

# **OIL PALM BIOMASS & BIOGAS IN MALAYSIA, 2017**

## **POTENTIALS FOR EUROPEAN SMES**



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# CONTENTS

- LIST OF FIGURES ..... 4
- LIST OF TABLES ..... 4
- 1. MALAYSIA AS THE GATEWAY TO ASEAN ..... 5
  - 1.1 ECONOMIC OVERVIEW ..... 6
  - 1.2 EU-MALAYSIA TRADE RELATIONS ..... 8
  - 1.3 ECONOMIC KEY FACTS: EU-ASEAN ..... 8
- 2. INTRODUCTION TO MALAYSIAN PALM OIL INDUSTRY ..... 9
  - 2.1 OIL PALM PLANTATIONS IN MALAYSIA ..... 9
  - 2.2 OIL PALM BIOMASS ..... 11
    - 2.2.1 EMPTY FRUIT BRUNCH (EFBS) ..... 12
    - 2.2.2 PALM FRONDS ..... 12
    - 2.2.3 TREE TRUNKS ..... 12
    - 2.2.4 MESOCARP FIBRES (MF) ..... 13
    - 2.2.5 PALM KERNEL SHELLS (PKS) ..... 13
    - 2.2.6 PALM OIL MILL EFFLUENTS (POME) ..... 13
  - 2.3 OIL PALM BIOGAS ..... 13
- 3. BIOMASS COMPOSITION IN MALAYSIA ..... 14
  - 3.1 BIOMASS AND BIOGAS IN EAST MALAYSIA ..... 14
    - 3.1.1 SABAH ..... 15
    - 3.1.2 SARAWAK ..... 15
- 4. LEGAL FRAMEWORK ..... 16
  - 4.1 FEED-IN TARIFF (FIT) SYSTEM ..... 16
  - 4.2 NET ENERGY METERING (NEM) ..... 17
- 5. INDUSTRY CHALLENGES ..... 18
- 6. POTENTIALS FOR MARKET ENTRY ..... 19
  - 6.1 PELLET PRODUCTION & PELLETISING TECHNOLOGY ..... 19
  - 6.2 TRADE AND EXPORT ..... 20
  - 6.3 HYBRID SOLUTIONS ..... 22
  - 6.4 KNOWLEDGE TRANSFER ..... 22
  - 6.5 BIO-BASED CHEMICALS ..... 22
- 7. CONCLUSION ..... 23
- EUMCCI & SEBSEAM-M ..... 24
- REFERENCES ..... 25

# LIST OF FIGURES

Figure 1: Map of Malaysia .....	5
Figure 2: Locations of Oil Palm Plantations in Malaysia.....	9
Figure 3: Distribution of Oil Palm Planting Area by Category of Stakeholders, 2015 .....	10
Figure 4: Components of Oil Palm.....	12
Figure 5: Annual Available Solid Biomass from Different Origins of the Palm Oil Industry in Malaysia (in million tons).....	14
Figure 6: Installed Renewable Energy Capacity by Source .....	16
Figure 6: Installed Renewable Energy Capacity by Source (cont'd) .....	17
Figure 7: Supply Chain of Pellet Production in Malaysia .....	21

# LIST OF TABLES

Table 1: Economical Key Facts .....	7
Table 2: Oil Palm Biomass-based Products and the Commercialisation Stage in Malaysia .....	11
Table 3: Calorific Value and Moisture Content of Oil Palm Biomass.....	19

# 1. MALAYSIA AS THE GATEWAY TO ASEAN

Malaysia is centrally located within the Association of Southeast Asian Nations (ASEAN) and consists of two regions separated by the South China Sea. These are Peninsula Malaysia and East Malaysia (consisting of the states of Sabah and Sarawak on the island of Borneo). The country has a total land mass of 328,657 square kilometers (126,895 square miles)<sup>1</sup>. Malaysia is a federation of 13 states and three federal territories. The capital city is Kuala Lumpur, whereas Putrajaya is the federal administrative centre of Malaysia. The official language of Malaysia is Bahasa Malaysia, but English, as well as Chinese are also widely spoken.

Figure 1: Map of Malaysia



Source: Nationsonline.org, K. K. (n.b.). Political and Administrative Map of Malaysia. Retrieved April 8, 2016 from [http://www.nationsonline.org/oneworld/map/malaysia\\_map.htm](http://www.nationsonline.org/oneworld/map/malaysia_map.htm)

As of April 2016, the country recorded a total population of 31,270,000 persons<sup>2</sup>. Malaysia is a multi-ethnic, multicultural, and multilingual society. Ethnic Malays make up the majority of the population at 57.1%, followed by Chinese at 24.6%, Indians at 7.3%, and other local ethnicities at 11%. Hence the country is reflected in a very colorful composition in terms of language, religions, and cultural practices. The Malaysian Constitution guarantees freedom of religion, although Islam is the official religion with the largest following. Approximately 61.3% of the population practice Islam, 19.8% Buddhism, 9.2% Christianity, 6.3% Hinduism, and 1.7% practice Confucianism, and other traditional religious practices<sup>3</sup>.

1. World by Map (n.b.). Land Area – World Statistics and Charts as Map, Diagram and Table, 2015. Retrieved January 4, 2017 from <http://world.bymap.org/LandArea.html>
2. World-o-meters (n.b. Countries in the World by Population, 2016. Retrieved April 8, 2016 from <http://www.worldometers.info/world-population/population-by-country/>
3. Department of Statistics Malaysia (n.b.). Population Distribution and Basic Demographic Characteristic Report 2010 (Updated: 5/8/2011). Retrieved April 8, 2016 from [https://www.statistics.gov.my/index.php?r=column%2FcthemByCat&cat=117&bul\\_id=M0Mx0HJzJWtK1SjFzTzNkRXyzcVZjdZ09&menu\\_id=L0pheU43NWJwRWVSZklWdzQ4TlhUUT09](https://www.statistics.gov.my/index.php?r=column%2FcthemByCat&cat=117&bul_id=M0Mx0HJzJWtK1SjFzTzNkRXyzcVZjdZ09&menu_id=L0pheU43NWJwRWVSZklWdzQ4TlhUUT09)

Malaysia is a founding member of ASEAN and the Organisation of Islamic Cooperation. It is also a member of the Commonwealth of Nations. Furthermore, the country participates in other international organisations such as the United Nations, the Asia-Pacific Economic Cooperation, the Developing 8 Countries, and the Non-Aligned Movement. Previously, the country had chaired ASEAN, the Organization of Islamic Cooperation as well as the Non-Aligned Movement. In 2015, Malaysia, as the Chairman, led ASEAN's ten member countries.

## 1.1 ECONOMIC OVERVIEW

Malaysia is a dynamic country that is constantly evolving. Being a middle-income country, Malaysia has transformed itself since the 1970s from a producer of raw materials into an emerging multi-sector economy spurred on by high technology, knowledge-based, capital-intensive, and natureexport-driven industries. Malaysia's GDP ranked at 27th out of 188 economies in 2015<sup>4</sup>. Strategically located in the heart of Southeast Asia, Malaysia offers a cost-competitive location for investors intending to set up offshore operations, in order to manufacture advanced technological products for both regional and international markets.

In 2011, the Malaysian Government launched the Economic Transformation Programme, managed by the Performance Management & Delivery Unit under the patronage of the Prime Minister<sup>5</sup>. The Economic Transformation Programme identifies National Key Economic Areas (NKEAs), which are drivers of economic activities that have the potential to materially contribute to the growth of Malaysia. Its objective — known as “Vision 2020” — is to transform Malaysia into a “high income country” by year 2020, and raise per capita income to at least USD 15,000 (2014: USD 11,120, Source: Worldbank.org), meeting the World Bank's threshold for a high-income nation.

The Malaysian economy expanded by 4.0% during the second quarter of 2016 (Q1 2016: 4.2%). Growth was supported by both domestic and export-oriented activities, despite a challenging external environment. The services sector remained the key driver of growth, expanding by 5.7% in the second quarter supported mainly by wholesale and retail trade (6.6% growth), information and communication (8.8 %) as well as business service activities (7.9%). Malaysia's manufacturing sector continued on a positive momentum at a moderate pace of 4.1%. The growth was supported by electrical, electronic & optical products and petroleum, chemical, rubber & plastic products.

