Newsletter Issue #31 September 2012

Commercializing Liquid Biofuels from Biomass

Task 39
IEA Bioenergy

Inside This Issue

From the Task

By Jack Saddler, Jim McMillan and Sergios Karatzos

Preparations are well underway for the IEA Bioenergy conference (www.ieabioenergy2012.org) that will be held in Vienna, 12-15 November. As part of the main conference program we have asked several of our Task 39 industrial members to profile the progress they have made in moving towards the commercialization of advanced biofuels, using a variety of biomass feedstock's and technical approaches. Our Task will be actively participating in what will constitute the "end-of-triennium" conference for all of the IEA Bioenergy Tasks, profiling what has been achieved over the last three years and projecting what can be anticipated for the next three years. Since our last newsletter (in the earlier part of 2012) Task 39 has been involved in several interesting meetings.

We have maintained our tradition of having a strong network presence at the *Biotechnology for Fuels and Chemicals Symposium* which was held this year in New Orleans (30 Apr-3 May). Although we did not have a formal session within the main symposia (this is planned for next year's meeting in Portland, Oregon) the many topics covered in the various sessions were of direct interest to our network members (www.simhq.org/sbfc).

One key aspect of any biomass-to-fuels-and-chemicals process, the Pretreatment step, was covered in a Task 39 sponsored workshop held in Vancouver on the 4-6 June. This meeting brought together many of the "traditional" pretreatment sectors such as pulp and paper, forest operations, agricultural engineering with many of the

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leading engineering (Andritz, Metso, etc.), bioconversion (Abengoa, Mascoma, etc.) technology providing (Lignol, Catchlight, etc.) and oil, chemical, energy companies as well as some of the world's top pretreatment researchers (www.nsercbioconversionworkshop.com).

The two day workshop was followed by field trips to several of the organisations and facilities (FP Innovations, UBC's Clean Energy Research Centre (CERC) and Centre for Interactive Research on Sustainability (CIRS), Nextera gasifier, UBC Process Development Unit). We are in the process of accepting submissions and reviewing papers based on presentations made at the workshop that will eventually be published in a special issue of the journal *Biotechnology for Biofuels.*

We are also in the final stages of polishing various reports that have been commissioned by our Task members in the areas described below.

Over that past few years Task 39 has published updates of the "Biofuel Implementation Agenda Reports" (this summary report compares and contrasts the policies used in Task 39 member countries to help catalyze biofuel use and development). These compilations of the summaries of the presentations from each of our Task39 Country Representatives on biofuel production targets/policies have become an important resource for our network members. The most recent update of this report will include an expanded section detailing the various biofuels policy approaches. It will also compare the relative successes of the different policies that have been used by the various member countries to try to develop or stimulate their respective biofuels industries. A draft report will be circulated round our country representative network for review/input in October with the goal of releasing the final report to our network members by the end of this year.

Our colleagues in the Advanced Motor Fuels (AMF) Implementation Agreement (IA) have recently released various reports that some of our Task 39 network members contributed. More information on these reports can be accessed through the AMF website at www.iea-amf.vtt.fi

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We continue to make progress on other Task 39 commissioned reports. One study is looking at the energy and GHG emissions balance of the various advanced biofuel technologies that are, or will soon be operating at a demonstration stage. The GHGenius LCA (Life Cycle Analysis) model is being used with a "cradle-to-grave" approach. Various feedstock conversion technologies and fuel types will be included in the analysis. Various data sources provided by our Task 39 network members have been used but with particular emphasis on data derived from US national laboratory (NREL and PNNL) techno-economic analyses. Preliminary results indicate that, depending on the choice of end fuel and feedstock, there are considerable differences between the various technical approaches with some more favourable for both energy and GHG balances. Overall, the report indicates that the LCAs of all of the biofuel technologies analyzed were sensitive to the product yield and even more so to the source of electric power for the overall process (biomass, hydro, fossil, etc.). The report is currently being reviewed by Task 39 colleagues and should shortly be available for distribution to the general network.

We also continue to evaluate the potential of so-called "drop-in" biofuels with regard to the various technical routes that can be taken for their production and their potential for commercialization. Although widely produced and utilized, conventional (sometimes called "first generation") biofuels (sugar and starch ethanol and oil crop-derived FAME) are not readily compatible with the existing petroleum/oil refining infrastructure. More petroleum-like biofuels ("drop-in" hydrocarbon biofuels) have more recently become a major area of R&D interest in many labs and companies around the world. "Drop-in" is a relative term and it refers to the extent of infrastructure compatibility of a given biofuel product. Since infrastructure such as car engines and fueling stations and refineries are very expensive to change, it has been suggested that it would be preferable if any future biofuel could be readily "dropped-into" the existing infrastructure (refining, distribution, specifications, etc.) The Aviation sector (military or civilian) has shown considerable interest in the potential of drop-in biofuels as automotive options such as electricity are not really viable. Similarly, conventional biofuels are not really suited as biodiesel freezes at flight altitude while bioethanol has a low energy density. One of the major reasons for the aviation sectors interest in biofuels is to meet its increasing commitments to reducing carbon emissions such as the IATA goal of a 50% reduction by 2050 or via binding carbon trading agreements such as the EU ETS (Emissions Trading Scheme).

