

SUSTAINABILITY CHALLENGES OF THE PALM OIL INDUSTRY: WHERE NEXT?



M P O C

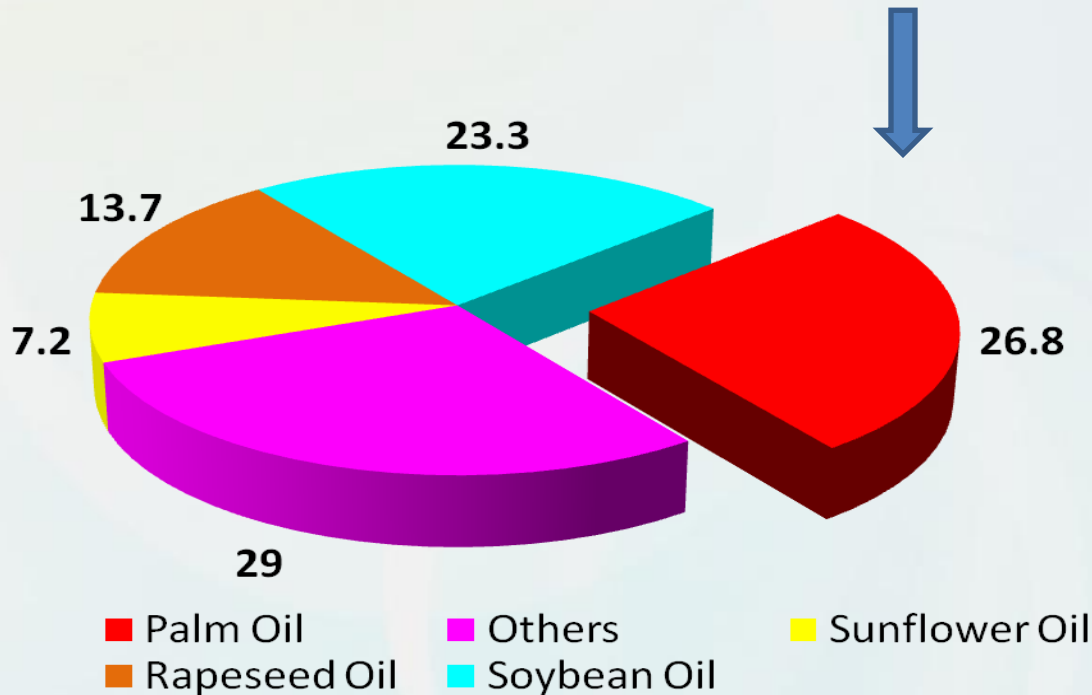
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MALAYSIAN PALM OIL COUNCIL (MPOC)



IMPORTANCE OF PALM OIL & ITS DERIVATIVES PRIMARILY AS A FOOD SOURCE

1. **Source of food (global food security):** 80%
2. **Oleochemicals:** 15%
3. **Biofuel :** 2%
4. **Renewable energy source:** Potential Remains Largely Untapped through Biomass

Palm Oil Currently Accounts for 27% of Global Oils & Fats Supply



The Challenge: Sustainability Concerns from the West

1980s

Palm oil harms human health
• Potential cause of heart disease



- Numerous palm oil researches and studies conducted proves that it is the best alternative to transfat and is equally as good as olive oil
- “Based on authoritative documentations, palm oil is indeed a versatile, nutritious ingredient and can be used for numerous industrial uses”
- Tan Sri Augustine S.H. Ong, Palm Oil Research Institute

2000s

Oil Palm Cultivation Erodes Environment

- Deforestation to make way for oil palm plantations
- Biodiversity loss destroys habitat of Orang Utan
- Deforestation > Greenhouse gas emissions > Climate Change

