MOBIL SUBMISSION ON BIODIESEL STANDARD - MAY 2003

SETTING NATIONAL FUEL QUALITY STANDARDS
Paper 6
National Standard for Biodiesel - Discussion Paper

Mobil congratulates Environment Australia on its extensive and thorough discussion paper which provides a very good reference on this subject and we welcome the opportunity to comment.

Mobil endorses the Australian Institute of Petroleum (AIP) submission and offers the following comments.

Summary / Overview:

Mobil supports the development of national fuel standards, including a standard for biodiesel, B100.

Biodiesel has some significant differences to conventional diesel and it must be introduced in a way that does not undermine the increasingly stringent quality requirements for diesel fuel, or the application of national fuels standards.

The overarching principles that need to be applied to the use of biodiesel are:

1. The use of the fuel should not have any adverse environmental effects, i.e. it should not increase emissions from diesel vehicles using the fuel.
2. The fuel should have no adverse performance effects on vehicles using the fuel, i.e. it should be fit-for-purpose in the existing diesel vehicle fleet both on-road and off-road without modification. However, any regulation must allow for the use of higher biodiesel content and even 100% biodiesel in dedicated vehicle fleets that have been modified to run on that fuel.
3. The consumer has the right to know that the fuel contains biodiesel.

To ensure a fuel that is fit-for-purpose in all diesel vehicles that could be expected to use that fuel, Mobil recommends the following strategy for biodiesel standards:

1. The establishment of a B100 standard for biodiesel used as a blendstock for normal on-road and off-road use and as a fuel in the case of vehicles designed to run on high biodiesel content.
2. A cap on biodiesel blend rates for normal on-road and off-road use, set at a level advised by vehicle manufacturers. This should be set at a level at which biodiesel blends can be used without modifying engines, and at which the energy loss is manageable.
3. A clear regulation that any blends including biodiesel must meet the conventional diesel standard.
4. Labelling of pumps dispensing biodiesel. This should also differentiate between B100 and biodiesel blends.

The blend cap rate for biodiesel blends that are sold for normal on-road and off-road use should be set in line with the advice from diesel vehicle manufacturers. Mobil points out that the European diesel standard is being revised to allow for a maximum of 5% biodiesel to be blended into "normal ADO" consistent with most auto manufacturers recommendations.

The B100 standard should be aligned with the proposed European prEN14214 biodiesel standard, for reasons of consistency and completeness. Cloudpoint and CFPP standards will however need to be adapted to Australian conditions.

Test methods should be those recommended for the prEN14214 standard, except where there is overlap with established Australian diesel standards and test methods. In these parameters, the latter should be used.

Other issues to be addressed:

1. Lubricant degradation. The use of B100 or high percentage biodiesel blends can cause severe engine lubricant degradation. Diesel engine manufacturers recommend more frequent oil change intervals if biodiesel is used.
2. Vehicle operators need to be informed of the lower energy content of biodiesel blends. This should be done through labelling at the dispenser.
3. Hygroscopic nature of biodiesel. Sites dispensing biodiesel should adopt due care and procedures to ensure that water does not contaminate the biodiesel.
4. Storage stability of biodiesel. Biodiesel producers should advise sites storing biodiesel of recommended storage intervals.
5. Blending. It is important that all biodiesel blends are fully blended with the conventional diesel. Splash blending alone is not recommended for blending biodiesel with conventional diesel.

It is essential, as with conventional diesel, that biodiesel complies with the relevant standards, and that there is a clear audit trail to enable the identification of the source of any off-specification fuel.

Specific Comments on the discussion paper:

Page 8: 2.6 Harmonisation with the European Union fuel standards

- Enabling future technology should be the primary driver for fuel changes. Lead removal and sulfur reduction have been the two major improvements in fuels over the past years because they allow the vehicle manufacturers to introduce new technology. It is the new engine technology rather than changes in fuel properties that have dramatically reduced vehicle emissions. By way of comparison, changes to other fuel properties have had relatively little impact on emissions.

Page 9: 2.7 General principles and policy requirements

- The statement that 'compatibility does not necessarily imply uniformity' is an important one. As Australia moves towards Euro IV emission standards, the sulfur level of the fuels will be important, but it may not be necessary to harmonise all other fuel properties with European standards to achieve appropriate emissions.

Page 11: 2.8 International biodiesel standards

- 1st Para: Although D6751-02 contains the statement given, that statement is in a Note and so is supplemental information included for the interest of the reader. It does not imply any level of approval for the use of any biodiesel blend as a fuel.