In the US the Obama administration has recently released two strategic documents related to advanced biofuels. First, the "Bioeconomy blueprint" is a "first-of-its-kind" strategy which lays out the targets that will help the US economy take advantage of the upcoming bioeconomy as supported by advances in genetics, agriculture/forestry and manufacturing. Secondly, the "integrated strategy for advanced biofuels" report describes "smart goals" for achieving commercialization of drop-in and advanced biofuels with particular emphasis on cost competitive military biofuels.

At a global level the IEA's recent report "Tracking Energy Technology" has indicated that total biofuel production needs to double, along with a four-fold increase in the production of advanced biofuels over currently announced capacity. This is a prerequisite if we are to reach the agency's goal of no-more-than a 2 degree Celsius increase in global temperatures by 2020. At the same time China's new five year plan (2011-2015) calls for a near doubling of its biofuel objectives.

We hope that Task 39's members, activities and reports will continue to be valued as an informed and neutral source of information and expertise as the many technical and policy aspects of Biofuels continue to develop

.

Finally, we want to thank our colleagues, Jin Suk Lee and Kyu Young Kang for continuing our tradition of profiling the biofuel initiatives that are underway in one of Task 39 member countries. As you can see, Korea has made incredible progress over the last decades and its expertise and commitment to the Biofuels area is as impressive as many other aspects of this country's development!

Jim Jack and Sergios

Progress on Transportation Biofuels in Korea

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1. Introduction

South Korea has a growing economy and the country consumed 0.27 billion tons of oil equivalent (toe) in 2011. It is now the world's 9th largest energy consumer and 7th largest CO_2 emitter. The major energy sources that are used in Korea are fossil fuels, such as oil and coal, which currently account for about 68% of the country's primary energy supply (Figure 1). Oil accounts for about 38.8% of the total energy consumed, followed by coal, gas and few other sources. As about 93% of South Korea's total energy supply (and 100% of the oil) is imported, the National government has been actively engaged in trying to ensure the ongoing stability of the cheap energy sources that have literally fueled the high economic growth that the country has experienced over the last several decades. However, as Korean living standards have risen, concerns have also risen about the shortcomings of fossil fuels, such as environmental issues (including climate change) and their finite nature. Recently, the Korean energy policy paradigm has changed from a focus on "the energy economy" to a focus on "the environmentally friendly energy economy".

In 2008, the Korean government announced the "Green Energy Vision" which has a goal of ensuring the sustainable growth of the country. According to this vision, a 30% CO_2 reduction from the BAU levels (813 M ton to 560 M ton) should be achieved by 2020 and the share of renewables in the energy mix should be increased to 11% of the country's primary energy consumption in 2030.

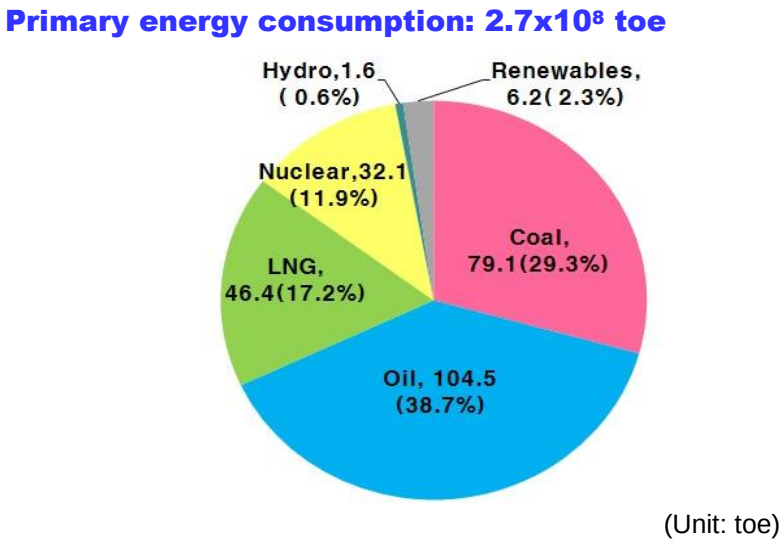

Figure 1. South Korea's primary energy consumption in 2011 (*Source: KESIS, 2012*).

Correspondingly, the contribution of renewable energy will be 5.1 times larger than that it is in 2011 (Figure 2) with Bioenergy playing a key role in this expansion of the renewable energy supply. The bioenergy supply in 2030 is projected to be 10.16 Mtoe which will be 14.8 times greater than it is in 2011.