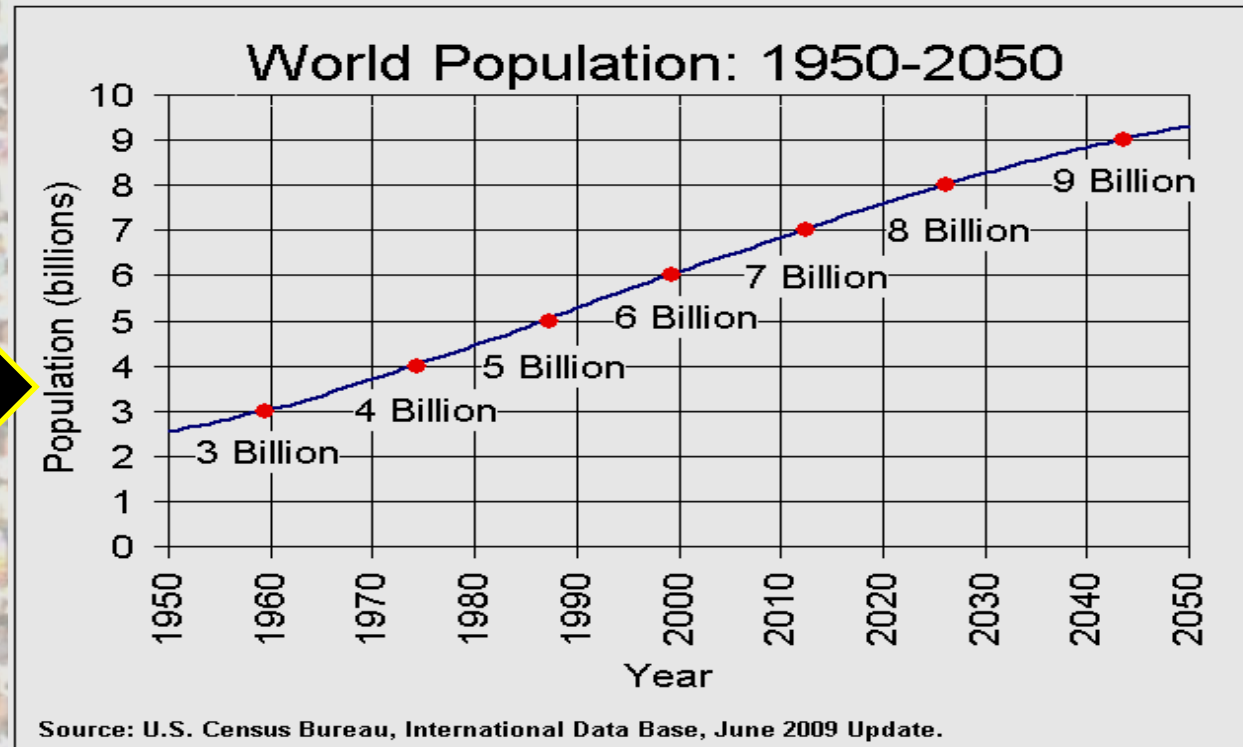


Industry Seeks sustainable solutions through Good Agricultural Practices and Certification including RSPO, ISCC etc.

Ever Growing World Population Results in More Mouths to Feed

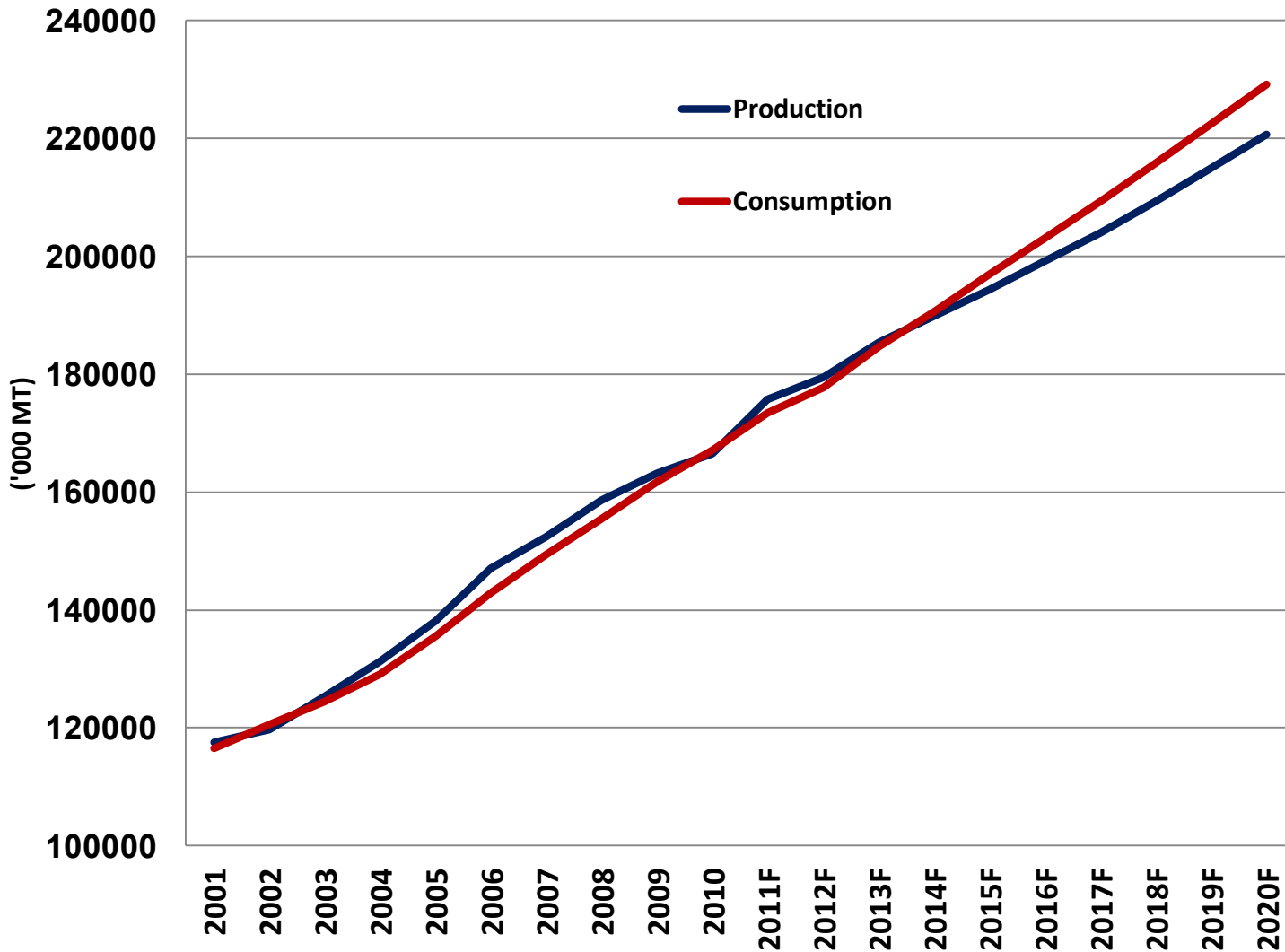
Future of palm oil is driven by growth in demand for food, oleochemicals and bio fuel due to population and economic growth

