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SUSUNAN REDAKSI

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Warta Kebijakan Iptek dan Manajemen Litbang (KIML) adalah jurnal ilmiah yang dimaksudkan untuk menjadi forum ilmiah tentang teori dan praktik kebijakan ilmu pengetahuan dan teknologi (Iptek) dan manajemen penelitian dan pengembangan (litbang) maupun manajemen inovasi di Indonesia. KIML dimaksudkan sebagai wadah pertukaran pikiran peneliti, akademisi dan praktisi kebijakan iptek untuk pembangunan ekonomi. KIML juga berisi sumbangan ilmiah dalam manajemen litbang dan inovasi untuk daya saing eknonomi. Tulisan bersifat asli berisi analisis empirik atau studi kasus dan tinjauan teoretis. Redaksi juga menerima tinjauan buku baru tentang kebijakan iptek dan manajemen litbang dan inovasi. Terbit dua kali setahun pada bulan Juli dan Desember.

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PENGANTAR REDAKSI

Pada Warta KIML vol. 9 no. 1 Juli 2011 ini menampilkan tulisan-tulisan dari kalangan akademisi dari berbagai institusi, baik universitas (ITB, IPB dan Universitas Djuanda) maupun lembaga penelitian (LIPI). Edisi ini memuat lima naskah tulisan hasil penelitian dan satu naskah berupa tinjauan buku. Tulisan-tulisan ini mendiskusikan hal-hal yang yang cukup strategis yakni penguatan peran litbang dalam memperkuat perekonomian nasional, dan isu nasional terkait pemenuhan kebutuhan energi nasional dan keamanan serta daya saing pangan nasional.

Dua naskah pertama mengulas tentang aspek kebijakan pengelolaan litbang dalam memperkuat pemanfaatan hasil riset. **Widjaya dkk** menggunakan kriteria tertentu untuk mengkaji potensi komersialisasi hasil litbang di universitas. Menurut penulis, riset pasar adalah mekanisme yang perlu dibangun untuk meningkatkan komersialisasi hasil riset. Sementara itu, hasil kajian **Arifin dan Handoyo** terhadap program riset kompetitif LIPI menemukan bahwa hasil riset baru sebatas pengembangan ilmu pengetahuan. Oleh karena itu penulis berpendapat, dua mekanisme berikut perlu diperkuat, yakni: (i) penguatan unit intermediasi litbang dan industri; dan (ii) pendanaan untuk melakukan kegiatan komersialisasi.

Dua naskah berikutnya menguraikan tentang strategi pengembangan energi alternatif di Indonesia dalam mengantisipasi kebutuhan energi kedepan. **Thaheer dkk** berpendapat bahwa diantara beragam jenis energi alternatif di Indonesia, biomassa dan batubara cair adalah energi alternatif yang paling potensial dikembangkan kedepan. Sementara itu energi tenaga surya dan angin masih terkendala penguasaan teknologinya. **Indahsari dkk** berpendapat bahwa bioethanol cukup potensial di Indonesia karena potensi bahan baku yang tersedia, biaya tenaga kerja murah disamping teknologinya yang sederhana.

Disamping isu energi, edisi kali ini memuat pula naskah tentang aspek daya saing agroindustri produk halal di Indonesia yang disampaikan **Purnomo dkk**. Meskipun Indonesia sebagai acuan sertifikasi halal dunia, potensi pasar dan ketersediaan bahan baku nya cukup besar, namun kemampuan inovasi produk dan mutu produk halalnya relatif masih rendah dibandingkan negara sekawasan khususnya Malaysia dan Thailand.

Dibagian akhir edisi ini, dikemukakan contoh inovasi pemasaran yakni manajemen rantai pasokan. Hasil telaahan **Kusnandar** terhadap buku tentang Manajemen Rantai Pasokan Toyota mengemukakan bahwa perusahaan ini mampu bersaing dan inovatif karena melibatkan para pemasoknya secara intensif dalam model bisnis mereka, mendorong sistem informasi dan kerja serta transfer pengetahuan didalam rantai pasokan tersebut. Namun buku ini, menurut Kusnandar, belum mengulas tentang aliran dan pembagian keuntungan yang juga berpengaruh penting dalam mendukung kelangsungan rantai pasokan tersebut.

Demikian pengantar dari Redaksi, semoga tulisan-tulisan berikut dapat menambah wawasan para pembacanya.

