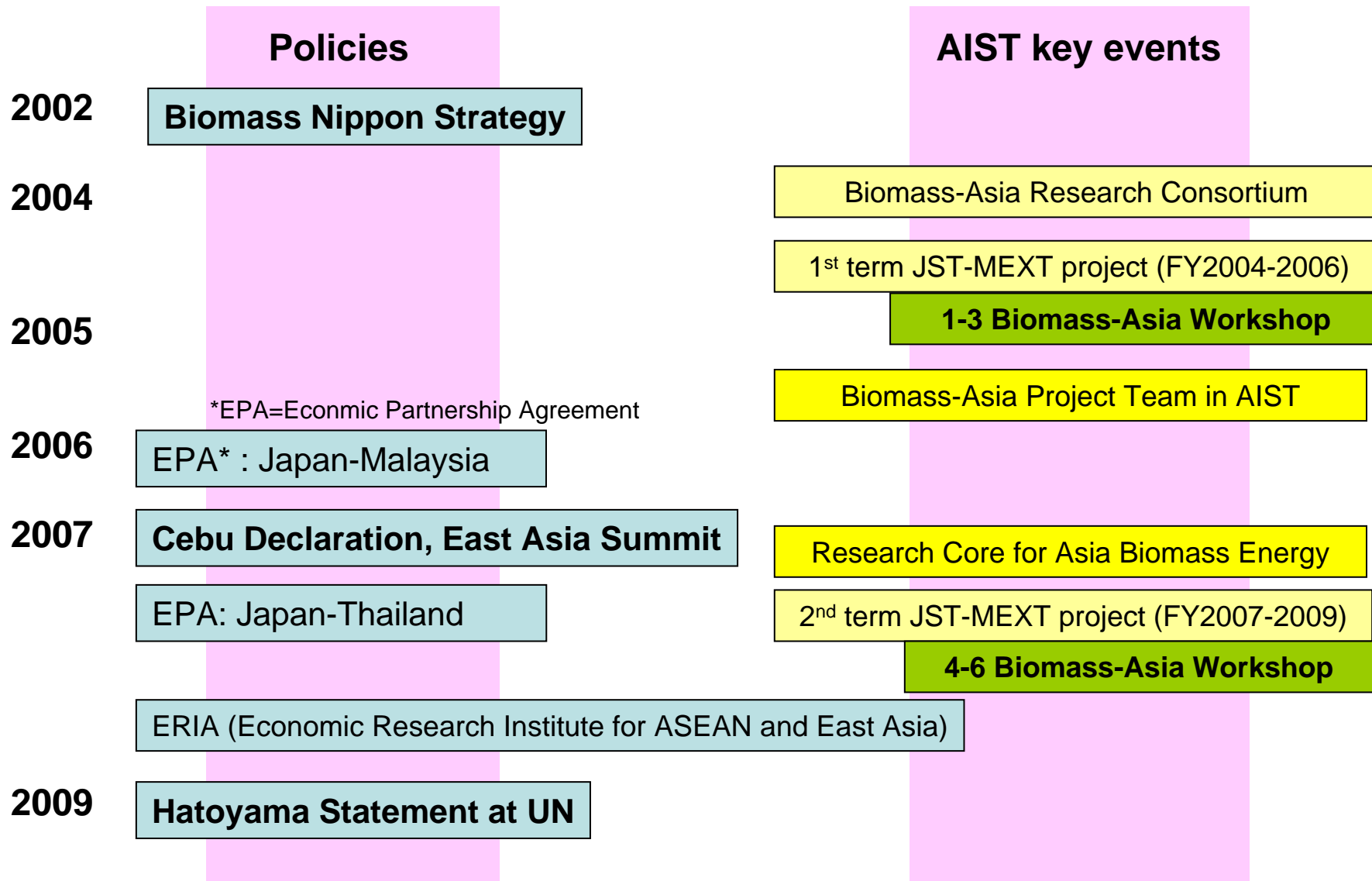


Biomass-Asia Strategy

Kozo Uto

International Affairs Department, AIST
National Institute of Advanced Industrial Science and Technology

AIST Biomass-Asia Project



Biomass-Asia Project

Asian countries

- Abundant biomass resources (ca. 40% of the world's biomass)
- Technology
- Cost efficiency