World Population: 1950-2050

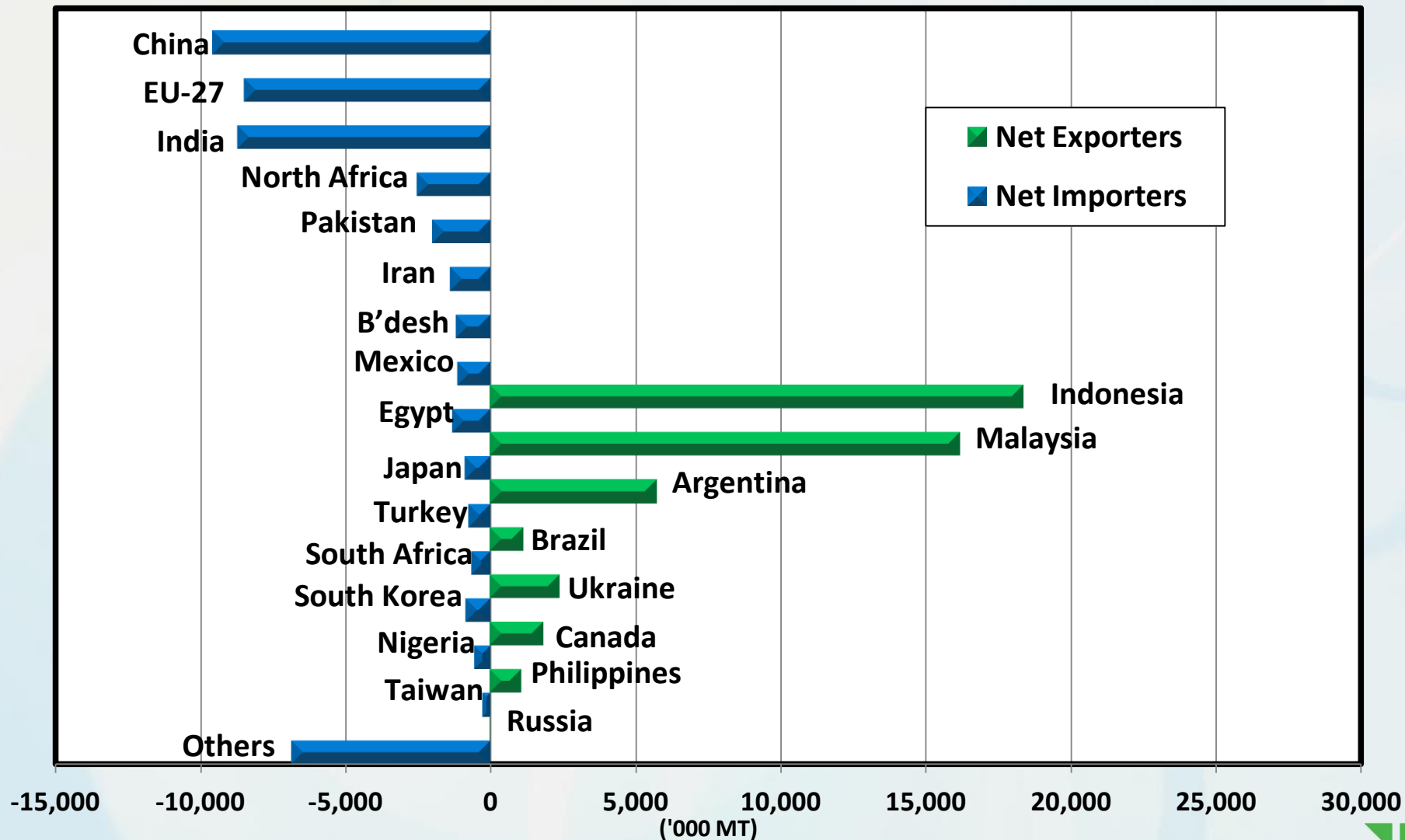


The world population is projected to grow from 7 billion in 2011 to 9 billion by 2043, an increase of 29 percent. Food production must meet this rate of increase.

