Malaysian Palm Oil Industry – Enhancing Competitiveness in Meeting Challenges

by

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Director General MPOB

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KEY MESSAGES

• Malaysian Oil Palm Industry is very competitive, will be here to stay – assured availability of palm oil

• Malaysian palm oil products – sustainable, green, low carbon footprint, continued improvement in line with global expectations

• Supported by extensive and intensive R&D – constant generation of new uses and improved products
PRESENTATION OUTLINE

• Competitiveness
  • Overview – statistics
  • Meeting challenges
  • Economic Transformation Programme
• Sustainability
  • People, Planet, Profits
• Research & Development
An Overview of the Malaysian Palm Oil Industry and its Importance to Malaysia
The Malaysian Oil Palm Sector (2011)

- Planted Area 5.00 million ha
- Crude Palm Oil – 18.91 million tonnes
- Crude Palm Kernel Oil – 2.14 million tonnes
- Mills – 426 with capacity to process 99.85 million tonnes of fresh fruit bunches/yr
- Refineries – 56 with capacity to process 24.97 million tonnes of crude palm oil/yr
- Bulking Installations – 34, total storage capacity 1.49 million tonnes
Exports of Malaysian Palm Oil

Total Export of Palm Oil
(Jan–Dec 2011)

Quantity: 17.99 million tonnes
PO Export Earnings: RM 60.5 billion
All Palm Products Export Earnings: RM 80.4 billion

Major Export Market of Malaysian Palm Oil

- China, PR: 22%
- EU-27: 11%
- Pakistan: 10%
- India: 9%
- U.S.A: 6%
- Egypt: 4%
- Others: 38%
Exports of Malaysian Products - 2011

Total Export of Malaysian Products: **RM 694.5 billion**

Total Export of All Palm Products: **RM 80.4 billion**

**Palm oil contribution: 12.0% of total export**
Average Oil Yield for Selected Crops

tones/ha

PO + PKO: 4.05
Palm Oil: 3.62
Rapeseed: 0.71
Sunflower: 0.52
Soya bean: 0.40

Calculated based on area and production data from Oil World
**Average Oil Yield for Selected Crops**

<table>
<thead>
<tr>
<th>Oil Crop</th>
<th>Total area (million ha)</th>
<th>% of total area</th>
<th>Production (million t)</th>
<th>% of total production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil palm</td>
<td>13.58</td>
<td>7.78</td>
<td>49.12</td>
<td>38.81</td>
</tr>
<tr>
<td>Soya bean</td>
<td>103.90</td>
<td>59.53</td>
<td>41.38</td>
<td>32.69</td>
</tr>
<tr>
<td>Rapeseed</td>
<td>33.07</td>
<td>18.95</td>
<td>23.62</td>
<td>18.66</td>
</tr>
<tr>
<td>Sunflower</td>
<td>23.98</td>
<td>13.74</td>
<td>12.45</td>
<td>9.84</td>
</tr>
</tbody>
</table>

*Oil Palm is the most efficient oil crop in the world!*
Enhancing competitiveness of Palm Oil – National Key Economic Areas (NKEA)
The New Economic Model has identified the right framework to drive Malaysia to achieve high income nation...

- **High Income**
  - Target USD 15,000-20,000 per capita by 2020

- **Sustainability**
  - Meets present needs without compromising future generations

- **Inclusiveness**
  - Enables all community benefits from the wealth of the country
The National Key Economic Activities (NKEA)

It is a driver of economic activity that has the potential to directly and materially contribute a quantifiable amount of economic growth to the Malaysian economy.
The prioritisation of 11 NKEAs & Greater KL will drive the economy to achieve a high income nation.
8 Entry Point Projects (EPPs)

**IMPROVE UPSTREAM PRODUCTIVITY & SUSTAINABILITY**

1. Accelerate Replanting
2. Improve FFB Yield
3. Improve Workers’ Productivity
4. Improve Oil Extraction Rate (OER)
5. Develop Biogas Facility at Mills

**ENHANCE DOWNSTREAM EXPANSION & SUSTAINABILITY**

6. Focus on high value oleo derivatives
7. Commercialise 2nd Generation Biofuels: Bio Oil
8. Expedite Growth of Food and Health Based Segment

**UPSTREAM GNI IMPACT**: RM33.1 billion (USD11.03 billion)

**DOWNSTREAM GNI IMPACT**: RM14.0 billion (USD4.67 billion)
Eight EPPs, three business opportunities, baseline growth and multiplier effect will deliver RM 125.3 billion incremental GNI impact as well as additional local jobs of 41,600 in 2020.
Meeting Challenges faced by the Malaysian Palm Oil
The Current Challenges

