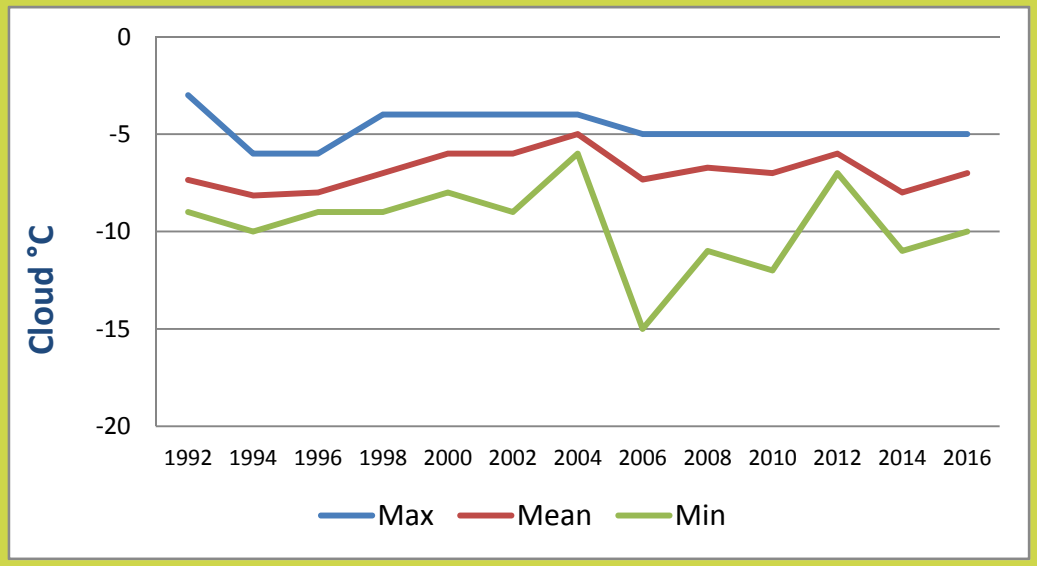
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600686
Cloud Point, °C		**-5**	**-7**	**-10**	-8
CFPP, °C	-15 (max)*	**-16**	**-22**	**-30**	-21
Pour Point, °C		**-18**	**-28**	**-36**	-24
HFRR, µm	460 (max)	**219**	**203**	**185**	185
Wax Content @ 10°C Below Cloud, wt%		**2.1**	**1.7**	**1.3**	2.0
Rancimat, hrs	**	**>30**	**>30**	**>30**	>30
Sulphur, ppm	10 (max)	**7**	**6**	**4**	7
Density @15°C, kg/m^3	820 - 845	**844**	**835**	**826**	836
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-
Cetane Index $_{2\ Variable}$		**56**	**51**	**48**	52
Cetane Index $_{4\ Variable}$	46 (min)	**55**	**50**	**47**	51
Cetane Number	51 (min)	**56**	**53**	**50**	53
Distillation, °C IBP		**174**	**162**	**155**	170
T_{10}		**205**	**193**	**185**	205
T_{20}		**221**	**210**	**197**	221
T_{50}		**274**	**261**	**250**	267
T_{90}		**338**	**333**	**331**	331
T_{95}	360 (max)	**351**	**346**	**345**	345
FBP		**358**	**355**	**351**	354
% FAME	7 (max)	**7**	**7**	**7**	7

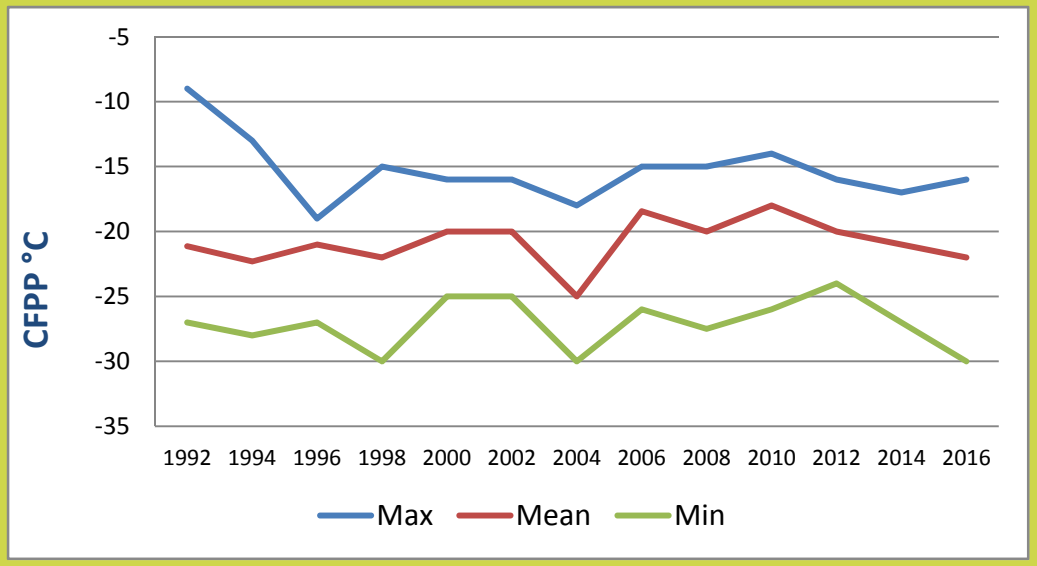
*Specification for Gazole-Hiver, Grand-Froid is -20°C

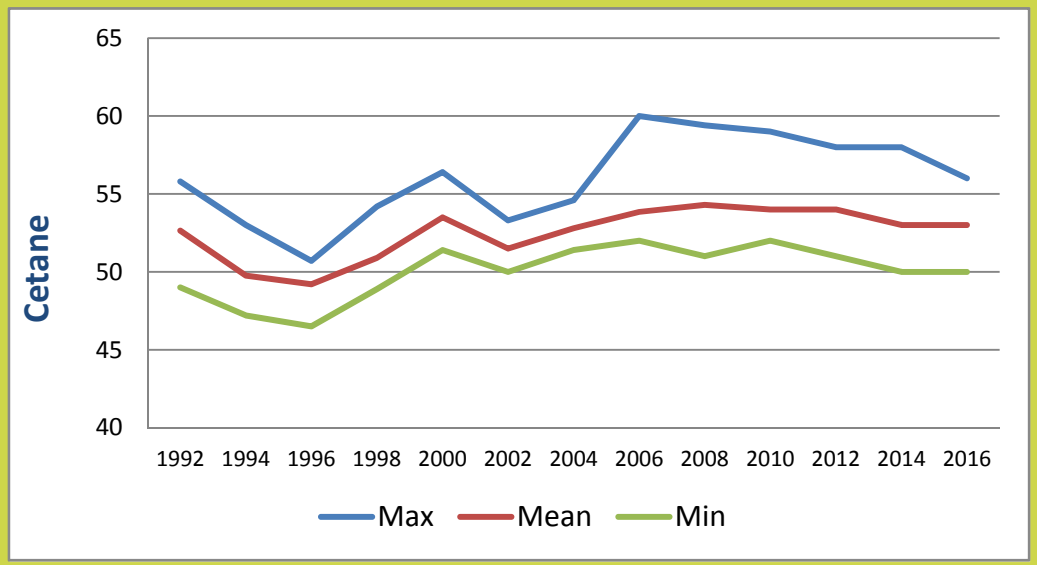
**20 hours min for diesel containing FAME above 2 % V/V

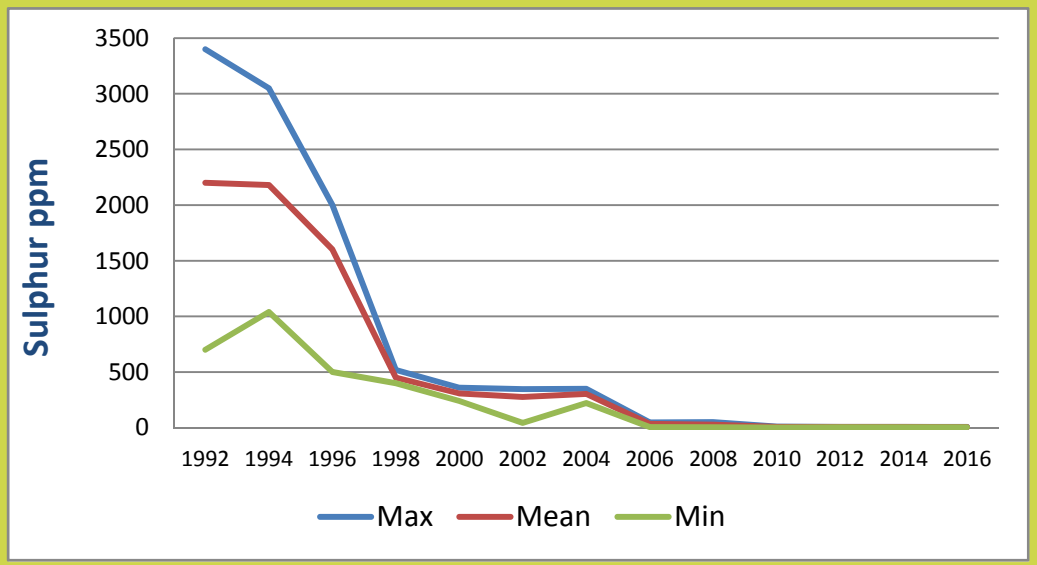
France

Europe









Germany

National standards and physical inspection data

Europe

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600497	DIES 1600498	DIES 1600499	DIES 1600501	DIES 1600502	DIES 1600503	DIES 1600504
Cloud Point, °C		**-7**	**-9**	**-14**	-7	-9	-10	-9	-8	-14	-11
CFPP, °C	-22 (max)	**-24**	**-28**	**-33**	-31	-27	-29	-28	-28	-30	-24
Pour Point, °C		**-21**	**-29**	**-48**	-27	-30	-30	-21	-27	-27	-48
HFRR, µm	460 (max)	**429**	**258**	**177**	390	402	359	228	202	180	366
Wax Content @ 10°C Below Cloud, wt%		**1.8**	**1.5**	**0.8**	1.3	1.5	1.8	1.8	1.6	1.6	1.4
Rancimat, hrs	*	**>30**	**>25**	**3**	>30	3	>30	>30	19	>30	>30
Sulphur, ppm	10 (max)	**9**	**6**	**<3**	5	5	6	6	7	4	<3
Density @15°C, kg/m^3	820 - 845	**839**	**834**	**828**	834	828	836	832	834	833	838
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-	-	-	-	-
Cetane Index 2 Variable		**56**	**53**	**48**	51	56	53	53	53	51	56
Cetane Index 4 Variable	46 (min)	**61**	**53**	**48**	51	57	53	54	52	51	61
Cetane Number	51 (min)	**63**	**55**	**50**	56	60	54	58	54	53	63
Distillation, °C IBP		**183**	**169**	**160**	168	175	177	182	165	183	175
T_{10}		**228**	**205**	**187**	206	209	216	219	202	205	228
T_{20}		**251**	**221**	**200**	222	228	232	235	211	210	251
T_{50}		**297**	**267**	**247**	261	275	271	266	269	260	297
T_{90}		**358**	**332**	**314**	324	340	328	314	333	324	340
T_{95}	360 (max)	**371**	**346**	**335**	343	352	342	340	348	336	371
FBP		**379**	**354**	**343**	354	358	352	351	355	345	379
% FAME	7 (max)	**7**	**4**	**0**	0	0	1	2	5	7	0

*20 hours min for diesel containing FAME above 2 % V/V

Germany (continued)

National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600505	DIES 1600506	DIES 1600508	DIES 1600509	DIES 1600510	DIES 1600512	DIES 1600513
Cloud Point, °C		**-7**	**-9**	**-14**	-7	-9	-8	-8	-8	-8	-7
CFPP, °C	-22 (max)	**-24**	**-28**	**-33**	-27	-30	-29	-27	-29	-29	-27
Pour Point, °C		**-21**	**-29**	**-48**	-30	-30	-30	-24	-30	-30	-30
HFRR, µm	460 (max)	**429**	**258**	**177**	188	406	225	205	429	244	213
Wax Content @ 10°C Below Cloud, wt%		**1.8**	**1.5**	**0.8**	1.7	1.5	1.4	1.8	1.6	1.3	1.3
Rancimat, hrs	*	**>30**	**>25**	**3**	>30	>30	>30	>30	5	>30	>30
Sulphur, ppm	10 (max)	**9**	**6**	**<3**	9	5	5	7	5	7	7
Density @15°C, kg/m^3	820 - 845	**839**	**834**	**828**	834	831	832	830	830	838	833
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-	-	-	-	-
Cetane Index $_{2\ Variable}$		**56**	**53**	**48**	54	53	53	56	55	48	50
Cetane Index $_{4\ Variable}$	46 (min)	**61**	**53**	**48**	53	53	53	56	56	48	49
Cetane Number	51 (min)	**63**	**55**	**50**	52	57	54	59	62	54	53
Distillation, °C IBP		**183**	**169**	**160**	165	172	166	162	174	167	166
T_{10}		**228**	**205**	**187**	202	208	201	205	214	203	194
T_{20}		**251**	**221**	**200**	219	225	219	225	231	212	208
T_{50}		**297**	**267**	**247**	272	265	267	275	273	253	254
T_{90}		**358**	**332**	**314**	336	326	332	334	338	337	334
T_{95}	360 (max)	**371**	**346**	**335**	349	342	346	342	349	352	347
FBP		**379**	**354**	**343**	355	351	354	343	349	360	349
% FAME	7 (max)	**7**	**4**	**0**	7	0	4	7	0	4	7

*20 hours min for diesel containing FAME above 2 % V/V

Germany (continued)

National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600514	DIES 1600515	DIES 1600516	DIES 1600517	DIES 1600518	DIES 1600519	DIES 1600520
Cloud Point, °C		**-7**	**-9**	**-14**	-7	-11	-7	-8	-14	-7	-7
CFPP, °C	-22 (max)	**-24**	**-28**	**-33**	-27	-30	-31	-27	-33	-28	-30
Pour Point, °C		**-21**	**-29**	**-48**	-24	-30	-27	-24	-27	-30	-33
HFRR, µm	460 (max)	**429**	**258**	**177**	213	188	190	190	368	187	177
Wax Content @ 10°C Below Cloud, wt%		**1.8**	**1.5**	**0.8**	1.6	1.4	1.4	1.0	0.8	1.4	1.4
Rancimat, hrs	*	**>30**	**>25**	**3**	>30	>30	>30	12	>30	>30	>30
Sulphur, ppm	10 (max)	**9**	**6**	**<3**	8	4	7	5	<3	6	9
Density @15°C, kg/m^3	820 - 845	**839**	**834**	**828**	837	837	834	836	828	839	829
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-	-	-	-	-
Cetane Index $_{2\ Variable}$		**56**	**53**	**48**	52	52	52	51	54	52	49
Cetane Index $_{4\ Variable}$	46 (min)	**61**	**53**	**48**	51	52	51	50	54	51	49
Cetane Number	51 (min)	**63**	**55**	**50**	54	53	53	52	57	53	52
Distillation, °C IBP		**183**	**169**	**160**	166	175	163	165	169	163	160
T_{10}		**228**	**205**	**187**	202	207	198	194	205	205	187
T_{20}		**251**	**221**	**200**	220	222	216	210	222	224	200
T_{50}		**297**	**267**	**247**	269	270	264	262	262	271	247
T_{90}		**358**	**332**	**314**	335	331	331	333	315	335	333
T_{95}	360 (max)	**371**	**346**	**335**	350	345	346	349	335	348	347
FBP		**379**	**354**	**343**	355	350	358	360	349	358	353
% FAME	7 (max)	**7**	**4**	**0**	6	5	4	7	2	6	7

*20 hours min for diesel containing FAME above 2 % V/V

Germany (continued)

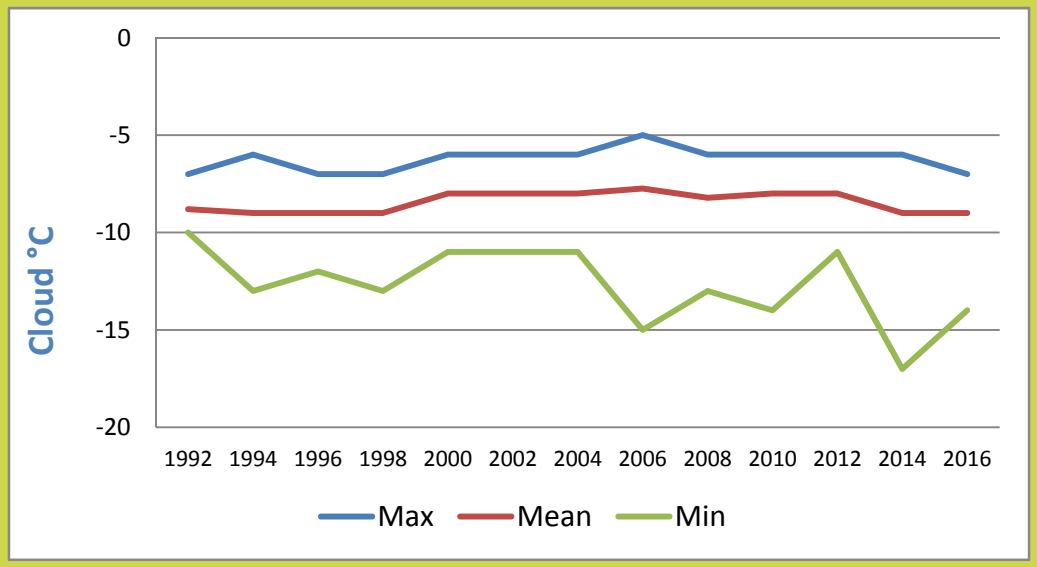
National standards and physical inspection data

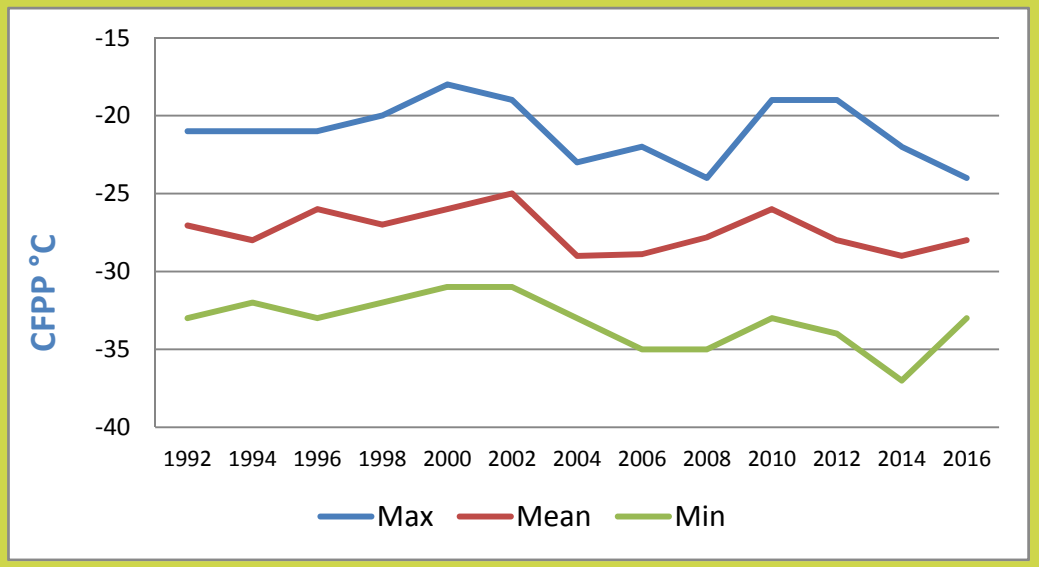
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600521	DIES 1600522	DIES 1600523
Cloud Point, °C		**-7**	**-9**	**-14**	-7	-8	-7
CFPP, °C	-22 (max)	**-24**	**-28**	**-33**	-26	-29	-28
Pour Point, °C		**-21**	**-29**	**-48**	-27	-27	-30
HFRR, µm	460 (max)	**429**	**258**	**177**	208	250	183
Wax Content @ 10°C Below Cloud, wt%		**1.8**	**1.5**	**0.8**	1.7	1.4	1.6
Rancimat, hrs	*	**>30**	**>25**	**3**	>30	>30	>30
Sulphur, ppm	10 (max)	**9**	**6**	**<3**	9	6	9
Density @15°C, kg/m^3	820 - 845	**839**	**834**	**828**	835	833	836
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-
Cetane Index $_{2\ Variable}$		**56**	**53**	**48**	53	52	53
Cetane Index $_{4\ Variable}$	46 (min)	**61**	**53**	**48**	52	52	52
Cetane Number	51 (min)	**63**	**55**	**50**	52	55	50
Distillation, °C IBP		**183**	**169**	**160**	166	168	169
T_{10}		**228**	**205**	**187**	200	200	202
T_{20}		**251**	**221**	**200**	217	217	220
T_{50}		**297**	**267**	**247**	269	263	271
T_{90}		**358**	**332**	**314**	334	331	335
T_{95}	360 (max)	**371**	**346**	**335**	344	346	346
FBP		**379**	**354**	**343**	352	355	354
% FAME	7 (max)	**7**	**4**	**0**	7	3	7

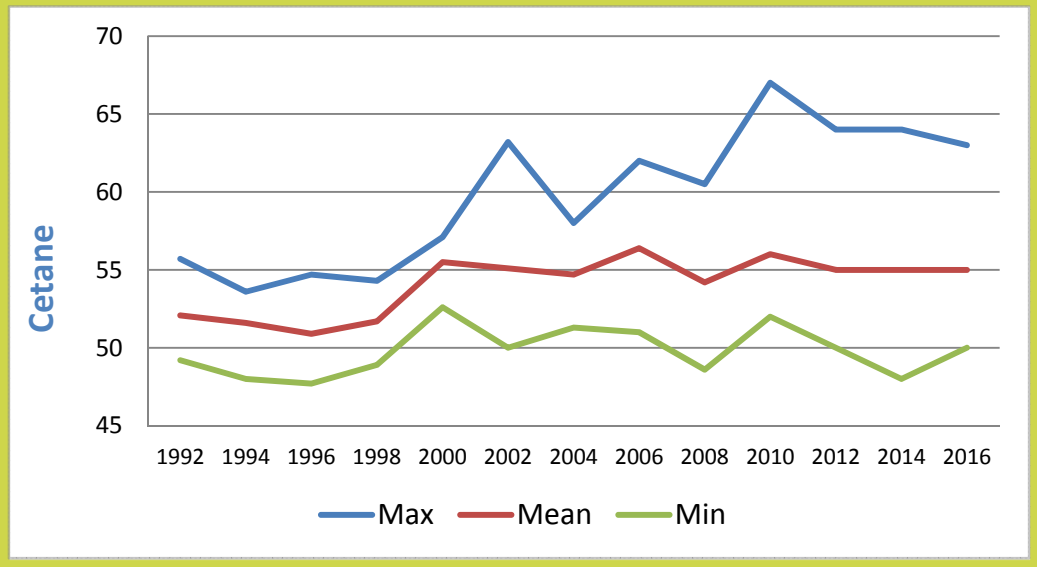
*20 hours min for diesel containing FAME above 2 % V/V

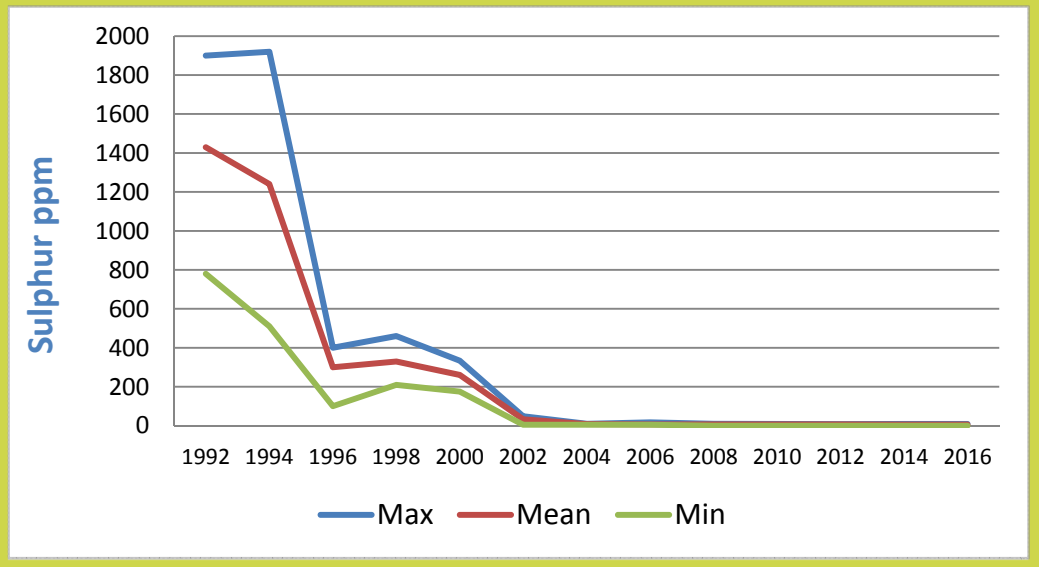
Germany

Europe









Greece

Europe

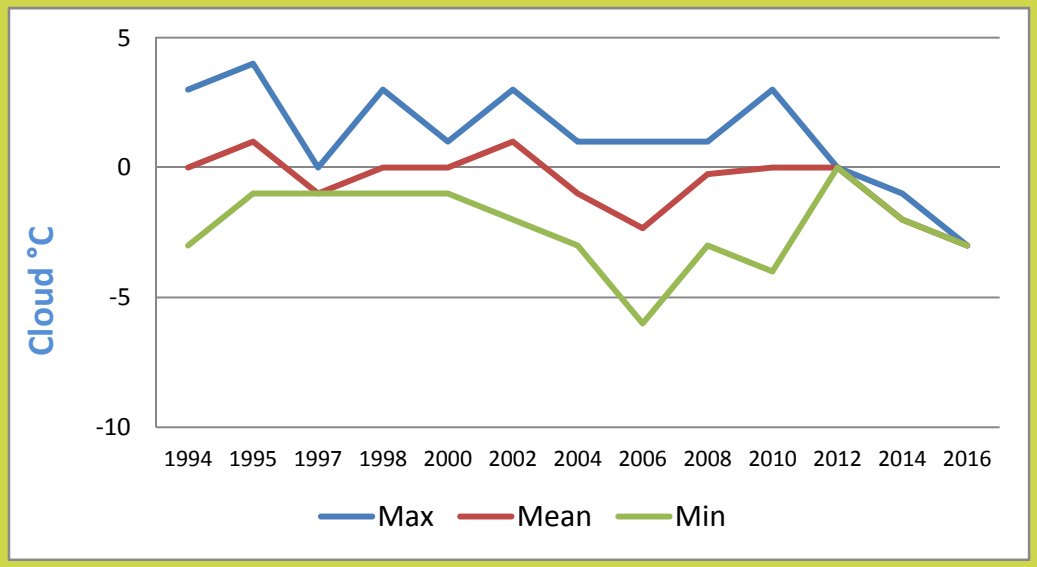
National standards and physical inspection data

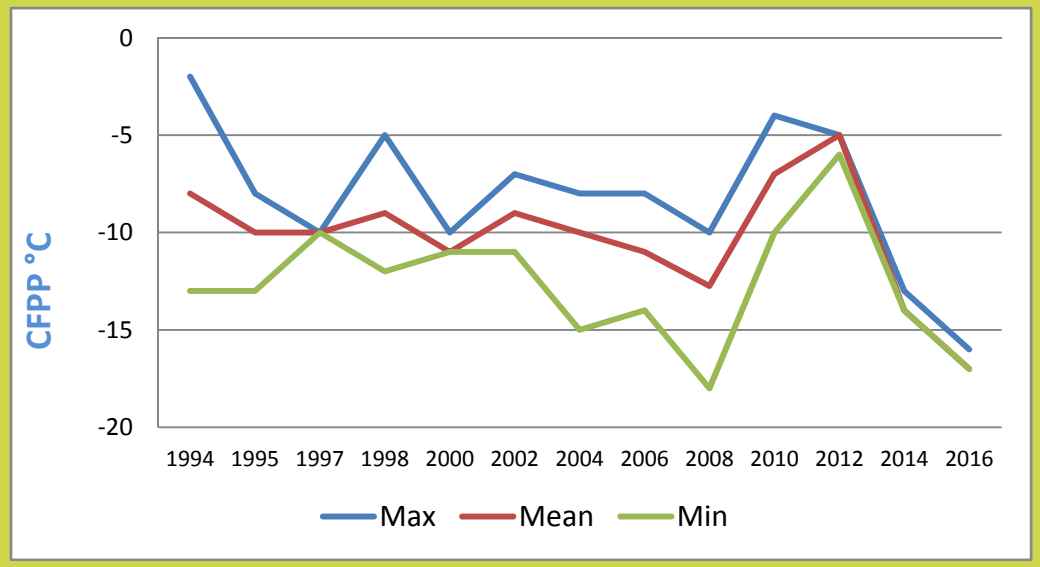
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600581	DIES 1600582
Cloud Point, °C		**-3**	**-3**	**-3**	-3	-3
CFPP, °C	-5 (max)	**-16**	**-17**	**-17**	-16	-17
Pour Point, °C		**-18**	**-18**	**-18**	-18	-18
HFRR, µm	460 (max)	**206**	**205**	**205**	205	206
Wax Content @ 10°C Below Cloud, wt%		**1.7**	**1.7**	**1.7**	1.7	1.7
Rancimat, hrs	*	**>30**	**>20**	**16**	16	>30
Sulphur, ppm	10 (max)	**6**	**5**	**5**	6	5
Density @15°C, kg/m^3	820 - 845	**834**	**834**	**834**	834	834
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-
Cetane Index $_{2\ Variable}$		**53**	**53**	**53**	53	53
Cetane Index $_{4\ Variable}$	46 (min)	**52**	**52**	**52**	52	52
Cetane Number	51 (min)	**52**	**50**	**49**	49	52
Distillation, °C IBP		**165**	**163**	**161**	165	161
T_{10}		**199**	**199**	**199**	199	199
T_{20}		**218**	**218**	**218**	218	218
T_{50}		**270**	**269**	**269**	269	270
T_{90}		**335**	**335**	**335**	335	335
T_{95}	360 (max)	**350**	**350**	**350**	350	350
FBP		**360**	**359**	**359**	359	360
% FAME	7 (max)	**7**	**7**	**7**	7	7

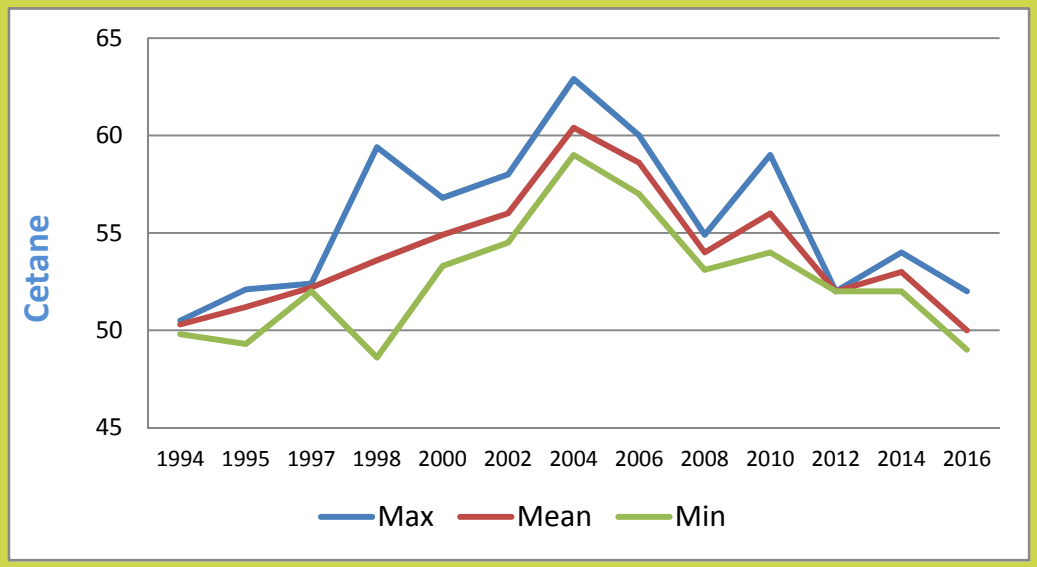
*20 hours min for diesel containing FAME above 2 % V/V

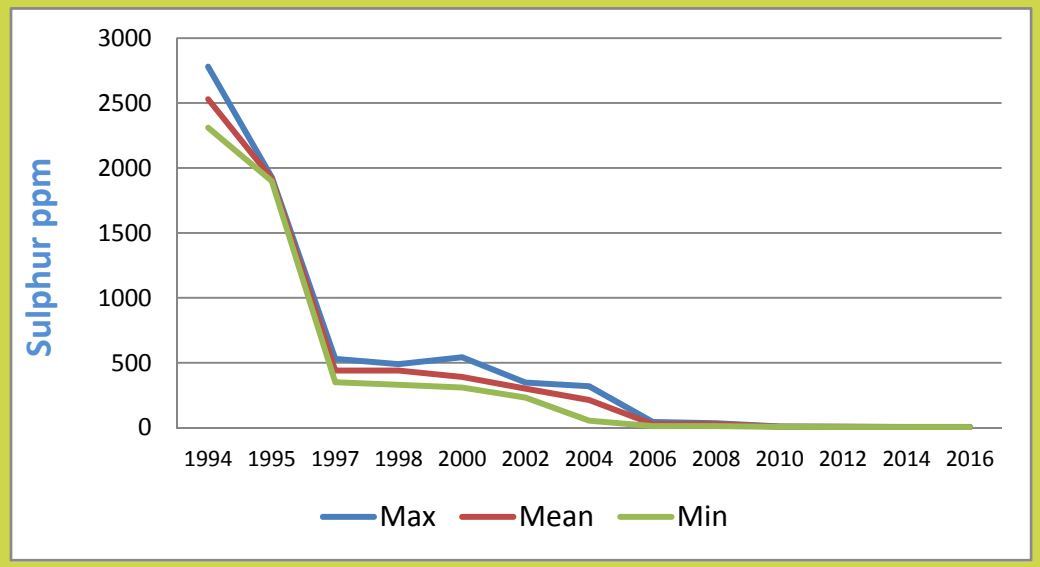
Greece

Europe









Hungary

Europe

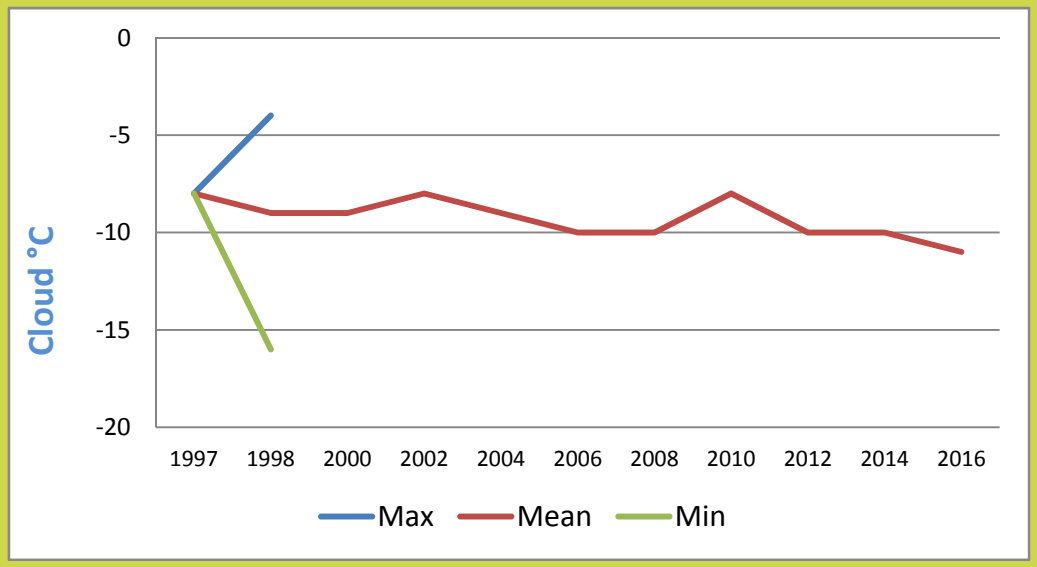
National standards and physical inspection data

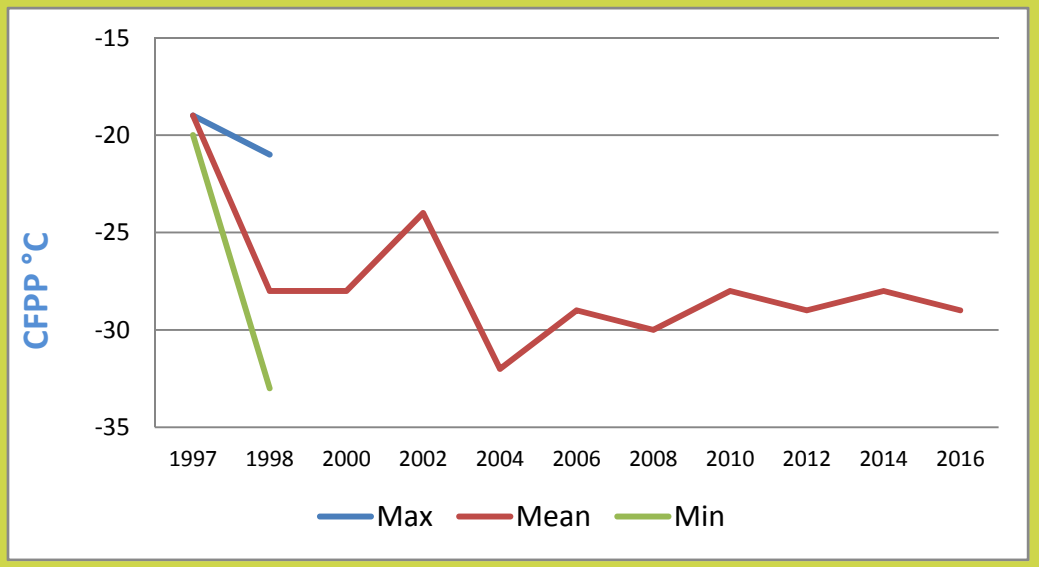
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600583
Cloud Point, °C			**-11**		-11
CFPP, °C	-20 (max)		**-29**		-29
Pour Point, °C			**-27**		-27
HFRR, µm	460 (max)		**308**		308
Wax Content @ 10°C Below Cloud, wt%			**1.3**		1.3
Rancimat, hrs	*		**>30**		>30
Sulphur, ppm	10 (max)		**8**		8
Density @15°C, kg/m^3	820 - 845		**840**		840
Viscosity @ 40°C, cSt	2.0 - 4.5		**-**		-
Cetane Index $_{2\ Variable}$			**51**		51
Cetane Index $_{4\ Variable}$	46 (min)		**50**		50
Cetane Number	51 (min)		**51**		51
Distillation, °C IBP			**169**		169
T_{10}			**203**		203
T_{20}			**220**		220
T_{50}			**268**		268
T_{90}			**340**		340
T_{95}	360 (max)		**356**		356
FBP			**363**		363
% FAME	4.8 (max)		**2**		2

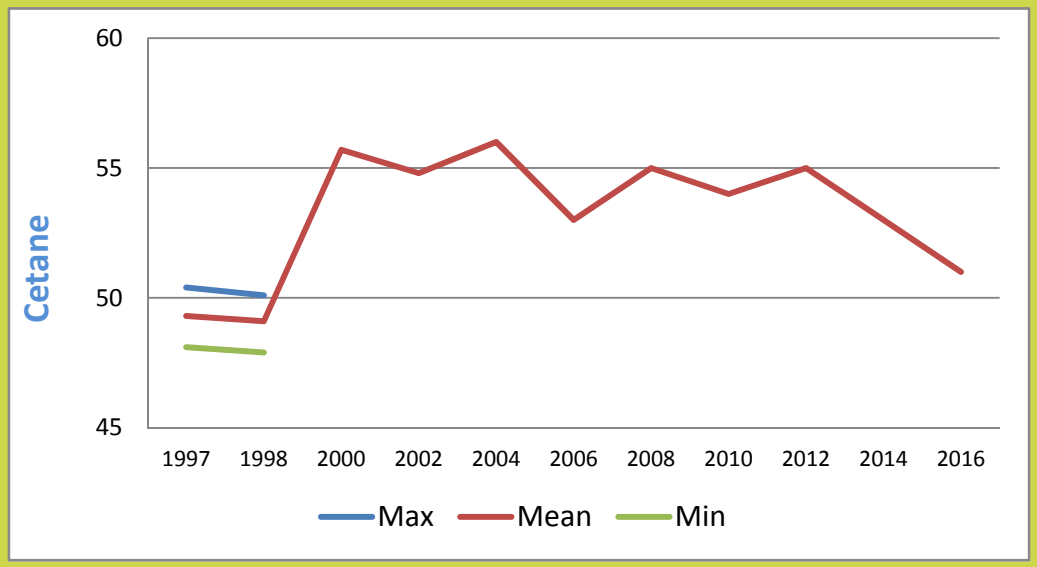
*20 hours min for diesel containing FAME above 2 % V/V

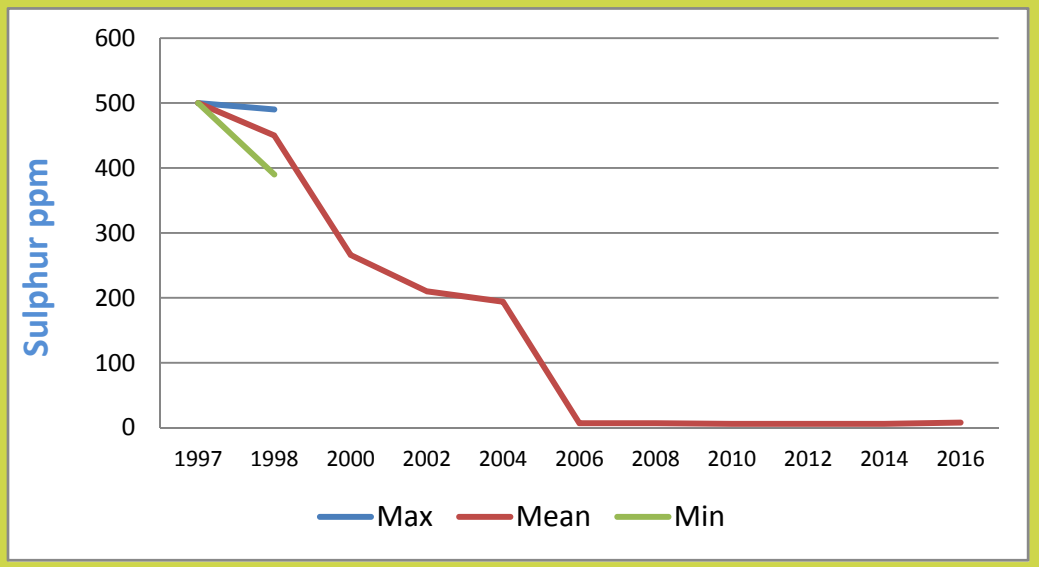
Hungary

Europe









Ireland

Europe

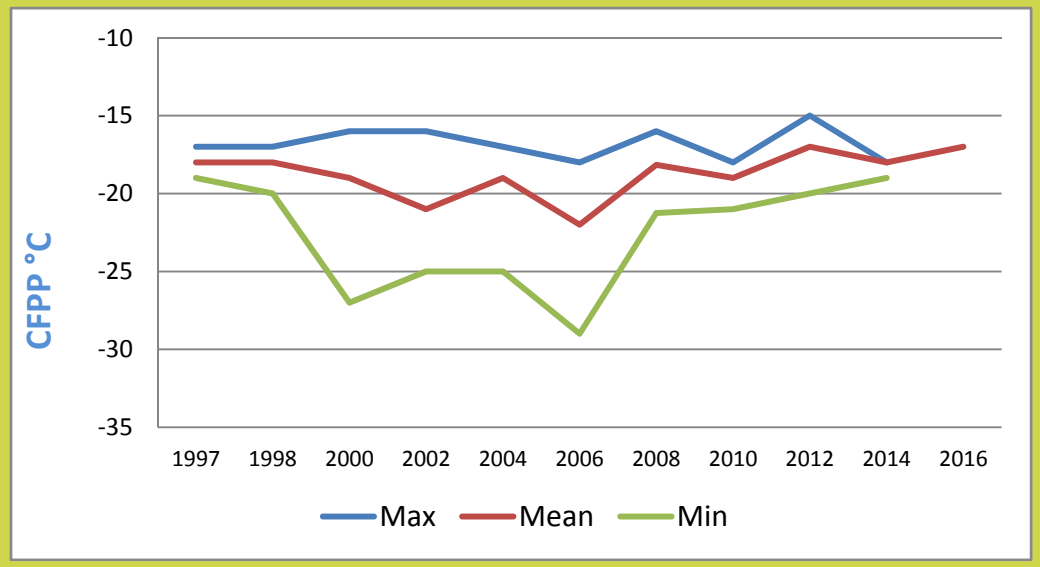
National standards and physical inspection data

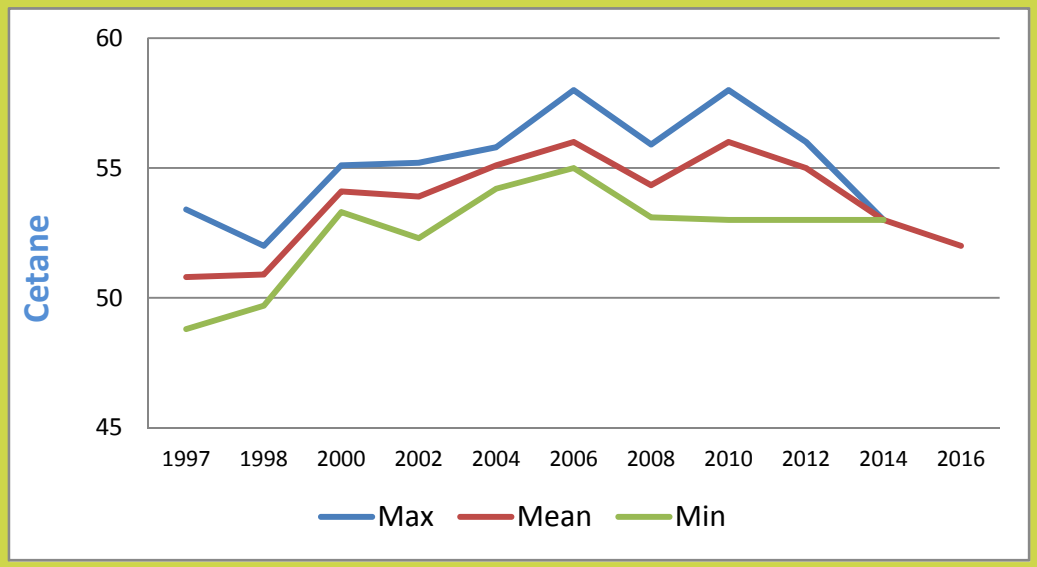
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600584
Cloud Point, °C			**-6**		-6
CFPP, °C	-15 (max)		**-17**		-17
Pour Point, °C			**-24**		-24
HFRR, µm	460 (max)		**403**		403
Wax Content @ 10°C Below Cloud, wt%			**2.0**		2.0
Rancimat, hrs	*		**>30**		>30
Sulphur, ppm	10 (max)		**8**		8
Density @15°C, kg/m^3	820 - 845		**830**		830
Viscosity @ 40°C, cSt	2.0 - 4.5		**-**		-
Cetane Index $_{2\ Variable}$			**52**		52
Cetane Index $_{4\ Variable}$	46 (min)		**52**		52
Cetane Number	51 (min)		**52**		52
Distillation, °C IBP			**163**		163
T_{10}			**200**		200
T_{20}			**216**		216
T_{50}			**260**		260
T_{90}			**330**		330
T_{95}	360 (max)		**345**		345
FBP			**352**		352
% FAME	7 (max)		**1**		1

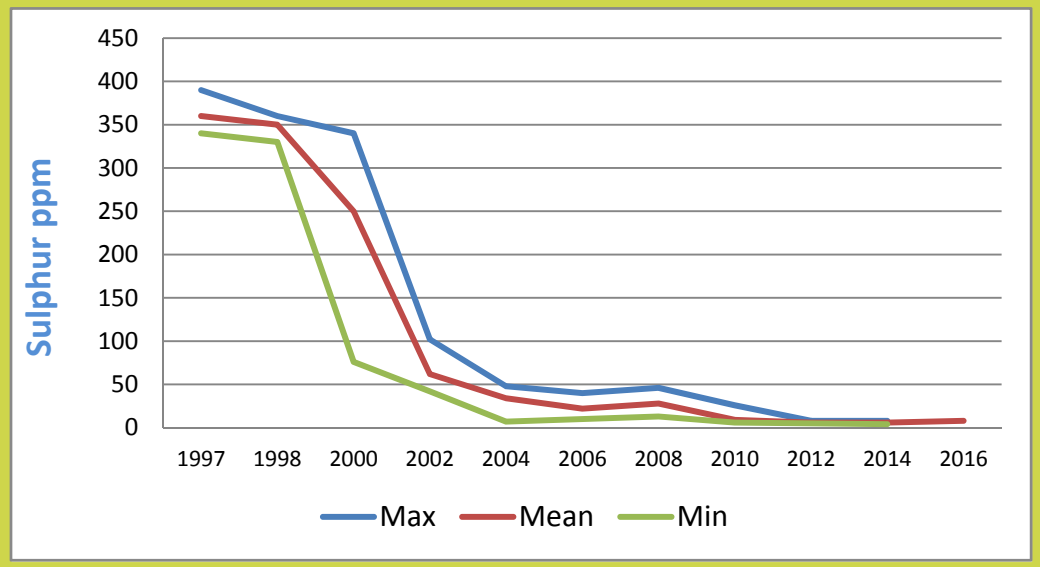
*20 hours min for diesel containing FAME above 2 % V/V

Ireland

Europe







Italy

National standards and physical inspection data

Europe

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600381	DIES 1600383	DIES 1600384	DIES 1600385	DIES 1600386	DIES 1600387	DIES 1600388
Cloud Point, °C		**-3**	**-5**	**-7**	-5	-5	-4	-3	-3	-3	-5
CFPP, °C	-12 (max)*	**-12**	**-17**	**-20**	-18	-18	-12	-18	-15	-16	-19
Pour Point, °C		**-15**	**-25**	**-33**	-24	-15	-18	-27	-33	-30	-27
HFRR, µm	460 (max)	**528**	**292**	**194**	399	194	528	198	195	242	343
Wax Content @ 10°C Below Cloud, wt%		**2.5**	**1.7**	**0.9**	1.4	1.7	2.5	1.4	2.0	1.8	0.9
Rancimat, hrs	**	**>30**	**>30**	**>30**	>30	>30	>30	>30	>30	>30	>30
Sulphur, ppm	10 (max)	**18**	**7**	**4**	5	6	7	7	7	18	4
Density @15°C, kg/m^3	820 - 845	**840**	**834**	**825**	832	840	828	837	840	837	825
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-	-	-	-	-
Cetane Index 2 Variable		**57**	**52**	**46**	52	52	57	52	50	51	54
Cetane Index 4 Variable	46 (min)	**58**	**51**	**47**	52	53	58	52	49	49	53
Cetane Number	51 (min)	**57**	**53**	**50**	52	51	56	50	53	53	53
Distillation, °C IBP		**186**	**165**	**156**	162	186	174	159	162	156	160
T_{10}		**221**	**200**	**187**	198	221	220	211	189	187	195
T_{20}		**238**	**215**	**196**	215	236	238	219	205	204	211
T_{50}		**276**	**263**	**231**	263	274	276	268	265	263	257
T_{90}		**342**	**337**	**330**	338	336	338	340	342	342	340
T_{95}	360 (max)	**360**	**352**	**346**	354	352	354	355	356	356	360
FBP		**370**	**361**	**355**	361	360	363	361	363	362	370
% FAME	7 (max)	**6**	**3**	**0**	1	5	0	5	4	4	2

*-16 /-18 CFPP is used for Northern areas called 'ALPINE'

**20 hours min for diesel containing FAME above 2 % V/V

Italy (continued)

National standards and physical inspection data

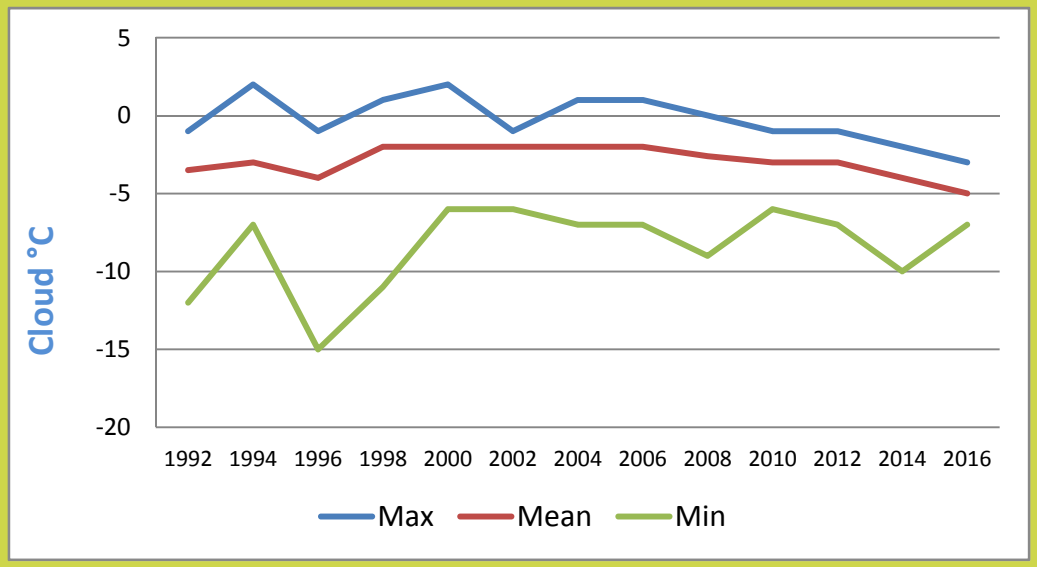
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600389	DIES 1600390	DIES 1600391	DIES 1600392	DIES 1600393	DIES 1600394	DIES 1600675
Cloud Point, °C		**-3**	**-5**	**-7**	-5	-3	-7	-6	-5	-7	-7
CFPP, °C	-12 (max)*	**-12**	**-17**	**-20**	-18	-13	-19	-19	-17	-20	-20
Pour Point, °C		**-15**	**-25**	**-33**	-24	-24	-27	-24	-21	-27	-24
HFRR, µm	460 (max)	**528**	**292**	**194**	351	418	227	284	211	288	212
Wax Content @ 10°C Below Cloud, wt%		**2.5**	**1.7**	**0.9**	1.6	1.5	1.9	1.8	2.0	1.3	1.7
Rancimat, hrs	**	**>30**	**>30**	**>30**	>30	>30	>30	>30	>30	>30	>30
Sulphur, ppm	10 (max)	**18**	**7**	**4**	6	6	7	8	8	6	7
Density @15°C, kg/m^3	820 - 845	**840**	**834**	**825**	832	835	834	836	833	827	837
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-	-	-	-	-
Cetane Index $_{2\ Variable}$		**57**	**52**	**46**	51	51	51	50	53	46	53
Cetane Index $_{4\ Variable}$	46 (min)	**58**	**51**	**47**	51	51	51	50	52	47	52
Cetane Number	51 (min)	**57**	**53**	**50**	55	52	56	57	54	53	54
Distillation, °C IBP		**186**	**165**	**156**	166	172	161	166	157	163	162
T_{10}		**221**	**200**	**187**	200	205	199	199	190	187	199
T_{20}		**238**	**215**	**196**	213	220	214	213	209	196	220
T_{50}		**276**	**263**	**231**	256	263	261	259	269	231	271
T_{90}		**342**	**337**	**330**	332	339	331	332	337	330	336
T_{95}	360 (max)	**360**	**352**	**346**	349	357	346	349	352	346	350
FBP		**370**	**361**	**355**	359	366	355	358	359	356	358
% FAME	7 (max)	**6**	**3**	**0**	2	1	3	3	6	6	6