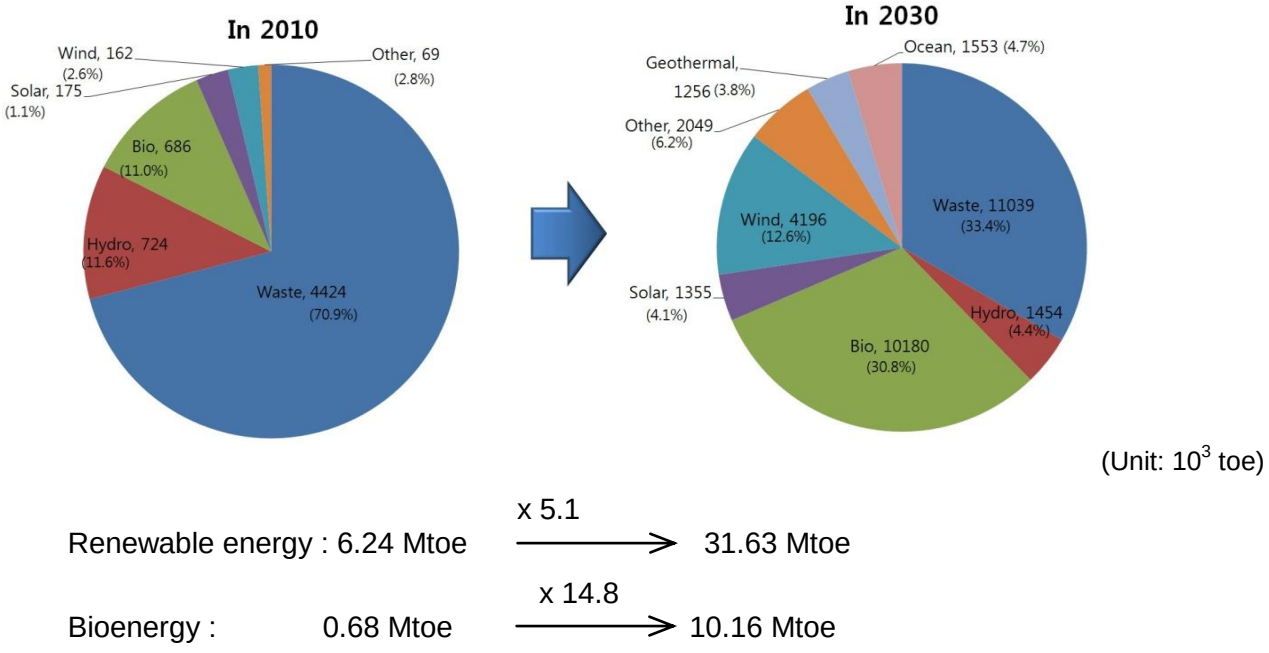

Figure 2. Targets for renewable energy and bioenergy implementation, 2030 (*Source: NREC, 2011*).

2. Policy and Goals

Korea has instituted several policy measures to promote the production and use of biofuels. For example, biodiesel is currently fully exempted from the fossil fuel tax ($0.5/L) to enhance its cost competitiveness. However, as the supply of biodiesel has increased, various financial challenges have been encountered. In 2010, when 400,000 kL of biodiesel was supplied to the country, about 0.2 billion dollars of government revenue was lost due to the exemption of the tax on biodiesel. Primarily due to this significant financial shortfall, the Korean government has held the biodiesel supply at 400,000 kL/yr since 2010. In response to this problem, the Korean government is now considering making biodiesel blended fuels mandatory, in place of the tax exemption strategy (Table 1). If mandatory use is imposed, a similar directive for a Renewable Fuel Standard (RFS), as is already practiced in the USA and the EU, will be issued in Korea.

Since the development of transportation biofuels will be a very important component of the national agenda, if the goals of the Green Energy Vision are to be realized, the supply of the biofuels is expected to grow until 2030 to reach a volume of about 5.0 Mtoe/yr (Figure 3).

Table 1. Targets and mandates for transportation biofuels (*Source: MKE, 2008*)

Year	Biodiesel (10^3 toe)	Bioethanol (10^3 toe)	Biogas (10^3 toe)
2007	100	-	-
2008	200	-	-
2009	300	-	-
2010	400	-	-
2014	Plan to be “mandate effective”		
2030	4,870	900	141

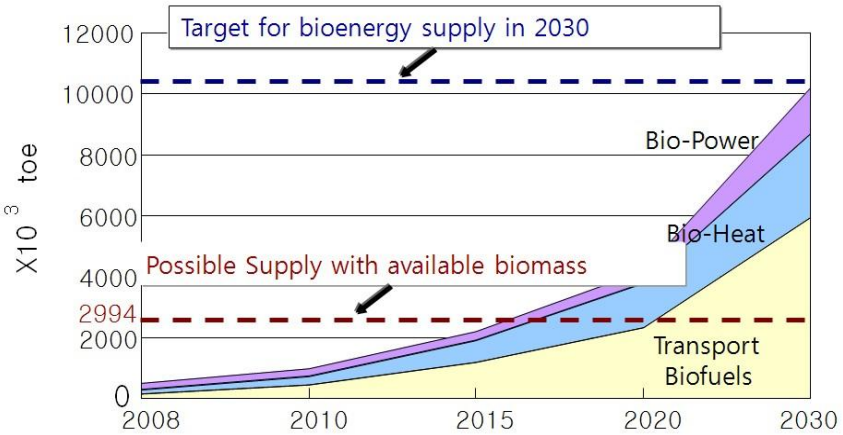

Figure 3. Targets for transportation biofuels in Korea (*Source: MKE, 2008*).

