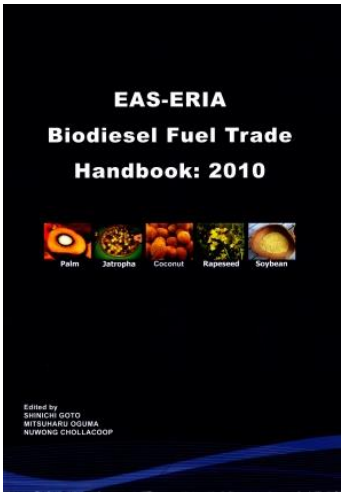
Chapter 1

Introduction

Energy consumption in the transportation sector in East Asia Summit (EAS) countries is expanding. To reduce the amount of imported crude oil, each country has established a target for reducing energy consumption. To achieve this target, biomass is being used from the viewpoint of introducing renewable energy and using domestic resources in various countries in the Association of Southeast Asian Nations (ASEAN). In particular, the introduction of first-generation biofuels such as bioethanol and biodiesel has been promoted in the transportation sector. Biofuel is often produced using a domestic resource at a relatively small-scale factory. Therefore, the fuel quality is not uniform and the low-grade fuel often causes engine trouble. To respond to this situation, our working group discussed between 2007 and 2012 creating a benchmark fuel standard to maintain the quality of biodiesel in the EAS region. We proposed the EAS–ERIA biodiesel fuel standard (EEBS2008) and published the EAS–ERIA Biodiesel Fuel Trade Handbook 2010 (Figure 1-1). It describes the importance of fuel quality assurance, the current status of the fuel specification of each country, and upgrading the technology of the first-generation biofuels. From 2013 to 2014, we revised the EAS–ERIA biodiesel fuel standard (EEBS2013) based on the revised European standard. This standard was introduced to the national standard in some ASEAN countries.

Figure 1-1. EAS–ERIA Biodiesel Fuel Trade Handbook: 2010

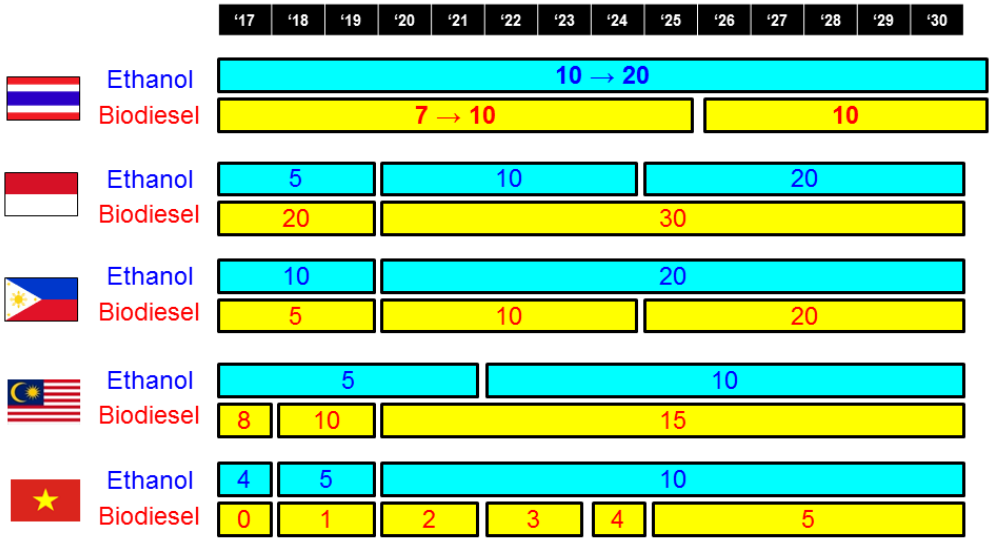


Source: ERIA, 2010, available at:
http://www.eria.org/EASERIA_Biodiesel%20Fuel%20Trade_Handbook_2010.pdf

Following this, energy-related ministries established medium- and long-term plans to promote the further introduction of biofuel in each ASEAN country (Figure 1-2). An ambitious target is set up as a biofuel introduction in the new plan.

To achieve the target, it is necessary to conquer various problems such as supply of raw materials, expansion of fuel production facilities, and quality assurance for high-concentration biofuel use. However, no optimum way has been identified yet.

Figure 1-2 Biofuel Road Map in Five ASEAN Countries



ASEAN = Association of Southeast Asian Nations.
Source: ASEAN.

