acea

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ACEA Position Paper

Revision of the Fuel Quality Directive (FQD)

EXECUTIVE SUMMARY

Even though the automobile industry is undergoing massive changes in the transition to decarbonise and deliver climate-neutral mobility solutions to the EU, the internal combustion engine will remain a solution for mobility for many years to come. An ageing fleet will remain, but older vehicles will be replaced by new passenger and goods vehicles with new generation internal combustion engines and electric powertrains.

This transition towards climate-neutral road transport will require many consistent EU-wide policy measures, especially for road transport. The EU Green Deal and the Fit for 55 climate package aim to address several issues that are interlinked.

ACEA published its position paper on the Renewable Energy Use Directive (RED)[1] in December 2021, which also briefly addressed a limited number of issues regarding the Fuel Quality Directive (FQD) that are in that RED proposal. This paper now goes into more detail on where and why ACEA sees a need for the FQD to be updated with new EU general fuel quality specifications that will contribute to the reduction of pollutant and CO2 emissions from both new and older vehicles.

Our proposals:

- Aim to update the Annexes of the FQD to improve certain fuel quality parameters that will help reduce pollutant emissions and provide a solution for not only reducing fleet CO2 emissions but also opening the FQD for higher shares of suitable renewable components.
- Maintain FAME in general market diesel at 7% v/v and add a new specification for a truly renewable diesel grade, ie HVO[2]-based.
- Aim to implement various new limits and housekeeping measures to help improve year-round fuel quality needs for customer acceptance – measures that the European Committee for Standardization (CEN) has not been successful in quickly addressing so far.
- Add a new Annex for methane-based transport fuel that addresses key methane quality parameters for specific use in high performance vehicle engines. The work in CEN in past years (focused on grid gas) has not been able to properly address methane needs for next generation road vehicles.
- Set specifications to avoid the EU market being contaminated with the use of cheap harmful chemicals in fuels. Such nitrogenous compounds may deliver cheap fuel performance boost (eg octane) but they irreparably damage engines and exhaust aftertreatment systems.

1 https://www.acea.auto/publication/position-paper-renewable-energy-use-directive-red-and-fuel-quality-directive-fqd/

2 Hydrotreated Vegetable Oil (HVO): a totally renewable diesel fuel made from renewable material

- Consider changing the Fuel Quality Directive to a Fuel Quality Regulation. As it stands today, the FQD simply says that if a certain petrol or diesel is placed on the market by a member state, it must meet the specifications given in the respective Annexes of the FQD. Diesel is pretty much standardised at B7 across the EU but, in the case of petrol the EU market is still fragmented because only few EU member states have introduced E10.
- Auto makers have introduced complex emission control technologies on the latest new (Euro 6d/Euro VI) vehicles and such vehicles, holding EU type approvals, are tested for compliance according to EU fleet surveillance rules using market fuels taken from filling stations. It is vital that any such compliance in any member state is carried out using common quality fuels. It would be wrong if a vehicle tested as compliant in one member state would receive an emissions fail result in another member state that could be due to different fuel quality.
- The European Commission will be adopting a proposal for more stringent Euro 7/VII emission regulations on 20 July 2022 and tough new CO2 fleet targets for 2030 are in the pipeline. Before new Euro 7/VII vehicles appear, it is therefore essential that fuel quality, commonly across the EU, is improved. While this is necessary to help enable Euro 7/VII, better quality fuels can also be compatible with older vehicles and help reduce overall EU fleet emissions.

ACEA recognises that acceptance of many of our technical requests and proposals may be difficult in the co-decision discussion on the Fuel Quality Directive part of the bigger Renewable Energy Use proposal.

In this respect the FQD proposal should still be amended in co-decision to give the European Commission the well-defined task and timetable to bring forward amendments to the FQD, this time addressing '**quality**', using the appropriate legal procedure.