3. Challenging Issues

However, there are many challenges to that need to be resolved if the 2030 bioenergy supply targets are to be met. The major issues are:

- Low stakeholder-group acceptance
- Limited biomass resources in Korea
- The high cost of biofuels

With regard to the implementation of transportation biofuels in Korea, strong opposition has been encountered from car makers and oil refineries who are two of the major stakeholder groups in the transportation sector. These lobby-groups are worried about the compatibility of biofuels-blended fuels with Korean-made cars and its stability during distribution. As a result, a series of biofuels demonstration supply projects have been conducted since 2002 (Refer to "3.1. Demonstration supply of biofuels"). The limited amounts of local biomass materials are another barrier that has limited the development of biofuels. Finally, a substantial amount of R&D work is currently being carried out in Korea to develop advanced biofuels and to lower the cost of all biofuels. Some of the work being done in this area is described below.

3.1. Demonstration of supply logistics for handling transport biofuels

The feasibility of being able implement the wide-scale distribution of biofuels throughout Korea, including biodiesel and bioethanol, has been investigated. The potential viability of a 20% biodiesel blended diesel oil (BD20) has been investigated since 2002. This blend was distributed through approximately 130 licensed gas stations in Seoul and Chonbuk province. During this demonstration project several automotive operation problems were reported. This was primarily because all diesel fuelled vehicles made by Korean companies are equipped with common rail direct injection (CRDI) engines, which are very sensitive to fuel quality. To resolve these issues, a Korean biodiesel standard close to EN14214 was instituted in 2004. After the institution of this standard an evaluation of biodiesel blended fuels as motor fuels was carried out, using three different vehicle models (Table 2). Each car had been run up to 60,000 kilometers over 2 years, from 2004 to 2006. After a two-year evaluation the fuel injection systems of the cars were checked and no signs of deterioration were found. Since this positive evaluation in 2007, biodiesel producers have supplied their products to the oil refineries and the oil refineries have been responsible for biodiesel blending and the distribution of biodiesel blended fuels to all gas stations in Korea. However, BD20 is only used by fleet users having their own gas stations. To avoid problems during the winter season (Nov.1-Mar.13), the biodiesel content in BD20 was lowered to 10% (Figure 4).

Table 2. Evaluated vehicles and fuels (2004-2006)

Vehicle brand	REXTON	SANTAFE	SORENTO
Injection system (Supplier)	CRDI (Delphi Inc.)	CRDI (Bosch GmbH)	CRDI (Bosch GmbH)
Tested fuel	BD5		BD20

When BD20 was tested as a locomotive fuel from 2006 to 2008, the locomotives were found to have emitted about 20% less air pollutants compared with diesel fuel and no operational problems were observed with BD20 over the entire two-year run.

From 2008 to the present day, biodiesel use in Korea has steadily increased with about 4.0×10^5 kL of Biodiesel supplied in 2010, which accounted for about 2% of total diesel consumption.

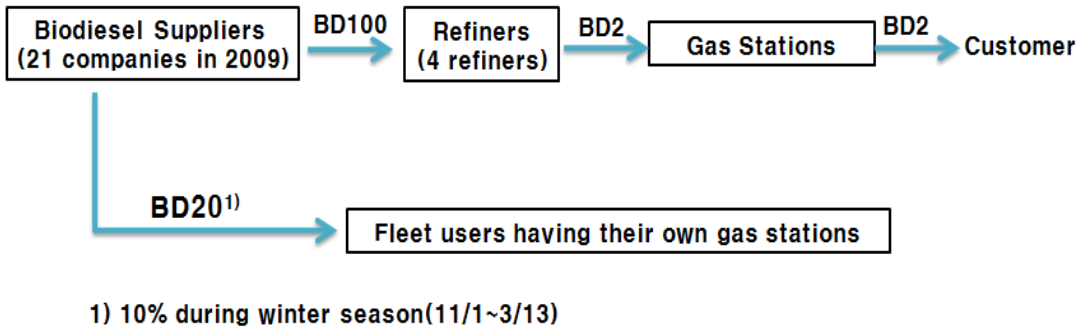

Figure 4. Schematic diagram of biodiesel distribution infrastructure (*Source: MKE, 2010*).

For ethanol, the major issue has been the compatibility of the established fuel distribution infrastructure with bioethanol blended gasoline (gasohol). When the ethanol concentration in gasohol is low (less than 10%), phase separation between ethanol and gasoline can occur even with very low concentrations of water. Unfortunately, fuel storage tanks at gas stations have no system to prevent water intake. In response to this potentially very serious problem, a one-year demonstration study on the supply of 3% (E3) and 5% ethanol (E5) gasohols, as delivered through the currently available distribution infrastructure was carried out from mid-June 2007 to the end of July 2008. The positive results coming out of this study concluded that the current fuel distribution infrastructure in Korea is fully compatible with E3 and/or E5 gasohol supply. The Korean government is currently considering when it will allow the full supply of gasohol and how to support this development.

