# MALAYSIAN BIOMASS INDUSTRY & BIOMASS SP PROJECT

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Submitted in partial fulfillment of the requirements for the course Sustainability Policy and Practice (STS 364/H) in the Science, Technology, and Society Program at the New Jersey Institute of Technology

10 May 2016

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# I. Acknowledgements

We would like to thank Mr. Tang Kok Mun, who worked on the Switch Asia team with the partnering SME's, for taking the time to answer all of our questions about the Biomass SP Project. Mr. Tang was incredibly helpful and his information helped us fully understand the scope of what the project entailed. We would also like to thank our professor, Maurie Cohen, for helping guide us along the way. He provided us with feedback and resources that helped to push our project in the right direction. Without the two of them this project would have not reached its full potential.

## II. Abstract

The biomass industry in Malaysia has become more relevant over the past few years. Through various government policies and the influence of the Switch Asia organization, there has been a push to move the country into the forefront of the green growth sector across all of Asia. Malaysia is one of the key countries in pushing this agenda of green technology/growth due to their abundance of natural resources, which are vital to the biomass industry. These resources include palm oil, timber, forest residues, sawdust, and rice husks, with many more to pick and choose from. The Biomass SP Project created by Switch Asia helped to spur on this movement in the region, and gave small businesses the knowledge and financial tools they needed in order to be successful. Switch Asia recognized that it was important to promote this cause among the smaller businesses in order to make it a true grassroots movement across the entire country. From this they hope that there will be a true policy shift in how energy is purchased and produced, and will start to focus more heavily on renewable energy sources rather than conventional energy production. Spreading the ideologies of biomass production and the benefits of it is one of the main issues at hand. There must be enough people backing the biomass industry in order to ensure the success of this emerging market. This Switch Asia project aimed to make all of these things a reality.

## III. Introduction

Malaysia is a country rich with natural resources. There is an abundance of different agricultural/production resources, including things like empty fruit bunches (EFB), rice husks, sugarcane bagasse, manure, sawdust, grass crops, forest residues, and palm oil ("Booming Biomass…"). These resources can be the key to making Malaysia a global leader in green production and consumption. The country, and the entire region of Asia, has been pushing something they like to call "green growth" for the past couple of years now. Ever since Najib Razak became the Prime Minister of Malaysia in 2009, he has had a strong and streamlined focus on certain issues. One of these issues at hand was how Malaysia could better utilize their waste/resources to help benefit their economy. Another issue that the Prime Minister thought was incredibly important moving forward was finding a way to lower the amount of greenhouse gases (GHG) they were emitting. He felt that they could become one of the leading Asian countries, and eventually a global leader, when it came to cutting down on emitting gases like $CO^2$. The country as a whole has realized that heading towards a more sustainable economic, social, and environmental model is the right way to go. In order to do this, various things must happen. There has to be enough funding and financial backing for these businesses and corporations to take on these projects. There needs to be enough public interest in the spur of this "green growth" movement. Universities and institutions will have to begin to take on some of the research aspects of these projects. A constant line of communication between the small and medium enterprises and the research institutions is key to ensuring that this project is successful.

The Biomass SP Project was created as a way to help spur on the green growth sector of Malaysia, while benefitting small and medium enterprises (SME's). Ms. Lee Jia Jing, the project manager, has noted that targeting these SME's is the best way to go about spreading this project throughout the country. She and the other project members have helped set up many ways to get

these smaller, family owned businesses involved. In the coming text, we will dive into how exactly the structure of this project was established and executed.