Jakarta, Juli 2011
Redaksi Warta

INDONESIA'S BIOETHANOL INDUSTRY DIAMOND PORTER MODEL[1]

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ABSTRACT

The continuing increase consumption of fossil fuel price has been a mounting debate related to the limited source of fossil fuel reservation available as well as global warming issues. Though the price of world oil price has been fluctuating, the tendency of it to rise has led bioethanol to be considered as an alternative substitute for fossil fuel due to its renewable and eco-friendly qualities. To combat the increasingly serious issues that came with oil, Indonesia had planned to develop the bioethanol industry since 2006, however this endeavor failed for reasons that were unclear. This study has been conducted for a year through the collection of primary and secondary data in six cities and is aimed to determine those factors which affect the competitiveness of the bioethanol industry as well as to develop a competitive strategy. Experts from the bioethanol industry came from government ministries, private sectors in the bioethanol industry, associates, researchers and universities. This paper concludes the findings of factors and conditions related to Indonesia's bioethanol industry competitiveness development with the final results suggesting that government miscoordination, insufficient incentives for local producers and unclear market price were major problems encountered in the industry. However, stakeholders in the bioethanol industry are still very optimistic on the future of bioethanol in Indonesia, so long as the government is able to facilitate, support and be consistent in the regulation implementations. Low cost labor, land geography, technology and the type of raw materials are used are also considered strengths for this industry and should be developed further to increase productivity.

***Keywords**: bioethanol, Competitiveness, Diamond Porter Model*

SARI KARANGAN

Tingginya harga minyak bumi dunia menjadi bahan perdebatan yang berkelanjutan sehubungan dengan akibat yang ditimbulkannya, yaitu pemanasan global dunia. Meskipun harga minyak bumi dunia berfluktuasi tetapi secara keseluruhan, harga minyak cenderung mengalami peningkatan. Hal ini menyebabkan berbagai industri berupaya mengurangi ketergantungan akan minyak bumi dengan menggantikannya dengan bahan lain yang lebih ramah lingkungan dan dapat diperbaharui, seperti bioetanol. Sejak tahun 2006, Indonesia juga telah berupaya untuk mengembangkan industri bioetanol akan tetapi perkembangan industri ini tersendat-sendat. Tulisan ini bertujuan untuk menyampikan hasil penelitan tentang identifikasi faktor-faktor industri faktor yang mempengaruhi persaingan industri bioetanol di Indonesia. Data primer dan sekunder yang diperoleh dari enam kota di Indonesia, dilakukan dengan industri wawancara bersama pakar pelaku bioetanol, baik dari pemerintah, swasta, asosiasi maupun peneliti. Hasilnya penelitian menunjukkan bahwa kurangnya koordinasi antar badan pemerintah, kurangnya insentif untuk produsen serta ketidakpastian harga pasar merupakan penghambat perkembangan industri ini. Meskipun demikian, para pelaku industri tetap optimis akan perkembangan industri bioetanol Indonesia di masa yang akan industri, di mana industri harus dapat ditunjang pemerintah dengan memberikan fasilitas, menerapkan secara konsisten dan kontinu kebijakan yang telah dicanangkan. Faktor-faktor penunjang lain dalam pengembangan industri ini adalah upah tenaga kerja yang rendah, ketersediaan lahan, teknologi serta ketersediaan bahan bakunya.

Kata kunci: bioetanol, daya saing, model Diamond Porter

[1] This paper is part of the Dissertation presented at the Graduate School Seminar of the Business Management Program at IPB, Bogor
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[3] Dissertation Advisors

1.INTRODUCTION

1.1 Background

In early 1990, climate change triggered by human activities began to receive wide attention. Global warming that is currently experienced in the world, among others, is the result of industrial and transportation burning and has contributed to the increase of 6 º C of temperature throughout the twentieth century (IPCC, 2007). The emission resulting from fossil fuel consumption are one of many major causes of global warming, the effects of which includes weather changes such as stronger storms, heavier floods and increasing droughts.

IEA (2009) stated that the availability of energy is strongly influenced by environmental, economic and social factors with the estimation that world energy demand will continue to rise by 45% from 2008 to 2030 at an average increase rate of 1.6% a year. Despite the fact that continued use of fossil fuels would considerably drain the world's fossil fuel reserves as well as cause significant damage to the worldwide health and the environment, it continues to be consumed for industry and transportation means with it being predicted to reach $1,000 per barrel by the year 2030.