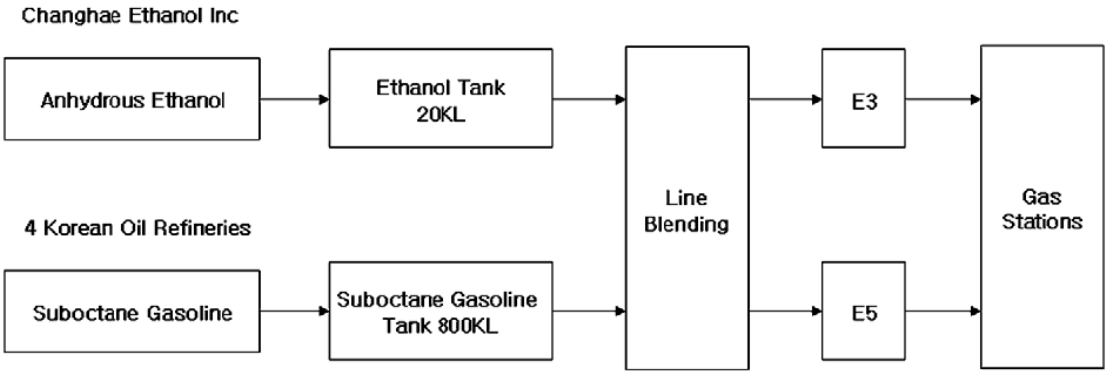

Figure 5. Schematic of trial project for gasohol implementation in Korea.

3.2. Strategy for securing a stable supply of biomass

The limited extent of biomass resources in Korea is another barrier to the expansion of the bioenergy supply. Although the bioenergy supply target for 2030 is about 10 Mtoe, the currently available biomass for bioenergy production is only about 3.0 Mtoe (Table 3). Therefore, additional biomass resources will have to be secured to meet the stated implementation goal (Figure 6). The feasibility of several options is currently under investigation. The first option to try and access increasing amounts of biomass for bioenergy production is to assess how much additional residual biomass might be available in South Korea itself. The second option is to assess the feasibility of energy crop cultivation on set-aside land. In Korea, river banks and reclaimed land are available for such use. Screening of suitable energy crops for set-aside lands by the Bioenergy Crop Research Center (BCRC), a subsidiary of the Rural Development Agency (RDA), has been initiated. Several strains of highly productive canola and *Miscanthus* have been isolated and demonstration cultivation is already underway for rapeseed and is being planned for *Miscanthus*. Mass cultivation of aquatic biomasses such as micro- and macro-algae for bioenergy utilization also is under review. The third and final option for securing biomass for bioenergy production is energy crop cultivation in foreign countries. Currently, several Korean companies are running palm farms and/or promoting *Jatropha* and *Eucalyptus* plantations in Southeast Asian countries. With all of these efforts it is hoped that the biomass required for achieving the bioenergy implementation target can be secured.

Table 3. Biomass availability in Korea (*Source: KIER, 2011*)

Resources	Waste biomass production ($x10^3$ tons/yr)	Energy availability ratio (%)	Energy Potential ($x10^3$ tons/yr)
Forest residues	6,760	25	1,690
Agricultural residues	571	25	143
Food wastes	170	-	51
Municipal wastes (Waste paper, woods)	1,080	100	1,080
Animal wastes	1,650	12.5	30
Total	10,231		2,994

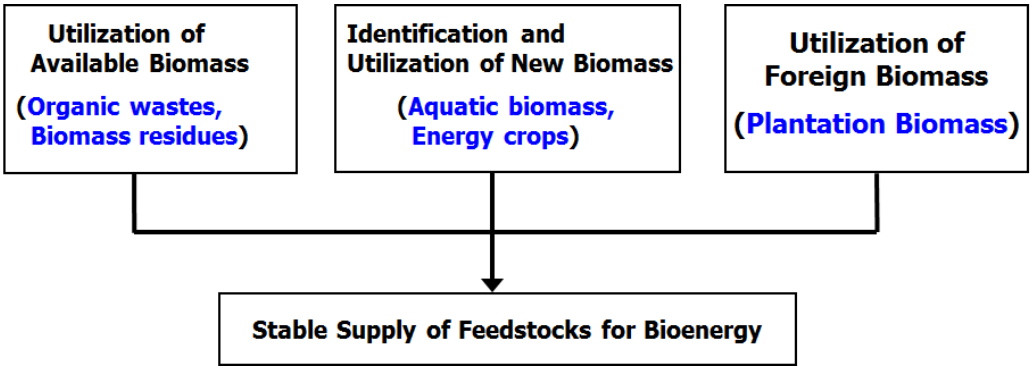

Figure 6. Strategy for securing stable supply of feedstocks (*Source: NAEK, 2008*).

