

Chapter 6

Minutes of Each Meeting

March 2008

This chapter should be cited as

Working Group for Standardization of Biodiesel Fuel for Vehicles in East Asia (2008), 'Minutes of Each Meeting', in Kimura, S. (ed.), *Analysis on Energy Saving Potential in East Asia Region*, ERIA Research Project Report 2007-6-2, Chiba: IDE-JETRO, pp.77-87.

6. MINUTES OF EACH MEETING

6.1. Minutes of the 1st Meeting

Minutes of 1st Meeting of ERIA Working Group for the Standardization of Biodiesel Fuel for Vehicles in East Asia

*ERIA Working Group
for the Standardization of Biodiesel Fuel for Vehicles in East Asia*

Minutes of the 1st Meeting

July 17-18, 2007 in Tsukuba, Japan

1. Date July 17, 18, 2007

Venue Network Meeting Room, AIST Tsukuba HQ bldg. 1F,
National Institute of Advanced Industrial Science and Technology AIST

2. Participants

7Countries: Australia, Indonesia, Japan, Malaysia, New Zealand, Philippine, Thailand
Unregistered: China, India, Korea, Vietnam

3. Opening ceremony

Opening speech by Dr. Goto WG Leader
Opening address by Dr. Kamimoto (Research Coordinator for Environment and Energy, AIST))

4. Outline of ERIA Energy Project & Introduction of Biofuels Utilization Trend

Explanation of outline of ERIA Energy Project by Dr. Goto

5. Japan: Quality control of FAME blended diesel oil and FAME standard in Japan

Presentation about concepts and regulation value of Japanese regulation by Dr. Shiotani

6. Introduction of Biofuels Utilization Trend

Introduction of Biofuels Utilization Trend in each country by oversea members
The amount of introduction and the outline of a standard are referring to Closing Address.

7. How to control the fuel qualities of FAME

“Oxidation stability of FAME” by Prof. Yamane

“JAMA’s Recommendation on Bio Diesel Specification” by Mr. Takei

Mr. Takei explained about Idea for Harmonized B100 Spec. by JAMA.

All members recognized the need of harmonized specification

8. Special Lecture

“The global trend of bio fuels” and “A general overview of combustion research activities in the University of Wisconsin” by Prof. Foster (University of Wisconsin)

9. Next generation Technologies of Biodiesel Fuels

“Upgrading of FAME by hydrogenation” by Dr. Yoshimura (AIST)

“The development of Bio Hydro-fined diesel “BHD”” by Mr. Saitou (Nippon Oil Corporation)

“Synthesis of BTL Fuel from Woody Biomass” by Dr. Murata (AIST)

10. Schedules of next WG’s

Future meetings will be held at following schedule

2nd meeting : late September at Thailand

3rd meeting : early November at Japan

4th meeting : February at Thailand

Harmonized FAME Specification will be discussed in 2nd meeting

Proposal of common statement about FAME standard will be considered as accomplishment of this WG.

6.2. Minutes of the 2nd Meeting

ERIA Working Group
for the Standardization of Biodiesel Fuel for Vehicles in East Asia
Minutes of the 2nd Meeting
October 2-3, 2007 in Bangkok, Thailand

Participating Countries:

Australia, Indonesia, Japan, Malaysia, New Zealand, Philippines, Korea, Thailand
(without the participation of China, India and Vietnam)

October 2: Tour of Thailand Institute of Scientific and Technological Research (TISTR)

The working group members visited TISTR to see BDF related facilities which arranged by Ms. Peesamai, Deputy Governor of TISTR.

Main facilities

BDF analysis equipment

BDF production facility (pilot plant)

Equipment for biomass gasification and thermal decomposition (charcoal, piece of wood)

Methane fermentation and hydrogen decomposition system by using waste product

October 3: Working Group Meeting

1. Opening address

Dr. Shinichi Goto, the working group leader, reported that the importance of BDF standards was mentioned in the joint statement at the 1st EAS Energy Ministers' Meeting (EMM1) held on 23 August in Singapore. He also insisted that the working group should accelerate discussion on common BDF standards as ISO and APEC started such activities. Lastly, he explained the preparation of a final report and asked the members' cooperation.

2. Introduction of the check points for BDF standardization

Dr. Hitoshi Shiotani of AIST made a presentation on the idea for BDF common specification and explained the draft standard proposed by Japan.

3. Introduction of current status on BDF

Introduction of current status on BDF was made from each member, along the template informed beforehand.

4. Discussion on FAME standardization

A lot of feedback about the proposed standard presented by Japan was seriously examined by all members, and the tentative target value was set as follows. The members agreed to review it with the relevant people in their countries.