- Shortage of labour
- Shortage of land
- Sustainability issues

Meeting these challenges head-on is the key towards enhancing competitiveness of the Malaysian palm oil industry.
The Current Challenges

- Shortage of labour
- Shortage of land
- Sustainability issues
Strategies to Address Labour Shortage

- Mechanisation
- Re-engineer the trees
- Diversify source of workers
- Enhance training
- Improve working conditions
- Reverse investment
Strategies to Address Shortage of Land

• Enhance productivity through improved planting material
• Enhance productivity through best management practices
• Improve pest control and disease management

Germinated seeds
Cover crops and nutrient recycling
Strategies to Address Sustainability

• Balancing agriculture and nature through policy measures
• Implementation of Good Agricultural Practices (GAP)
• MPOB Life Cycle Assessment (LCA) Studies
• Certification for sustainable palm oil
Malaysian Perspective on Sustainability

The Holistic Approach is all about BALANCING the 3-Ps

PEOPLE
(Social development of the people)

PLANET
(Conservation and management of the environment)

PROFIT
(Economic development for progress of nation)
PEOPLE
Oil Palm in Malaysia’s Economy

- Palm oil contributes about 9% of Malaysian GDP
- Provides employment to 0.61 million workers in the industry and those related to it

Source: World Development Bank Indicator
GNI: Gross National Income

<table>
<thead>
<tr>
<th>Country</th>
<th>2011: GNI per Capita (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>$ 48,450</td>
</tr>
<tr>
<td>UK</td>
<td>$ 37,780</td>
</tr>
<tr>
<td>China PR</td>
<td>$ 4,930</td>
</tr>
<tr>
<td>India</td>
<td>$ 1,410</td>
</tr>
<tr>
<td>Malaysia</td>
<td>$ 8,420</td>
</tr>
<tr>
<td>Indonesia</td>
<td>$ 2,940</td>
</tr>
</tbody>
</table>
Importance of Oil Palm to Malaysia

The oil palm industry: a major source of employment

- Eradicated poverty and narrowed income gap between town and rural folk
- Created rural townships where workers reside and enjoy good quality of life
- Contributed to social security and peace
- Reduced migration of labour force from rural areas

More Equitable Distribution of Wealth Social Responsibility
The Federal Land Development Authority (FELDA)
- established in 1956
- supported by World Bank & the United Nations
- tasked with reducing rural poverty
- resettlement of landless farmers
- planting of economically viable crops
The FELDA Scheme Provides:

- Basic amenities - water, electricity, telephones, schools, roads, clinics, etc...
- Offer greater employment opportunities
- Established centers of economic & social life for entire rural community.

FELDA - a recognised model for poverty eradication and succeeded in moulding modern farming community with secured future!
# Oil Palm - The tool to eradicate poverty

<table>
<thead>
<tr>
<th>Year</th>
<th>Felda Settler’s Income</th>
<th>National Poverty Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>RM 1,338 (~ US$ 405)</td>
<td>RM 526 (~ US$ 159)</td>
</tr>
<tr>
<td>2007</td>
<td>RM 2,221 (~ US$ 673)</td>
<td>RM 740 (~ US$ 224)</td>
</tr>
<tr>
<td>2008</td>
<td>RM 3,278 (~ US$ 993)</td>
<td>RM 691 (~ US$ 209)</td>
</tr>
<tr>
<td>2009</td>
<td>RM 2,457 (~ US$ 745)</td>
<td>RM 666 (~ US$ 202)</td>
</tr>
<tr>
<td>2010</td>
<td>RM 3,000 (~ US$ 974)</td>
<td>RM 720 (~ US$ 233)</td>
</tr>
</tbody>
</table>

Increasing income levels and eradicating poverty are the main concerns.
PLANET
# The Regulatory Framework

## Land Matters:
- National Land Code 1965
- Land Acquisition Act 1960

## Environmental Matters:
- Environmental Land Conservation Act 1960 revised in 1989
- Quality Act 1974 (Environmental Quality) (Prescribed Premises) (Crude Palm Oil) Regulation 1977
- Environmental Quality (Clean Air) Regulation 1978
- Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987

## Labour and Employee Matters:
- Labour Law
- Workers’ Minimum Standard of Housing & Amenities Act 1990
- Occupational Safety & Health Act 1977

## Pesticide Use:
- Pesticides Act 1974 (Pesticides Registration) Rules 1988
- Pesticides (Licensing for sale & storage) Rules 1988
- Pesticides (Labeling) Regulations 1984
- Factories & Machinery (Noise Exposure) Regulations 1989