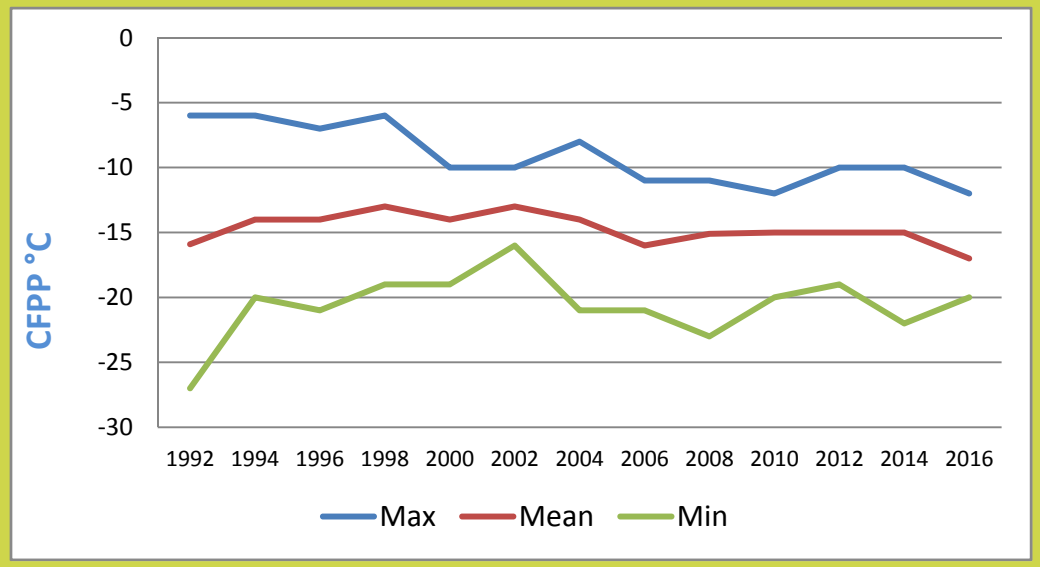
*-16 /-18 CFPP is used for Northern areas called 'ALPINE'

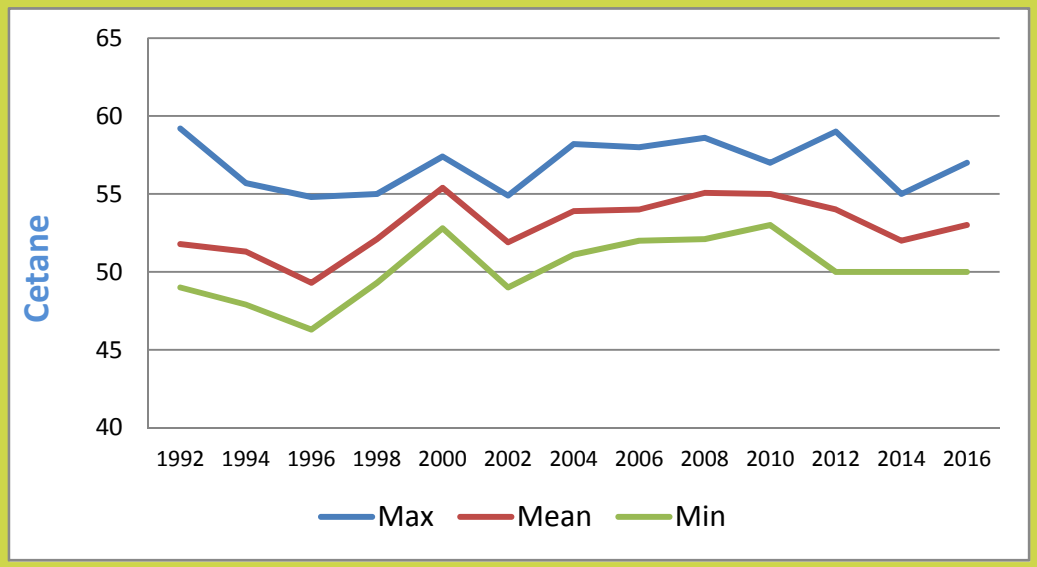
**20 hours min for diesel containing FAME above 2 % V/V

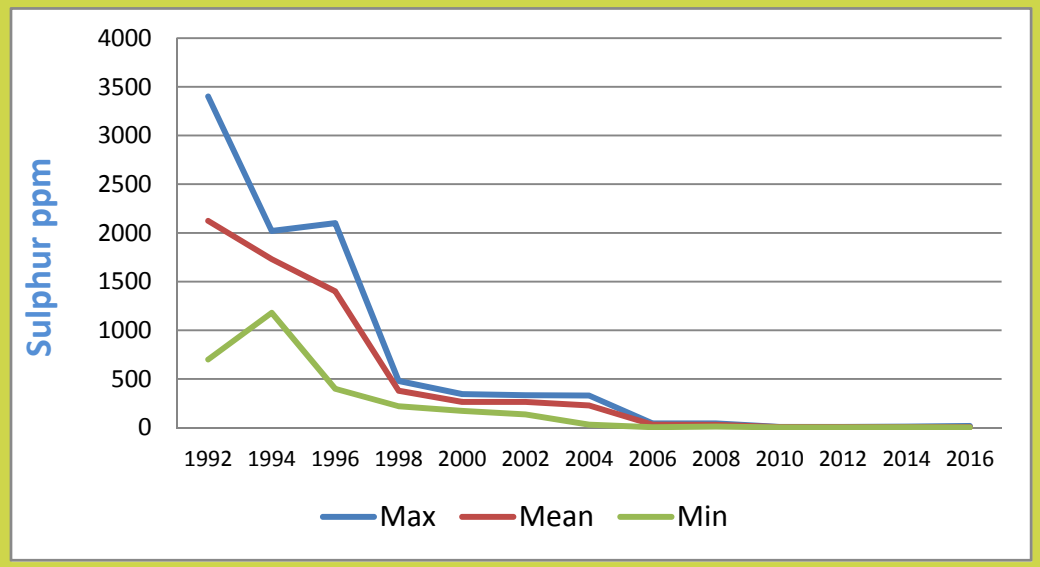
Italy

Europe









Lithuania

Europe

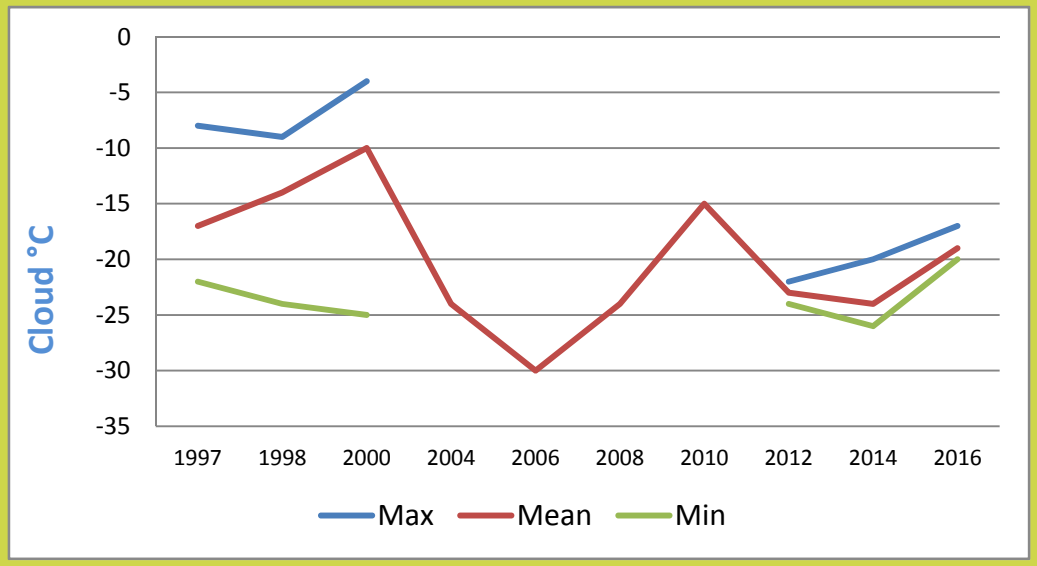
National standards and physical inspection data

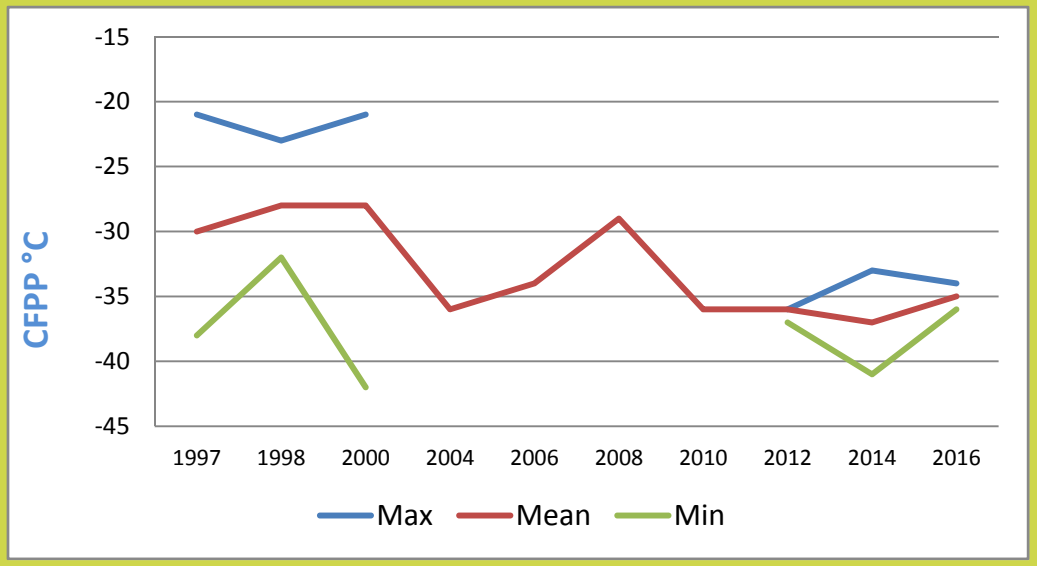
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600658	DIES 1600659
Cloud Point, °C	-22 (max)	**-17**	**-19**	**-20**	-20	-17
CFPP, °C	-32 (max)	**-34**	**-35**	**-36**	-36	-34
Pour Point, °C		**-30**	**-32**	**-33**	-33	-30
HFRR, µm	460 (max)	**424**	**407**	**390**	390	424
Wax Content @ 10°C Below Cloud, wt%		**1.0**	**0.9**	**0.8**	0.8	1.0
Rancimat, hrs	*	**>30**	**>30**	**>30**	>30	>30
Sulphur, ppm	10 (max)	**5**	**5**	**5**	5	5
Density @15°C, kg/m^3	840 (max)	**832**	**832**	**832**	832	832
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-
Cetane Index $_{2\ Variable}$		**48**	**47**	**47**	47	48
Cetane Index $_{4\ Variable}$		**48**	**47**	**47**	47	48
Cetane Number	48 (min)	**53**	**53**	**53**	53	53
Distillation, °C IBP		**163**	**162**	**162**	162	163
T_{10}		**195**	**193**	**191**	191	195
T_{20}		**207**	**206**	**204**	204	207
T_{50}		**246**	**243**	**240**	240	246
T_{90}		**307**	**304**	**300**	300	307
T_{95}	360 (max)	**329**	**324**	**320**	320	329
FBP		**339**	**338**	**336**	336	339
% FAME	7 (max)	**0**	**0**	**0**	0	0

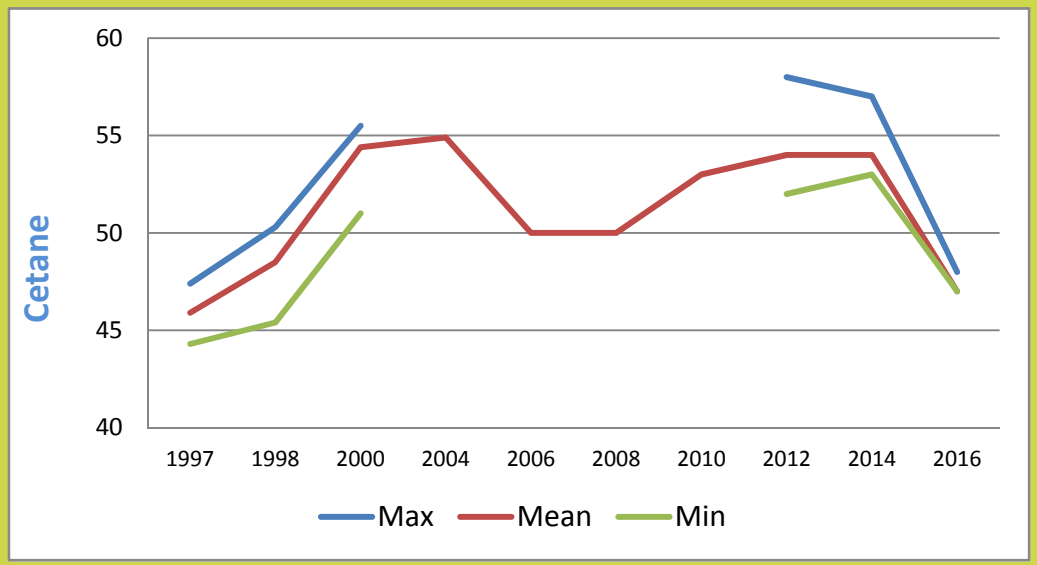
*20 hours min for diesel containing FAME above 2 % V/V

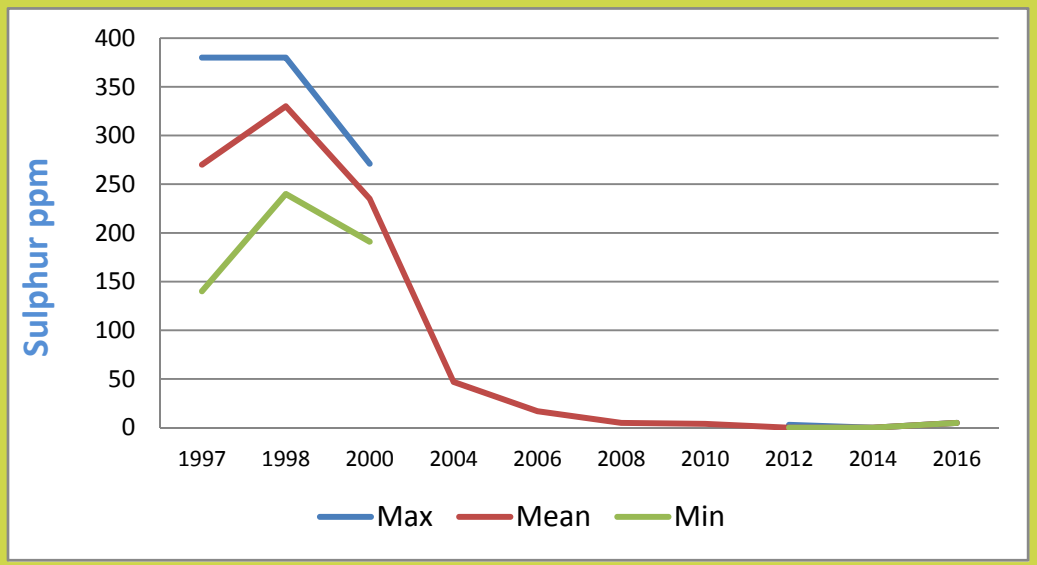
Lithuania

Europe









Norway

Europe

National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600660	DIES 1600661
Cloud Point, °C	-22 (max)	**-25**	**-25**	**-25**	-25	-25
CFPP, °C	-32 (max)	**-33**	**-37**	**-41**	-41	-33
Pour Point, °C		**-42**	**-45**	**-48**	-42	-48
HFRR, µm	460 (max)	**217**	**215**	**214**	217	214
Wax Content @ 10°C Below Cloud, wt%		**1.6**	**1.3**	**1.0**	1.0	1.6
Rancimat, hrs	*	**>30**	**>30**	**>30**	>30	>30
Sulphur, ppm	10 (max)	**7**	**6**	**5**	5	7
Density @15°C, kg/m^3	800 - 840	**831**	**829**	**827**	827	831
Viscosity @ 40°C, cSt	1.5 - 4.0	**-**	**-**	**-**	-	-
Cetane Index $_{2\ Variable}$		**49**	**49**	**48**	49	48
Cetane Index $_{4\ Variable}$	46 (min)	**49**	**49**	**48**	49	48
Cetane Number	51 (min)**	**54**	**53**	**51**	54	51
Distillation, °C IBP		**166**	**165**	**163**	166	163
T_{10}	180 (min)	**195**	**193**	**190**	195	190
T_{20}		**207**	**206**	**205**	207	205
T_{50}		**246**	**244**	**242**	242	246
T_{90}		**316**	**314**	**312**	316	312
T_{95}	360 (max)	**330**	**327**	**325**	330	325
FBP		**338**	**335**	**332**	338	332
% FAME	7 (max)	**7**	**6**	**5**	5	7

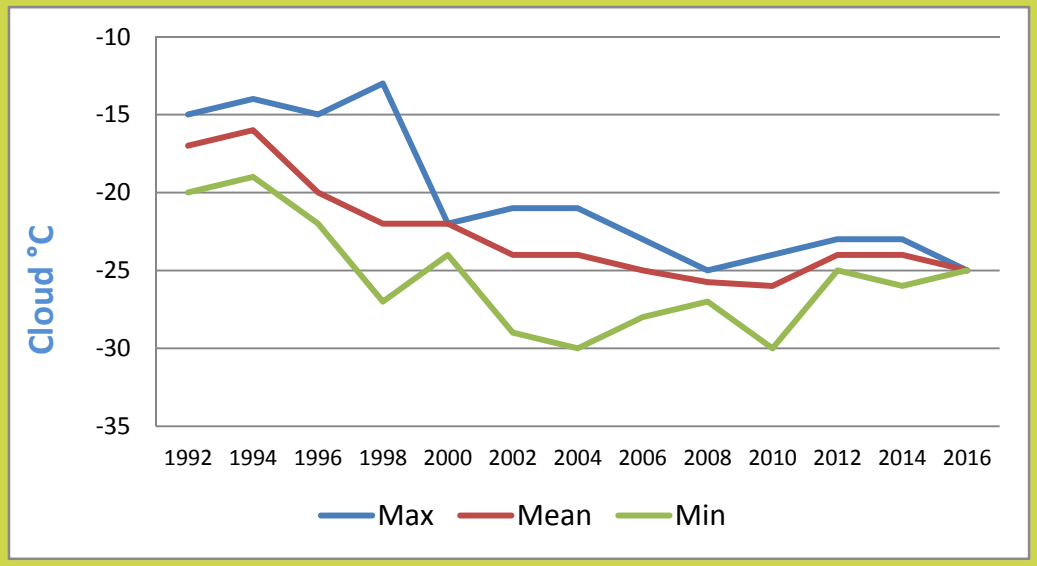
Specification shown is Norwegian Arctic Class II

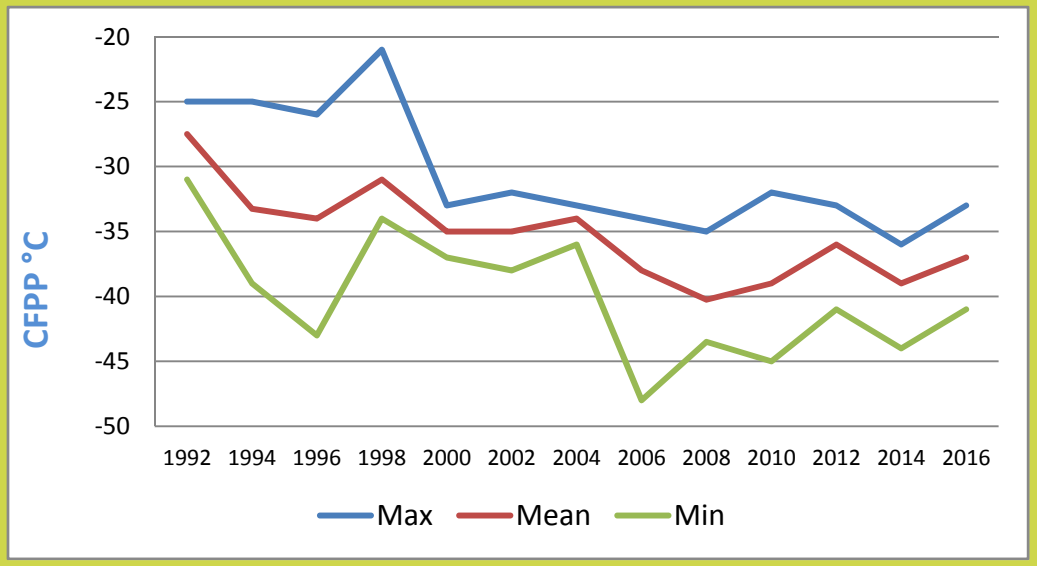
*20 hours min for diesel containing FAME above 2 % V/V

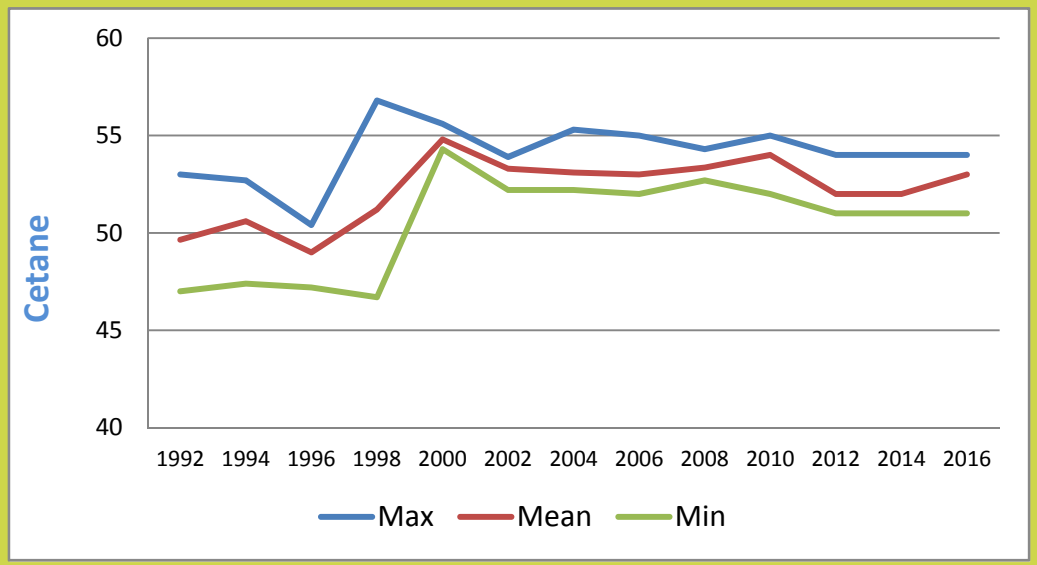
** Cetane number to meet European Fuels Directive 98/70/EC (Otherwise 48 min)

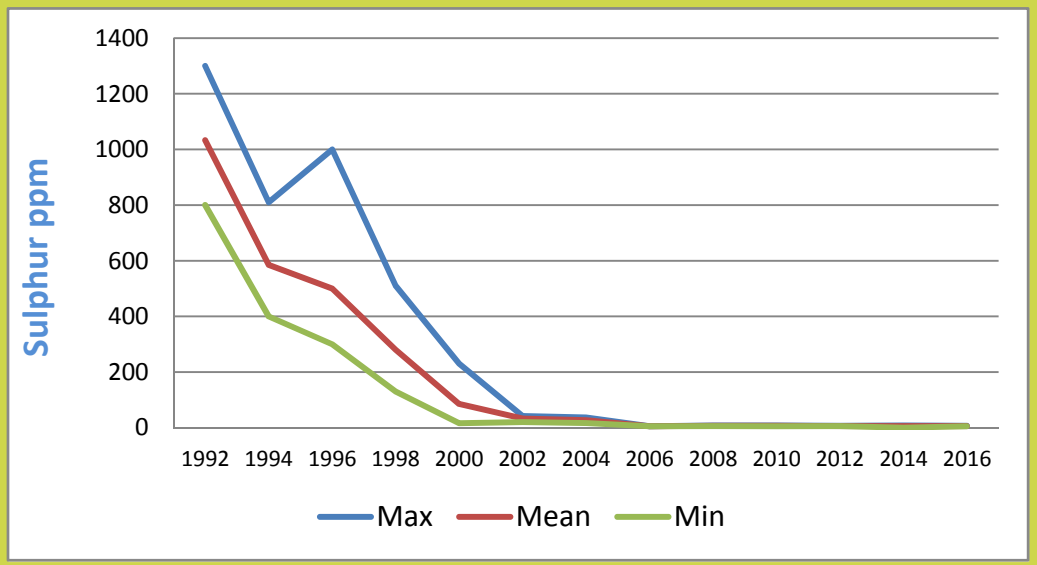
Norway

Europe









Poland

Europe

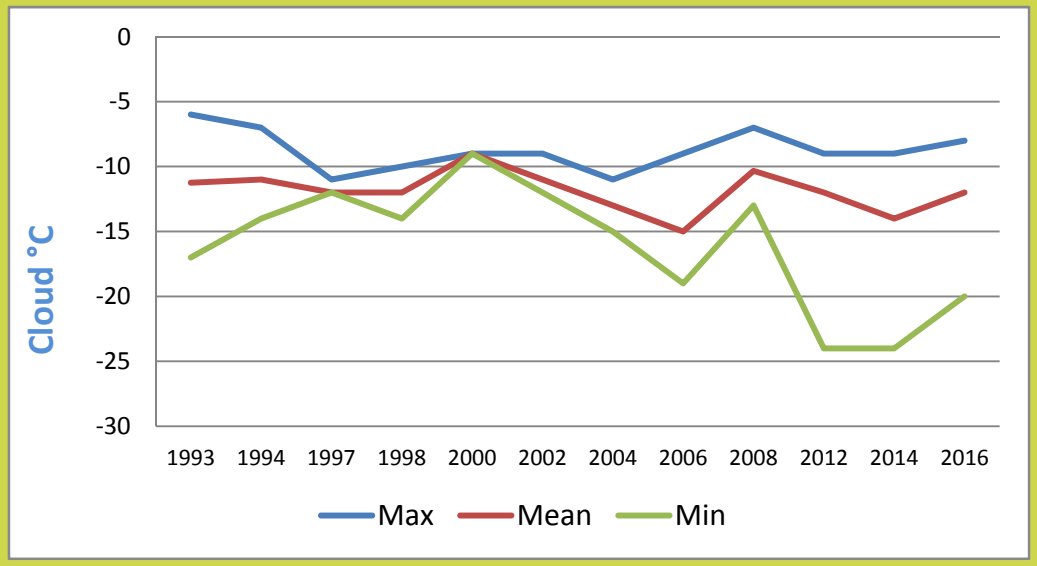
National standards and physical inspection data

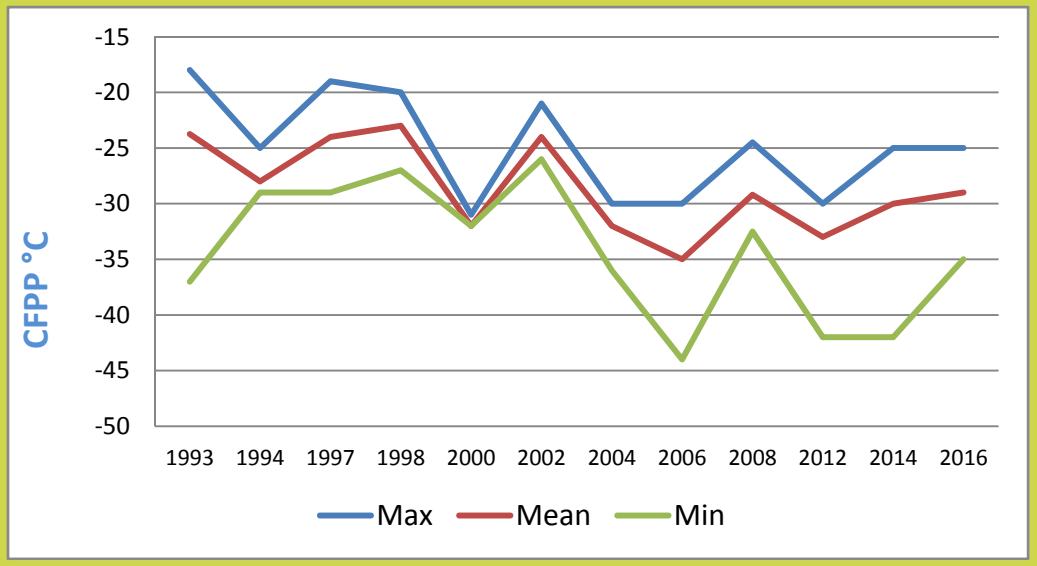
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600662	DIES 1600663	DIES 1600664	DIES 1600665
Cloud Point, °C		**-8**	**-12**	**-20**	-8	-20	-11	-11
CFPP, °C	-10 (max)	**-25**	**-29**	**-35**	-25	-35	-29	-28
Pour Point, °C		**-30**	**-32**	**-36**	-36	-33	-30	-30
HFRR, µm	460 (max)	**463**	**418**	**306**	306	443	463	463
Wax Content @ 10°C Below Cloud, wt%		**1.1**	**0.9**	**0.8**	0.9	1.1	0.8	0.8
Rancimat, hrs	*	**>30**	**>30**	**>30**	>30	>30	>30	>30
Sulphur, ppm	10 (max)	**10**	**7**	**5**	5	6	8	10
Density @15°C, kg/m^3	820 - 845	**831**	**826**	**821**	822	821	830	831
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-	-
Cetane Index 2 Variable		**56**	**54**	**52**	56	54	52	53
Cetane Index 4 Variable	46 (min)	**55**	**53**	**52**	55	54	52	52
Cetane Number	51 (min)	**57**	**55**	**53**	54	57	53	57
Distillation, °C IBP		**167**	**161**	**151**	151	162	167	165
T_{10}		**201**	**196**	**189**	189	194	201	201
T_{20}		**218**	**213**	**207**	207	209	217	218
T_{50}		**262**	**259**	**252**	261	252	260	262
T_{90}		**340**	**331**	**318**	340	318	332	335
T_{95}	360 (max)	**355**	**348**	**335**	355	335	350	352
FBP		**365**	**358**	**346**	365	346	360	361
% FAME	7 (max)	**3**	**1**	**0**	3	1	0	0

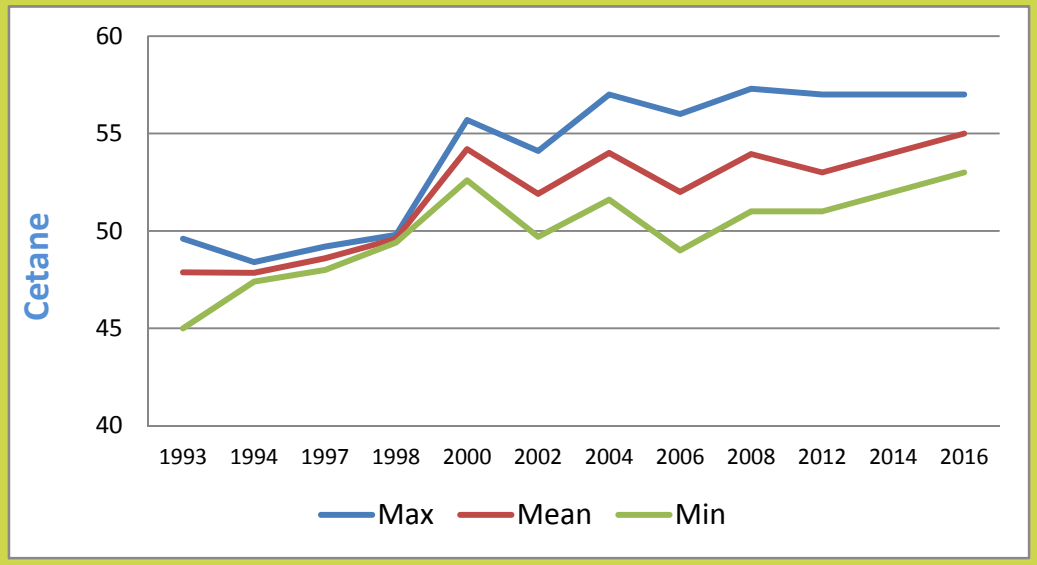
*20 hours min for diesel containing FAME above 2 % V/V

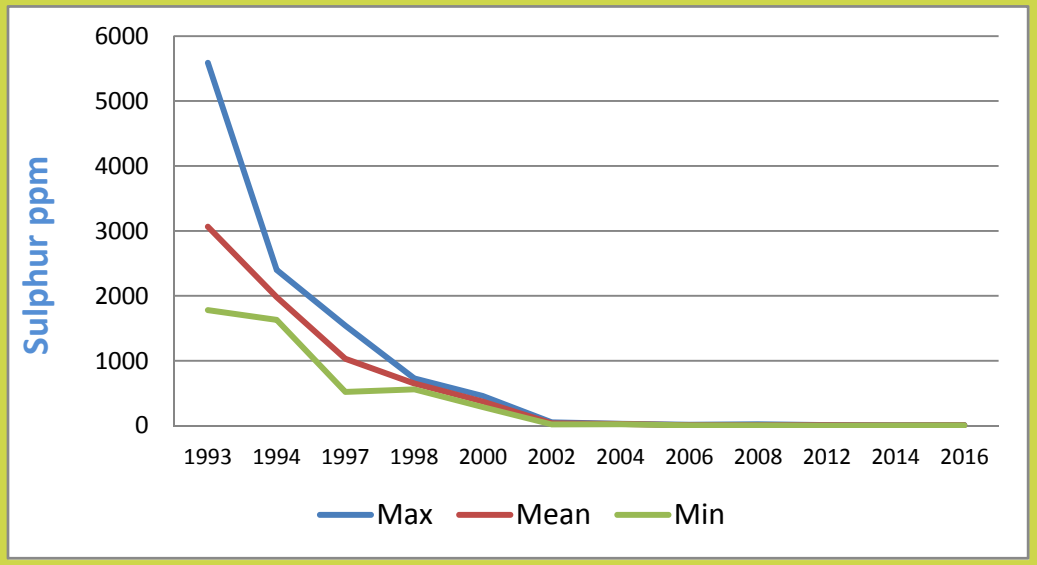
Poland

Europe









Portugal

Europe

National standards and physical inspection data

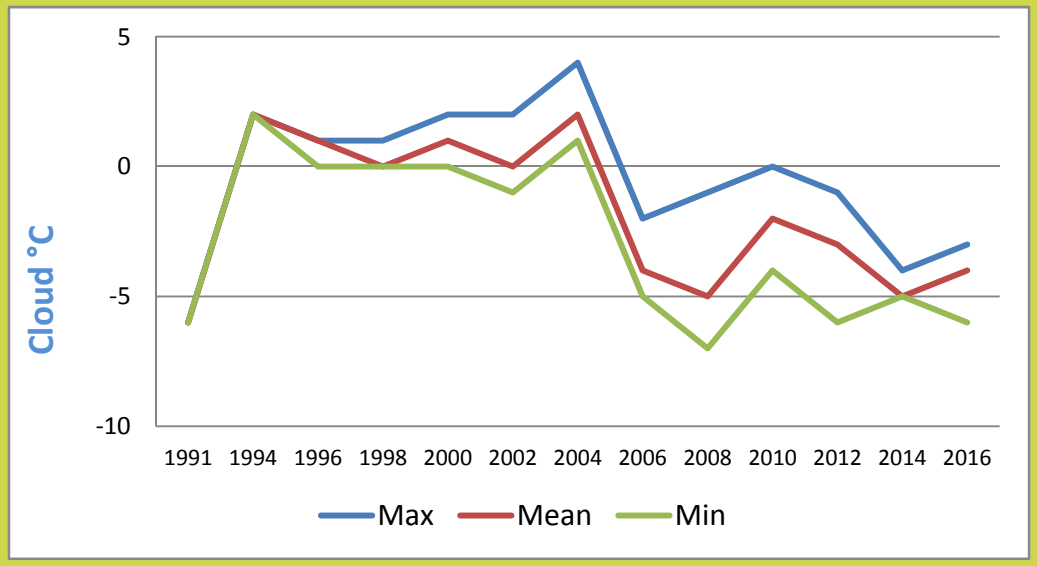
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600589	DIES 1600590	DIES 1600591
Cloud Point, °C		**-3**	**-4**	**-6**	-6	-3	-3
CFPP, °C	-10 (max)**	**-7**	**-10**	**-14**	-10	-7	-14
Pour Point, °C		**-12**	**-14**	**-18**	-12	-18	-12
HFRR, µm	460 (max)	**269**	**232**	**204**	269	204	223
Wax Content @ 10°C Below Cloud, wt%		**1.7**	**1.6**	**1.4**	1.4	1.7	1.6
Rancimat, hrs	*	**>30**	**>25**	**17**	17	>30	>30
Sulphur, ppm	10 (max)	**8**	**7**	**6**	8	7	6
Density @15°C, kg/m^3	820 - 845	**842**	**840**	**837**	842	840	837
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-
Cetane Index $_{2\ Variable}$		**54**	**53**	**51**	51	54	54
Cetane Index $_{4\ Variable}$	46 (min)	**55**	**53**	**50**	50	55	55
Cetane Number	51 (min)	**59**	**58**	**55**	55	59	59
Distillation, °C IBP		**178**	**176**	**171**	171	178	178
T_{10}		**224**	**218**	**211**	211	224	219
T_{20}		**245**	**238**	**230**	230	245	239
T_{50}		**286**	**279**	**272**	272	286	280
T_{90}		**343**	**340**	**337**	337	343	341
T_{95}	360 (max)	**359**	**357**	**354**	354	359	357
FBP		**368**	**366**	**364**	364	368	365
% FAME	7 (max)	**7**	**7**	**6**	7	7	6

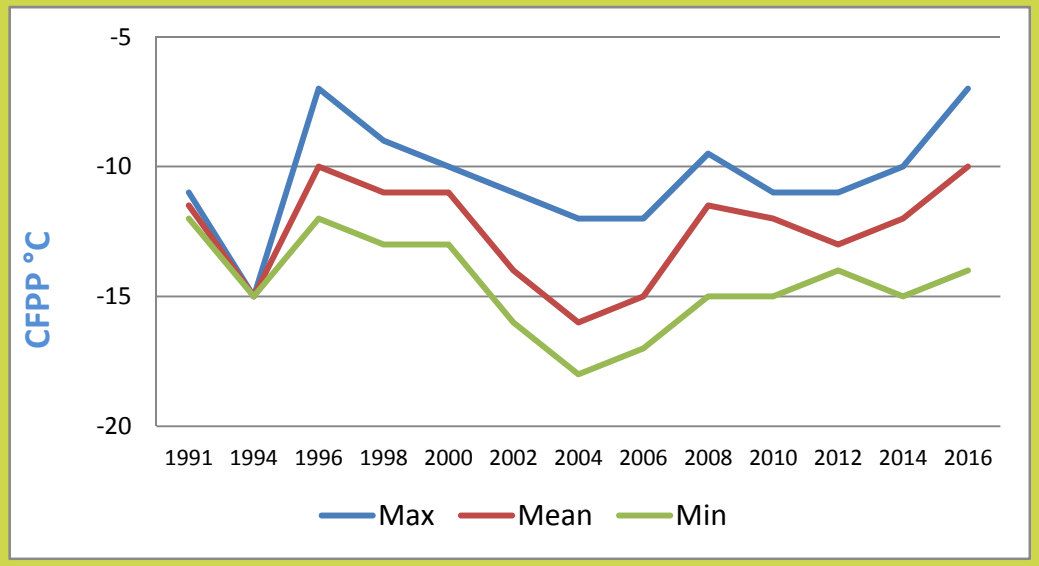
*20 hours min for diesel containing FAME above 2 % V/V

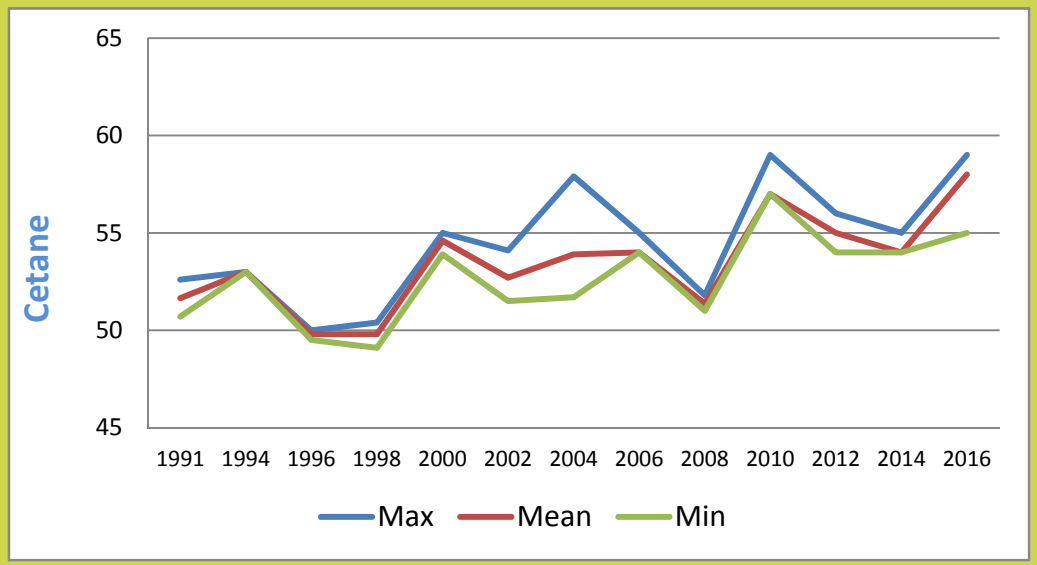
** -5 (max) CFPP used from 1st to 31st Mar and from 15th Oct to 30th Nov

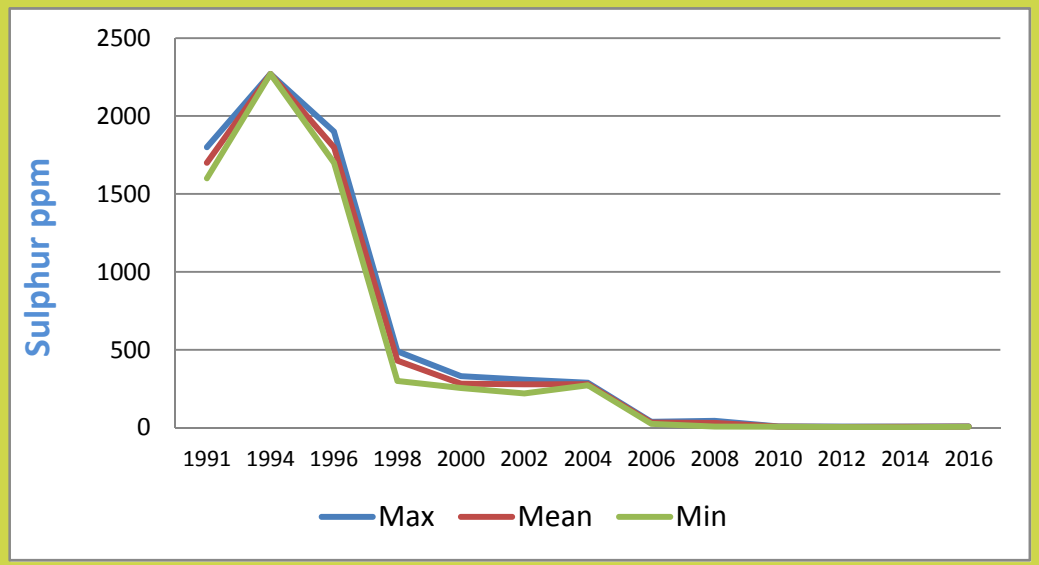
Portugal

Europe









Romania

Europe

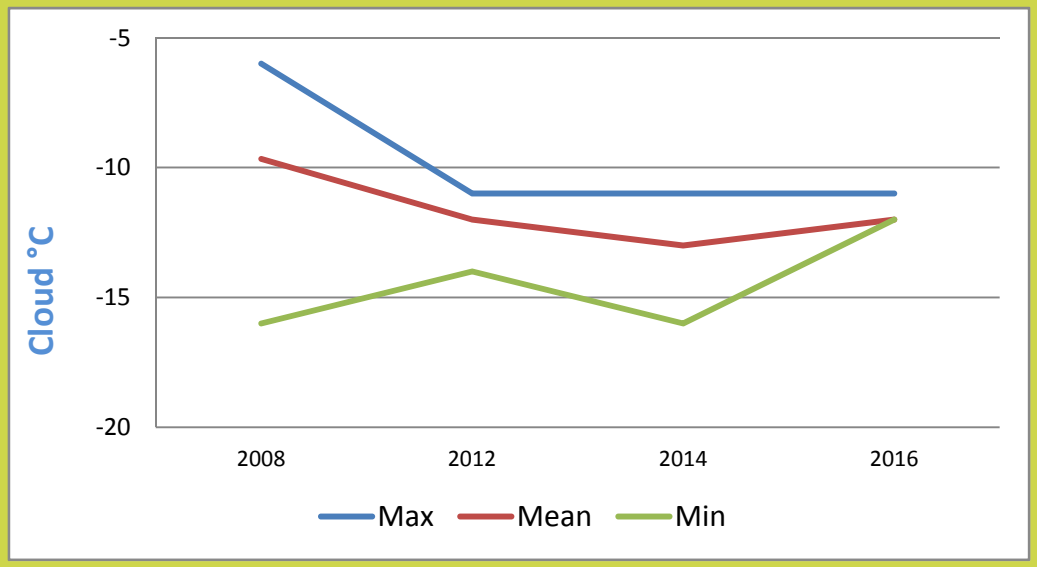
National standards and physical inspection data

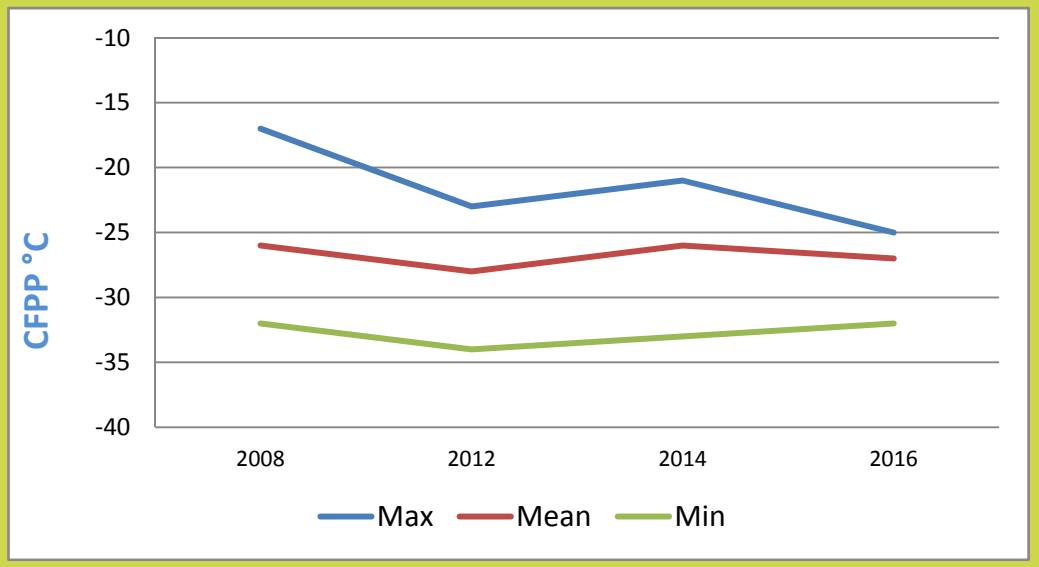
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600592	DIES 1600593	DIES 1600594	DIES 1600595
Cloud Point, °C		**-11**	**-12**	**-12**	-12	-11	-12	-12
CFPP, °C	-10 (max)	**-25**	**-27**	**-32**	-32	-25	-28	-25
Pour Point, °C		**-24**	**-32**	**-36**	-36	-33	-33	-24
HFRR, µm	460 (max)	**417**	**352**	**201**	391	201	402	417
Wax Content @ 10°C Below Cloud, wt%		**2.1**	**1.6**	**1.2**	1.4	1.7	2.1	1.2
Rancimat, hrs	*	**>30**	**>30**	**>30**	>30	>30	>30	>30
Sulphur, ppm	10 (max)	**6**	**<5**	**<3**	4	6	5	<3
Density @15°C, kg/m^3	820 - 845	**845**	**838**	**834**	838	837	834	845
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-	-
Cetane Index $_{2\ Variable}$		**51**	**49**	**46**	49	51	51	46
Cetane Index $_{4\ Variable}$	46 (min)	**51**	**49**	**46**	49	51	51	46
Cetane Number	51 (min)	**59**	**55**	**53**	53	59	55	53
Distillation, °C IBP		**167**	**162**	**158**	158	162	159	167
T_{10}		**206**	**202**	**201**	201	206	201	201
T_{20}		**222**	**218**	**216**	217	222	217	216
T_{50}		**263**	**258**	**255**	256	263	260	255
T_{90}		**325**	**323**	**321**	325	325	321	321
T_{95}	360 (max)	**342**	**339**	**335**	341	338	335	342
FBP		**354**	**348**	**344**	351	345	344	354
% FAME	7 (max)	**6**	**1**	**0**	0	6	0	0

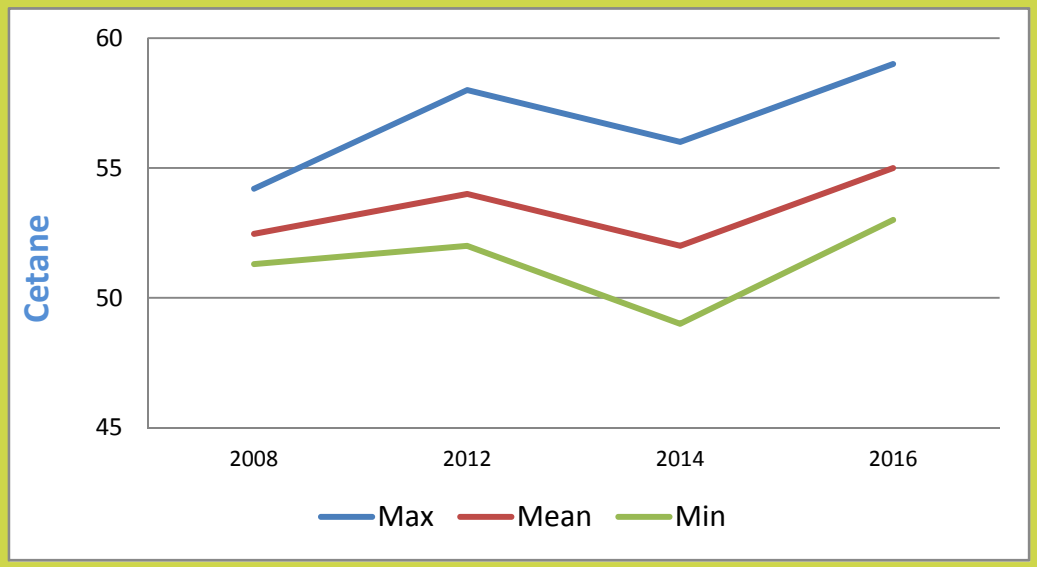
*20 hours min for diesel containing FAME above 2 % V/V

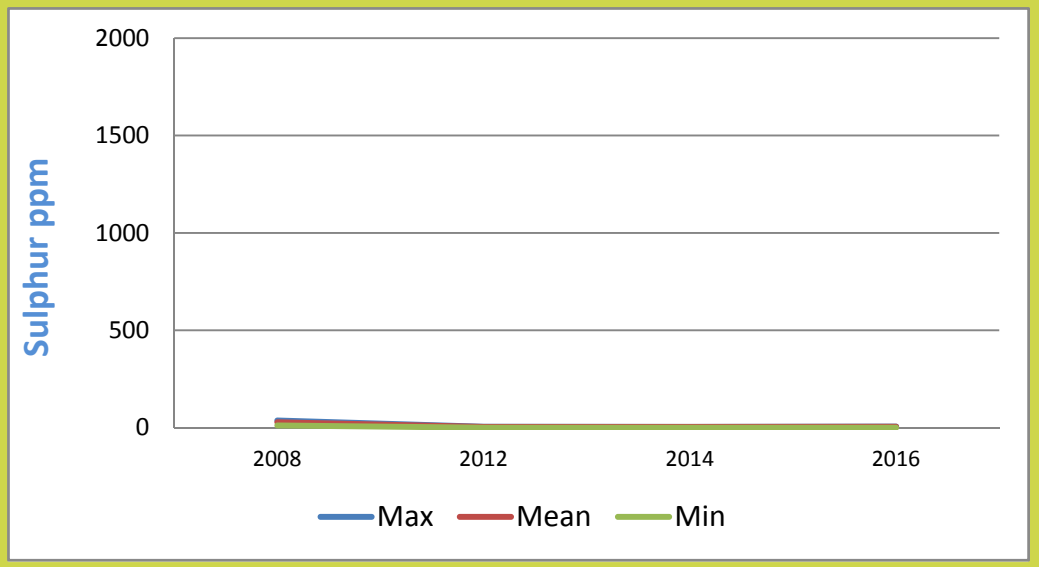
Romania

Europe









Slovakia

Europe

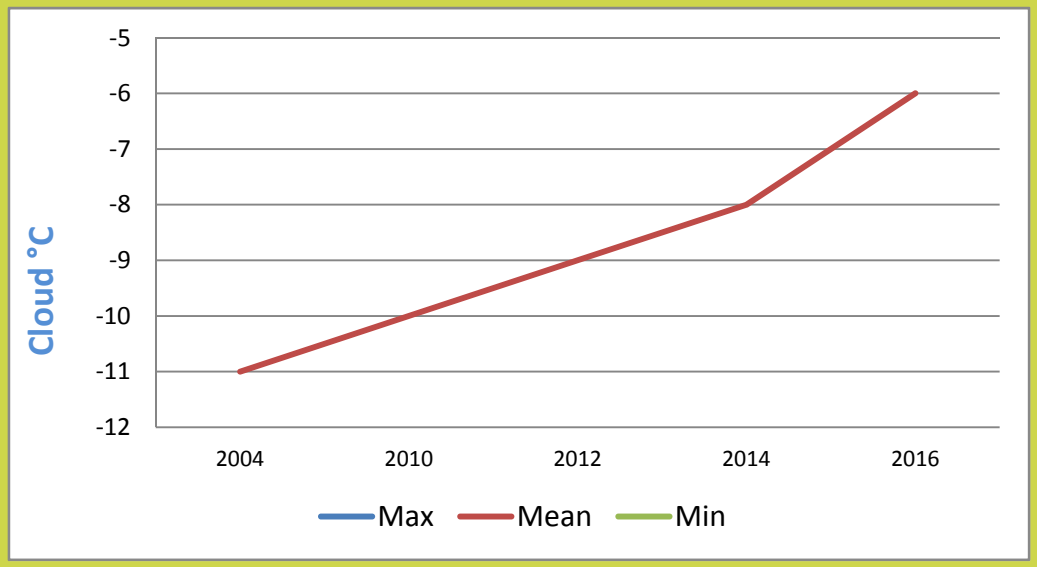
National standards and physical inspection data

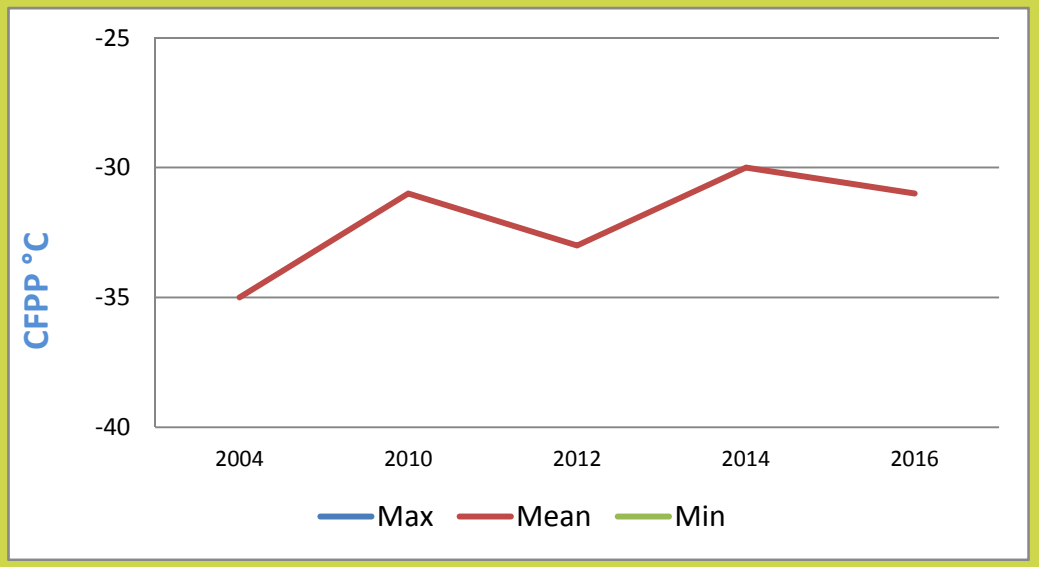
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600596
Cloud Point, °C			**-6**		-6
CFPP, °C	-10 (max)		**-31**		-31
Pour Point, °C			**-33**		-33
HFRR, µm	460 (max)		**175**		175
Wax Content @ 10°C Below Cloud, wt%			**1.4**		1.4
Rancimat, hrs	*		**>30**		>30
Sulphur, ppm	10 (max)		**6**		6
Density @15°C, kg/m^3	820 - 845		**841**		841
Viscosity @ 40°C, cSt	2.0 - 4.5		**-**		-
Cetane Index $_{2\ Variable}$			**51**		51
Cetane Index $_{4\ Variable}$	46 (min)		**50**		50
Cetane Number	51 (min)		**54**		54
Distillation, °C IBP			**178**		178
T_{10}			**210**		210
T_{20}			**224**		224
T_{50}			**270**		270
T_{90}			**336**		336
T_{95}	360 (max)		**350**		350
FBP			**358**		358
% FAME	7 (max)		**7**		7