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4. World Bank (2016, December 16). Gross Domestic Product 2015, PPP. Retrieved January 6, 2017 from [http://databank.worldbank.org/data/download/GDP\\_PPP.pdf](http://databank.worldbank.org/data/download/GDP_PPP.pdf)

5. Economic Transformation Programme (n.b.). Overview of ETP. Accessed April 8, 2016 from [http://etp.pemandu.gov.my/About\\_ETP-@-Overview\\_of\\_ETP.aspx](http://etp.pemandu.gov.my/About_ETP-@-Overview_of_ETP.aspx)

**Table 1: Economical Key Facts**

<b>Currency</b>	1 Ringgit (RM) = 100 sen
<b>Exchange Rate</b>	1 EURO = RM 4.83 <sup>1</sup> ; 1 USD = RM 4.08 <sup>2</sup> (as on 4 <sup>th</sup> December 2017)
<b>GDP (billion USD)<sup>3</sup></b>	323.277 (2013); 338.069 (2014); 296.283 (2015)
<b>GDP – Real Growth Rate<sup>4</sup></b>	4.7% (2013); 6.0% (2014); 5.0% (2015); 4.5% (2016) Forecast: 4.5% (Q3, 2017)
<b>Inflation Rate<sup>5</sup></b>	2.1% (2013); 3.1% (2014); 2.1%(2015); 2.1% (2016)
<b>Unemployment Rate<sup>6</sup></b>	3.3% (Dec. 2015)
<b>Population below poverty line<sup>7</sup></b>	>1% (2014)
<b>Exports<sup>8</sup></b>	RM 780.0 billion (2015)
<b>Exports – commodities<sup>9</sup></b>	Electrical & electronic products 35.6%; chemical products 7.1%; petroleum products 7.0%; LNG 6.0%; palm oil 5.1%; machinery, appliances & parts 4.6%; manufactures of metal 4.5%; optical & scientific equipment 3.3%; crude petroleum 3.3%; rubber products 2.6%; other products 20.7% (2015)
<b>Exports – Partners<sup>10</sup></b>	Singapore 13.9%, China 13.0%, EU 10.1%, Japan 9.5%, USA 9.4%, Thailand 5.7%, Hong Kong 4.7%, Indonesia 3.7%, Republic of Korea 3.2%, Taiwan 3.0% (2015)
<b>Imports<sup>11</sup></b>	RM 685.7 billion (2015)
<b>Imports – commodities<sup>12</sup></b>	Electrical & electronics products 29.4%; chemical products 9.5%; petroleum products 9.3%; machinery, appliances & parts 8.7%; manufactures of metal 6.4%; transport equipment 5.3%; iron & steel products 3.2%; optical & scientific equipment 3.2%; processed food 2.6%; textiles, clothing & footwear 2.3%; other products 20.3% (2015)
<b>Imports – Partners<sup>13</sup></b>	China 18.9%, Singapore 12.0%, EU 10.2%, USA 8.1%, Japan 7.8%, Thailand 6.1%, Taiwan 5.3%, Indonesia 4.5%, Republic of Korea 4.5%, Hong Kong 1.7% (2015)

**Sources:**

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9. MATRADE (n.d.). Top 10 Major Export Products, 2015. Retrieved April 8, 2016 from <http://www.matrade.gov.my/en/malaysia-exporters-section/33-trade-statistics/3816-top-10-major-export-products-2015>
10. MATRADE (n.d.). Top 10 Major Export Countries, 2015. Retrieved April 8, 2016 from <http://www.matrade.gov.my/en/malaysia-exporters-section/33-trade-statistics/4573-top-10-major-export-countries-2015>
11. MATRADE (n.d.). Trade Performance: December 2015 and January – December 2015. Retrieved April 8, 2016 from <http://www.matrade.gov.my/en/malaysia-exporters-section/235-trade-performance-2015/4518-trade-performance--december-2015-and-january-december-2015>
12. MATRADE (n.d.). Top 10 Major Import Products, 2015. Retrieved April 8, 2016, from <http://www.matrade.gov.my/en/malaysia-exporters-section/33-trade-statistics/3817-top-10-major-import-products-2015>
13. MATRADE (n.d.). Top 10 Major Import Countries, 2015. Retrieved April 8, 2016 from <http://www.matrade.gov.my/en/malaysia-exporters-section/33-trade-statistics/4574-top-10-major-import-countries-2015>

## 1.2 EU-MALAYSIA TRADE RELATIONS

In accordance with the Delegation of the EU to Malaysia, cooperation in trade and economic issues has been the driving force for closer ties between the EU and Malaysia. In October 2010, Malaysian Prime Minister Najib Razak and the EU leaders launched two major EU-Malaysia bilateral initiatives, namely the negotiations for the Free Trade Agreement (FTA) and for the Partnership and Cooperation Agreement (PCA). The two initiatives are respectively aimed at boosting bilateral trade and investment and at creating a new strategic dimension for the EU-Malaysia political dialogue and economic cooperation. Both negotiations are currently ongoing.

The EU is Malaysia's third largest trading partner and accounts for about 10% of Malaysia's total external trade, both in terms of import and export and as a very important source of Foreign Direct Investment into Malaysia. In contrast, the country is the EU's third largest trading partner in ASEAN after Singapore and Vietnam and the 22nd largest trading partner of the EU worldwide.

## 1.3 ECONOMIC KEY FACTS: EU-ASEAN

The EU and ASEAN enjoy a strong trade relationship. ASEAN as a whole represents the EU's third largest trading partner outside Europe with more than EUR 245 billion of trade in goods and services in 2013. The EU is ASEAN's second largest trading partner worldwide.

The EU remains the biggest investor in ASEAN. It is the largest provider of Foreign Direct Investment (FDI) to ASEAN, accounting for 22% of total FDI inflow. The EU's main exports to ASEAN are chemical products, machinery, and transport equipment. The main imports from ASEAN into the EU are machinery and transport equipment, agricultural products as well as textiles and clothing. The largest part of EU FDI stock in ASEAN is concentrated in Singapore, Malaysia, Thailand, Indonesia, and the Philippines.

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6. Sanusi, N., & Ghazali, N. (n.b.). The Creation of Bangsa Malaysia: Towards Vision 2020 Challenges. Retrieved April 8, 2016 from [http://www.ukm.my/fep/perkem/pdf/perkem2014/PERKEM\\_2014\\_5D1.pdf](http://www.ukm.my/fep/perkem/pdf/perkem2014/PERKEM_2014_5D1.pdf)
  7. Department of Statistics Malaysia (2016, August 12). Gross Domestic Product Second Quarter 2016. Retrieved May 18, 2017 from <https://www.dosm.gov.my/v1/index.php?r=column/pdfPrev&id=OTZaMlp4YWRRPaTdHRmpnTOxEQ0hWdz09>
  8. MATRADE (n.b.). Top 10 Major Export Countries, 2015. Retrieved April 8, 2016 from <http://www.matrade.gov.my/en/malaysia-exporters-section/33-trade-statistics/4573-top-10-major-export-countries-2015>
  9. EU-ASEAN Relations – EUMCCI. (n.b.). Retrieved January 5, 2017 from <http://www.eumcci.com/eu-asean-relations1>
  10. Ibid