Item	Unit	EN14214	JASO M360	Specification on ERIA PJ Oct.3.2007 (Tentative)
Ester content	mass%	96.5 min.	96.5 min.	96.5 min.
Density	g/cm ³	0.860 - 0.900	0.860 - 0.900	0.860 - 0.900
Viscosity	mm ² /s	3.50 - 5.00	3.50 - 5.00	2.00 - 5.00
Flash point	deg C.	120 min.	120 min.	100 min.
Sulfur content	mass%	0.0010 max.	0.0010 max.	0.0010 max.
Carbon residue (10%)	mass%	0.3 max.	0.3 max.	0.3 max.
Cetane number		51.0 min.	51.0 min.	51.0 min.
Sulfated ash	mass%	0.02 max.	0.02 max.	0.02 max.
Water content	mg/kg	500 max.	500 max.	500 max.
Total contamination	mg/kg	24 max.	24 max.	24 max.
Copper strip corrosion		1	1	1
Oxidation stability	hr.	6 min.	Meet diesel oil specification	10 min. (* ¹)
Total acid number	mgKOH/g	0.50 max.	0.50 max.	0.50 max.
Iodine number		120 max.	120 max.	Reported
Methyl linolenate	mass%	12.0 max.	12.0 max.	12.0 max.
Polyunsaturated FAME	mass%	1.0 max.	Not Detected	Not Detected (* ²)
Methanol content	mass%	0.20 max.	0.20 max.	0.20 max.
Monoglyceride	mass%	0.80 max.	0.80 max.	0.80 max.
Diglyceride	mass%	0.20 max.	0.20 max.	0.20 max.
Triglyceride	mass%	0.20 max.	0.20 max.	0.20 max.
Free glycerol	mass%	0.02 max.	0.02 max.	0.02 max.
Total glycerol	mass%	0.25 max.	0.25 max.	0.25 max.
Na+K	mg/kg	5.0 max.	5.0 max.	5.0 max.
Ca+Mg	mg/kg	5.0 max.	5.0 max.	5.0 max.
Phosphorous	mg/kg	10.0 max.	10.0 max.	10.0 max.

*¹ JAMA and AIST will check the data

*² need further discussion

Tentative target value on the WG

Viscosity: 2.00-5.00

Flash point: over 100 deg. C

Oxidation stability: over 10 Hr

Polyunsaturated FAME : Need further discussion

Iodine number: Just report (not to be fixed)

1. Future work for ERIA project

The members discussed further activities next year and agreed to work for;

Measurement of FAME contents (applicable to coconuts oil FAME)

Measuring method of sludge

Quality control at fueling stations

2. Next meeting Schedule

The third meeting: 29-30 November, 2007 in Kyoto, Japan

The fourth meeting: February, 2008 in Australia (Tentative)

3. Participating countries

The involvement of Singapore in the working group is desirable. Ms. Monsada will recommend an appropriate representative by the next meeting.

6.3. Minutes of the 3rd Meeting

ERIA Working Group
for the Standardization of Biodiesel Fuel for Vehicles in East Asia
Minutes of the 3rd Meeting
November 29-30, 2007 in Kyoto/Osaka, Japan

Participating Countries:

Australia, China, Indonesia, Japan, Malaysia, New Zealand, Philippines, Singapore and Thailand

(-without participation from India and South Korea)

November 29: Tour of Kyoto Municipal Waste Edible Oil Fuel Production Facility

DVD-based introduction of the facility and the tour were conducted, and many inquiries came up from foreign members.

They seemed to obtain useful information on the actual production process through the tour.

November 30: Working Group Meeting

1. Session I –Introduction of status of BDF in China and Singapore-

China: Dr. Wugao Zhang

Since 2006, biodiesel fuel suddenly booming, many private and state-owned enterprises, even foreign countries, have entered this field. The production ability is more than 100 thousand tons/year, but the real production scale is less than 20 thousand tons/year.

The raw materials are mainly waste industry oil and waste cooking oil, which have more economic advantages than fossil oil.

The national specifications for B5 or B10 are under discussion, and will be published next year.

Un-compulsory standard for FAME blended diesel fuel have been established this year.

Singapore: Dr. Rong Yan

Singapore is major oil and gas hub in East Asia.

Large scaled biodiesel fuel production facilities are built by cooperate initiative.

However a rise of the price of palm oil cause various problems.

Singapore does not have any national standard even for conventional fuels. It is important to meet EN or ASTM Standards, and it is also essential to comply with exhaust emission regulation, EURO-IV.

2. Session II –Oxidative and thermal degradations of biodiesel and possible methods for determining related stabilities -

Indonesia: Dr. Tatang Hernas Soerawidjaja

The mechanism of oxidative degradations and thermal degradations was explained, and the current and alternative test methods of sludge formation and thermal degradations were introduced.