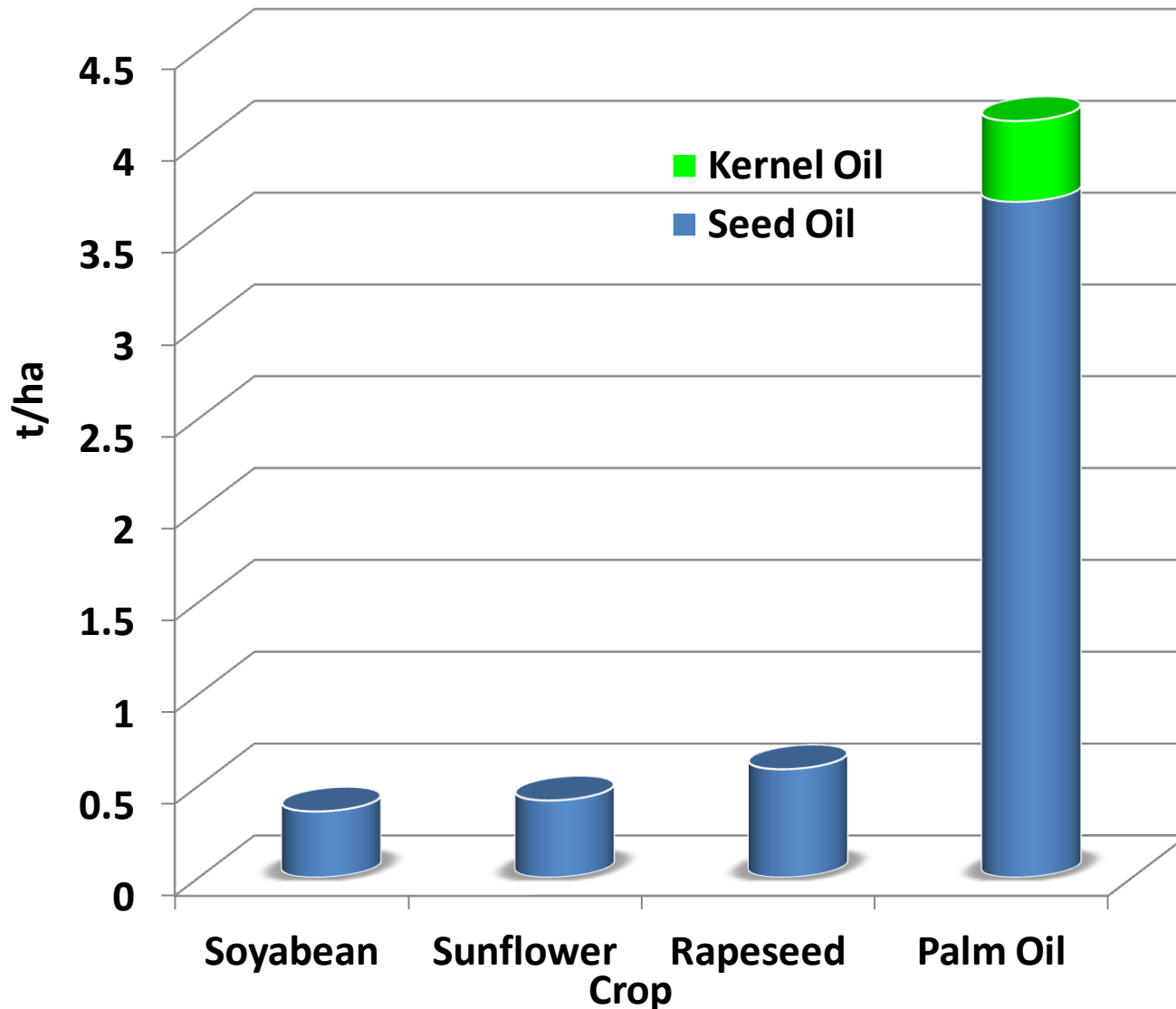
Global Supply and Demand of Oils and Fats – A 20 year Outlook



Net Importing & Exporting Countries for Oils and Fats (2011)



High oil palm land productivity



Oil Palm produces 11 x more than Soyabean, 10x Sunflower & 7x Rapeseed

**Population Growth Reduces Arable Land Availability.
Need to choose the most efficient oil bearing crop
which happens to be oil palm!**

Year	World's population (bil)	Arable land per capita (ha)
1922	2.0	0.75
1975	4.0	0.38
2005	6.6	0.23
2030	8.0	0.19
2042	9.0	0.17

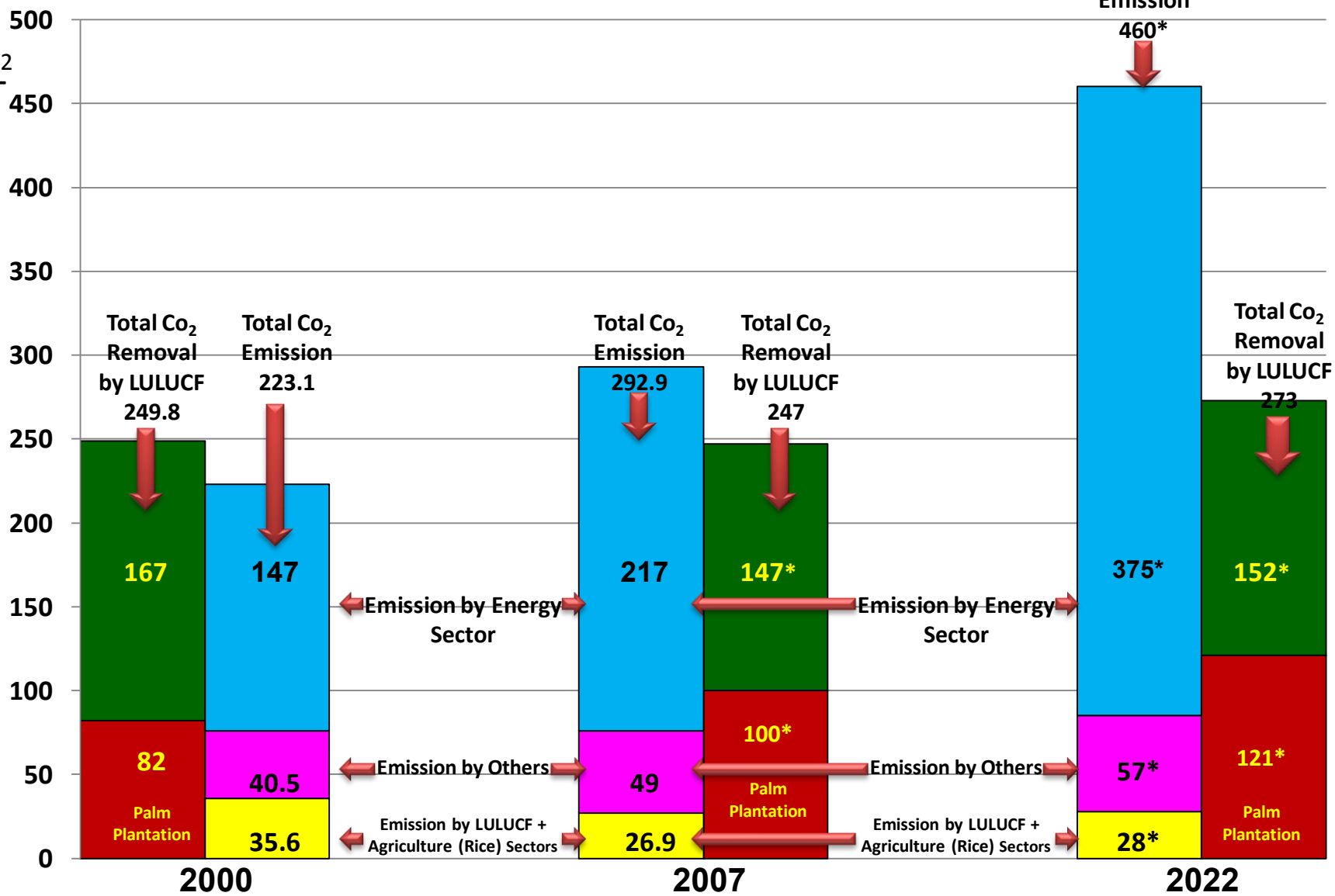
Source: Freeworld Academy & University of Michigan

