

SUSTAINABLE PALM OIL FOR BIOFUEL DEVELOPMENT

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SUSTAINABLE PALM OIL FOR BIOFUEL DEVELOPMENT

OUTLINE :

- IOPRI at a Glance
- Importance of Oil Palm
- Sustainable Palm Oil Development
- Abundance of Oil Palm Biomass
- Potential of Oil Palm for Biofuel

IOPRI AT A GLANCE

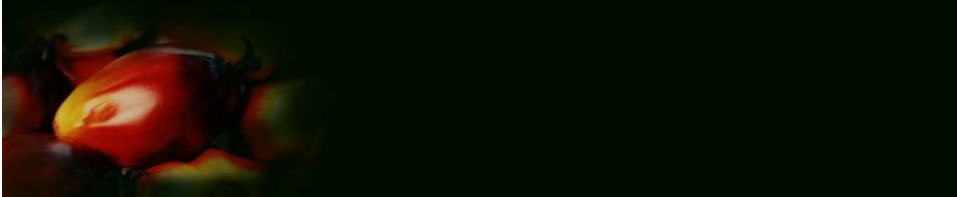
- IOPRI (PPKS) → Located in Medan, North Sumatra
- Oil palm seed producer (51.7 million seeds in 2008 → 30%)
- 6 research groups from pre- to post harvest
- Achmad Bakrie Award 2008 – Technology
- Center of excellence



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- **Importance of Oil Palm**
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IMPORTANCE OF OIL PALM

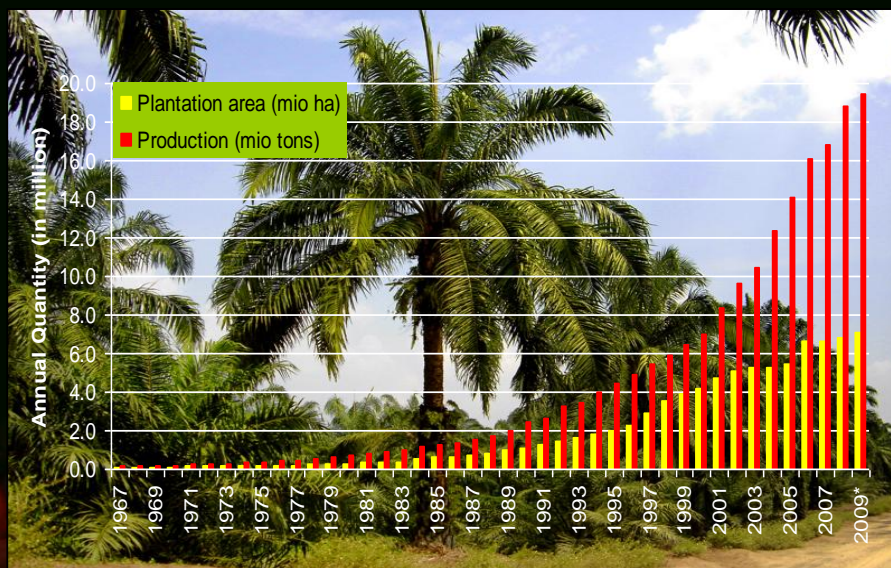
Oil palm (*Elaeis guineensis* Jacq.)

- 1848 → introduce to Indonesia
- 1911 → commercial plantation
- Main products → CPO and PKO
 - ✓ 1.5% of GDP (2004) & 60% of total estate crops' contribution
 - ✓ Provides job opportunities for 3.25 Million
 - ✓ Great multiplier effects