3. Session III –Benchmarking of BDF standards in EAST Asia-

Japan (AIST): Mr. Shingo Ozawa

This presentation was made for the main theme of the working group, “common BDF specification ” .

The Japanese opinion “Oxidation stability and unsaturated FAME”, which was a pending issue of the 2nd meeting’s, was reported.

Oxidation stability:

As explained heretofore, 10Hr is necessary to prevent metal tank corrosion.

Mr. Takei, a representative of JAMA, informed that EU auto-manufacturers had the same opinion because of many injector deposit problem occurred since this year.

Polyunsaturated FAME:

Polyunsaturated FAME is contained in only fish oil, and the result of conformity test by METI showed that 1% unsaturated FAME caused a significant increase of sludge formation.

Discussion on common BDF specification:

With regard to improvement of oxidation stability 6Hr of EN standard to 10Hr of Japanese proposal, there were some opinions from foreign members.

All members agreed to summarize this WG’s common biodiesel fuel specification in “One table with note”.

As for unsaturated FAME, Japanese Proposal “Not detected” was accepted.

< Proposed common BDF specification on WG >

Items	Units	U.S.	EU	JASO	Specification on ERIA PJ Nov.30.2007
		ASTM D6751-07a	EN14214	JASO M360	
Ester content	mass%	-	>96.5	>96.5	>96.5
Density	kg/m ³	-	0.860-0.900	0.860-0.900	0.860 - 0.900
Viscosity	mm ² /s	1.9-6.0	3.50-5.00	3.50-5.00	2.00-5.00
Flashpoint		>130	>120	>120	>100
Sulfur content	mass%	<0.0015	<0.0010	<0.0010	<0.0010
Distillation property		<360 (T90)	-	-	-
Carbon residue (100%)	mass%	<0.05	-	-	-
Carbon residue (10%)	mass%	-	<0.30	<0.3	<0.3
Cetane number		>47	>51.0	>51.0	>51.0
Sulfated ash	mass%	<0.02	<0.02	<0.02	<0.02
Water content	mg/kg	<0.05[vol%]	<500	<500	<500
Total contamination	mg/kg	-	<24	<24	<24
Copper corrosion		No.3	Class-1	Class-1	Class-1
Acid value	mgKOH/g	<0.5	<0.50	<0.50	<0.50
Oxidation stability	hr.	>3	>6.0	(*)	>10
Iodine value		-	<120	<120	Reported
Methyl Linolenate	mass%	-	<12.0	<12.0	<12.0
Polyunsaturated FAME	Mass%	-	<1	(**)	N.D.
Methanol content	mass%	<0.2	<0.20	<0.20	<0.20
Monoglyceride content	mass%	-	<0.80	<0.80	<0.80
Diglyceride content	mass%	-	<0.20	<0.20	<0.20
Triglyceride content	mass%	-	<0.20	<0.20	<0.20
Free glycerol content	mass%	<0.02	<0.02	<0.02	<0.02
Total glycerol content	mass%	<0.24	<0.25	<0.25	<0.25
Na+K	mg/kg	<5	<5.0	<5.0	<5.0
Ca+Mg	mg/kg	<5	<5.0	<5.0	<5.0
Phosphorous content	mg/kg	<10	<10.0	<10.0	<10.0

* To meet diesel fuel specifications

** Mentioned in requirement as "Should not included"

4. Making Database –Energy and Automobile Situations in East Asia Countries- Japan (AIST): Dr. Mitsuharu Oguma

He explained the necessity to make a database, asked the members to collect the data of energy and automobile situations.

It is desirable to use prepared templates.

Date for data submission from each countries: 19th Jan. 2008

AIST will organize the data gathered from the members.

5. Schedule of Next meeting (the forth meeting)

Date: the week of 19th Feb, 2008.

Venue: Manilla, Philippines. Ms. Zenaida Ygnacio Monsada will inform Dr. Goto of the possibility.

Agenda: final report and database.

6. Future work for ERIA project

The following items were proposed,

New raw materials and new production method

Study for test method for sludge and oxidation stability

Evaluation method for thermal degradation

Study for Fatty Acid Ethyl Ester (FAEE)

6.4. Minutes of the 4th Meeting

ERIA Energy Project

Working Group for Standardization of Biodiesel Fuel for Vehicles in East Asia

Minutes of the 4th Meeting

February 21-22, 2008 in Manila, Philippines

Written by Mitsuharu OGUMA, AIST, Japan

Participating Countries:

China, Indonesia, Japan, Malaysia, New Zealand, Philippines, Singapore and Thailand
(Absence: Australia and South Korea)

February 21: Technical Tour “Coconut Oil Production Facility”

Venue: Chemrez Technologies Inc. (65 Industria St., Bagumbayan Quezon City, 1110 MM, Pilippines

- 60 million liters/year of coco-biodiesel producer’s Plant was visited.
- A lot of information of coco-biodiesel was introduced, using ppt slides from the staffes.
- A few chemical analysis rooms were shown.
- In front of the plant facilities, the outlines of the facility were explained.