- ❖ **World's population increasing**
- ❖ **Arable land resource decreasing**

MALAYSIAN GREENHOUSE GAS EMISSION AND REMOVAL



CO₂
MT

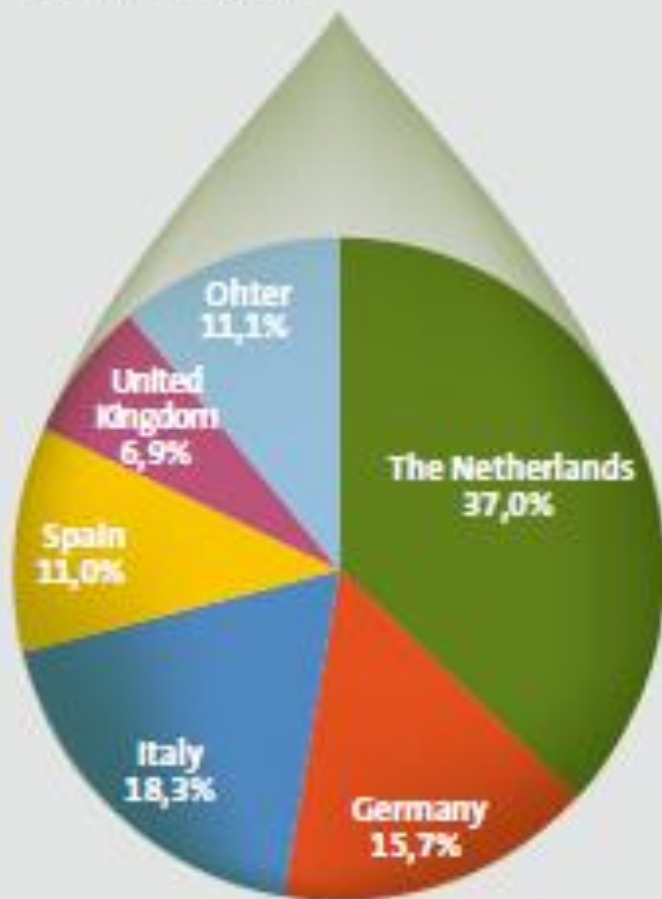


Land Use, Land Use Change and Forestry (LULUCF) is made up of Forestry and (Oil Palm) Plantation Sector

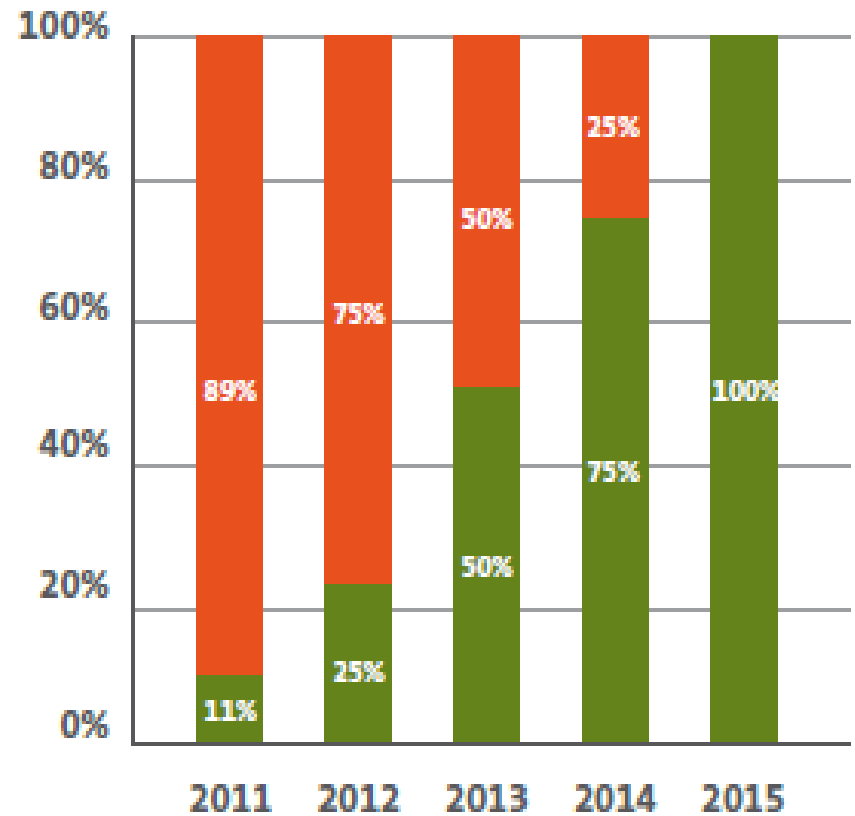
* Trend Estimate

Main EU Importers of palm oil in 2011*

5.4 million tonnes



Share of sustainable palm oil



CSPO Palm Fat: Possibly The only Certified SUSTAINABLE INGREDIENT IN A CHOCOLATE Bar