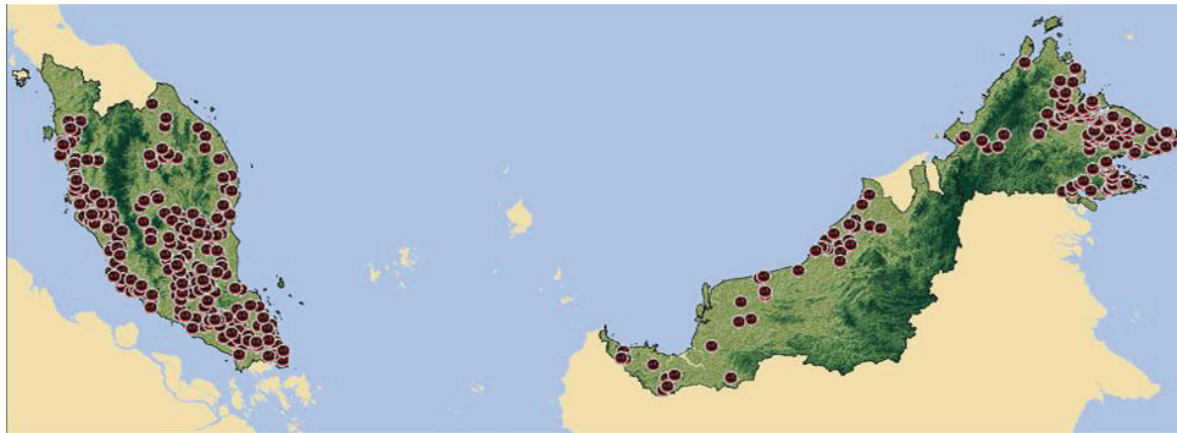
## 2. INTRODUCTION TO MALAYSIAN PALM OIL INDUSTRY

This market report provides European small and medium-sized enterprises an overview of the biomass and biogas derived from palm oil and their market potential in Malaysia. The potential and challenges for European manufacturers to participate in this market is highlighted in this Report. The information herein was gathered from primary research interviews with industry players in the field of interest. This Report summarises the experience, views, thoughts and recommendations of those interviewed. This is further supported with data and information gathered via secondary research.

### 2.1 OIL PALM PLANTATIONS IN MALAYSIA

Malaysia's humid tropical climate, coupled with ample sunshine and evenly distributed annual rainfall provides optimal condition for growth of oil palm and production of palm oil. Over the past decades, palm oil production has boomed, resulting in an expansion of the global oil palm planting area. Regionally, Malaysia and Indonesia have been the epicenter of this dynamic development on oil palm planting. The rapid expansion of oil palm in Malaysia began in the 1960s and was encouraged by the Malaysian government itself, which recognized its potential as a complementary crop to rubber<sup>11</sup>. According to the Malaysian Palm Oil Board (MPOB), there are about 5.64 million hectares of oil palm planted areas nationwide at the end of 2015, which is equal to about 23% of Malaysia's total land area<sup>12</sup>. The figure below shows the locations of oil palm plantations in Malaysia.

**Figure 2: Locations of Oil Palm Plantations in Malaysia**



Source: Malaysian Palm Oil Board (n.b. ). Oil Palm in Malaysia.

Retrieved on January 1, 2016 from <http://www.mpob.gov.my/> (the original link is no longer accessible)

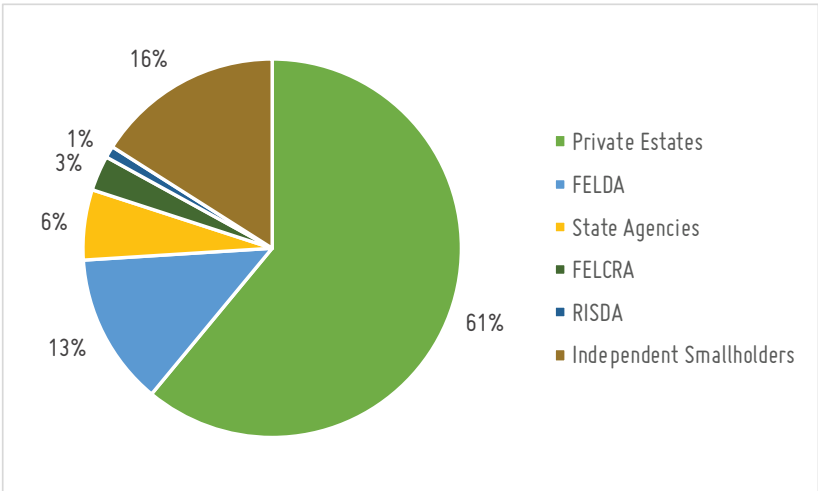
11. AOCs (2012, September) Malaysia: Economic Transformation Advances Oil Palm Industry. Retrieved May 18, 2017 from <https://www.aocs.org/stay-informed/read-inform/featured-articles/malaysia-economic-transformation-advances-oil-palm-industry-september-2012>

12. Malaysian Palm Oil Board (n.b.) Oil Palm Planted Area by State as at December 2016 (Hectares). Retrieved May 22, 2017 from [http://bepi.mpob.gov.my/images/area/2016/Area\\_summary.pdf](http://bepi.mpob.gov.my/images/area/2016/Area_summary.pdf)

Most of these plantations are owned by large conglomerates such as IOI, Sime Darby, KLK and other governmental agencies (i.e.: FELDA and FELCRA); whereas only about 100 plantations are owned by independent smallholders. Acquisition of stakes in the palm oil industry by governmental agencies in Malaysia can be traced back to the 1990s, where the industry was part of the government's effort to promote growth, urbanisation, and infrastructure developments in rural areas. Over time, the oil palm plantations were commercialised and today the government agency , such as Felda Global Ventures Holding, has become the world's third biggest operator of oil palm plantations with a plantation area in Malaysia of more than 850,000 hectares<sup>13</sup>.

Due to its significant contribution to the country's economic development, the palm oil industry was identified as one of the National Key Economic Areas (NKEA). The industry is mainly export-oriented and is one of the major contributors to Malaysia's national revenue. Furthermore, Malaysia is also one of the major producers and exporters of palm oil in the world.

**Figure 3: Distribution of Oil Palm Planting Area by Category of Stakeholders, 2015**



Source: Malaysian Palm Oil Board (n.b.) Economics & Industry Development Division, MPOB Area 2015. Retrieved May 18, 2017 from [http://bepi.mpob.gov.my/images/area/2015/Area\\_summary.pdf](http://bepi.mpob.gov.my/images/area/2015/Area_summary.pdf)

Oil palm yield is about 10 times higher than that of soyabean; 6.9 times higher than that of sunflower, and 6.3 times higher than that of rapeseed<sup>14</sup>. It usually needs 24 to 30 months after planting of the sapling until the first fresh fruit bunches (FFB) are ready for harvest. Each oil palm tree, with a height of up to 6 meters and a maximum age of 30 years, bears 9 to 15 fresh fruit bunches per year. Each of these fresh fruit bunches may weigh 10 to 25 kg and contain 1,000 to 3,000 oil palm fruits<sup>15</sup>.

The palm oil industry is also the main biomass source in Malaysia, and supply is abundant. The oil palm plantation as well as milling activities nationwide, leave behind huge amounts of biomass, way much larger than any other type of biomass. Biomass from oil palm is very diverse and can be processed into a wide variety of products such as fertilisers, animal feed, wood products, electricity, pellets, biofuels, and bio-based chemicals, amongst others.

14. WFL Publisher Science and Technology (2015, March 18) Malaysian oil palm industry: Prospect and Problem. Retrieved May 18, 2017 from [https://www.researchgate.net/publication/281275048\\_Malaysian\\_oil\\_palm\\_industry\\_Prospect\\_and\\_problem](https://www.researchgate.net/publication/281275048_Malaysian_oil_palm_industry_Prospect_and_problem)  
 15. Malaysian Palm Oil Council (n.b.) The Oil Palm Tree. Retrieved May 22, 2017 from <http://www.palmoilhealth.org/what-is-palm-oil/the-oil-palm-tree/>

With a large area of land in Malaysia increasingly occupied with oil palm plantations, the amount of biomass accrued also increases correspondingly. Due to huge amounts of biomass generated, Malaysia has the potential to utilise biomass and biogas as a source of renewable energy; and palm oil residues appear to be a promising alternative source of raw materials in the biomass and biogas industry.

## 2.2 OIL PALM BIOMASS

The oil palm biomass can be categorised into two: solid and liquid biomass. The production of both solid and liquid biomass is the result of the process of extracting oil from oil palm. As a rich source of biomass, the oil palm consists of the following components: empty fruit bunches (EFB), palm fronds, tree trunks, mesocarp fibres (MF), palm kernel shells (PKS), and palm oil mill effluents (POME).