## Wildlife Matters:
- Protection of Wildlife Act 1972
Good Agricultural Practices

- Optimisation of fertilizer inputs
- Accumulation of soil carbon in replanting
- Recycling of oil palm biomass
- Implementing zero-burning
- Planting of leguminous cover crops
- Integrated Pest Management
Zero burning technique
- recycling of biomass in plantation

Total biomass available 100 t/ha
- contains significant pool of nutrients
  642kg N, 58kg P, 1384kg K and 156kg Mg

Use of natural predators and beneficial plants
Life Cycle Assessment (LCA)

National LCA Project of Malaysia (2006-2010)

**Goal:**
To develop capacity and to conduct LCA leading to eco-design and improved environmental performance of products and services for the local and export market

**MPOB LCA Projects**
LCA for oil palm production: nursery to seedling, CPO, PKP/PKC, RPO, RPOs and RPOo, palm biodiesel, cooking oil, margarine, shortening, palm based soap, handling and transportation of palm products, \( \alpha \)-methyl suphonates
Life Cycle Assessment (LCA)

- LCA from nursery to the production of palm biodiesel (mineral soils) was completed
- Reviewed by independent international review panel and published in Journal of Oil Palm Research (JOPR) and International Journal of LCA
- MPOB offers LCA consultancy to the industry
- Data submitted to Joint Research Centre, European Commission and to Environmental Protection Agency, United States
# GHG Emissions of Major Vegetable Oils

<table>
<thead>
<tr>
<th>GHG emission</th>
<th>Refined Palm Oil (MPOB study)</th>
<th>Refined Rapeseed Oil*</th>
<th>Refined Soybean Oil*</th>
</tr>
</thead>
<tbody>
<tr>
<td>tonne CO$_2$eq/tonne oil</td>
<td>1.11</td>
<td>1.35</td>
<td>1.70</td>
</tr>
<tr>
<td></td>
<td>0.63 (Biogas capture)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Mortimer et al. (2010)*
# EU Renewable Energy Directive

<table>
<thead>
<tr>
<th>Biofuel Feedstock</th>
<th>GHG emission savings (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Typical</td>
</tr>
<tr>
<td>Palm oil biodiesel (process not specified)</td>
<td>36</td>
</tr>
<tr>
<td>Palm oil biodiesel (process with methane capture at oil mill)</td>
<td>62</td>
</tr>
<tr>
<td>Soybean oil biodiesel</td>
<td>40</td>
</tr>
<tr>
<td>Rapeseed oil biodiesel</td>
<td>45</td>
</tr>
<tr>
<td>Sunflower seed oil biodiesel</td>
<td>58</td>
</tr>
</tbody>
</table>
## GHG Emissions Savings (MPOB Data*)

<table>
<thead>
<tr>
<th>Palm biodiesel pathway</th>
<th>GHG emission savings (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palm oil biodiesel (Without biogas capture)</td>
<td>50</td>
</tr>
<tr>
<td>Palm oil biodiesel (With biogas capture)</td>
<td>71</td>
</tr>
</tbody>
</table>

* Based on methodology as stipulated under EU Directive on the Promotion of the Use of Energy from Renewable Sources (2009/28/EC)
MPOB Codes of Practice (CoP)

• Launched in August 2007 by Minister of Plantation Industries and Commodities

• Seven Codes of Practice (CoP):
  – Good Practice for Nursery
  – Good Agricultural Practice for Oil Palm Estates & Smallholdings
  – Good Milling Practice for Palm Oil Mills
  – Good Crushing Practice for Palm Kernel Crushers
  – Good Refining Practice for Palm Oil Refineries
  – Good Practice for the Handling, Transport and Storage of Products from the Oil Palm
  – Good Practice for Bulking Installations
PROFITS
Profitability - Public Listed Malaysian Oil Palm Companies

- 43 on the Main Board
- Total Market capitalisation RM 138 Billion (or Euros 35.1 billion)
RESEARCH AND DEVELOPMENT
Some Key Attributes of Palm Oil
Some Strengths of Palm Oil

- Highly productive oil crop (~ 4 t/ha/yr)
- Perennial crop (up to 20-25 years of economic productivity)
- Versatile – food and non-food applications
- Balanced fatty acid composition
- Stable, not readily oxidized
- Naturally semi-solid – 20% SFC at 20 °C desirable plasticity needing no hydrogenation
- Healthy oil that improves well-being
## Fatty acid composition of palm and palm kernel oils