BACKGROUND

The European Automobile Manufacturers' Association (ACEA) has taken note of the proposal by the European Commission to revise, in this case, the Renewable Energy Use Directive (EU) 2018/2001 (RED) and Fuel Quality Directive 98/70/EC (FQD)[3]. While the RED has an obvious role to play as part of the Fit for 55 package addressing the transition and roadmap towards climate neutrality and eventual fossil-free fuels and energy for road transport, the **FQD should not be forgotten**.

Vehicles equipped with combustion engines will remain within the EU vehicle fleet for many years, so it is imperative that:

- The market fuels available to those vehicles, old and new, improve in terms of the key fuel parameters that have an impact on environment and health.
- Vehicle pollutant and CO2 emissions are addressed by the engine-exhaust aftertreatment-fuel as a system. Fuels are a critical enabler of that system and in many respects improved fuels have a positive benefit on tailpipe emissions from vehicles old and new.
- The market fuels available to those vehicles, old and new, improve in terms of overall quality and consistency across the EU market (and outside). There are areas where housekeeping of the overall distribution system can be improved.
- The EU provides a key signal that fuel quality can and will be improved for other global regulators to see in markets where EU industry also sell vehicles with complex emission control systems and where they may follow EU pollutant emission standards.

THE CURRENT FQD PROPOSAL

It is a major disappointment that in the European Commission's proposal, the first two words of the Fuel Quality Directive, ie 'Fuel Quality', seem to have been forgotten because the only other change to the FQD is to increase the maximum FAME[4] content of diesel from 7% v/v (B7) to 10% v/v (B10) and to indicate that if B10 is sold, B7 must be sold in parallel for fuel vehicles not compatible with the use of B10.

In terms of 'Fuel Quality, far more can be and should be proposed, as this section describes below.

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3 COM(2021) 557 final, 2021/0218 (COD).

4 FAME: Fatty Acid Methyl Ester. A biological component considered as a first-generation biofuel that can be produced from various waste streams but also food/feed crops. Although the physical characteristics of pure FAME (B100) used to blend with fossil diesel to make B7 (or B10, or Bxx) is covered by standard EN 14124, the quality of biodiesel containing FAME at levels of B7 can still cause serious vehicle operational problems, especially in colder conditions.

Proposal for B10 diesel

The increase to B10 is not a good idea considering:

- The use of first-generation biofuels (food and feed crops) such as FAME, which is blended with fossil diesel, remains capped in the RED at 7% of final transport energy consumption, and many member states want to reduce the use of such first-generation biofuels even further.
- Waste streams such as used cooking oil and animal fat that meet the RED sustainability criteria and can be used to produce FAME are far better used as a feedstock for HVO production (due to their impurities which cause vehicle technical problems).
- However, even with high quality FAME, vehicle compatibility issues, most typically fuel filter blocking (leading to lack of fuel to the engine when demanded), increases with increased FAME content in diesel.
- The production capacity of HVO is expanding. HVO is an alternative and sustainable drop-in blending component to reduce diesel fossil content and HVO can also be used on its own.
- For heavy-duty vehicles, the Euro VI emission requirements require type-approval tests to be met using B7 diesel. If a manufacturer would declare that such an engine can also use B10, the engine would require an additional full Euro VI type-approval using B10. This additional and costly burden will mean many manufacturers of heavy-duty vehicles will not declare compatibility with B10 – see ACEA B10 compatibility list[5] – and many manufacturers of passenger cars and vans also do not accept the use of B10 in their vehicles for compatibility reasons and regarding the consequences of unpopular customer cost-impacting measures (eg reduced periods between service intervals and oil changes) for B10 applications.
- The impact of B10 as a market diesel fuel will therefore be minimal, especially since filling stations will also have to sell B7 in parallel (as a ‘protection grade’). Fragmentation of the EU fuels market, where different fuels appear in different countries, must be avoided.
- If the intention is that B10 becomes the main diesel grade, customers and operators will not accept that B7, which all diesel engines can use, would end up being sold as a premium diesel fuel (general limitation to fillings stations having two diesel nozzles).
- There are much better renewable solutions to replace fossil diesel, ie HVO, which can be used as a drop-in fuel in all diesel engines, old and new. HVO should be promoted in the FQD because FAME and HVO compete for the same raw

5 https://www.acea.auto/publication/b10-diesel-fuel-vehicle-compatibility-list/

materials having the same impact on greenhouse gas (GHG) emissions while FAME has the additional challenge of road transport fleet compatibility.