Different components of oil palm biomass have different potential uses, including as fuel for electricity generation, biochemical products, fertiliser, and biofuel. This also means that different components may require different processing methods to be converted into each of their usable forms. The following table further provides an overview of oil palm–biomass–based products and their commercialisation stage in Malaysia.

Table 2: Oil Palm Biomass-based Products and the Commercialisation Stage in Malaysia

	Pellets	Biofuel	Biogas	Green Chemicals	Biofertiliser	Biochar	Biocomposites	Other
Empty fruit bunch (EFB)	EFB Pellets	Bioalcohol	Syngas	Industrial Sugars/Chemical	Organic Compost	Carbon Fibers	Fibreboard	Pulp Fibremat
Palm kernel shells (PKS)	Coal substitute					Activated Carbon		
Trunkc (OPT)	OPT Pellets	Bioalcohol	Syngas	Industrial Sugars/Chemical	Organic Compost	Biochar	Engineered Lumber	
Fronds (OPF)	OPF Pellets	Bioalcohol	Syngas	Industrial Sugars/Chemical	Organic Compost	Biochar		Phytochemicals
Palm kernel cake (PKC)	PKC Pellets			Biopolymers				Animal Feed
POME		Bioalcohol	Methane	Biopolymers	Organic Compost			

= Commercialised

= Development Stage

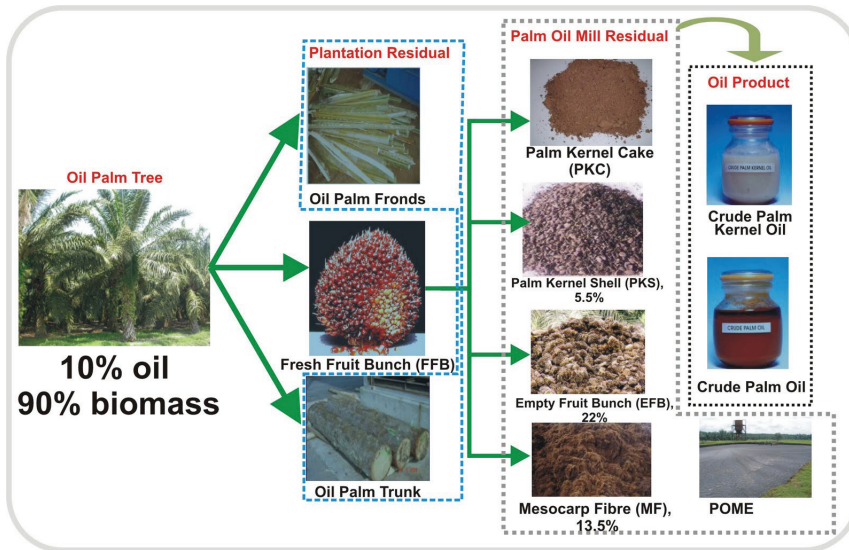
= Potential

Source: MIGHT (2013, November 12) Malaysian Biomass Industry Action Plan 2020 [Powerpoint Slides]. Retrieved May 18, 2017 from <http://biomass-sp.net/wp-content/uploads/2013/11/MIGHT.pdf>

The palm oil industry accounts for the major share of available biomass in Malaysia and is responsible for a steady growth of available biomass in recent years. According to MPOB, the palm oil industry accounts for approximately 80 million tonnes of solid biomass and approximately 60 tonnes of POME in the past years. The Malaysian government further forecasts that the supply of biomass from oil palm will increase to 85–111 million tonnes of solid biomass and 70–110 million tonnes of POME by 2020<sup>16</sup>.

16. Agensi Inovasi Malaysia (2011, November) National Biomass Strategy 2020: New Wealth Creation for Malaysia's Palm Oil Industry. Retrieved May 18, 2017 from [http://www.innovation.my/pdf/1mbas/National\\_Biomass\\_Strategy\\_Nov\\_2011\\_FINAL.pdf](http://www.innovation.my/pdf/1mbas/National_Biomass_Strategy_Nov_2011_FINAL.pdf)

Figure 4: Components of Oil Palm



Source: Bioenergy Consult (2014, April). Palm Biomass Wastes.

Retrieved May 18, 2017 from <http://www.bioenergyconsult.com/wp-content/uploads/2012/04/palm-biomass-wastes.jpg>

## 2.2.1 EMPTY FRUIT BRUNCH (EFBS)

The EFB can be useful in crop production. However, the process of incinerating EFB, to be used for the aforementioned purposes, releases harmful pollutants — this process is therefore restricted by the Department of Environment Malaysia. Nevertheless, EFBs are produced in large amounts in Malaysia and are particularly applied as fertiliser and mulch in plantations. They are also used in power generation. Apart from that, EFBs are also used in the production of wood fibre boards and paper.

However, the transport requirements and the resulting high transportation costs pose a challenge in the processing of EFBs. EFBs are quite unwieldy as they can be up to 50cm in size and weigh up to 20kg. In addition, they have to be processed within 3 days after harvest, or else the EFBs start to rot due to their high moisture content. This is a clear difference from wood waste, which can be stored for up to 30 days.

## 2.2.2 PALM FRONDS

For per hectare of oil palm plantation, about 10 tonnes of dry palm fronds are produced. The palm frond consists of two main parts: petiole and leaflets. Palm fronds are cut during harvesting of fruit bunches. In Malaysia, apart from being used as fertilisers, fronds from oil palm trees are also processed into fibres, which in turn are used to make animal feeds for livestock. Additionally, palm fronds are used as raw materials in the production of wood products and are processed to produce biofuels.

## 2.2.3 TREE TRUNKS

The wood from the oil palm tree cannot be used directly as timber; however, it is used as raw material in the woodworking industry for the production of plywood, flooring and furniture. The trunks of oil palm trees are also shredded to be added to natural fertiliser in plantations, or sold for RM8 to RM18 per strain<sup>17</sup>. Additionally, the trunks can be processed to produce bioethanol, which in turn is used as biofuel.

17. Information from interview

## 2.2.4 MESOCARP FIBRES (MF)

Mesocarp fibres are by-products from the extraction of crude palm oil (CPO) and palm kernel oil. The mesocarp fibres are used as fertilisers as well as raw materials for a variety of products such as stuffing for mattresses and pillows, and as fibreboard base for carpets. The mesocarp fibres are also used as fuel in steam generation.

## 2.2.5 PALM KERNEL SHELLS (PKS)

Like the mesocarp fibres, PKS are also the by-products of extracting crude palm oil (CPO) and palm kernel oil. It contains high calorific value which can be used as fuel to generate energy. The incineration of PKS will result in ashes that can be used as fertilizers for crop production. PKS can also be converted into carbon to produce carbon filter for water purification. Apart from that it is used as concrete aggregate to make roads.

## 2.2.6 PALM OIL MILL EFFLUENTS (POME)

POME is the liquid waste or by-product generated from palm oil processing mills. Often regarded as pollutants, POME however can be processed and converted into biogas to generate renewable energy. Other than that, POME is also used as fertilisers in plantations. It is estimated that the 447 Palm Oil Mills produce around 60 million tons of pome per year.

# 2.3 OIL PALM BIOGAS

Despite its plentiful supply, biogas in Malaysia still has not been fully optimised — only a small fraction of biomass from oil palm are currently being processed to generate biogas. However, there has been growing interest from the Malaysian government to develop as well as encourage biogas utilisation nationwide. The government has set up a number of incentives including subsidies as well as support and financing of biogas facilities and technologies. Apart from government support, private companies such as Sime Darby and Malaysian Biomass Industries Confederation (MBIC) are also actively involved in promoting the biogas industry by offering partnerships to investors interested to venture into the field.

Biogas from POME has the potential to be processed for other external applications such as the following<sup>18</sup>:

- Use as biogas compressed natural gas (BioCNG), an alternative fuel for natural gas powered vehicles
- Feeding into natural gas pipeline or bottling and transporting for industrial use
- Supply energy to other operational units such as vapour absorption chiller, hot water and hot air production, biodiesel plant, EFB fibre plant as well as crushing plant
- Use as future second generation biofuel projects in the production of hydrogen, bio methane, and others

That Malaysia's plans to have all 447 Palm Oil Mills equipped with biogas plants by 2020 is an ambitious target; Sabah aims to reach this goal even by end of 2018. Currently, all mill licenses will only be extended if a biogas plant or plan for it is submitted to the authorities.