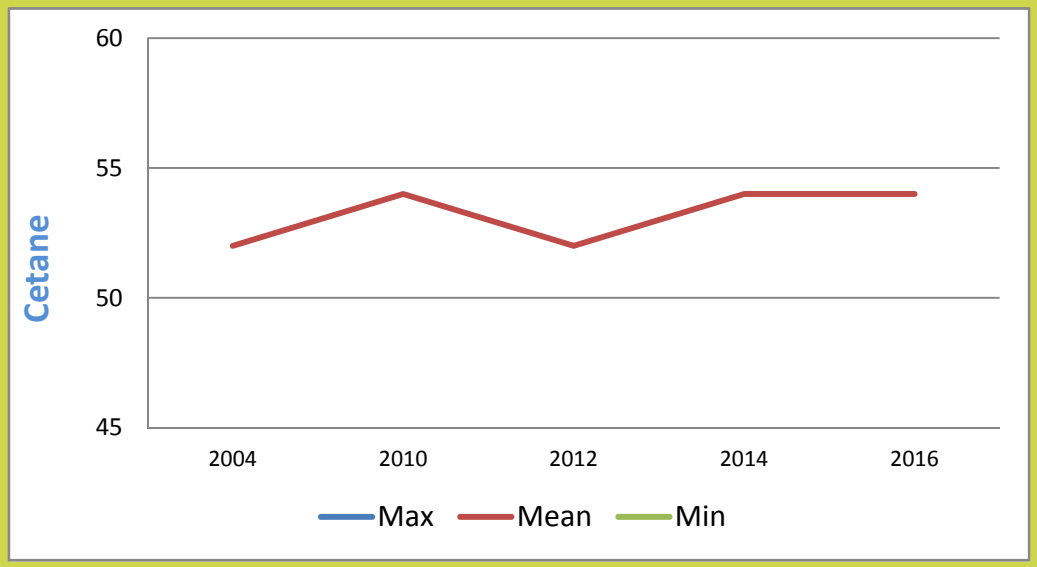
*20 hours min for diesel containing FAME above 2 % V/V

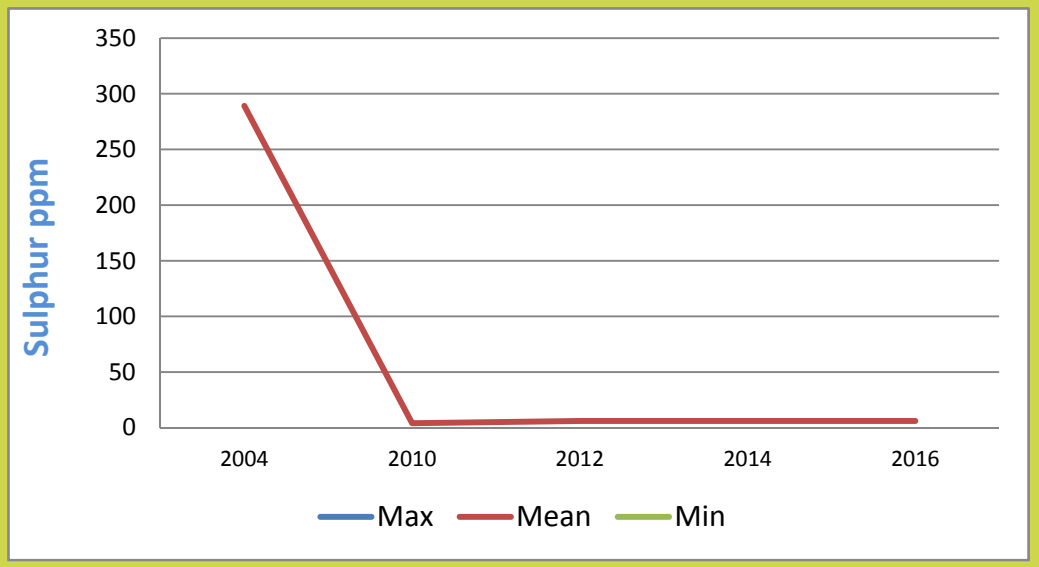
Slovakia

Europe









Spain

National standards and physical inspection data

Europe

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600598	DIES 1600599	DIES 1600639	DIES 1600640	DIES 1600641	DIES 1600642	DIES 1600644
Cloud Point, °C		**-1**	**-4**	**-6**	-4	-5	-5	-1	-1	-6	-4
CFPP, °C	-10 (max)	**-11**	**-16**	**-21**	-15	-20	-18	-14	-14	-11	-18
Pour Point, °C		**-12**	**-18**	**-21**	-21	-18	-21	-12	-18	-18	-15
HFRR, µm	460 (max)	**465**	**355**	**258**	363	422	316	437	286	465	258
Wax Content @ 10°C Below Cloud, wt%		**2.0**	**1.5**	**1.1**	1.7	1.1	1.5	2.0	2.0	1.4	1.6
Rancimat, hrs	*	**>30**	**>30**	**>30**	>30	>30	>30	>30	>30	>30	>30
Sulphur, ppm	10 (max)	**11**	**7**	**6**	11	8	7	7	6	6	6
Density @15°C, kg/m^3	820 - 845	**843**	**839**	**827**	836	843	840	827	839	840	842
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-	-	-	-	-
Cetane Index $_{2\ Variable}$		**55**	**52**	**50**	50	50	52	55	54	51	53
Cetane Index $_{4\ Variable}$	46 (min)	**54**	**51**	**49**	49	49	51	54	53	52	51
Cetane Number	51 (min)	**56**	**54**	**52**	53	53	52	56	54	56	55
Distillation, °C IBP		**166**	**159**	**155**	163	156	163	161	157	166	159
T_{10}		**216**	**199**	**190**	191	196	199	194	201	216	202
T_{20}		**231**	**220**	**205**	205	218	223	213	227	231	227
T_{50}		**281**	**271**	**258**	258	270	276	264	281	270	281
T_{90}		**343**	**339**	**332**	335	339	340	338	342	341	343
T_{95}	360 (max)	**360**	**356**	**349**	352	359	356	359	357	359	360
FBP		**371**	**366**	**361**	363	368	366	370	366	371	368
% FAME	7 (max)	**7**	**3**	**0**	2	1	5	0	6	0	5

*20 hours min for diesel containing FAME above 2 % V/V

Spain (continued)

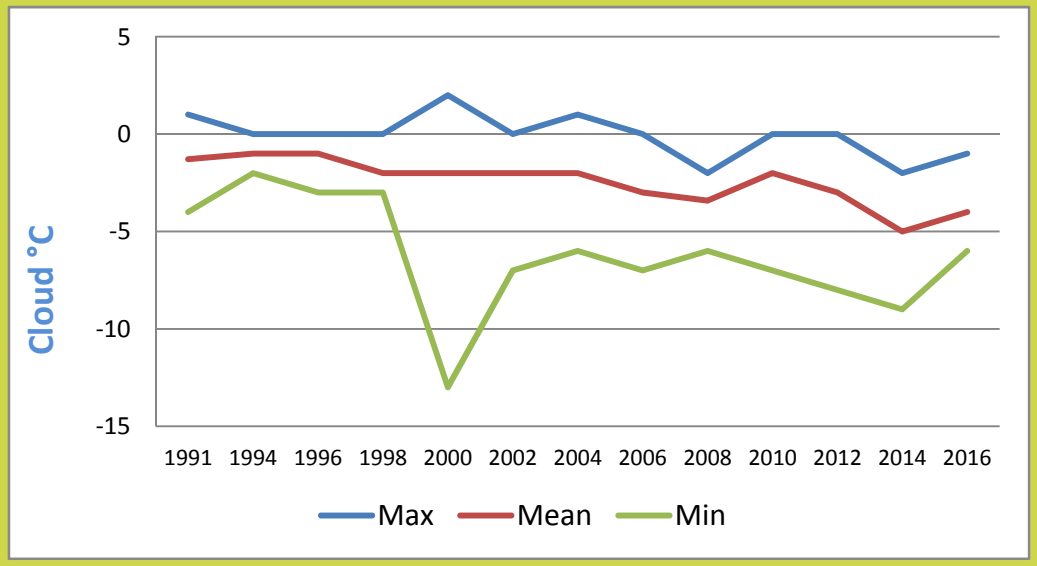
National standards and physical inspection data

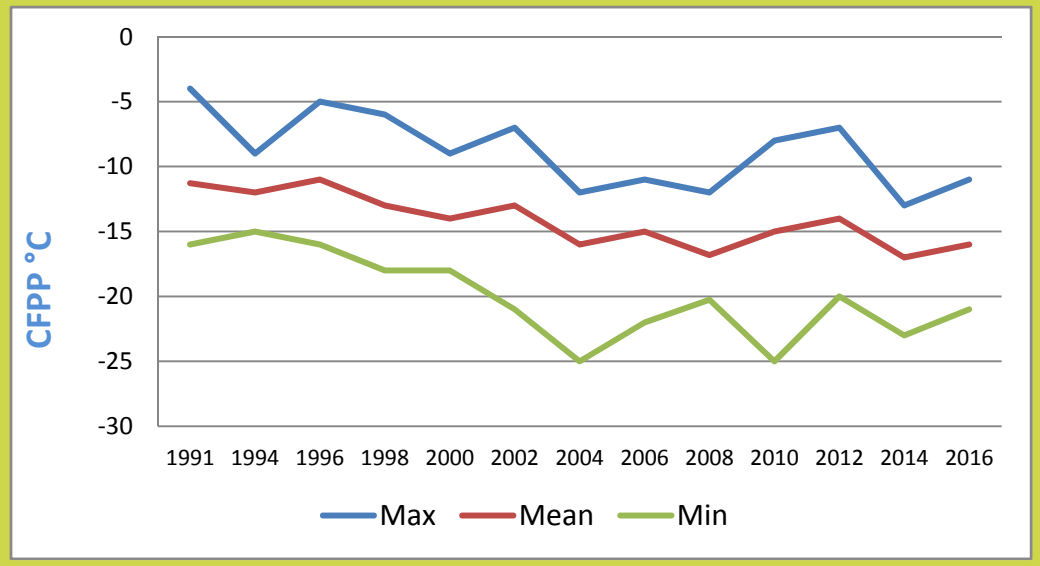
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600645	DIES 1600646	DIES 1600648	DIES 1600650
Cloud Point, °C		**-1**	**-4**	**-6**	-5	-4	-5	-4
CFPP, °C	-10 (max)	**-11**	**-16**	**-21**	-14	-20	-21	-20
Pour Point, °C		**-12**	**-18**	**-21**	-15	-21	-21	-21
HFRR, µm	460 (max)	**465**	**355**	**258**	278	388	399	295
Wax Content @ 10°C Below Cloud, wt%		**2.0**	**1.5**	**1.1**	1.6	1.4	1.3	1.4
Rancimat, hrs	*	**>30**	**>30**	**>30**	>30	>30	>30	>30
Sulphur, ppm	10 (max)	**11**	**7**	**6**	7	7	7	8
Density @15°C, kg/m^3	820 - 845	**843**	**839**	**827**	835	841	841	842
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-	-
Cetane Index $_{2\ Variable}$		**55**	**52**	**50**	51	51	51	51
Cetane Index $_{4\ Variable}$	46 (min)	**54**	**51**	**49**	50	50	50	50
Cetane Number	51 (min)	**56**	**54**	**52**	52	56	56	54
Distillation, °C IBP		**166**	**159**	**155**	156	160	155	158
T_{10}		**216**	**199**	**190**	190	201	201	202
T_{20}		**231**	**220**	**205**	209	222	221	223
T_{50}		**281**	**271**	**258**	263	272	271	272
T_{90}		**343**	**339**	**332**	332	339	339	338
T_{95}	360 (max)	**360**	**356**	**349**	349	357	356	356
FBP		**371**	**366**	**361**	361	367	365	366
% FAME	7 (max)	**7**	**3**	**0**	7	2	2	3

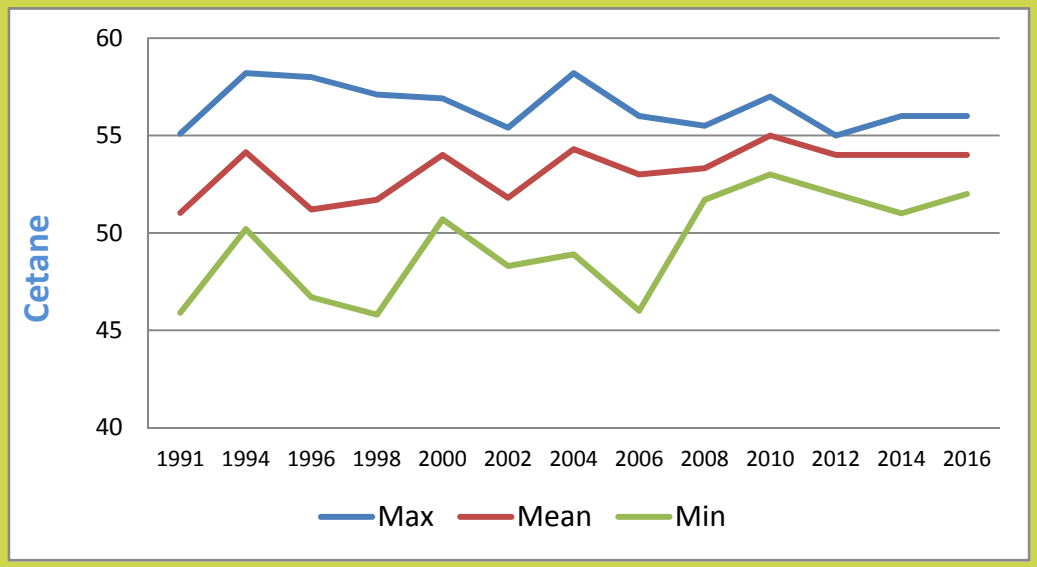
*20 hours min for diesel containing FAME above 2 % V/V

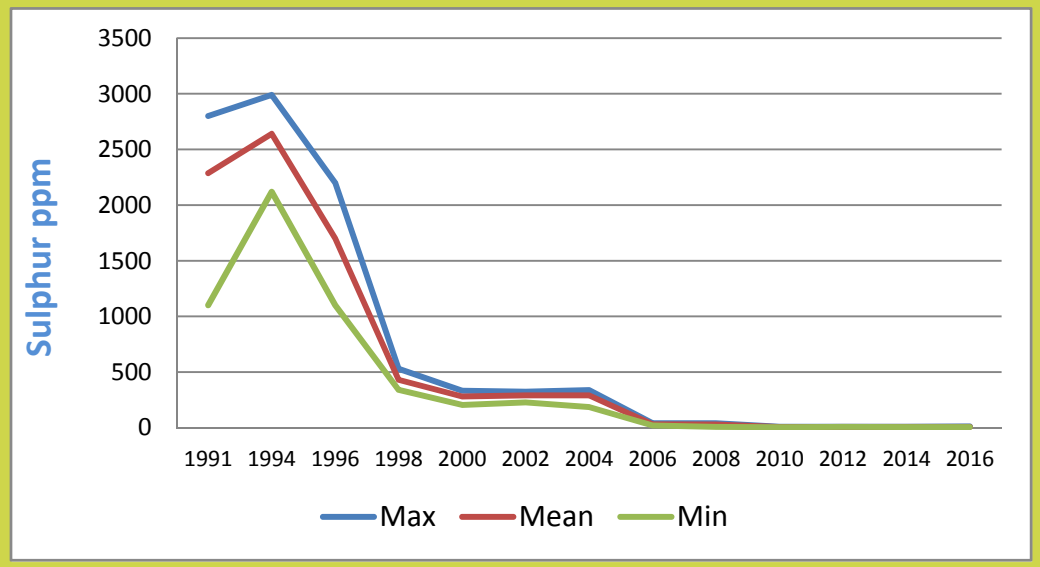
Spain

Europe









Sweden

Europe

National standards and physical inspection data

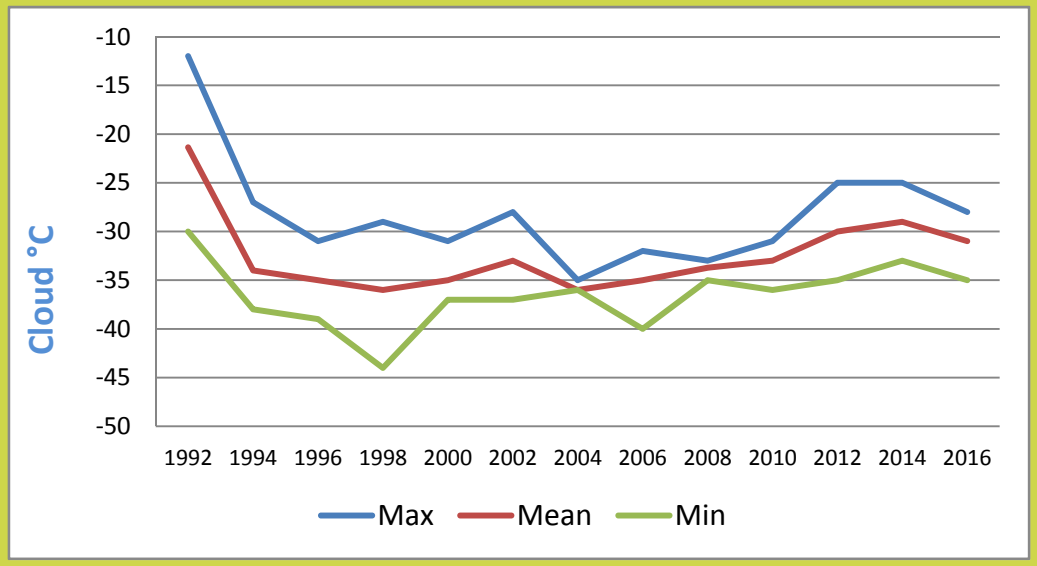
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600620	DIES 1600621	DIES 1600622	DIES 1600623	DIES 1600624
Cloud Point, °C	-22 (max)	**-28**	**-31**	**-35**	-29	-30	-34	-35	-28
CFPP, °C	-32 (max)	**-30**	**-35**	**-44**	-31	-31	-44	-40	-30
Pour Point, °C		**-30**	**-35**	**-39**	-33	-36	-39	-36	-30
HFRR, µm	460 (max)	**241**	**223**	**209**	209	241	226	230	209
Wax Content @ 10°C Below Cloud, wt%		**3.0**	**2.4**	**1.9**	1.9	2.7	2.2	3.0	2.3
Rancimat, hrs	*	**>30**	**>30**	**>30**	>30	>30	>30	>30	>30
Sulphur, ppm	10 (max)	**<3**	**<3**	**<3**	<3	<3	<3	<3	<3
Density @15°C, kg/m^3	810 - 830	**823**	**810**	**803**	806	803	805	814	823
Viscosity @ 40°C, cSt	1.5 - 4.0	**-**	**-**	**-**	-	-	-	-	-
Cetane Index $_{2\ Variable}$		**64**	**59**	**53**	64	64	61	53	54
Cetane Index $_{4\ Variable}$	50 (min)	**70**	**63**	**55**	70	69	65	55	56
Cetane Number	51 (min)	**63**	**59**	**53**	63	63	59	53	55
Distillation, °C IBP	180 (min)	**188**	**185**	**180**	180	183	188	187	188
T_{10}		**227**	**218**	**211**	227	220	218	211	214
T_{20}		**242**	**230**	**218**	242	234	230	218	225
T_{50}		**273**	**258**	**239**	273	265	257	239	256
T_{90}		**305**	**297**	**285**	302	296	295	285	305
T_{95}	340 (max)	**318**	**307**	**295**	313	309	295	303	318
FBP		**328**	**323**	**319**	325	321	319	321	328
% FAME	5 (max)	**7**	**6**	**5**	7	5	5	5	7

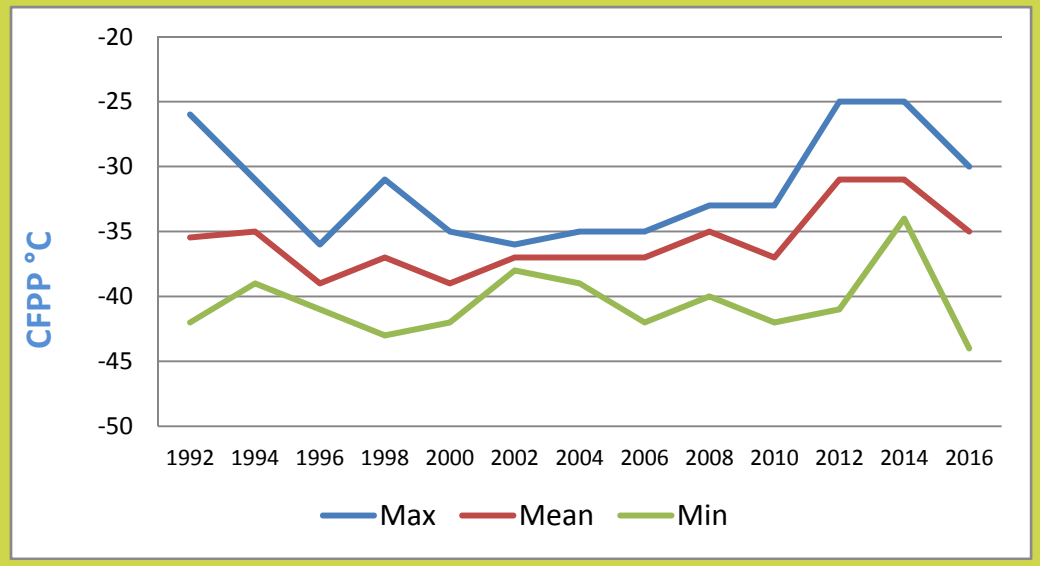
Specification shown is for B5.

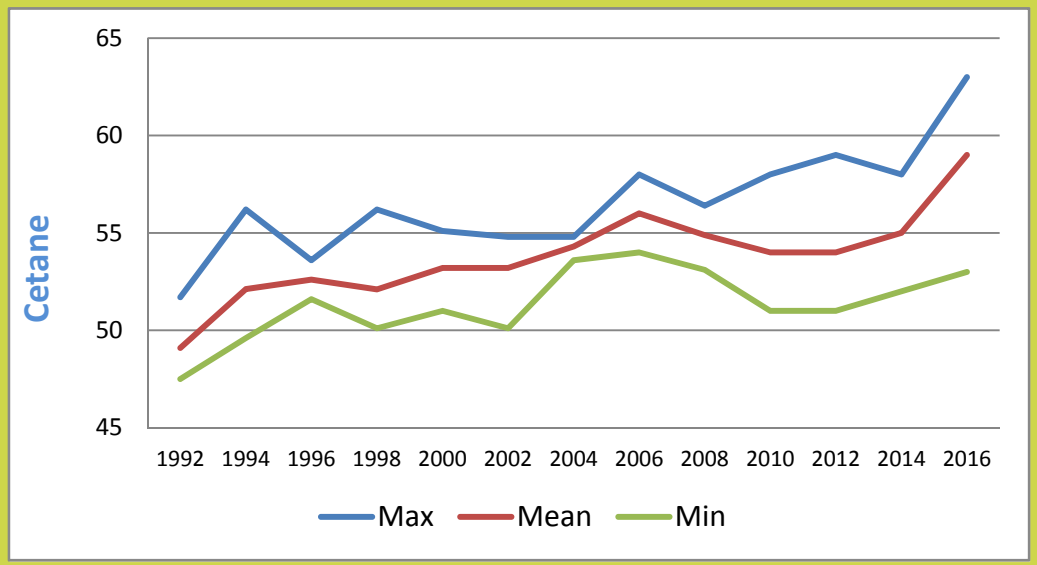
*20 hours min for diesel containing FAME above 2 % V/V

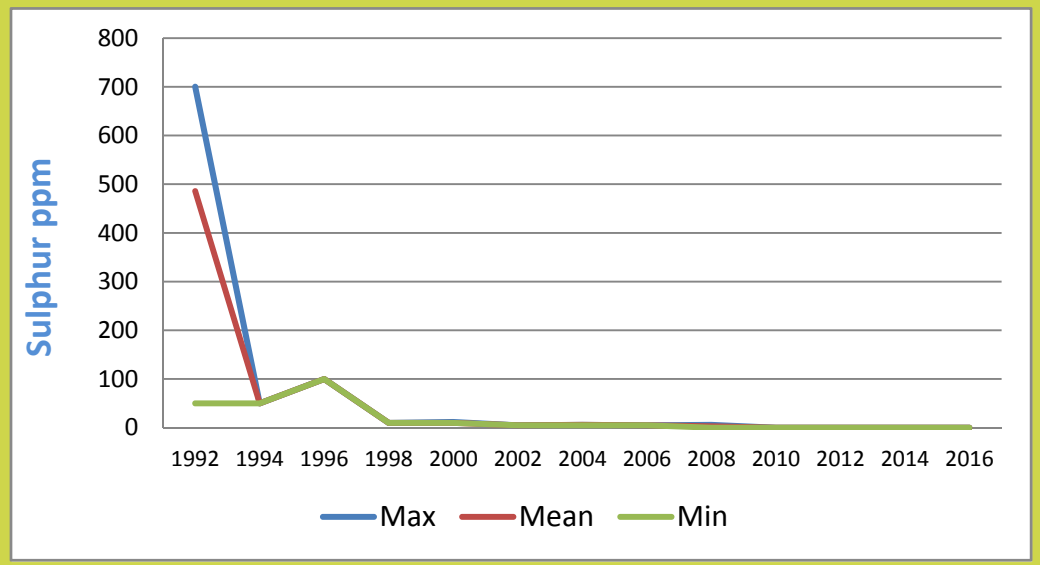
Sweden

Europe









Switzerland

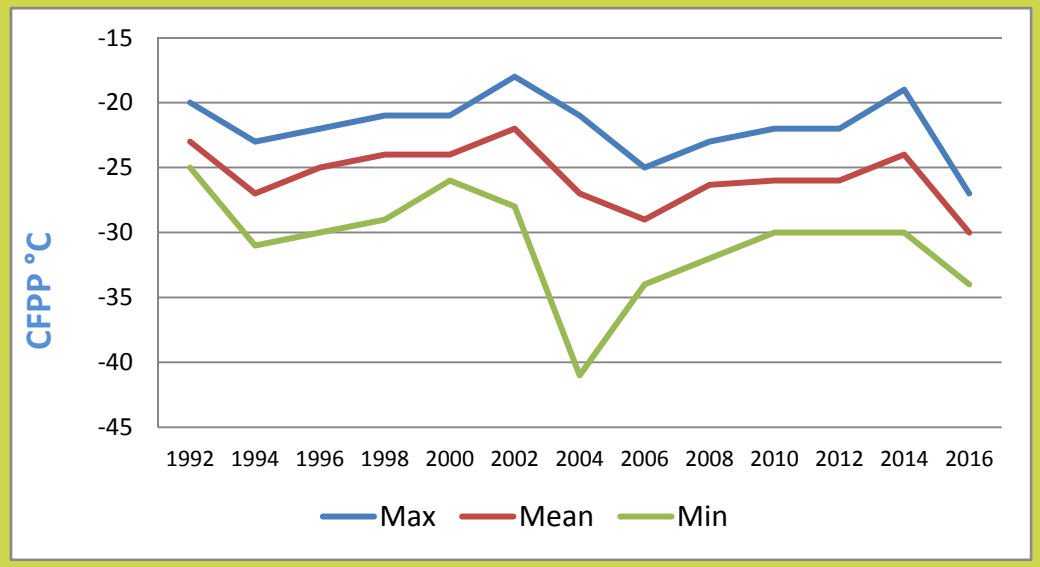
National standards and physical inspection data

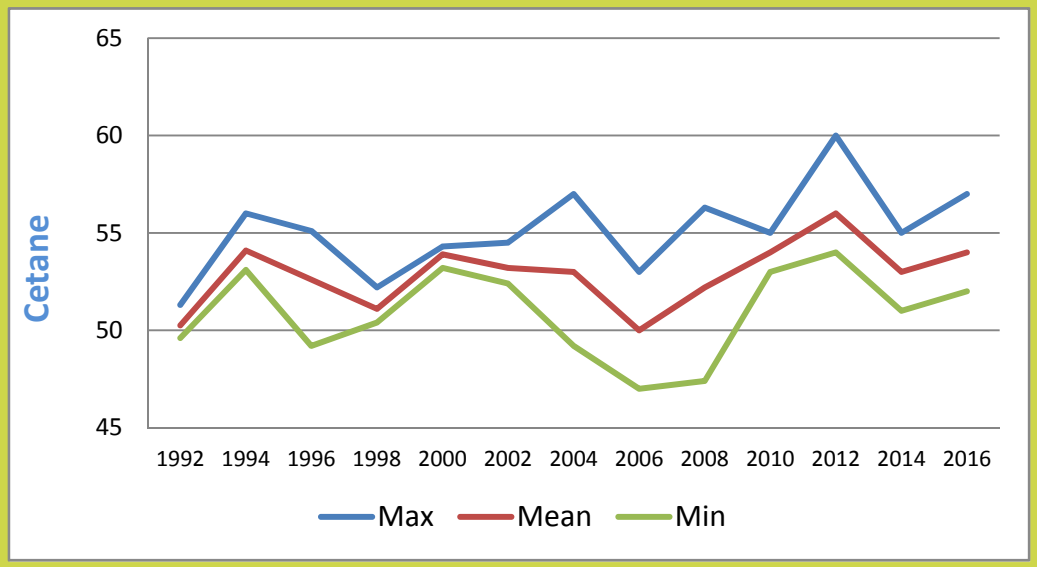
Europe

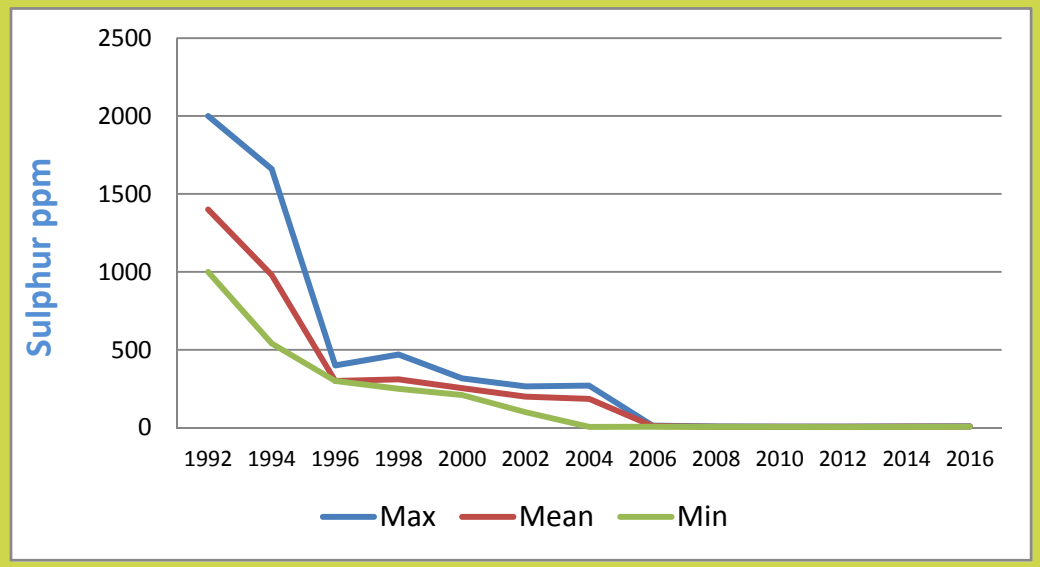
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600625	DIES 1600626	DIES 1600627	DIES 1600628	DIES 1600629	DIES 1600630	DIES 1600631
Cloud Point, °C	-10 (max)	**-12**	**-13**	**-15**	-12	-12	-15	-13	-12	-12	-12
CFPP, °C	-20 (max)	**-27**	**-30**	**-34**	-32	-34	-30	-27	-29	-33	-27
Pour Point, °C		**-24**	**-28**	**-33**	-30	-33	-24	-24	-27	-33	-27
HFRR, µm	460 (max)	**436**	**419**	**379**	420	419	423	434	379	436	422
Wax Content @ 10°C Below Cloud, wt%		**1.7**	**1.4**	**1.1**	1.7	1.2	1.1	1.4	1.3	1.3	1.7
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30	>30	>30	>30	>30	>30
Sulphur, ppm	10 (max)	**9**	**7**	**6**	6	7	9	6	9	6	6
Density @15°C, kg/m^3	845 (max)	**834**	**831**	**828**	833	828	829	832	828	832	834
Viscosity @ 40°C, cSt	1.5 - 4.0	**-**	**-**	**-**	-	-	-	-	-	-	-
Cetane Index $_{2\ Variable}$		**52**	**51**	**50**	52	52	50	51	50	52	52
Cetane Index $_{4\ Variable}$	46 (min)	**52**	**51**	**49**	52	51	49	50	50	52	51
Cetane Number	51 (min)	**57**	**54**	**52**	56	56	52	52	53	55	57
Distillation, °C IBP		**168**	**163**	**159**	168	162	159	162	161	164	162
T_{10}	180 (min)	**206**	**196**	**186**	206	196	186	195	190	203	198
T_{20}		**224**	**213**	**202**	224	213	202	212	205	220	219
T_{50}		**265**	**256**	**248**	265	254	248	255	249	260	262
T_{90}		**324**	**317**	**307**	324	307	311	320	315	323	321
T_{95}	340 (max)	**341**	**337**	**331**	339	338	331	339	334	341	336
FBP		**352**	**349**	**347**	350	350	348	351	348	352	347
% FAME		**0**	**0**	**0**	0	0	0	0	0	0	0

National standard shown is EN 590 Arctic Class 0

Switzerland







Turkey

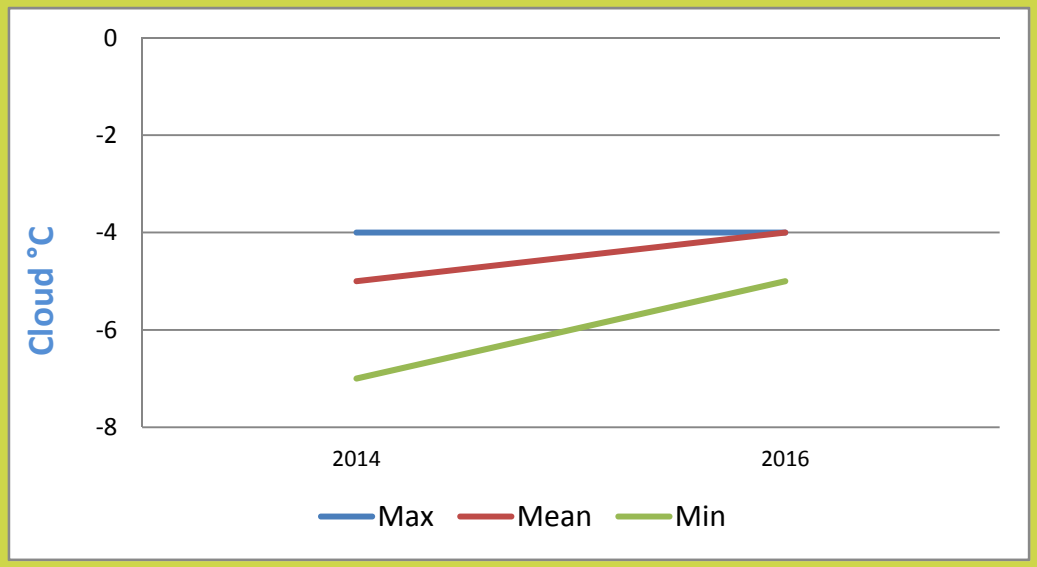
Europe

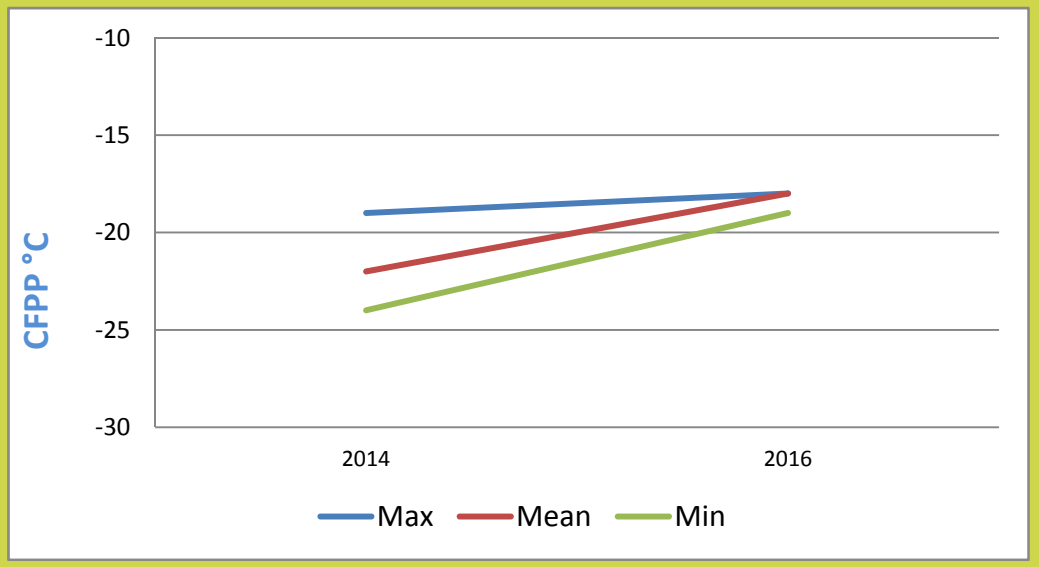
National standards and physical inspection data

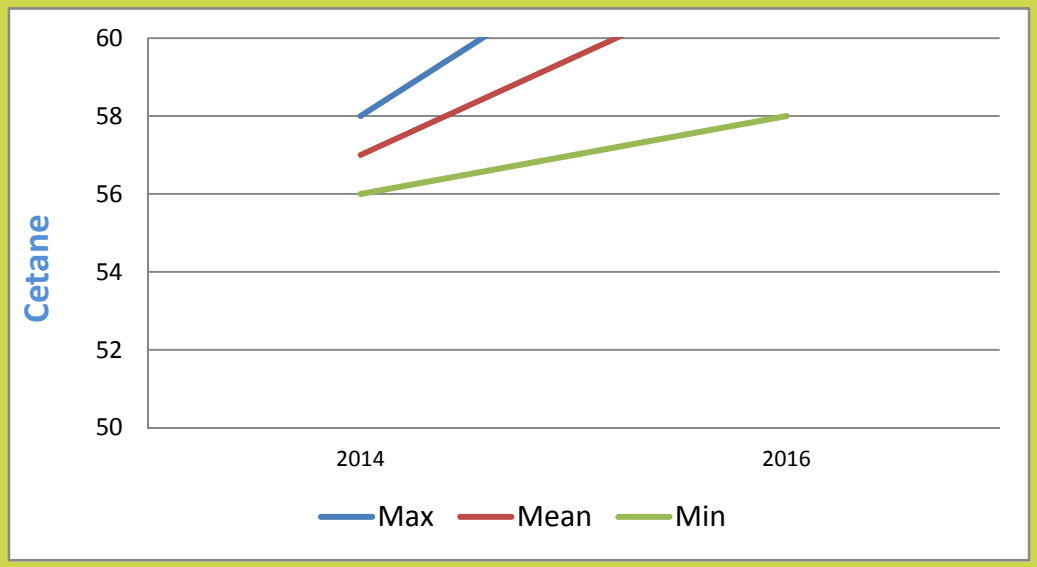
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600632	DIES 1600633
Cloud Point, °C		**-4**	**-4**	**-5**	-4	-5
CFPP, °C		**-18**	**-18**	**-19**	-19	-18
Pour Point, °C		**-24**	**-24**	**-24**	-24	-24
HFRR, µm	460 (max)	**422**	**421**	**420**	422	420
Wax Content @ 10°C Below Cloud, wt%		**1.9**	**1.6**	**1.3**	1.9	1.3
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30
Sulphur, ppm	10 (max)	**4**	**4**	**4**	4	4
Density @15°C, kg/m^3	820 - 845	**833**	**828**	**824**	833	824
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-
Cetane Index $_{2\ Variable}$		**58**	**58**	**58**	58	58
Cetane Index $_{4\ Variable}$	46 (min)	**60**	**59**	**57**	60	57
Cetane Number	51 (min)	**65**	**62**	**58**	65	58
Distillation, °C IBP		**157**	**156**	**156**	157	156
T_{10}		**228**	**211**	**194**	228	194
T_{20}		**255**	**237**	**219**	255	219
T_{50}		**295**	**284**	**273**	295	273
T_{90}		**345**	**342**	**340**	345	340
T_{95}	360 (max)	**359**	**358**	**357**	357	359
FBP		**369**	**366**	**363**	363	369
% FAME	7 (max)	**0**	**0**	**0**	0	0

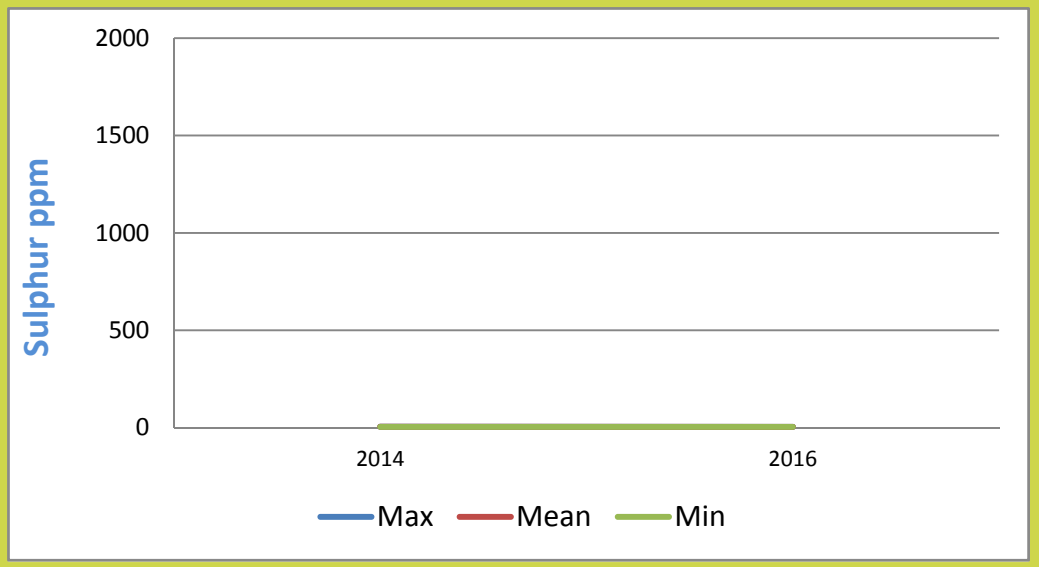
Turkey

Europe









United Kingdom

National standards and physical inspection data

Europe

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600426	DIES 1600428	DIES 1600429	DIES 1600430	DIES 1600432	DIES 1600434	DIES 1600435
Cloud Point, °C		**-5**	**-7**	**-10**	-8	-8	-6	-7	-7	-7	-8
CFPP, °C	-15 (max)	**-17**	**-19**	**-22**	-21	-20	-20	-20	-21	-21	-18
Pour Point, °C		**-15**	**-24**	**-30**	-30	-30	-30	-30	-21	-21	-21
HFRR, µm	460 (max)	**429**	**349**	**198**	411	390	388	418	218	211	429
Wax Content @ 10°C Below Cloud, wt%		**2.2**	**1.6**	**0.8**	1.7	1.7	1.7	1.7	0.8	1.1	1.5
Rancimat, hrs	*	**>30**	**>30**	**>30**	>30	>30	>30	>30	>30	>30	>30
Sulphur, ppm	10 (max)	**9**	**8**	**5**	9	8	8	8	6	7	8
Density @15°C, kg/m^3	820 - 835	**844**	**840**	**838**	840	840	839	839	844	844	839
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-	-	-	-	-
Cetane Index 2 Variable		**53**	**50**	**48**	50	50	50	50	48	49	51
Cetane Index 4 Variable	46 (min)	**53**	**49**	**48**	48	48	49	49	48	48	51
Cetane Number	51 (min)	**56**	**53**	**51**	54	54	54	55	52	52	53
Distillation, °C IBP		**183**	**164**	**156**	157	160	157	158	170	165	167
T_{10}		**218**	**201**	**190**	190	191	191	191	203	203	207
T_{20}		**237**	**219**	**209**	210	210	211	210	219	221	225
T_{50}		**273**	**265**	**259**	263	263	263	264	263	266	267
T_{90}		**335**	**330**	**324**	329	329	329	330	335	335	331
T_{95}	360 (max)	**354**	**346**	**342**	345	344	346	346	354	353	347
FBP		**366**	**358**	**352**	355	355	355	356	366	365	358
% FAME	7 (max)	**5**	**1**	**0**	0	0	0	0	5	5	0

*20 hours min for diesel containing FAME above 2 % V/V

United Kingdom (continued)

National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600436	DIES 1600437	DIES 1600438	DIES 1600439	DIES 1600440	DIES 1600441	DIES 1600444
Cloud Point, °C		**-5**	**-7**	**-10**	-9	-5	-5	-9	-6	-10	-8
CFPP, °C	-15 (max)	**-17**	**-19**	**-22**	-20	-17	-17	-21	-17	-22	-19
Pour Point, °C		**-15**	**-24**	**-30**	-21	-15	-15	-30	-24	-24	-21
HFRR, µm	460 (max)	**429**	**349**	**198**	412	375	396	360	334	198	421
Wax Content @ 10°C Below Cloud, wt%		**2.2**	**1.6**	**0.8**	1.7	2.2	2.1	1.6	1.7	1.7	1.4
Rancimat, hrs	*	**>30**	**>30**	**>30**	>30	>30	>30	>30	>30	>30	>30
Sulphur, ppm	10 (max)	**9**	**8**	**5**	6	8	5	8	8	9	8
Density @15°C, kg/m^3	820 - 835	**844**	**840**	**838**	839	842	838	839	841	839	839
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-	-	-	-	-	-	-
Cetane Index $_{2\ Variable}$		**53**	**50**	**48**	52	50	53	49	51	49	51
Cetane Index $_{4\ Variable}$	46 (min)	**53**	**49**	**48**	52	49	53	48	49	49	50
Cetane Number	51 (min)	**56**	**53**	**51**	52	51	51	56	52	55	52
Distillation, °C IBP		**183**	**164**	**156**	183	168	176	157	156	161	164
T_{10}		**218**	**201**	**190**	218	208	217	191	193	199	204
T_{20}		**237**	**219**	**209**	237	225	237	209	215	215	222
T_{50}		**273**	**265**	**259**	273	266	273	259	270	261	265
T_{90}		**335**	**330**	**324**	324	330	325	326	334	325	331
T_{95}	360 (max)	**354**	**346**	**342**	342	347	342	342	350	343	349
FBP		**366**	**358**	**352**	356	358	356	352	360	355	360
% FAME	7 (max)	**5**	**1**	**0**	1	0	0	0	0	3	0

*20 hours min for diesel containing FAME above 2 % V/V

United Kingdom (continued)

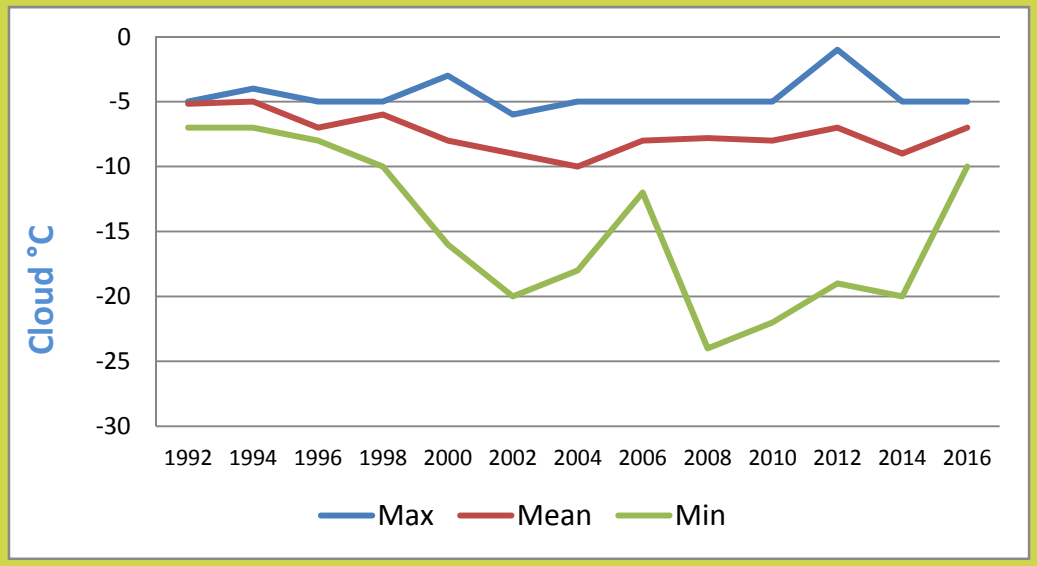
National standards and physical inspection data

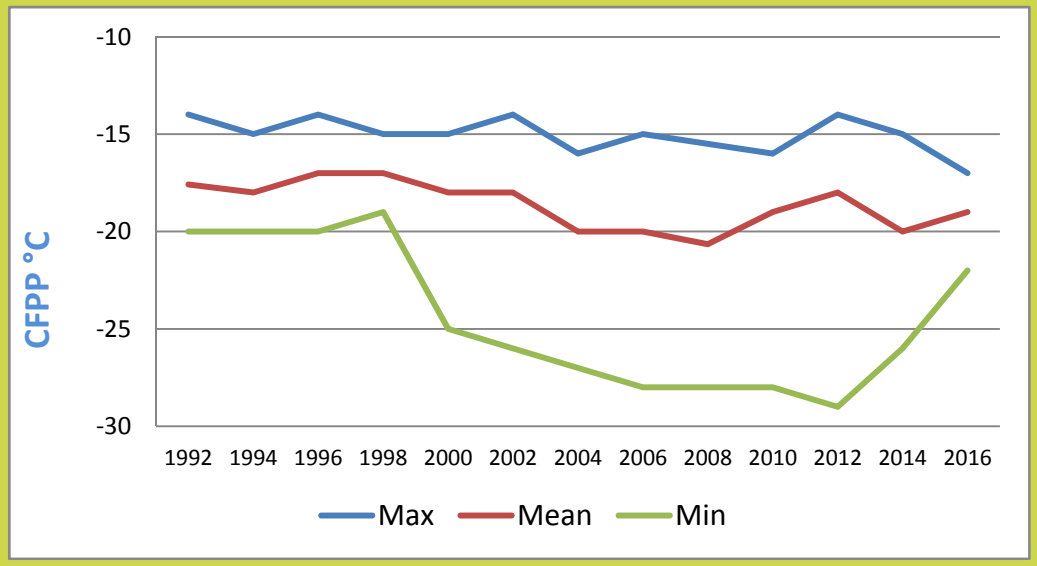
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600446
Cloud Point, °C		**-5**	**-7**	**-10**	-9
CFPP, °C	-15 (max)	**-17**	**-19**	**-22**	-20
Pour Point, °C		**-15**	**-24**	**-30**	-21
HFRR, µm	460 (max)	**429**	**349**	**198**	283
Wax Content @ 10°C Below Cloud, wt%		**2.2**	**1.6**	**0.8**	1.6
Rancimat, hrs	*	**>30**	**>30**	**>30**	>30
Sulphur, ppm	10 (max)	**9**	**8**	**5**	6
Density @15°C, kg/m^3	820 - 835	**844**	**840**	**838**	842
Viscosity @ 40°C, cSt	2.0 - 4.5	**-**	**-**	**-**	-
Cetane Index $_{2\ Variable}$		**53**	**50**	**48**	50
Cetane Index $_{4\ Variable}$	46 (min)	**53**	**49**	**48**	49
Cetane Number	51 (min)	**56**	**53**	**51**	53
Distillation, °C IBP		**183**	**164**	**156**	163
T_{10}		**218**	**201**	**190**	207
T_{20}		**237**	**219**	**209**	226
T_{50}		**273**	**265**	**259**	267
T_{90}		**335**	**330**	**324**	331
T_{95}	360 (max)	**354**	**346**	**342**	347
FBP		**366**	**358**	**352**	358
% FAME	7 (max)	**5**	**1**	**0**	3

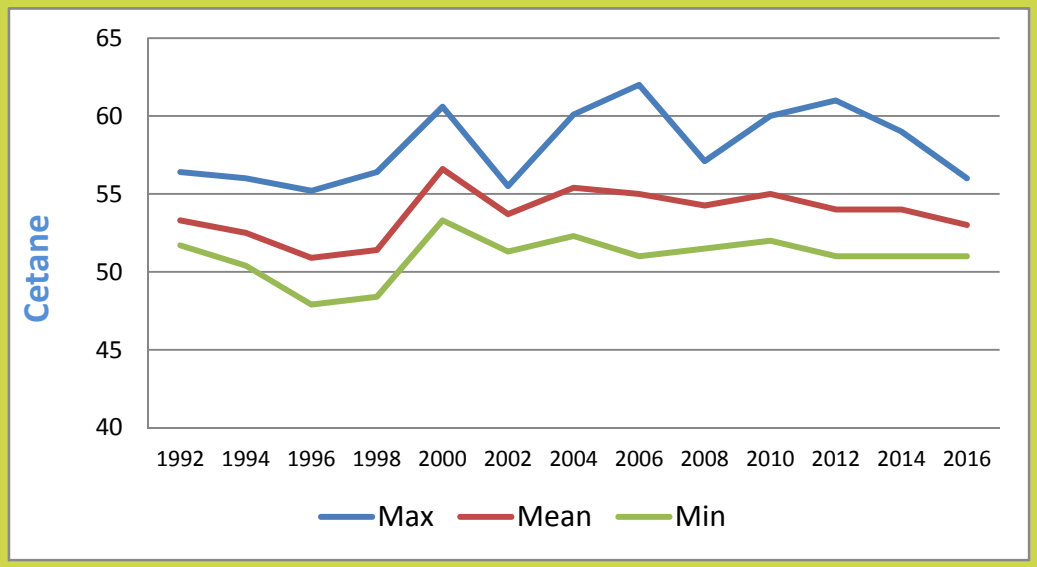
*20 hours min for diesel containing FAME above 2 % V/V

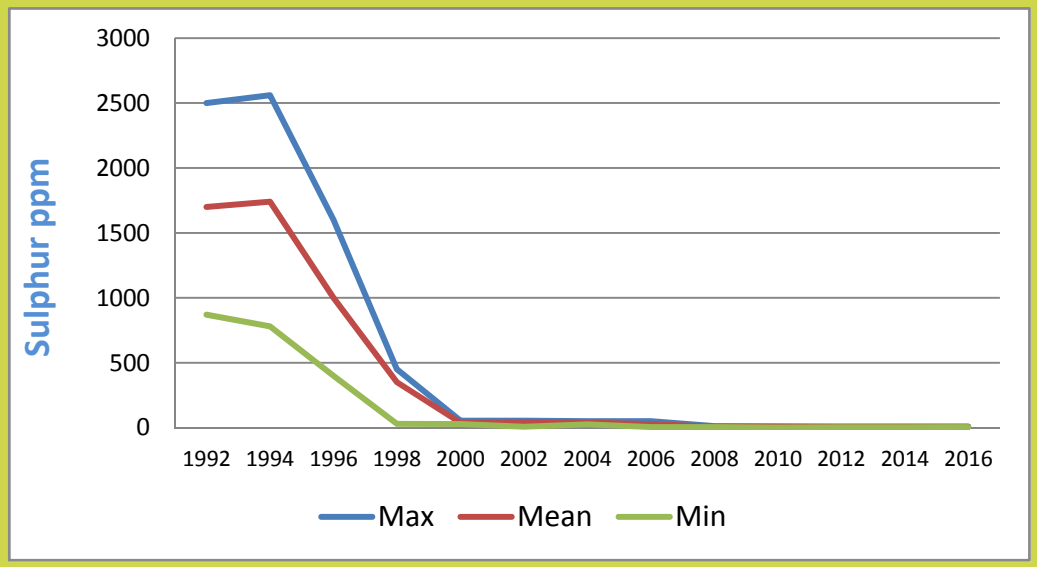
United Kingdom

Europe









Ukraine

Europe

National standards and physical inspection data

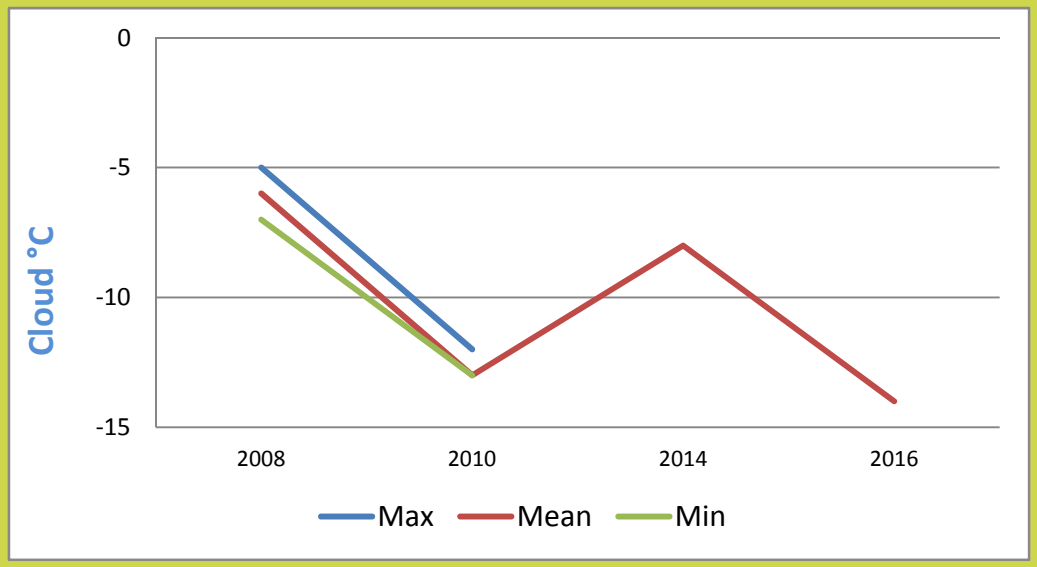
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600322
Cloud Point, °C			**-14**		-14
CFPP, °C	-20 (max)		**-32**		-32
Pour Point, °C			**-30**		-30
HFRR, µm	460 (max)		**422**		422
Wax Content @ 10°C Below Cloud, wt%			**1.2**		1.2
Rancimat, hrs			**>30**		>30
Sulphur, ppm	50 (max)		**15**		15
Density @15°C, kg/m^3			**840**		840
Viscosity @ 40°C, cSt			**-**		-
Cetane Index $_{2\ Variable}$			**52**		52
Cetane Index $_{4\ Variable}$			**53**		53
Cetane Number	51 (min)		**49**		49
Distillation, °C IBP			**161**		161
T_{10}			**228**		228
T_{20}			**242**		242
T_{50}			**272**		272
T_{90}			**335**		335
T_{95}	360 (max)		**353**		353
FBP			**363**		363
% FAME	5 (max), 7 (max) *		**0**		0

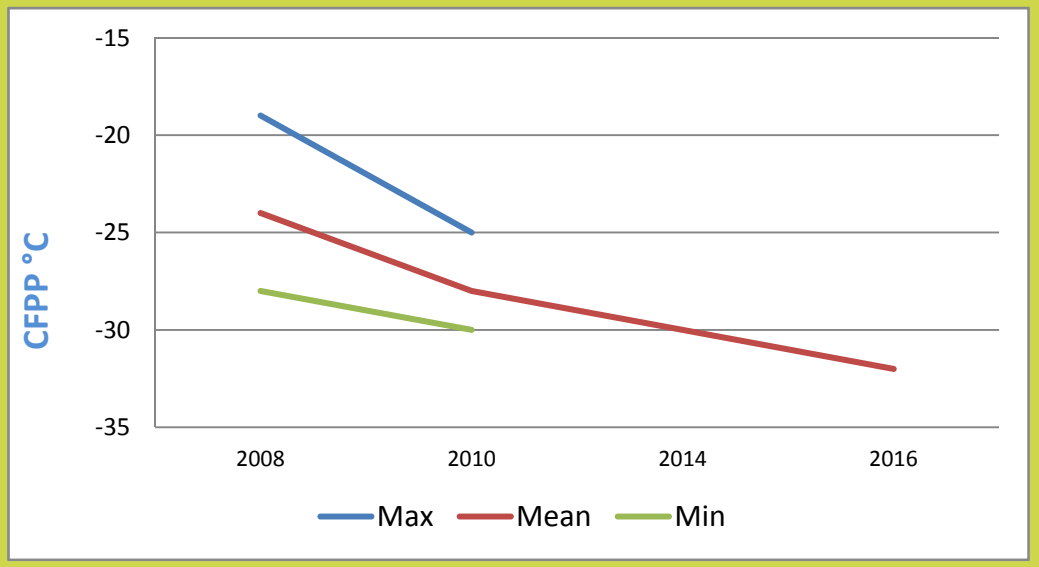
Specification shown for EVR04 diesel.