With the high world oil prices causing countries to search for alternative energy sources which are both renewable and eco-friendly, bioethanol as fuel processed from plants has risen as an option that could be used to replace the usage of gasoline, reduce CO2 emission and activate agricultural fallow land (Lee *et al,* 2007).

1.2 Problem Identification

Indonesia used to be a major producer for oil, however in May 2008, the country officially withdrew from OPEC because it was now a net importer for fossil fuel. While oil reserve and production in Indonesia continued to decline, consumption tended to increase. The government had slowly reduced the amount of subsidy for domestic consumption which allowed the price of gasoline to follow world oil price fluctuations. In accordance to this policy, the government had also proclaimed to reduce gas emission related to fossil fuel which led it to search for an alternative energy to substitute fossil fuel with biofuel and bioethanol considered to be the most potential energy available.

While Indonesia had much potential as a result of the fertile lands, the development of the bioethanol industry was not an easy task. In 2006 the government along with the Blue Print of Energy Mix produced Presidential Decree No. 5 Year 2006 regarding Energy Mix Policy for 2010 which included the roadmap in the development plan for the biofuel industry. Presidential Decree No.10 Year

2006 established a national team for renewable energy that had consisted of all representatives of institutions and organizations. Mix Energy Policy included energy for household, industry and commercial transportations.

In 2008, the government planned to utilize 5 to 5.5 million hectares of cassava and 750 thousand hectares of sugar cane to increase the productivity of these alternative fuels while the development of cassava and sugar cane seedlings was planned for 2009 realization by the government. An additional Rp 100 billion was budgeted to realize the objectives of which the interest subsidy of Rp 1 trillion were allocated for the farmers and Rp 2 trillion for the initial capital to establish the financing institutions for biofuel development (Ircham, 2008). Based on data from the Investment Coordinating Board (BKPM, 2005), the number of registered domestic companies (domestic investment) was a total of 31 business units worth IDR8 trillion, while foreign companies (Foreign investment) totaled 28 companies worth about U.S. $ 464 million (Waluyo, 2007). Despite these well planned blue prints and investments, PT Molindon Raya from Malang which was the only company out of 11 companies targeted by the government for bioethanol supply, halted in providing bioethanol to Pertamina in favor of exporting its products abroad.

1.3 Study Questions

1. Why is it difficult to develop the bioethanol industry in Indonesia?
2. Which factors influence the competitiveness of the bioethanol industry in Indonesia?
3. How far do these factors affect each other, both as a support and barrier in the potential development of bioethanol industry in Indonesia?

1.4 Purpose of Study

The purpose of this study is to formulate the strategy of developing Indonesia's bioethanol competitiveness and to identify the inhibiting and supporting factors to develop the bioethanol industry in Indonesia.

This study is based on the competitive theory Diamond Porter Model (1990) which can be seen in the figure below, where the Porter's Diamond Model demonstrates that competitive forces, infrastructure and resources in a nation determines its competitiveness in world market and not only in a single industry. Each determinant factor creates a national environment, how the company was founded and the type of competition. Every point in the diamond or the diamond itself is a unit system which influences each other in order to be successful in winning the world level competition.