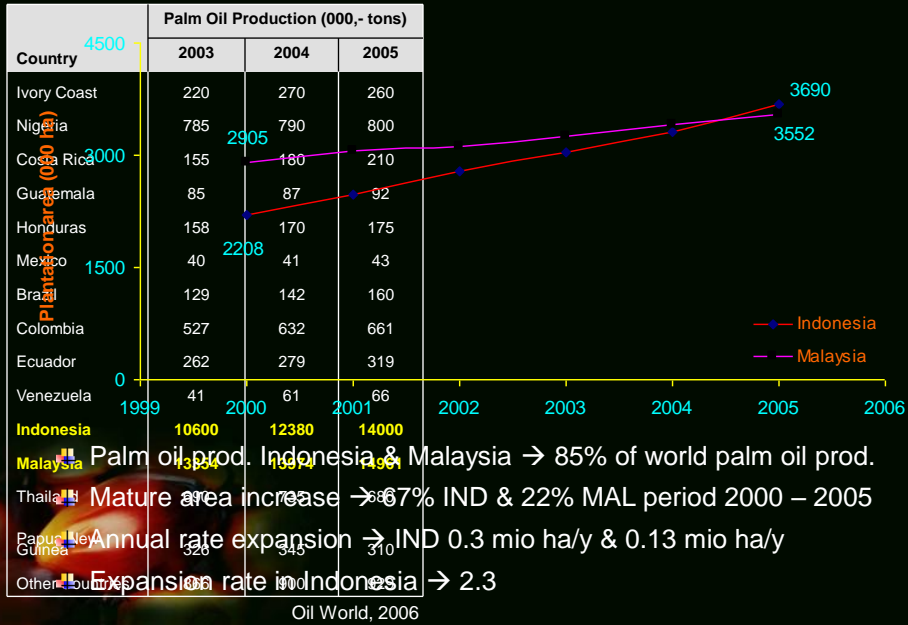
Oil palm wastes (Biomass)

- Solid → EFB, fibres, shells, fronds, trunk
- Liquid → POME

IMPORTANCE OF OIL PALM



IMPORTANCE OF OIL PALM



IMPORTANCE OF OIL PALM

- The most efficient oil crop
- Improves the environment in marginal land, degraded agricultural land

Productivity per hectare of oil crops

Oil Crops	Production (mio tons)	Percent of total production	Oil yield (t/ha/yr)	Total area (mio ha)	% Area
Oil Palm	36.90	36.30	3.73	9.86	6.50
Rapeseed	18.34	18.10	0.67	27.29	17.90
Sunflower	11.09	10.90	0.48	22.95	15.00
Soybean	35.19	34.70	0.38	92.63	60.60

Oil world, 2007



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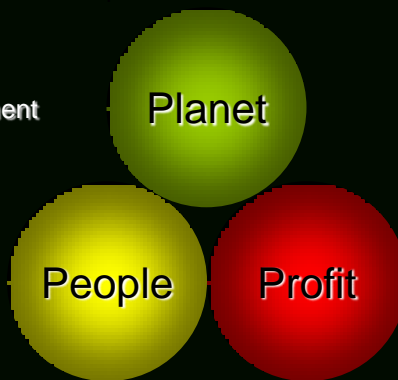
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SUSTAINABLE PALM OIL DEVELOPMENT

3Ps

Principle of Sustainable Development



PEOPLE	: Socially acceptable
PLANET	: Environmentally friendly
PROFIT	: Economically viable



SUSTAINABLE PALM OIL DEVELOPMENT

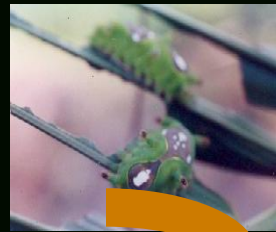
Environmentally Sustainable Development of Oil Palm Industry

- Zero burning for land clearing
- Soil amelioration and soil and water conservation through legume cover crops
- Enhancing the ecological value by planting oil palm on degraded agricultural land such as cleared land and 'grassland' that able avoid erosion and better water catchments
- Research on breeding program which is resulted in high productivity planting materials



SUSTAINABLE PALM OIL DEVELOPMENT

- Integrated pest management through biological control
- Application of the control techniques decrease the use of pesticides which save biodiversity of insects