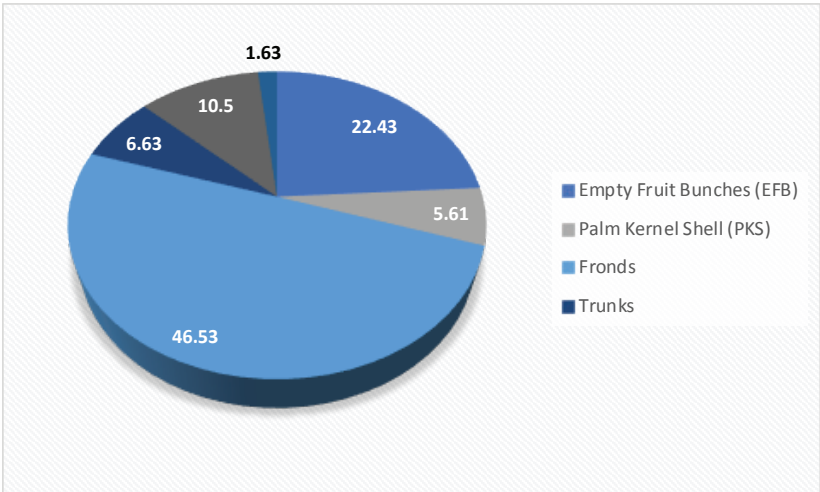
18. Malaysian Palm Oil Board (2014, October 9). NKEA: National Biogas Implementation (EPP5). Retrieved on May 8, 2017 from <http://www.mpob.gov.my/en/component/content/article/153-demo-content/992-nkea-national-biogas-implementation-epp5>

### 3. BIOMASS COMPOSITION IN MALAYSIA

Biomass is organic material from plants and animals. Biomass contains energy that can be processed into electricity, fuel, heat, and other forms of energy. In recent years, interest in the biomass industry is growing rapidly worldwide.

In Malaysia, biomass is the principal source of renewable energy. Biomass resources that are available in Malaysia include organic waste from oil palm, timber, rice husk, livestock, and municipal solid waste. Biomass composition in Malaysia can be divided into 3 sectors: oil palm, forestry, and municipal waste, which account for more than 95% of Malaysia’s available biomass. The oil palm biomass sector is the most abundant source of biomass in Malaysia.

Figure 5: Annual Available Solid Biomass from Different Origins of the Palm Oil Industry in Malaysia (in million tons)



Source: MIGHT (2013, November 12) Malaysian Biomass Industry Action Plan 2020 [Powerpoint Slides]. Retrieved May 18, 2017 from <http://biomass-sp.net/wp-content/uploads/2013/11/MIGHT.pdf>

#### 3.1 BIOMASS AND BIOGAS IN EAST MALAYSIA

In Malaysia, up to 20% of the total land area is planted with oil palm. The East Malaysian states of Sabah and Sarawak constitute the largest share of oil palm planting area, subsequently producing the largest share of biomass. This makes up the distinct differences between Peninsula Malaysia and East Malaysia in terms of bioenergy potential.

Nonetheless, East Malaysia is comparatively sparsely populated compared to Peninsula Malaysia as some areas in East Malaysia have insufficient to non-existent access to the public electricity grid. Realising this, the government is taking various measures to ensure the well-being and life quality of the rural population including focusing on the expansion of renewable energies in East Malaysia.

However, due to low energy consumption and high cost involved in expanding renewable energies to rural areas, this is often viewed as unprofitable. Hence, local solutions such as electricity generation using biomass or biogas could offer great potentials.

### 3.1.1 SABAH

Sabah has the most fertile soil in Malaysia for oil palm plantation. This allows for a 5%–15% higher yield compared to Peninsula Malaysia, depending on the locations and usage of fertilisers. Sabah is also the largest producer of palm oil in Malaysia. As of December 2014, plantation areas for oil palm in Sabah covered a total area of 1.51 million hectares (or 20.5% of Sabah's total land mass). In Sabah, within a radius of 100km<sup>2</sup>, there are around 90 palm oil mills; whereas in Peninsula Malaysia within the same radius, there are only about 50 palm oil mills thereby making Sabah, the state with the highest density of palm oil production plants in Malaysia<sup>19</sup>.

The government of Sabah recognised the potential of the palm oil industry and had set up the Palm Oil Industrial Cluster (POIC) in 2005 to spearhead the development of Lahad Datu in Sabah as Malaysia's palm oil hub<sup>20</sup>. Lahad Datu is located in Sabah's oil palm belt which produces more than 5 million tonnes of Crude Palm Oil (CPO) per year, providing ample raw materials for downstream activities. It is planned to be the most important port in the region for the export of palm oil<sup>21</sup>. For this to be realised, POIC is tasked to provide the necessary infrastructure that encourages smart partnerships between public and private sectors in order to fully utilise the potential of the palm oil industry. The industrial park in Lahad Datu is said to cover over 4,400 acres of integrated industrial complex designed to cater for light, medium, and heavy industries. The industrial park is equipped with far-reaching infrastructure, including street grid, reliable energy supply, telecommunication infrastructure, different tube facilities to transport liquid substances, fresh water supply, as well as various facilities for the disposal of both liquid and solid waste. It is also equipped with terminals for the loading of liquid and solid goods onto ships of up to 100,000 deadweight tonnage (dwt)<sup>22</sup>.

### 3.1.2 SARAWAK

The palm oil industry remains an important sector in the economic growth of Sarawak. In 2015, plantation areas for oil palm in Sarawak covered a total area of 1,263,391 hectares (or about 10.2% of Sarawak's total landmass). It is further expected, that the plantation areas in Sarawak will increase to up to 2 million hectares and the number of palm oil production plants will increase to more than 100 by 2020<sup>23</sup>.

Biomass and biogas have great potential in Sarawak when it comes to energy generation in order to reduce reliance on fossil fuels — this could especially be extended to remote areas that are sparsely populated. This could further encourage value creation in Sarawak in terms of production of high-value products, employment, as well as sales- and export income. It is said that the biomass industry has the potential to generate an additional MYR 4.8 billion in GNI, as well as create 30,000 new jobs and MYR 18 billion worth of investment opportunities for the state throughout the value chain, utilising around 6 million dry tons of its biomass resources<sup>24</sup>.

The main biomass sources in Sarawak are oil palm biomass and paddy waste, with current production rate of oil palm fresh fruit bunch and paddy at about 9,300,000 tonnes and 208,000 tonnes per annum respectively<sup>25</sup>. However, a large part of biomass remains unused until now, as the development in the area of bio-energy in Sarawak is still at its early stage. Furthermore, there is a lack of incentives for palm oil plant operators in the state in this sector, particularly in terms of infrastructure, technology, and financial support.

19. Palm Oil Industrial Cluster (n.b.). Retrieved on May 9, 2017 from <http://www.poic.com.my/index.asp>

20. Ibid

21. Economic Transformation Programme (2012, November 16). Sabah Economic Development & Investment Authority. Retrieved on May 9, 2017 from [http://etp.pemandu.gov.my/16\\_November\\_2012-@-16\\_November\\_2012.aspx#sthash.mY2vk2Ze.dpuf](http://etp.pemandu.gov.my/16_November_2012-@-16_November_2012.aspx#sthash.mY2vk2Ze.dpuf)

22. Palm Oil Industrial Cluster (n.b.). Retrieved on May 9, 2017 from <http://www.poic.com.my/index.asp>

23&25. Sarawak Energy (n.b.) Biomass in Sarawak. Retrieved on May 11, 2017 from <http://www.sarawakenergy.com.my/index.php/r-d/biomass-energy>

24. Borneo Post Online (2016, February 26). PM launches Sabah and Sarawak Biomass Industry Development Plan. Retrieved on May 11, 2017 from <http://www.theborneopost.com/2016/02/26/pm-launches-sabah-and-sarawak-biomass-industry-devt-plan/>