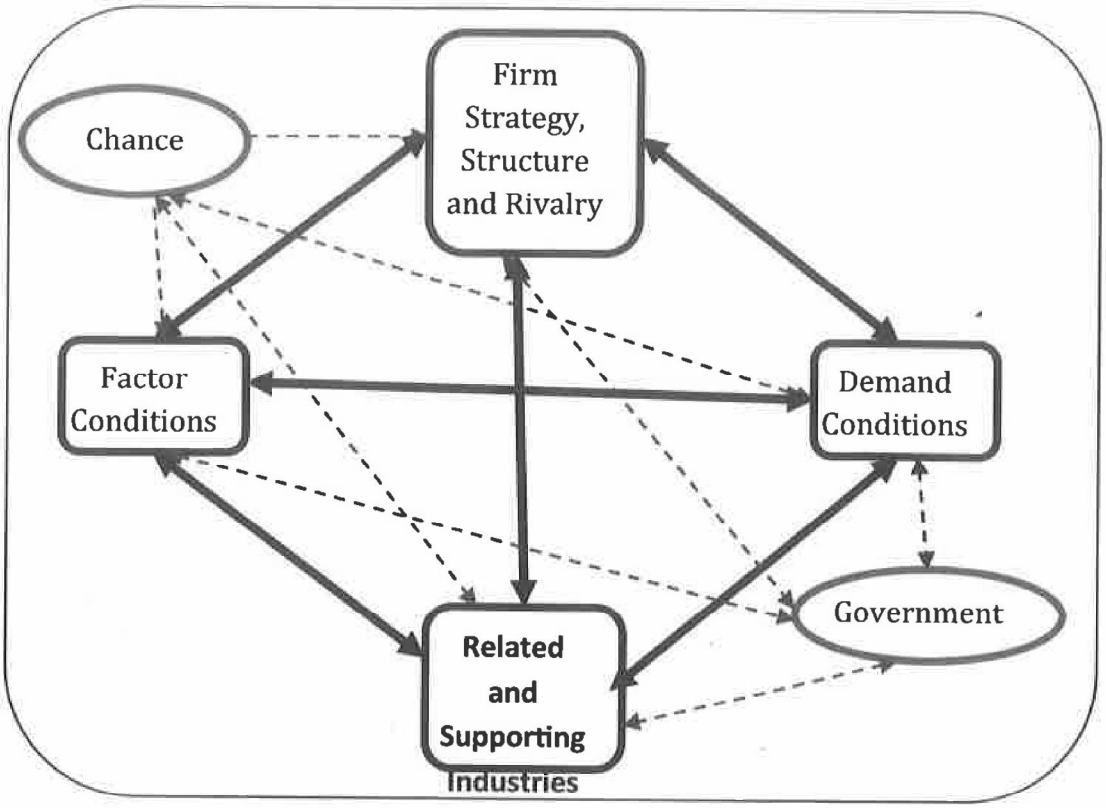

Figure 1. Diamond Porter Model (Porter, 1990)

1.5 Study Benefits

The benefits of this study is to determine factors affecting the competitiveness of Indonesia's bioethanol industry as it relates to national policies since it has the potential to stimulate the growth of the bioethanol industry in Indonesia. This study is also useful for consumers in disseminating the use of bioethanoin the long term given that consumers' reliance on fossil fuels must be altered to a mix of biofuels so that dependency on imported fossil fuels can be reduced.

2. LITERATURE REVIEW

Competitiveness can be defined as the combination of favorable trade performance and any other factors (Krugman, 1994) . Porter (1990) argued that due to dynamic changes in the environmental industry, companies were forced to comply with the environment and choose to develop and adopt innovations. These innovations resulted in more productive combinations of factors, compensating for the initial increase in costs arising from the obligation where the effect of increasing productivity is the most critical factor that increases competitiveness of firms (Porter and van der Linde, 1995).

The Diamond Model captures the major determinants of competitive advantage, including factor conditions, demand conditions, related and supporting

industries and firm, strategy, structure and rivalry (Porter, 1990). Influencing the major determinants are chance and the government. Cho (1994) later developed Porter's model with Nine Diamond Factors which is considered to be more applicable to companies in developing countries. The differences between the two theories are on the exogenous and indigenous factors. Every point in the diamond or the diamond itself is a unit system which influences each other in order to be successful in winning the world level competition. (Porter, 1990)

Ethanol which is produced from sugar and raw starch and fermented is a good substitute for petrol. The mixing of ethanol with fossil fuels was done due to the 'oxygenation properties', energy balance, its environment-friendly characteristics, the advantages in the labor problem in rural areas, as well as its contributions to national energy security (Fernández-Tirado and López, 2008) and as a result, total ethanol production has increased by 18% since 2006 to 2007 to 46 billion liters (World watch Institute, 2009). World bioethanol production in 2012 is expected to grow 5%from the year 2008 to reach 20 billion, where the United States and Brazil combined produce more than half the world's bioethanol with the United States being the largest producer of bioethanol from corn and Brazil from sugar cane.

