February 8, 2007

Biofuels Program Approaches in Selected Asian Countries

In the recently concluded 5th Asian Petroleum Technology Symposium held 23-25 January 2007. Jakarta, Indonesia, 23 resource persons representing ASIAN national and private oil companies, governments, academe, automotive persons, and NGO's presented equal number of country research papers touching on the theme "Fuel Quality Improvement and Technology Developments".

The symposium was sponsored by the Japan Petroleum Energy Center (JPEC) a research foundation funded by 82 major Japanese companies and organizations with LEMIGAZ, Indonesia's largest gas company as co-sponsor.

Various research and position papers presented, articulated technical and economic results ranging from alternative fuels programs and corresponding benefits and cost trade-offs to recent developments in the refining technology aimed at producing more environment friendly gasolines. This summary touches mainly on the biodiesel.

Summary of Biodiesel Program in the ASIAN countries

Fatty Acid Methyl Easters (FAME) based biodiesels are being introduced or implemented in selected ASIAN countries taking into consideration decreasing dependence on imported fossil fuels, energy supply security, environmental, improvement as dictated by advancing stringent emission regulations.

Shown below are the types of biodiesels being promoted in the selected ASIAN countries including the status of implementation in their respective countries.

Country	BLEND/FAME TYPE	Implementation Status
India	B20 – JATROPHA	no mandate
South Korea	B5 - PALM	no mandate
Hongkong	B5 – PEANUTS	no mandate
Japan	B5 – waste cooking fuel	no mandate
New Zealand	B5 – Tarrow	no mandate

Philippines	B1-B5 – CME/Other FAME	mandated by RA 9367 signed 12th Jan. 2007
Malaysia	B5 – Palm (olein)	Gov't. suspended Implementation due to the Palm oil supply/price considerations
Indonesia	B2-B5 – Palm/Jatropha	provisioned for 2008
Thailand	B5-B10 – Palm/Jatropha	B5 (2010)/B10 (2012)
Taiwan	B1-B20 – not identified	no mandate

B2 means 2% blend of FAME with diesel etc.

Source: Kazuhisa MOGI JAMA paper

Summary of Findings on Biodiesel

According to the paper presented by Mr. Yasunori Takei (member of the Fuel and Lubricants Committee) of the JAPAN Automotive Manufacturers Association (JAMA).

In the event of a mandated use of biodiesel (FAME) in any country, three (3) issues should be given serious consideration and further evaluation by the mandating authority.

1. Specification

In the more than two (2) years of test study, the European requirement (EN 14214) was selected as a base specification to ensure conformity tests in developing FAME blended diesel specs. It was concluded that oxidation stability requirement in EN 14214 is not adequate and recommend oxidation stability of diesel fuel after blending FAME is essential.

2. Distribution System

Good housekeeping in the distribution system is essential for the quality at the pump. Inadequate safeguards in the fuel distribution system has the potential to cause some troubles in the fuel system when fuel quality cannot be secured.

In the same paper, it was concluded that the problem can occur in the storage, transport/fuelling and blending stages of the distribution supply chain of biodiesel. These potential problems can best be illustrated by the following cause effect diagrams on the use of FAME-based biodiesel.