Not only was it key to promote the project through various media and traveling seminars, but it was important to shift the way the country thought about green growth and technology as a whole. Many businesses do not delve into this sector strictly because it is unproven and there are not enough success stories to influence companies that this is the right way to go. Not only is it unproven, but the government is strongly supportive of standard industry technologies and energy methods. The market for biomass, which is directly tied to renewable energy, is small but growing in Malaysia. It is still cheaper to use standard energy sources, but with policy shifts and funding from the right companies, this can all change. This paper will cover how Malaysia is going to deal with this uphill battle of defining a new type life in the upcoming years. It is key to understand a document called the *11th Malaysia Plan*, which details every single aspect of what the government plans to accomplish up until 2020. Understanding how all of these issues come together in order to create a positive environment for the Biomass SP Project, and the entire biomass industry itself, to thrive in is the only way to create this shift in policy and development in Malaysia.

## IV. Background of Malaysia

As mentioned previously, Malaysia wants to cut down on their emissions and become "greener" in the upcoming years. They have outlined a strategic plan to achieve this task by the year 2020 (Alagesh). More specifically, they want to cut carbon emissions by 40 %. They feel that this will help fight against global warming and other climate change issues. Prime Minister Razak has said that the country is on track as of right now. To date, they have cut down on their carbon emissions by 33 %, which makes them one of the leaders globally. As you can see from Table-1 below, ever since the year 2012, Malaysia has been decreasing the amount of $CO^2$ they are emitting into the atmosphere. Every year since 2012 the amount of installed biomass capacity in the country has increased, which is a positive sign. This assures that the biomass market is heading in the right direction and people are starting to buy into the validity of it as a more common source of energy ("SEDA Portal").

Annual Power Generation (MWh) of Commissioned RE Installations

| Year | Biogas | Biogas ( Landfill / Agri Waste ) | Biomass | Biomass ( Solid Waste ) | Small Hydro | Solar PV | Geothermal | CO2 Avoidance (tonne) |
|---|---|---|---|---|---|---|---|---|
| 2016 | 35436.64 | 68289.85 | 533161.85 | 30208.32 | 156949.63 | 363989.17 | 0.00 | 1188035.46 |
| 2015 | 33612.63 | 64523.82 | 529460.37 | 25403.50 | 150912.73 | 332684.32 | 0.00 | 1136597.37 |
| 2014 | 22140.38 | 36520.99 | 393387.12 | 12921.35 | 112682.33 | 160128.13 | 0.00 | 737780.3 |
| 2013 | 8497.53 | 14548.33 | 237311.61 | 9921.35 | 68143.07 | 37080.71 | 0.00 | 375502.6 |
| 2012 | 67.70 | 8008.79 | 92820.38 | 2231.82 | 17750.91 | 3524.20 | 0.00 | 124403.8 |

**Table-1**

Members of this Malaysian biomass industry feel that if they set the tone for the rest of the world, people will follow their plan and help contribute to climate change mitigation. The Malaysian government plays a huge part in these mitigation efforts and in order to help they have produced the 11$^{th}$ Malaysia Plan. This plan outlines the goals, aspirations, strategies, and techniques the country will use in order to become a more advanced nation. One of the biggest

issues behind advancing the green growth and technology market is financing and finding people who will fully support these endeavors. So far, the government has spent roughly $2.6 billion on nearly 200 projects throughout the country (Alagesh). According to the 11th Malaysia Plan, they have decided to keep pouring money into these projects by saving $2.3 billion for projects in the future. It is logical to surmise that the growth of a new industry will spark the economy while creating thousands of new job opportunities.

In order for the biomass industry to be successful, there are specific things that need to happen. To better understand the industry, it can be broken down into a few steps. One of the most important aspects in any project is money. The entire biomass industry starts with public and private funding. There must be a strong initial goal, correct amount of resources, and the knowledge of the product at hand to get investors on board. Next comes the scientific phase. This is where having strong, research based universities and labs with the intellectual firepower is key to keep the momentum of the project. After more research is done and there seems to be something concrete to explore, the government will shift their current policy in order to facilitate the growth of these projects ("An Ecosystem…"). Government mandates can help to spark the initial growth of the biomass projects. As the industry gains more attention, start-ups and other companies will want to come on board. This is key because industry professionals can help guide them in running successful smaller scale businesses that can spread the biomass way of life into more remote areas of the country. The final step in the process of ensuring the biomass industry's success is the creation of Centers of Knowledge. These become hubs of information where people from the industry and those not involved can gain a better understanding of what exactly is going on ("An Ecosystem…").