Ciain and Kancs (2009) in their paper found several factors of comparative advantage in China's products as these products are highly competitive when compared to products made in other countries. The factors, namely low-wage workforce, a large amount of manpower, and lower China's currency exchange rate, attract significant amount of foreign investors that Foreign Direct Investments are found in China. Hallat (2011) who examined the level of competitiveness of oilseeds from South Africa found that this material had a high level of competitiveness when compared to products from other countries, but since Africa does not have the technology to process it further it had to be processed by Argentina . Argentina's added value indicates that the country was better able to compete on the downstream, while South Africa with oilseed raw materials was more successful on the upstream. Lee and Han (2007) in South Korea examined the B / C ratio for biodiesel production while Cunha and Scaramucci (2007) showed that by developing existing technologies, the production of bioethanol using sugar cane would replace the global fossil fuel use by 5% in 2025 in which the world GDP could be increased by 11.4 %.

Szulczyk (2007) studied the influence of economic and technological factors have on the penetration of bioethanol into the transportation fuels market. The study uses the Forest and Agricultural Sector Optimization Model Greenhouse Gas (FASOM-GHG) to quantitatively examine the influence of fossil fuel prices, bioethanol manufacturing technology, prices of greenhouse gas offsets and the effect of agricultural commodity markets for feedstocks and bioethanol byproducts. The results indicate that gasoline prices have a major impact on aggregate bioethanol production but only at low prices, while at higher prices, there is a capacity constraint which limits the expansions of bioethanol production capacity. Tirado and Lopez (2008) studied the competitiveness of biofuel in Spain using the ANP and

AHP method for multicriteria decision-making. The most important objectives for a sustainable development of biofuels in Spain are conservation of non-renewable resources, within the environmental issues, the ease to be technically implemented in production, storage, distribution, and consumption, within the economic issues, and the direct employment in the agro-energy system within the social issues. ANP is preferred than AHP for policy planning due to the importance of fine-tune the results for decision making due the significance of the society's benefit.

3. RESEARCH METHODOLOGY

The study was conducted in 2010 during over the course of a year where primary and secondary data were collected from six cities: Jakarta, Bogor, Jogjakarta, Malang, Jember and Surabaya. Expert panels and secondary data were collected from governments, private sectors, educators, researchers and associations with twenty experts interviewed for the study using open end questions. After the bioethanol industry framework was determined, the framework was then cross examined by these experts, ten of whom experts were further consulted to determine which factors played a major role in either supporting or prohibiting the developement of Indonesia's bioethanol industry.

4. RESULT AND DISCUSSIONS

After completion of research, the answers were then concluded in the Diamond Porter model for Indonesia's bioethanol industry where bioethanol's biodegradable and less toxic properties made it a good candidate to replace fossil fuel. In addition, bioethanol was discovered to improve air quality in older engines by reducing the amount of carbon monoxide produced by the vehicle. Another advantage of bioethanol is the ease with which it can be easily integrated into the existing road transport fuel system where in quantities up to 5% bioethanol could be blended with conventional fuel without the need of engine modifications. Another advantage is that bioethanol is produced using familiar methods such as fermentation so it is able to be distributed using the same petrol forecourts and transportation systems as previously used.

The Indonesian bioethanol Diamond Porter Model was classified into several categories: input factors or factor conditions, demand conditions, related and supporting industries and firm strategy structure and rivalry. The Indonesian bioethanol Diamond Porter model also includes government and chance as important factors affecting this industry. Figure 2 shows these factors in details affecting the industry competitiveness.