SUSTAINABLE PALM OIL DEVELOPMENT

ZERO WASTE PRODUCTION SYSTEM

- EFB Compost production at commercial scale
- Improvement in POME processing: application of rock filter & RANUT
- Land application of POME
- Improving the efficiency of energy in palm oil mills
- Improving the quality of oil palm wood: applying bio-resin



SUSTAINABLE PALM OIL DEVELOPMENT

Bio-energy

Technology to produce renewable energy from palm oil and oil palm biomass

Road tests has been undertaken to study the effects of palm biodiesel on the diesel engine performance



SUSTAINABLE PALM OIL DEVELOPMENT



Higher Community Impacts

Socio-economic improvement

Identification of social conflicts associated with oil palm industry

Community Development project has been proven to be the most effective method in preventing social conflict

SUSTAINABLE PALM OIL DEVELOPMENT

Oil Palm Estate Development and Environmental Conservation

- Intensify dialogues with representatives of NGOs and other key stakeholders to find for solutions that answer economic, social and environmental challenges of the industry
→ RSPO
- NI-RSPO National Interpretation of RSPO
→ To implement sustainability principles on oil palm plantation (industry) in Indonesia



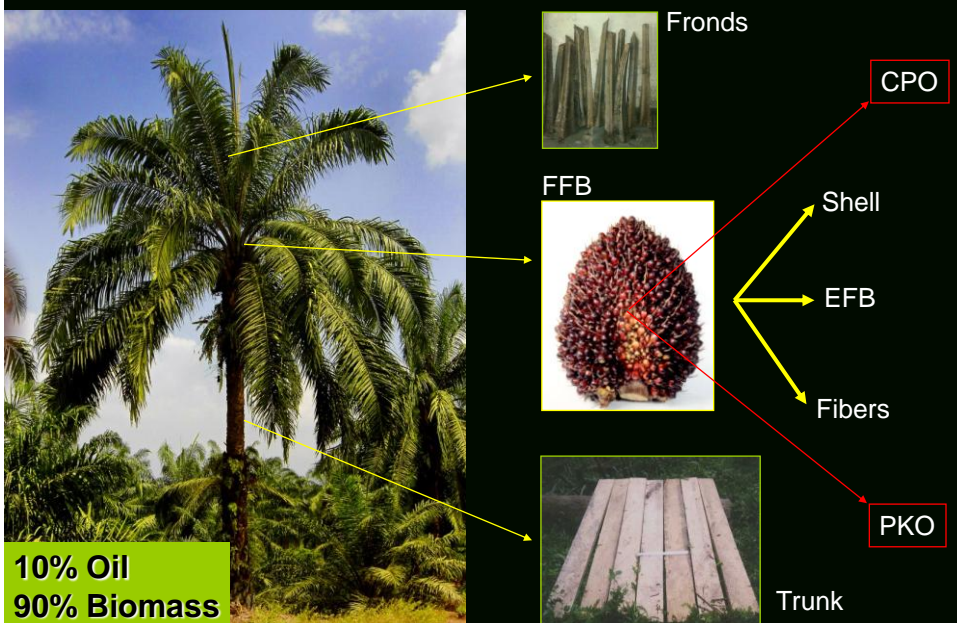
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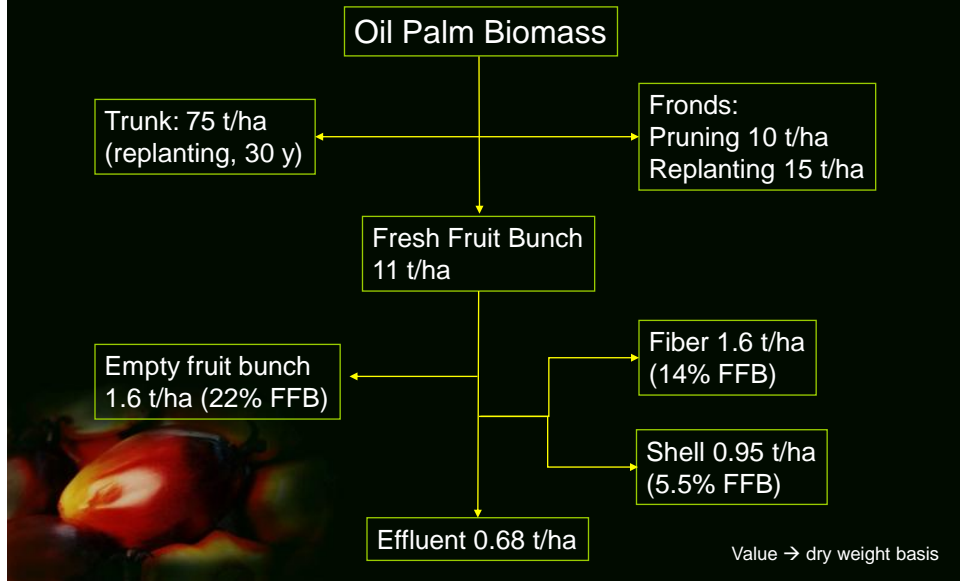