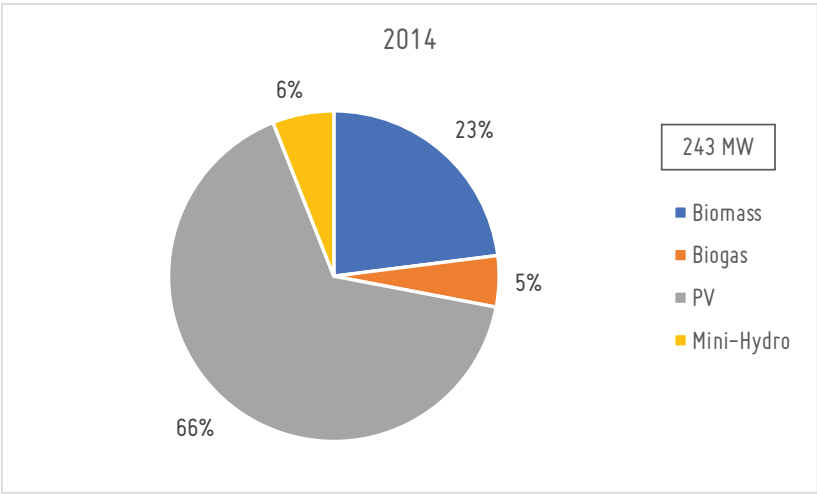
# 4. LEGAL FRAMEWORK

In 2011, the Malaysian government initiated the National Biomass Strategy 2020 (NBS 2020) as a national strategy on how to use biomass for the portfolio of high-value downstream activities. The primary objective of NBS2020 is to maximize sustainable GNI impact from biomass in the 2020-time frame. The biomass industry in Malaysia has the potential to generate an additional GNI of MYR 30 billion, 66,000 new jobs, as well as MYR 25 billion investment opportunities. Coordinated by the Agensi Inovasi Malaysia (AIM), the NBS 2020 initially focused on the palm oil industry, as it is the main source of the country’s biomass. In 2013, the NBS2020 was revised and it now focuses on the entire biomass resources across different sectors<sup>26</sup>.

## 4.1 FEED-IN TARIFF (FIT) SYSTEM

The Renewable Energy Act 2011 was enforced on 1 April 2011 in Malaysia, followed by the establishment of the Feed-in Tariff (FiT) system<sup>27</sup>. The FiT system allows producers to sell renewable energy (i.e.: biomass, biogas, photovoltaic, and hydropower) to utility providers at a fixed price per unit of power over a period of 21 years. Since the introduction of the FiT, the installed renewable energy capacity has grown from 53 MW in 2009 to 243 MW in 2014<sup>28</sup>. FiT for solar has, however, been suspended and replaced with Net Energy Metering system (NEM) in 2015.

Figure 6: Installed Renewable Energy Capacity by Source



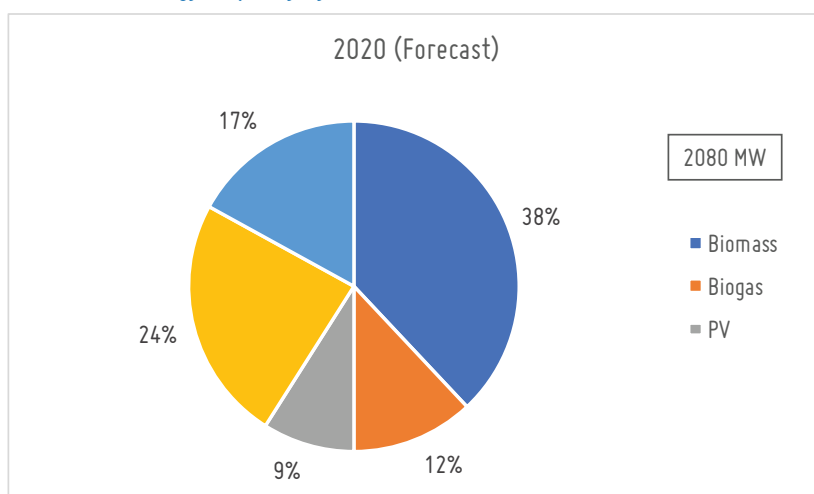
26. Agensi Inovasi Malaysia (2015). National Biomass Strategy 2020: Capturing the Biomass Opportunity [Powerpoint Slides]. Retrieved on May 11, 2017 from [https://www.eclareon.com/sites/default/files/timothy\\_ong\\_-\\_national\\_biomass\\_strategy\\_2020.pdf](https://www.eclareon.com/sites/default/files/timothy_ong_-_national_biomass_strategy_2020.pdf)

27. International Energy Agency (2016). Renewable Energy Act Establishing Feed-in Tariff (FiT) System. Retrieved on May 18, 2017 from <https://www.iea.org/policiesandmeasures/pams/malaysia/name-24984-en.php>

28. OECD (2016). Economic Outlook for Southeast Asia, China and India 2016: Enhancing Regional Ties, OECD Publishing, Paris. Retrieved from May 18.2017 from <http://dx.doi.org/10.1787/saao-2016-en>



**Figure 6: Installed Renewable Energy Capacity by Source (cont'd)**



Source: Economic Planning Unit (n.b.) Sustainable Usage of Energy to Support Growth.  
Retrieved on May 18, 2017 from <http://www.epu.gov.my/sites/default/files/Strategy%20Paper%2017.pdf>

The 11th Malaysia Plan published in June 2015 stated that the government aspires to increase the share of renewable energy in the total energy mix from the current 1% (243 MW) to 7.8% (2,080 MW) by 2020. There is also a particular focus on renewable energy from biomass and biogas as the government aims to increase their shares of 28% (as of 2014) of the total renewable energy capacity to 50% by 2020<sup>29</sup>.

## 4.2 NET ENERGY METERING (NEM)

Net Energy Metering (NEM) was introduced under the 11th Malaysia Plan to further support the government's effort to increase the share of renewable energy in the energy generation mix. This is executed by the Ministry of Energy, Green Technology & Water (KeTTHA), regulated by the Energy Commission (EC), and implemented by the Sustainable Energy Development Authority (SEDA). The NEM allows self-consumption of electricity generated by solar photovoltaic system, while selling the excess energy to utility providers. Under the NEM, Malaysia implements a capacity of 500 MW until 2020 with 100 MW capacity limit annually in both Peninsula Malaysia and Sabah<sup>30</sup>.

The NEM allows industrial, commercial, and domestic sectors to export the excessive renewable energy produced to the public grid. Unlike the FiT system, the NEM does not generate income for consumers. However, consumers will be able to lower their electricity consumption from utility companies, and this translates into savings on their electricity bills. In case of a net electricity supply at the end of the billing period, the excess can even be transferred and accounted for in the next invoice period.

29. Economic Planning Unit (n.b.) Sustainable Usage of Energy to Support Growth. Retrieved on May 18, 2017 from <http://www.epu.gov.my/sites/default/files/Strategy%20Paper%2017.pdf>

30. Sustainable Energy Development Authority Malaysia (n.b.). Overview of NEM. Retrieved on May 12, 2017 from <http://seda.gov.my/?omaneq=00010100000010101000100001000000000000000000000&s=5730>

## 5. INDUSTRY CHALLENGES

In the Malaysian biomass industry, the quality of machines and its parts is not the only thing that matters. It is also crucial that these machines be calibrated to handle the varying characteristics of different biomass resources. Additionally, it is worth noting that within the production process, particularly that of oil palm biomass, the feedstock is dependent on the fine-tuning of a machine to handle raw materials. This is due to the nature of the different types of biomass from the palm oil industry. Therefore, a comprehensive understanding of the nature of these raw products in the biomass industry is absolutely necessary before new technology can be introduced.

Another challenging area in the biomass technology business sector is the maintenance and after-sales services. Industry players most often prefer quick response time for maintenance over procurement of new or substitute machine parts. This is because importing machine parts from foreign countries can be time consuming in comparison to buying from domestic technology providers, who have their engineering team readily available on-site for maintenance. On the other hand, the development of the biogas industry, particularly biogas from POME, has not progressed as fast as initially expected. One of the efforts implemented by the Malaysian government to promote biogas from POME is the Entry Point Project No. 5 (EPP 5) under the National Key Economic Areas (NKEA) which aims to achieve the installation of biogas facilities in all palm oil mills in Malaysia by 2020. However, this has not progressed as planned. One of the reasons is the termination of the Clean Development Mechanism (CDM), developed under the Kyoto Protocol, which subsequently eliminates the possibility of generating additional income in an external market<sup>31</sup>.