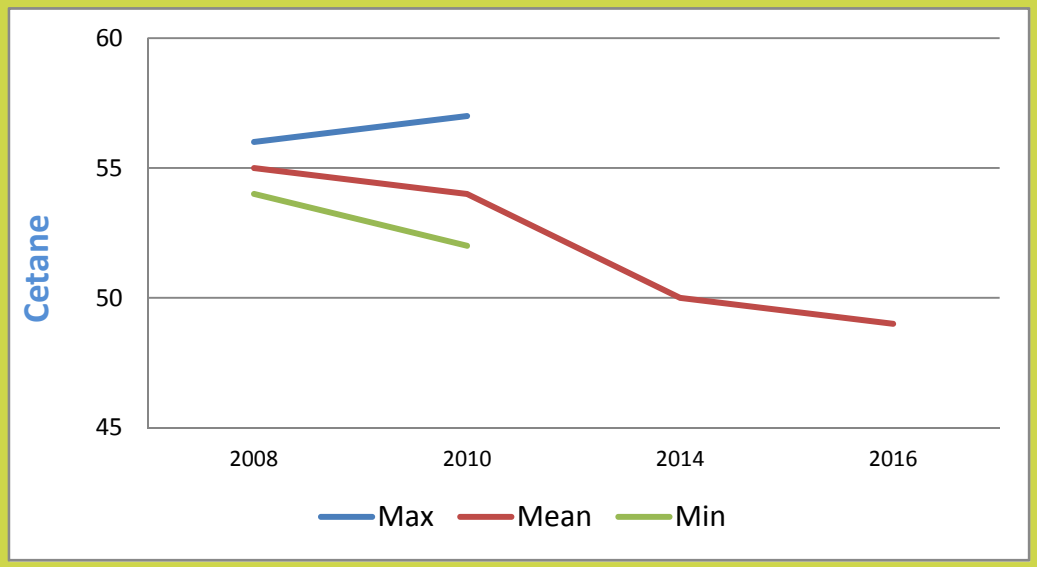
*For ambient temperatures below -20°C, using biodiesel is not recommended. Two grades are allowed on the market.

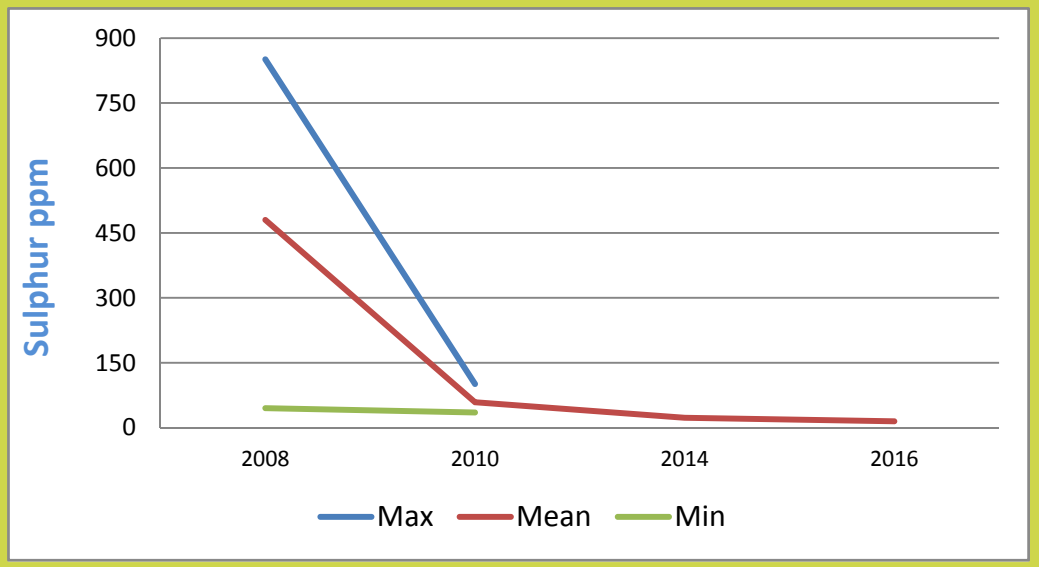
Ukraine

Europe









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Australia

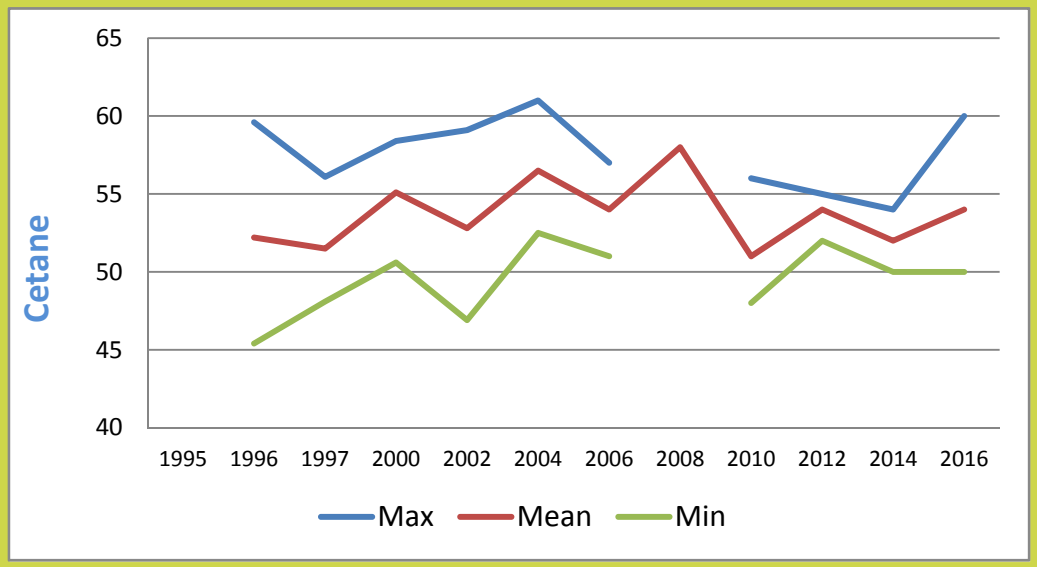
National standards and physical inspection data

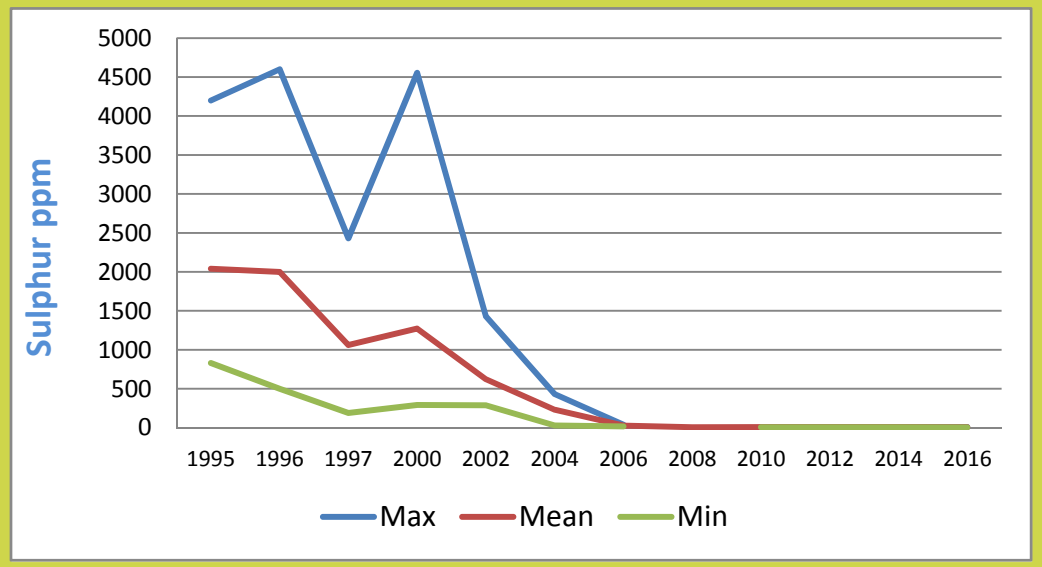
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1504428	DIES 1504429	DIES 1504430	DIES 1504431
Cloud Point, °C		**-1**	**-3**	**-6**	-4	-2	-1	-6
CFPP, °C		**-2**	**-7**	**-16**	-6	-4	-2	-16
Pour Point, °C		**-6**	**-8**	**-12**	-9	-6	-6	-12
HFRR, µm	460 (max)	**407**	**324**	**190**	407	340	359	190
Wax Content @ 10°C Below Cloud, wt%		**4.9**	**4.0**	**2.1**	4.1	4.8	4.9	2.1
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30	>30	>30
Sulphur, ppm	10 (max)	**8**	**6**	**5**	6	5	8	6
Density @15°C, kg/m^3	820 - 850	**842**	**833**	**821**	821	833	842	836
Viscosity @ 40°C, cSt	2.0 - 4.5	**2.89**	**2.80**	**2.64**	2.89	2.79	2.64	2.87
Cetane Index $_{2\ Variable}$		**59**	**54**	**50**	59	53	50	53
Cetane Index $_{4\ Variable}$	46 (min)	**62**	**55**	**50**	62	55	50	53
Cetane Number	51 (min)*	**60**	**54**	**50**	60	52	50	55
Distillation, °C IBP		**178**	**174**	**171**	172	174	178	171
T_{10}		**225**	**218**	**211**	222	225	216	211
T_{20}		**241**	**235**	**230**	241	240	231	230
T_{50}		**278**	**272**	**266**	278	268	266	275
T_{90}		**335**	**328**	**324**	328	324	327	335
T_{95}	360 (max)	**350**	**344**	**339**	344	339	341	350
FBP		**360**	**353**	**348**	354	348	349	360
% FAME	5 (max)	**4**	**1**	**0**	0	0	0	4

*Only for diesel containing biodiesel

Australia

Asia Pacific





Peoples Republic of China

National standards and physical inspection data

Asia Pacific

	National Standard	Maximum Observed	Mean	Minimum Observed	ST16-01941.001	ST16-01941.022	ST16-01941.002	ST16-01941.003	ST16-01941.004	ST16-01941.005	ST16-01941.006
Cloud Point, °C	*	**0**	**-12**	**-37**	-7	-7	-27	-8	-7	0	-6
CFPP, °C		**0**	**-14**	**-41**	-10	-10	-33	-9	-8	-2	-9
Pour Point, °C	*	**-7**	**-21**	**-44**	-21	-20	-38	-16	-16	-7	-17
HFRR, µm	460 (max)	**515**	**426**	**327**	396	388	327	410	400	494	491
Wax Content @ 10°C Below Cloud, wt%		**-**	**-**	**-**	-	-	-	-	-	-	-
Rancimat, hrs		**>30**	**>20**	**7**	>30	22	>30	15	18	29	>30
Sulphur, ppm	350 (max)**	**285**	**64**	**1**	147	141	22	76	193	33	6
Density @ 20°C, kg/m^3	*	**858**	**833**	**805**	838	838	808	850	838	830	836
Viscosity @ 20°C, cSt	*	**5.24**	**4.04**	**2.10**	3.38	3.38	2.10	4.38	4.05	4.56	5.23
Cetane Index $_{2\ Variable}$		**57**	**51**	**42**	54	47	45	47	50	55	54
Cetane Index $_{4\ Variable}$	*	**58**	**50**	**40**	54	46	48	46	48	54	54
Cetane Number	*	**57**	**49**	**40**	45	44	49	46	48	52	53
Distillation, °C IBP		**204**	**171**	**151**	167	164	151	190	164	168	188
T_{10}		**238**	**209**	**174**	226	193	174	223	202	210	226
T_{20}		**249**	**223**	**182**	246	208	182	236	217	227	240
T_{50}		**281**	**259**	**210**	281	251	210	266	262	271	279
T_{90}	300 (max)	**341**	**320**	**269**	335	326	276	322	330	340	341
T_{95}	355 (max)	**355**	**337**	**288**	351	347	291	337	346	355	355
FBP	365 (max)	**364**	**350**	**308**	361	362	308	348	353	364	364
% FAME	1 (max)	**0**	**0**	**0**	0	0	0	0	0	0	0

* Various spec depend on grade, see tables.

** 10ppm max in big cities.

Grade	5°C	0°C	-10°C	-20°C	-35°C	-50°C
Solid Point °C Max.	5	0	-10	-20	-35	-50
CFPP °C Max.	8	4	-5	-14	-29	-44
Cetane Number Min.	49	49	49	46	45	45

Grade	5°C	0°C	-10°C	-20°C	-35°C	-50°C
Cetane Index Min.	46	46	46	46	43	43
Density @20°C, kg/m^3	810-850	810-850	810-850	790-840	790-840	790-840
Viscosity @ 20°C, cSt	3 - 8	3 - 8	2.5 - 8	2.5 - 8	1.8 - 7	1.8 - 7

Peoples Republic of China (continued)

Asia Pacific

National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	ST16-01941.007	ST16-01941.008	ST16-01941.009	ST16-01941.010	ST16-01941.011	ST16-01941.012	ST16-01941.013
Cloud Point, °C	*	**0**	**-12**	**-37**	-4	-27	-29	-35	-11	-37	-7
CFPP, °C		**0**	**-14**	**-41**	0	-32	-34	-41	-12	-40	-9
Pour Point, °C	*	**-7**	**-21**	**-44**	-14	-35	-41	-43	-23	-44	-14
HFRR, µm	460 (max)	**515**	**426**	**327**	508	343	391	413	456	359	420
Wax Content @ 10°C Below Cloud, wt%		**-**	**-**	**-**	-	-	-	-	-	-	-
Rancimat, hrs		**>30**	**>20**	**7**	>30	>30	>30	>30	16	>30	>30
Sulphur, ppm	350 (max)**	**285**	**64**	**1**	6.0	15	285	23	26	98	5
Density @ 20°C, kg/m^3	*	**858**	**833**	**805**	829	805	810	815	835	816	835
Viscosity @ 20°C, cSt	*	**5.24**	**4.04**	**2.10**	5.02	2.17	2.15	2.62	4.32	2.33	5.19
Cetane Index $_{2\ Variable}$		**57**	**51**	**42**	57	48	46	48	53	47	55
Cetane Index $_{4\ Variable}$	*	**58**	**50**	**40**	58	48	46	48	51	46	54
Cetane Number	*	**57**	**49**	**40**	56	50	46	47	52	46	52
Distillation, °C IBP		**204**	**171**	**151**	167	151	156	160	176	163	182
T_{10}		**238**	**209**	**174**	226	176	181	185	210	187	223
T_{20}		**249**	**223**	**182**	246	183	188	195	226	196	239
T_{50}		**281**	**259**	**210**	281	214	215	225	268	222	279
T_{90}	300 (max)	**341**	**320**	**269**	335	278	269	285	327	271	339
T_{95}	355 (max)	**355**	**337**	**288**	351	293	288	312	340	297	354
FBP	365 (max)	**364**	**350**	**308**	361	309	311	336	351	326	363
% FAME	1 (max)	**0**	**0**	**0**	0	0	0	0	0	0	0

* Various spec depend on grade, see tables.

** 10ppm max in big cities.

Grade	5°C	0°C	-10°C	-20°C	-35°C	-50°C
Solid Point °C Max.	5	0	-10	-20	-35	-50
CFPP °C Max.	8	4	-5	-14	-29	-44
Cetane Number Min.	49	49	49	46	45	45

Grade	5°C	0°C	-10°C	-20°C	-35°C	-50°C
Cetane Index Min.	46	46	46	46	43	43
Density @20°C, kg/m^3	810-850	810-850	810-850	790-840	790-840	790-840
Viscosity @ 20°C, cSt	3 - 8	3 - 8	2.5 - 8	2.5 - 8	1.8 - 7	1.8 - 7

Peoples Republic of China (continued)

Asia Pacific

National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	ST16-01941.014	ST16-01941.015	ST16-01941.016	ST16-01941.017	ST16-01941.018	ST16-01941.019	ST16-01941.020
Cloud Point, °C	*	**0**	**-12**	**-37**	-4	-3	-2	-11	-4	-34	-4
CFPP, °C		**0**	**-14**	**-41**	-6	-6	-3	-13	-9	-32	-6
Pour Point, °C	*	**-7**	**-21**	**-44**	-11	-11	-10	-32	-12	-41	-11
HFRR, µm	460 (max)	**515**	**426**	**327**	425	425	343	420	413	417	392
Wax Content @ 10°C Below Cloud, wt%		**-**	**-**	**-**	-	-	-	-	-	-	-
Rancimat, hrs		**>30**	**>20**	**7**	18	>30	24	7	17	16	11
Sulphur, ppm	350 (max)**	**285**	**64**	**1**	15	9	205	136	7	1	28
Density @ 20°C, kg/m^3	*	**858**	**833**	**805**	836	833	853	858	831	813	844
Viscosity @ 20°C, cSt	*	**5.24**	**4.04**	**2.10**	4.81	5.24	4.94	3.72	5.02	3.18	5.10
Cetane Index $_{2\ Variable}$		**57**	**51**	**42**	54	55	48	42	56	54	51
Cetane Index $_{4\ Variable}$	*	**58**	**50**	**40**	54	57	46	40	57	53	51
Cetane Number	*	**57**	**49**	**40**	52	57	46	40	56	54	51
Distillation, °C IBP		**204**	**171**	**151**	181	204	160	158	176	171	162
T_{10}		**238**	**209**	**174**	228	236	218	194	229	198	226
T_{20}		**249**	**223**	**182**	242	247	236	211	246	208	244
T_{50}		**281**	**259**	**210**	276	279	276	254	279	241	277
T_{90}	300 (max)	**341**	**320**	**269**	333	335	336	328	333	304	333
T_{95}	355 (max)	**355**	**337**	**288**	349	350	349	348	348	328	349
FBP	365 (max)	**364**	**350**	**308**	361	360	358	362	360	344	358
% FAME	1 (max)	**0**	**0**	**0**	0	0	0	0	0	0	0

* Various spec depend on grade, see tables.

** 10ppm max in big cities.

Grade	5°C	0°C	-10°C	-20°C	-35°C	-50°C
Solid Point °C Max.	5	0	-10	-20	-35	-50
CFPP °C Max.	8	4	-5	-14	-29	-44
Cetane Number Min.	49	49	49	46	45	45

Grade	5°C	0°C	-10°C	-20°C	-35°C	-50°C
Cetane Index Min.	46	46	46	46	43	43
Density @20°C, kg/m^3	810-850	810-850	810-850	790-840	790-840	790-840
Viscosity @ 20°C, cSt	3 - 8	3 - 8	2.5 - 8	2.5 - 8	1.8 - 7	1.8 - 7

Peoples Republic of China (continued)

National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	ST16-01941.021	ST16-02562.001	ST16-02562.002	ST16-02562.003	ST16-02562.004
Cloud Point, °C	*	**0**	**-12**	**-37**	-7	-9	-7	-4	-
CFPP, °C		**0**	**-14**	**-41**	-11	-11	-11	-9	-9
Pour Point, °C	*	**-7**	**-21**	**-44**	-14	-19	-13	-18	-17
HFRR, µm	460 (max)	**515**	**426**	**327**	417	505	489	515	507
Wax Content @ 10°C Below Cloud, wt%		**-**	**-**	**-**	-	-	-	-	-
Rancimat, hrs		**>30**	**>20**	**7**	9	15	13	16	19
Sulphur, ppm	350 (max)**	**285**	**64**	**1**	28	5	21	18	126
Density @ 20°C, kg/m^3	*	**858**	**833**	**805**	840	829	833	847	851
Viscosity @ 20°C, cSt	*	**5.24**	**4.04**	**2.10**	4.94	3.81	4.53	4.23	4.69
Cetane Index $_{2\ Variable}$		**57**	**51**	**42**	52	52	54	47	48
Cetane Index $_{4\ Variable}$	*	**58**	**50**	**40**	52	51	53	45	46
Cetane Number	*	**57**	**49**	**40**	51	51	53	44	45
Distillation, °C IBP		**204**	**171**	**151**	202	169	172	162	170
T_{10}		**238**	**209**	**174**	238	196	223	197	214
T_{20}		**249**	**223**	**182**	249	211	237	216	232
T_{50}		**281**	**259**	**210**	273	258	270	260	272
T_{90}	300 (max)	**341**	**320**	**269**	319	328	325	333	333
T_{95}	355 (max)	**355**	**337**	**288**	337	345	341	351	349
FBP	365 (max)	**364**	**350**	**308**	355	355	354	360	360
% FAME	1 (max)	**0**	**0**	**0**	0	0	0	0	0

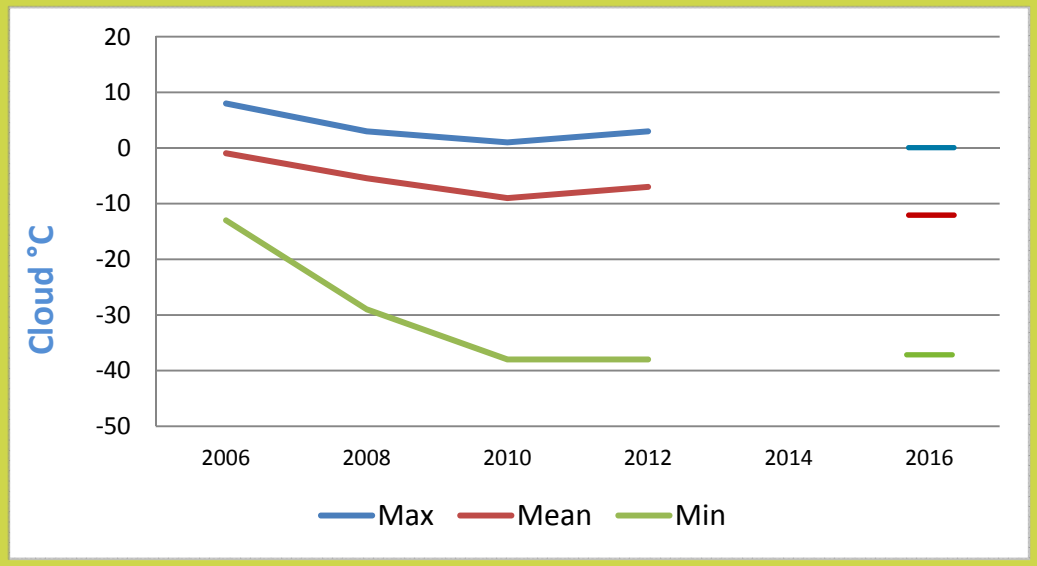
* Various spec depend on grade, see tables.

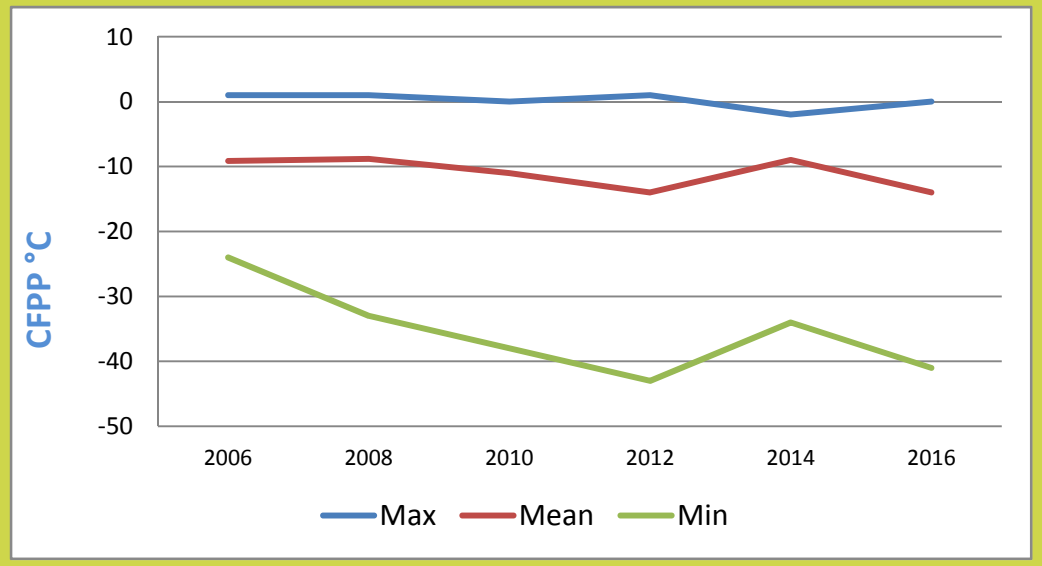
** 10ppm max in big cities.

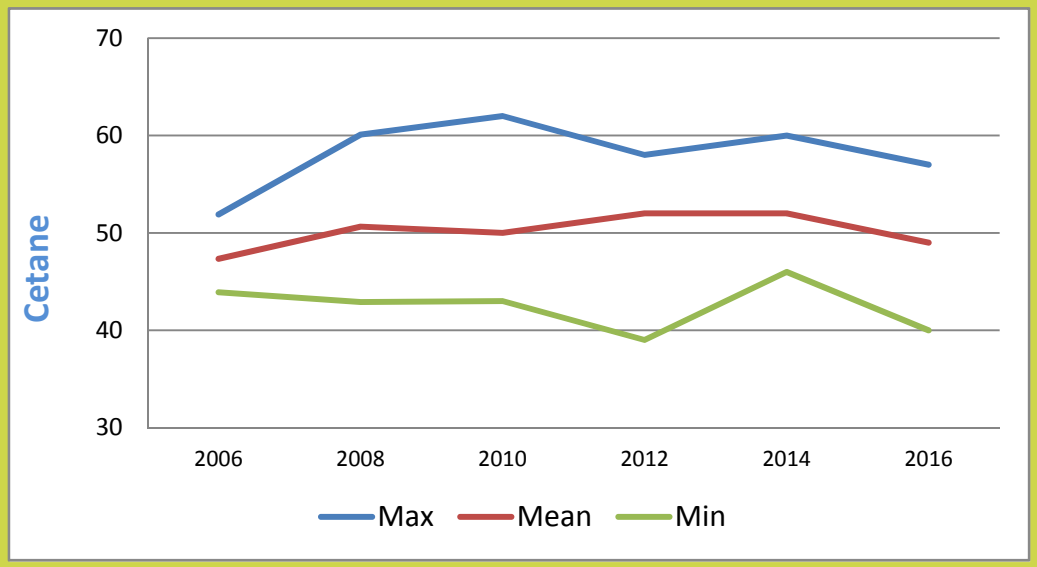
Grade	5°C	0°C	-10°C	-20°C	-35°C	-50°C
Solid Point °C Max.	5	0	-10	-20	-35	-50
CFPP °C Max.	8	4	-5	-14	-29	-44
Cetane Number Min.	49	49	49	46	45	45

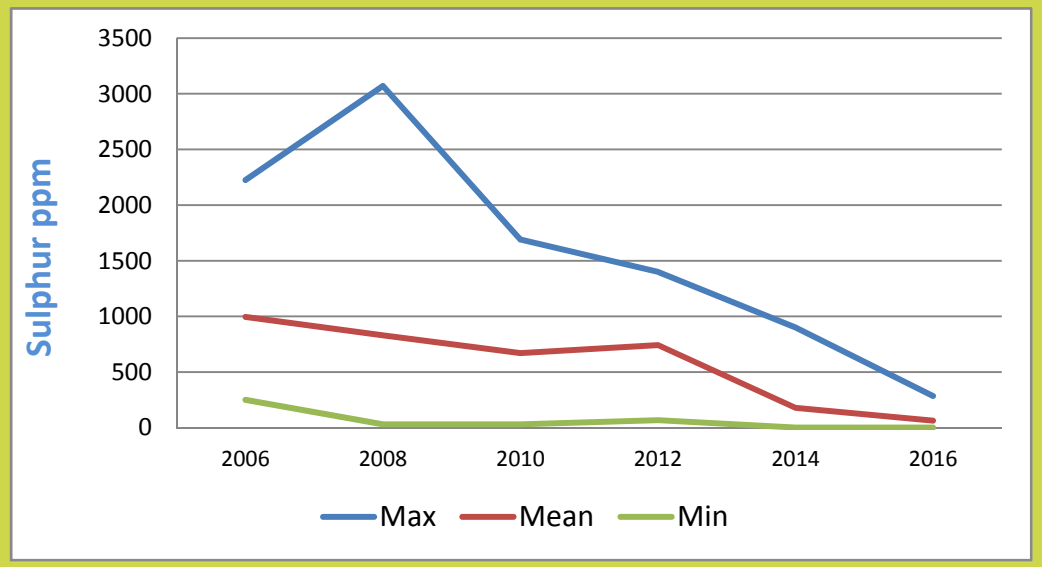
Grade	5°C	0°C	-10°C	-20°C	-35°C	-50°C
Cetane Index Min.	46	46	46	46	43	43
Density @20°C, kg/m^3	810-850	810-850	810-850	790-840	790-840	790-840
Viscosity @ 20°C, cSt	3 - 8	3 - 8	2.5 - 8	2.5 - 8	1.8 - 7	1.8 - 7

Peoples Republic of China









India

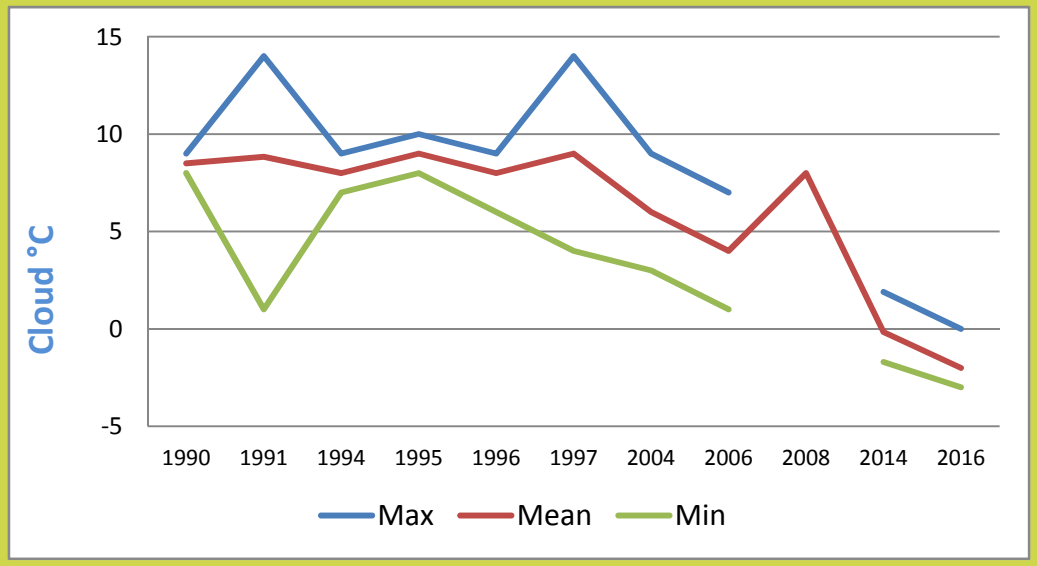
National standards and physical inspection data

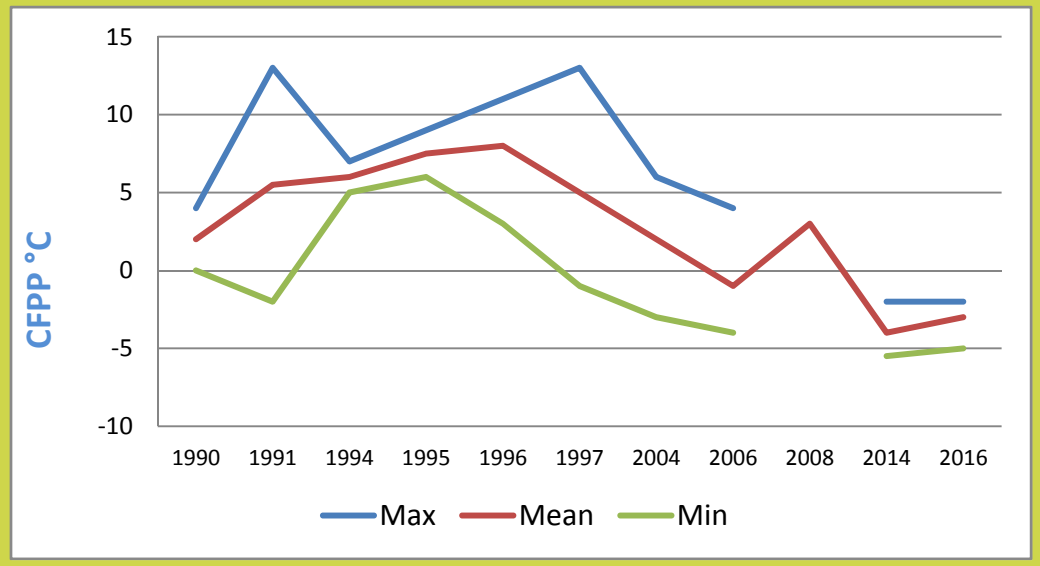
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600483	DIES 1600484	DIES 1600485
Cloud Point, °C		**0**	**-2**	**-3**	-3	-2	0
CFPP, °C	6 (max)	**-2**	**-3**	**-5**	-5	-4	-2
Pour Point, °C	3 (max)	**-3**	**-6**	**-9**	-9	-6	-3
HFRR, µm	460 (max)	**477**	**459**	**444**	444	477	457
Wax Content @ 10°C Below Cloud, wt%		**2.2**	**2.0**	**1.7**	2.2	1.7	2.2
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30	>30
Sulphur, ppm	350 (max)*	**261**	**105**	**22**	22	261	33
Density @15°C, kg/m^3	820 - 845	**836**	**830**	**823**	823	836	832
Viscosity @ 40°C, cSt	2.0 - 4.5	**2.63**	**2.41**	**2.29**	2.29	2.31	2.63
Cetane Index $_{2\ Variable}$		**55**	**53**	**50**	55	50	54
Cetane Index $_{4\ Variable}$	46 (min)	**54**	**51**	**48**	54	48	52
Cetane Number	51 (min)	**58**	**56**	**55**	58	56	55
Distillation, °C IBP		**141**	**135**	**130**	130	141	133
T_{10}		**184**	**180**	**178**	179	178	184
T_{20}		**217**	**207**	**199**	205	199	217
T_{50}		**270**	**262**	**257**	259	257	270
T_{90}		**341**	**337**	**331**	331	339	341
T_{95}	360 (max)	**361**	**356**	**350**	350	358	361
FBP		**370**	**365**	**361**	361	365	370
% FAME	5 (max)	**0**	**0**	**0**	0	0	0

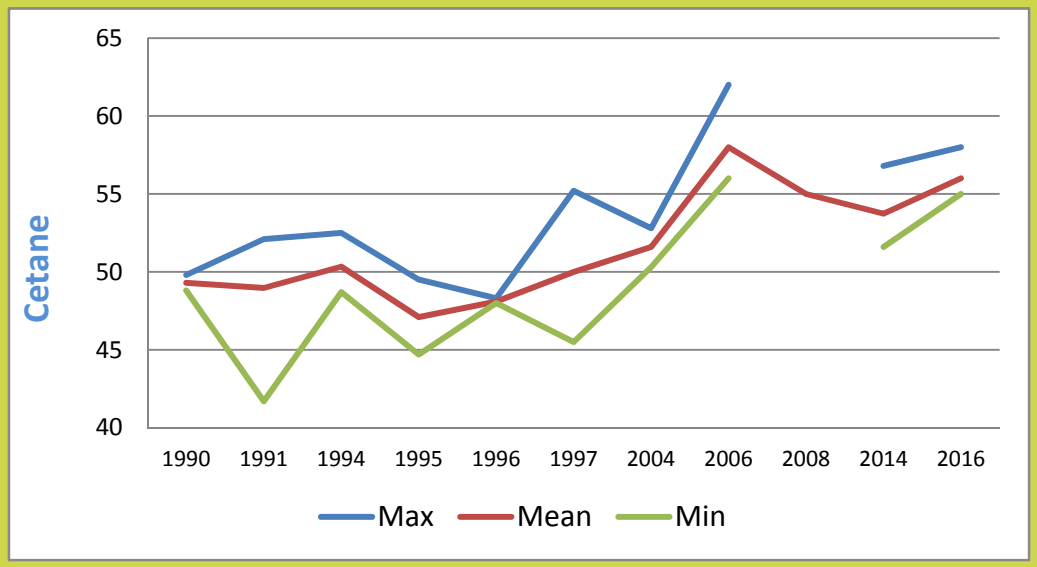
Specification shown for Bharat IV grade fuels.
* 50ppm max in big cities.

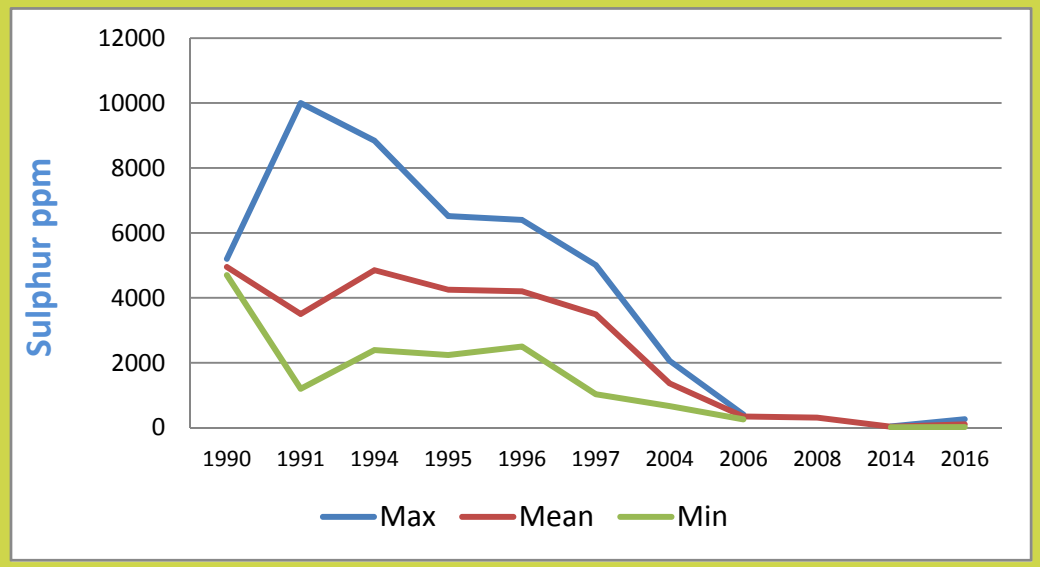
India

Asia Pacific









Indonesia

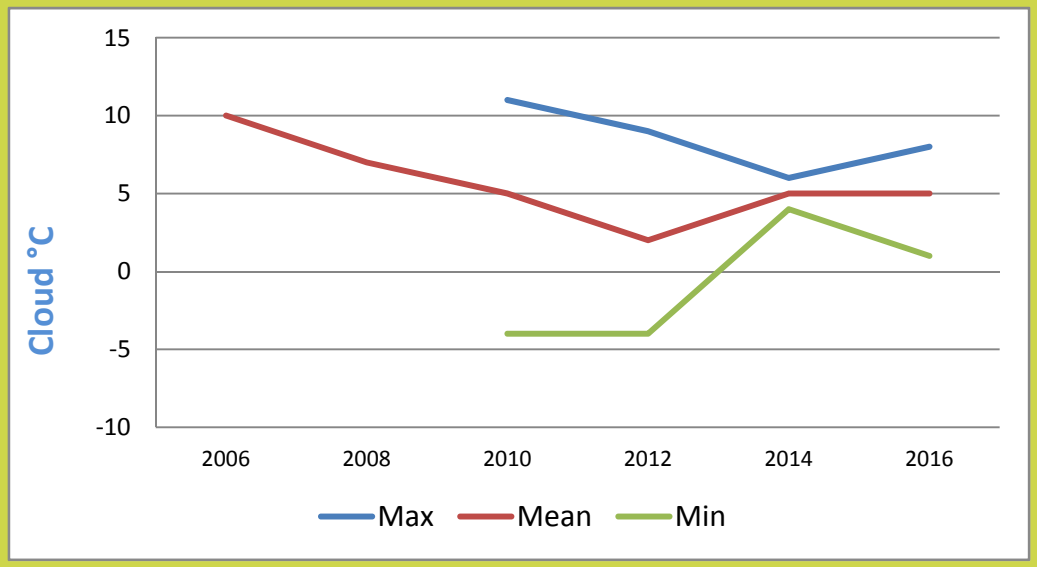
National standards and physical inspection data

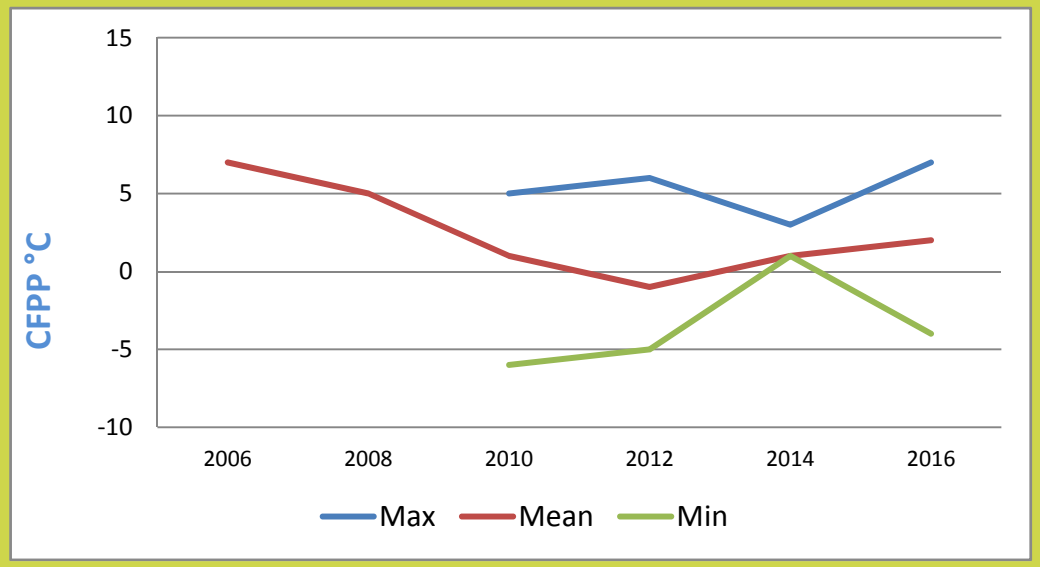
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600486	DIES 1600487	DIES 1600488
Cloud Point, °C		**8**	**5**	**1**	8	1	7
CFPP, °C		**7**	**2**	**-4**	4	-4	7
Pour Point, °C	18 (max)	**3**	**-1**	**-6**	0	-6	3
HFRR, µm		**251**	**224**	**207**	251	207	214
Wax Content @ 10°C Below Cloud, wt%		**2.3**	**1.9**	**1.3**	2.3	1.3	2.1
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30	>30
Sulphur, ppm	3500 (max)	**2690**	**1973**	**558**	558	2690	2670
Density @15°C, kg/m^3	810 – 860	**854**	**853**	**853**	853	854	853
Viscosity @ 40°C, cSt	2.0 – 4.5	**3.61**	**3.31**	**3.14**	3.14	3.19	3.61
Cetane Index $_{2\ Variable}$		**52**	**51**	**51**	51	51	52
Cetane Index $_{4\ Variable}$	45 (min)	**51**	**49**	**48**	49	48	51
Cetane Number	48 (min)	**56**	**53**	**52**	56	52	52
Distillation, °C IBP		**164**	**160**	**156**	156	159	164
T_{10}		**220**	**213**	**209**	210	209	220
T_{20}		**247**	**240**	**235**	238	235	247
T_{50}		**299**	**294**	**291**	291	292	299
T_{90}	370 (max)	**357**	**349**	**344**	344	348	357
T_{95}		**370**	**365**	**362**	362	363	370
FBP		**377**	**373**	**368**	368	374	377
% FAME	10 (min)	**21**	**15**	**8**	21	14	8

Specification shown for PSO graded fuels

Indonesia

Asia Pacific





Japan – Grade 2

National standards and physical inspection data

Asia Pacific

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1602416	DIES 1602417	DIES 1602418	DIES 1602419	DIES 1602420	DIES 1602422	DIES 1602423
Cloud Point, °C		**-2**	**-6**	**-13**	-6	-5	-9	-6	-6	-6	-3
CFPP, °C	-5 (max)	**-5**	**-12**	**-19**	-17	-14	-19	-11	-14	-16	-14
Pour Point, °C	-7.5 (max)*	**-10**	**-20**	**-30**	-22.5	-25	-22.5	-22.5	-20	-22.5	-25
HFRR, µm		**476**	**375**	**257**	257	362	408	322	362	277	331
Wax Content @ -10°C, wt%		**2.1**	**1.0**	**0.0**	0.7	1.2	0.0	0.8	0.8	0.8	1.2
Rancimat, hrs		**-**	**-**	**-**	-	-	-	-	-	-	-
Sulphur, ppm	10 (max)	**9**	**7**	**5**	9	8	7	7	5	8	7
Density @15°C, kg/m^3	860 (max)	**843**	**832**	**825**	838	829	826	832	827	833	826
Viscosity @ 30°C, cSt	2.5 (min)	**4.19**	**3.70**	**2.71**	4.19	3.55	2.71	3.37	3.65	3.71	3.54
Cetane Index $_{2\ Variable}$		**59**	**56**	**52**	55	57	52	55	57	55	57
Cetane Index $_{4\ Variable}$	45 (min)	**60**	**56**	**52**	56	57	52	54	58	55	58
Cetane Number	45 (min)	**56**	**52**	**50**	51	53	50	51	54	52	54
Distillation, °C IBP		**-**	**-**	**-**	-	-	-	-	-	-	-
T_{10}		**239**	**218**	**186**	226	210	186	207	216	209	210
T_{20}		**252**	**239**	**205**	250	234	205	228	236	234	232
T_{50}		**287**	**278**	**254**	287	280	254	273	278	279	275
T_{90}	350 (max)	**339**	**330**	**315**	336	333	323	333	333	333	338
T_{95}		**357**	**344**	**326**	350	347	345	348	348	347	357
FBP		**372**	**358**	**338**	363	359	362	363	362	361	372
% FAME		**0**	**0**	**0**	0	0	0	0	0	0	0

*Pour point measured at 2.5°C intervals (Japanese Industry Standard).

Japan – Grade 2 (continued)

National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1602425	DIES 1602426	DIES 1602427	DIES 1602428	DIES 1602429	DIES 1602430	DIES 1602431
Cloud Point, °C		**-2**	**-6**	**-13**	-5	-2	-3	-4	-3	-7	-3
CFPP, °C	-5 (max)	**-5**	**-12**	**-19**	-10	-10	-11	-10	-14	-17	-13
Pour Point, °C	-7.5 (max)*	**-10**	**-20**	**-30**	-10	-10	-10	-30	-30	-20	-20
HFRR, µm		**476**	**375**	**257**	458	419	432	453	407	408	366
Wax Content @ -10°C, wt%		**2.1**	**1.0**	**0.0**	2.0	2.1	1.5	1.9	1.8	0.4	1.4
Rancimat, hrs		**-**	**-**	**-**	-	-	-	-	-	-	-
Sulphur, ppm	10 (max)	**9**	**7**	**5**	6	7	6	7	7	7	7
Density @15°C, kg/m^3	860 (max)	**843**	**832**	**825**	834	831	834	826	825	833	837
Viscosity @ 30°C, cSt	2.5 (min)	**4.19**	**3.70**	**2.71**	3.88	3.80	3.80	3.70	3.64	3.37	3.53
Cetane Index $_{2\ Variable}$		**59**	**56**	**52**	56	57	56	59	59	54	54
Cetane Index $_{4\ Variable}$	45 (min)	**60**	**56**	**52**	57	57	57	59	60	53	55
Cetane Number	45 (min)	**56**	**52**	**50**	53	53	52	55	55	51	52
Distillation, °C IBP		**-**	**-**	**-**	-	-	-	-	-	-	-
T_{10}		**239**	**218**	**186**	225	211	221	206	202	202	217
T_{20}		**252**	**239**	**205**	249	238	245	235	231	225	240
T_{50}		**287**	**278**	**254**	285	285	282	283	284	272	282
T_{90}	350 (max)	**339**	**330**	**315**	336	335	333	335	339	330	338
T_{95}		**357**	**344**	**326**	350	348	346	349	353	345	353
FBP		**372**	**358**	**338**	363	359	359	362	364	361	365
% FAME		**0**	**0**	**0**	0	0	0	0	0	0	0

*Pour point measured at 2.5°C intervals (Japanese Industry Standard).

Japan – Grade 2 (continued)

National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1602432	DIES 1602433	DIES 1602434	DIES 1602435	DIES 1602436	DIES 1602437	DIES 1602438
Cloud Point, °C		**-2**	**-6**	**-13**	-12	-12	-13	-13	-4	-4	-4
CFPP, °C	-5 (max)	**-5**	**-12**	**-19**	-11	-12	-12	-12	-13	-8	-8
Pour Point, °C	-7.5 (max)*	**-10**	**-20**	**-30**	-20	-12.5	-25	-22.5	-22.5	-17.5	-12.5
HFRR, µm		**476**	**375**	**257**	410	259	390	346	453	330	325
Wax Content @ -10°C, wt%		**2.1**	**1.0**	**0.0**	0.0	0.0	0.0	0.0	1.3	1.7	1.7
Rancimat, hrs		**-**	**-**	**-**	-	-	-	-	-	-	-
Sulphur, ppm	10 (max)	**9**	**7**	**5**	9	9	7	6	7	6	7
Density @15°C, kg/m^3	860 (max)	**843**	**832**	**825**	839	835	836	838	826	843	833
Viscosity @ 30°C, cSt	2.5 (min)	**4.19**	**3.70**	**2.71**	3.91	3.81	3.94	3.62	3.70	4.11	3.97
Cetane Index $_{2\ Variable}$		**59**	**56**	**52**	53	54	53	52	59	53	56
Cetane Index $_{4\ Variable}$	45 (min)	**60**	**56**	**52**	55	57	54	54	60	53	58
Cetane Number	45 (min)	**56**	**52**	**50**	51	52	50	50	56	50	54
Distillation, °C IBP		**-**	**-**	**-**	-	-	-	-	-	-	-
T_{10}		**239**	**218**	**186**	237	239	228	233	212	225	227
T_{20}		**252**	**239**	**205**	251	252	243	247	239	246	249
T_{50}		**287**	**278**	**254**	278	277	271	272	283	284	284
T_{90}	350 (max)	**339**	**330**	**315**	319	316	316	316	335	337	335
T_{95}		**357**	**344**	**326**	330	328	328	326	350	352	350
FBP		**372**	**358**	**338**	343	342	341	338	363	367	364
% FAME		**0**	**0**	**0**	0	0	0	0	0	0	0

*Pour point measured at 2.5°C intervals (Japanese Industry Standard).