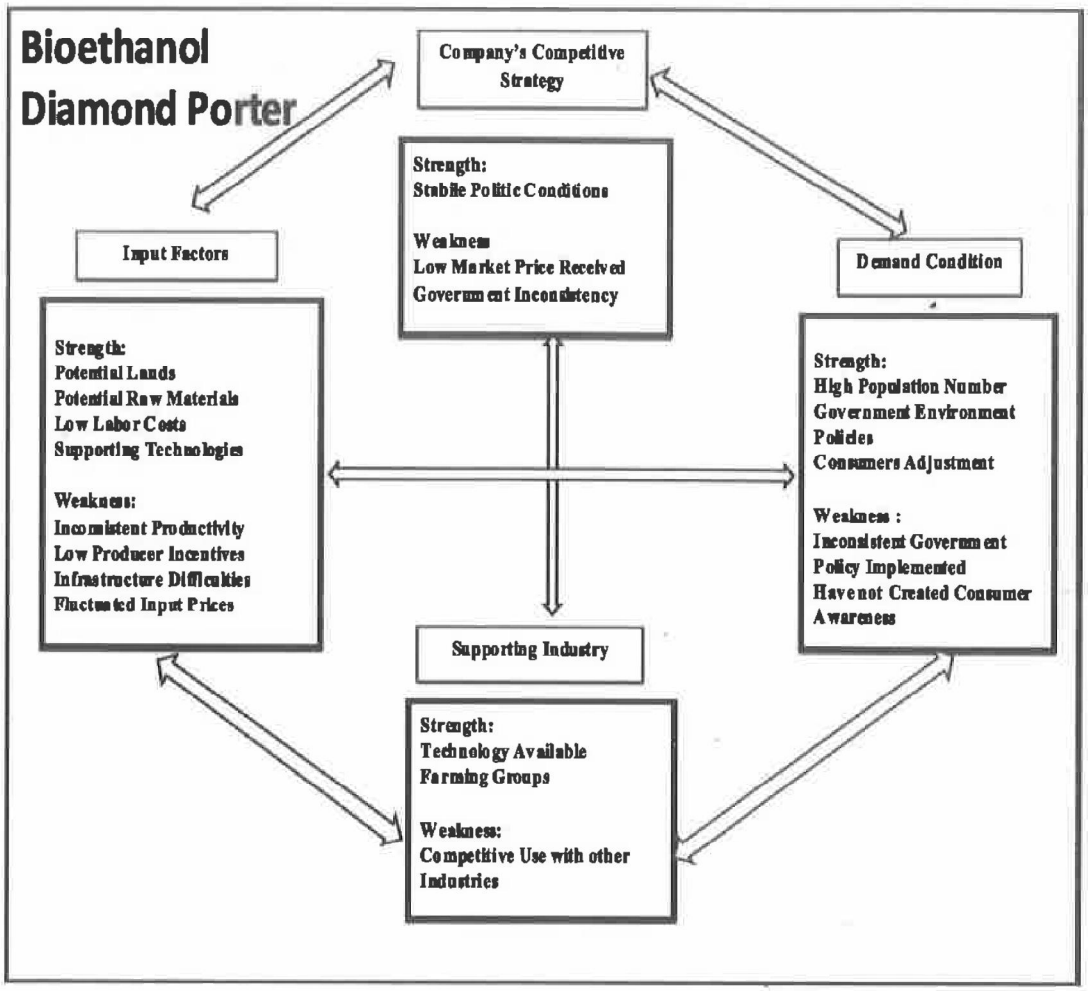

Figure 2. Indonesia's Bioethanol Industry Competitive Model (Study Result, 2010)

Figure 1 shows that input factors include factors affecting production and productivity of raw materials with cultivation potential, input factors used to produce bioethanol production, demand conditions which consisting of factors affecting bioethanol consumption, supporting industry consisting of industries related to the bioethanol industry and the company's own competition strategy in developing bioethanol.

4.1. Input Factors

The model shows that competitiveness is divided into strengths and weaknesses for input factors affecting the bioethanol industry. Land availability is considered a strength due to the large amount of land with the potential to be cultivated. Table 1 of the following page shows the government's initial development plan by extending land use to planting and cultivating the raw materials needed to produce bioethanol.

Table 1. Land Distributions for Bioethanol Development

Region	Land Area (hectares)
Southeast Sulawesih	212,123
North Sulawesi	34,812
East Nusa Tenggara	101,830
Mollucas	2,304,932
Papua	9,262,130
West Kalimantan	514,350
Sulawesi	251,856
South Kalimantan	65,638
Total	12,947,671

Source : Ministry of Agriculture (2008)

Potential areas include margin land and areas that have not yet been cultivated such as Papua or plantation territories (multi cultivated with forest trees, for cassava). The government planned to develop 6.5 million hectares of land for the cultivation of biofuel in which 3 million hectares would be reserved for the production of palm oil, 1.5 million hectares for castor, a further 1.5 million hectares for cassava and 5 million hectares for sugar cane crops. It can be seen that Papua and Mollucas were considered as having the most potential to develop bioethanol due to it having the most amount of land area with MIFEE extended in Papua. Despite the advantage of having land with a large amount of potential, the government had not provided adequate infrastructure and as a result, the input prices for companies fluctuated as the risk in development in these sectors increased with companies forced to provide their own infrastructure in order to cultivate plantations.

