EU-Malaysia Biomass Sustainable Production Initiative
Snapshot of Results & Findings

Funded By: Promoted By:
Presentation Outline

1. Introduction on Biomass-SP and Sustainable Production (SP)
2. EU-Malaysia Biomass Entrepreneur Nurturing Program (EUM-BENP)
3. Achievements of EUM-BENP SMEs
4. Outreach exercises
5. Interaction with government for relevant course of action
6. Take Home Points
What is bioMass.sp?

• A development cooperation environmental initiative of the European Union (EU) under the SWITCH-Asia Programme; one of the 16 projects selected by the EU out of more than 300 proposals under the competitive evaluation process in 2009.

• Promotes implementation of sustainable production practices in small and medium enterprises (SMEs) involved in biomass utilisation and production in Malaysia.
# Sustainable Production (SP) Practices

## SCP Practices supported by SWITCH-Asia

<table>
<thead>
<tr>
<th>Raw material</th>
<th>Production</th>
<th>Supply</th>
<th>Retail</th>
<th>Usage</th>
<th>End-of-life</th>
</tr>
</thead>
</table>
| • Designing for sustainability  
• Eco-Design  
• Products for the poor  
• Product Improvement | • Improving production  
• Emission reduction  
• Technical innovation  
• CSR  
• Environmental management systems  
• Industrial symbiosis | • Greening supply chain  
• Sustainability criteria  
• Knowledge sharing | • Creating demand for better products  
• Consumer awareness raising  
• Promote sustainable lifestyle  
• Marketing for eco-products | • Eco-labelling products  
• Product information disclosure  
• Eco-label schemes | • Greening public procurement  
• Sustainable public procurement  
• Encouraging green product supply |

## Value Chain

- Policy instruments to provide support
Main Objectives

1. To **develop Malaysian family-owned SMEs to implement SP models** in the biomass industry – economic growth, social well-being and address the issues of industrial pollution

2. To **improve biomass supply chain** in Malaysia by promoting collaboration between EU-Malaysia biomass industry, research institutions and universities

3. To **reduce industrial emissions** by improving production process of biomass commercialization projects and contribute to global climate change mitigation efforts

4. To **create enabling environment** for improving policy cohesiveness based on multi-stakeholders’ approach
EU-Malaysia Biomass Entrepreneurs Nurturing Programme (EUM-BENP)

- EUM-BENP serves to build up management and technical capacity of selected Biomass SMEs to improve business and environmental performance.
- Under the EUM-BENP, selected SMEs can gain access to:
  a. Capacity Building Programs on various topics relating to biomass
  b. Coaching on Green Financing & market access opportunities on selected biomass products
  c. Facilitation of business partnerships
  d. Support in implementing Sustainable Production (SP) practices
Encourage Sustainable Production (SP) Practice Among the SMEs

- ISO 14001:2004 Environmental Management System (EMS)
- Life Cycle Analysis (LCA)
- Eco-Labeling
- Carbon Emission Reduction Scheme
  - Clean Development Mechanism (CDM)
  - Verified Carbon Standard (VCS)
## Capacity Building Programmes (CBP)

<table>
<thead>
<tr>
<th>Date</th>
<th>CBP</th>
<th>Speakers</th>
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<tbody>
<tr>
<td>19 - 20 April 2011</td>
<td>Biomass and Green Technology Financing Opportunities by Government Agencies and Financial Institutions</td>
<td>MIGHT, BiotechCorp, Cradle Fund, SME Corp, CGC, MIDF, SJPP, MGTC, Maybank, MTDC, MLSCF</td>
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<tr>
<td>21 – 22 April 2011</td>
<td>Biomass Technologies for Uptaking by Research Institutions and Universities</td>
<td>UPM, UKM, UiTM, FRIM, UNITEN, MPOB</td>
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<tr>
<td>11 – 12 July 2011</td>
<td>Biomass Pelleting &amp; Briquetting Technology (Market Access Opportunity, EU Standards Compliance &amp; etc.)</td>
<td>Danish Technological Institute (DTI)</td>
</tr>
<tr>
<td>13 – 14 July 2011</td>
<td>Success Stories on Biomass Conversion/SCP Projects</td>
<td>Danish Technological Institute (DTI)</td>
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<tr>
<td>3 – 4 October 2011</td>
<td>Benchmarking Biomass Economic Value and Setting Up Sustainable Supply Chain</td>
<td>European Biomass Industry Association (EUBIA)</td>
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<tr>
<td>26 – 27 March 2012</td>
<td>Biofertiliser: Meeting Sustainable Production (SP) Principles and Green Market Access Opportunities in Europe</td>
<td>Danish Technological Institute (DTI)</td>
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# Capacity Building Programmes (CBP)