Cocoa Powder

Palm Fat (CSPO)

Sugar



Milk Solids

Permitted Food Additives and Colorants

FRITO-LAY/PEPSICO GROUP: CHIPS



THE LAYS' COMMITMENT

PALM-OIL FREE:
 Since 2007 Lay's produce chips with 100% sunflower oil. It's less saturated fats which improves the nutritional facts.
 In addition, the sunflower oil has a better impact on the environment because it doesn't contribute to the deforestation.

PALM-OIL FREE

PROJECTED WORLD REQUIREMENTS FOR EDIBLE OILS & BIOFUELS (M tonnes)

Source	2015	2030
Food	147.2	160.7
Biofuels	57	102
TOTAL	204.2	262.7

Source: Legge (2008)

Malaysian oil palm industry is land conservation friendly

Parameter	Area or %
Malaysian palm oil area	4.98 million ha
Malaysian agricultural land area	6.89 million ha
Total world land area for vegetable oils	244 million ha
Total world agricultural land area	5,660 million ha
Malaysian palm oil as % of total Malaysian agricultural land area	70%
Malaysian palm oil as % of total world land area for oil bearing crops	2.0 %
Malaysian palm oil as % of total world agricultural land area	0.09% (of 5,660 million ha)
Malaysian palm oil's contribution to global oils & fats supply	11.4%