February 22: Working Group Meeting

1. “Information of Project leaders Meeting and ECTF” from Dr. Goto, Japan

- Dr. Goto informed the progress of ERIA energy project leaders meeting as this WG leader.
- Our progresses were usually reported to Energy Ministers Meeting, Economic Ministers Meeting and Energy Cooperation Task Force (ECTF) of East Asia Summit (EAS).
- Japan would like to finalize the Standard of Biodiesel Fuel for Vehicles in East Asia as a Benchmark in this meeting.

2. “Progress of Final Report and Discussion on Each Country’s Comments for EAS-ERIA BDF Benchmark Standards” from Dr. Oguma, Japan

- Which countries did not submit the final report, annotation for the benchmark standard and data for database were checked, then, modified schedules of making final report and database were explained from Dr. Oguma.
- Each country’s comments for the benchmark standard were discussed in detail.
- The final style of our “EAS-ERIA Biodiesel Fuel Benchmark Standard” in the final report was decided as follows;

(1) The following sentences should be explained clearly in the final report.

- Working Group for Standardization of Biodiesel Fuel for Vehicle in East Asia made an “EAS-ERIA Biodiesel Benchmark Standard”. This is a benchmark standard suggested for member countries for the purpose of harmonizing biodiesel standards in East-Asia.

- This standard is B100 aimed for blending in diesel fuel.

- In case of the use as a final fuel for B100.....

(2) The final style of our “EAS-ERIA Biodiesel Fuel Benchmark Standard” in the final report as follows.

Items	Units	U.S.	EU	Japan	EAS-ERIA BDF Benchmark Standard:2008
		ASTM D6751-07b	EN142142:2003	JASO M360:2006	
Ester content	mass%	-	>96.5	>96.5	>96.5
Density	kg/m ³	-	0.86-0.9	0.86-0.9	0.860 - 0.900
Viscosity	mm ² /s	1.9-6.0	3.5-5.0	3.5-5.0	2.0-5.0
Flashpoint		>130	>120	>120	>100
Sulfur content	mass%	<0.0015	<0.001	<0.001	<0.0010
Distillation property		<360 (T90)	-	-	-
Carbon residue (100%)	mass%	<0.05	-	-	-
Carbon residue (100%) or Carbon residue (10%)	mass%	-	-	-	<0.05 <0.3
Carbon residue (10%)	mass%	-	<0.3	<0.3	-
Cetane number		>47	>51	>51	>51
Sulfated ash	mass%	<0.02	<0.02	<0.02	<0.02
Water content	mg/kg	<0.05[vol%]	<500	<500	<500
Total contamination	mg/kg	-	<24	<24	<24
Copper corrosion		No.3	Class-1	Class-1	Class-1
Acid value	mgKOH/g	<0.5	<0.5	<0.5	<0.5
Oxidation stability	hr.	>3	>6	(**)	10 (***)
Iodine value		-	<120	<120	Reported (***)
Methyl Linolenate	mass%	-	<12	<12	<12
Polyunsaturated FAME (4 double bond)	Mass%	-	<1	N.D.	N.D. (***)
Methanol content	mass%	<0.2	<0.2	<0.2	<0.2
Monoglyceride content	mass%	-	<0.80	<0.80	<0.80
Diglyceride content	mass%	-	<0.2	<0.2	<0.2
Triglyceride content	mass%	-	<0.2	<0.2	<0.2
Free glycerol content	mass%	<0.02	<0.02	<0.02	<0.02
Total glycerol content	mass%	<0.24	<0.25	<0.25	<0.25
Na+K	mg/kg	<5	<5	<5	<5
Ca+Mg	mg/kg	<5	<5	<5	<5
Phosphorous content	mg/kg	<10	<10	<10	<10

(*) Equivalent to diesel oil

(**) Meet diesel oil specification

(***) Need data check and further discussion

(***) Need more data & discussion from 6 to 10 hrs.

(3) Explaining more details about Oxidation stability, for example,

- General comments-

(i) Oxidation stability

(ii) Cetane number

(iii)

- Additional information such as; -

(i) Japanese situation

(ii) Europe situation

(ii)

- Indonesia's general comments seem to be fixed in this part.