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| 4 July 2012         | Workshop on Understanding the Green Market: Eco-labelling and Carbon Footprint | Dr. Chen Sau Soon, SIRIM  
Dr. Chan Kook Weng, Malaysian Palm Oil Board (MPOB) |
Dr. Ing. Giuliano Grassi, EUBIA  
Mr. Tang Kok Mun, Biomass-SP |
| 18 – 19 April 2013  | Commercialisation of Sustainable Biochar                               | GERES, Cambodia Biochar Systems Limited (BSL)  
Faculty of Agriculture, UPM Environment Technology Section, MICET UniKL |
| 24 – 25 June 2013   | Small Scale Biorefinery                                               | EUBIA                                                                    |
| 19 August 2013      | Transforming Biomass SMEs to Exporter : Preparatory Steps to International Market | AB Teoh, Malaysian Export-Import Expert |
Enhancing Access to **Green Financing**

**STRATEGY**
Identify different avenues of financing for SMEs to commercialise biomass ventures via linkages and networking with related financial institutions & government agencies such as MIDA, MOSTI, MTDC, Cradle Fund, MDV, etc.

- MiIGHT/ the Association of Banks in Malaysia (ABM) to enhance the awareness on biomass business models to close to 50 bankers from financial institutions such as RHB Bank, AmBank, Maybank, Public Bank etc.

- Knowledge Exchange Session with AgroBank, HSBC, Maybank Islamic, and Bank Pembangunan to discuss current status of different sectors in biomass industry such as renewable energy, bio-fertiliser, kenaf, etc.

- Successfully facilitated more than RM10 million loan financing deals for biomass SMEs by reference to the right contacts and providing advice on technical, financial and business aspects for SMEs in their application for financing and another RM20 million ongoing green financing consultation.

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**Loan Financing** ➔ **Government Grants** ➔ **Venture Capital**
Greenearth Group of Companies believes in effective use of waste materials to cropped land. Specifically targeting plantation and agriculture industries, the company is converting up to **45,000 tonne empty fruit bunches (EFB)** to **10,000 and 5,000 tonnes compost and value-added biofertiliser** every year.

Keeping abreast in the local and global biofertiliser value chain, the Group recognises the importance of uptaking sustainable production (SP) practices in its management and business operations. The Group implemented **ISO 14001:2004 Environmental Management System (EMS)** in its production process. Under its marketing arm, Greenearth Alliance Sdn. Bhd., the Group also conducted the **Life Cycle Analysis (LCA)** of its product, **25 kg organic fertiliser “Blackgold”** which amounts to **0.38 kg CO₂-equivalent** for every pack. The Group is currently on its way to obtain Eco-Labelling Certification.
CE Technology Sdn. Bhd. was using up to 7100 litres of heavy fuel oil (HFO) at RM 1.70/litre for heating purposes from 2008 to 2011 until management decided to switch to solid fuel fired thermo oil heater. Following an initial investment of RM 2 million on land, building, equipment and ancillaries, the company is now using 42 tonne/day wood chips which are sourced from surrounding saw mills. In addition, Biomass-SP also supported the company in registering its greenhouse gas reduction activity under the Verified Carbon Standard (VCS). The company is expected to reduce GHG emission up to 153,027 tonne CO₂-equivalent throughout the project lifecycle, with potential generation of 16,107 verified carbon units (VCUs) every year.