- Today we see only France selling B10 in some areas of the country and ACEA would not want to see other countries selling B10 in a patchwork across the EU. Such market fragmentation is not beneficial for customers and operators, fuel suppliers and vehicle manufacturers.

Therefore, ACEA asks that the proposal to amend the FQD:

- Retains B7 as the basis for the general market diesel commonly and widely used across the EU.
- Deletes the proposal for B10.
- Gives greater emphasis within the EU diesel grade (FQD Annex II) to the use of HVO as the preferential non-fossil low carbon renewable and blending component that can also meet the proposed sustainability criteria of the RED.
- Considers a new Annex for a low carbon renewable diesel grade.

The FQD is only permissive – strengthen the FQD

- Vehicle manufacturers type-approve vehicles for the EU internal market. A vehicle type approved in France, for example, has the right to be sold and circulate throughout the EU (and EEA). Vehicles are type approved to meet the latest Euro 6/VI emission requirements in the laboratory using reference fuels (common specifications for test fuels).
- However, the more stringent pollutant emission requirements must now be met during on-road driving using market fuels. Along with more stringent emission limits, the coming Euro 7/VII emission standards will likely make the on-road test requirements more severe.
- In this respect it is essential that market fuels to be used during type approval via on-road tests throughout the EU must be common across the EU in terms of availability and in terms of high quality.
- The proposals outlined in this paper to amend Annex I (petrol) and Annex II (diesel) to help improve engine pollutant emissions is one factor. The second factor must be to strengthen the FQD by making it a Regulation so that the fuels prescribed in the FQD (and completed by the appropriate CEN standard) are actually sold across in all member states of the EU and market fragmentation is avoided. Alternatively, strengthen the FQD so that fuels complying with the FQD (and the respective EN standards) must be sold across the EU in a much more harmonised way.

Therefore, ACEA asks that the proposal to amend the FQD is extracted from the current proposal that combines RED and FQD in one proposal and instead a new stand-alone Regulation for Fuel Quality is agreed.

If that is not possible the scope of the FQD should be strengthened so that fuels meeting the FQD are really sold EU-wide.

FQD – GOING FURTHER NOW

The European Commission aims to adopt proposals for new Euro 7 pollutant emission standards for passenger cars and light commercial vehicles (vans) and new Euro VII pollutant emission standards for heavy-duty vehicles on 20 July 2022.

While the following comments refer to the situation now with the current Euro 6d and Euro VI pollutant emissions standards, it is essential that fuel quality is improved, as outlined in this position paper as a matter of priority, to be both an enabling factor for Euro 7 and Euro VII but also to deliver new high-quality fuels that can also be used in the existing (older) fleet, thereby also helping reduce total fleet emissions.