It is important to also understand the role that the Switch Asia organization played in getting this project off the ground. Switch Asia operates in 18 different, developing Asian countries. They have more than 90 grant projects spread throughout these 18 countries

("SWITCH-Asia.eu - Facts and Figures"). A large amount if this funding comes from European partners, as they want to closely work with the emerging Asian markets industry's in order to spread these new and improved ideologies and practices across the globe. It is key to understand Switch Asia does not intend to stay in these countries for more than 4 years at a time. Once a project starts, the typical duration of that project ranges anywhere from 24-48 months (SWITCH-Asia.eu - Facts and Figures"). Switch Asia only has the funding to help these program get started, they do not have the resources to permanently stay in these countries. They ensure that the businesses involved have all the proper tools, knowledge, and resources in order to be successful once they pull out of the country.

In correspondence with the Biomass SP Project, another strategy plan was developed to ensure the success of this growing industry. The National Biomass Strategy 2020 was developed in November 2011. The country realized that they had an abundance of palm oil and other resources that were being severely underutilized. The palm oil industry is the biggest producer of biomass in the entire country ("An Ecosystem…"). They began to think of different uses for these products in order to create more revenue. Once again, the government was heavily involved in this plan, as well as private sector companies. Research institutes and universities came on board as well, as they are key to developing a fundamental understanding of the problems at hand. By the year 2020, the plan strives to produce an additional $30 billion in Gross National Income (GNI). With this increased revenue, they hope to develop 66,000 new jobs, all while reducing carbon emissions by 12%. As the technologies pertaining to the palm oil industry become more and more advanced, companies will start to branch out to include other products like rubber, wood, and even rice husks ("An Ecosystem…").

In order to keep the biomass industry relevant, there have been multiple initiatives started since the Biomass SP Project. The Sabah Biomass Industry Development Action Plan aspires to create 5 million dry tons of biomass within the next 25 years ("An Ecosystem…"). Another one

is the Sarawak Biomass Industry Development Action Plan. This plan focuses heavily on the forestation found in Malaysia and sawmills that are linked to them. Milling companies want to take the residue from sawmills in Sarawak and transform that material into a renewable energy source. With there being an abundance of forestry, this plan has the potential to contribute around 21 million tons of biomass. A project that is coming to fruition and is scheduled to break ground this June is the Brooke Renewable 2G Bioethanol Plant. This plant will become the country's first second generation bioethanol plant. They are hoping that when the construction is finished, this plant will spur on the future development of the biomass industry ("An Ecosystem…"). As seen above, there is a high demand for these types of projects which shows that the biomass industry is just beginning to thrive. With all of these initiatives and plants being created, there will soon be an increased number of jobs and revenue to follow.

With all of this being said there are still some drawbacks to the biomass industry. As of right now, the biomass industry is still considered to be only a "patchwork" fix of voluntary programs and initiatives (Roeland). There is a large amount of confusion amongst the industry on what exactly the correct policies are to follow, which in turn creates mass market confusion. The idea of using the abundant timber mills in Malaysia as a main source of energy is a good idea in theory, but it has its drawbacks. The fact that using wood for electricity could take away from the amount of coal that is used, in turn lowering the amount of GHGs emitted into the atmosphere is a good thing (Roeland). But deforestation would be the ultimate consequence of this action. Forest sequester carbon and protect the biodiversity of these beautiful areas which help support the natural ecosystems (Roeland). One may argue that even though Malaysia is rich with woodlands that does not mean they have to be slowly destroyed in order to promote the biomass industry. Many countries that lack fossil fuels have a higher demand to find sources of renewable energy. Unfortunately this can have detrimental social and environmental impacts on these countries (Roeland).