<table>
<thead>
<tr>
<th>Fatty acid</th>
<th>Palm oil</th>
<th>Palm kernel oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>C6:0</td>
<td>ND</td>
<td>ND – 0.8</td>
</tr>
<tr>
<td>C8:0</td>
<td>ND</td>
<td>2.4 – 6.2</td>
</tr>
<tr>
<td>C10:0</td>
<td>ND</td>
<td>2.6 – 5.0</td>
</tr>
<tr>
<td>C12:0 (lauric)</td>
<td>ND – 0.5</td>
<td>45.0 – 55.0</td>
</tr>
<tr>
<td>C14:0 (myristic)</td>
<td>1.0 – 1.4</td>
<td>14.0 – 18.0</td>
</tr>
<tr>
<td>C16:0 (palmitic)</td>
<td>39.3 – 47.5</td>
<td>6.5 – 10.0</td>
</tr>
<tr>
<td>C16:1</td>
<td>ND – 0.6</td>
<td>ND – 0.2</td>
</tr>
<tr>
<td>C18:0</td>
<td>3.5 – 6.0</td>
<td>1.0 – 3.0</td>
</tr>
<tr>
<td>C18:1 (oleic)</td>
<td>36.0 – 44.0</td>
<td>12.0 – 19.0</td>
</tr>
<tr>
<td>C18:2</td>
<td>9.0 – 12.0</td>
<td>1.0 – 3.5</td>
</tr>
<tr>
<td>C18:3</td>
<td>ND – 0.5</td>
<td>ND – 0.6</td>
</tr>
</tbody>
</table>
Palm Olein and Olive Oil Have Similar Effects on Blood Lipids

Numerous human studies including one conducted at the University of Sydney, comparing the health effects of palm olein and olive oil (both high in oleic acid) have shown that palm oil (olein) and olive oil have similar beneficial effects on blood cholesterol.
FOOD APPLICATIONS OF PALM OIL

• Cooking oil
• Industrial Frying Fats
• Margarine
• Bakery fats
• Shortening
• Vegetable Ghee
• Confectionery Fats
• Ice Cream
• Dairy substitutes
• Mayonnaise
• Salad dressing
• Palm-based cheese
Palm Oil Phytonutrients

- Vitamin E (Tocotrienols, tocopherols)
- Carotene
- Squalene
- Lecithin
- Polyphenols
- Co-Q10
- Phytosterol
Non-Food Applications for Palm Oil

- Oleochemicals
- Biodiesel
Biodiesel Industry in Malaysia

- Malaysia has undertaken R&D on palm-based biofuels since 1982
- Home-grown palm biodiesel production technologies, including winter grade biodiesel have been successfully commercialised
- Palm biodiesel is used locally in Malaysia’s B5 programme and also exported
- Palm biodiesel meets the international standards (EN 14214 and ASTM D6751)
Further Applications of Oil Palm Biomass

**PROPERTIES OF OPT, OPF & EFB FIBRE BUNDLES**
- Fibre quality
- Fibre morphology
- Fibre properties
- Usable fibre fractions

**OIL PALM BIOMASS**

**BOARD OF VARIOUS KINDS**
- MDF
- Plywood
- Moulded particleboard
- Sawn lumber

**PAPER PULP & PAPER PRODUCTS**
- Chemical pulp
- Semi-mechanical pulp
- Mechanical pulp
- Moulded paper products
- Soiless planting medium

**FIBRE REINFORCING COMPOSITES**
- Agrolumber
- Plastic composite

**OTHER PRODUCT TYPES**
- Oil palm heart
- Carbon products
- Carboxymethyl cellulose
- Fine chemicals
2nd Generation Biofuels
Emerging Field from Palm Biomass

- Production of syngas (gasification)
- Production of bio-oils (pyrolysis)
- Production of Palm bioethanol
- Palm biomass synthetic diesel (CDP)
New Externalities Can Impact Competitiveness

- Externalities can disrupt competitiveness
e.g. Competitiveness of Malaysian downstream sector is affected by Indonesia’s export tax structure
- Non-tariff barriers in the form of regulations – e.g. sustainability requirements
- Need to be constantly on the lookout for externalities that could change the equilibrium
CONCLUSION

- Malaysian Oil Palm Industry is very competitive, will be here to stay – assured availability of palm oil
- Malaysian palm oil products – sustainable, green, low carbon footprint, continued improvement in line with global expectations
- Supported by extensive and intensive R&D – constant generation of new uses and improved products
Thank You for Your Kind Attention

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