4. R&D in the Advanced Biofuels area

In Korea, transportation biofuels are very important to energy security and CO_2 reduction. However, the currently produced conventional (or so-called, first-generation) biofuels suffer from poor cost competitiveness and feedstock supply issues. To try to develop biofuels from, hopefully, less expensive and less food-vs-fuel problematic feedstock's, advanced (or so called second-generation) biofuels need to be developed. As a result Korea has developed an active R&D program to identify and commercialize suitable technologies including cellulosic (biomass) derived and algal liquid biofuels.

4.1. Cellulosic based biofuels

Several pilot projects based on cellulosic biofuels are currently being carried out (Table 4).

Table 4. Major R&D projects on cellulosic biofuels

Project	Organisation/Location	Duration	Budget (US$10^6)	Target
Biobutanol from lignocellulosic biomass	GS-CALTEX R&D center/ Daedeok Science Town, Daejeon	2007.10 - 2012.09	12	Establish the demonstration process for biobutanol production (0.5 kL/day)
Bioethanol from palm residues	Gendocs Inc/ Daedeok Science Town, Daejeon	2010.06 - 2014.02	17	Establish pilot ethanol plant (0.2 kL/day)
Bioethanol from new local energy crops (*Miscanthus*)	Changhae ethanol R&D center/ Jeonju	2011.07 - 2016.06	15	Establish pilot ethanol plant (0.2 kL/day) using new local *Miscanthus* developed in Korea

4.2. Algal biofuels

South Korea is dedicating significant efforts toward algae biofuel commercialization. Due to the limited availability of land, the algal biofuels are regarded as a promising option to meet Korea's implementation target for transportation biofuels. However, the uncertainty about the availability of algal biomass is a major barrier limiting the commercialization of this type of biofuel. To try to improve the economics of algal biofuels, a biorefinery-based approach based on a multi-disciplinary collaboration will likely be required. Several R&D projects that will run until ~2020 have been initiated and the projects are summarized in Table 5.

Table 5. Major R&D projects on algal biofuels

Type	Organisation/Location	Duration	Budget (US$10^6)	Target
Macro-algae (red algae to ethanol)	Biol Systems Inc./Goheung, Korea	2010.01 - 2012.12	16	Establish pilot ethanol plant (1.0 kL/day)
Micro-algae (marine)	Marine Bioenergy Center	2009.01 - 2018.12	200	Identify suitable algal strains (fresh and marine) Low cost photo-bioreactor for mass cultivation Demonstration of pilot production system
Microalgae (fresh water)	KAIST Advanced Biofuels Center			

4.3. Biofuels' R&D roadmap

In 2011, the Ministry of the Knowledge Economy (MKE) of Korea announced the plans defined within the Biofuels' R&D road map needed to achieve the goals set for 2030. In the road map a two track approach, with short-term and mid-to-long-term R&D goals, has been identified.

The short-term R&D projects cover the technology developments related to conventional or "first-generation" biofuels such as developing transportation biofuels from wastes. The mid-to-long term projects will mainly focus on different technologies that can be used to produce advanced biofuels. A summary of the road map is described in Figure 7.