## V. The Biomass SP Project

With background knowledge of the biomass industry being laid out, we can now go into further detail about the Biomass SP Project that Ms. Lee Jia Jing ran in coordination with Switch-Asia, the Malaysian Industry-Government Group for High Technology (MIGHT), the European Biomass Industry Association (EUBIA), the Danish Technological Institute (DTI), and the Association of Environmental Consultants and Companies Malaysia (AECCOM). The project ran from January of 2010 all the way up until January of 2014 ("Sustainable Production of…" 2). The budget for the project was listed at $2,248,688, with 80% of these funds coming from European partners ("Sustainable Production of…" 2). This project wanted to further develop the biomass industry based around the idea of sustainable consumption and production (SCP). This was accomplished through the utilization of biomass projects by small and medium enterprises (SME's) and other stakeholders (Weh 1). Biomass production and utilization was selected as such a key component to enhancing the future of Malaysia because of its diversity. It has the ability to be used for green products and the generation of renewable energy (RE). The scope of this project is not just limited to Malaysia, as it will incorporate aspects from the international market and seek funding from European investors. This project was noted as one of the most important to propelling the green technology sector in Malaysia forward.

The Biomass SP Project had a specific set of goals when it was created. These goals were as followed: to facilitate Malaysian family owned SME's in the implementation of sustainable production models in the biomass industry, to improve the biomass supply chain by enhancing collaboration between the industry, research institutions, and universities, to reduce the amount of industrial emissions, and finally, to create an enabling environment for improving policy pertaining to sustainable production in the biomass industry (Jing 8).

This all sounds good on paper, but actually executing this plan was not as easy as it seemed to be. There were various challenges facing the team as they proceeded with the project.

The biomass waste generated from plantations, farming activities, and milling activities has a high potential to be converted into a product of much more use and value. For example, some forms of biomass waste can be converted into bio-pellets, bio-briquettes, bio-fibers, bio-compost, pulp, eco-friendly food packaging, bio-plastics, and even transformed into certain bio-chemicals (Weh 1). The problem lies in the fact that the SME's that are being targeted do not have access to the green financing facilities, and some do not comply with industry environmental standards (Jing 8). As noted above, without this initial financial support it is incredibly difficult to gain any momentum. To make matters worse, the raw material used for these larger scale biomass projects is not always available to the SME's. They also lack the access to industry proven methods of converting larger scale material to fit into smaller size production needs (Jing 8).

The project managers realized the SME's will need as much help as they can get. To make things easier, 50 SME's will receive training in order to strengthen their financial, technical, and environmental knowledge in the biomass field (Weh 1). The training of these businesses is instrumental to ensuring the future success of the program. The 50 SME's that were chosen to be coached were granted access to government grants/financing, business partnerships with European companies, information of the Clean Development Mechanism for business, and even carbon footprint measurement tools ("Sustainable Production…" 2).While these businesses are rooted in Malaysia, there will be a constant focus on making a connection back to Europe. The European biomass market is booming, with many successful projects to boast. The Asian biomass market can benefit by learning from the European model. The end goal should be "the increased commercialization of local biomass between research institutions and universities and the SME's" (Weh 1).

The Biomass SP Project leaders felt it was key to target these SME's in order to spread the biomass message throughout the country at a smaller, more personal scale. Targeting SME's that were heavily based around wood and fiber production was a top priority. The project also

wanted to include eco-friendly product manufacturers, solid waste management service providers, and other traders/suppliers of biomass, biomass technology, and licenses ("Sustainable Production…" 3). Including key environmental professionals will help to increase the climate change mitigation aspect of the project as well as the physical manifestation of this knowledge. Professionals like engineers, consultants, contractors, patent agents, and industrial designers would have the greatest impact in this area. Government agencies, research institutions, and financial institutions (FI's) will have the greatest impact on the policy that is formed around the biomass industry ("Sustainable Production…" 3).