As a result, the company made substantial financial savings from fuel-switching practice while playing a role in the global climate change mitigation efforts.
Uptake of Sustainable Production (SP) Practices among SMEs: ISO 14001 EMS / High Value Commercialisation

**Creation of High Value Bio-Engineering Products from Utilisation of Biomass**

**MTS Fibromat (M) Sdn Bhd** is an established company with a long history and experience in the manufacturing of high-value **Erosion Control Products** using biomass substrates such as EFB, paddy straw, and coconut coir.

The company is able to generate 10X the value of biomass by applying the engineering know-how to its products in erosion control bioengineering. The increased value chain enhances economic opportunities for paddy farmers and creates substantial socio-economic improvements to the surrounding communities by providing employment to retirees and housewives.
Uptake of Sustainable Production (SP) Practices among SMEs

ISO 14001: 2004 Environmental Management System (EMS)

1. **Biotechnology Diversified Industries Sdn. Bhd.** successfully commercialized indigenous R&D to utilize agricultural waste from sago to produce high value maltodextrin, a starch based ingredient for animal and aqua feed.

2. **Builders Biomass Sdn. Bhd.** produces high energy, high density biomass pellets using wood and palm biomass. The company is able to reduce GHG emission up to 54,147 tCO$_2$–eq every year.

3. **Exus Biomass Sdn. Bhd.** utilises wood saw dust in the state of Johor for production of biomass pellets. The company is able to reduce GHG emission up to 10,803 tCO$_2$ –eq every year.

4. **PZ Bio Energy Sdn. Bhd.** converts used cooking oil and fish waste to produce biofuel and fuel additives. The company was able to reduce GHG emission up to 3,203 tCO$_2$ –eq every year in its production.
Uptake of Sustainable Production (SP) Practices among SMEs

ISO 14001: 2004 Environmental Management System (EMS)

5. **Millenium Partners Sdn. Bhd.** manufactures industrial solvents and general cleaning agents using palm based esters. The venture is a result of commercialization of indigenous R&D with the Malaysian Palm Oil Board (MPOB).

6. **Rapat Nusantara Sdn. Bhd.** utilises industrial wood waste as a replacement for fossil fuel in its production process for drying of lemongrass. The company is able to reduce GHG emission up to 203 tCO2 –eq every year.

7. **Waris Nove Sdn. Bhd.** turns empty fruit bunches (EFB) from oil palm into a high value carboxy methylcellulose (CMC) via commercialisation of indigenous R&D with the Malaysian Palm Oil Board (MPOB).

8. **TT Biotechnologies Sdn. Bhd.** and **Ecopha Sdn. Bhd.** are biotechnology companies devoted to commercialisation of biodegradable plastics. Using agricultural wastes such as empty fruit bunches the companies utilise high value indigenous technology to produce bioplastic resin such as polylactic acid (PLA) and polyhydroxyalkanoate (PHA).
Uptake of Sustainable Production (SP) Practices among SMEs

ISO 14001: 2004 Environmental Management System (EMS)

9. **Greeneearth Intl Holdings Sdn. Bhd.** converts oil palm waste such as empty fruit bunches (EFB) and Palm Oil Mill Effluent (POME) into value-added compost and fertiliser. The company is able to reduce GHG emission up to 5,664 tCO2 –eq every year.

10. **MTS Fibromat Sdn. Bhd.** provides erosion control engineering solutions by utilising agricultural waste such as empty fruit bunches (EFB), paddy husks, and coconut coir husk as substrates.
Uptake of Sustainable Production (SP) Practices among SMEs

Greenhouse Gas Reduction Project via Verified Carbon Standards (VCS)

**CE Technology Berhad** uses biomass such as wood and landscape waste in replacement of fossil fuel in its production for heating and drying purposes. By registering under VCS, the company is able to reduce GHG emission up to 16,107 tCO2 –eq every year.

Life Cycle Assessment (LCA) & Eco-Labeling Certification

**Composite Technology Wood Sdn. Bhd.** utilises rice husk from paddy to produce green building materials, biofibre composite. By applying for Eco-Labeling Certification, the company is able to contribute towards green building development and their products comply with the Green Building Index (GBI) Criteria.