Japan

- Technology and Intellectual Property
- Governmental policies (Biomass-Nippon Strategy)
- Needs for collaboration with Asian countries

For Sustainable Growth

Complimentary collaboration in R&D with mutual benefit

1. Environmentally-friendly development of new energy (bio-energy) and biomaterial industry
2. Reducing CO₂ emission by biomass utilization
3. Encouraging sustainable primary industry, and creating new biomass-based industry

- To diversify energy and to ensure energy security in Asia and world
- To reinforce collaborative efforts with Asian countries
 - Preventing global warming
 - Encouraging sustainable development
 - Balancing environmental load, energy efficiency and economic growth

For creation of post-petroleum society

Biomass-Asia Research Consortium

National Institute of Advanced Industrial Science and Technology (AIST)

Japan International Research Center for Agricultural Science (JIRCAS)

National Agriculture and Food Research Organization (NARO)

Forestry and Forest Products Research Institute (FFPRI)

University of Tokyo

Hiroshima University



Partnership with Industry and Academia

- **Research consortium in Asia**
- **Collaboration programs with Asian countries**

Activity funded by JST-MEXT

- 1st term
 - Special Coordination Fund for Promoting Science and Technology (MEXT) FY2004-2006
 - “ASEAN Biomass Research and Development Strategy”
- 2nd term
 - Special Coordination Fund for Promoting Science and Technology (MEXT) FY2007-2009
 - “Research and Technological Development for Sustainable Biomass Utilization in Asian Countries”

Research and Technological Development for Sustainable Biomass Utilization in Asian Countries

FY2007-2009

Japan: Biomass-Asia Research Consortium

- National Institute of Advanced Industrial Science and Technology (AIST)
Biomass-Asia Project Team (BAPT)
- Japan International Research Center for Agricultural Sciences (JIRCAS)
- National Agriculture and Food Research Organization (NARO)
- Forestry and Forest Products Research Institute (FFPRI)
- The University of Tokyo
- Hiroshima University