ABUNDANCE OF OIL PALM BIOMASS



ABUNDANCE OF OIL PALM BIOMASS

Distribution of oil palm biomass



ABUNDANCE OF OIL PALM BIOMASS

Palm Oil Mill Effluent as a renewable energy source → Biogas

- ✦ Potential yield: 1 m³ of completely digested POME → 28 m³ biogas
- ✦ Biogas → 60-70% CH₄; 30-40% CO₂; trace H₂S
- ✦ Recovery energy → 539 millions Nm³ CH₄

Kheang *et al*, 2008



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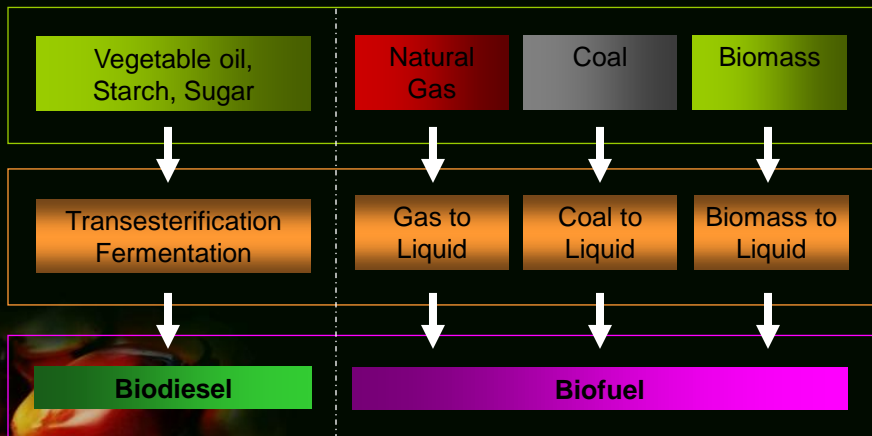