**Greenearth Alliance Sdn. Bhd.** conducted Life Cycle Assessment (LCA) for its product, 25 kg “Blackgold” organic fertiliser to help customers make informed choices in their purchase. Every 25 kg of product is equivalent to 0.38 kg CO2.
Boosting Renewable Energy Projects with Advanced European Technology

CHE Metal Works Sdn Bhd, an established processing equipment manufacturer in Malaysia entered into a joint venture agreement with Torftech UK Ltd.

The objective of forming the joint venture (JV) is to provide the local biomass industry an advanced biomass pre-treatment and power generation solution. As a result of the JV, the company as clinched a RM1.97bil contract to undertake the design, engineering work and commissioning of 20 rice husk biomass plants totaling 200MW in the southwestern part of Vietnam with GHG reduction potential of 2.8 million tCO2-equivalent.
CHE Group JV with Torftech UK and Hau Giang Power Plant Co. to Develop Rice Husk Power Plants in Vietnam

CHE signs JVA with Torftech UK
Biomass Asia Conference, May 2013

CHE signs MOA with Hau Giang Power Plant Co., Vietnam
Biomalaysia & Bioeconomy Asia Pacific Conference & Exhibition, October 2013
Dr. Tan Keok Lye, the Managing Director of Matrix PLC Manufacturing Sdn. Bhd. realised the tremendous opportunities in carbonization business to produce high value and niche consumer products after attending the CBP on Biomass Technologies for Uptaking by RIUs.

The company is currently producing up to 500 briquettes and charcoal, utilising up to 1000 biomass feedstock every month.
R&D Collaboration and Indigenous Technology

• Myagri Nutribio Sdn. Bhd. undertook R&D collaboration on waste-to-wealth project for developing country with Danish Technological Institute (DTI).

• Local institutions promoting R&D collaboration and utilisation of indigenous technologies:
  – Malaysian Palm Oil Board (MPOB)
  – Universiti Malaysia Pahang (UMP)
  – Universiti Teknologi Petronas (UTP)
  – Universiti Sains Malaysia (USM)
  – Standards & Industrial Research Institute of Malaysia (SIRIM)
Country-Wide Outreach & Engagement with Stakeholders

**Awareness Road Show Seminars 2010**
- 7 states in West & East Malaysia
- More than 1000 stakeholders & SMEs attended.

**EU-Asia Biomass Best Practices & Business Partnering Conference 2012**
- Gathering of more than 1000 local, regional, and international biomass stakeholders at the EU-Asia Biomass Best Practices & Business Partnering Conference 2012 & its satellite and subsequent events.
Synergy with industry associations, government agencies and relevant stakeholders group - Share findings, best practices and lessons learnt in biomass industry.

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<tr>
<th>Event</th>
<th>Organiser</th>
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<tr>
<td>19th European Biomass Conference 2011</td>
<td>European Biomass Industry Association (EUBIA)</td>
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<td>Training Seminar on Renewable Energy 2011</td>
<td>Italian Trade Commission</td>
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<td>2nd Biomass &amp; Pellets Update Asia 2012</td>
<td>Bioenergy International</td>
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<tr>
<td>International Oil Palm Biomass Conference 2012</td>
<td>Malaysian Palm Oil Board (MPOB)</td>
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<tr>
<td>International Conference on Biomass for Biofuels &amp; Value Added Products 2012</td>
<td>Ministry of Higher Education (MOHE), Forest Research Institute Malaysia (FRIM), Universiti Malaysia Pahang (UMP)</td>
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<tr>
<td>10th Biomass-Asia Workshop 2013</td>
<td>New Energy Foundation (NEF), Japan</td>
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<tr>
<td>1st China-ASEAN Forum on Technology Transfer and Innovation Collaboration 2013</td>
<td>China-ASEAN Technology Transfer Centre (CATTC)</td>
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<tr>
<td>4th International Green Purchasing Conference 2013</td>
<td>Malaysia Productivity Corporation (MPC), Green Purchasing Network Malaysia (GPNM)</td>
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Etc.
6th Asia Clean Energy Forum 2011
Manila, Philippines

35th ADFIAP Annual Meeting 2012 – Workshop
on Enabling Access to Finance for Green SMEs
Istanbul, Turkey

Forum on China-ASEAN Technology
Transfer & Collaborative Innovation 2013 –
Nanning, China

MPOB Oil Palm International
Biomass Conference 2012
Kuala Lumpur
Creation of Industry-Wide Network

The **Malaysia Biomass Industries Confederation (MBIC)** was founded by SMEs under Biomass-SP to represent the biomass industry network in Malaysia.