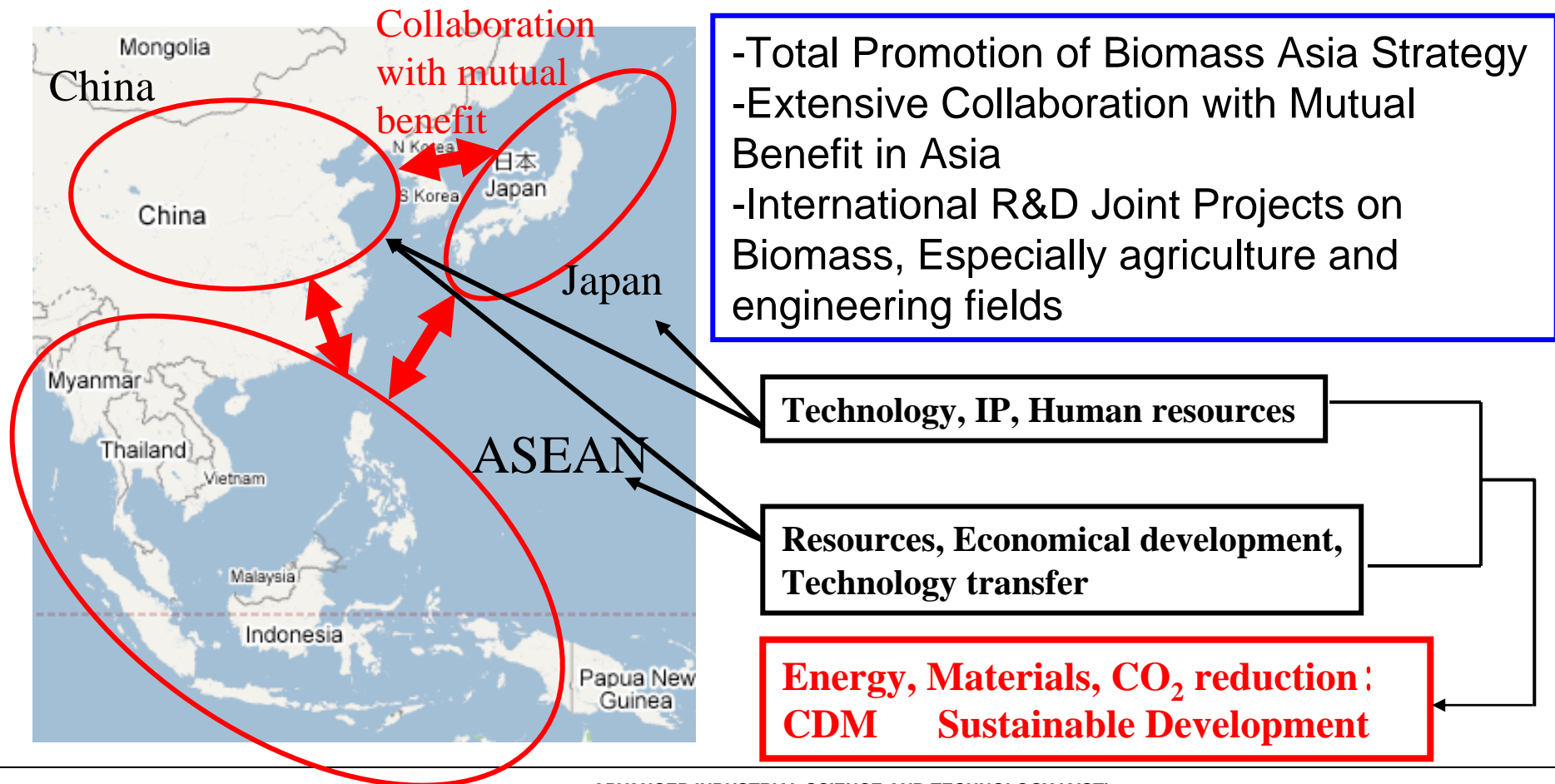
Asian Countries

- **China:** Chinese Academy of Sciences (CAS)
- **Thailand:** National Science and Technology Development Agency (NSTDA)
Thailand Institute of Scientific and Technological Research (TISTR)
- **Malaysia:** Standards and Industrial Research Institute of Malaysia (SIRIM)
- **Vietnam:** Vietnamese Academy of Science and Technology (VAST)
- **Indonesia:** The Agency for Assessment and Application of Technology (BPPT)

funded by JST, Ministry of Education, Culture, Sports, Science & Technology (MEXT)

Research and Technological Development for Sustainable Biomass Utilization in Asian Countries

Best Practice Scenario and System for Sustainable Biomass Utilization Models in Asian Countries



Promoting Biomass Research in AIST

**Research Core for Asia
Biomass Energy (ABECORE)**

Established
in Apr. 2007

Biomass Technology R. C.

**R. C. for New Fuel
Vehicle Technology**

International Affairs Dept., Headquarters etc.

**R. I. of Science for Safety
and Sustainability**

Energy Technology R.I.

**R. I. for Innovation in
Sustainable Chemistry**

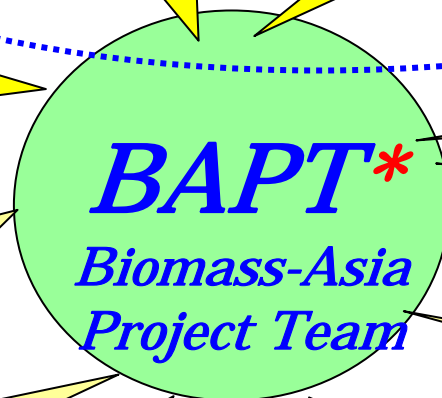
**R.I. for Environmental Management
Technology**

**R.C. for Compact
Chemical Process**

R.I. for Cell Engineering

R.I. for Genome-based Biofactory

Institute for Biological Resources and Functions



***established in Dec. 2005**

Cebu Declaration, Second East Asia Summit

- To realize Sustainable Development and Energy Security in East Asia
 - Encourage the **use of biofuels** and work to achieve a **standard for biofuels** used in engines and motor vehicles,
 - Set individual goals and formulate action plans voluntarily for improving energy efficiency,
 - Encourage collective efforts in intensifying the search for new and renewable energy resources and technologies, including **research and development in biofuel**

Research Core for Asian Biomass Energy (ABECORE)