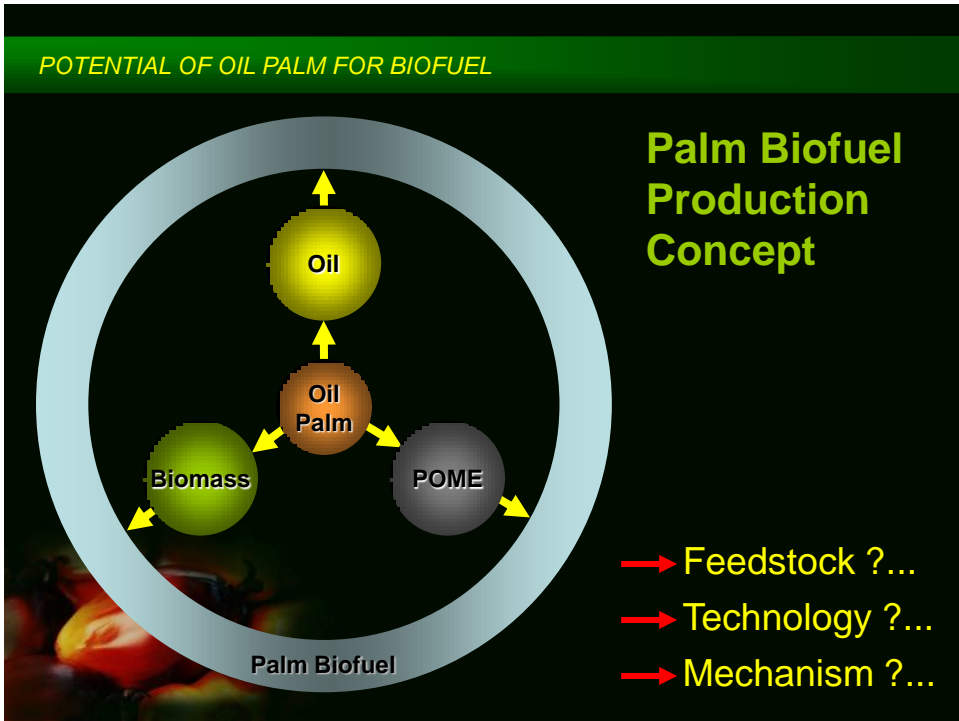
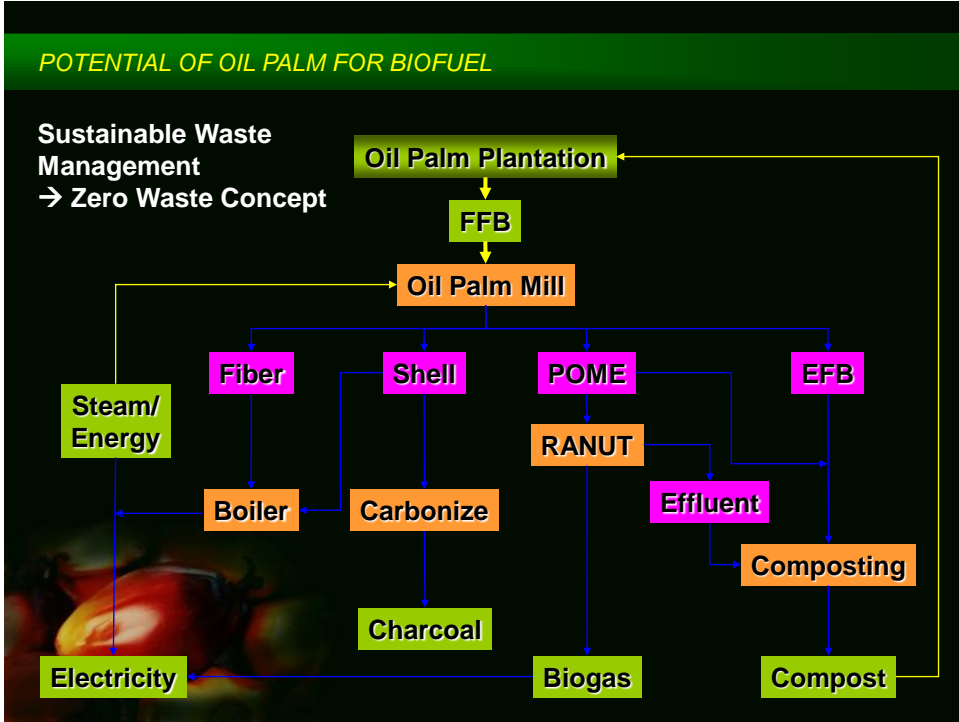
POTENTIAL OF OIL PALM FOR BIOFUEL

Generation of Biofuel

1st Generation Biofuel

2nd Generation Biofuel





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