Japan – Grade 2 (continued)

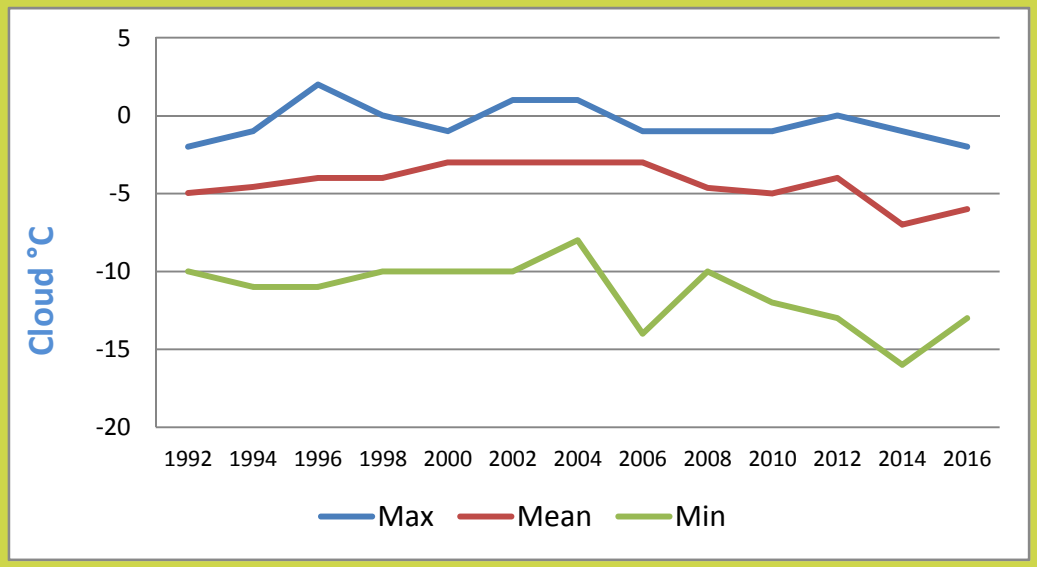
National standards and physical inspection data

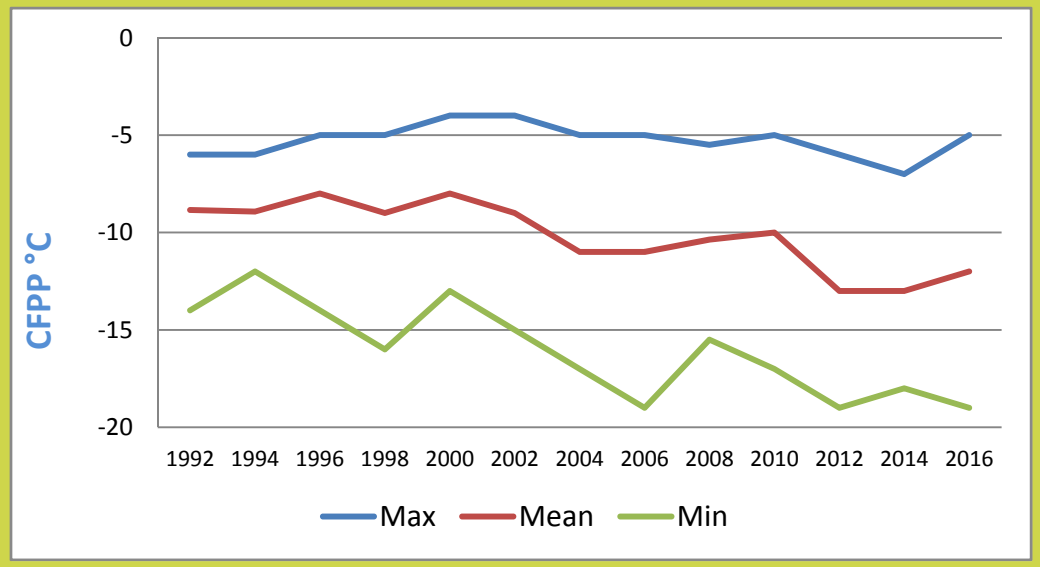
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1602439	DIES 1602440
Cloud Point, °C		**-2**	**-6**	**-13**	-4	-11
CFPP, °C	-5 (max)	**-5**	**-12**	**-19**	-5	-10
Pour Point, °C	-7.5 (max)*	**-10**	**-20**	**-30**	-20	-12.5
HFRR, µm		**476**	**375**	**257**	379	476
Wax Content @ -10°C, wt%		**2.1**	**1.0**	**0.0**	1.8	0.0
Rancimat, hrs		**-**	**-**	**-**	-	-
Sulphur, ppm	10 (max)	**9**	**7**	**5**	6	7
Density @15°C, kg/m^3	860 (max)	**843**	**832**	**825**	833	825
Viscosity @ 30°C, cSt	2.5 (min)	**4.19**	**3.70**	**2.71**	3.98	3.61
Cetane Index $_{2\ Variable}$		**59**	**56**	**52**	56	56
Cetane Index $_{4\ Variable}$	45 (min)	**60**	**56**	**52**	58	60
Cetane Number	45 (min)	**56**	**52**	**50**	54	55
Distillation, °C IBP		**-**	**-**	**-**	-	-
T_{10}		**239**	**218**	**186**	223	236
T_{20}		**252**	**239**	**205**	247	248
T_{50}		**287**	**278**	**254**	285	270
T_{90}	350 (max)	**339**	**330**	**315**	336	315
T_{95}		**357**	**344**	**326**	349	327
FBP		**372**	**358**	**338**	363	339
% FAME		**0**	**0**	**0**	0	0

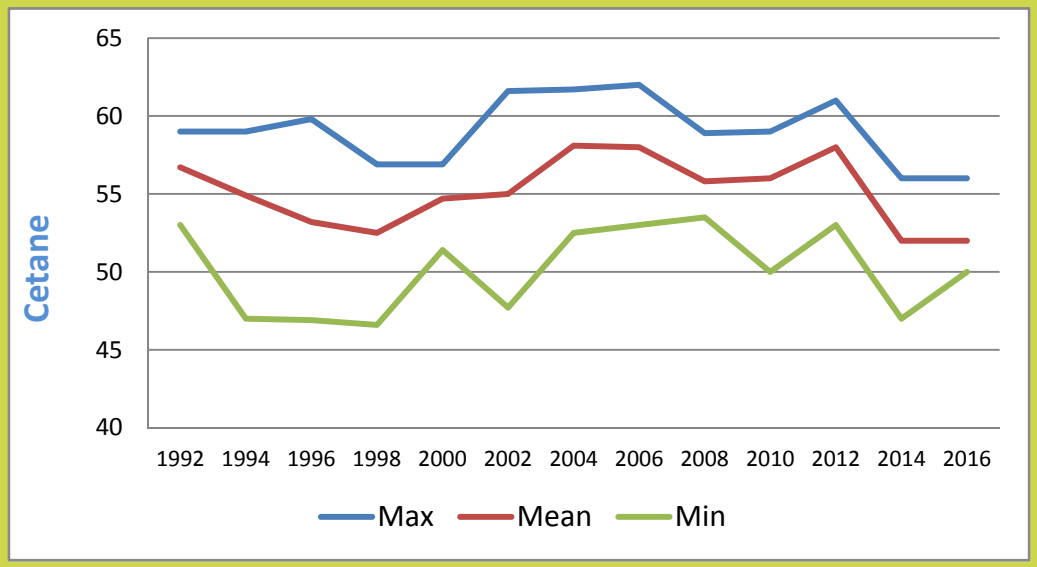
*Pour point measured at 2.5°C intervals (Japanese Industry Standard).

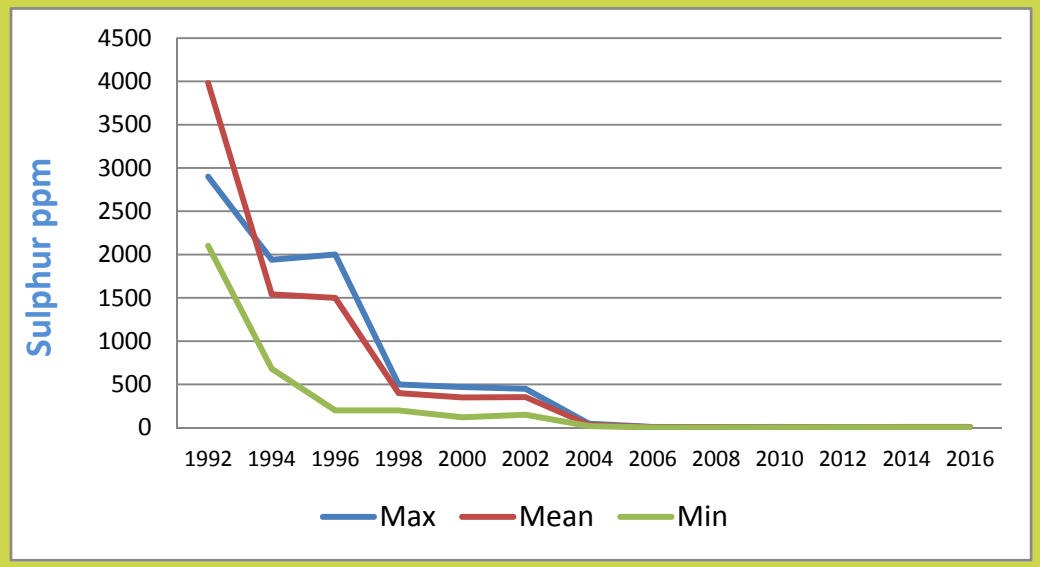
Japan – Grade 2

Asia Pacific









Japan – Grade 3

National standards and physical inspection data

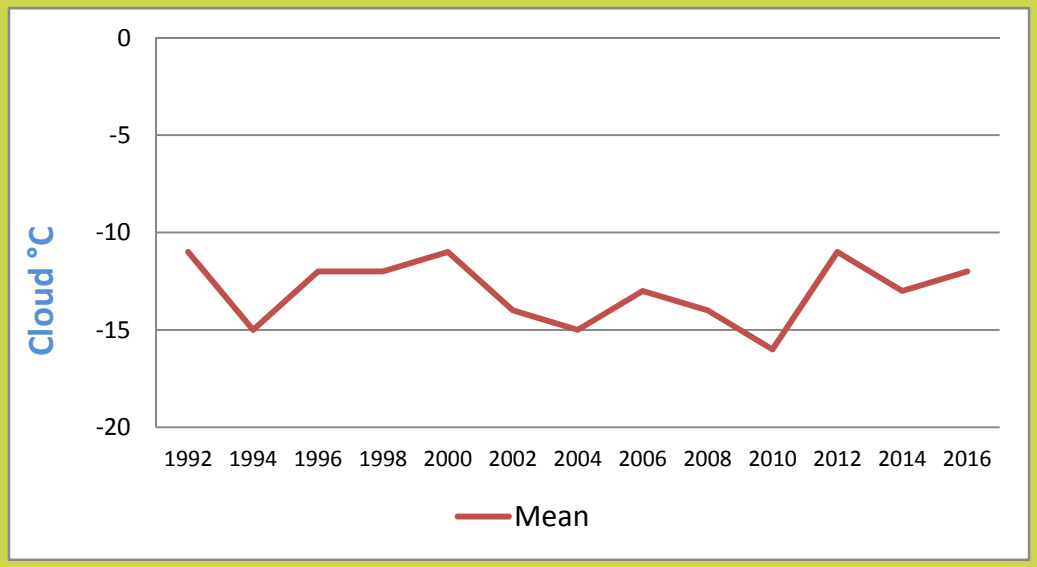
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1602414
Cloud Point, °C			**-12**		-12
CFPP, °C	-12 (max)		**-16**		-16
Pour Point, °C	-20 (max)*		**-25**		-25
HFRR, µm			**505**		505
Wax Content @ -20°C, wt%			**1.5**		1.5
Rancimat, hrs			**-**		-
Sulphur, ppm	10 (max)		**7**		7
Density @15°C, kg/m^3	860 (max)		**816**		816
Viscosity @ 30°C, cSt	2.0 (min)		**2.58**		2.58
Cetane Index $_{2 \text{ Variable}}$			**56**		56
Cetane Index $_{4 \text{ Variable}}$	45 (min)		**56**		56
Cetane Number	45 (min)		**52**		52
Distillation, °C IBP			**-**		-
T_{10}			**186**		186
T_{20}			**203**		203
T_{50}			**252**		252
T_{90}	330 (max)**		**318**		318
T_{95}			**333**		333
FBP			**347**		347
% FAME			**0**		0

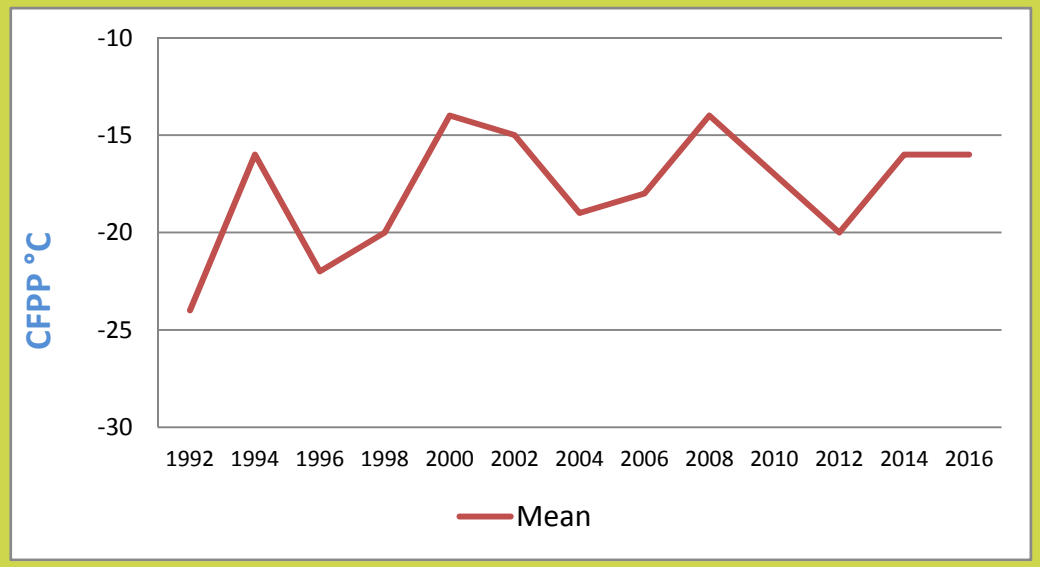
*Pour point measured at 2.5°C intervals (Japanese Industry Standard)

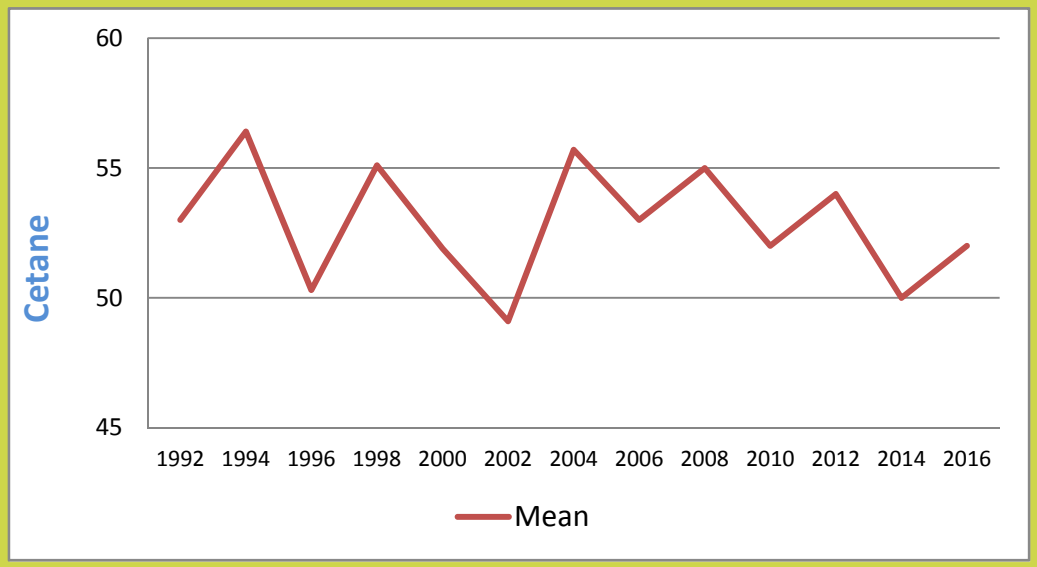
** T90 should be 350°C max if viscosity is 4.7cSt min.

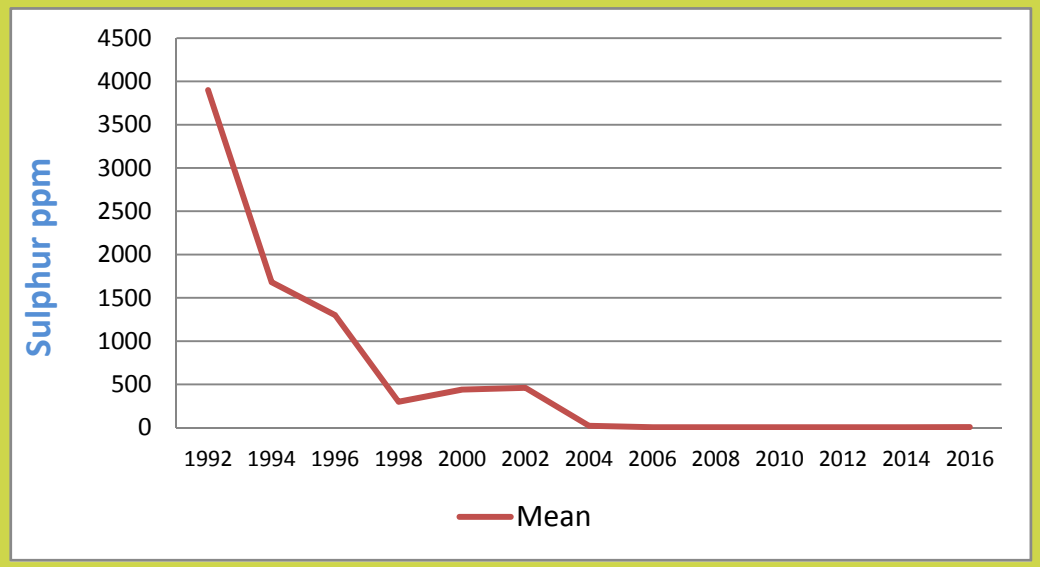
Japan – Grade 3

Asia Pacific









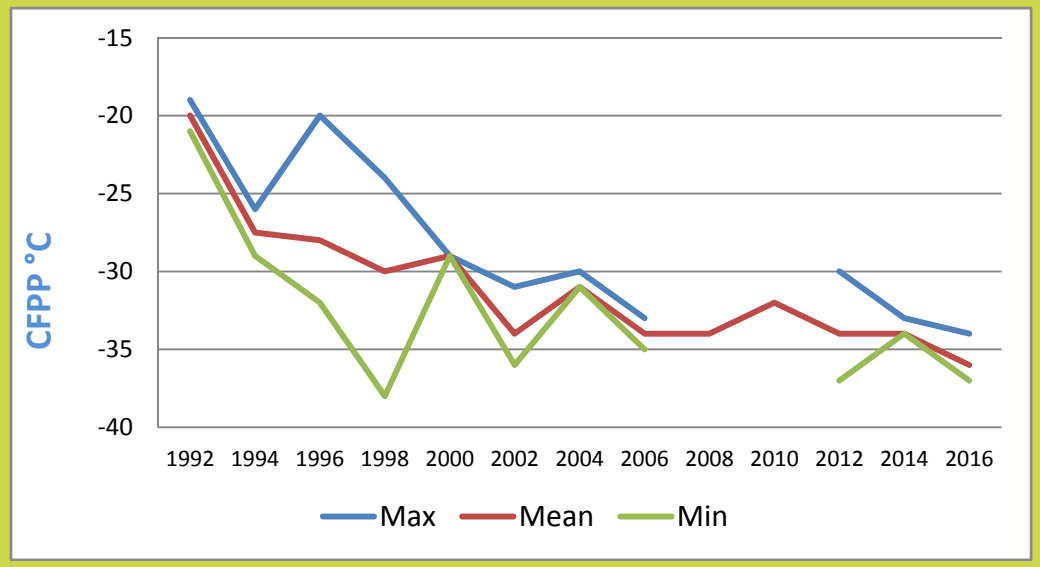
Japan – Special Grade 3

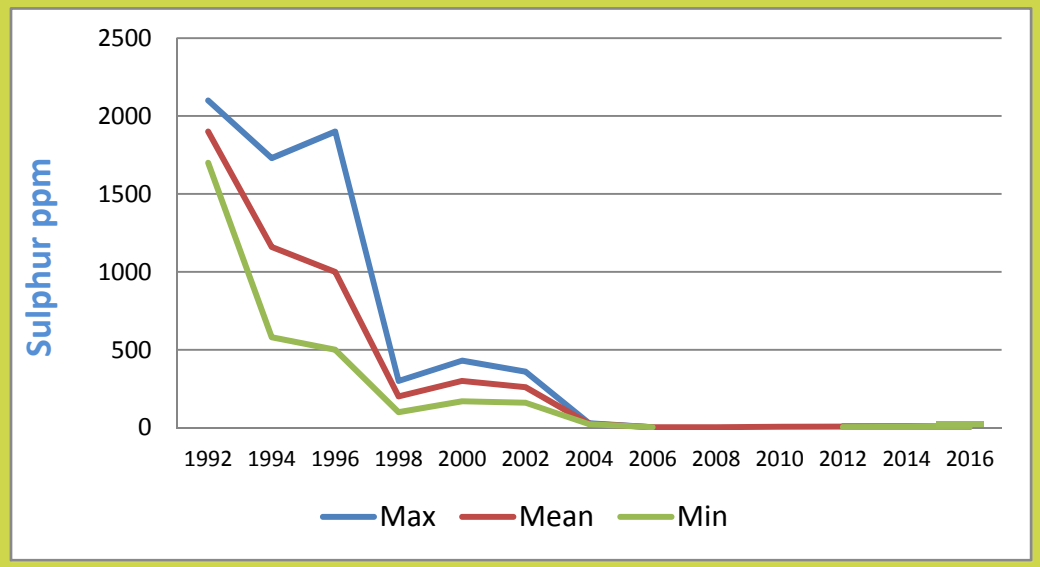
National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1602413	DIES 1602424
Cloud Point, °C		**-17**	**-18**	**-19**	-19	-17
CFPP, °C	-19 (max)	**-34**	**-36**	**-37**	-34	-37
Pour Point, °C	-30 (max)*	**-40**	**-40**	**-40**	-40	-40
HFRR, µm		**517**	**484**	**451**	517	451
Wax Content @ -30°C, wt%		**1.0**	**0.9**	**0.8**	0.8	1.0
Rancimat, hrs		**-**	**-**	**-**	-	-
Sulphur, ppm	10 (max)	**6**	**6**	**5**	6	5
Density @15°C, kg/m^3	860 (max)	**816**	**813**	**810**	810	816
Viscosity @ 30°C, cSt	1.7 (min)	**2.45**	**2.19**	**1.93**	1.93	2.45
Cetane Index $_{2\ Variable}$		**53**	**50**	**47**	47	53
Cetane Index $_{4\ Variable}$	45 (min)	**52**	**50**	**49**	49	52
Cetane Number	45 (min)	**49**	**48**	**47**	47	49
Distillation, °C IBP		**-**	**-**	**-**	-	-
T_{10}		**174**	**174**	**174**	174	174
T_{20}		**189**	**186**	**184**	184	189
T_{50}		**243**	**230**	**218**	218	243
T_{90}	330 (max)	**329**	**315**	**300**	300	329
T_{95}		**346**	**335**	**324**	324	346
FBP		**363**	**355**	**347**	347	363
% FAME		**0**	**0**	**0**	0	0

*Pour point measured at 2.5°C intervals (Japanese Industry Standard).

Japan – Special Grade 3





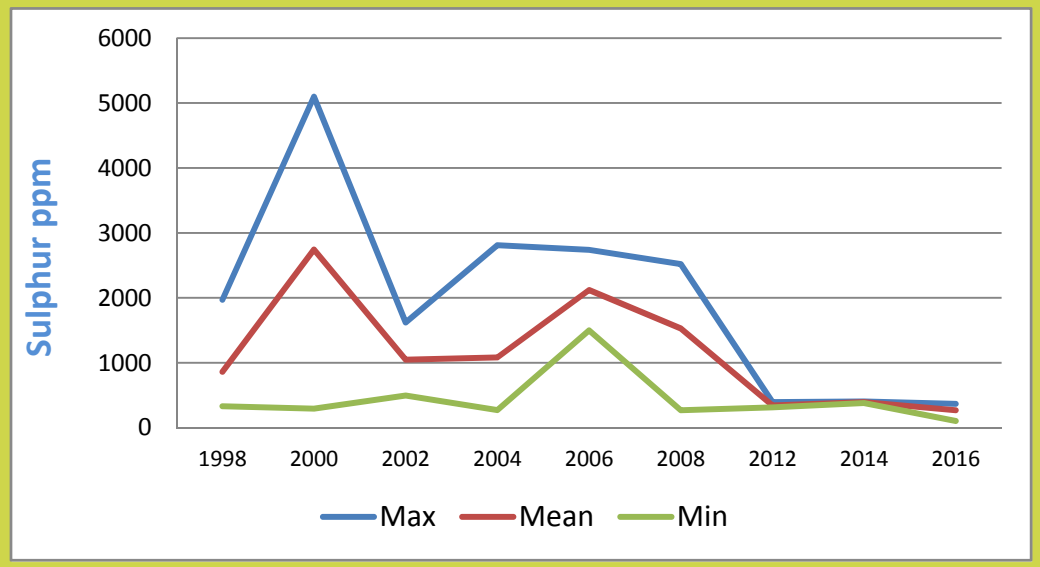
Malaysia

National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600544	DIES 1600546	DIES 1600547
Cloud Point, °C	19 (max)	**12**	**10**	**6**	12	6	11
CFPP, °C		**12**	**7**	**4**	12	4	7
Pour Point, °C		**9**	**5**	**0**	6	0	9
HFRR, µm	460 (max)	**245**	**221**	**207**	245	210	207
Wax Content @ 10°C Below Cloud, wt%		**4.7**	**4.0**	**3.5**	4.7	3.5	3.8
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30	>30
Sulphur, ppm	500 (max)	**367**	**269**	**104**	367	335	104
Density @15°C, kg/m^3	810 - 870	**850**	**845**	**837**	837	850	849
Viscosity @ 40°C, cSt	1.5 - 5.8	**3.77**	**3.45**	**3.23**	3.23	3.77	3.35
Cetane Index $_{2\ Variable}$		**55**	**52**	**51**	55	52	51
Cetane Index $_{4\ Variable}$	49 (min)	**55**	**53**	**50**	55	53	50
Cetane Number	49 (min)	**62**	**60**	**58**	62	58	60
Distillation, °C IBP		**176**	**172**	**169**	169	176	169
T_{10}		**243**	**227**	**218**	218	243	219
T_{20}		**261**	**247**	**239**	239	261	241
T_{50}		**291**	**285**	**282**	282	291	283
T_{90}		**347**	**345**	**344**	347	344	345
T_{95}	370 (max)	**364**	**361**	**357**	364	357	362
FBP		**372**	**369**	**365**	372	365	370
% FAME	7 (max)	**7**	**7**	**7**	7	7	7

Malaysia

Asia Pacific



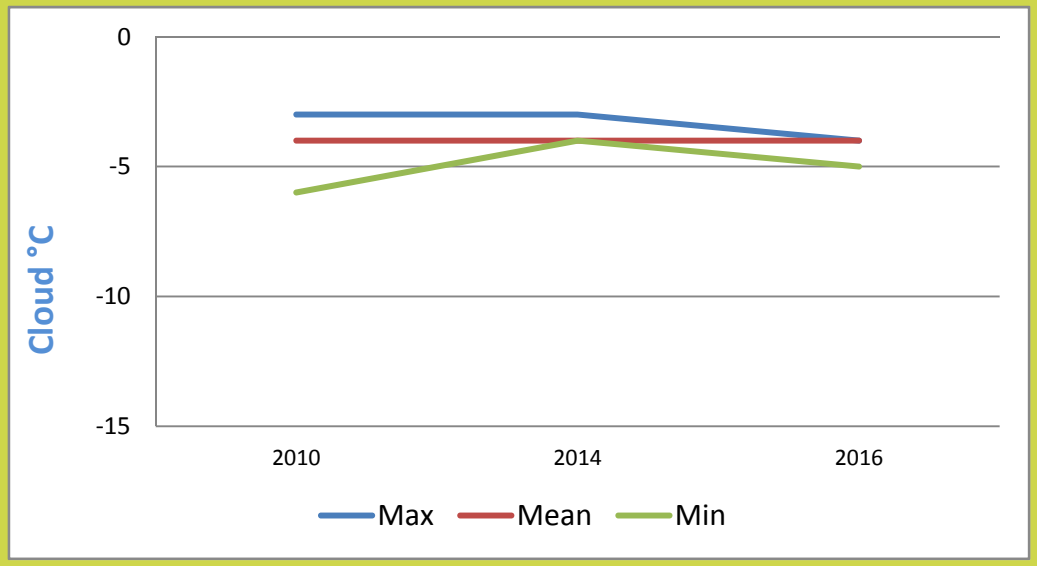
New Zealand

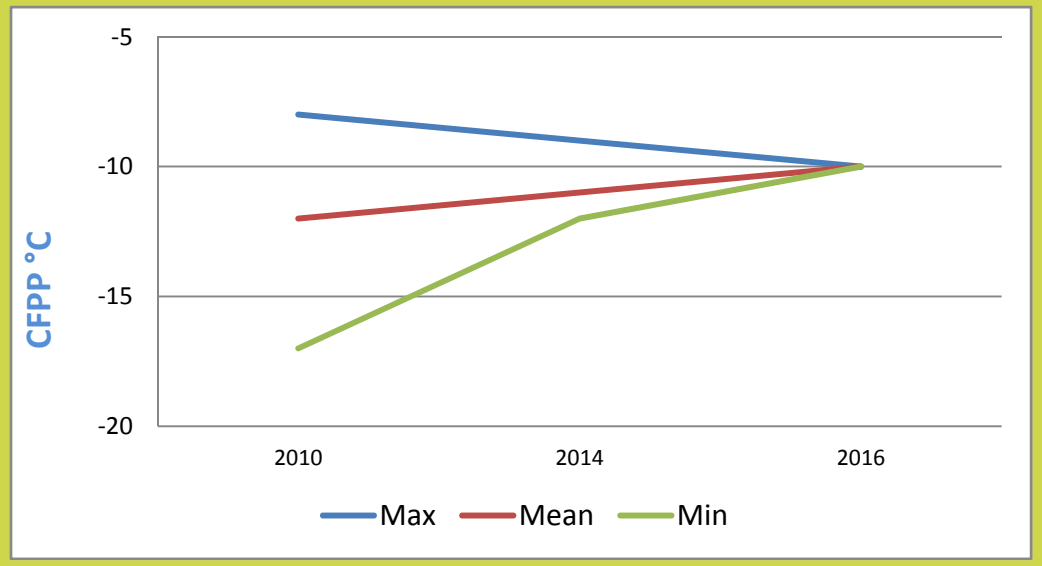
National standards and physical inspection data

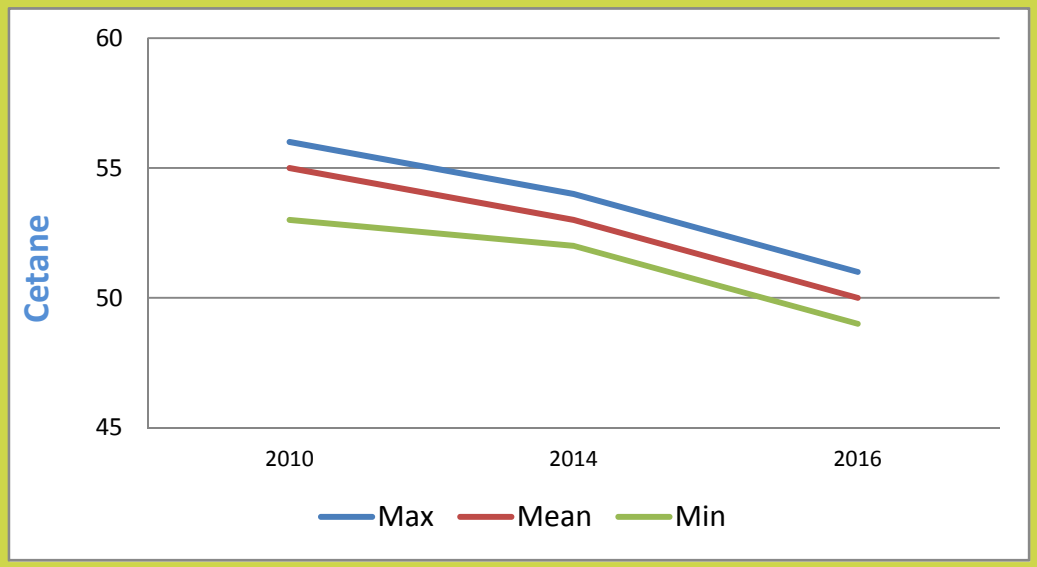
Asia Pacific

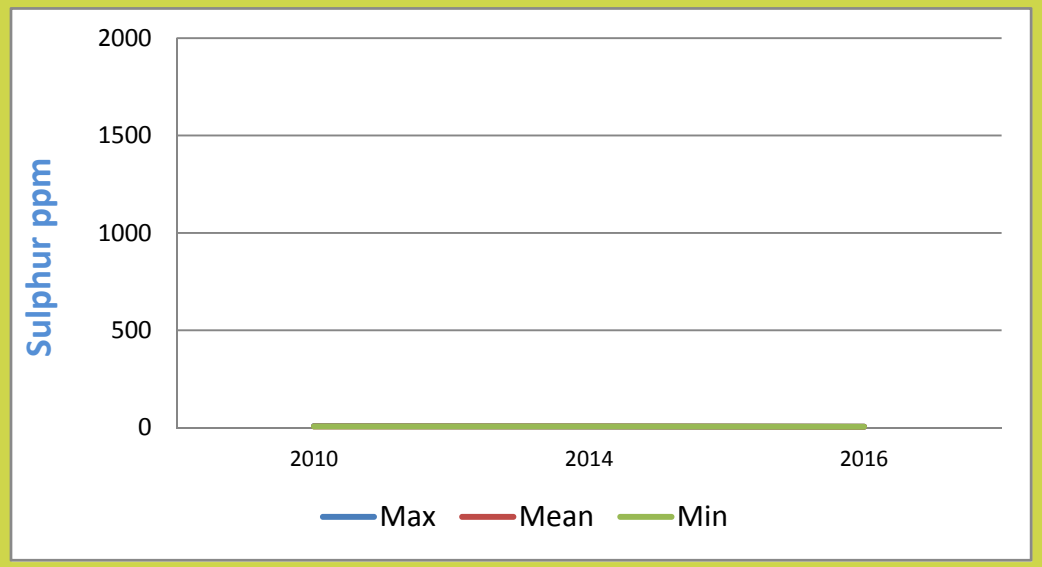
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1504460	DIES 1504461
Cloud Point, °C		**-4**	**-4**	**-5**	-5	-4
CFPP, °C		**-10**	**-10**	**-10**	-10	-10
Pour Point, °C		**-15**	**-17**	**-18**	-15	-18
HFRR, µm	460 (max)	**413**	**359**	**305**	413	305
Wax Content @ 10°C Below Cloud, wt%		**1.9**	**1.8**	**1.7**	1.7	1.9
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30
Sulphur, ppm	10 (max)	**5**	**5**	**5**	5	5
Density @15°C, kg/m^3	820 - 850	**846**	**845**	**844**	846	844
Viscosity @ 40°C, cSt	2.0 - 4.5	**3.51**	**3.51**	**3.51**	3.51	3.51
Cetane Index $_{2\ Variable}$		**52**	**52**	**51**	51	52
Cetane Index $_{4\ Variable}$	47 (min)	**53**	**52**	**52**	52	53
Cetane Number	51 (min)	**51**	**50**	**49**	49	51
Distillation, °C IBP		**176**	**174**	**172**	172	176
T_{10}		**231**	**229**	**228**	228	231
T_{20}		**248**	**248**	**247**	247	248
T_{50}		**281**	**281**	**280**	280	281
T_{90}		**337**	**337**	**337**	337	337
T_{95}	360 (max)	**352**	**352**	**352**	352	352
FBP		**362**	**361**	**361**	362	361
% FAME	5 (max)	**0**	**0**	**0**	0	0

New Zealand









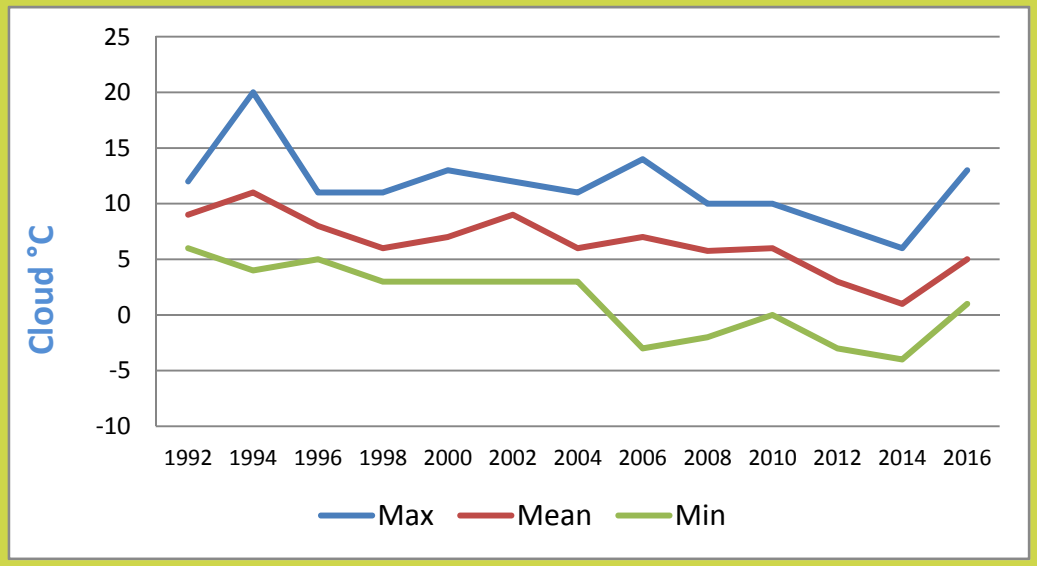
Singapore

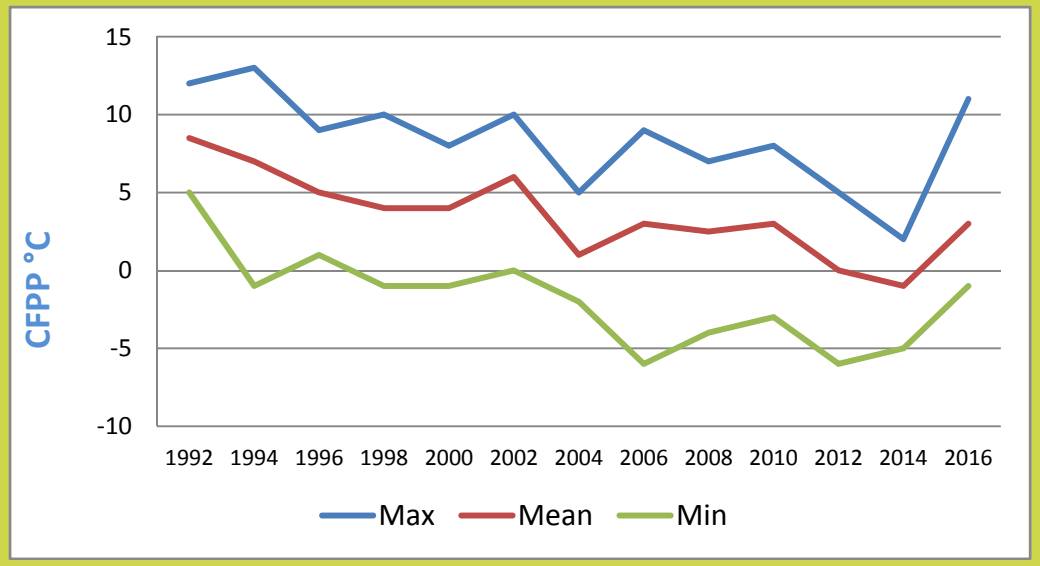
National standards and physical inspection data

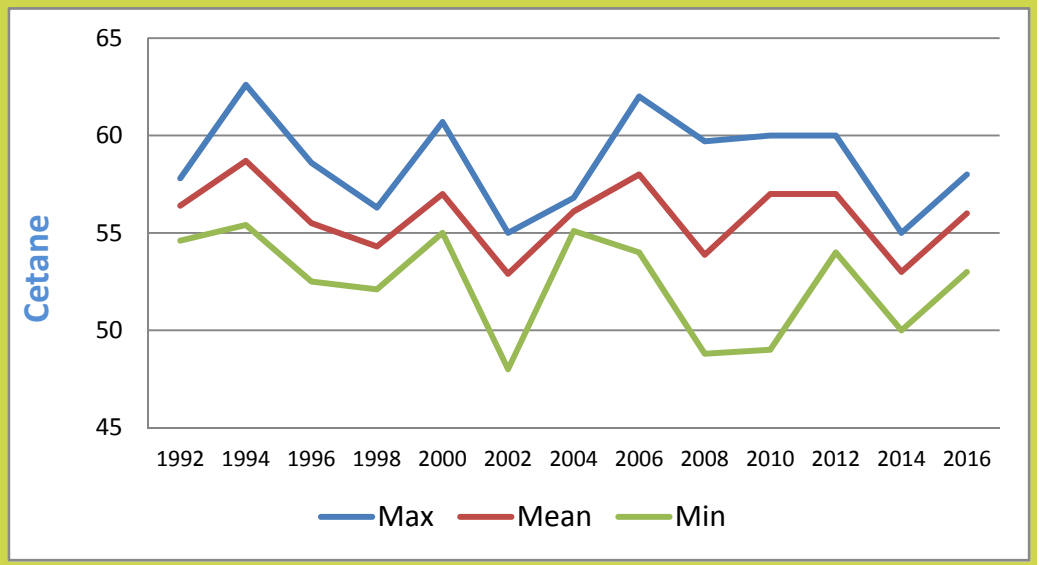
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600524	DIES 1600525	DIES 1600526	DIES 1600527
Cloud Point, °C		**13**	**5**	**1**	1	4	2	13
CFPP, °C		**11**	**3**	**-1**	0	0	-1	11
Pour Point, °C		**9**	**-2**	**-9**	-6	-9	-3	9
HFRR, µm		**375**	**342**	**301**	332	359	301	375
Wax Content @ 10°C Below Cloud, wt%		**4.7**	**2.6**	**1.4**	2.0	1.4	2.4	4.7
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30	>30	>30
Sulphur, ppm	10 (max)	**5**	**4**	**3**	4	5	3	5
Density @15°C, kg/m^3		**847**	**837**	**830**	830	847	830	841
Viscosity @ 40°C, cSt		**3.99**	**3.73**	**3.50**	3.73	3.99	3.71	3.50
Cetane Index $_{2\ Variable}$		**60**	**57**	**53**	60	53	59	55
Cetane Index $_{4\ Variable}$		**61**	**58**	**54**	61	54	61	55
Cetane Number		**58**	**56**	**53**	58	53	58	55
Distillation, °C IBP		**185**	**178**	**171**	171	185	175	179
T_{10}		**231**	**224**	**215**	221	231	231	215
T_{20}		**252**	**247**	**237**	248	252	252	237
T_{50}		**299**	**296**	**292**	302	294	297	292
T_{90}		**360**	**359**	**357**	360	357	358	360
T_{95}		**374**	**373**	**371**	372	374	371	374
FBP		**381**	**379**	**376**	376	381	379	379
% FAME		**0**	**0**	**0**	0	0	0	0

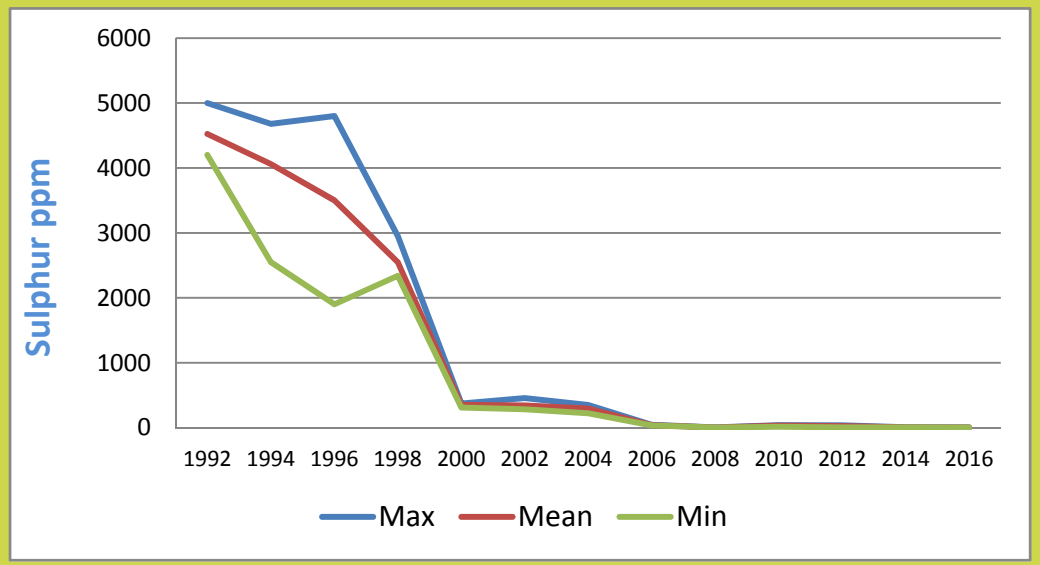
Singapore

Asia Pacific









South Korea

National standards and physical inspection data

Asia Pacific

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600563	DIES 1600564	DIES 1600565	DIES 1600567	DIES 1600569
Cloud Point, °C		**-5**	**-11**	**-25**	-7	-9	-7	-25	-5
CFPP, °C	-18 (max)*	**-25**	**-29**	**-31**	-30	-25	-29	-28	-31
Pour Point, °C	**	**-30**	**-31**	**-33**	-30	-33	-33	-30	-30
HFRR, µm	400 (max)	**345**	**311**	**272**	273	272	345	338	327
Wax Content @ 10°C Below Cloud, wt%		**2.2**	**1.1**	**0.3**	0.9	2.2	0.7	0.3	1.5
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30	>30	>30	>30
Sulphur, ppm	10 (max)	**7**	**<5**	**<3**	6	4	7	<3	<3
Density @15°C, kg/m^3	815 - 835	**829**	**826**	**823**	826	823	823	829	829
Viscosity @ 40°C, cSt	1.9 - 5.5	**3.26**	**2.55**	**2.22**	2.34	2.47	2.22	3.26	2.47
Cetane Index $_{2\ Variable}$		**57**	**55**	**54**	55	57	54	57	54
Cetane Index $_{4\ Variable}$	***	**57**	**54**	**52**	53	56	52	57	53
Cetane Number	***	**57**	**54**	**52**	53	57	54	57	52
Distillation, °C IBP		**152**	**138**	**124**	143	152	141	124	132
T_{10}		**204**	**182**	**168**	168	191	171	204	179
T_{20}		**240**	**207**	**185**	185	212	189	240	208
T_{50}		**282**	**267**	**256**	264	268	256	282	267
T_{90}	360 (max)	**349**	**342**	**333**	346	333	344	349	337
T_{95}		**375**	**361**	**348**	364	348	367	375	353
FBP		**384**	**375**	**366**	376	369	380	384	366
% FAME	5 (max)	**2**	**2**	**2**	2	2	2	2	2

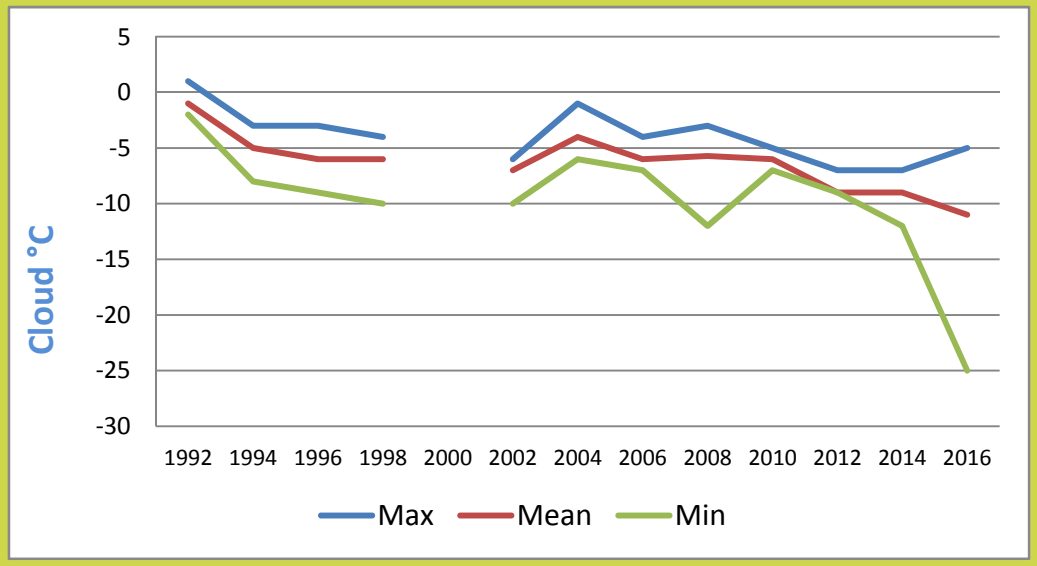
CFPP spec. is applied from 15/11 to 15/2

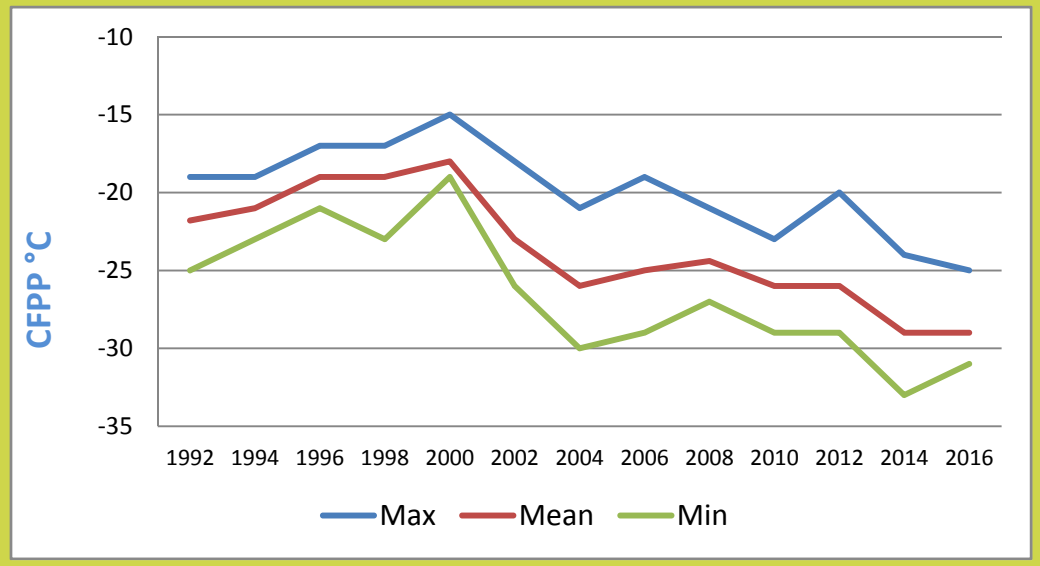
** PP spec. period, - 0°C : 1/4 ~ 30/9, -17.5°C : 1/10 ~ 15/3, -12.5°C : 16/3 ~ 31/3

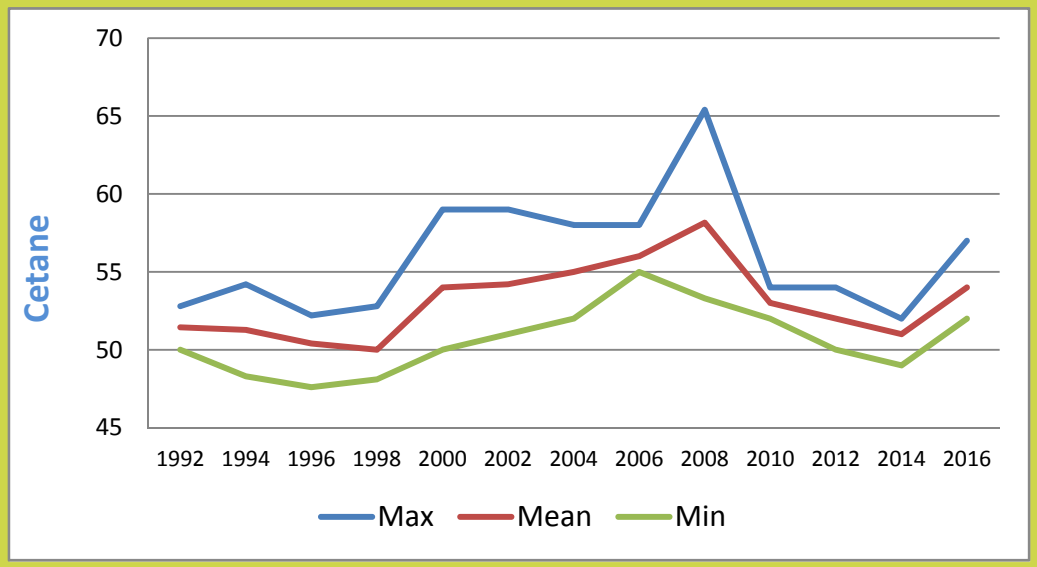
*** A target of 52 or 48 is acceptable for either Cetane Index or Cetane Number, 48 (min) spec. is only applied for winter (15/11 ~ 28/2)

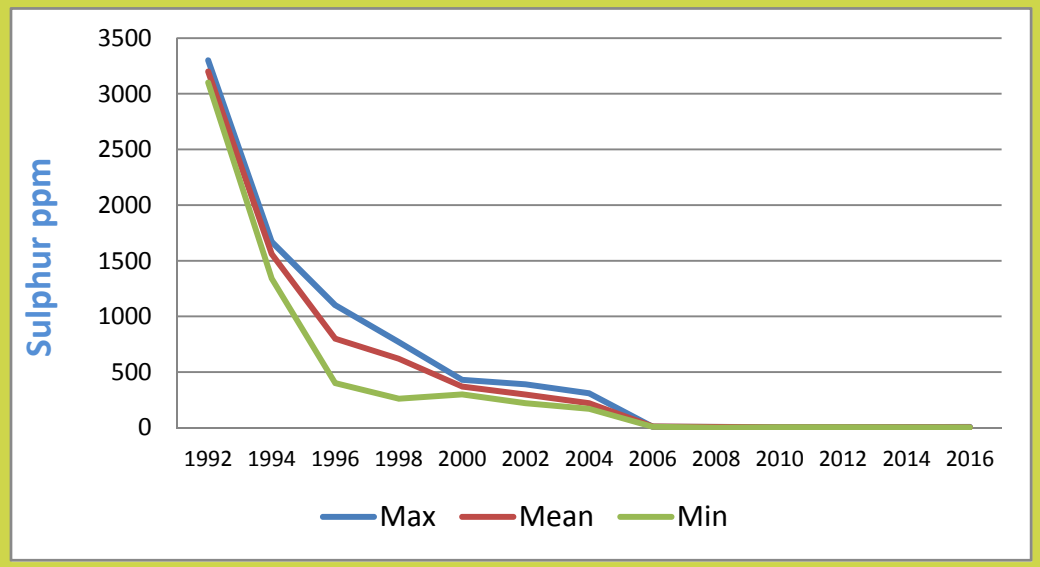
South Korea

Asia Pacific









Thailand

Asia Pacific

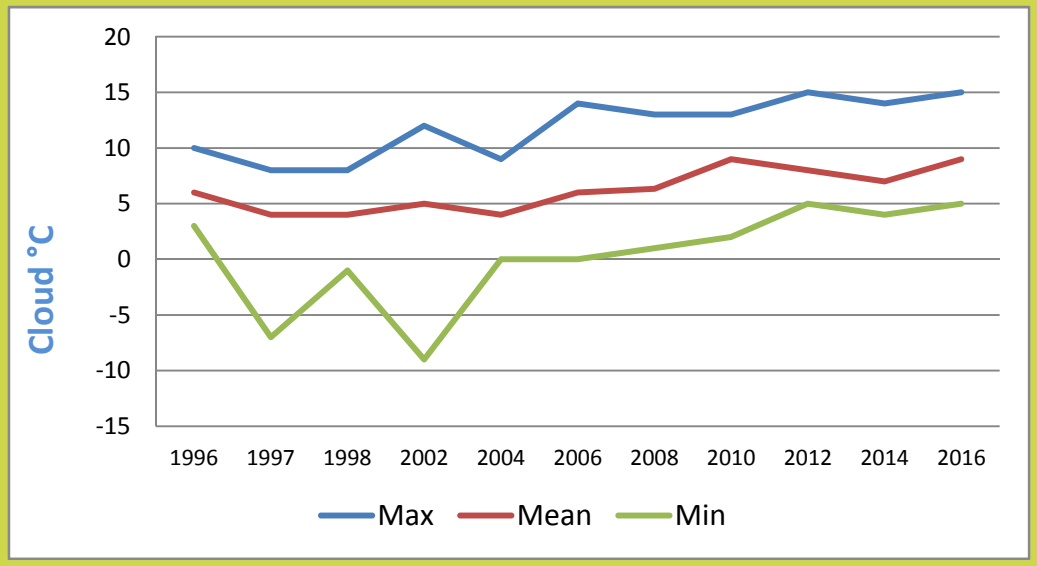
National standards and physical inspection data