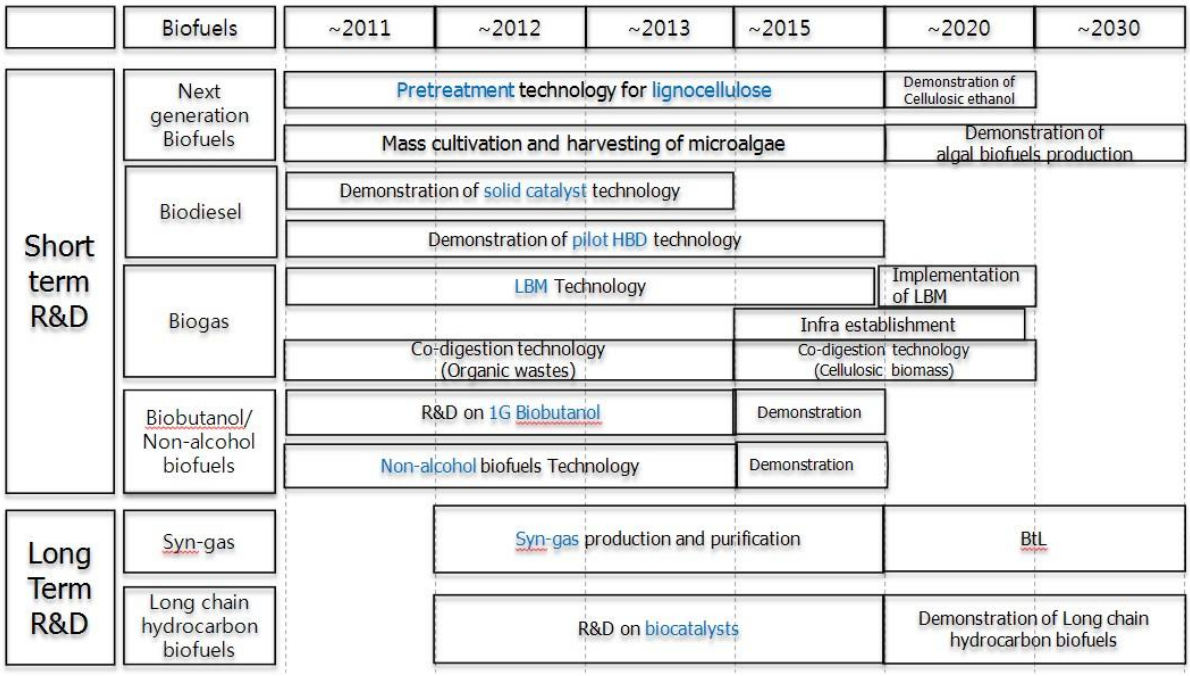

Figure 7. Transportation biofuels R&D road map in Korea (*Source: MKE, 2011*).

Acknowledgements

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- KEEI, http://www.kesis.net
- KNREC, http://www.knrec.or.kr
- KETEP, http://www.ketep.re.kr

Reports and Research

International Energy Agency calls for doubling biofuels production by 2020

"Tracking Clean Energy Progress" report released on 25 April is an early except of the *Energy Technology Perspectives 2012 (ETP2012)*. The report tracks progress in the development and deployment of clean energy and energy efficiency technologies in the power generation, industry, buildings, and transport sectors. Progess is assessed against rates required to achieve a 2°C limit in global temperature rise (referred to as the "2 degree scenario" or "2DS"). The report finds that while some progress has been made, most clean energy technologies are not on track to make their required contribution to reducing carbon dioxide (CO2) emissions and thereby provide a more secure energy system. It also highlights that getting back on track is possible, if timely and significant policy action is taken.

NAABB Chooses Harvesting and Extraction Technologies for Phase II Scale-Up Development

The National Alliance for Advanced Biofuels and Bioproducts (NAABB) has selected three harvesting technologies and one extraction technology for Phase II scale-up development. The three harvesting technologies include an electrolytic flocculation system from Texas AgriLife Research at Texas A&M; new cross-flow membrane technologies from Pacific Northwest National Laboratory; and the ultrasonic algal biofuel harvester from Los Alamos National Laboratory. The selected extraction technology is a specialized mesoporous nanomaterial technology for extraction of high-value lipids, e.g., tocopherol, which Iowa State University is developing. NAABB selected these four harvesting and extraction technologies for scale-up following a rigorous review. Five harvesting technologies and four extraction technologies being developed within the NAABB program were compared to each other and to market benchmarks for projected operational costs and energy consumption for this down-select process. More…

ExCo67 workshop: Future biomass-based transport fuels summary and conclusions

This publication provides the summary and conclusions from the workshop 'Future Biomass-based Transport Fuels' held in conjunction with the meeting of the Executive Committee of IEA Bioenergy in Helsinki, Finland, on 10 May 2011.

The purpose of the workshop was to provide the Executive Committee with perspectives on the likely contribution of biomass-derived transportation fuels. The aim was to stimulate discussion between the Executive Committee, Task Leaders, invited experts, and various stakeholders and thereby enhance the policy-oriented work within IEA Bioenergy.

In the News

Policy and Regulatory Developments

The Obama plan for cost-competitive military biofuels

The Obama Administration has laid out an integrated strategy for commercializing advanced biofuels, with a focus in this phase on military advanced biofuels at cost-competitive prices with conventional fuels.The vehicle is a joint program between the DOE, USDA and the Department of Defense (mainly Navy). More…

Republicans Order Navy to Quit Buying Biofuels

This highly controversial article argues that, according to the Republicans, the US Navy should no longer be prepared to play the role of promoting and buying biofuels at all costs. This argumentation is challenged in a separate article at biofuels digest...

The US Navy green fleet sails on biofuel for demo at the Hawaii PACRIM

July 17, Pearl Harbour. Military Sealift Command fleet replenishment oiler USNS Henry J. Kaiser (T-AO 187), delivers 900,000 gallons of a 50-50 blend of advanced biofuels and traditional petroleum-based fuel to the U.S. Navy aircraft carrier USS Nimitz (CVN 68) strike group. The fuel delivery is part of the Navy's Great Green Fleet demonstration, which allows the Navy to test, evaluate and demonstrate the cross-platform utility and functionality of advanced biofuels in an operational setting. More…

China nearly doubles biofuel targets

China seeks to promote the development of its biofuels industry through a series of supportive measures despite mass production difficulties. A spokesperson for the National Energy Bureau said that the Chinese government has set a goal of utilizing five million tons of ethanol fuel during the "12th Five-Year" period spanning 2011 to 2015, nearly double that set for the prior period (2006-2010). More…

USDA, DOE invest $41M to drive biofuels feedstock yields, diversification

The recent focus on drought, and the scarcity scare, shows that diversification and yield enhancement remain the bioeconomy's chief weapons in the war on availability and affordability. The USDA and DOE respond with a $41M investment in basic science, feedstock development. More…