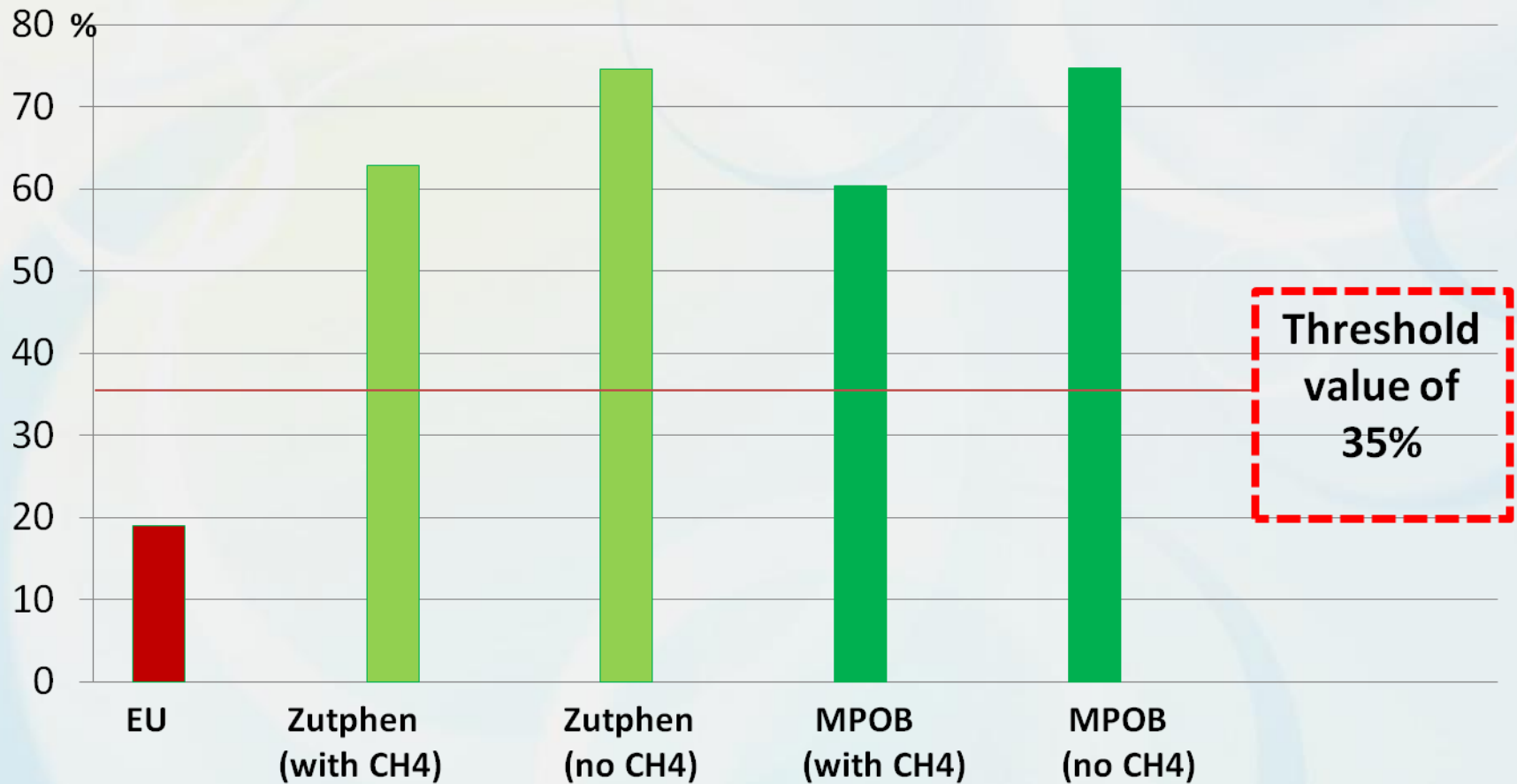
LCA GHG emissions of palm biodiesel

Emission sources	Amount (kg CO ₂ /tonne biodiesel)	
1. Production of fertilizers used	185	(11.5%)
2. Nitrous oxide emitted	130	(8.1%)
3. Use of pesticides	34	(2.1%)
4. Transportation & machinery use	89	(5.6%)
5. Milling & refining of palm oil	19	(1.2%)
6. EFB	87	(5.4%)
7. Effluent ponds	824	(51.5%)
8. Transportation to mills, refineries	36	(2.3%)
9. Biodiesel refining	197	(12.3%)
Total	1,601	(100%)
10. Production & use of fossil fuel	4,228	
11. Palm biodiesel savings	2,627	
12. GHG emission savings relative to fossil diesel	62%	

Source: van Zutphen (2007)

GHG emission savings exceed 35% threshold value of EU Directive

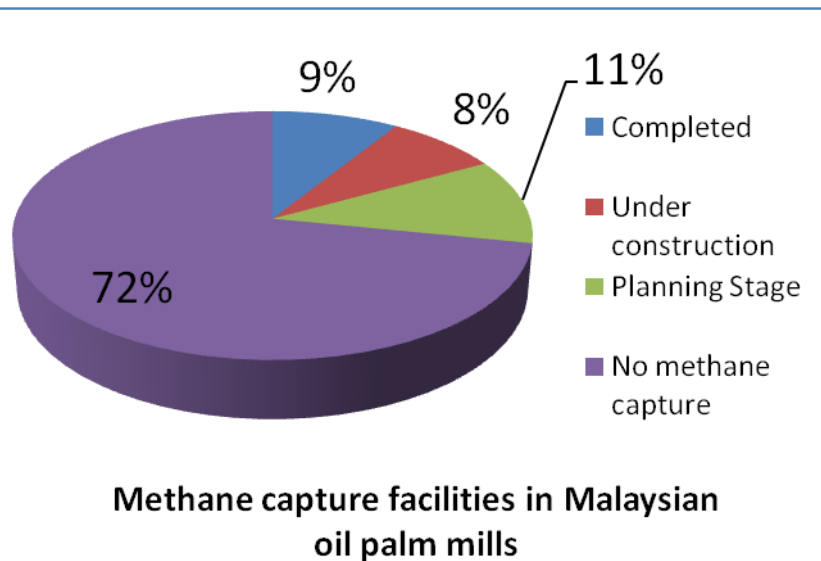
GHG emission savings for palm oil biodiesel compared to fossil diesel



Renewable Energy Potential – POME



- Currently nearly 80% of Clean Development Mechanism (CDM) projects in Malaysia are from the palm oil industry,
- There are now 423 palm oil mills in the country as of May 2011.
- Out of this figure 38 mills (9%) have completed their biogas facility
- A further 34 are under construction while another 47 more facilities are planned
- By 2012, 28% of the mills will be equipped with methane capture facilities.
- Therefore, the Malaysian palm oil industry has a tremendous opportunity to improve its environmental performances for better market acceptance.



Constraints and Challenges



No	Study / report	GHG emission savings
1	Renewable Energy Directive - Default, process not specified	19%
2	Renewable Energy Directive - Default, process with methane capture at oil mill	56%
3	MPOB (with mill waste)	60%
4	MPOB (without mill waste)	75%
5	Carboncapital Solution (with mill waste)	60%
6	Carboncapital Solutions (without mill waste)	80%
7	ISCC	± 55%
8	CSIRO's study	80%
9	The Gallagher Review (RTFO UK)	± 25 to 70%
	Palm oil NODA study from EPA	17