The availability and potential of raw materials such as sugar cane, cassava and corn were considered to be intensively and extensively developed. The low labor cost and less complicated technology could be used by smaller scaled farmers to produce bioethanol in local scales with Sukabumi being a prominent example. This contrasts with the cultivation of sugarcane where the high technology used would be better suited in large scale production such as sugar plantations. The raw materials' inconsistent productivity also poses a problem as it makes it more difficult for bioethanol purposes as the limited distribution and incontinuity causes tight competition from industries. Production is very important because of the high competition at the end users with the low producer incentives and fluctuated input prices putting more pressure on producers in deciding where products and raw materials should be sold. Until now Brazil has been the lowest bioethanol producing country selling for only US $0.15/liter compared to other countries' higher prces (Murdiayatmo, 2006).

4.2. Company's Competitive Strategy

Taheripour *et al* (2009) studied the relationship between biofuel industry and livestock industry in which both industries compete for the same raw material. Although both industries contain the potential to influence each other, the development of the bioethanol industry could stall and withdraw and cause a significant drop in price if the livestock industry's was unable to absorb the byproduct of ethanol. According to Caesar, (2007), the strategy for successful bioethanol program could be divided into three parts:

a. Asset owners (producers, agribusiness, chemical companies, petroleum companies) which are more related to issues of geography and technological change
b. Producers and service providers, such as plant breeding companies, companies producing equipment, biotechnology companies, which are more focused on technology development and commercial risk;
c. Players in the market, such as gasoline blenders, Farmers, agricultural-equipment companies, suppliers of inputs Poor 'Fertilizers and logistics providers, which are more focused on the development of biofuel industry demand.

Because Pertamina and the government had failed to give producers a fair market price, Indonesian bioethanol producing companies were faced with the dilemma to either continue to produce bioethanol at a low market price or to produce ethanol or surfactant that could be sold at a higher price. Due to the higher Octane that ethanol produced, it had the same quality as Premix and deserved to be sold at that price, instead it was given the same price as Premium gasoline that was highly subsidized by the government. Indeed, Gopinathan and Sudhakaran (2009) in their research paper of bioethanol production in India stated that the volatility of the market and energy prices had significant impacts on the competitiveness of the bioethanol industry.

4.3. Supporting Industry

According to Azahari (2008), some constraints in the development of bioethanol are the concern of competition with food supply, the structure of production costs which depended on the scale of production, market structure that has not been consolidated, limitations in infrastructure for processing, distribution and transportation of biofuels, limited planting system, water availability, seed and fertilizer, biodiversity conservation and limited networks in logistics and distribution.

Technology available for the first bioethanol production was considered reachable for small scale farmers as by fermenting cassava, farmers could produce bioethanol. Farming groups constituted a strength for supporting the industry since the quality of raw materials used to produce bioethanol did not necessarily need to be homogeneous as technology enabled it to eliminate these differences in quality of input in order to produce bioethanol output. According to Sethi and Pal (2006) the

close geographic proximity and efficient technology used by small scale and energy efficient industries meantt that strategy was the most effective way to increase productivity and. However, within clusters it was not the strategy but the similarity in the level of technology, operating practices and trade parties that were potential factors to develop and implement common solutions. Whether it be sugarcane or cassava, either type of raw materials could easily be used to produce other products by competing industries such as the ketchup, tapioca or MSG industry.

4.4. Demand Condition

Even though the government has tried to initiate the use of bioethanol by mixing it with fossil fuel, consumers remain unaware of the product and as such, the demand for bioethanol in Indonesia has yet to be developed. This is a pity as Indonesia contains enormous potential to be a market for bioethanol being the 4th most populated country with a population of 237,641,326 (BPS, 2011) and a growth rate of 1.49% per year (BPS, 2011).

With population in Indonesia continuing to rise, so will the demand for transportation which in turn would influence the demand for fossil fuels. Motorcycles represented the largest increase in transportation with there being three times as many motorcycles as there were in 2000 while the amount of private cars increased two-fold since 2000. (BPS, 2011).

As a major bioethanol producer from corn, the United States subsidizes heavily on producers with the amount predicted to reach up to US $ 19 billion/ year by 2020 (Wescott, 2007). These initiatives contributed to the rapid growth of liquid biofuels in terms of volume and share of transport fuels (Gopinathan and Sudhakaran, 2007) and in 2010, the bioethanol industry in the USA had succeeded forming consumer demand for bioethanol with the industry shifting from production push to consumer pull market.