Page 20: 4.6 Energy Balance

- This section is surprisingly brief considering the large amount of work that has been done on well-to-wheel analyses. The cited DOE figures look optmistic. Concawe figures (Report No.2/02 "energy and greenhouse gas balance of biofuels for europe - an update") indicated that including by-products 1.4 units of energy are gained for each unit input (ie 58% of the energy in the displaced diesel is saved, the remaining 42% is used to produce the biodiesel)

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Page 22: 5.2 The United States experience

- 2nd Para: The text suggest that biodiesel could replace US Grade No. 1 which is not correct because of the cold flow limitations.
- last Para: ASTM D6751 is a standard for B100 as a blendstock and not B100 as a diesel fuel. At no point does the standard endorse or approve the use of such a blend as a fuel. Note 2, cited on page 11, was intended to introduce an element of caution into consideration of blends higher than B20.

Page 25: 6 Biodiesel parameters

- In table 6.1 some note should be taken that, unlike the other standards in this table, D6751 is for B100 as a blendstock only, not a fuel.
- The ASTM T90 point is for D1160. A reader may assume that it is for the more common D86. A footnote may be in order.
- Without showing test methods this table could be very confusing or misleading.

Page 28: 6.1 Sulfur

- D6751 sets a limit of 0.05 mass% or 500 ppm on sulfur, not 50 ppm. For your information ASTM is currently working on inclusion of a second grade with a limit of 15 ppm to differentiate those biodiesels with sulfur content below that level.
- ASTM does not recommend the use of D2622 for any biodiesel fuel because it may give falsely high results. The recommended method is D5453.

Page 29: 6.2 Carbon Residue

- Comparison of the European CCR limit to the ASTM limit without a detailed comment of the different test methods could lead to the impression that the ASTM limit is a lot tougher. It probably isn't.

Page 42: 6.13 Triglyceride content

- Mono, di and tri-glycerides are controlled by the T90 distillation requirement in D6751.

Page 47: 6.17 Thermal Stability - Test Method

- D381 and D525 are designed for gasoline or aviation fuel. They are not suitable for B100, any biodiesel blends or even petroleum diesel.

Page 50: 6.19 Alcohol Content - International Trends

- D6751 controls all alcohol content through the flash point requirement.

Page 51: 6.20 Cloud Point - International Trends

- International Trends: Since the ASTM spec is for blendstock only setting a requirement for cloud point is not appropriate. This should be set by local weather conditions and the sensitivity of the vehicle population and so should probably not be different for bio and petroleum diesels.

Page 51: 6.20 Cloud Point - Test Methods

- The objection to cloud point by D2500 raised by Dunn and Bagby would also apply to petroleum diesel, but the test method works for that fuel.

Page 53: 6.21 CFPP - International Trends

- The statement "for biodiesel used as a blend, a higher freezing diesel is acceptable" is not in D6751. Furthermore, it could be read as saying biodiesel blends with operability temperatures higher than petroleum diesel in the same location are acceptable. This is not true. The presence or absence of biodiesel in a fuel does not change the vehicle requirements for low temperature operability.

Page 53: 6.21 CFPP - Test Methods

- D4539 (LTFT) is seen generally as a more critical test method than CFPP. It is used by some in the US because it has been found to simulate the heavy duty trucks used there better than the CFPP.

Page 53: 6.22 Distillation Temperature

- Since calculated cetane index cannot be used for biodiesel fuels, the comments related to cetane index is out of place in this section.
- The comment about biodiesel having a very narrow boiling range is germane for B100, but not for blends.

Page 54: 6.22 Distillation Temperature - International Trends

- The ASTM limit on T90 is meant to control mono, di and tri-glycerides.

Page 54: 6.22 Distillation Temperature - Test Method

- The ASTM distillation method is D1160, Test method for distillation of petroleum products at reduced pressure.

Page 57: 6.75 Flash Point - Test Method

- The flash point is specified as 130°C because it is part of a requirement that includes D93. If D93 is used as the method, the limit should not be 100°C no matter if that is "intended". The 100°C statement is in a non-mandatory appendix. Putting such statements in an appendix is sometimes done in ASTM as a compromise with a small vocal minority of voters.

Page 65: 8.1.6 Acid Value

- We are unable to find in D6751 any reference to a B20 blend in connection with acid number.

Page 66: 8.1.7 Iodine Number

- 2nd Para - the statement that diesel contains 98% aromatics is incorrect. It is generally less than 30%.

Page 87 Appendix B - International Trends in Biodiesel Production and Use

- The statement that supply will limit biodiesel to 10% of diesel needs is a gross understatement. The Concawe report (Report No.2/02 "energy and greenhouse gas balance of biofuels for europe - an update") suggests that substitution even at 1.5% level would be a severe challenge, and very costly.