In addition, two other significant challenges have been found to have hampered the development of both biomass and biogas from oil palm: the high costs of investment including plant construction, as well as lack of required knowledge and technical expertise.

POME is the most difficult and expensive waste to manage by mill operators. Even today, instead of treating the POME generated and recovering methane gas from it, most mill operators still only use the conventional open pond system just to comply with government regulation, without capturing biogas released from the process. This is also mainly due to lower costs. Furthermore, many mill operators do not see investing in a biogas plant as a worthwhile investment, due to the long payback period, and the larger space that is required to install the biogas plant.

Moreover, treatment of POME to generate biogas is a complex process, as the characteristic of POME can vary throughout the year due to the seasonal nature of palm oil milling operation, which in turn causes operational uncertainties to the biogas plant. The lack of knowledge and local expertise on the handling of POME-based biogas plant is therefore a constraint in ensuring the stability of the system for continuous biogas production. This subsequently reduces the confidence level of mill operators on the viability of the biogas plant.

Nevertheless, the biggest challenge in the industry remains the technical constraints of connecting these renewable energy sources into the national grid. The distance between the renewable energy plant and the location of the interconnection point at the distribution system will need to be within a 10-km distance in order to avoid power loss. However, there are a number of palm oil mills, especially those in East Malaysia, that are located far from the interconnection points. It is therefore difficult to connect these renewable energy sources to the national grid as longer connection distance results in higher costs and power loss.

31. Wong et al., (2015). Renewable Energy Policy Status and Challenges of POME-Biogas Industry in Malaysia. Retrieved on May 19, 2017 from [https://www.researchgate.net/publication/287817723\\_Renewable\\_Energy\\_Policy\\_Status\\_and\\_Challenges\\_of\\_POME-Biogas\\_Industry\\_in\\_Malaysia](https://www.researchgate.net/publication/287817723_Renewable_Energy_Policy_Status_and_Challenges_of_POME-Biogas_Industry_in_Malaysia)

# 6. POTENTIALS FOR MARKET ENTRY

Malaysia has abundant biomass resources, making biomass the most promising option, compared to other sources of renewable energy. Despite the abundance of biomass, the sector is yet to be fully developed in Malaysia. In recent years, the Malaysian government has been stepping up its efforts in developing the biomass and biogas sectors, as well as promoting the use of these energy sources across the country. The oil palm industry in particular, offers a wide range of potentials in both the biomass and biogas sectors. This is discussed in detail in the following sections.

## 6.1 PELLET PRODUCTION & PELLETISING TECHNOLOGY

Converting biomass to pellets allows producers to immediately capitalise on available biomass. In Malaysia, many pellet producers generate about 1,000 to 3,000 tonnes of pellets per month — these pellets are made using sawdust as feedstock. Export demand for these pellets comes mainly from Europe, Japan, Korea, and China<sup>32</sup>.

Table 3: Calorific Value and Moisture Content of Oil Palm Biomass

Biomass	Calorific Value (GJ/ton)	Moisture Content (%)
PKS	17.3	12
Fiber	11.1	35–37
EFB	5.3	65–67
POME (Biogas)	20 MJ/m3	98–99

Source: YTL SVCarbon (2010, April 28). Practical Issues for CDM Projects Implementation in Malaysia [Powerpoint Slides Retrieved on May 5, 2017 from <http://biomass-sp.net/downloads/3465hdaoq92i97w938/2804%20llango%20S%20Bharathi%20Govindarajulu.ppt>

There are a wide variety of pellets from oil palm in the biomass industry including mesocarp pellet, EFB pellet, and tree trunk pellet, among others. Two main factors influencing the production of pellets are the calorific value and moisture content of the feedstock used. Among the oil palm solid biomass, PKS contains the highest calorific value, whereas the EFB contains the highest moisture content. This is illustrated in the table above.

Biomass from oil palm, particularly EFB offers great potential as a cost-effective feedstock for producing pellets. The EFB pellet is also the more widely-known oil palm pellet in the market<sup>33</sup>.

Presently, there are a number of pelletising plants in Malaysia that are operating on machinery and machine parts that are manufactured locally or imported from China, Japan, Korea, as well as Europe. According to local industry players, when comparing the local and foreign pelletising machinery, the qualities of the end-product are very much

32. Biomass-SP (2011, January). EU-Malaysia Biomass Sustainable Production Initiative Newsletter, Issue 2. Retrieved on May 15, 2017 from <http://biomass-sp.net/wp-content/uploads/2012/02/Biomass-SP-Newsletter-Issue-2.pdf>  
33. Ibid

alike. However, the significant difference between the local and imported technology is the operational costs which occur during the production process. Additionally, the operational costs are associated with the production process and technology maintenance, after-sales services, as well as technology response time. Oftentimes, local players in the biomass industry highlighted their concerns on both the operational and production costs when adopting European technology since the costs for feedstock and the quality of the end-product are almost similar. It was further revealed that machines with a production capacity of over 10 tonnes per hour have not been introduced in Malaysia due to the inadequate production capacities of biomass.

In an interview conducted with a local biomass pelletising machine manufacturer, it was revealed that their pelletising machine, which is locally designed and produced in Malaysia (with only certain parts such as the motor, imported from Italy), is currently priced at approximately MYR 240,000, and has a production capacity of 1 ton per hour. Imported biomass pelletising technology from China is priced at about MYR 100,000 or less while technology from Europe comes at a significantly higher price<sup>34</sup>. These differences in prices are reflected in the quality of the technology. European machines are engineered to the highest quality standards, designed mostly for wood biomass. These may not necessarily be suitable for oil palm biomass due to its unique characteristics, such as varying moisture content. Hence, it is important that the machines be calibrated to accommodate these differences.

In spite of all concerns, it must be mentioned that industry leaders have a high regard of leading European technology and have purchased it.

Industry players are also anticipating innovation and improvement in the production process of oil palm pellets, particularly on the technologies used in the pre-treatment process. During the pre-treatment process, oil palm biomass is crushed and dried, to reduce the moisture content from approximately 70% to approximately 10% — these processes are currently carried out by different machines. The pellet production costs can be further reduced if these processes can be carried out by one machine instead of various machines. This is an area where European technology providers may have an edge, by providing quality machines and technologies<sup>35</sup>.

## 6.2 TRADE AND EXPORT

A large quantity of pellets produced in Malaysia is exported to countries such as South Korea and Japan. Malaysia's exports took the largest share of its new production within a short period. Reportedly, in 2013, Malaysia exported 81,142 tonnes, and this significantly increased to 168,588 tonnes in 2014. It was further reported that, in 2014, about 94% of Malaysia domestic production went to South Korea, making South Korea one of its largest importer of biomass pellets<sup>36</sup>. With the development of NBS2020, Malaysia seeks to be one of the major pellet producers in the region. It is further expected that the export demand for pellets will continue to increase in the coming years.