IMPROVEMENT OF FQD ANNEX I (PETROL) TO ENABLE ENGINE POLLUTANT EMISSION REDUCTION

- According to the Euro 6 and VI Regulations, the focus for vehicles to be type approved for pollutant emissions is strongly on the use of on-road driving tests (Real Driving Emissions, RDE), where vehicles are subject to a wide range of on-road driving conditions (ie hot and cold ambient temperatures, altitude, dynamic driving with high accelerations, various speeds in urban, rural and motorway driving, vehicle loading, etc).
- In addition, unlike laboratory emission tests where a common ‘reference fuel’ is used to allow replication of results and comparison of vehicle performance under standard conditions, RDE tests use market fuels that are available wherever RDE tests may be carried out.
- However, because the FQD and the corresponding EN standards allow fuel suppliers to deliver fuel that comply with important parameters within a range of minimum/maximum limits, that in some cases can be quite broad and compliance at the fuel pump is infrequently checked, the EU fuels market is not consistent in terms of the quality of parameters that lead to an impact on pollutant emissions.
- A vehicle that is tested under RDE conditions in one country using a market fuel available there could well have very different emission results if it was tested in another country using market fuels available there.
- One example of this problem is for particle emissions, where a particle number limit for ultra-fine particles in Euro 6 means all new vehicles (petrol, diesel) use

particle filters. However, the FQD and standard EN228 permits a broad range of petrol distillation characteristics (a measure of petrol volatility) and sets only a maximum limit for total aromatics content.

- Data shows that within a total aromatics limit and within the wide distillation ranges, fuel suppliers have scope to include heavy aromatic components (normally high carbon C9+ chains). This leads to high particle emissions and the risk that a vehicle tested under RDE conditions could fail a test but would pass an RDE test if tested using a different petrol containing less C9+ aromatics. That is unfair on vehicle manufacturers who cannot double-guess what fuel suppliers deliver to fuel pumps.
- Unfortunately, data shows that diesel contamination occurs frequently in petrol, via the distribution system and via poor fuel supplier and distribution housekeeping.
    - The result is heavier unwanted components ('heavy boilers') in petrol delivered to customers which the EU fuel quality monitoring system and local checks (if any) will never pick-up. The consequence will be higher particle emissions from engines and negative impact on low-speed pre-ignition.
    - For example, data shown at CEN WG21 in April 2021 indicate that just 1% diesel contamination in E10 petrol can increase ultra-fine particle emissions (particle number, PN) emissions by 5% and up to 25% with 2% diesel contamination.
    - Work in CEN continues to define appropriate measurement techniques that would lead to the determination of an appropriate threshold to limit (stop) diesel contamination.
- Detergents are mostly welcome components to improve fuel cleanliness, but we are seeing an overdosing of detergents in EU petrol that will lead to cases of higher exhaust ultra-fine particle emissions (particle number, PN).
- The 2019 World-Wide Fuel Charter (WWFC)[6] draws attention to the risk of uncontrolled dosing (or overdosing) and, to control that, sets a limit of 30 mg/100ml for unwashed gum.
- SGS sampling in 2020 shows a high percentage of EU petrol containing well over 30 mg/100ml unwashed gum.

While the two above issues of diesel contamination and overdosing of detergents in petrol are being addressed in CEN, it takes time for solutions to agreed and a lot of resistance to changes. We strongly recommend that issues such as these which directly impact vehicle emissions are addressed directly in the FQD or the Commission and/or FQD set clear regulatory demands on CEN to deliver solutions within a reasonable time-period.

6 https://www.acea.auto/news/global-fuels-harmonisation-renewed-call-by-acea-and-worldwide-vehicle-and-engine-partners/

It is now time for a change in petrol fuel quality and ACEA asks that Annex I (petrol) of the FQD be amended as follows:

- As noted in the section below regarding a higher minimum RON.
- Initially MON maintain a 10-point delta to RON but look at replacing MON by a low-speed pre-ignition test parameter (work in progress in DIN and in CEN WG21) that is related to more severe combustion conditions in lower speed highly turbocharged higher efficiency engines.
- Introduce a limit for carbon/hydrogen (C/H) ratio. The EU petrol market today indicates a C/H ratio for petrol > 6.0. Lower carbon content is needed to help reduce exhaust CO2 and hydrocarbon (HC) emissions (ie Euro 7).
- Retain the total aromatics limits at 35% v/v but introduce a C9+ aromatics limit of 10% v/v and a C10+ aromatics limit of 2% v/v. This is needed to help reduce ultra-fine particle emissions (ie Euro 7).
- The petrol distillation range should be expanded, as outlined in the table below:

	Units	Current FQD / EN228	Proposal
Final boiling point	ºC, max	210	
E50	% v/v, min		10.0
E100	% v/v, min	46.0	
E130	% v/v, min		70.0
E150	% v/v, min	75.0	
E170	% v/v, min		90.0

- Lower the minimum petrol density limit from 720 to 690 kg/m^3 to allow greater blending of lighter components having low exhaust particle formation potential. However, this also needs review with respect to likely higher fuel consumption.
- The Commission should request CEN to deliver the appropriate test methods and thresholds to address diesel contamination (‘heavy boilers’) in petrol and a more controlled approach to useful detergent dosing rates (such as adding an unwashed gum limit of maximum 30 mg/100ml). This can be addressed via a time-limited review article for CEN to act, or the Commission to take direct action.
- For any future vehicle pollutant emission tests to be defined/to be agreed in Euro 6d and for Euro 7, market fuel quality must be improved. If that will not be the case, any test results from a sample of vehicles that suggest non-conformity due to the fuel must be repeated using Euro 6 (Euro 7) test certification fuels.

IMPROVEMENT OF ANNEX I (PETROL) TO ENABLE ENGINE CO2 REDUCTION

- Petrol octane (expressed as RON) is a key petrol parameter that can help improve engine efficiency, therefore help reduce engine CO2 emissions.
- The main petrol grade has a RON of 95 but the FQD (and EN228) does not set a maximum RON. Therefore, several fuel suppliers offer higher RON petrol (eg 98, 100, 102 RON), but at premium prices at the pump. In many cases, this premium petrol is offered as the E5 protection grade (for vehicles that are not compatible with the use of E10).
- Data shows that the use of higher RON petrol can improve engine efficiency of engines designed to take advantage of higher RON, leading to a reduction in CO2 emissions of several percent over a typical standard drive.
- Depending how it is formulated, higher RON petrol can also be used in the majority of existing petrol vehicles, but the CO2 improvement will be marginal, at best.
- Studies have shown that EU refiners have the capability to deliver higher RON petrol as the main EU grade[7].
- This suggest that moving from 95 RON to a higher minimum RON as the main EU petrol grade is technically and economically feasible. Since higher RON petrol can be used in the majority of existing vehicles without harm, there is a ready high-volume market waiting for the fuel suppliers to act.

How could high RON petrol best be delivered to help achieve EU fleet CO2 reductions?

1. Maintain the E10 base like today in the FQD and use refined components to deliver higher RON petrol. Such an approach will deliver high RON petrol that will have no ethanol compatibility issues for the great majority of older cars that are already E10 compatible (see ACEA E10 compatibility list[8]).
2. Allow a higher volume of renewable ethanol blending above the current E10 limitation. This would likely mean a new E20 petrol grade. However, such an approach would mean that not all vehicles could use E20 high RON petrol since many existing vehicles can only use maximum 10% ethanol petrol (E10).
3. New sustainable petrol components having low engine-knock resistance have been announced by the fuels industry. To exploit maximum CO2 savings, the content of such components in a petrol blend should exceed 10% by volume to deliver as high GHG savings as possible with improved engines. Therefore, a lower RON 98 (at a minimum) compared to ACEA's previous for RON 102, could

[7] Economical evaluation of refinery capability to deliver improved high-octane petrol and benefit for engines, IFPEN study VYC28-001 for ACEA, September 2020. Available from ACEA on request.

[8] https://www.acea.auto/publication/e10-petrol-fuel-vehicle-compatibility-list-2021-update/

also be considered to enable the use of such components in the petrol pool at a significantly high volume. A new fuel standard accompanied with a suitable engine pre-ignition criteria and renewable ethanol as the sole oxygenate at a level around 20% by volume[9] would still be directed primarily at new vehicles and some in the existing fleet currently limited to E10[8]. It is noted that CEN WG21 is starting a new task force looking specifically at E10+ petrol addressing both approaches: higher ethanol content and higher content of different sustainable petrol components.