As mentioned before, the SME's are going to have a difficult time obtaining funding for these projects. A lot of the times they do not have the ability to comply with the environmental standards and lack the ability to access the raw material needed for the proper scale biomass project ("Sustainable Production of…" 2). The only way to fix this problem is to reorganize the supply chain for the SME's and allow them to play a bigger role in the importing and exporting of biomass.

One of the best ways to influence large groups of people is advertising, branding, and promoting. The Biomass SP Project team understood that if they did not get the word out about how beneficial biomass can be to the country, then the project did not stand a chance. They set up Awareness Roadshow Seminars across Malaysia in order to reach out to SME's. These seminars were supposed to show the businesses that becoming a part of this new system was not a difficult task, and that the Biomass SP team would help every step of the way. By the end of these seminars, more than 1,000 stakeholders and industry professionals had attended (Jing 8). Along with these educational roadshows, they deployed an advertisement campaign strategy that accumulated a total of 16 articles and write ups in local and national newspapers ("Sustainable Production of…" 7). These articles and seminars all included topics such as the fundamentals of biomass, renewable energy, eco-friendly products, and how to invest in the biomass industry.

With so many different aspects to the project, it was key that the team behind the Biomass SP Project knew what signs to look for in order to tell if the project was going in a positive or negative direction. They needed to stay on top of the SME's and continuously communicate with them to make sure the trajectory of the project was headed in the right direction. They knew that if the SME's began to commercialize the technologies that the local research and development centers were creating then they were in a good place. This showed that the SME's were able to financially support these concepts and were willing to implement them in their business models. In turn, if these methodologies began to be copied by other agencies outside the scope of the project, this was a good sign. If government agencies started to reach out and form partnerships with some of the local SME's, this was also another fantastic sign ("Sustainable Production of…" 7). As soon as the National Biomass Initiative was created by the Global Science Innovation Advisory Council (GSIAC), MIGHT, and BiotechCorp, this showed that the biomass industry was ready to be accepted.

With all of the support for this project, many people were curious to see exactly how successful it was. The environmental impact of the project was more successful in certain areas than others. Over the four years the project ran, there were 11 new "green biomass businesses" established. One SME successfully registered with the Verified Carbon Standard (VCS) in order to further report on their emissions. One SME received certification with Eco-label, in order to brand themselves as an eco-friendly company. They were also able to use the biomass to produce the labels themselves. One SME completed a life cycle assessment (LCA) with help from member of the team and Switch-Asia (Jing 9). The number of SME's that were able to get certified and recognized by a lot of these green sector related institutions was alarmingly low. This was compensated for by the fact that the project was able to create 11 completely new businesses. The fact that these businesses will run a strictly "green" business model is a step toward their climate change mitigation goal. The social impact of the project was huge as well.

With the creation of 11 new businesses, comes more job opportunities for locals. The working conditions of these people were drastically improved where employees were trained in Environmental Management System's standards. Health hazards created by the workplace were better managed and the communities around these businesses were protected from air, water, and noise pollution (Jing 9).

With one of the Biomass SP Projects main goals being to substantially contribute to climate change mitigation, they were very invested in the emissions numbers by the end of the project. There was a total greenhouse gas reduction of 3,006,304 tons $CO^2$ per year over the course of the project. One registered Verified Carbon Standard (VCS) project has a projected reduction of 153,000 tons $CO^2$ over ten years. Moving toward the business end of the project, one of the more successful projects used woodchips as a fuel. They ended up consuming about 2,100 tons of this woodchip biomass per month, which led to a reduced carb emission of 16,000 tons of $CO^2$ per year (Jing 9). The Biomass SP Project also helped to spur on new interests in other areas of the "green technology" sector. There was one major bio-fertilizer project that was able to receive financing in Malaysia from the Malaysia Debt Venture (MDV). Investors in this market have also shown extreme interest in products such as palm oil mill effluent (POME), biogas from methane capture projects, and biomass power plant projects ("Sustainable Production…" 4).