- Established in AIST by the initiative under Cebu Declaration, East Asia Summit (January 15, 2007)
- Promotion of manufacturing technology of biomass fuels and its standardization
- Led by Dr. Kinya Sakanishi
 - Biomass Technology Research Center
 - Production of biofuels
 - Research Center for New Fuel Vehicle Technology
 - Standardization of biofuels
 - Research Institute of Sciences for Safety and Sustainability
 - Sustainability assessment

- Proposed by METI, Japan, at Second East Asia Summit
- Research body that conducts policy analysis and other research related to East Asian economic integration
 - Deepening integration
 - Narrowing economic development gaps
 - Sustainable economic growth
- ERIA Energy Projects
 - “Energy Security in East Asia”
 - Test run projects established in FY2007
 - Analysis on Energy Saving Potential in East Asia Region
 - **Standardization of Biodiesel Fuel for Vehicles in East Asia (led by AIST)**
 - **Sustainable Biomass Utilisation Vision in East Asia (led by AIST)**

Contribution to ERIA Energy Project

ERIA: Economic Research Institute for ASEAN and East Asia

Working Group at ERIA Energy Project (FY2008)

Achievements are reported to the
5th ASEAN+3 Energy Minister
Meeting in August, 2008

“Benchmarking of Biodiesel Fuel Standardization in East Asia”

<Leader> Dr. Shinichi Goto, Director,
Research Center for New Fuels and Vehicle Technology

“Sustainability Assessment of Biomass Utilisation in East Asia”

<Leader> Dr. Masayuki Sagisaka, Deputy Director,
Research Institute of Science for Safety and Sustainability

Human resources exchanging / training programs

Researchers and trainee from East Asia countries
through Asia Biomass Office at New Energy
Foundation

In FY 2008, 19 researchers/engineers
from 6 countries for 10days to 8 months
(5 in fuel production, 11 in fuel
standards, and 3 in LCA areas)

AIST Biomass Networking

Biomass-Asia Workshop (FY2004-)

<http://www.biomass-asia-workshop.jp/>

- Indonesia, Thailand, China, Malaysia, Vietnam “Research and technological development for sustainable biomass utilization in Asian countries (2007- 2009)

Promotion of collaborative research

- Thailand “Innovation on production and automotive utilization of biofuels from non-food biomass” (FY2009-)
- Brazil “Research on ethanol production from sugarcane wastes” (FY2008-)
- Malaysia “Bioethanol production from palm residues” FY2008-)

Human resources exchanging/training program

-as a hub for biomass research-

- ERIA Human resources exchanging/training program
- AIST Biomass-Asia Fellowship Program
- JICA training course “Biomass utilization”

Biomass-Asia Workshop

<http://www.biomass-asia-workshop.jp/>

- Targets: Sustainable biomass utilization in Asia
- **THREE MULTI**
Multinational,
Multisectors (government, industry and academia),
Multidisciplines (agriculture and industries)
- 1st (Jan. 2005 in Japan) Starting Networking
- 2nd (Dec. in Thailand) Thailand initiative workshop
- 3rd (Nov. 2006 in Japan) Complimentary collaboration with mutual benefit, biomass-Asia Network
- 4th (Nov. in Malaysia) Discussion on three models proposed, Palm complex model
- 5th (Dec. in China) Discussion on three models, Hybrid Agricultural wastes utilization model
- 6th (Nov. in Japan) Summary of studies on three models for sustainable biomass utilization in Asia
- Biomass-Asia network with 12 countries
Thailand, Cambodia, China, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Japan, Korea, and Vietnam

Collaborative Research for Palm Industry Complex

November, 2007

Memorandum of Understanding (MOU) among University Putra (UPM) Malaysia, Kyushu Institute of Technology (KIT), and Biomass Technology Center (BTRC), AIST

April, 2008

Collaborative research on bioethanol production from palm residues by collaboration of UPM, KIT, and BTRC

November, 2008

Collaborative laboratory (Biomass Technology Centre) in UPM



Signing ceremony of JRA at UPM



Opening ceremony of Biomass Technology Center at UPM

JST-JICA Joint Project of "Innovation on production and automotive utilization of biofuels from non-food biomass" (FY2009-FY2013)