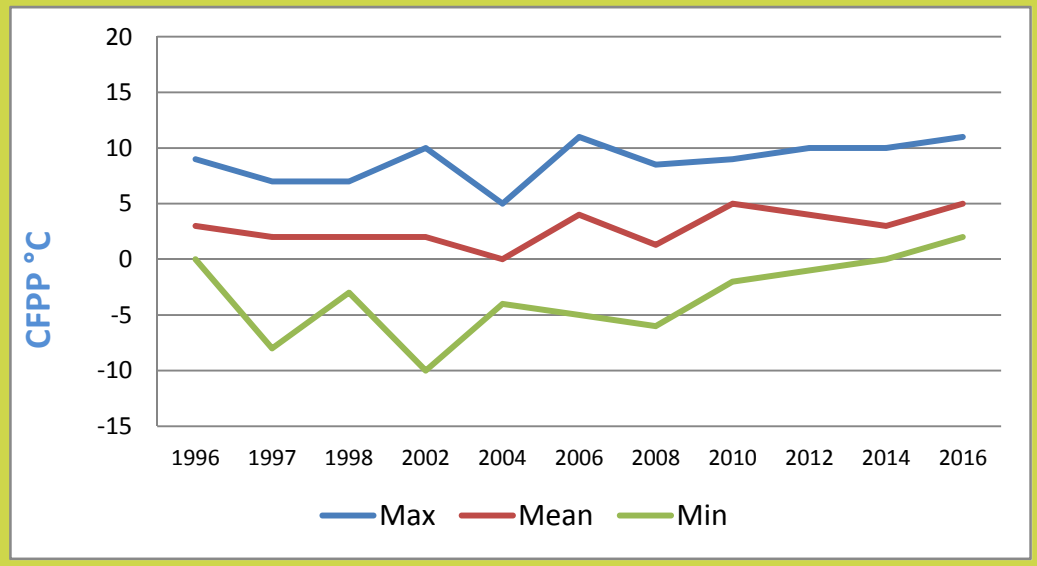
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600536	DIES 1600537	DIES 1600539	DIES 1600540	DIES 1600541	DIES 1600542	DIES 1600543
Cloud Point, °C		**15**	**9**	**5**	10	15	8	8	9	5	8
CFPP, °C		**11**	**5**	**2**	4	11	5	4	5	2	3
Pour Point, °C	10 (max)	**9**	**3**	**0**	3	9	0	0	3	0	3
HFRR, µm	460 (max)	**214**	**187**	**157**	209	157	191	167	214	179	193
Wax Content @ 10°C Below Cloud, wt%		**4.5**	**2.9**	**2.1**	2.5	4.5	3.2	2.5	2.7	2.1	2.7
Rancimat, hrs		**>30**	**>20**	**14**	>30	14	>30	>30	>30	>30	>30
Sulphur, ppm	50 (max)	**39**	**30**	**22**	31	39	35	28	31	22	23
Density @15°C, kg/m^3	810 - 870	**844**	**838**	**833**	835	844	842	836	837	833	837
Viscosity @ 40°C, cSt	1.8 - 4.1	**3.60**	**3.38**	**3.28**	3.28	3.60	3.60	3.28	3.35	3.28	3.30
Cetane Index $_{2\ Variable}$		**57**	**55**	**54**	56	54	55	56	55	57	55
Cetane Index $_{4\ Variable}$	50 (min)*	**57**	**56**	**55**	56	55	55	56	56	57	55
Cetane Number	50 (min)*	**63**	**60**	**57**	62	63	59	57	58	63	58
Distillation, °C IBP		**184**	**176**	**169**	172	189	183	169	173	172	177
T_{10}		**235**	**222**	**216**	218	235	228	218	219	216	217
T_{20}		**254**	**243**	**238**	241	254	250	240	242	239	238
T_{50}		**292**	**287**	**284**	286	301	292	286	287	286	284
T_{90}	357 (max)	**351**	**348**	**347**	349	349	351	348	348	347	347
T_{95}		**369**	**365**	**362**	365	369	367	363	364	362	363
FBP		**378**	**370**	**366**	371	378	372	367	368	366	367
% FAME	6 - 7	**7**	**7**	**7**	7	7	7	7	7	7	7

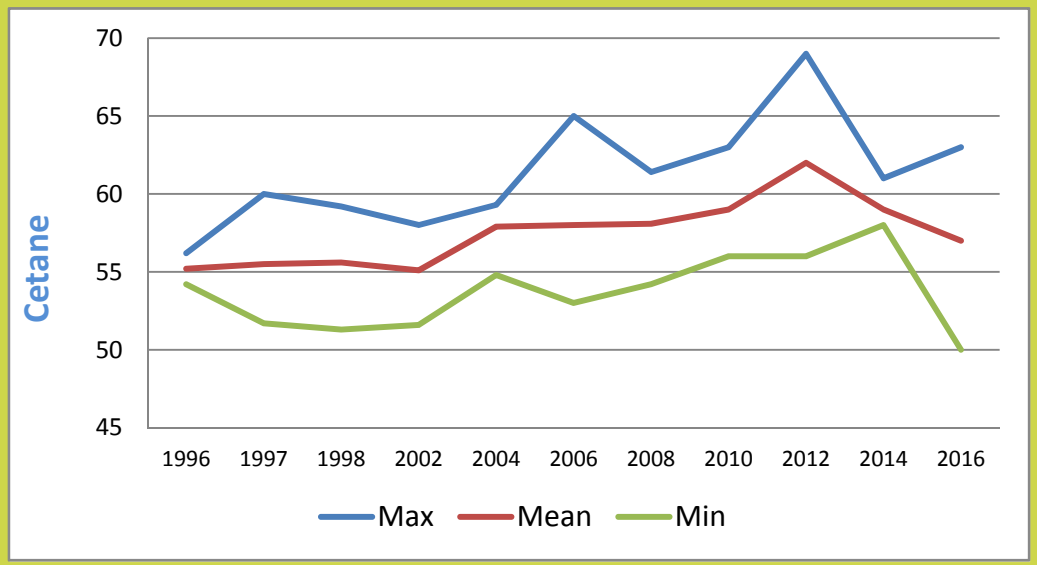
Specification shown is HSD grade

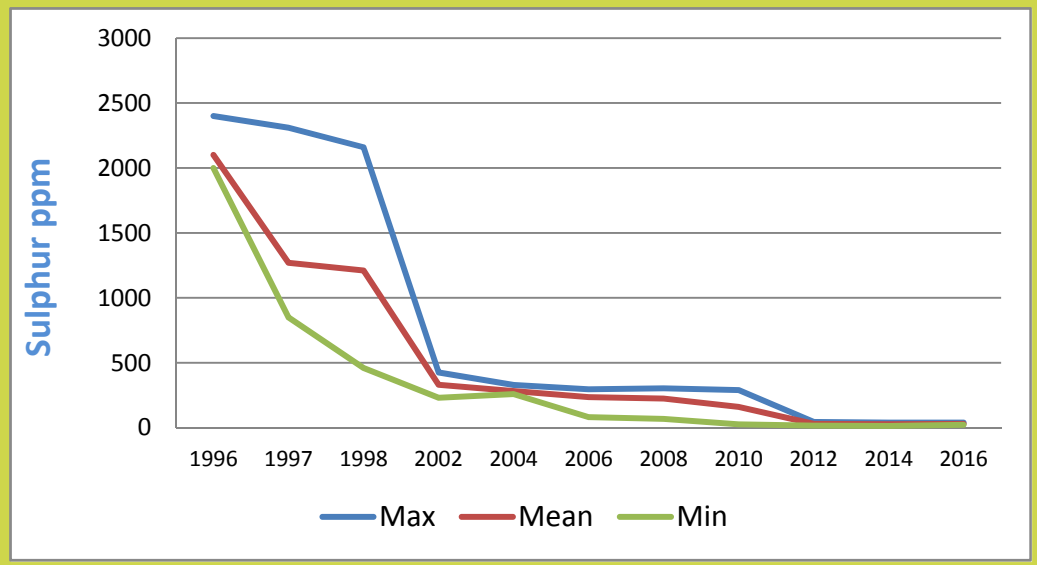
*Cetane number or cetane index may be used

Thailand









Worldwide Survey – The Americas

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140 United States of America (Midwest)
147 United States of America (West Coast)

Argentina

National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1504432	DIES 1504433	DIES 1504434	DIES 1504435	DIES 1504436	DIES 1504437	DIES 1504438
Cloud Point, °C		**2**	**-2**	**-12**	-1	-1	-2	0	-12	0	-1
CFPP, °C		**-9**	**-14**	**-20**	-16	-15	-14	-15	-20	-14	-10
Pour Point, °C		**-6**	**-13**	**-21**	-15	-12	-15	-12	-21	-15	-9
HFRR, µm		**281**	**193**	**166**	281	178	166	185	182	195	174
Wax Content @ 10°C Below Cloud, wt%		**2.4**	**1.9**	**1.3**	1.5	2.1	2.4	2.0	1.7	1.6	2.1
Rancimat, hrs		**>30**	**>20**	**6**	>30	6	20	7	9	>30	12
Sulphur, ppm	500 (max)*	**431**	**223**	**5**	198	148	372	344	5	114	431
Density @15°C, kg/m^3	800 - 870	**856**	**847**	**837**	840	845	851	852	837	854	847
Viscosity @ 40°C, cSt	2.0 - 4.5	**3.74**	**3.10**	**2.61**	2.62	3.74	3.06	3.16	2.63	3.56	3.15
Cetane Index $_{2\ Variable}$		**53**	**51**	**50**	50	53	51	51	53	52	53
Cetane Index $_{4\ Variable}$	45 (min)	**52**	**50**	**49**	49	52	50	49	52	50	51
Cetane Number	48 (min)	**54**	**51**	**48**	51	54	53	49	54	48	51
Distillation, °C IBP		**172**	**159**	**134**	159	172	171	169	170	134	139
T_{10}		**216**	**205**	**188**	188	212	214	216	201	212	202
T_{20}		**247**	**229**	**206**	206	234	233	234	222	247	231
T_{50}	310 (max)	**301**	**284**	**266**	266	286	287	288	272	301	289
T_{90}	360 (max)	**359**	**347**	**332**	345	344	345	347	332	359	356
T_{95}		**378**	**366**	**343**	366	361	368	369	343	378	377
FBP		**385**	**373**	**350**	373	370	372	376	350	385	383
% FAME	10 (min)	**11**	**9**	**2**	2	9	10	10	11	11	8

* Sulphur limit of 10ppm for Diesel Ultra grade

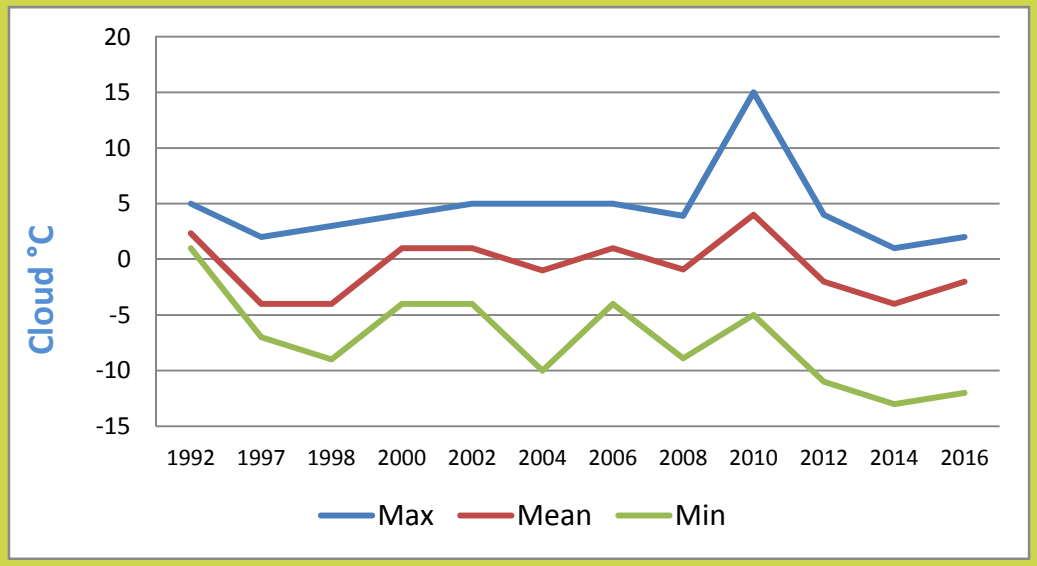
Argentina (continued)

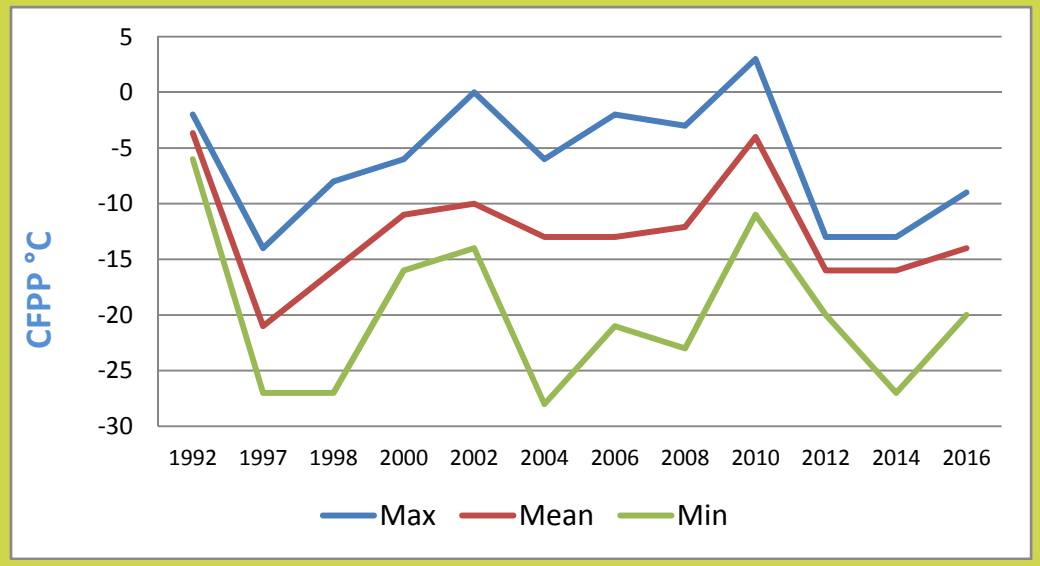
National standards and physical inspection data

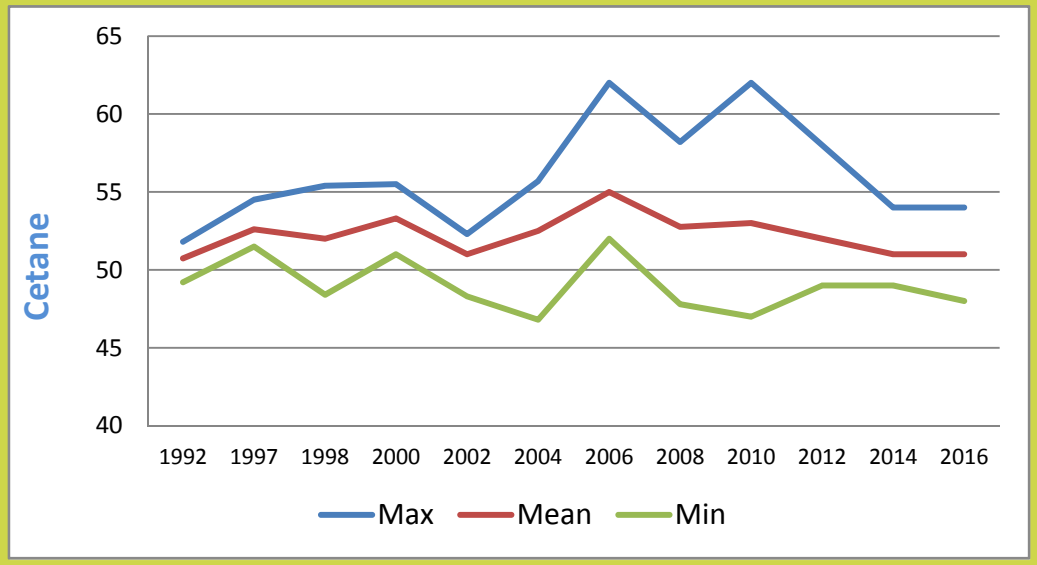
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1504439	DIES 1504440
Cloud Point, °C		**2**	**-2**	**-12**	-1	2
CFPP, °C		**-9**	**-14**	**-20**	-16	-9
Pour Point, °C		**-6**	**-13**	**-21**	-12	-6
HFRR, µm		**281**	**193**	**166**	187	190
Wax Content @ 10°C Below Cloud, wt%		**2.4**	**1.9**	**1.3**	1.3	2.2
Rancimat, hrs		**>30**	**>20**	**6**	>30	19
Sulphur, ppm	500 (max)*	**431**	**223**	**5**	219	180
Density @15°C, kg/m^3	800 - 870	**856**	**847**	**837**	841	856
Viscosity @ 40°C, cSt	2.0 - 4.5	**3.74**	**3.10**	**2.61**	2.61	3.41
Cetane Index $_{2\ Variable}$		**53**	**51**	**50**	51	51
Cetane Index $_{4\ Variable}$	45 (min)	**52**	**50**	**49**	49	49
Cetane Number	48 (min)	**54**	**51**	**48**	49	51
Distillation, °C IBP		**172**	**159**	**134**	158	158
T_{10}		**216**	**205**	**188**	188	214
T_{20}		**247**	**229**	**206**	207	246
T_{50}	310 (max)	**301**	**284**	**266**	271	295
T_{90}	360 (max)	**359**	**347**	**332**	343	348
T_{95}		**378**	**366**	**343**	361	366
FBP		**385**	**373**	**350**	374	376
% FAME	10 (min)	**11**	**9**	**2**	8	11

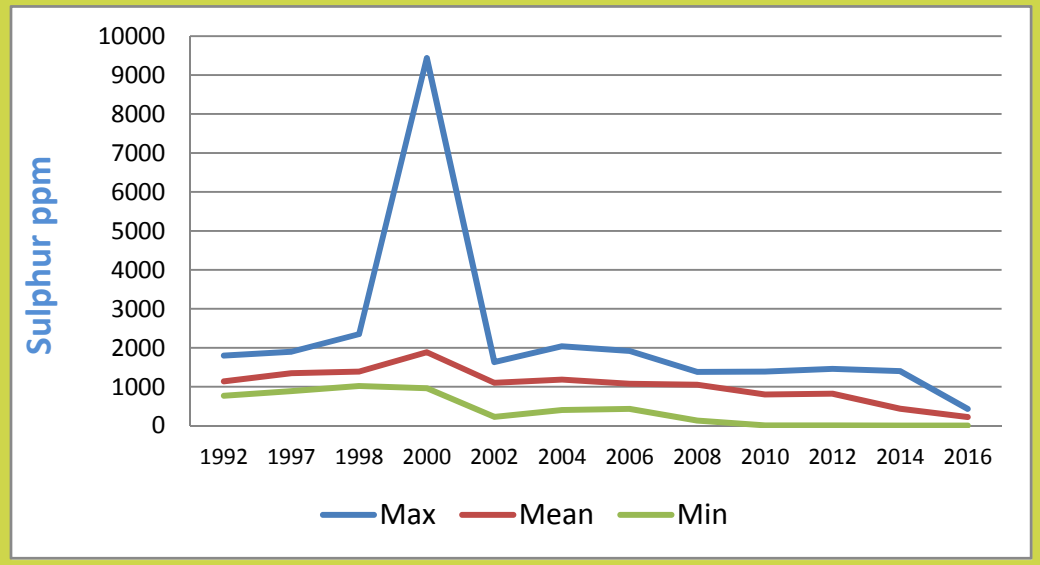
* Sulphur limit of 10ppm for Diesel Ultra grade

Argentina







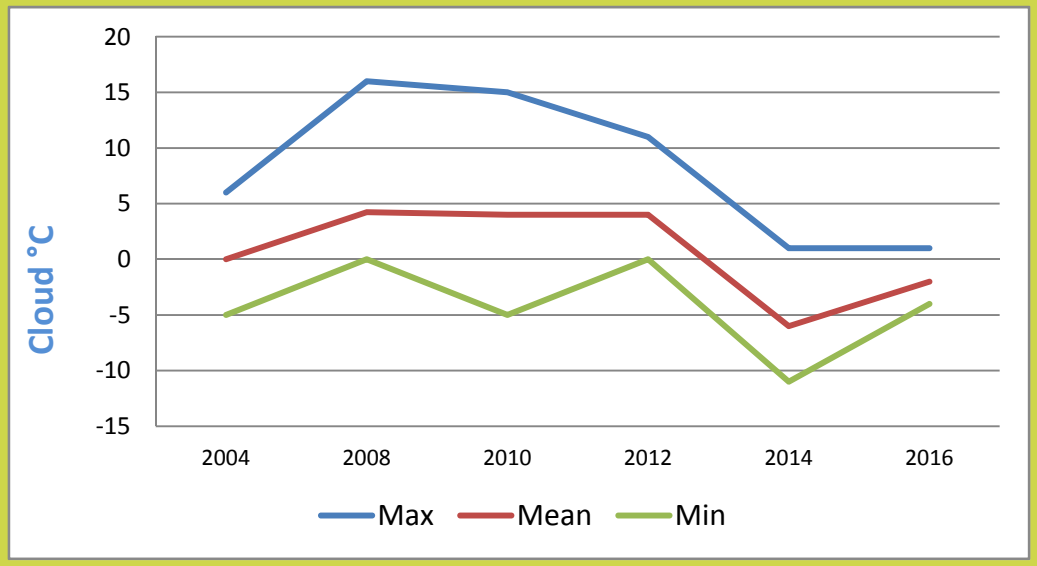


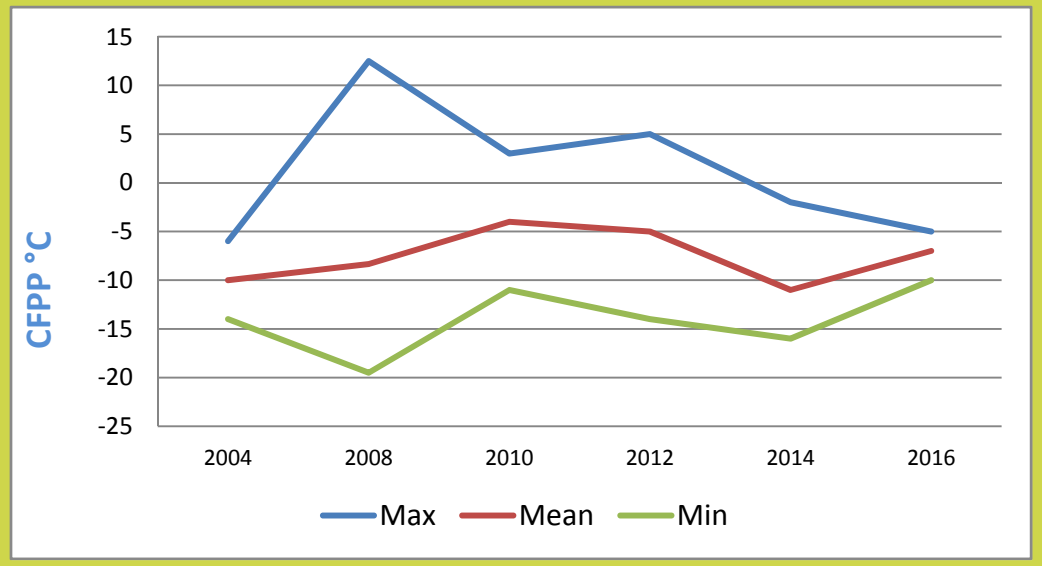
Brazil

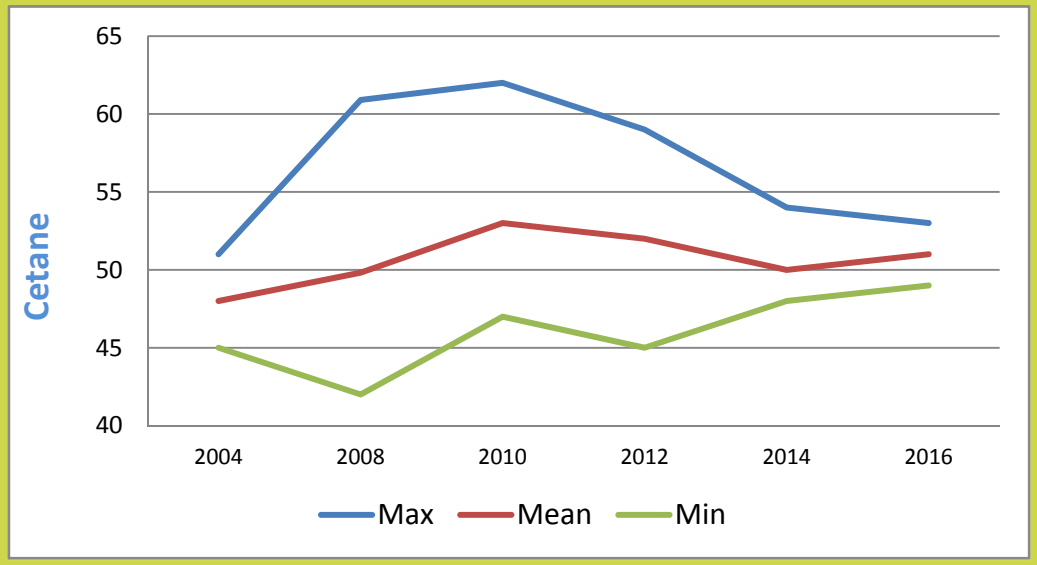
National standards and physical inspection data

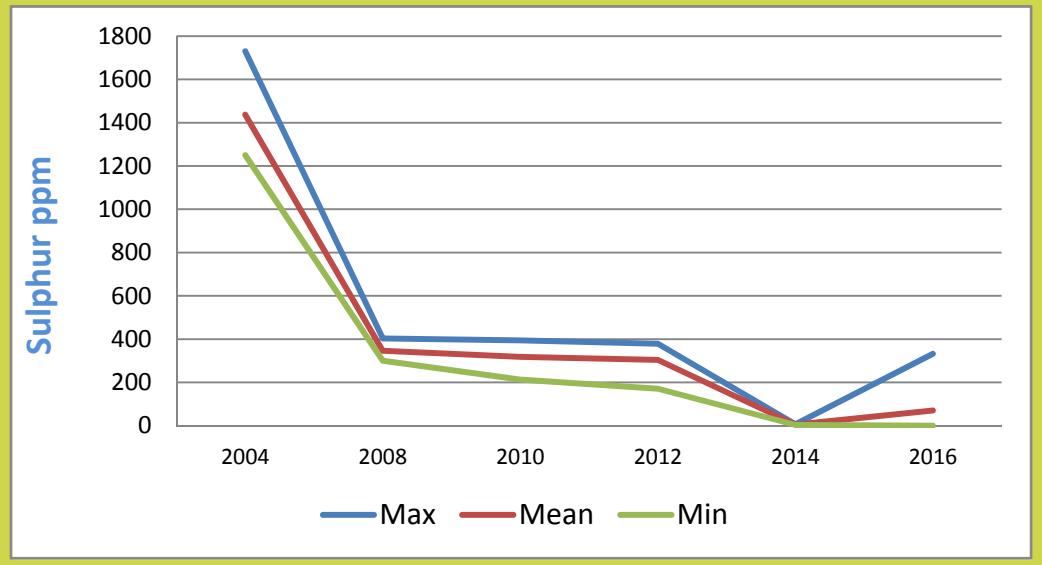
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1504441	DIES 1504442	DIES 1504443	DIES 1504445	DIES 1504446
Cloud Point, °C		**1**	**-2**	**-4**	-4	-4	-1	-3	1
CFPP, °C		**-5**	**-7**	**-10**	-10	-9	-5	-7	-5
Pour Point, °C		**-6**	**-12**	**-18**	-15	-12	-18	-9	-6
HFRR, µm	460 (max)	**199**	**180**	**150**	164	195	150	199	196
Wax Content @ 10°C Below Cloud, wt%		**1.3**	**0.8**	**0.5**	0.7	0.8	0.5	0.8	1.3
Rancimat, hrs		**20**	**15**	**5**	16	20	18	5	14
Sulphur, ppm	10 (max)	**332**	**70**	**<3**	4	<3	<3	6	332
Density @15°C, kg/m^3		**851**	**842**	**830**	839	843	847	830	851
Viscosity @ 40°C, cSt	2.0 - 4.5	**3.42**	**2.78**	**2.46**	2.71	2.68	2.64	2.46	3.42
Cetane Index $_{2\ Variable}$		**53**	**50**	**46**	50	50	46	53	51
Cetane Index $_{4\ Variable}$		**52**	**49**	**46**	50	48	46	52	50
Cetane Number	48 (min)	**53**	**51**	**49**	51	49	50	53	52
Distillation, °C IBP		**181**	**147**	**129**	165	130	181	129	132
T_{10}		**213**	**203**	**190**	204	190	211	199	213
T_{20}		**243**	**227**	**217**	221	230	225	217	243
T_{50}	245 - 295	**291**	**269**	**256**	265	269	256	262	291
T_{90}		**353**	**336**	**326**	338	331	333	326	353
T_{95}	370 (max)	**373**	**356**	**343**	358	351	356	343	373
FBP		**379**	**367**	**354**	370	365	369	354	379
% FAME	7 (min)	**7**	**7**	**7**	7	7	7	7	7

Brazil









Canada

National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600274	DIES 1600275	DIES 1600279	DIES 1600280	DIES 1600286	DIES 1600287	DIES 1600288
Cloud Point, °C		**-24**	**-33**	**-46**	-40	-36	<-51	-32	-24	-32	-28
LTFT, °C		**-29**	**-37**	**-47**	-42	-42	-47	-33	-39	-33	-30
CFPP, °C		**-27**	**-34**	**-46**	-41	-37	<-51	-33	-28	-31	-29
Pour Point, °C		**-33**	**-45**	**-69**	-57	-69	-57	-33	-42	-33	-33
HFRR, µm	460 (max)	**595**	**446**	**358**	385	595	461	468	396	429	432
Wax Content @ 10°C Below Cloud, wt%		**2.0**	**1.0**	**0.5**	0.5	0.5	0.5	2.0	0.5	1.5	1.0
Rancimat, hrs		**>30**	**>20**	**18**	26	>30	22	>30	>30	>30	>30
Sulphur, ppm	15 (max)	**9**	**6**	**3**	6	4	<3	7	4	6	7
Density @15°C, kg/m^3		**853**	**838**	**813**	839	836	850	833	831	844	850
Viscosity @ 40°C, cSt	1.7 - 4.1*	**3**	**2**	**2**	2.00	2.03	2.44	1.97	1.93	2.29	2.66
Cetane Index $_{2\ Variable}$		**47**	**45**	**40**	43	43	44	46	44	46	46
Cetane Index $_{4\ Variable}$		**47**	**44**	**40**	43	44	43	46	45	45	45
Cetane Number	40 (min)	**46**	**43**	**41**	42	41	42	42	43	46	46
Distillation, °C IBP		**175**	**162**	**146**	159	166	175	162	172	163	161
T_{10}		**211**	**192**	**170**	187	190	204	191	190	199	207
T_{20}		**229**	**206**	**183**	200	200	218	204	199	216	225
T_{50}		**264**	**241**	**214**	237	234	251	240	229	252	262
T_{90}	360 (max)	**317**	**301**	**286**	303	305	299	290	306	301	317
T_{95}		**333**	**318**	**300**	319	322	314	305	327	318	333
FBP		**344**	**330**	**311**	328	332	324	320	339	332	344
% FAME	1.0 - 5.0	**0**	**0**	**0**	0	0	0	0	0	0	0

*For operating temperatures of below -20°C the minimum KV is 1.3cSt

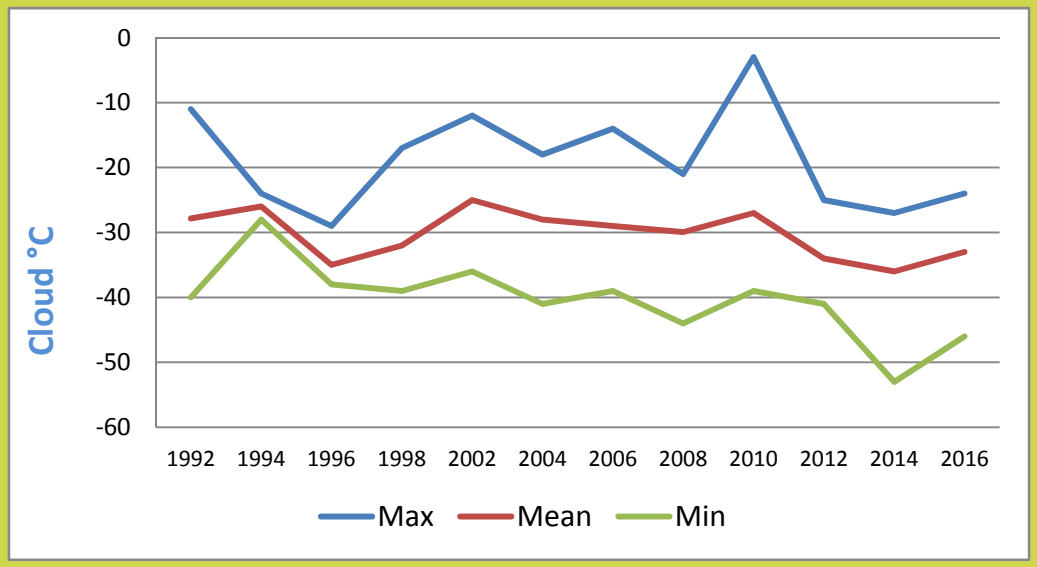
Canada (continued)

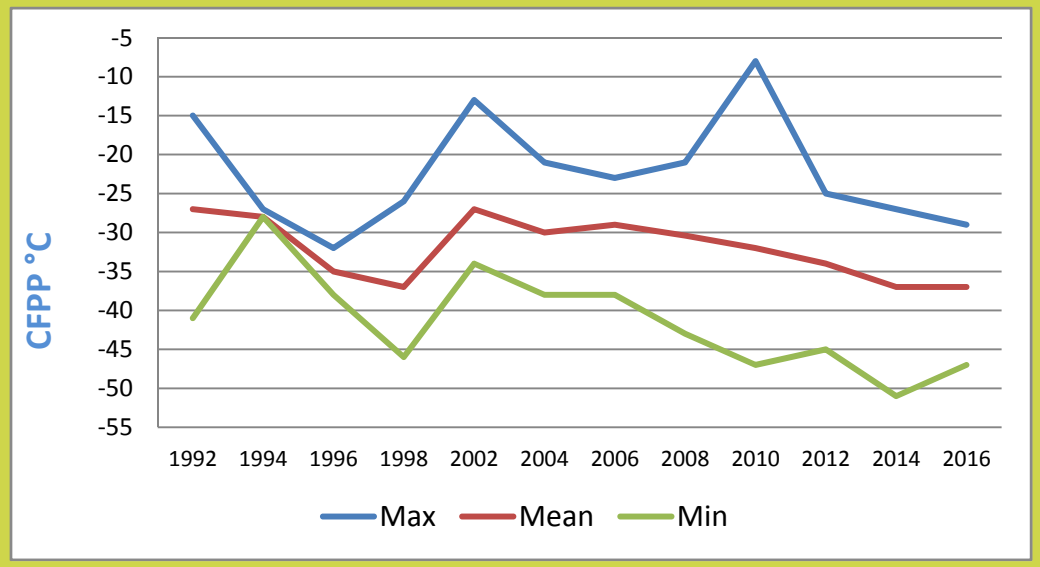
National standards and physical inspection data

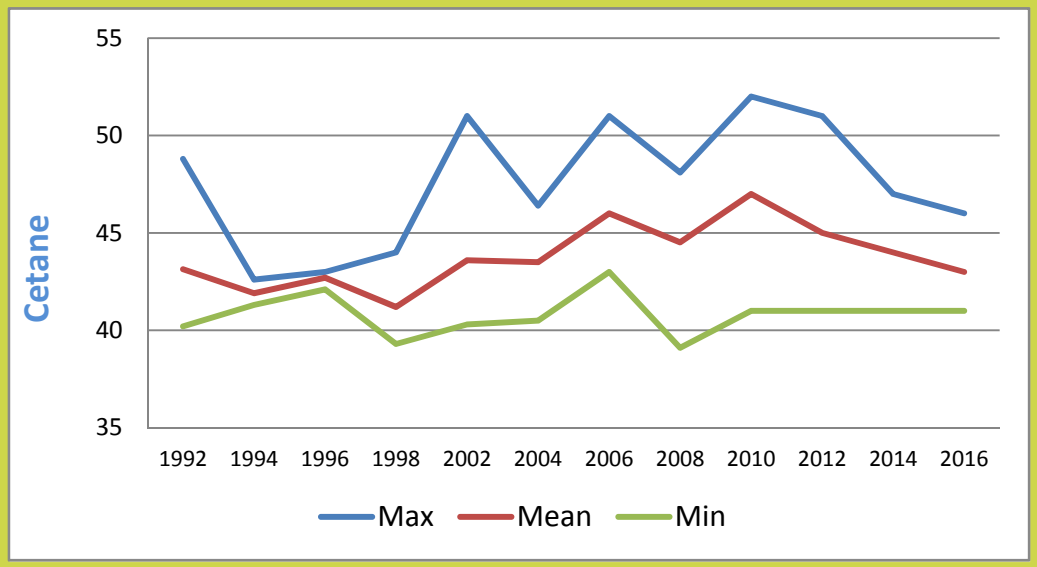
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600289	DIES 1600295	DIES 1600297	DIES 1600298	DIES 1600299	DIES 1600316
Cloud Point, °C		**-24**	**-33**	**-46**	-30	-34	-26	-31	-46	-42
LTFT, °C		**-29**	**-37**	**-47**	-30	-40	-29	-34	-43	-42
CFPP, °C		**-27**	**-34**	**-46**	-29	-40	-27	-32	-46	-43
Pour Point, °C		**-33**	**-45**	**-69**	-36	-45	-36	-36	-57	-51
HFRR, µm	460 (max)	**595**	**446**	**358**	400	565	435	499	374	358
Wax Content @ 10°C Below Cloud, wt%		**2.0**	**1.0**	**0.5**	1.0	0.5	0.9	0.8	1.1	1.7
Rancimat, hrs		**>30**	**>20**	**18**	>30	>30	>30	>30	18	18
Sulphur, ppm	15 (max)	**9**	**6**	**3**	5	6	9	7	8	3
Density @15°C, kg/m^3		**853**	**838**	**813**	853	813	820	831	845	850
Viscosity @ 40°C, cSt	1.7 - 4.1*	**3**	**2**	**2**	2.68	1.59	1.74	2.14	2.06	2.05
Cetane Index 2 Variable		**47**	**45**	**40**	46	45	47	47	43	40
Cetane Index 4 Variable		**47**	**44**	**40**	45	46	47	47	42	40
Cetane Number	40 (min)	**46**	**43**	**41**	43	45	44	44	42	45
Distillation, °C IBP		**175**	**162**	**146**	164	154	146	159	152	172
T_{10}		**211**	**192**	**170**	211	176	170	190	188	201
T_{20}		**229**	**206**	**183**	229	184	183	204	203	213
T_{50}		**264**	**241**	**214**	264	214	227	242	242	239
T_{90}	360 (max)	**317**	**301**	**286**	317	289	298	306	297	286
T_{95}		**333**	**318**	**300**	333	312	315	323	309	300
FBP		**344**	**330**	**311**	342	330	328	336	319	311
% FAME	1.0 - 5.0	**0**	**0**	**0**	0	0	0	0	0	0

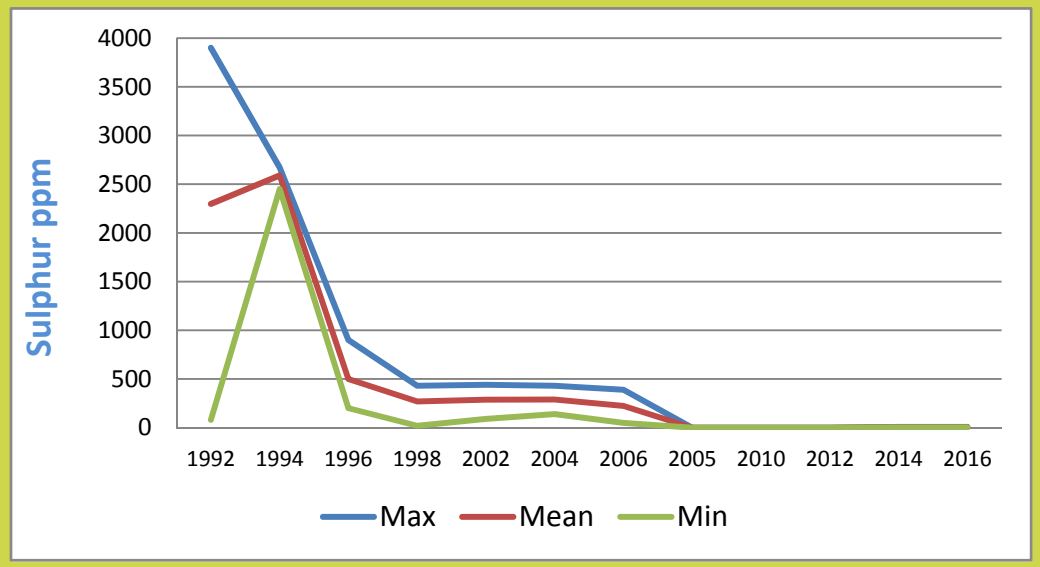
*For operating temperatures of below -20°C the minimum KV is 1.3cSt

Canada







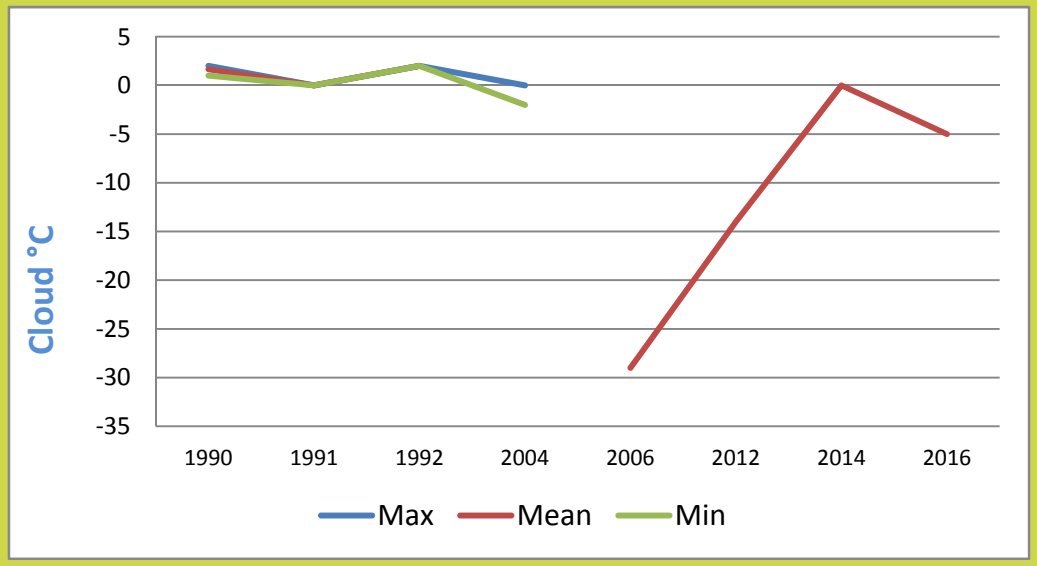


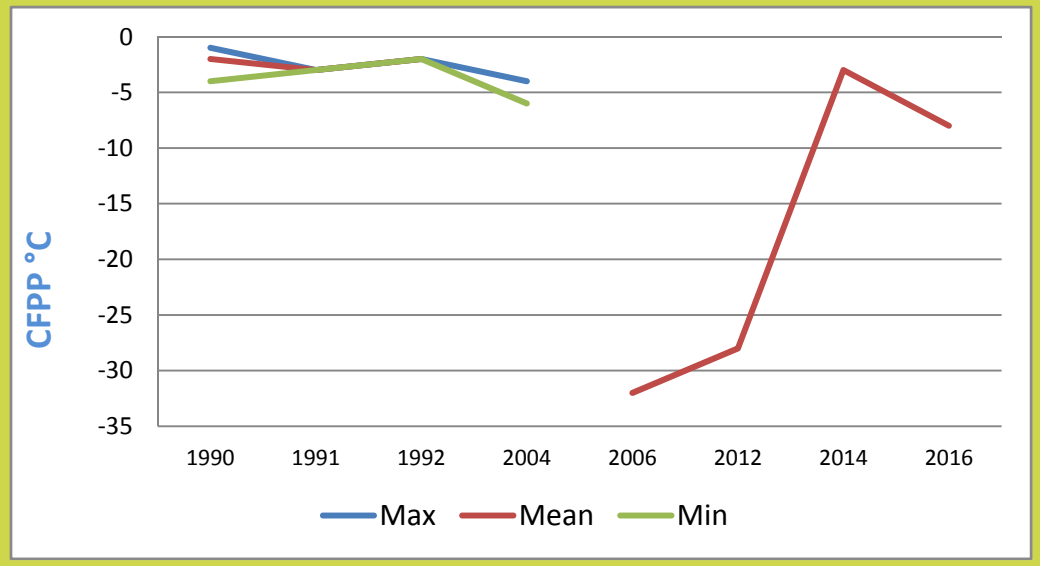
Chile

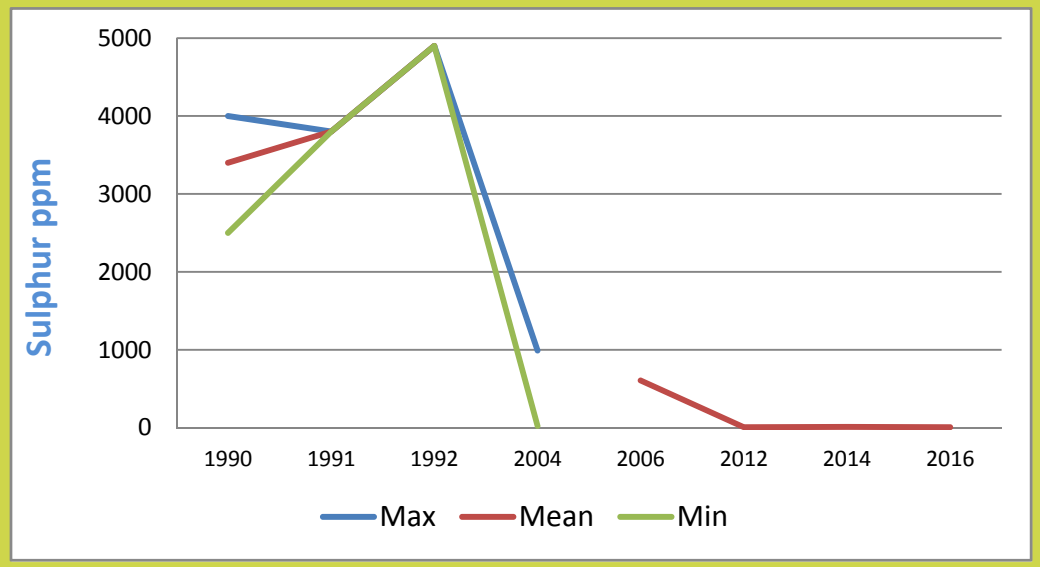
National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1504420
Cloud Point, °C			**-5**		-5
CFPP, °C			**-8**		-8
Pour Point, °C			**-12**		-12
HFRR, µm	460 (max)		**324**		324
Wax Content @ 10°C Below Cloud, wt%			**1.3**		1.3
Rancimat, hrs			**>30**		>30
Sulphur, ppm	15 (max)		**6**		6
Density @15°C, kg/m^3	820 - 850		**839**		839
Viscosity @ 40°C, cSt	1.9 - 4.1		**2.88**		2.88
Cetane Index $_{2\ Variable}$			**52**		52
Cetane Index $_{4\ Variable}$			**51**		51
Cetane Number	50 (min)		**52**		52
Distillation, °C IBP			**159**		159
T_{10}			**208**		208
T_{20}			**228**		228
T_{50}			**271**		271
T_{90}	282 - 350		**337**		337
T_{95}			**354**		354
FBP			**364**		364
% FAME			**0**		0

Chile







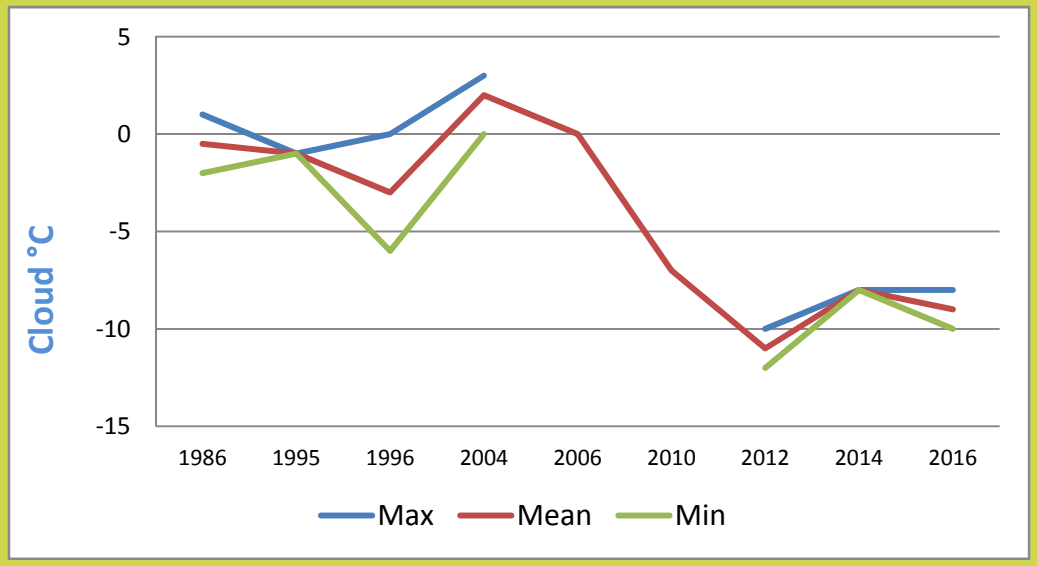
Colombia

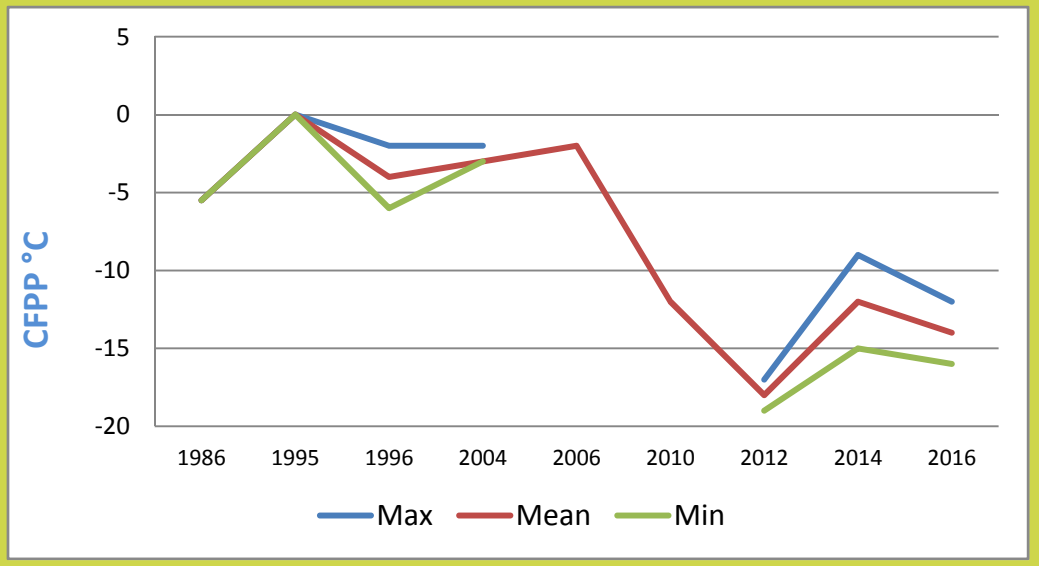
National standards and physical inspection data

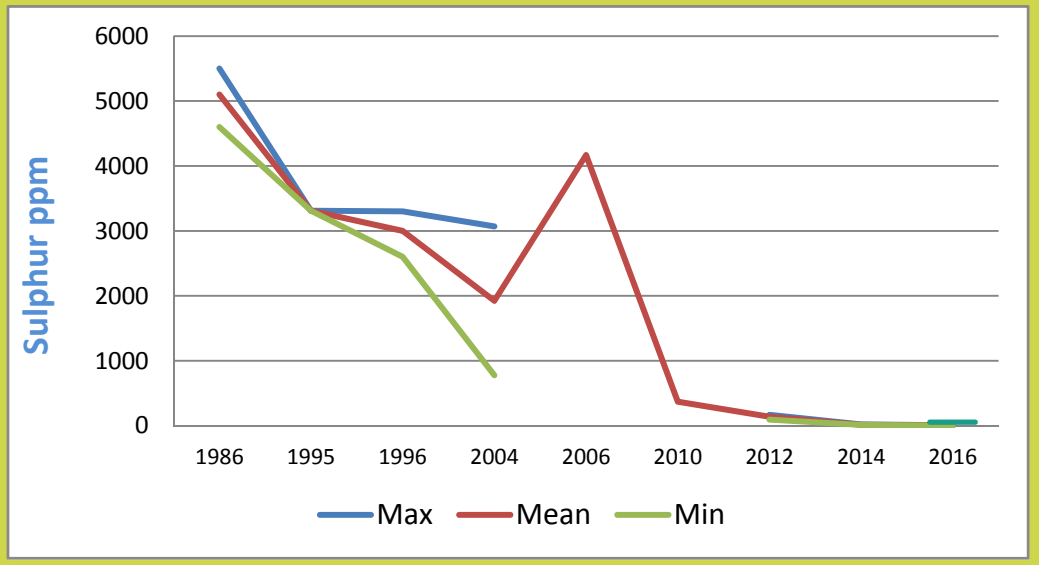
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1504421	DIES 1504422	DIES 1504423	DIES 1504424
Cloud Point, °C		**-8**	**-9**	**-10**	-8	-10	-9	-9
CFPP, °C		**-12**	**-14**	**-16**	-12	-13	-16	-14
Pour Point, °C	3 (max)	**-12**	**-12**	**-12**	-12	-12	-12	-12
HFRR, µm	450 (min)	**248**	**192**	**169**	248	169	177	176
Wax Content @ 10°C Below Cloud, wt%		**4.0**	**3.5**	**3.2**	3.3	3.2	3.3	4.0
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30	>30	>30
Sulphur, ppm	50 (max)	**7**	**5**	**4**	5	4	4	7
Density @15°C, kg/m^3		**849**	**846**	**841**	847	849	848	841
Viscosity @ 40°C, cSt	1.9 - 4.1	**3.42**	**3.23**	**2.84**	3.34	3.42	3.33	2.84
Cetane Index $_{2\ Variable}$		**53**	**53**	**52**	53	53	52	53
Cetane Index $_{4\ Variable}$	45 (min)	**53**	**52**	**52**	53	52	52	52
Cetane Number	43 (min)	**51**	**50**	**50**	51	50	50	50
Distillation, °C IBP		**170**	**166**	**159**	159	167	167	170
T_{10}		**226**	**220**	**211**	222	226	223	211
T_{20}		**252**	**244**	**232**	247	252	247	232
T_{50}		**293**	**289**	**278**	292	293	291	278
T_{90}		**337**	**334**	**329**	337	334	335	329
T_{95}	282 - 360	**349**	**345**	**341**	349	345	346	341
FBP		**357**	**353**	**349**	357	352	354	349
% FAME	10 (min/max)	**10**	**10**	**10**	10	10	10	10

Specification shown is for standard grade diesel

Colombia







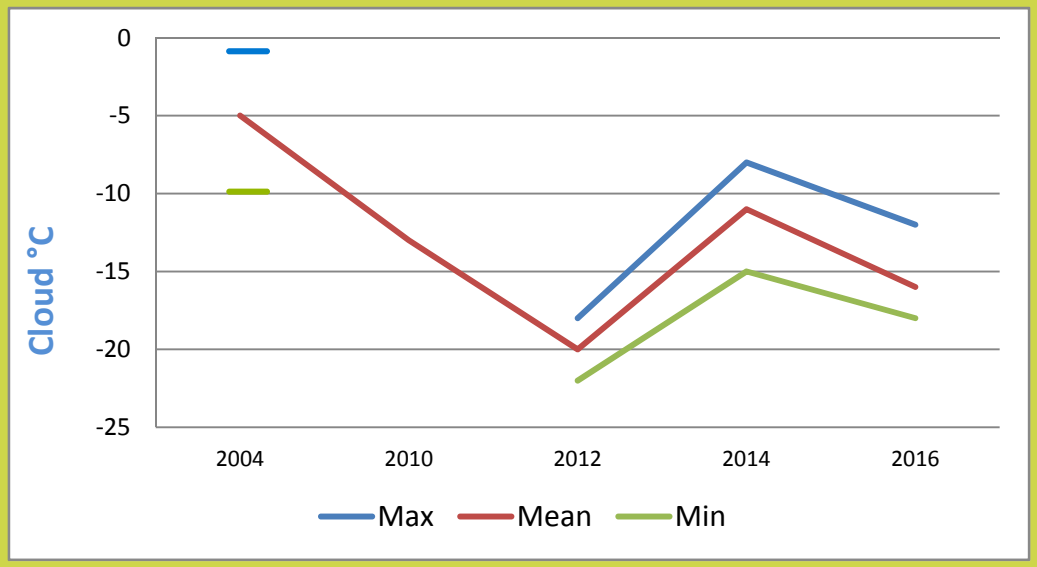
Peru

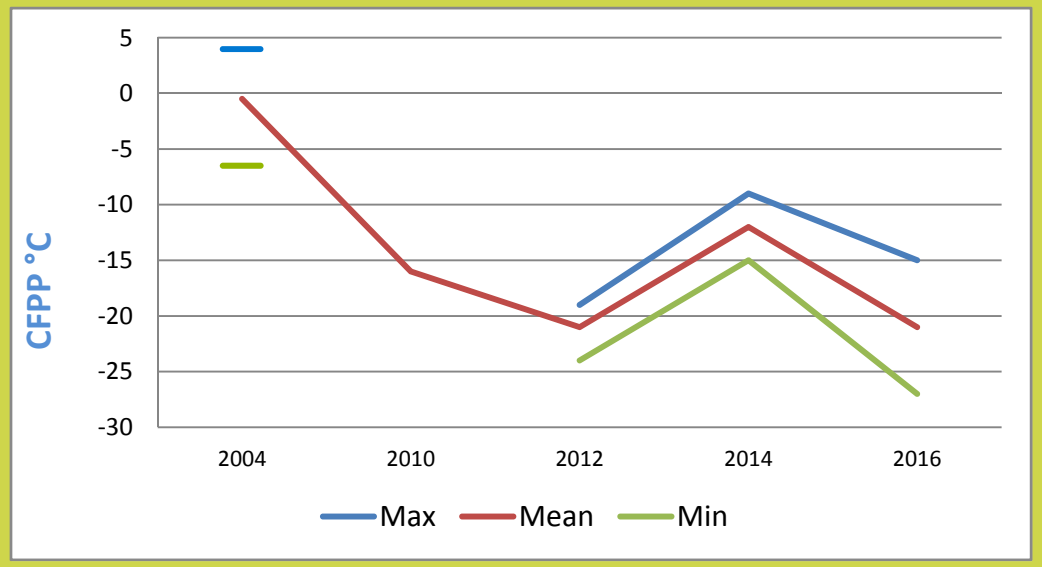
National standards and physical inspection data