Diagram 1

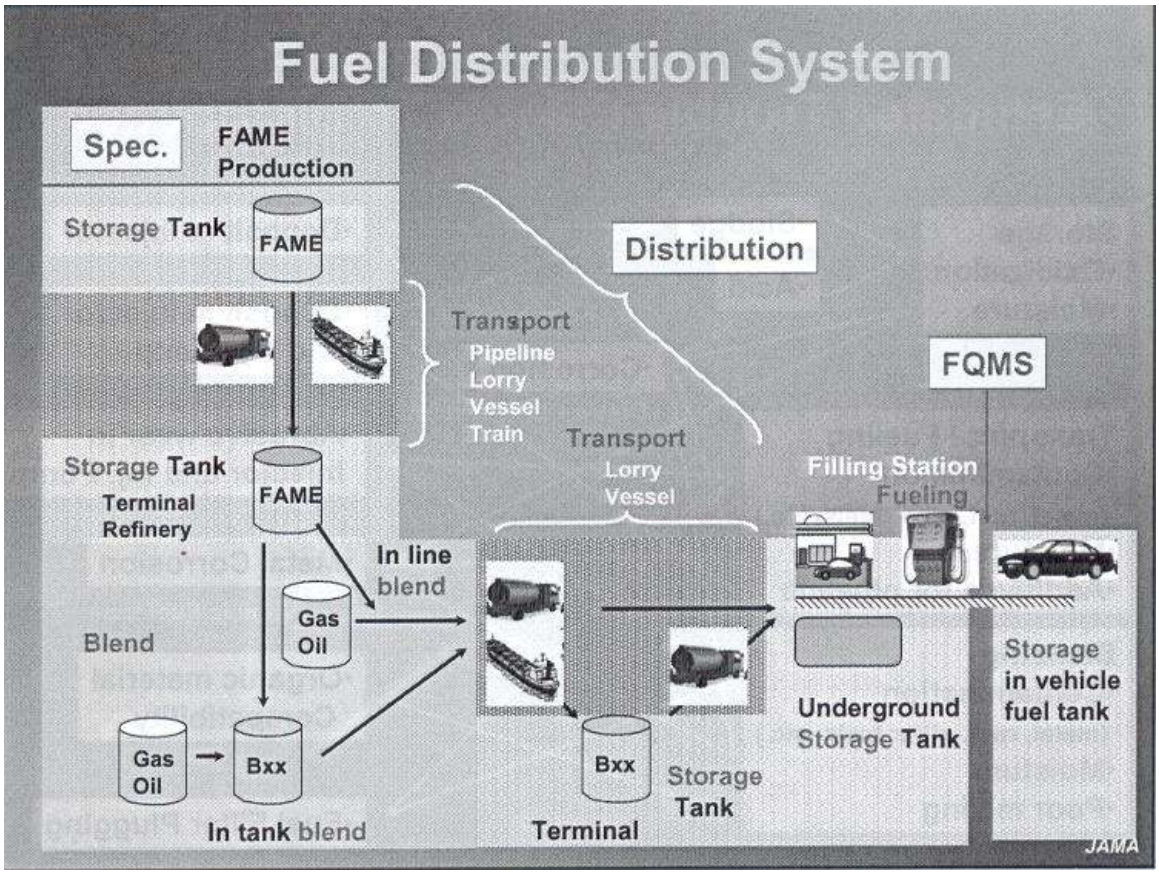


Diagram 2

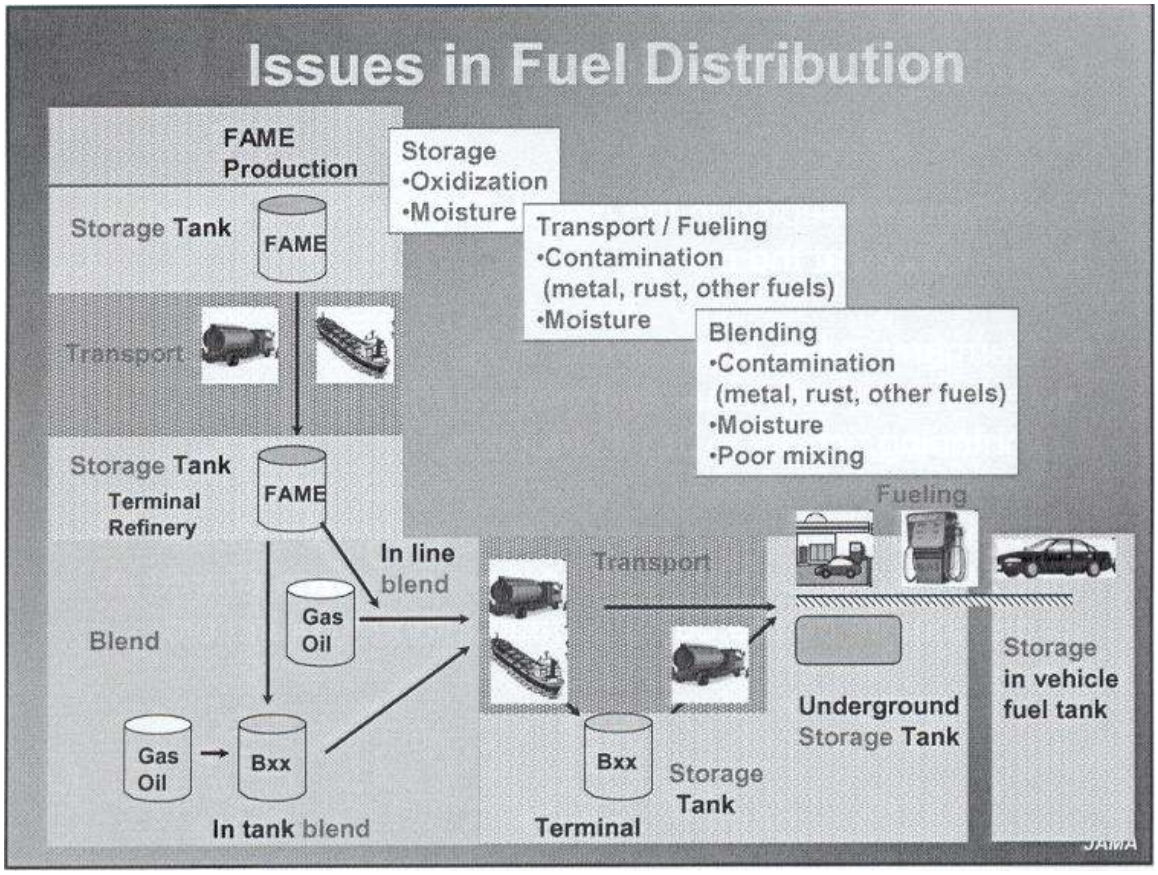
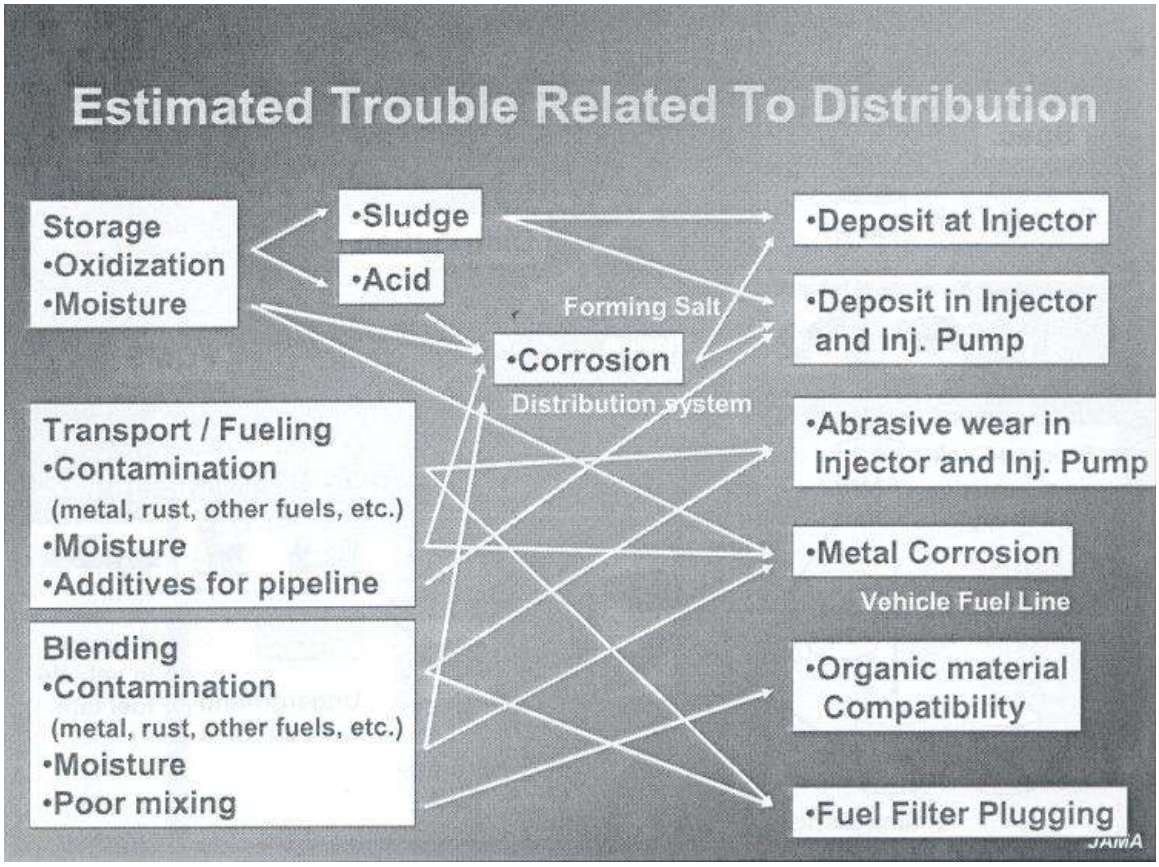

Issues in Fuel Distribution
FAME Production
Storage
•Oxidization
•Moisture
Storage Tank
FAME
Transport / Fueling
•Contamination
(metal, rust, other fuels)
•Moisture
Transport
Blending
•Contamination
(metal, rust, other fuels)
•Moisture
•Poor mixing
Storage Tank
Terminal
Refinery
FAME
Fueling
In line
blend
Transport
Gas
Oil
Blend
Storage
in vehicle
fuel tank
Underground
Storage Tank
Gas
Oil
Bxx
Bxx
Storage
Tank
In tank blend
Terminal
JAMA

Diagram 3



3. Fuel Quality Monitoring System (FQMS)

Government monitoring authority should ensure that fuel quality of the blended diesel is strictly adhered to by all suppliers. The FQMS is the only guarantee of quality fuel at the pump which originally is being used to dispense conventional diesel.

In all the presentations, articulated by speakers/resource persons from ASEAN countries e.g. Thailand, Malaysia, Indonesia, the common denominator anchors on the reality that the long term sustainability of the alternative biofuels program lies on the proven technical and economic viability of the alternative biofuel and the government's program to ensure the alternative fuels do not go into the way of food supply security.

Bioethanol