ACEA asks that the proposal to amend the FQD in respect of petrol:

- Retains Annex I with a minimum RON of 95 but with the other quality-related petrol parameters amended as outlined in the section above.
- Introduces a new Annex for a higher minimum RON grade (and with the other quality-related petrol parameters amended as outlined in the section above) that aims for maximum compatibility for the EU fleet, and which should become the main EU petrol grade.
- In addition, we recommend that footnote (3) of the Table in Annex I (petrol) – which says: "Member States may decide to continue to permit the placing on the market of unleaded regular grade petrol with a minimum motor octane number (MON) of 81 and a minimum research octane number (RON) of 91." – is deleted. RON 91 petrol is no longer relevant for the EU fleet.

IMPROVEMENT OF ANNEX II (DIESEL) TO ENABLE POLLUTANT EMISSION REDUCTION

FAME-based diesel or renewable diesel?

- As noted above, the proposal to increase the maximum allowable FAME content in diesel is not a good idea and has limitations for its use due to vehicle compatibility concerns. ACEA believes it would be far more beneficial to keep European diesel at a maximum FAME content of 7% v/v and instead accommodate the blending of renewable feedstocks such a hydrotreated vegetable oils (HVO).
- Renewable feedstocks such as vegetable oils are processed by variations of conventional petroleum refining, including hydrotreatment. These refining methods produce saturated paraffinic hydrocarbon molecules with extremely low aromatic levels and a narrow distillation range. When properly processed, they

[9] EN228 addresses a few combination of alcohols and mono-ethers, beyond an ethanol equivalent of 10% it is simply not possible to approve all variations. A focus on the most applied oxygenate (ie ethanol E10) will help to increase market share of sustainable petrol.

can provide the required cold flow properties to address diesel flow concerns during cold temperatures.

- Unlike FAME, the paraffinic middle distillate fuel oils produced by these methods are indistinguishable from conventional paraffinic fuel oils derived from petroleum and lack the residual process elements typical of biodiesel. Thus, they are highly suited as a blend stock for diesel fuel.
- Engine and vehicle manufacturers widely support the development and roll-out of HVO to increase diesel fuel's renewable, low carbon content without the concerns associated with methyl ester (FAME) fuels.
- HVO are very clean burning themselves and can help improve conventional diesel fuel because they have virtually no sulphur or aromatics. EN15940 may be used as a production guideline for HVO when used as blending components. Additional engine validation may be needed to ensure the fuel ultimately works well in vehicles and engines. Subject to such validation and care using additives, these fuels are usable in any old or new diesel engine either in pure form or when blended with conventional diesel fuel, assuming the finished fuels also meet finished fuel quality requirements.
- The Commission's proposal also, unintentionally, bans the use of diesel with FAME higher than 10% v/v (which can currently be used in captive fleets of dedicated vehicles, possibly encouraged by local or national incentive schemes for public or private fleets).
- Presently, the blending of HVO in EN590 is limited by the minimum density limit of EN590 (the FQD sets no minimum diesel density limit). CEN WG24 relaxed the minimum density of diesel from 820 kg/m^3 to 815 kg/m^3 a couple of years ago (fuel injection suppliers advised against going down to 810 kg/m^3 due to concerns about cavitation impacts in fuel injectors when using a lighter diesel fuel). That means the blend limit for lighter HVO in an EN590 diesel is about 30% v/v.
- We therefore propose that the current diesel fuel defined by the FQD and EN 590 maintain its FAME content at 7% v/v (ie B7) but the specifications be opened-up to allow more blending of renewable HVO.
- Alternatively, the current diesel specification should be maintained at B7 (FQD and EN 590), but a new diesel grade be promoted that is a fully renewable diesel (ie legalising the equivalent of EN15940).