4.5. Government

According to research results, the government has been aware of the importance of bioethanol development in the country, however Djojosudirjo (2009) states that unclear mandatory supply to the domestic needs of biofuel program resulted in losses up to U.S. $ 2 billion. Among the many reasons that caused the producers to stop their initial production was the high raw material prices. Park (2005) found that companies in Korea were not motivated enough to develop technology innovation due to the government's malfunctioning environmental regulations. The role of local authorities is also important in creating a dynamic climate as it supports the competitiveness of the existing firms and attracts new ones (Gardner, 2007). Although the government is planning to reduce subsidy for oil, it would take some time for the country to fulfill its need for fuel as if the government is unable to produce local bioethanol then it is left with the only alternative to import it. This dependency on other countries would be extremely crucial to the eventual

price as exporting countries have to fulfill their own energy policies by tending to domestic needs first before selling the excess to importer countries.

Figure 3 below shows the relationship between bioethanol production, fossil uel consumption and GDP for the USA, China, Brazil, India, Thailand and Indonesia. Indonesia in the figure is represented as an empty circle showing that in 2011, it was the only country in the group that did not produce bioethanol nationally.

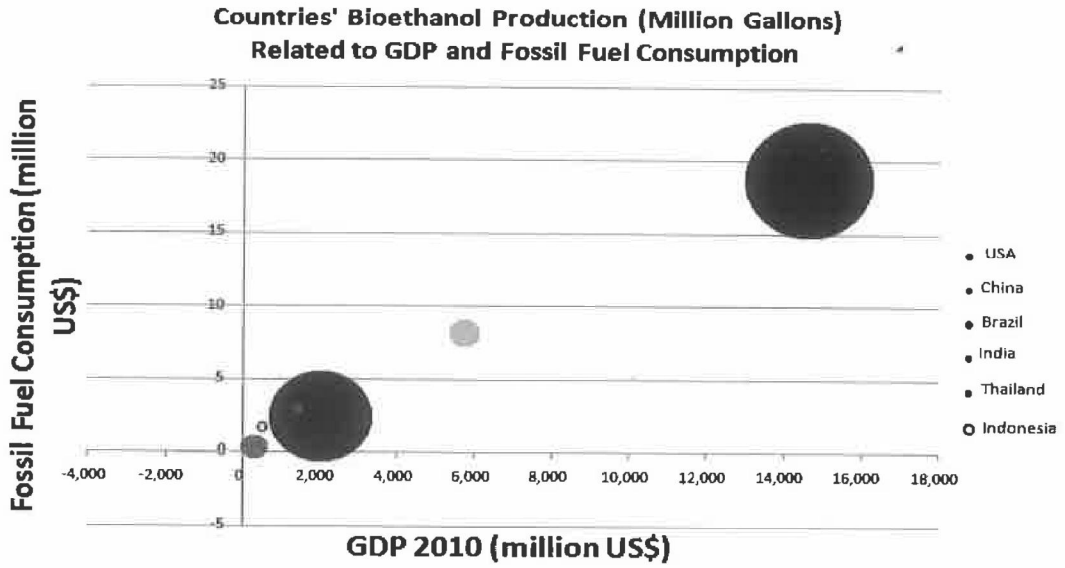

Figure 3. Bioethanol Production Comparison Between Countries

Source FAO, Oil Petroleum Data and World Fact Data (2011)

The figure shows that the USA and Brazil have high demand on fossil fuel as a percentage of their GDP., however, unlike Indonesia, these countries have successfully developed their bioethanol industry either by corn (USA) or by sugarcane (Brazil). Indonesia is still lagging behind because in 2010, the only producer and supplier of bioethanol, Molindo, had stop producing bioethanol for Pertamina (indicated by the empty circle on the figure above).

4. CONCLUSION AND RECOMMENDATION

1. The Indonesian bioethanol Diamond Porter Model shows that factors such as government inconsistency and miscoordination, low producer support and incentives as well as uncertain market prices received by producers are the major obstacles for developing the bioethanol industry.
2. The Indonesian bioethanol Diamond Porter Model also provides factors that has the potential to support the development of the industry which include high demand for fuel, potential land and raw material types, low cost labors and easy technology so that the first generation of bioethanol could be produced in smaller scaled units.

3. Government should consider to support local producers despite the small size of unit production as it could be produced and consumed locally.
4. Further studies such as the Merauke Integrated Food and Energy Estate (MIFEE) should be conducted on factors affecting cluster concentration development.

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