However, when we look closely at the relationship between car registration numbers classified by the kind of fuel used and the biofuel introduction policy in various ASEAN countries, we recognise that there are discrepancies. That is, there is a gap between the current situation in the transportation sector and the fuel policy. It is important to establish a biofuel introduction policy that corresponds to the demand in the market to supply the necessary fuel. To achieve the reduction target for petroleum consumption, the transportation sector needs to consider using various resources, improving fuel efficiency of vehicles and road infrastructure, as well as promoting biofuel.

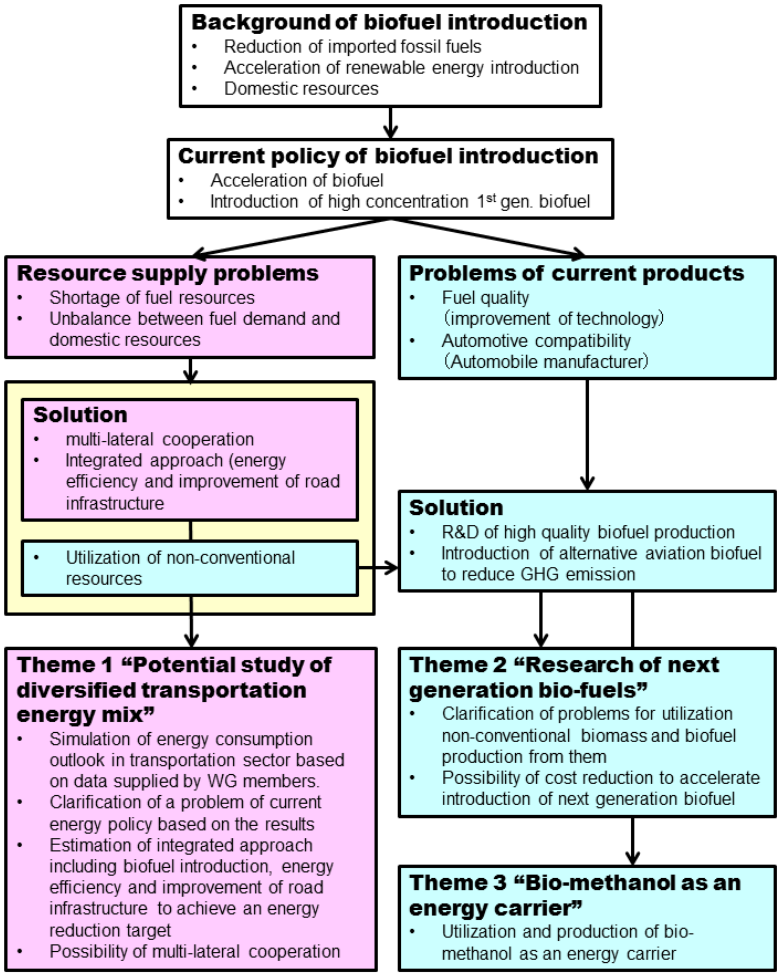
To find solutions to the problems mentioned above, the working group set three themes from the viewpoints of raw material supply and fuel quality (Figure 1-3).

For a solution based on raw material supply, the fuel supply and demand outlook in the transportation sector has been simulated up to 2030 based on the present policy and biofuel supply in theme 1 'Potential study of diversified transportation energy mix'. We chose five major ASEAN countries (Thailand, Indonesia, the Philippines, Malaysia, and Viet Nam), according to the number of cars registered in the country. The purpose of this theme is to propose measures for mitigating energy issues in the transportation sector (Chapter 2).

Theme 2 ‘Research of next-generation biofuels’ mainly deals with the next-generation biofuels that are more compatible with cars even with high concentrations of biofuel in the mix., We look at the current status from the aspect of biofuel technology. For future introduction, we clarify the factors related to technical development in production and cost reduction. The last aim is to find economical means to contribute to a high-quality fuel supply (Chapter 3).

Theme 3 ‘Biomethanol as an energy carrier’ deals with methanol produced from biomass. Currently, methanol is mainly produced from fossil resources. To promote methanol production from biomass resources, we investigate the current status of the manufacturing plants and consider the availability of methanol as a biofuel intermediate (Chapter 4).

Figure 1-3. Composition of Each Research Theme



Source: Authors.

Finally, we integrate these results and indicate measures for the reduction of energy consumption in the transportation sector as well as the promotion of next-generation biofuel introduction.