The figure illustrated on the next page shows the supply chain of pellet production in Malaysia. As the pellet industry continues to grow with demand, the prices of raw materials for pellets continue to increase. Such a situation can lead to either the sole utilisation of raw materials for commodity owners' personal economic gains, or the selling of

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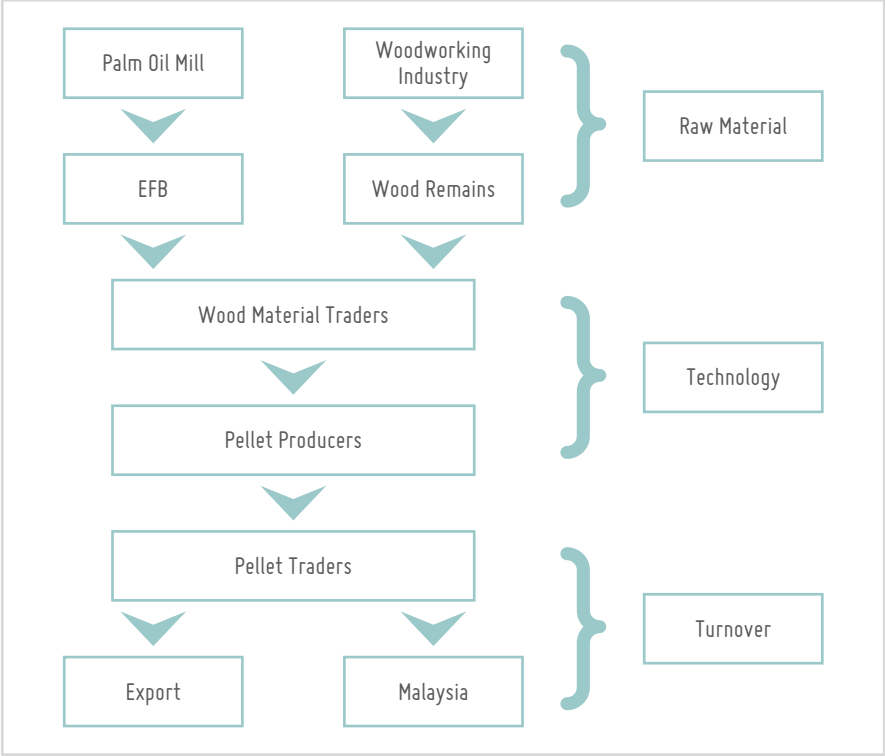
34. Information from interview

35. Ibid

36. Kotrba, (2016, November 16). Asian Wood Pellet Producer & Market Snapshot. Retrieved on May 18, 2017 from <http://biomassmagazine.com/articles/13880/asian-wood-pellet-producer-market-snapshot>

raw materials for pellet production at a very high price by commodity owners. This also explains why the funding for investment in pellet production is delayed or has not set off. A temporary solution to this is the insourcing of investment and pellet production from commodity owners.

Figure 7: Supply Chain of Pellet Production in Malaysia



Source: Author's Illustration (2016)

Malaysia can be a potential entry point for European players for business in oil palm pellets in the region. According to the Malaysian Industry–Government Group for High Technology (MIGHT), the demand for pellets in South Korea, Japan and China is estimated to reach 16 million tonnes by 2020. This means a market potential of about MYR 4.8 billion (approximately EUR 1.1 billion) annually. MIGHT further added that owing to the Renewable Portfolio Standard (RPS) introduced by the South Korean government, demand for pellets from South Korea may reach about 5 million tonnes by 2020, out of which about 75% to 80% of pellets will be imported. Similarly, demand for pellets for heat and electricity generation in Japan continues to increase as it moves away from nuclear power generation. Meanwhile in China, the generation of electricity from renewable energy is encouraged to curb air pollution in the country<sup>37</sup>.

There is also a range of investment opportunities especially for companies that produce pellets from oil palm biomass for export purpose to Europe or other Asian countries. For this, collaboration with a Malaysian company that is already active in the biomass sector is highly recommended. This is because local companies possess relevant knowledge on the specifications, characteristics, as well as the state of the sector and market.

37. Information from interview

## 6.3 HYBRID SOLUTIONS

In Malaysia, there is a considerable area where there is no infrastructure for distributing energy so supply of electricity is still lacking. This creates demand for autonomous and decentralised solutions (or hybrid solutions) for generating energy and supplying electricity, especially to small and remote villages. One such solution is to make use of the locally available renewable energy sources, such as solar energy, and biomass such as wood biomass and oil palm biomass, to generate energy. This is not only a sustainable solution but also helps in reducing the consumption of fossil fuels. Furthermore, boilers presently used in oil palm plantations in Malaysia have been rather inefficient. Therefore, there is a need to replace the boilers with newer models, technologies, and work processes.

This area offers great potential for European solution providers as European technology is already well-established in Malaysia and in demand for its efficiency and ecological sustainability at the existing oil palm plantations, especially in East Malaysia.

## 6.4 KNOWLEDGE TRANSFER

European players can not only provide machines and solutions, but also expertise and knowledge transfer via research and development (R&D) in the field of biomass and biogas. This can be done in collaboration with Malaysian companies. From an interview conducted with a local industry player, it was revealed that a local company has been working with a European research institute on R&D to minimize the slagging in boilers caused by combustion of oil palm pellets resulting in a reduction of the output.

Moreover, there is a lack of expertise among plant operators in terms of capacity assessment. As such, current investment may not necessarily be corresponding to the actual capacity, thereby causing poor electricity generation from renewable sources.

As knowledge and expertise in the biomass and biogas sectors are still scarce in Malaysia, European service providers can expect to further capitalise on the market opportunity in this area. There is also opportunity for foreign companies to offer consulting services to mill operators on plant management and refinancing.

## 6.5 BIO-BASED CHEMICALS

The green chemical market has been identified as a potential market entry area, in which bio-based chemicals can be extracted from oil palm and used in fertilisers, pharmaceutical products and cosmetic products. Today, it can be observed that bio-based chemicals are gaining momentum worldwide, especially in Europe and North America. Malaysia's oil palm biomass can be further harnessed and capitalised for the unique strength of higher value downstream processing with advancement in bio-based technology. With innovative bio-based technologies from foreign technology providers, Malaysia can further leverage on its oil palm biomass to produce bio-based chemicals.

## 7. CONCLUSION

Malaysia, being one of the countries that is active in agricultural activities, and being globally the second largest producer of palm oil, is blessed with abundant biomass resources that can be converted into alternative energy and eco-products. Biomass and biogas from the palm oil industry particularly have great potential to grow into the most significant renewable energy sources in the future.

However, the commercialisation of the biomass and biogas sectors will require further intervention to flourish into a modern and robust industry. The Malaysian government has implemented several initiatives to promote sustainable utilisation of the biomass potential. This includes the launching of NBS2020 that focuses on oil palm biomass as a starting point, and which was later extended to include biomass from other sources. Nonetheless, despite the government policies and market incentives being put in place to support industry players in the field of biomass and biogas, there is still a lack in terms of technology, financial support, knowledge, and expertise among local players.

At the same time, these challenges create market opportunities for foreign industry players. It can be seen that there has been an increasing number of companies in Malaysia that are venturing into the production of biomass pellets for the export market. This further creates a market for the pelletising technology where foreign players may have an edge. Next to this, the Malaysian Biogas Market aims to equip all 447 palm oil mills with biogas plants by 2020; Sabah aims, even by 2018, to have all their mills equipped with biogas installments. That SEDA has approved 145 biogas plants until end of 2019 stands for a great market potential. There is also growing interest for autonomous and decentralised solutions (or hybrid solutions) for generating energy and supplying electricity to remote areas. Where local expertise, technology and experience is lacking, European players who have a wide experience in biomass usage can expect to gain from the market. Furthermore, the industry offers opportunity for service providers to collaborate with local industry players in terms of knowledge transfer via research and development. In addition, with bio-based chemicals gaining traction worldwide, there is great market entry potential for foreign players.

Nevertheless, foreign players have to be able to adjust themselves, implement an adjusted risk management due to market data in Malaysia being unreliable and difficult to interpret. Accordingly, it is advisable for foreign companies to have the support of based in Malaysia and experienced partners such as the bilateral chambers to assist with their market entry strategies.

# EUMCCI & SEBSEAM-M

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Established in 2003, the EU-Malaysia Chamber of Commerce and Industry (EUMCCI) stand as a public non-profit organisation financed by projects, events, memberships and corporate partnerships.

### OUR MISSION

We aim to promote, support and develop EU business interests in Malaysia as well as facilitate trade, commerce and investments between the two trading blocs. We achieve this by carrying out social and business activities that will catalyse and stimulate networking of European companies in Malaysia with the Malaysian business community, business associations, relevant ministries, official representations and other Chambers in Asia.



## SUPPORT FOR EUROPEAN BUSINESS IN SOUTH EAST ASIA MARKETS - MALAYSIA COMPONENT (SEBSEAM-M)

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We also reach Malaysian SMEs wanting to establish themselves regionally from partnership with reputed and innovative EU companies which can offer high standard quality and services.

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