AIST
National Institute of Advanced Industrial Science and Technology

Waseda University



NSTDA
MTEC
a member of NSTDA



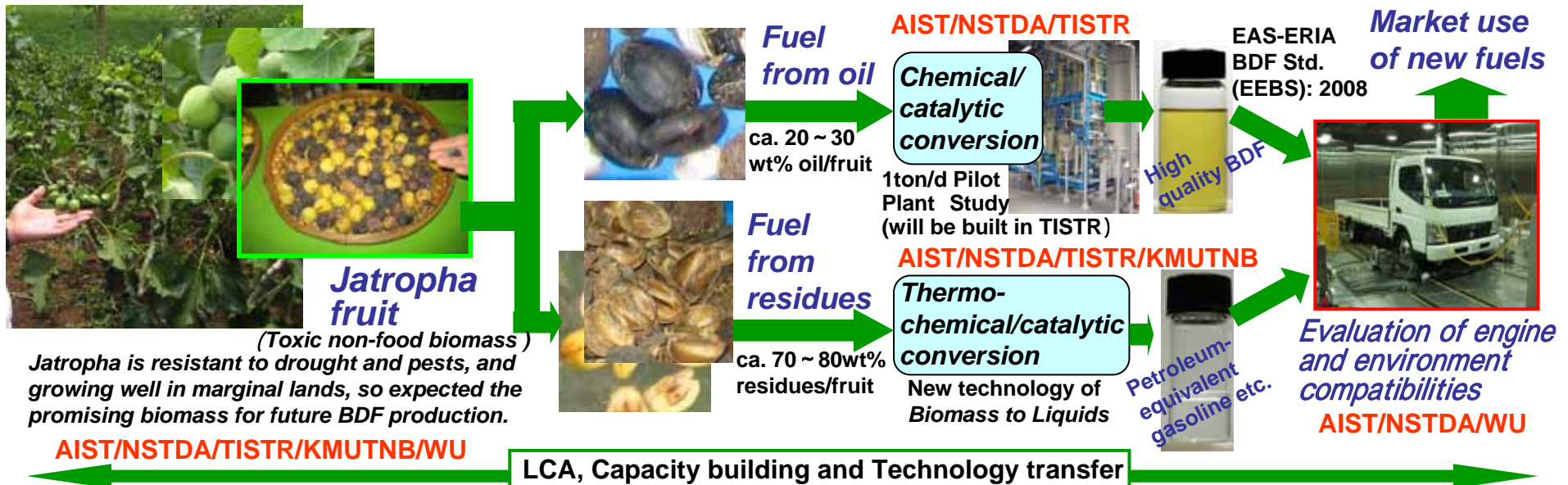
Thailand Institute of Scientific and Technological Research

National Science and Technology Development agency

National Metal and Materials Technology Center



King Mongkut's University of Technology NB



Sustainable introduction of biofuels into the transportation sector is a promising measure to reduce the causes of climate changes, so there have been pressing demands for the development of the innovative technology to produce transport fuels from non-food biomass. In this project, we will develop the scientific and technological bases for the production of transport biofuels, and for the evaluation of biofuels in automotive utilization and in life cycle assessment (LCA). We will focus on Jatropha as a non-food biomass, and will develop the novel biofuels production technology from Jatropha residues in addition to the technology for production of high quality biodiesel (BDF) from Jatropha oil to enhance its over-all utilization efficiency. We will demonstrate these new fuels as the new transportation fuels via. engines and emission tests, etc. Capacity buildings related on biomass research will be also our purpose of this project.

Future Prospect

- Further development of Biomass-Asia initiative and complimentary collaboration with mutual benefit
 - ERIA activity
 - Biofuel production, standardization, sustainability assessment
 - Exchanging experts on biomass utilization
 - Specific joint research
 - Joint laboratory in Universiti Putra Malaysia (UPM), targeting to realize a concept of Palm Complex Model
 - Collaborative research with Thailand on production and automotive utilization of biofuels from non-food biomass”
 - AIST Biomass-Asia Fellowship
 - To encourage personnel exchange for future reinforcement of Biomass-Asia network
 - Biomass-Asia Workshop
 - To maintain and reinforce Biomass-Asia network
 - Member country initiative
 - Expert meeting focusing on specific topic