In terms of financing the projects, there were two SME's that were able to get safe loan from commercial banks. Two different SME's were helped by the Biomass SP Project to obtain government grants for research and implementation. One SME entered into the Kuala Lumpur Stock Exchange (Bursa Malaysia). A handful of SME's were able to get referrals to certain banks for "green loans." Through all of this though, one of the most helpful aspects of the project was created. A checklist was developed to help guide all future SME's on how to apply for loans from banks and government institutions (Jing 9). This is what is crucial in order to keep the

momentum gained from this project going. It is key that small companies now have the proven framework to base their business models off of.

Overall, the Biomass SP Project was a part of 50 local, regional, and even international events relevant to renewable energy and the biomass industry. Altogether, there were over 8,800 biomass stakeholders either engaged or involved in this project. These 8,800 stakeholders, were not just limited to the local SME's, these were businesses from all levels of the industry. When the project came to its end, there were a total of 75 news items in newspapers and magazines, some of them being local and a few international. With social media and the electronic platform of communication being so crucial nowadays, the team leaders were pleased to find out that there had been around 20 news items about them online (Jing 9).

As mentioned before briefly, changing policy is key to enabling a new way of thinking within a country. The Biomass SP Project was able to influence the new green policy that Malaysia is so strongly enacting in the coming years. The project participated in 7 policy stakeholder meetings that were organized by government agencies that would be directly affected by this industry. By the end of the project, the team had been in contact with, and thoughtfully engaged, 10 different ministries/government agencies. This project was also instrumental in the formation of the Malaysian Biomass Industry Action Plan 2020 (Jing 9). Another sign of success was that the European investors and stakeholders showed consistent interest in the project. By the end of it, there was the potential for one European-Asia biomass project potentially valued at $440 million in Vietnam (Jing 9).

## VI. The 11th Malaysia Plan Influence

The Eleventh Malaysian plan, set up to be followed from 2016-2020, realizes how important that green growth will be to improving the socio-economic development of the country. Among the many improvements suggested in the plan was an analysis that policy and regulatory framework, human capital, green technology investments, and financial instruments are key to promoting green growth (Economic 161). The plan talks about the waste to wealth attitude that Malaysia wants to promote within the upcoming years, the National Biomass Strategy 2020 was launched in 2013 to assess how Malaysia will develop new industries by utilizing agricultural biomass waste for high value products, including those for exports. An example is the use of palm oil biomass pellets for power generation and for other uses such as medium fiber density boards (Economic 165). Furthermore, the addition of the large forest area added to the country greatly helped to reduce the amount of GHG emissions and reduction of $CO^2$ (Economic 165). Likewise, focus was given to the adaptation of water resources and the agricultural sector to better withstand the impact of climate change.

More importantly, some of the 11th Malaysia Plan's end goals included ensuring up to 40% reduction in GHG emission intensity of GDP compared to 2005 level, achieving 2,080 MW of installed capacity renewable energy, ensuring that at least 20% of government procurement to be green, achieving a 22% recycling rate of household waste and ensuring the safety and protection of 2 million Malaysians through flood mitigation projects.

As a result, the success of the goals stated in the plan hinges upon the government to introduce a transformative green growth strategy framework. This framework reinforces the government's commitment to address the impact of climate change and manage natural resources in a comprehensive and sustainable manner while also strengthening the supportive environment for this transformation to take place. Ideally, the plan hopes that the management of waste will shift towards a comprehensive ruse, reduce, and recycle (3R) approach that will reduce

development of new landfills. Likewise, the plan hopes that development in environmentally sensitive areas and dependency on stressed natural resources will be reduced significantly (Economic 170).

The key areas that the government plans on focusing to improve green growth (related to biomass) include strengthening the enabling environment for green growth for Focus Area A, adopting the sustainable consumption and production concept for Focus Area B, Conserving natural resources for present and future generations for Focus Area C and Strengthening resilience against climate and natural disaster for Focus Area D.