Obama announces US Bioeconomy Blueprint

Late April in Washington, the Obama Administration released its Bioeconomy Blueprint, outlining its strategy for US economic revival based on a US technological lead in agriculture, biotechnology, health sciences and entrepreneurism. **More…**

Triple win for biofuels on Capitol Hill

Advanced biofuels make a stunning comeback in Washington with three quick committee-level touchdowns on military biofuels, tax credits and algae parity. The US Senate Committee on Appropriations and the Senate Finance Committee handed the advanced biofuels industry three of its most significant wins on Capitol Hill this year. More…

Sustainability

European Commission president says "back to the drawing board" on indirect land use change
In Belgium, European Commission president Jose Manuel Barroso wants the energy and environment departments to go back to the drawing board on ILUC. Reason? The College of Commissioners rejected at their May 2 meeting not only the compromise that would have seen crop-specific ILUC factors added to the Fuel Quality Directive but not the Renewable Energy Directive, but also suggestions to add ILUC to both directives or to raise the GHG minimum threshold to compensate for ILUC. More...

Industry News

Neste Oil, Stora Enso shelve plans for renewable diesel plant
Neste Oil and forest products company Stora Enso are abandoning plans to build a renewable diesel plant. The two companies had applied for funding under the E.U.'s NER 300 program, but the project was not selected for an award by the European Commission. More…

Amyris Successfully Makes Biofene from Cellulosic Hydrolysate
Amyris, in collaboration with its partners as part of the National Advanced Biofuels Consortium (NABC), has produced renewable farnesene (Biofene®), a diesel fuel and chemical precursor, by the simultaneous fermentation of ligno-cellulosic sugars including xylose. More…

The 2012 London Olympics: BP to showcase its three most advanced biofuels
This year in London, BP Biofuels will be using the occasion to showcase the future of fuels, when BP's sugarcane-based diesel, cellulosic ethanol and Butamax biobutanol will be used (in blends) to power the Olympic fleet, and will be available at BP's retail site right before the Hammersmith Flyover in west London. More…

Coskata switches focus from biomass to natural gas
Coskata, looking at CAPEX opportunities, political uncertainty, and the investor climate — switches to an "all natural gas" feedstock strategy. Initiates a $100M private placement, puts Alabama project on hold. More…

Honeywell Green Jet Fuel™ Powers First-Ever Transatlantic Biofuel Flight
PARIS, June 18, 2011 – Honeywell **(NYSE: HON)** announced today that its Green Jet Fuel has successfully powered the first transatlantic biofuel flight, which landed today at Paris-Le Bourget Airport. The Honeywell-operated Gulfstream G450 became the first aircraft to fly from North America to Europe with a 50/50 blend of Honeywell Green Jet Fuel and petroleum-based jet fuel, powering one of the aircraft's Rolls-Royce engines. It was also the first business jet to be powered by a biofuel. More...

Shell, Iogen and cancellation in Manitoba
In Canada, Shell and Iogen announced that they will not pursue the jointly owned 23 million gallon Iogen Energy cellulosic ethanol project in southern Manitoba. The announcement, according to the partners, "will lead to a smaller development program at Iogen Energy and a loss of 150 jobs". More…

Upcoming Meetings & Conferences

World Biofuels Markets Brazil

September 18-19, Sao Paulo, Brazil

The 2nd annual World Biofuels Markets Brazil conference, offers both new entrants and established energy market professionals the chance to hear from and meet with feedstock and biofuel producers, policy makers, biotechnology providers, project developers, financiers and end-users who are driving the development of next generation biofuels in Brazil.

Biofuels 2012

October 17-19, Amsterdam, The Netherlands

Biofuels 2012 is the place where strategic, commercial, R&D and technical experts from biofuels producers, oil companies, second generation biofuels companies, the transport sector, policy managers and solution providers meet to discuss the latest industry critical developments.

IEA Bioenergy Conference

November 13-15, Vienna, Austria

The IEA Bioenergy Conference 2012 will provide to stakeholders in R&D, industry and policy an insight into the recent research and market developments in bioenergy. The conference includes all topics dealt with by IEA Bioenergy as well as by partner organizations like FAO, GBEP and UNDP.

National Advanced Biofuels Conference & Expo

November 27-29, Houston, USA

The event brings together existing and future advanced biofuels producers with strategic petrochemical and agribusiness partners, government officials, investors and project finance professionals, technology and biomass supply-chain service companies.

For more events visit www.task39.org

IEA Bioenergy Task 39 Meetings

The following is a tentative schedule of Task 39 meetings over the course of the next few years. Please contact us for more detailed information:

- Vienna, Austria – November 2012 (IEA Bioenergy Conference)
- Stellenbosch, S.Africa – March 2013 (International symposium on Alcohol Fuels)

2013 May	US (Portland)	Business/evening session – with 35th SBFC
2014 Jan	Germany (Berlin)	10th BBE/UFOP International Congress on Biofuels
2014 May	Sweden	Business Meeting/World Bioenergy Symposium - Jönköping
2014 Sept	South Korea	TBD