Aromatics

- Total aromatics is currently not limited in the FQD or EN590. A low level of aromatics will help reduce emissions of HC/CO/CO2/particles and latest market sampling data indicates average aromatic levels around 24 to 26% m/m. We would advocate setting a maximum diesel aromatics limit that challenges current market levels.

- The FQD limits poly aromatic hydrocarbons (PAH) to a maximum of 8% m/m but market data indicates PAH levels much lower, between 1% m/m and 3% m/m. We would advocate setting a maximum diesel PAH limit that challenges current market levels.

Year-round quality performance

- We continue to require a strong consumer focus for year-round diesel quality, particularly in winter seasons. While we have EN14214 (B100) which is the basis for the quality of FAME blended into EN590 biodiesel, we are still seeing impacts on diesel cold flow properties depending on the raw materials used to produce the B100, even if the B100 meets EN14214 and the blended diesel (eg B7) meets EN590.
- For example, recent discussions in CEN WG24 have been updated on unacceptably high levels of poor low temperature performance of diesel during several past winter periods. This is despite the best efforts of CEN over several years to address new performance parameters and territories applying appropriate winter diesel climate classes, for example:
    - Application of stricter cold filter plugging point (CFPP) EN590 classes for winter diesel performance.
    - Saturated Monoglyceride limits below what is recommended for north European winter diesel in EN14214.
    - National application of a filter blocking tendency limit of 2.52.
    - Specific limits on hard particles exceeding 4µm (due to issues with poor proper housekeeping of fuel distribution systems).
- Vehicle operational issues observed by customers in the field are generally directed at vehicle manufacturers and dealers. We cannot do anything if the fuel is of poor quality except analyse the fuel in the tank and drain it if it does not meet specifications. By then, the culpable filling station (if known) may have refilled its tanks with a new delivery that may be better quality, depending on the materials used to produce B100 that is then used to blend B7.
- These issues continue to require resolution to ensure year-round high-quality diesel performance and customer satisfaction. If CEN is not able to resolve these issues, we ask the European Commission to set appropriate quality parameters directly in the FQD, for example.

ACEA asks that the proposal to amend the FQD in respect of diesel:

- Retains B7 as the general market diesel specification but permits the wider blending of HVO (and other renewable components) in diesel. Alternatively, retain B7 according to FQD and EN590 and introduce a new Annex to specify a fully renewable diesel as the preferred Euro-diesel grade (based on EN15940).

- Set a maximum aromatics limit at a level that is at least representative of best practice in the EU diesel pool, challenging current market levels in the range of 24 to 26% m/m.
- Set a maximum poly aromatic hydrocarbon (PAH) limit at a level that is at least representative of best practice in the EU diesel pool, challenging current market levels around 3% m/m.
- Take appropriate steps to set additional limits for critical year-round diesel performance directly in the FQD, for example, limits on saturated monoglyceride content, a filter blocking tendency limit and a maximum limit for particle concentration.

ADDITION OF A NEW ANNEX TO SET BASIC PERFORMANCE CHARACTERISTICS FOR THE USE OF METHANE AS A TRANSPORT FUEL

- Important to provide methane quality for current and future gas engine & exhaust aftertreatment technology. That means not the same quality as gas provided for domestic or industrial consumption.
- First industry World-Wide Fuel Charter for Methane published in October 2019.
- The Alternative Fuels Infrastructure Regulation (AFIR) sets targets for infrastructure expansion, many member states have invested in infrastructure and the fuel has high interest for helping meet future CO2 and emission targets.