The plan for Focus Area A involves the government creating long term commitment from all stakeholders, businesses, civil society, and most importantly the people. Furthermore, measures and instruments to build capacity, monitor, and evaluate programs to support green growth efforts will be put in place. In doing so, the government will shift policies and framework in order to promote and encourage companies to shift toward greening their technology and products, which will in turn accelerate the innovation and development of emerging green technologies (Economic 172). Additionally, revision of regulations and policies that are already in place, such as the Environmental Quality Act (1974), Solid Waste and Public Cleansing Management Act (2007), Nationals Policy on Climate Change (2009), and any bio-diversity policies will be made along with the creation of new policies like the sustainable consumption and production (SCP) blueprint, sustainable development blueprint, national mitigation plan, and national policy on geospatial information management (Economic 172). Other initiatives involve the establishment of new environmental agencies including a national climate change center, a national committee on sustainable waste management, and a national chemical management board through the restructuring and deployment of talent from existing agencies.

The promotion of green growth is seen as vital in the future growth of Malaysia. As a result, ministries and agencies at the federal, state, and local levels as well as the private sector

and academia will be further developed and focused on. Progress in this manner will be conducted through the introduction of evaluation mechanisms. These will be used to track and assess the effectiveness of green growth initiatives, as well as to facilitate planning and decision-making process in order to enable continuous improvements in undertaken efforts.

Moreover, a one stop center will be established to provide access and linkage to all data in the nation, including data that are housed in relevant agencies. This is vital as it will facilitate data searching and ensure accessibility to all information. This initiative will be led by The Department of Statistics Malaysia in coordination with relevant ministries and agencies (Economic 173).

Finally, the plan would be deemed a success if the detrimental impact of socio-economic activity on environmental systems is reduced along with the sustainable management and meaningful evaluation of natural capital, including forested areas, biodiversity, and water resources as well as its ecosystem. This would result in the protection of development gains, thus ensuring the wellbeing of a generations of Malaysians that use renewable energy efficiently.

Currently, Malaysia's performance with the Montreal protocol commitment entails having achieved specific pre-2010 outcomes for reducing ozone depleting substances and is on track to comply with the post 2010 provisions of the Protocol by the end of 2015, with the phasing out of the hydro chlorofluorocarbon (HCFC) substances (Economic 166). Actions such as supporting the development of local green products by issuing 73 eco-label licenses to the relevant companies, including electrical appliances, cleaning agent for household and personal care as well as products used for construction and steel industry have been responsible for this successful impact. Furthermore, ancillary responses such as the launching of the MyCarbon Reporting Program in 2013 to encourage and facilitate private entities to measure and report their GHG emission from which they could identify actions to reduce the emissions have proved pivotal in ensuring that the government and the Malaysian public remain engaged in the goals of

the 11th Malaysian Plan. Concurrently, current numbers show that as of January 2015 there were 26 companies that volunteered to participate in the program (Economic 166).

## VII. Interview with a Biomass SP Project Member

After many failed attempts to get in contact with the project manager and other members crucial to the success of the project, we were able to get in contact with one of the technical coaches from the Biomass SP Project. Mr. Tang Kok Mun has intensive knowledge of the biomass industry and how to help make a business thrive in this environment. He was one of the people involved in training the 50 SME's. We were curious and excited to see what Mr. Tang had to say about the project.

So exactly how successful do you feel that the Biomass SP Project was overall? His response to this was, "One of the successes of the project is the increased visibility of the biomass industry in Malaysia. Prior to that, there were some small players but there was lack of awareness by the other more important stakeholders such as government agencies, banks, investors etc. These stakeholders are important in order to ensure the right resources and directions are in place so that the industry can be sustainable over the long-term.
Another success was the opportunity for all the players to come together to network and collaborate to create more value for the industry. Last but not least, one of the key legacies of the project is the formation of Malaysia Biomass Industries Confederation (MBIC) as a private industry organization to future drive the industry forward." This all sounds very promising, but are there still any forms or policies from this project that are continuing today? Mr. Tang had this to say, "Malaysia does not have specific policies on biomass per se, as it falls under other larger policy scope such as our Biotech Policy, Greentech Policy, and Renewable Energy Policy where biomass is part of the scope. But we do have several action plans on biomass." This was a little disappointing to find out, as we know that policy enforcement is one of the main drivers behind a thriving biomass ecosystem.