MBIC was graciously officiated by the Negeri Sembilan State Ruler, Duli Yang Maha Mulia Yang Di-Pertuan Besar Negeri Sembilan Darul Khasus Tuanku Muhriz Ibni Almarhum Tuanku Munawir, in 2012.
Participation in Stakeholders Consultations Session on Green/Bio Initiatives

• Bioeconomy Initiative Malaysia (BIM)
  — Malaysian Biotechnology Corporation & The Ministry of Science, Technology and Innovation (MOSTI)

• Enhancing Competitiveness of Renewable Energy Sector & Related Services
  — The Ministry of International Trade & Industry (MITI)

• National Green Technology Master Plan
  — The Malaysian Green Technology Corporation

• Stakeholders Engagement on Used Cooking Oil
  — The Ministry of Energy, Green Technology and Water (KeTTHA)

• Working Group to Drive Policy and Roadmap for Biomass Science, Technology and Innovation in ASEAN Economic Region
  — Thailand Science, Technology and Innovation Policy Office

• China-ASEAN Technology Transfer & Innovation Collaboration
  — China-ASEAN Technology Transfer Centre

...and many more
Malaysian Biomass Industry Action Plan 2020
(Championed by MiGHT)

To promote participation of SMEs via uptake of Sustainable Production (SP) practices in the biomass industry in Malaysia through a set of intervention strategies and specific action plans based on multi-stakeholders consultative approach:

- **Unlocking biomass feedstock for downstream utilization** via optimizing the efficiencies of resource utilization upstream at the plantation and milling stage.
- **Smart utilization of biomass for high value production** via commercialization and scaling-up of local know-how and expertise and setting of market-focused Biomass Smart Hubs.
- **Positioning Malaysia as regional and international biomass hub** via establishing the nation as the focal point for internal and external biomass stakeholders in aspects such as trading, logistics, technology, engineering, equipment, standards development, investments and finance.

Biomass Benchmarking Study
(Championed by MiGHT)

The Biomass Benchmarking Study provides **quantitative perspective of the potential economic value** that can be generated from various commercial utilisations of different types of biomass available in Malaysia.
European Commission Development Cooperation (DEVCO) Communication Award 2012

- Biomass-SP, a Malaysian-based project focusing on energy and biomass, recently received a Special Mention in the Asia category of the European Commission's Development & Cooperation (DEVCO) Communication Awards 2012. The jury lauded the project's successful three-year communication plan implementation.

- Thanks to the nomination by the Delegation of the European Union to Malaysia.
Take Home Points

1. Feedstock – Finance – Technologies – Market + Human Capital

2. For big-scale project developers without feedstock, Sourcing the “raw materials” remain a big challenge for projects requiring more than 100,000 MT (dry) feedstock per year, such as biomass power plants.

3. Biomass SMEs to focus on niche projects to maximize the utilisation of feedstock for conversion to higher-value products.

4. New era; need to commercialize currently patented technologies related to biomass
   - Unlock the monetary value of Intellectual Properties through the newly launched IP Valuation Model (IPVM) and IP financing (RM200million promoted by MDV)
Take Home Points

5. Government commended for superb ongoing support of the Malaysian biomass sector particularly in terms of intervention and financing.
   – GTFS from Greentech Corp, Greenlane policy from MOF – 1Innocert, MTDC Incubation Company
   – SME soft loans from DFIs (SME Bank MIDF, Agrobank etc.) & Islamic Banks, soft loans for Bionexus Companies
   – Grants from MIDA, MOSTI, MTDC, Matrade, Cradle Fund
   – SME schemes from commercial banks promoted by Bank Negara
   – Venture Capital and private equity fund from Malaysia.

6. Using biomass as bioenergy is the best approach to reduce GHG Emission vis-à-vis other high value products such as biofertiliser, eco-products from the perspective of Carbon Footprint measurement.