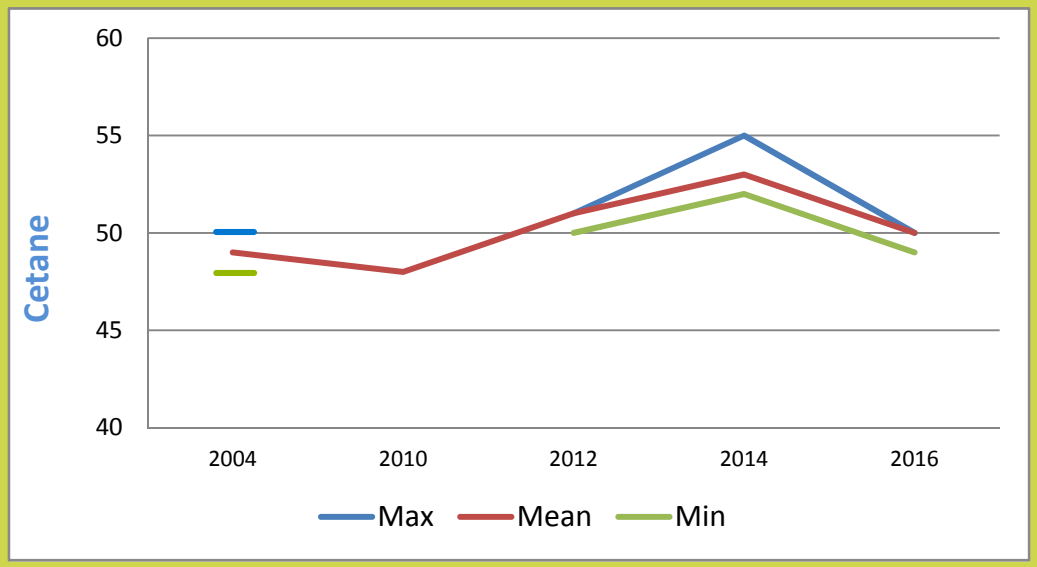
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1504425	DIES 1504426	DIES 1504427
Cloud Point, °C		**-12**	**-16**	**-18**	-18	-18	-12
CFPP, °C	-8 (max)	**-15**	**-21**	**-27**	-27	-22	-15
Pour Point, °C	4 (max)	**-21**	**-23**	**-24**	-24	-24	-21
HFRR, µm	520 (max)	**191**	**187**	**185**	185	191	185
Wax Content @ 10°C Below Cloud, wt%		**1.9**	**1.4**	**1.1**	1.2	1.1	1.9
Rancimat, hrs		**22**	**19**	**15**	15	22	20
Sulphur, ppm	50 (max)	**34**	**25**	**13**	27	34	13
Density @15°C, kg/m^3		**841**	**831**	**825**	827	825	841
Viscosity @ 40°C, cSt	1.9 - 4.1	**2.83**	**2.38**	**2.14**	2.17	2.14	2.83
Cetane Index $_{2\ Variable}$		**52**	**51**	**51**	51	51	52
Cetane Index $_{4\ Variable}$	40 (min)	**51**	**51**	**50**	50	51	51
Cetane Number	45 (min)	**50**	**50**	**49**	50	49	50
Distillation, °C IBP		**164**	**163**	**162**	162	162	164
T_{10}		**203**	**191**	**184**	185	184	203
T_{20}		**225**	**207**	**198**	200	198	225
T_{50}		**278**	**258**	**248**	249	248	278
T_{90}	282 - 360	**332**	**327**	**323**	323	325	332
T_{95}		**345**	**340**	**336**	336	338	345
FBP		**353**	**348**	**346**	346	346	353
% FAME	5 (max)	**5**	**5**	**5**	5	5	5

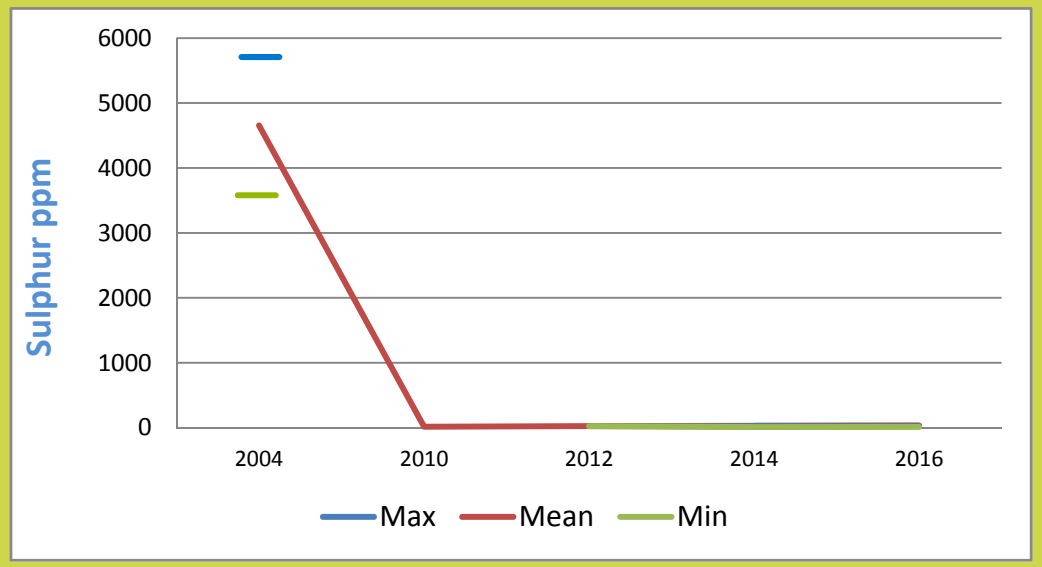
Specification shown for S-50 grade diesel

Peru









USA – East Coast

National standards and physical inspection data

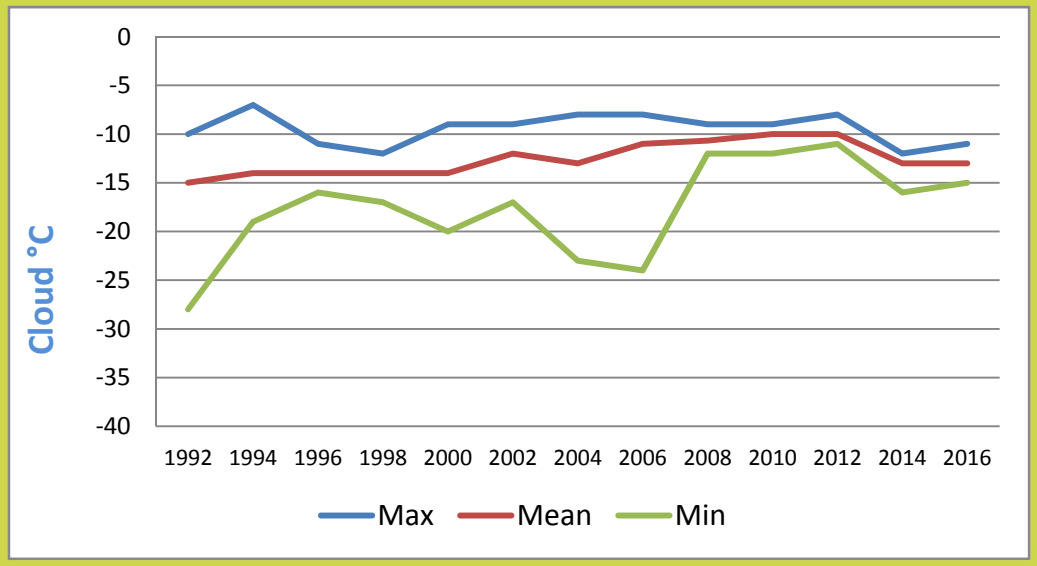
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600131	DIES 1600168	DIES 1600170	DIES 1600172	DIES 1600173	DIES 1600183	DIES 1600184
Cloud Point, °C		**-11**	**-13**	**-15**	-14	-13	-13	-15	-15	-12	-13
LTFT, °C		**-12**	**-15**	**-21**	-14	-19	-16	-21	-16	-12	-13
CFPP, °C		**-14**	**-19**	**-32**	-22	-24	-19	-32	-16	-16	-18
Pour Point, °C		**-21**	**-25**	**-36**	-24	-30	-24	-36	-21	-24	-21
HFRR, µm	520 (max)	**425**	**328**	**204**	402	245	261	361	425	327	204
Wax Content @ 10°C Below Cloud, wt%		**2.5**	**1.8**	**1.3**	1.8	1.6	1.8	1.4	1.3	2.3	1.7
Rancimat, hrs		**>30**	**>25**	**10**	>30	27	10	>30	23	>30	23
Sulphur, ppm	15 (max)	**9**	**7**	**5**	5	6	7	7	7	8	7
Density @15°C, kg/m^3		**849**	**844**	**836**	849	844	846	844	836	844	844
Viscosity @ 40°C, cSt	1.9 - 4.1	**2.70**	**2.51**	**2.37**	2.52	2.70	2.60	2.46	2.44	2.46	2.58
Cetane Index $_{2\ Variable}$		**50**	**48**	**46**	46	49	49	48	50	48	49
Cetane Index $_{4\ Variable}$	40 (min)	**49**	**47**	**45**	45	49	48	47	49	47	48
Cetane Number	40 (min)	**48**	**45**	**42**	42	47	48	44	48	44	45
Distillation, °C IBP		**165**	**162**	**155**	165	164	165	155	163	162	163
T_{10}		**206**	**202**	**196**	204	206	206	198	196	203	202
T_{20}		**224**	**220**	**212**	223	224	223	217	212	221	220
T_{50}		**268**	**263**	**259**	261	268	267	260	259	261	264
T_{90}	282 - 338	**329**	**323**	**314**	321	328	329	323	326	317	326
T_{95}		**346**	**339**	**328**	339	342	344	340	343	333	341
FBP		**353**	**348**	**341**	351	350	352	350	349	344	350
% FAME	5 (max)	**5**	**1**	**0**	0	5	4	0	0	0	4

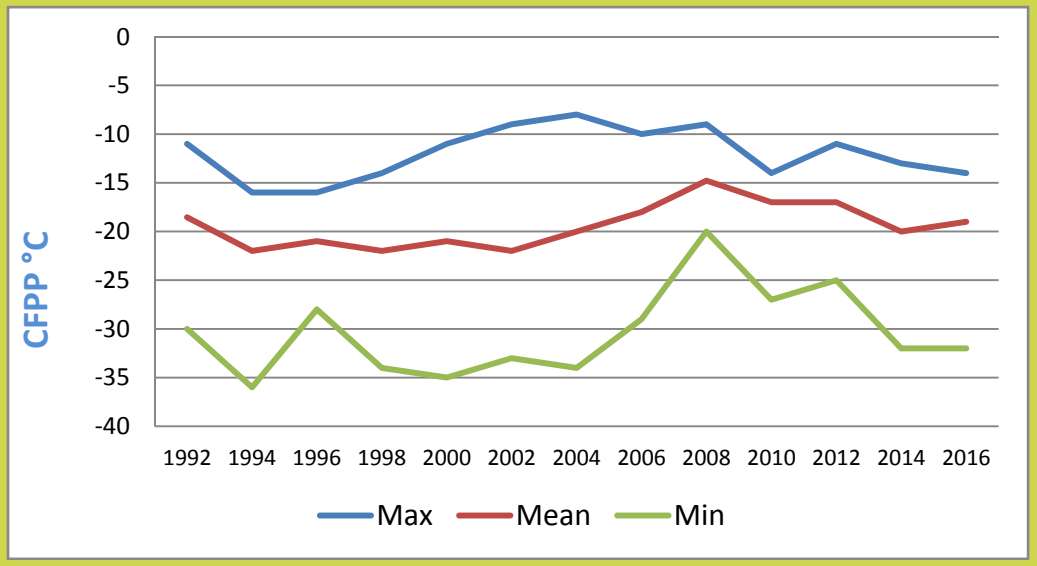
USA – East Coast (continued)

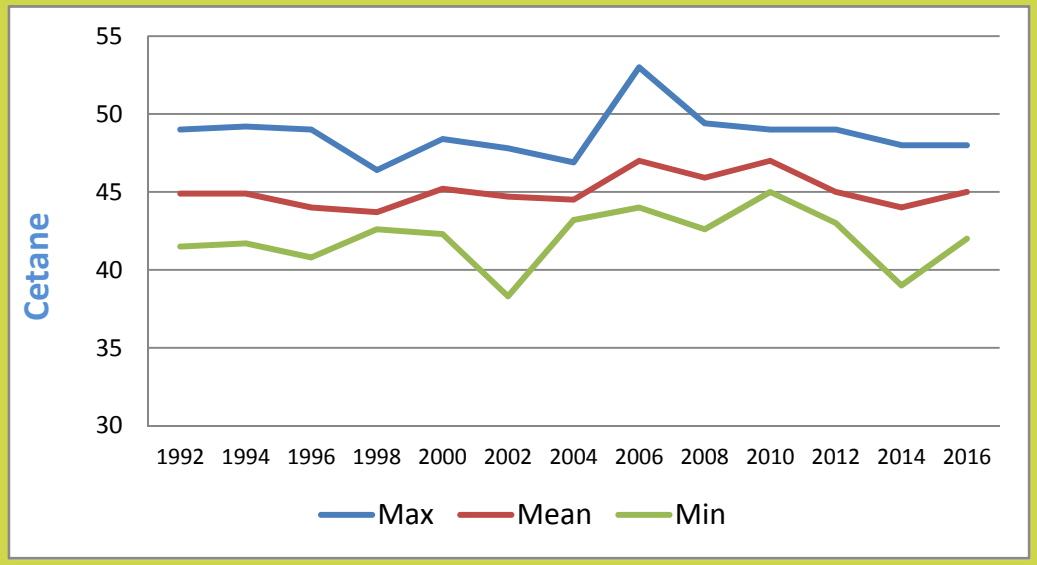
National standards and physical inspection data

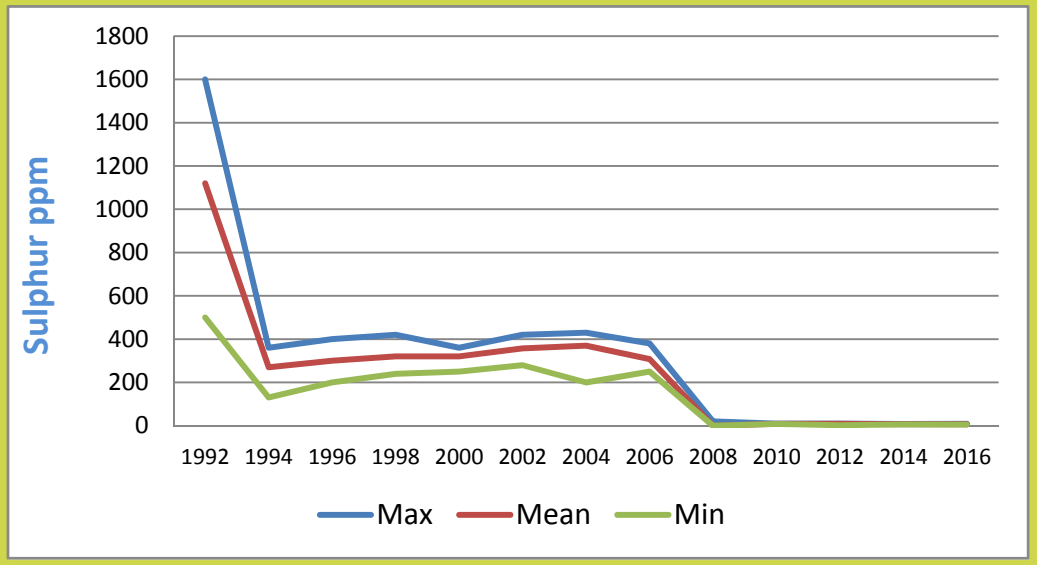
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600185	DIES 1600186	DIES 1600187
Cloud Point, °C		**-11**	**-13**	**-15**	-14	-11	-11
LTFT, °C		**-12**	**-15**	**-21**	-14	-12	-12
CFPP, °C		**-14**	**-19**	**-32**	-14	-15	-15
Pour Point, °C		**-21**	**-25**	**-36**	-24	-24	-24
HFRR, µm	520 (max)	**425**	**328**	**204**	345	321	391
Wax Content @ 10°C Below Cloud, wt%		**2.5**	**1.8**	**1.3**	1.4	2.3	2.5
Rancimat, hrs		**>30**	**>25**	**10**	>30	>30	>30
Sulphur, ppm	15 (max)	**9**	**7**	**5**	8	7	9
Density @15°C, kg/m^3		**849**	**844**	**836**	842	845	845
Viscosity @ 40°C, cSt	1.9 - 4.1	**2.70**	**2.51**	**2.37**	2.60	2.37	2.41
Cetane Index $_{2\ Variable}$		**50**	**48**	**46**	49	48	48
Cetane Index $_{4\ Variable}$	40 (min)	**49**	**47**	**45**	48	46	47
Cetane Number	40 (min)	**48**	**45**	**42**	45	44	45
Distillation, °C IBP		**165**	**162**	**155**	164	156	159
T_{10}		**206**	**202**	**196**	203	198	204
T_{20}		**224**	**220**	**212**	220	217	222
T_{50}		**268**	**263**	**259**	262	262	262
T_{90}	282 - 338	**329**	**323**	**314**	327	316	314
T_{95}		**346**	**339**	**328**	346	333	328
FBP		**353**	**348**	**341**	353	343	341
% FAME	5 (max)	**5**	**1**	**0**	0	0	0

USA – East Coast









USA – Midwest

National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600126	DIES 1600127	DIES 1600128	DIES 1600129	DIES 1600130	DIES 1600144	DIES 1600145
Cloud Point, °C		**-10**	**-17**	**-28**	-12	-13	-18	-17	-15	-20	-20
LTFT, °C		**-12**	**-20**	**-39**	-12	-12	-21	-17	-15	-24	-23
CFPP, °C		**-12**	**-22**	**-46**	-14	-15	-34	-17	-18	-24	-31
Pour Point, °C		**-15**	**-30**	**-54**	-15	-18	-39	-24	-24	-27	-30
HFRR, µm	520 (max)	**534**	**406**	**182**	465	447	380	311	469	182	217
Wax Content @ 10°C Below Cloud, wt%		**2.4**	**1.4**	**0.6**	2.4	1.6	0.8	0.7	1.7	1.7	1.5
Rancimat, hrs		**>30**	**>25**	**13**	>30	>30	>30	>30	>30	>30	>30
Sulphur, ppm	15 (max)	**10**	**7**	**4**	<3	<3	9	9	5	6	9
Density @15°C, kg/m^3		**868**	**843**	**814**	814	825	846	840	827	868	855
Viscosity @ 40°C, cSt	1.9 - 4.1	**3.16**	**2.56**	**2.13**	2.36	2.26	2.37	2.13	2.29	2.81	2.71
Cetane Index $_{2\ Variable}$		**56**	**48**	**43**	56	51	46	45	51	43	46
Cetane Index $_{4\ Variable}$	40 (min)	**58**	**47**	**41**	58	52	45	45	51	41	45
Cetane Number	40 (min)	**55**	**45**	**40**	55	49	41	40	49	40	42
Distillation, °C IBP		**190**	**164**	**127**	177	165	127	157	171	177	164
T_{10}		**222**	**205**	**190**	205	197	194	190	201	214	211
T_{20}		**236**	**221**	**203**	217	210	212	203	214	231	228
T_{50}		**275**	**259**	**243**	253	249	255	243	249	272	269
T_{90}	282 - 338	**330**	**322**	**312**	312	316	328	319	320	329	329
T_{95}		**348**	**339**	**327**	327	333	348	339	340	339	340
FBP		**360**	**350**	**340**	340	347	360	354	353	348	347
% FAME	5 (max)	**12**	**2**	**0**	0	0	0	0	0	12	11

USA – Midwest (continued)

National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600146	DIES 1600147	DIES 1600148	DIES 1600149	DIES 1600150	DIES 1600153	DIES 1600154
Cloud Point, °C		**-10**	**-17**	**-28**	-20	-16	-21	-19	-21	-22	-16
LTFT, °C		**-12**	**-20**	**-39**	-39	-20	-25	-30	-22	-25	-18
CFPP, °C		**-12**	**-22**	**-46**	-28	-30	-32	-45	-20	-21	-19
Pour Point, °C		**-15**	**-30**	**-54**	-51	-33	-36	-42	-30	-30	-45
HFRR, µm	520 (max)	**534**	**406**	**182**	209	525	214	428	446	231	410
Wax Content @ 10°C Below Cloud, wt%		**2.4**	**1.4**	**0.6**	1.5	1.4	1.5	1.1	1.5	1.2	1.6
Rancimat, hrs		**>30**	**>25**	**13**	>30	>30	>30	>30	>30	>30	>30
Sulphur, ppm	15 (max)	**10**	**7**	**4**	10	6	9	9	8	10	6
Density @15°C, kg/m^3		**868**	**843**	**814**	854	841	853	833	860	852	833
Viscosity @ 40°C, cSt	1.9 - 4.1	**3.16**	**2.56**	**2.13**	2.71	2.57	2.69	2.17	2.79	2.60	2.49
Cetane Index $_{2\ Variable}$		**56**	**48**	**43**	46	49	46	48	44	46	50
Cetane Index $_{4\ Variable}$	40 (min)	**58**	**47**	**41**	45	48	45	48	43	45	50
Cetane Number	40 (min)	**55**	**45**	**40**	43	45	42	52	41	42	51
Distillation, °C IBP		**190**	**164**	**127**	155	167	164	160	167	161	180
T_{10}		**222**	**205**	**190**	209	206	210	194	213	208	203
T_{20}		**236**	**221**	**203**	227	223	227	209	231	225	213
T_{50}		**275**	**259**	**243**	269	260	268	245	266	263	254
T_{90}	282 - 338	**330**	**322**	**312**	329	320	328	312	321	325	322
T_{95}		**348**	**339**	**327**	340	337	338	328	337	338	335
FBP		**360**	**350**	**340**	347	350	346	340	351	348	342
% FAME	5 (max)	**12**	**2**	**0**	11	0	11	0	0	5	0

USA – Midwest (continued)

National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600156	DIES 1600157	DIES 1600159	DIES 1600161	DIES 1600166	DIES 1600174	DIES 1600175
Cloud Point, °C		**-10**	**-17**	**-28**	-11	-15	-13	-13	-12	-23	-20
LTFT, °C		**-12**	**-20**	**-39**	-24	-17	-16	-15	-15	-24	-23
CFPP, °C		**-12**	**-22**	**-46**	-19	-15	-17	-16	-14	-24	-20
Pour Point, °C		**-15**	**-30**	**-54**	-42	-21	-21	-21	-18	-33	-30
HFRR, µm	520 (max)	**534**	**406**	**182**	404	396	419	389	430	454	445
Wax Content @ 10°C Below Cloud, wt%		**2.4**	**1.4**	**0.6**	2.1	1.7	1.6	1.6	1.9	0.8	0.6
Rancimat, hrs		**>30**	**>25**	**13**	>30	>30	>30	>30	>30	>30	>30
Sulphur, ppm	15 (max)	**10**	**7**	**4**	7	6	6	6	6	<3	6
Density @15°C, kg/m^3		**868**	**843**	**814**	840	834	833	834	832	855	858
Viscosity @ 40°C, cSt	1.9 - 4.1	**3.16**	**2.56**	**2.13**	3.16	2.49	2.49	2.46	2.56	2.77	2.92
Cetane Index $_{2\ Variable}$		**56**	**48**	**43**	52	50	51	51	52	45	45
Cetane Index $_{4\ Variable}$	40 (min)	**58**	**47**	**41**	53	50	51	50	52	44	44
Cetane Number	40 (min)	**55**	**45**	**40**	51	48	51	49	50	40	40
Distillation, °C IBP		**190**	**164**	**127**	190	154	161	160	159	164	166
T_{10}		**222**	**205**	**190**	222	199	200	197	202	210	216
T_{20}		**236**	**221**	**203**	236	216	218	215	220	229	233
T_{50}		**275**	**259**	**243**	275	258	260	259	263	264	268
T_{90}	282 - 338	**330**	**322**	**312**	330	320	325	325	327	318	327
T_{95}		**348**	**339**	**327**	341	337	345	345	346	337	348
FBP		**360**	**350**	**340**	347	352	356	356	356	346	356
% FAME	5 (max)	**12**	**2**	**0**	0	0	0	0	0	0	0

USA – Midwest (continued)

National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600176	DIES 1600177	DIES 1600178	DIES 1600179	DIES 1600180	DIES 1600181	DIES 1600182
Cloud Point, °C		**-10**	**-17**	**-28**	-18	-21	-18	-22	-28	-28	-20
LTFT, °C		**-12**	**-20**	**-39**	-19	-25	-16	-27	-32	-34	-21
CFPP, °C		**-12**	**-22**	**-46**	-17	-23	-17	-22	-46	-46	-24
Pour Point, °C		**-15**	**-30**	**-54**	-21	-30	-24	-39	-51	-54	-30
HFRR, µm	520 (max)	**534**	**406**	**182**	422	479	485	521	255	342	312
Wax Content @ 10°C Below Cloud, wt%		**2.4**	**1.4**	**0.6**	1.6	1.1	1.5	1.4	0.6	0.6	1.0
Rancimat, hrs		**>30**	**>25**	**13**	21	>30	>30	>30	>30	>30	>30
Sulphur, ppm	15 (max)	**10**	**7**	**4**	5	7	5	8	7	7	8
Density @15°C, kg/m^3		**868**	**843**	**814**	846	845	849	858	846	845	860
Viscosity @ 40°C, cSt	1.9 - 4.1	**3.16**	**2.56**	**2.13**	2.65	2.53	2.88	2.65	2.33	2.29	3.02
Cetane Index $_{2\ Variable}$		**56**	**48**	**43**	47	46	47	44	45	45	45
Cetane Index $_{4\ Variable}$	40 (min)	**58**	**47**	**41**	47	46	47	43	44	45	44
Cetane Number	40 (min)	**55**	**45**	**40**	44	43	44	41	45	45	40
Distillation, °C IBP		**190**	**164**	**127**	163	163	166	171	159	161	160
T_{10}		**222**	**205**	**190**	213	207	218	214	194	195	214
T_{20}		**236**	**221**	**203**	230	222	234	229	211	211	233
T_{50}		**275**	**259**	**243**	262	256	266	262	251	250	274
T_{90}	282 - 338	**330**	**322**	**312**	320	315	321	316	321	321	330
T_{95}		**348**	**339**	**327**	340	333	340	333	336	337	343
FBP		**360**	**350**	**340**	352	347	354	346	347	349	354
% FAME	5 (max)	**12**	**2**	**0**	0	0	0	0	3	3	5

USA – Midwest (continued)

National standards and physical inspection data

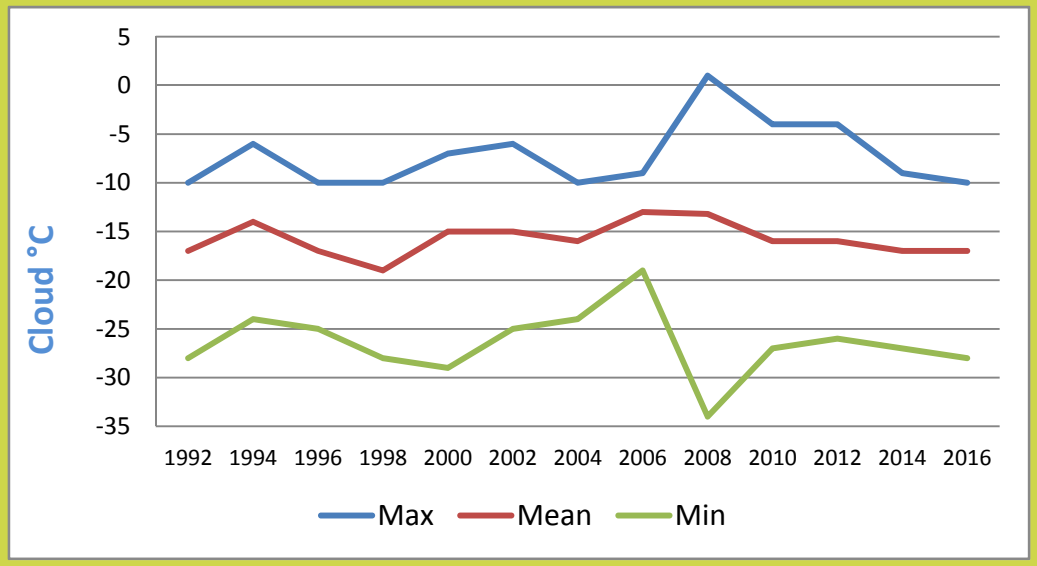
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600189	DIES 1600190	DIES 1600191	DIES 1600192	DIES 1600193	DIES 1600194	DIES 1600195
Cloud Point, °C		**-10**	**-17**	**-28**	-15	-13	-11	-10	-15	-14	-13
LTFT, °C		**-12**	**-20**	**-39**	-22	-13	-12	-15	-14	-14	-13
CFPP, °C		**-12**	**-22**	**-46**	-26	-15	-12	-14	-17	-15	-14
Pour Point, °C		**-15**	**-30**	**-54**	-39	-24	-18	-27	-24	-21	-27
HFRR, µm	520 (max)	**534**	**406**	**182**	492	521	533	434	474	355	486
Wax Content @ 10°C Below Cloud, wt%		**2.4**	**1.4**	**0.6**	1.0	1.4	1.5	1.8	1.6	1.4	1.3
Rancimat, hrs		**>30**	**>25**	**13**	>30	19	13	20	>30	>30	>30
Sulphur, ppm	15 (max)	**10**	**7**	**4**	6	6	7	4	5	5	7
Density @15°C, kg/m^3		**868**	**843**	**814**	841	843	834	831	839	848	845
Viscosity @ 40°C, cSt	1.9 - 4.1	**3.16**	**2.56**	**2.13**	2.43	2.58	2.27	2.49	2.57	2.77	2.45
Cetane Index $_{2\ Variable}$		**56**	**48**	**43**	48	48	48	51	49	47	46
Cetane Index $_{4\ Variable}$	40 (min)	**58**	**47**	**41**	47	47	48	51	49	47	46
Cetane Number	40 (min)	**55**	**45**	**40**	47	45	46	49	46	48	46
Distillation, °C IBP		**190**	**164**	**127**	165	165	161	165	168	164	168
T_{10}		**222**	**205**	**190**	200	206	196	199	207	215	200
T_{20}		**236**	**221**	**203**	215	221	209	215	222	229	215
T_{50}		**275**	**259**	**243**	256	258	249	257	260	265	255
T_{90}	282 - 338	**330**	**322**	**312**	322	323	320	323	322	325	327
T_{95}		**348**	**339**	**327**	339	339	337	340	337	339	345
FBP		**360**	**350**	**340**	352	352	350	356	350	352	356
% FAME	5 (max)	**12**	**2**	**0**	0	0	0	0	0	3	0

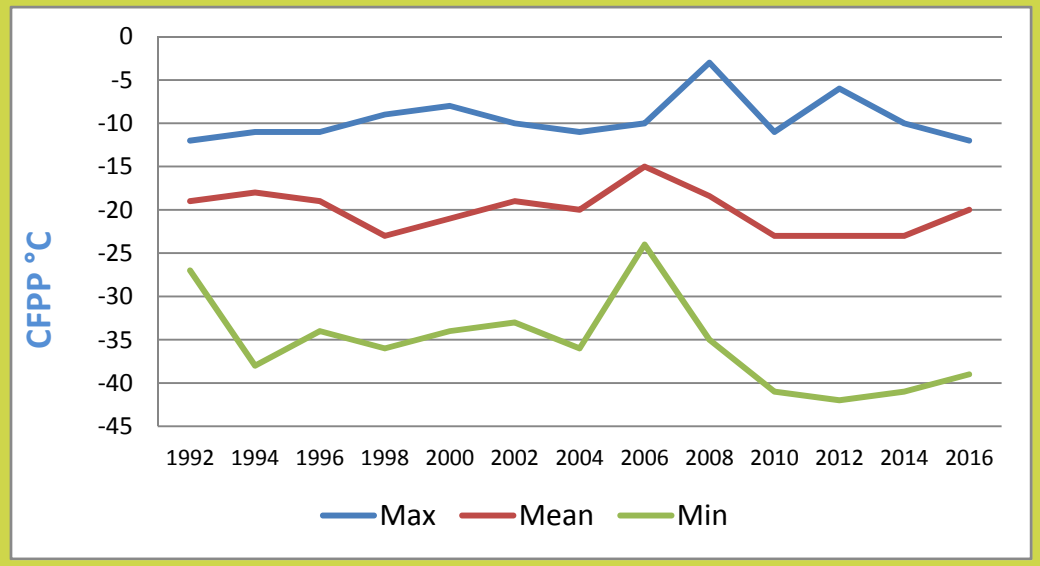
USA – Midwest (continued)

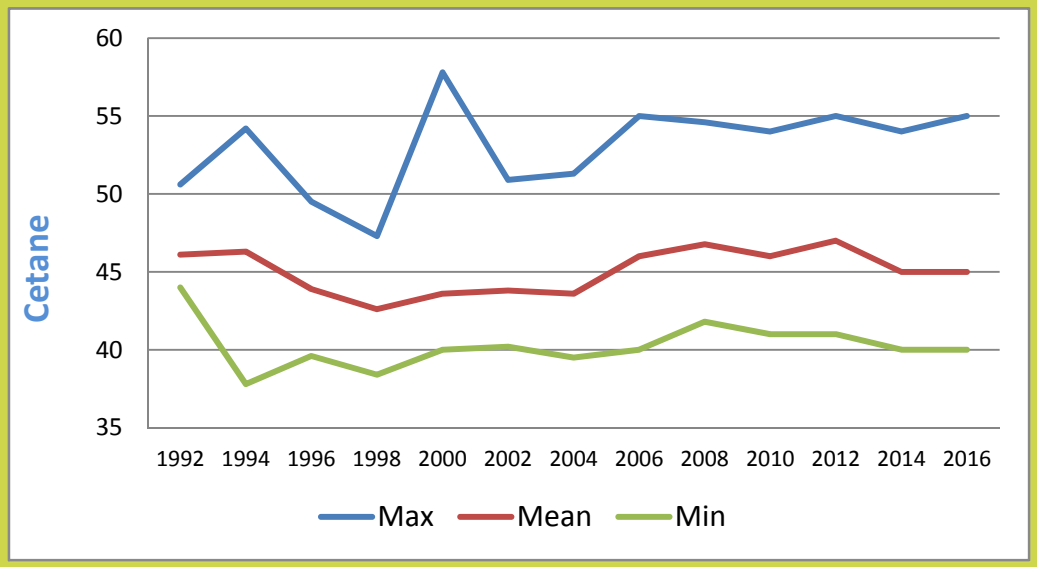
National standards and physical inspection data

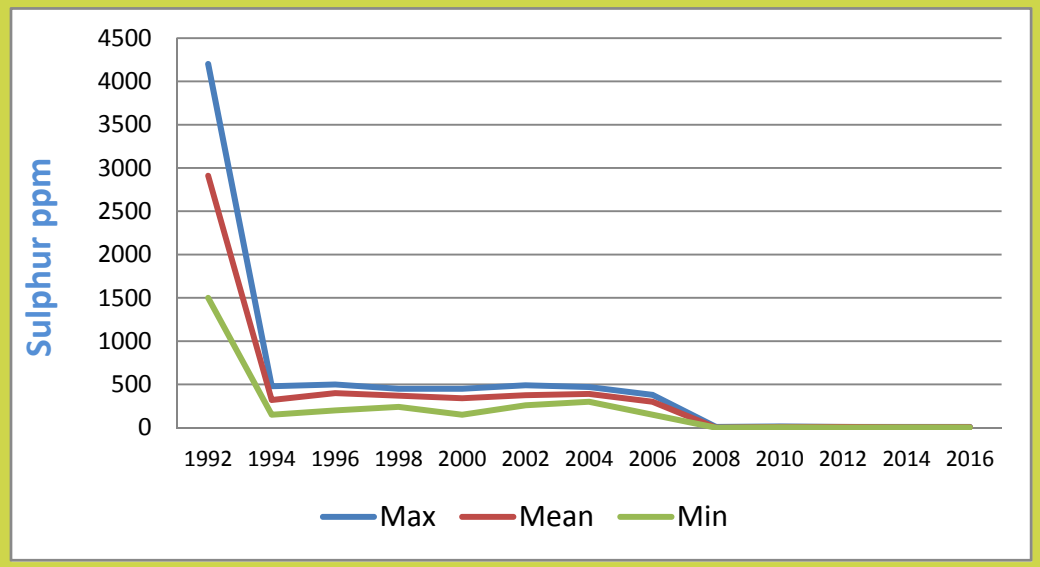
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600196	DIES 1600197
Cloud Point, °C		**-10**	**-17**	**-28**	-13	-13
LTFT, °C		**-12**	**-20**	**-39**	-14	-17
CFPP, °C		**-12**	**-22**	**-46**	-13	-15
Pour Point, °C		**-15**	**-30**	**-54**	-21	-24
HFRR, µm	520 (max)	**534**	**406**	**182**	499	534
Wax Content @ 10°C Below Cloud, wt%		**2.4**	**1.4**	**0.6**	1.5	1.4
Rancimat, hrs		**>30**	**>25**	**13**	21	>30
Sulphur, ppm	15 (max)	**10**	**7**	**4**	6	6
Density @15°C, kg/m^3		**868**	**843**	**814**	839	842
Viscosity @ 40°C, cSt	1.9 - 4.1	**3.16**	**2.56**	**2.13**	2.51	2.56
Cetane Index $_{2\ Variable}$		**56**	**48**	**43**	48	48
Cetane Index $_{4\ Variable}$	40 (min)	**58**	**47**	**41**	48	48
Cetane Number	40 (min)	**55**	**45**	**40**	47	46
Distillation, °C IBP		**190**	**164**	**127**	170	169
T_{10}		**222**	**205**	**190**	204	208
T_{20}		**236**	**221**	**203**	219	222
T_{50}		**275**	**259**	**243**	256	257
T_{90}	282 - 338	**330**	**322**	**312**	322	323
T_{95}		**348**	**339**	**327**	340	340
FBP		**360**	**350**	**340**	351	351
% FAME	5 (max)	**12**	**2**	**0**	0	0

USA – Midwest









USA – West Coast

National standards and physical inspection data

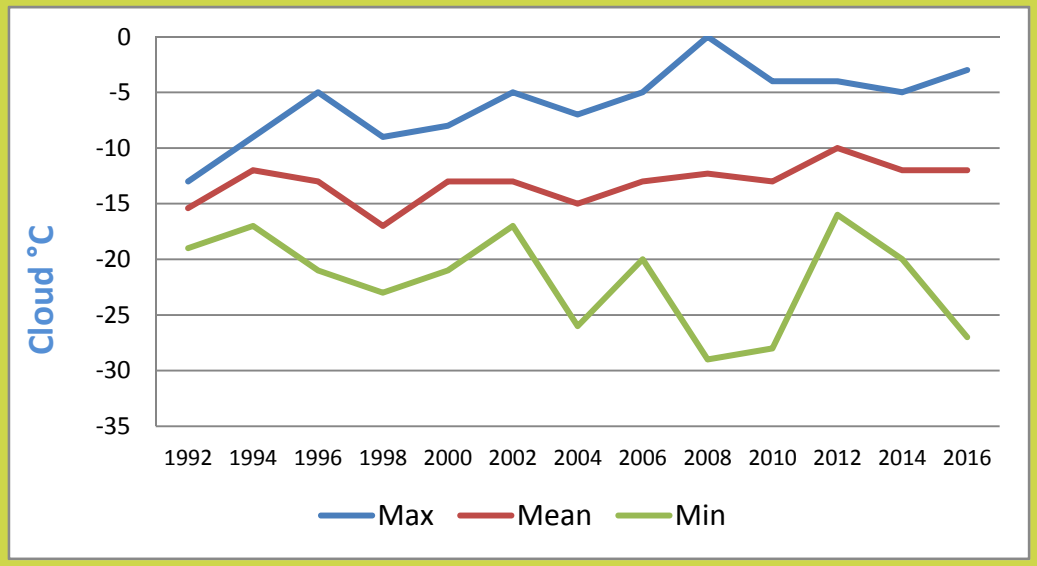
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600132	DIES 1600134	DIES 1600135	DIES 1600136	DIES 1600137	DIES 1600139	DIES 1600141
Cloud Point, °C		**-3**	**-12**	**-27**	-3	-12	-27	-7	-13	-6	-4
LTFT, °C		**-2**	**-13**	**-26**	-4	-13	-26	-5	-13	-7	-2
CFPP, °C		**-4**	**-13**	**-26**	-4	-11	-26	-10	-15	-10	-6
Pour Point, °C		**-6**	**-21**	**-45**	-6	-15	-45	-9	-24	-15	-9
HFRR, µm	520 (max)	**580**	**449**	**302**	354	302	439	580	438	552	403
Wax Content @ 10°C Below Cloud, wt%		**3.3**	**1.9**	**0.6**	2.8	2.4	3.3	1.6	0.7	0.6	2.8
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30	>30	>30	>30	>30	>30
Sulphur, ppm	15 (max)	**8**	**6**	**3**	<3	8	<3	6	3	5	<3
Density @15°C, kg/m^3		**849**	**830**	**780**	823	849	780	833	837	835	824
Viscosity @ 40°C, cSt	1.9 - 4.1	**3.41**	**2.67**	**2.36**	2.48	3.41	2.96	2.72	2.44	2.59	2.51
Cetane Index $_{2\ Variable}$		**76**	**53**	**47**	54	51	76	52	48	49	54
Cetane Index $_{4\ Variable}$	40 (min)	**93**	**55**	**47**	55	51	93	52	48	49	55
Cetane Number	40 (min)	**82**	**54**	**45**	54	50	82	55	52	55	55
Distillation, °C IBP		**184**	**172**	**157**	183	181	157	173	170	173	184
T_{10}		**262**	**213**	**199**	208	234	262	203	199	204	209
T_{20}		**271**	**226**	**212**	220	249	271	218	212	215	221
T_{50}		**283**	**261**	**249**	257	283	280	262	249	252	258
T_{90}	282 - 338	**333**	**322**	**292**	328	327	292	333	322	332	327
T_{95}		**356**	**338**	**297**	347	339	297	351	346	356	345
FBP		**369**	**350**	**306**	357	348	306	361	359	369	354
% FAME	5 (max)	**5**	**1**	**0**	0	5	0	0	0	0	0

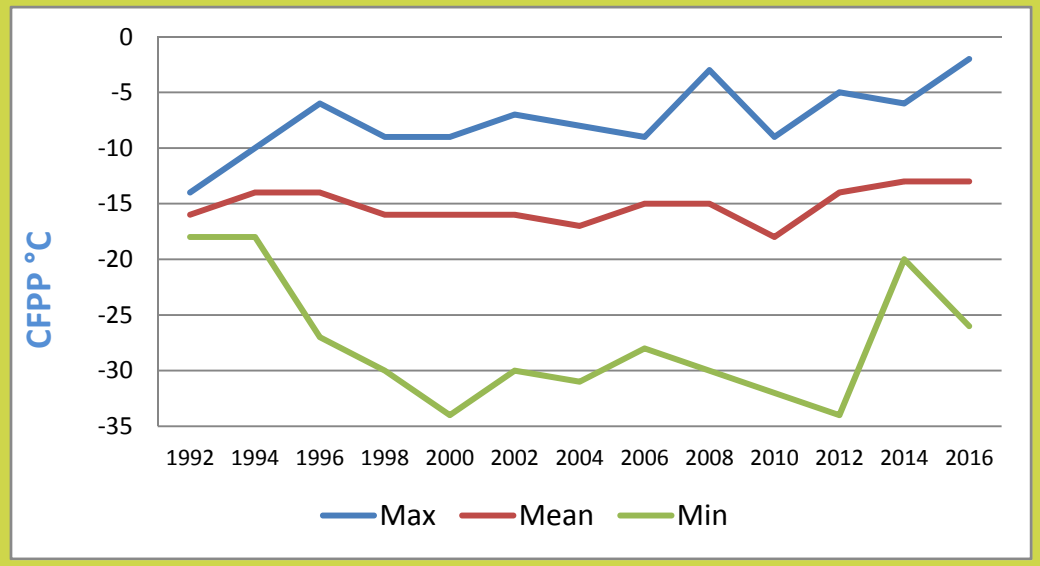
USA – West Coast (continued)

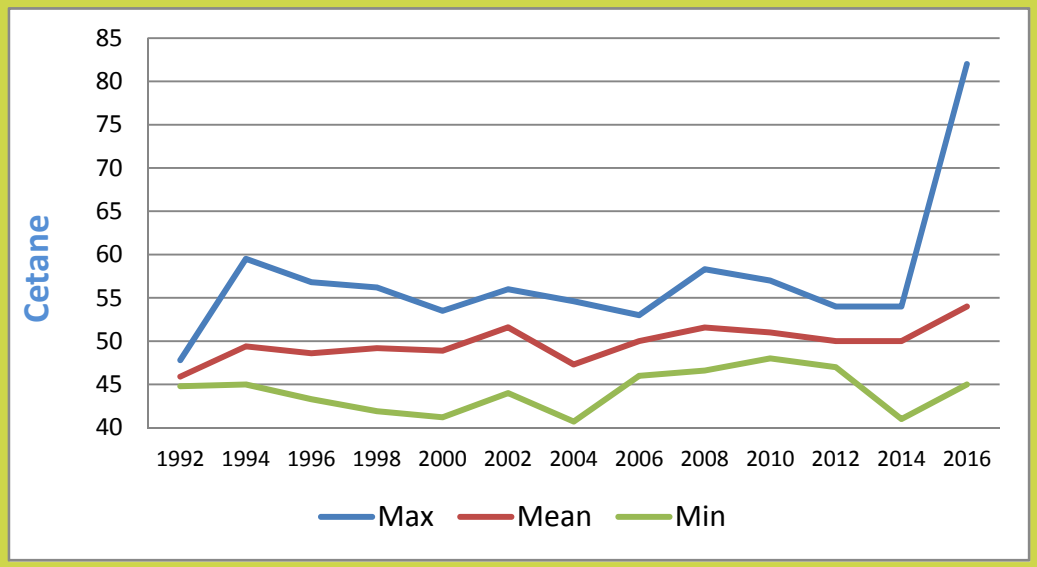
National standards and physical inspection data

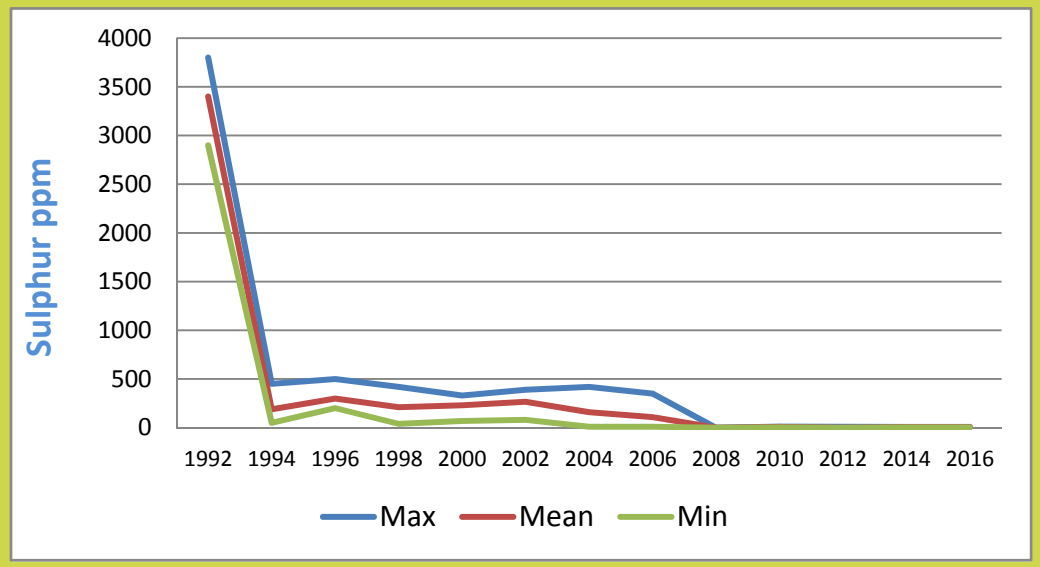
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600142	DIES 1600143	DIES 1600188
Cloud Point, °C		**-3**	**-12**	**-27**	-15	-17	-18
LTFT, °C		**-2**	**-13**	**-26**	-18	-19	-21
CFPP, °C		**-4**	**-13**	**-26**	-20	-17	-16
Pour Point, °C		**-6**	**-21**	**-45**	-33	-24	-30
HFRR, µm	520 (max)	**580**	**449**	**302**	437	462	528
Wax Content @ 10°C Below Cloud, wt%		**3.3**	**1.9**	**0.6**	1.6	1.5	1.2
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30	>30
Sulphur, ppm	15 (max)	**8**	**6**	**3**	8	6	7
Density @15°C, kg/m^3		**849**	**830**	**780**	843	838	843
Viscosity @ 40°C, cSt	1.9 - 4.1	**3.41**	**2.67**	**2.36**	2.70	2.36	2.50
Cetane Index $_{2\ Variable}$		**76**	**53**	**47**	49	48	47
Cetane Index $_{4\ Variable}$	40 (min)	**93**	**55**	**47**	48	48	47
Cetane Number	40 (min)	**82**	**54**	**45**	45	45	47
Distillation, °C IBP		**184**	**172**	**157**	173	166	161
T_{10}		**262**	**213**	**199**	207	201	202
T_{20}		**271**	**226**	**212**	222	216	217
T_{50}		**283**	**261**	**249**	265	253	256
T_{90}	282 - 338	**333**	**322**	**292**	324	315	319
T_{95}		**356**	**338**	**297**	338	332	335
FBP		**369**	**350**	**306**	349	345	349
% FAME	5 (max)	**5**	**1**	**0**	1	0	0

USA – West Coast









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Bahrain

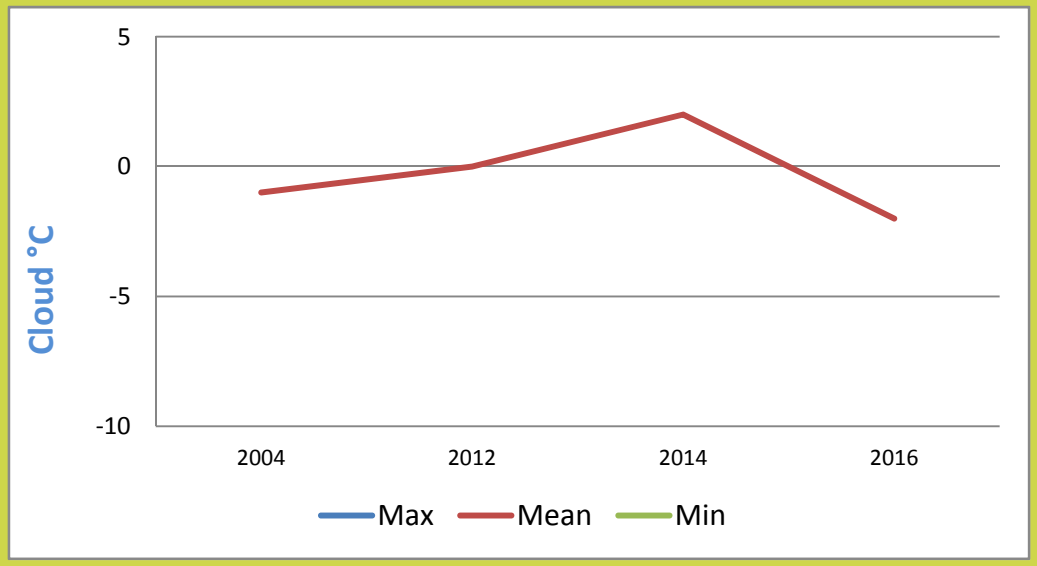
Middle East and Africa

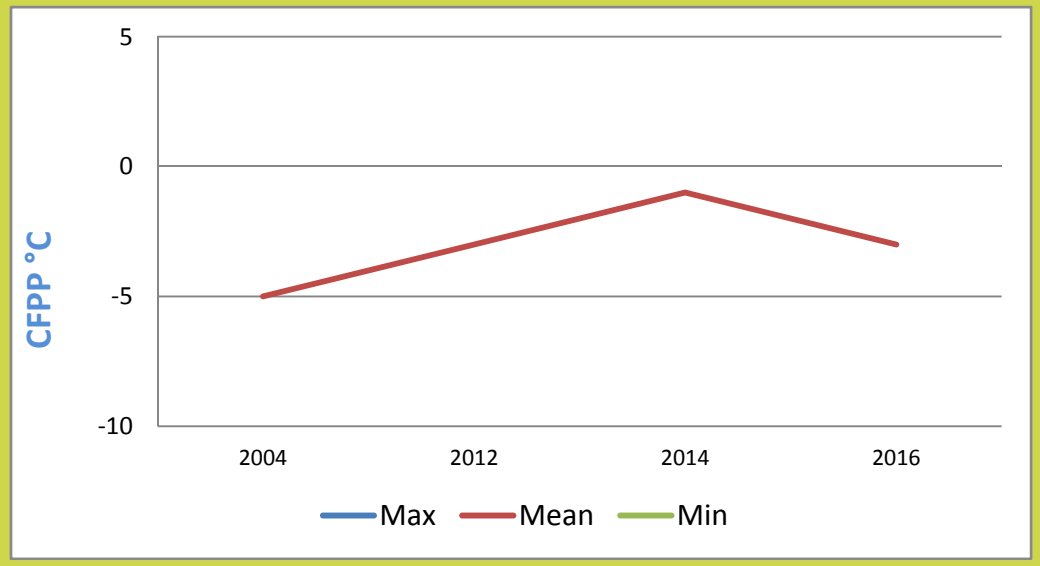
National standards and physical inspection data

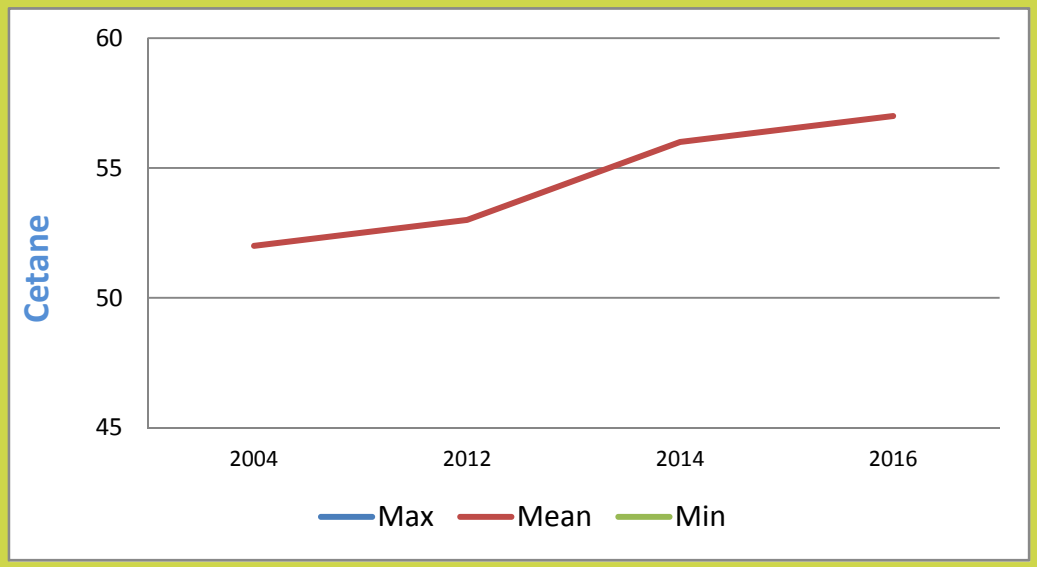
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600351
Cloud Point, °C			**-2**		-2
CFPP, °C	0 (max)		**-3**		-3
Pour Point, °C			**-9**		-9
HFRR, µm	460 (max)		**449**		449
Wax Content @ 10°C Below Cloud, wt%			**2.6**		2.6
Rancimat, hrs			**>30**		>30
Sulphur, ppm	500		**324**		324
Density @15°C, kg/m^3	820 - 845		**834**		834
Viscosity @ 40°C, cSt	2.0 - 4.5		**3.65**		3.65
Cetane Index $_{2\ Variable}$	46 (min)		**58**		58
Cetane Index $_{4\ Variable}$			**60**		60
Cetane Number			**57**		57
Distillation, °C IBP			**149**		149
T_{10}			**237**		237
T_{20}			**257**		257
T_{50}			**292**		292
T_{90}	357 (max)		**347**		347
T_{95}			**357**		357
FBP	385 (max)		**366**		366
% FAME			**0**		0