We know you feel the project had its successes, but in terms of biomass creation, do you feel that the country has more access to biomass as a whole now? We asked this because we

knew that not only was the creation of biomass one of the goals of the project, but expanding the network to include more access to the biomass material and market was crucial. His response was as followed, "Yes, mainly due to the realization that value can be created from biomass. It used to be perceived as a form of agri-waste but now it is a resource. However, this creates another problem i.e. difficulty in securing long-term supply of feedstock as the owners knows that the price of the biomass will go up in the future, therefore they are unwilling to sign any long-term contract with the buyers or traders. Any biomass projects nowadays will usually be on a joint venture basis i.e. the owner of the biomass feedstock would want to have profit sharing of the biomass venture. Another long-term solution is to create a commodity exchange for the biomass feedstock but this will require product standards to be established, trading mechanism to be created and so on." From this response, we gathered that there was still some serious work to be done within the industry. The Biomass SP Project was instrumental in getting the industry started, but there is still room for improvement. In a couple of years when many of the projects listed above have statistical records and are proven to be successful, financial institutions will be more willingly to supply the funding for these ventures. But his response does show that there is a shift in the way people think about waste from certain products. They are maximizing their materials and putting them to use to create new jobs and spur on economic growth.

The country has much greater access to biomass products as a whole now, but that does not necessarily mean they are being translated into anything productive. So, has the creation of biomass products been successfully commercialized throughout the country? He responded with good news, as he said, "Yes, there are four sub-sectors of biomass that are being commercialized. They are as followed, Bioenergy (biomass pellets, biogas, biofuels), Agro-nutrients (compost, biofertilizers, Biochemicals (biosugars, polylactic acid, fine chemicals), and Eco-products (biodegradable packaging, fibermats for agriculture/erosion control, papers etc.)."

With all of this being said, what are the major things that you feel still need to change and be improved in terms of renewable energy and biomass energy in Malaysia? “My personal wish list would be the creation of technical standards for biomass feedstock, creation of biomass commodity exchange, participation of public listed companies via investing in biomass startups, and more active participation of local researchers in real commercialization ventures.” Mr. Tang Kok Mun realizes that the Biomass SP Project was a good starting point but there is still work to be done. From his “wish list,” it is clear that he wants the country to become more invested in the biomass industry. By increasing the amount of companies investing in biomass startups and having more research institutions participate in the development phase of the projects, there will be a boom in the biomass, and even, renewable energy markets.

## VIII. Conclusion

As we look back on what the Switch-Asia Biomass SP Project was able to accomplish, we see that they were stronger in certain areas than others. It was upsetting to see that there were only 50 SME's that were able to be taken on by the project. Out of the thousands that were engaged in the process of learning about the biomass industry, it would have been nice to find out that at least half of them got the help that they needed. It is understandable though that the biomass team could not stretch themselves too thin, and it most likely ended up being more beneficial that they focused heavily on those 50 SME's rather than try and vaguely help a couple hundred. There was a much smaller amount of businesses that were successful in applying for specific programs and financial institutions than I would have liked to seen. As previously mentioned, there are some drawbacks to the biomass industry. Deforestation is a serious issue and should not be a repercussion of producing biomass in Malaysia. There are still many things in this emerging market that need to be improved upon. There needs to be more solid policies laid out by the government in order to solidify the industry. Once there are actual ground rules set up that are unifying across the board, the market can begin to develop in unison. When one country grows, a partnering country can grow alongside with it. The biomass industry as a whole is promising, and can provide Malaysia with years of increased revenue and energy production, all while limiting the amount of GHGs that are being emitted into the atmosphere.

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