Therefore, ACEA asks for a new Annex in the FQD that will set key methane parameters, as follows:

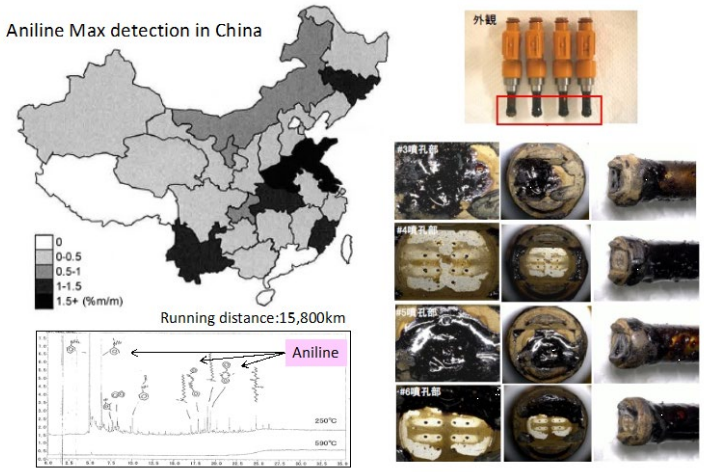
- Sulphur content → maximum 10 mg/kg (like for petrol and diesel).
- Wobbe Index → minimum 46 MJ/m^3.
- Methane number → minimum 75.
- Siloxanes relevant for bio-methane.

PROHIBIT THE USE OF 'NITROGENOUS COMPOUNDS' AS CHEAP OCTANE BOOSTERS

- Contaminants – eg diesel contamination in petrol (failings in the distribution system), silicon and chloride – may enter fuel in many ways, both intentionally and unintentionally. Fuel additives may introduce some undesirable contaminants, as may fuel production or distribution.

- Many of these compounds can cause significant harm to the powertrain, fuel, exhaust or emission control systems. Good housekeeping practices can help minimise or prevent inadvertent contamination.
- However, we are also now seeing the use of nitrogenous compounds (eg anilines) as cheap octane boosters in EU petrol. These harm engine internal components and lead to failure, for example from China:

Figure 1: Issues caused by anilines[10]



- The 2019 World-Wide Fuel Charter (WWFC)[11] draws attention to the risk of harmful chemicals in fuels.
- ACEA is collaborating with Sustainable Fuels[12] in some EU and global fuel sampling that is showing levels of some nitrogen-containing compounds being used in EU premium petrol.
- There are studies looking at aniline-type nitrogen-containing octane boosters such as N-methylaniline (NMA), N,N-dimethylaniline, xylidines, and toluidines and their impact on human health, the environment and vehicles. They show lower performance than metal-based octane boosters (eg MMT), have an unfavourable human health and environment profile, and are detrimental to air quality.

ACEA recommends the Commission act against the use of such nitrogenous compounds before the situation gets out of hand and to set an example to other global markets.

ACEA will be pleased to work with the Commission on collecting field data on use of nitrogenous compounds such as those noted above and to provide evidence of their harm. At the very least, if immediate limits or bans are not feasible, we would ask the FQD specifically include a strongly worded review article that recommends the Commission quickly review the issue and act by setting appropriate requirements in the FQD.

10 Source: Japan Automobile Manufacturers Association (JAMA)
11 https://www.acea.auto/publication/worldwide-fuel-charter-2019-gasoline-and-diesel-fuel/
12 https://www.sustainablefuels.eu

ABOUT THE EU AUTOMOBILE INDUSTRY

- 12.7 million Europeans work in the auto industry (directly and indirectly), accounting for 6.6% of all EU jobs
- 11.5% of EU manufacturing jobs – some 3.5 million – are in the automotive sector
- Motor vehicles are responsible for €398.4 billion of tax revenue for governments across key European markets
- The automobile industry generates a trade surplus of €76.3 billion for the European Union
- The turnover generated by the auto industry represents more than 8% of the EU's GDP
- Investing €58.8 billion in R&D per year, automotive is Europe's largest private contributor to innovation, accounting for 32% of the EU total

ACEA REPRESENTS EUROPE'S 16 MAJOR CAR, VAN, TRUCK AND BUS MANUFACTURERS

ACEA
European Automobile
Manufacturers' Association
+32 2 732 55 50
info@acea.auto
www.acea.auto

twitter.com/ACEA_auto

linkedin.com/company/acea

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