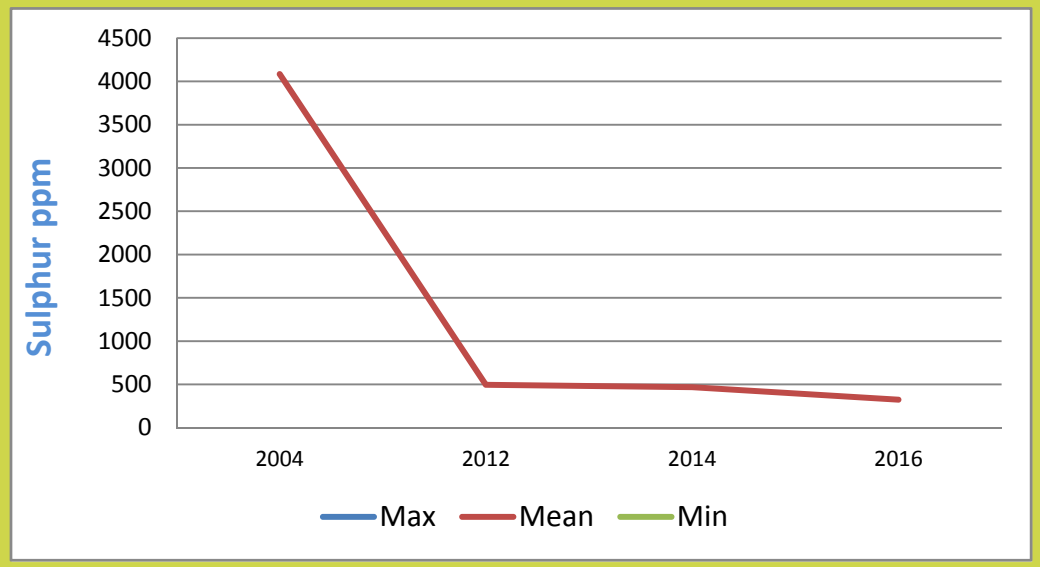
Bahrain

Middle East and Africa









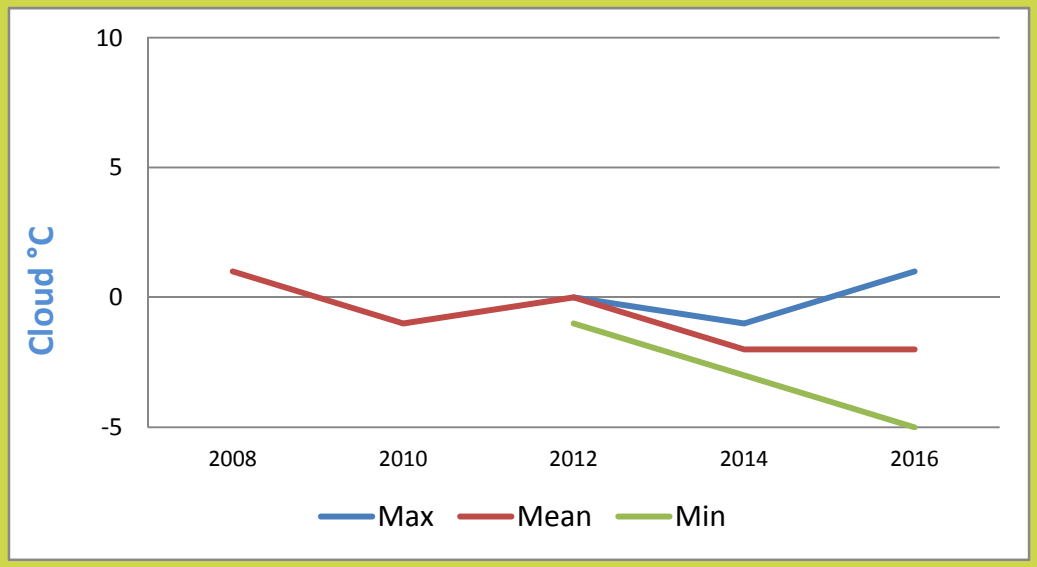
Israel

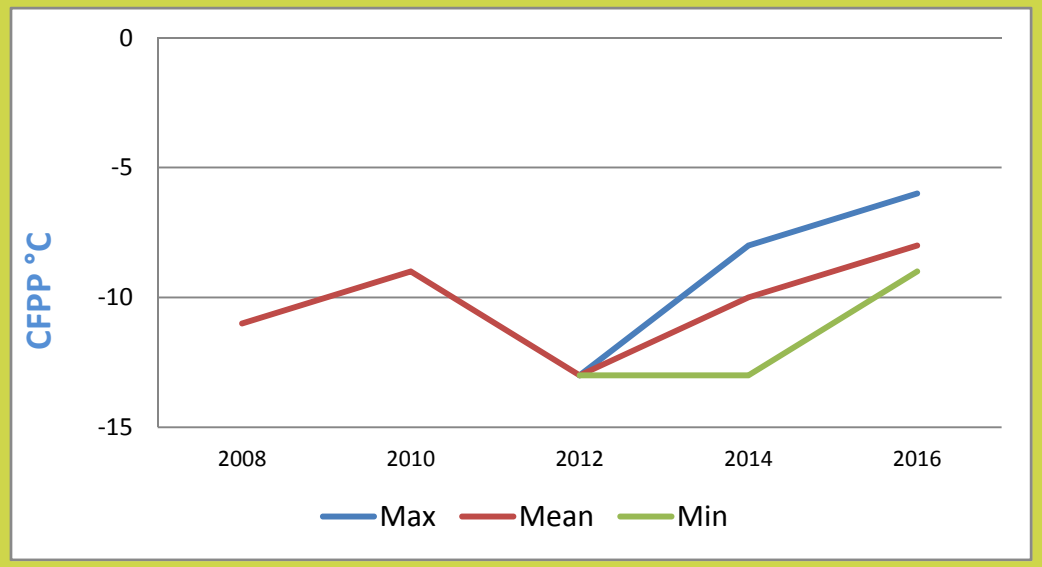
National standards and physical inspection data

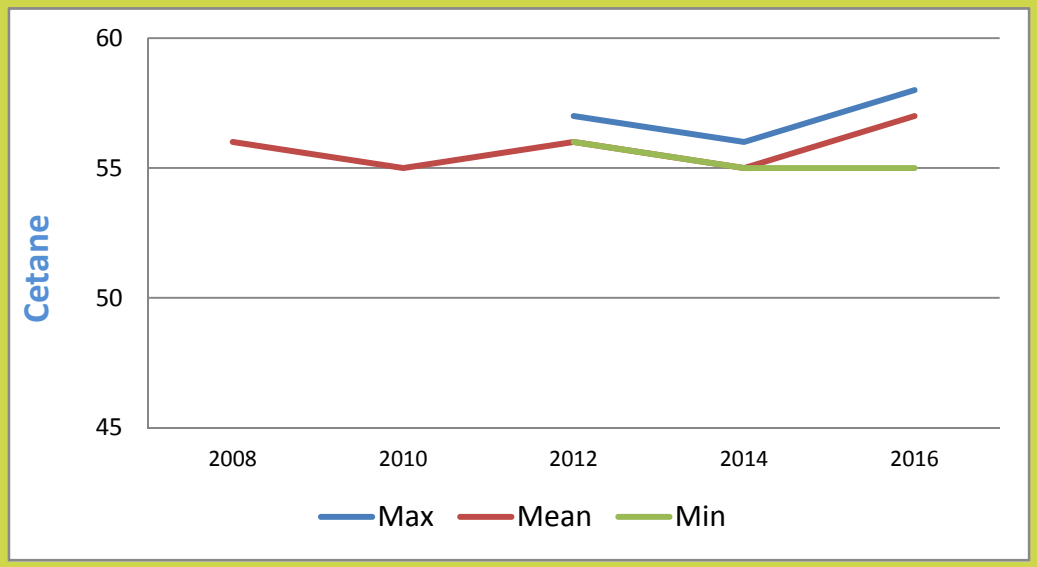
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600352	DIES 1600353
Cloud Point, °C		**1**	**-2**	**-5**	1	-5
CFPP, °C	-5 (max)	**-6**	**-8**	**-9**	-9	-6
Pour Point, °C		**-9**	**-12**	**-15**	-9	-15
HFRR, µm	460 (max)	**447**	**437**	**428**	428	447
Wax Content @ 10°C Below Cloud, wt%		**2.9**	**2.4**	**1.8**	2.9	1.8
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30
Sulphur, ppm	10 (max)	**8**	**<6**	**<3**	8	<3
Density @15°C, kg/m^3	820 - 845	**844**	**833**	**822**	844	822
Viscosity @ 40°C, cSt	2.0 - 4.5	**3.72**	**3.39**	**3.05**	3.72	3.05
Cetane Index $_{2\ Variable}$		**60**	**56**	**53**	53	60
Cetane Index $_{4\ Variable}$	46 (min)	**61**	**58**	**55**	55	61
Cetane Number	51 (min)	**58**	**57**	**55**	55	58
Distillation, °C IBP		**196**	**184**	**172**	196	172
T_{10}		**240**	**224**	**207**	240	207
T_{20}		**255**	**242**	**228**	255	228
T_{50}		**288**	**284**	**280**	288	280
T_{90}		**345**	**344**	**343**	345	343
T_{95}	360 (max)	**362**	**359**	**356**	362	356
FBP		**368**	**365**	**362**	368	362
% FAME	5 (max)	**0**	**0**	**0**	0	0

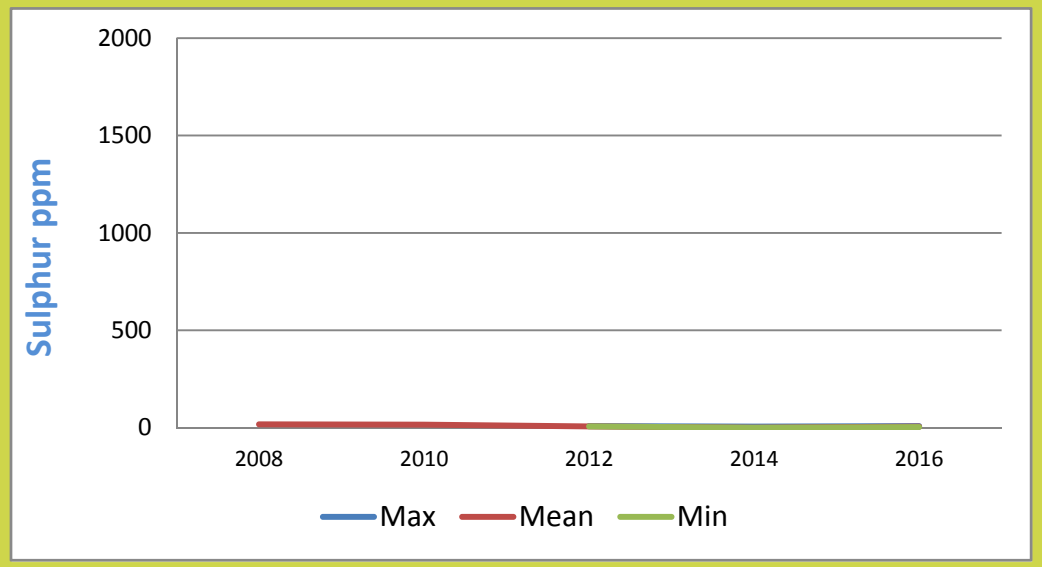
Israel

Middle East and Africa









Kuwait

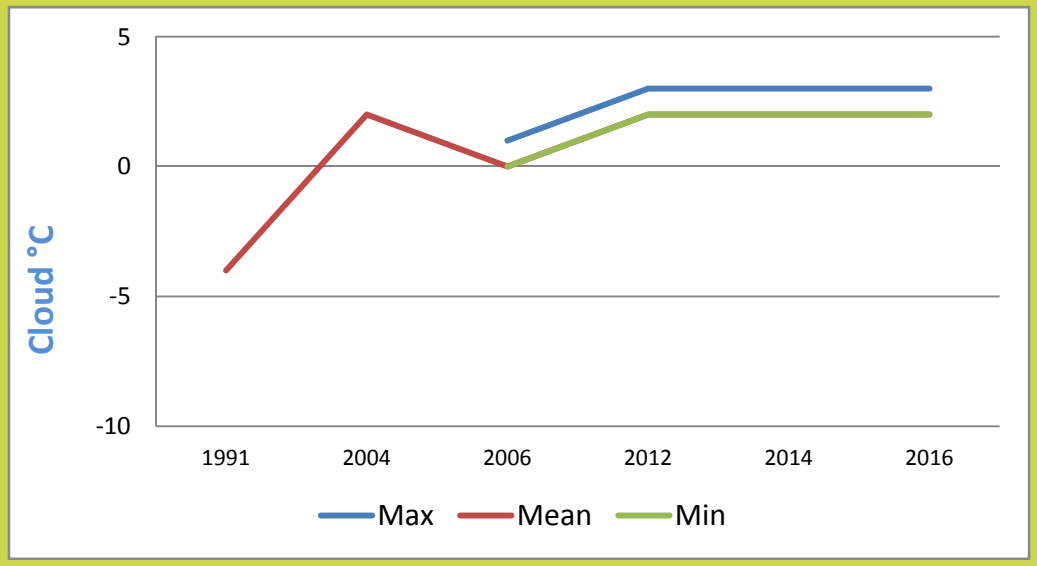
Middle East and Africa

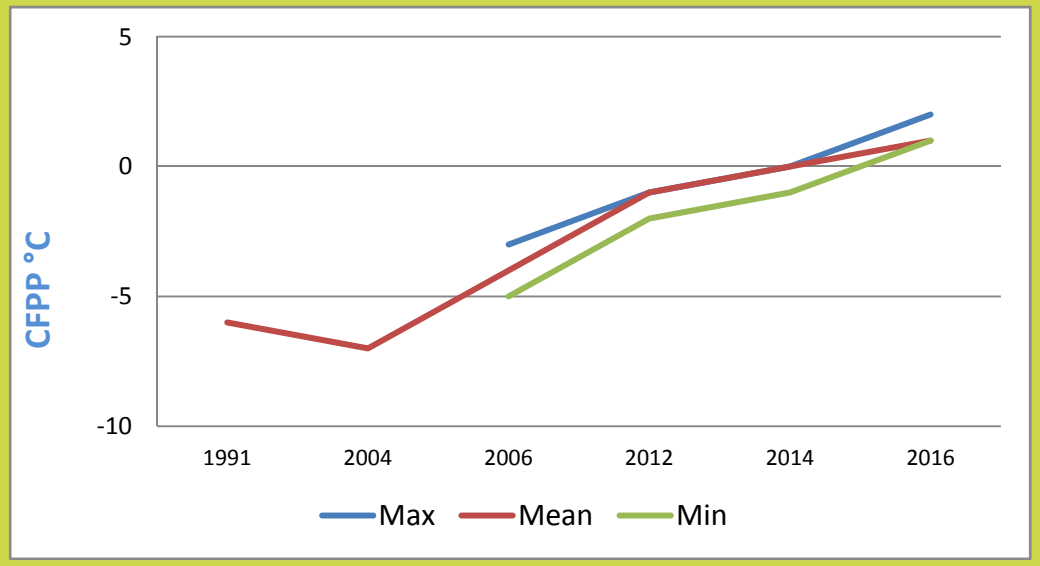
National standards and physical inspection data

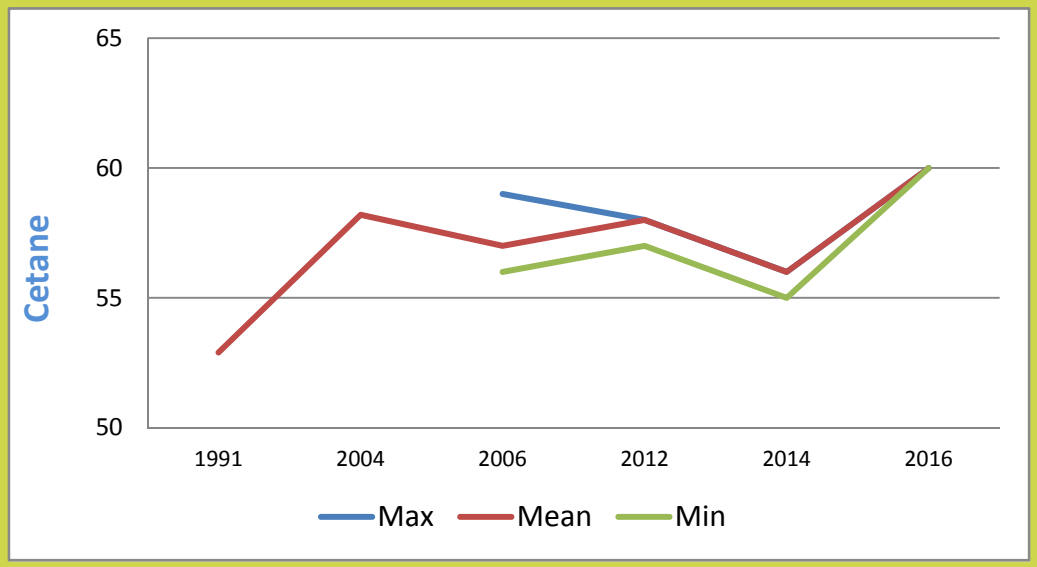
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600354	DIES 1600355
Cloud Point, °C	4 (max)	**3**	**2**	**2**	2	3
CFPP, °C		**2**	**1**	**1**	1	2
Pour Point, °C	0 (max)	**0**	**0**	**0**	0	0
HFRR, µm		**490**	**484**	**478**	490	478
Wax Content @ 10°C Below Cloud, wt%		**4.3**	**4.2**	**4.1**	4.1	4.3
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30
Sulphur, ppm	2000	**1610**	**1575**	**1540**	1540	1610
Density @15°C, kg/m^3	820 - 870	**839**	**839**	**839**	839	839
Viscosity @ 40°C, cSt	1.6 - 5.5	**4.96**	**4.93**	**4.90**	4.90	4.96
Cetane Index $_{2\ Variable}$		**58**	**58**	**58**	58	58
Cetane Index $_{4\ Variable}$	48 (min)	**65**	**65**	**65**	65	65
Cetane Number		**60**	**60**	**60**	60	60
Distillation, °C IBP		**216**	**213**	**211**	211	216
T_{10}		**268**	**268**	**268**	268	268
T_{20}		**283**	**283**	**283**	283	283
T_{50}		**311**	**311**	**311**	311	311
T_{90}	357 (max)	**351**	**351**	**351**	351	351
T_{95}		**362**	**362**	**361**	362	361
FBP		**370**	**369**	**369**	369	370
% FAME		**0**	**0**	**0**	0	0

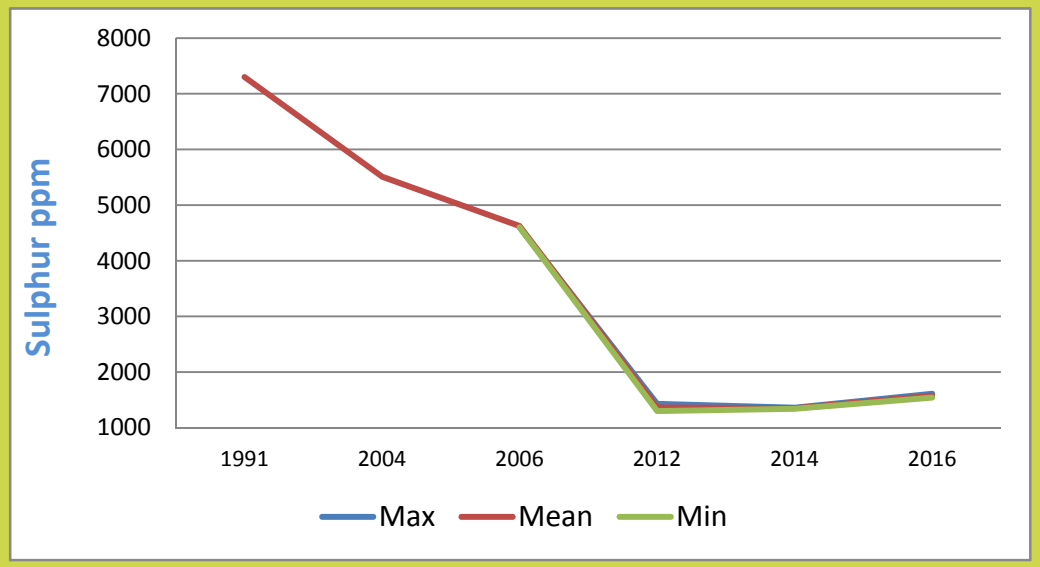
Kuwait

Middle East and Africa









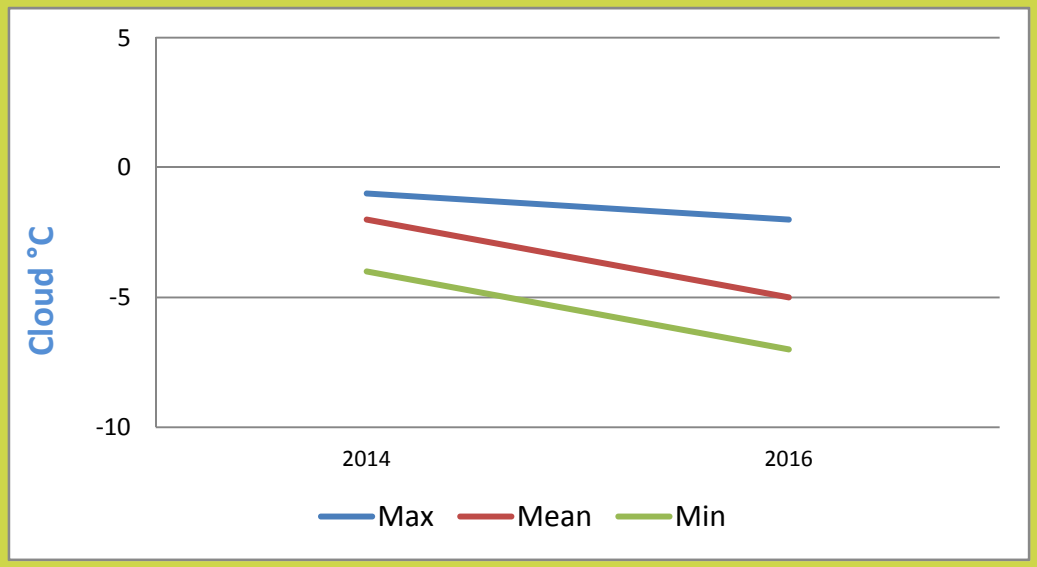
Oman

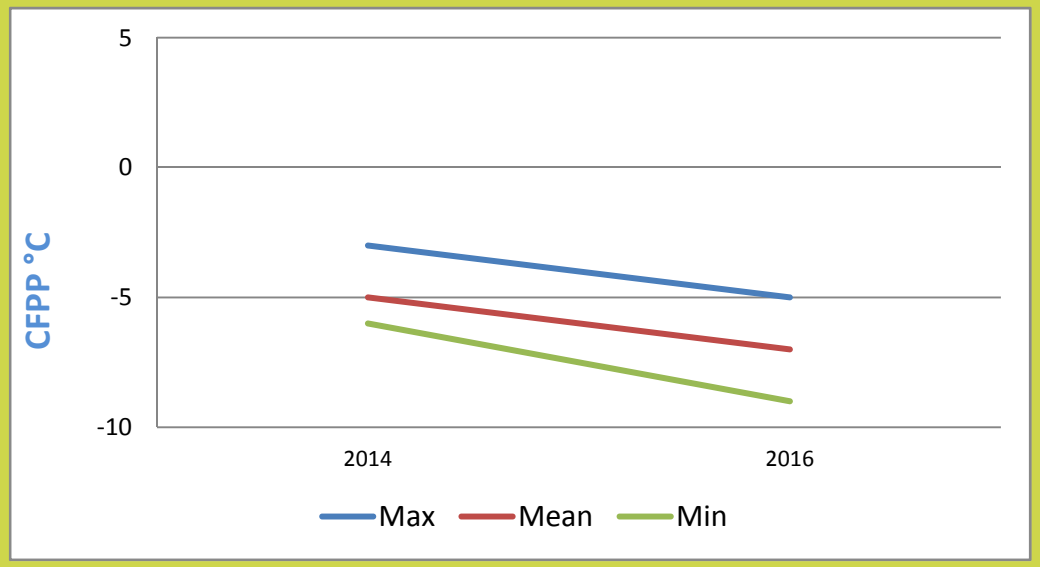
National standards and physical inspection data

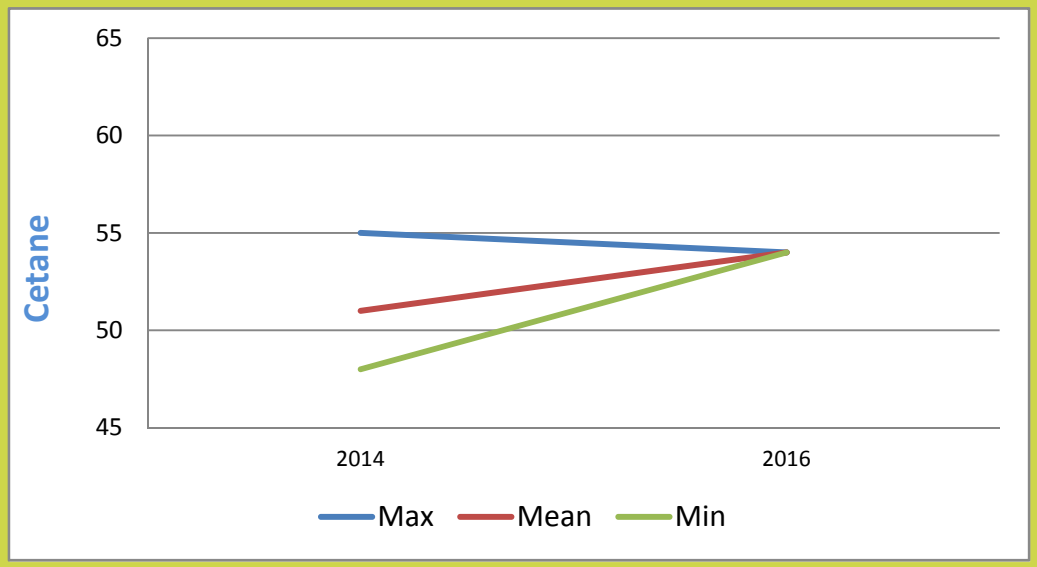
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600361	DIES 1600363
Cloud Point, °C		**-2**	**-5**	**-7**	-7	-2
CFPP, °C		**-5**	**-7**	**-9**	-9	-5
Pour Point, °C	0 (max)	**-9**	**-11**	**-12**	-12	-9
HFRR, µm	460 (max)	**466**	**446**	**426**	466	426
Wax Content @ 10°C Below Cloud, wt%		**2.1**	**1.9**	**1.7**	1.7	2.1
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30
Sulphur, ppm	500 (max)	**345**	**315**	**285**	345	285
Density @15°C, kg/m^3	820 - 870	**836**	**832**	**829**	829	836
Viscosity @ 40°C, cSt	1.6 - 5.3	**3.42**	**3.08**	**2.74**	2.74	3.42
Cetane Index $_{2\ Variable}$	47 (min)	**56**	**55**	**54**	54	56
Cetane Index $_{4\ Variable}$		**57**	**56**	**54**	54	57
Cetane Number		**54**	**54**	**54**	54	54
Distillation, °C IBP		**180**	**175**	**170**	170	180
T_{10}		**224**	**214**	**204**	204	224
T_{20}		**244**	**232**	**221**	221	244
T_{50}		**286**	**277**	**267**	267	286
T_{90}		**348**	**343**	**339**	339	348
T_{95}		**364**	**361**	**359**	359	364
FBP		**370**	**370**	**369**	369	370
% FAME		**0**	**0**	**0**	0	0

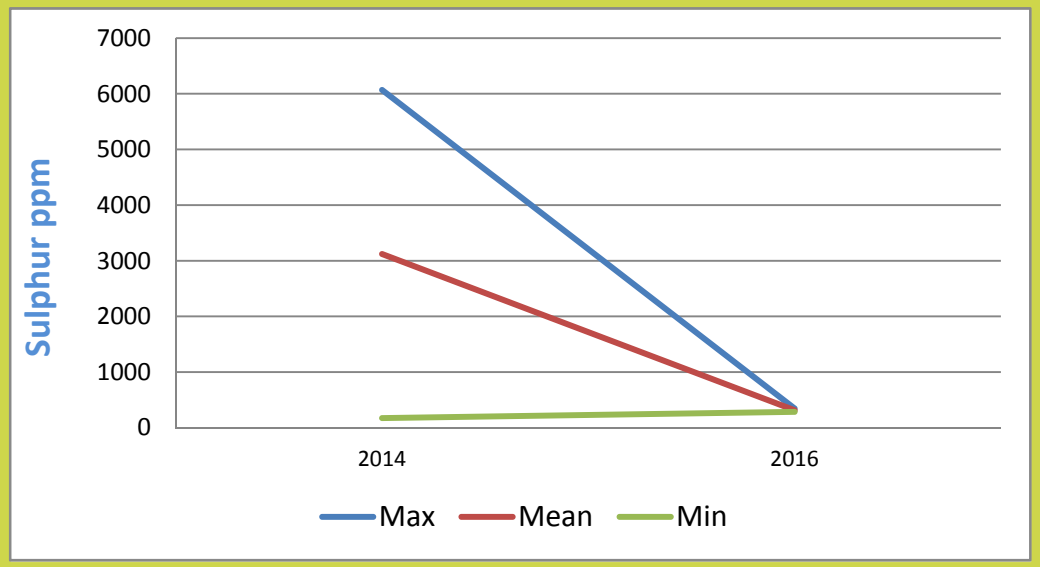
Oman

Middle East and Africa









Qatar

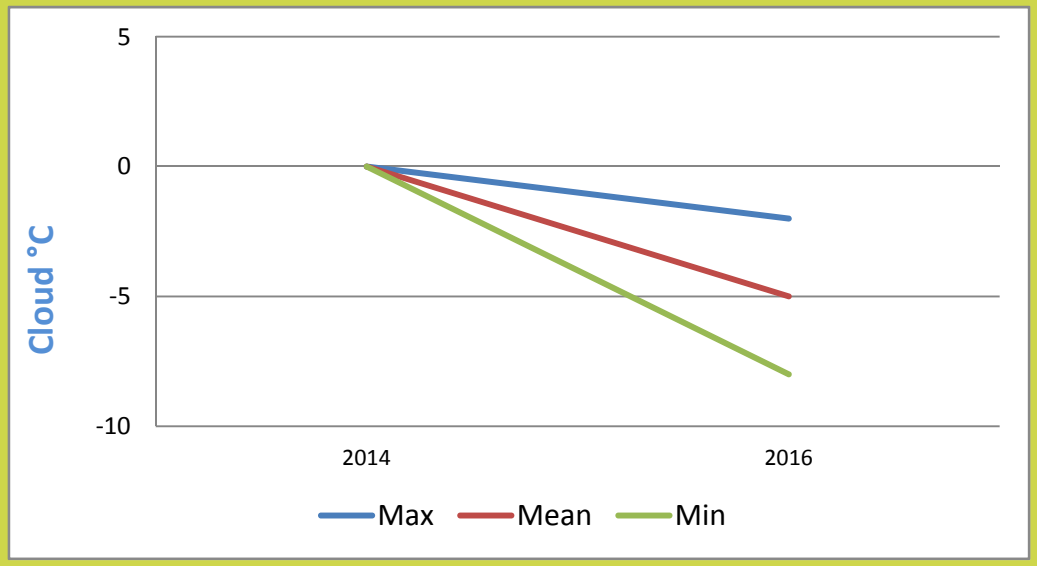
Middle East and Africa

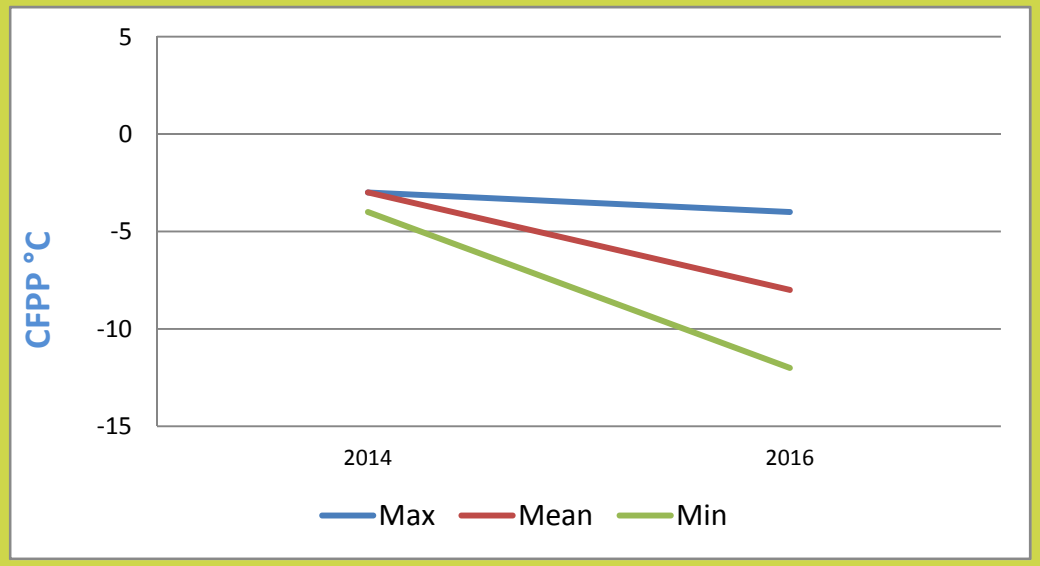
National standards and physical inspection data

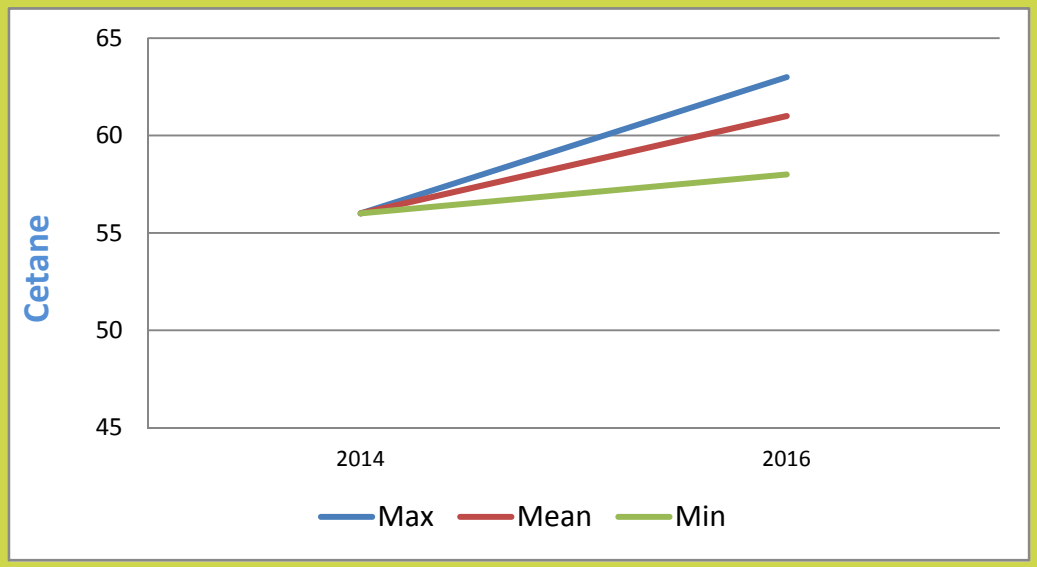
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600359	DIES 1600360
Cloud Point, °C	0 (max)	**-2**	**-5**	**-8**	-8	-2
CFPP, °C		**-4**	**-8**	**-12**	-12	-4
Pour Point, °C	-3 (max)	**-6**	**-8**	**-9**	-9	-6
HFRR, µm		**415**	**411**	**408**	415	408
Wax Content @ 10°C Below Cloud, wt%		**3.8**	**3.4**	**2.9**	3.8	2.9
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30
Sulphur, ppm	500 (max)	**376**	**191**	**6**	6	376
Density @15°C, kg/m^3	820 - 850	**836**	**830**	**825**	825	836
Viscosity @ 40°C, cSt	1.6 – 6.0	**3.37**	**3.22**	**3.06**	3.37	3.06
Cetane Index 2 Variable	50 (min)	**59**	**57**	**55**	59	55
Cetane Index 4 Variable		**62**	**60**	**57**	62	57
Cetane Number		**63**	**61**	**58**	58	63
Distillation, °C IBP		**199**	**188**	**177**	199	177
T_{10}		**238**	**236**	**234**	238	234
T_{20}		**253**	**252**	**251**	253	251
T_{50}		**282**	**281**	**280**	280	282
T_{90}	338 (max)	**342**	**333**	**325**	325	342
T_{95}		**358**	**351**	**345**	345	358
FBP		**365**	**362**	**358**	358	365
% FAME		**0**	**0**	**0**	0	0

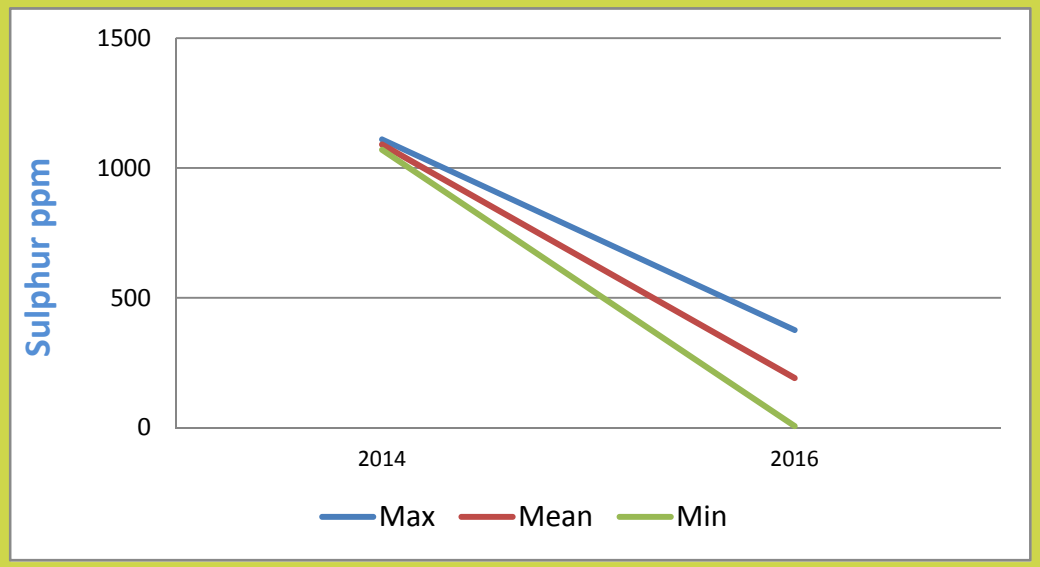
Qatar

Middle East and Africa









Saudi Arabia

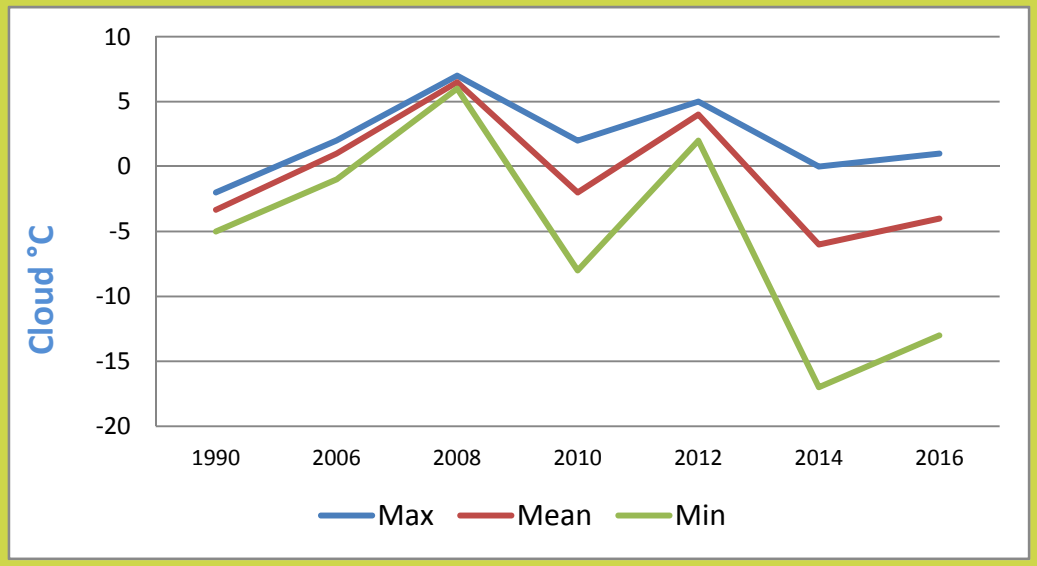
Middle East and Africa

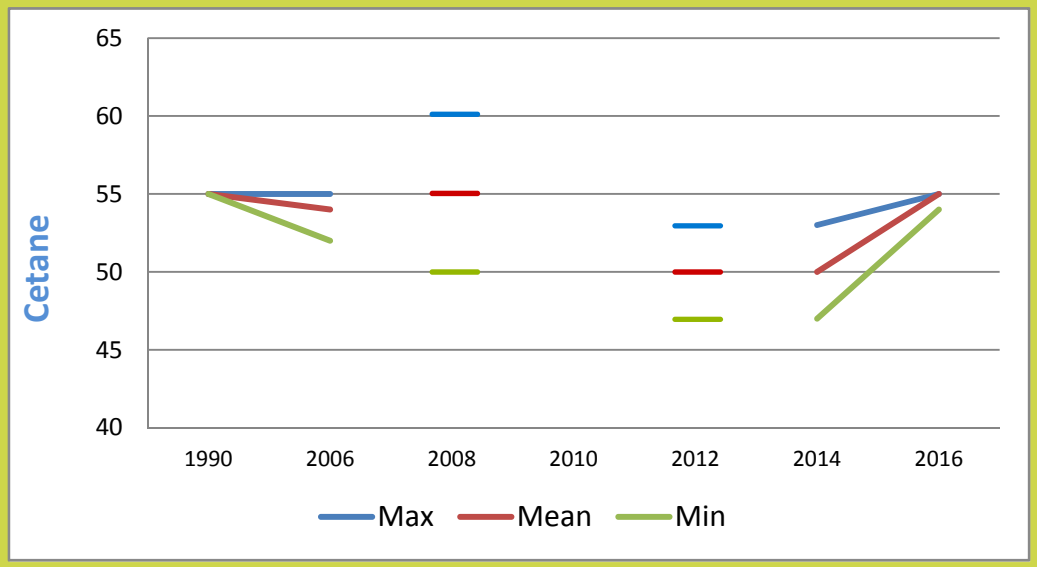
National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600524	DIES 1600525	DIES 1600526	DIES 1600527
Cloud Point, °C	2 (max) *	**1**	**-4**	**-13**	1	-5	-13	-1
CFPP, °C	-4 (max) *	**-3**	**-8**	**-15**	-6	-7	-15	-3
Pour Point, °C		**-6**	**-12**	**-15**	-15	-12	-15	-6
HFRR, µm		**628**	**519**	**382**	628	382	539	526
Wax Content @ 10°C Below Cloud, wt%		**2.4**	**1.9**	**1.3**	1.3	1.5	2.2	2.4
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30	>30	>30
Sulphur, ppm	500 (max)	**451**	**279**	**12**	451	12	221	433
Density @15°C, kg/m^3		**836**	**826**	**821**	824	821	822	836
Viscosity @ 40°C, cSt	1.9 - 4.1	**3.10**	**2.73**	**2.53**	2.71	2.57	2.53	3.10
Cetane Index $_{2\ Variable}$		**56**	**55**	**55**	55	56	55	55
Cetane Index $_{4\ Variable}$	45 (min)	**57**	**56**	**55**	55	56	57	55
Cetane Number		**55**	**55**	**54**	55	55	54	55
Distillation, °C IBP		**188**	**177**	**167**	167	175	188	179
T_{10}		**218**	**207**	**199**	199	201	218	211
T_{20}		**230**	**222**	**214**	215	214	229	230
T_{50}		**280**	**266**	**260**	264	260	260	280
T_{90}		**353**	**338**	**316**	353	336	316	347
T_{95}		**372**	**355**	**334**	372	353	334	363
FBP		**373**	**364**	**347**	372	363	347	373
% FAME		**0**	**0**	**0**	0	0	0	0

Specification shown for 0.05% Sulphur grade
*Cloud point and CFPP are for winter specification.
When CFPP is used the difference between cloud point and CFPP must not exceed 10°C.

Saudi Arabia





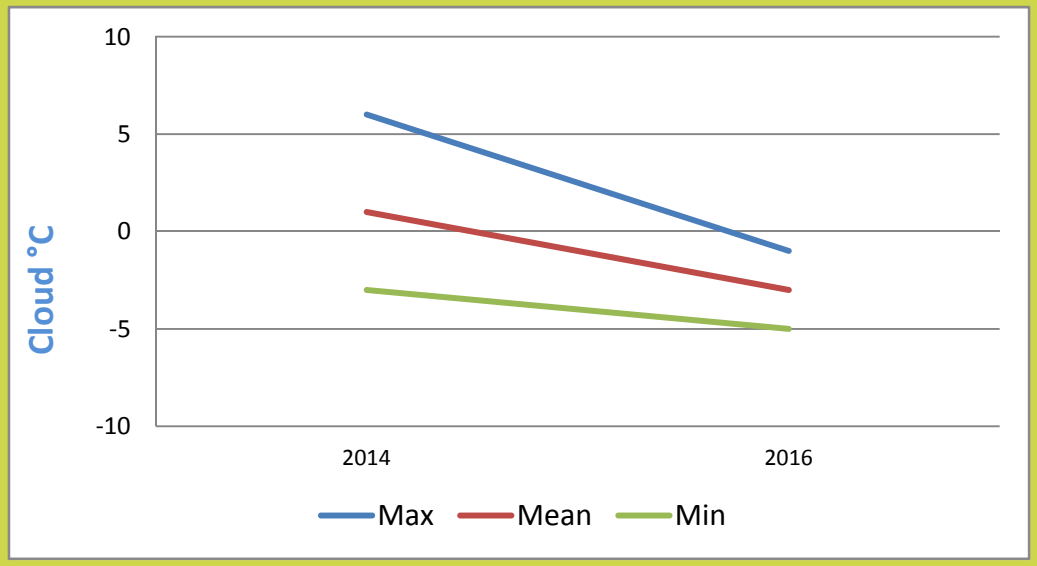
United Arab Emirates

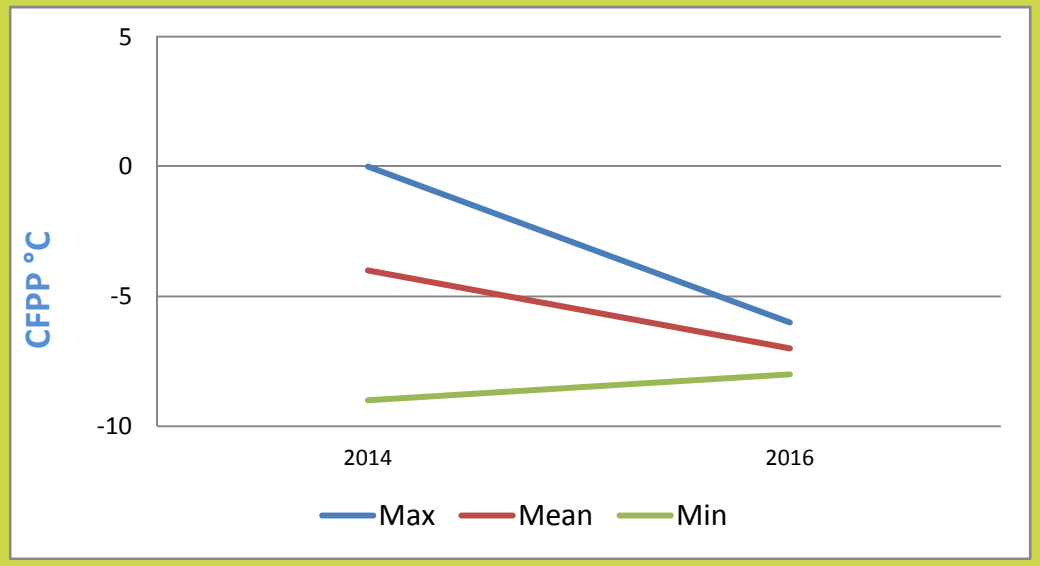
National standards and physical inspection data

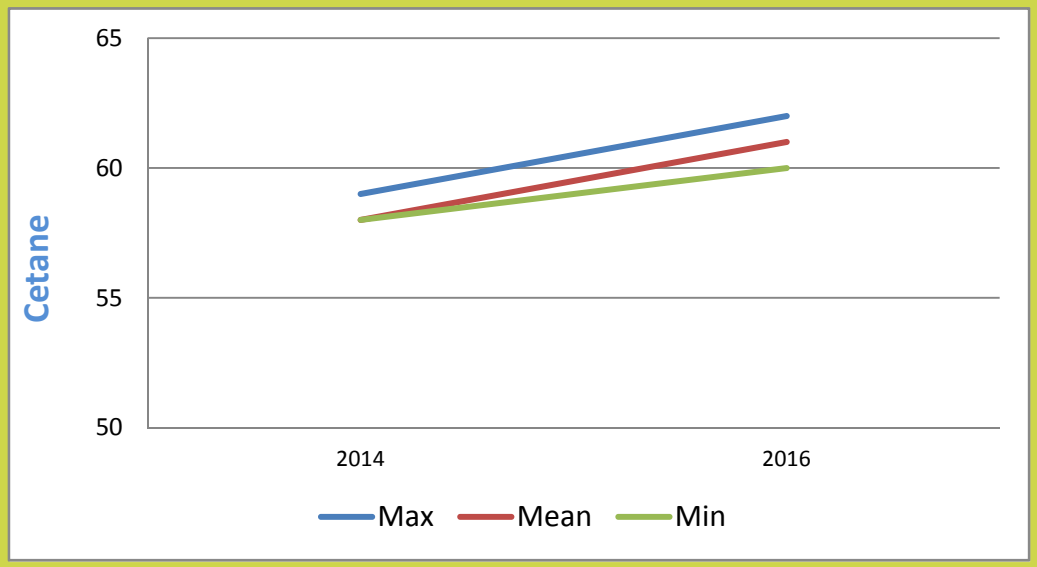
	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600356	DIES 1600357	DIES 1600358
Cloud Point, °C	15 (max)	**-1**	**-3**	**-5**	-1	-5	-4
CFPP, °C		**-6**	**-7**	**-8**	-6	-8	-7
Pour Point, °C		**-3**	**-7**	**-9**	-3	-9	-9
HFRR, µm	460 (max)	**435**	**423**	**404**	435	431	404
Wax Content @ 10°C Below Cloud, wt%		**4.2**	**3.3**	**2.7**	4.2	2.7	3.0
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30	>30
Sulphur, ppm	500 (max)	**8**	**8**	**7**	8	8	7
Density @15°C, kg/m^3	820 - 845	**830**	**828**	**827**	830	828	827
Viscosity @ 40°C, cSt	2.0 - 4.5	**3.90**	**3.49**	**3.05**	3.90	3.52	3.05
Cetane Index 2 Variable	52 (min)	**59**	**59**	**58**	58	59	59
Cetane Index 4 Variable		**63**	**63**	**62**	63	62	63
Cetane Number		**62**	**61**	**60**	60	62	60
Distillation, °C IBP		**207**	**198**	**192**	207	192	197
T_{10}		**249**	**243**	**236**	249	236	243
T_{20}		**262**	**258**	**255**	262	255	258
T_{50}		**288**	**287**	**287**	288	287	288
T_{90}	357 (max)	**339**	**338**	**336**	336	339	339
T_{95}		**353**	**352**	**351**	351	353	353
FBP		**362**	**362**	**362**	362	362	362
% FAME		**0**	**0**	**0**	0	0	0

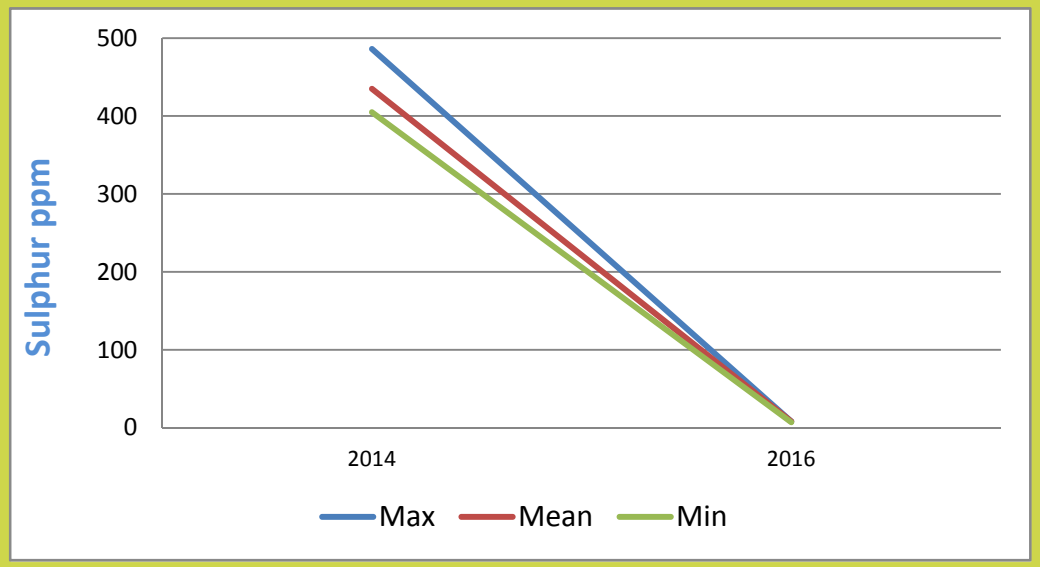
United Arab Emirates

Middle East and Africa









South Africa

National standards and physical inspection data

	National Standard	Maximum Observed	Mean	Minimum Observed	DIES 1600536	DIES 1600537	DIES 1600539	DIES 1600540	DIES 1600541	DIES 1600542
Cloud Point, °C		**-1**	**-9**	**-18**	-18	-8	-13	-8	-5	-1
CFPP, °C	-4 (max)	**-6**	**-14**	**-23**	-23	-14	-15	-13	-12	-6
Pour Point, °C		**-12**	**-15**	**-24**	-24	-12	-15	-15	-12	-12
HFRR, µm	460 (max)	**446**	**409**	**382**	446	402	396	382	428	401
Wax Content @ 10°C Below Cloud, wt%		**4.9**	**1.8**	**0.2**	0.2	2.4	4.9	1.1	1.7	0.4
Rancimat, hrs		**>30**	**>30**	**>30**	>30	>30	>30	>30	>30	>30
Sulphur, ppm	50 (max)	**262**	**65**	**5**	26	6	24	5	262	<3
Density @15°C, kg/m^3		**841**	**826**	**814**	817	814	825	841	830	828
Viscosity @ 40°C, cSt	2.2 - 5.3	**2.92**	**2.70**	**2.20**	2.57	2.92	2.87	2.78	2.87	2.20
Cetane Index $_{2\ Variable}$		**62**	**54**	**48**	55	62	56	50	55	48
Cetane Index $_{4\ Variable}$		**65**	**56**	**49**	58	65	59	49	56	49
Cetane Number	45 (min)	**68**	**56**	**49**	53	68	56	52	55	49
Distillation, °C IBP		**202**	**177**	**167**	202	167	181	170	171	172
T_{10}		**231**	**213**	**194**	221	217	231	204	214	194
T_{20}		**245**	**228**	**204**	227	237	245	221	233	204
T_{50}		**277**	**263**	**241**	252	277	267	264	273	241
T_{90}	362 (max)	**347**	**329**	**308**	319	333	308	335	333	347
T_{95}		**375**	**349**	**322**	348	348	322	353	349	375
FBP		**381**	**360**	**334**	360	357	334	367	362	381
% FAME	5 (max)	**0**	**0**	**0**	0	0	0	0	0	0

South Africa