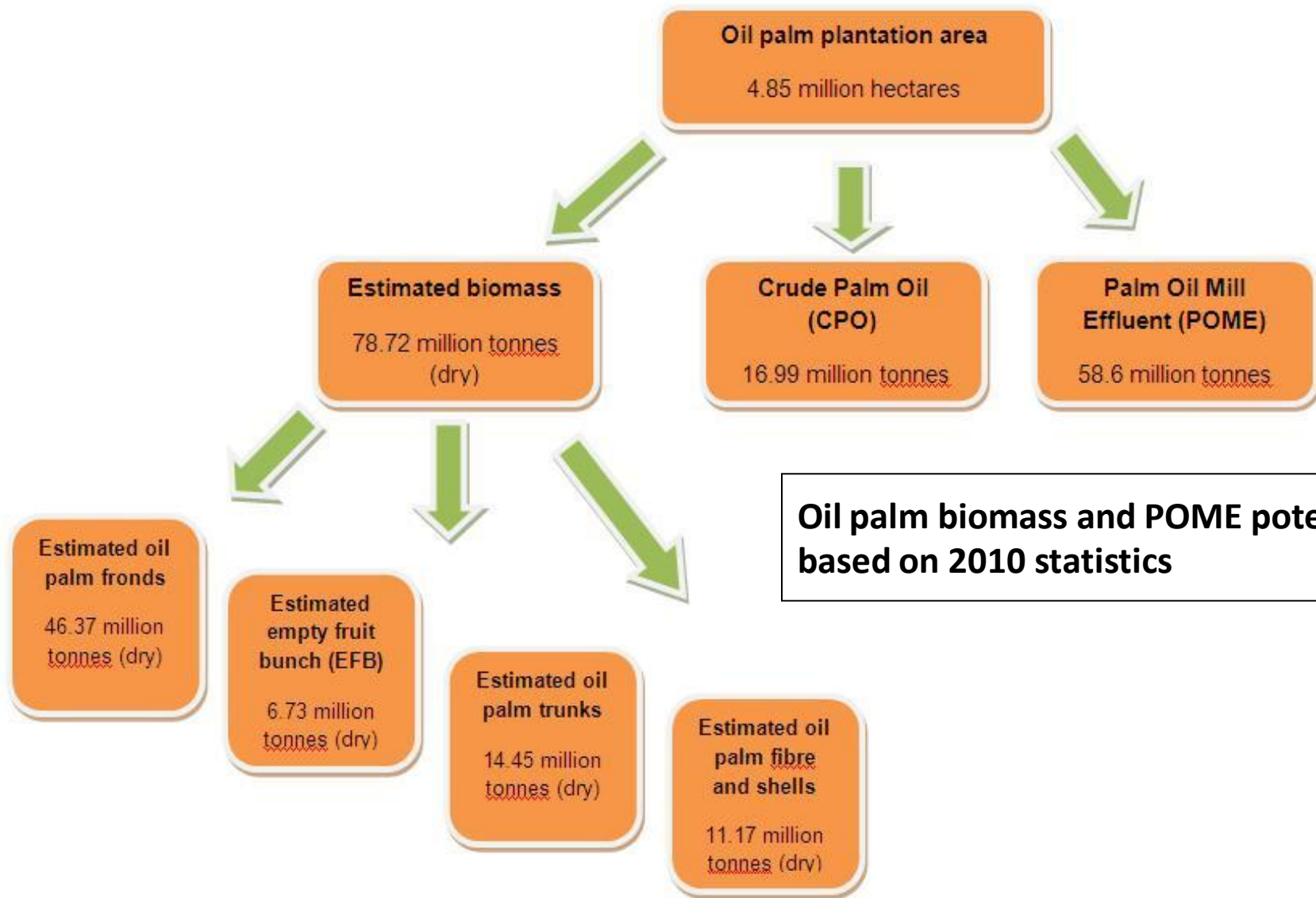
Variances in palm oil's GHG emission savings

Mileage per hectare per year - based on a VW Polo -



Source: "Biofuels", Fachagentur Nachwachsende Rohstoffe e.V. (FNR), 2006 ;
Preusser (2008) and own data

3. Malaysian Oil Palm Biomass



Potential Biofuel /Renewable Energy Feedstocks from the Palm Oil Industry



10% Oil
90% Biomass



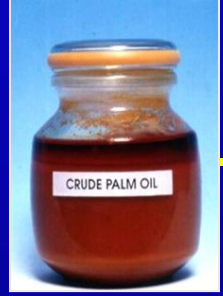
OIL PALM FRONDS



FRESH FRUIT BUNCH



OIL PALM TRUNK



Crude Palm Oil



Biofuel / Biodiesel



Palm Biomass



Fuel for CHP



POME



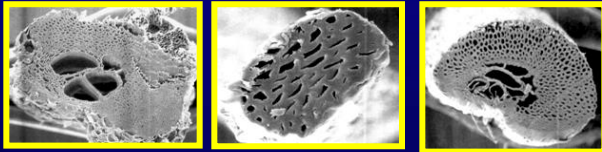
Biogas



APPLICATIONS OF OIL PALM BIOMASS

PROPERTIES OF OPT, OPF & EFB FIBRE BUNDLES

- Fibre quality
- Fibre morphology
- Fibre properties
- Usable fibre fractions



BOARD OF VARIOUS KINDS

- MDF
- Plywood
- Moulded particleboard
- Sawn lumber



OIL PALM BIOMASS

PAPER PULP & PAPER PRODUCTS

- Chemical pulp
- Semi-mechanical pulp
- Mechanical pulp
- Moulded paper products
- Soilless planting medium



OTHER PRODUCT TYPES

- Oil palm heart
- Carbon products
- Carboxymethyl cellulose
- Fine chemicals

FIBRE REINFORCING COMPOSITES

- Agrolumber
- Plastic composite



Palm Biomass Briquettes

- Treated EFB can be used as a raw material for the production of palm based biomass briquettes



100% Pulverized EFB
(PEFB)

Pulverized EFB + sawdust
(PEFB+SD) (50:50)

EFB Fibre + sawdust
(FEFB+SD) (50:50)

- As a substitute raw material for commercial sawdust briquette industry
- Made either from 100% palm biomass or mixed with sawdust



Conservation of the Environment and Protection of Ecosystems

- Deeply concerned over the rapid erosion of the environment, SDF dedicates itself to the protection and preservation of the environment and the conservation of animals in their natural habitat.
- This includes support for, and the promotion of, initiatives to protect and restore waterways to their natural states; conserve forest; animals and their biodiversity; and ensure that ecosystems are protected.



YSD's Big 9 Animals and Tabin Wildlife Sanctuary Project

YSD commitment: RM 2.3 million for 3 years (2008-2011)



- SDF's effort to **conserve nine animal species** that are **classified as endangered or vulnerable**.
- Indigenous to Malaysia and on the brink of extinction.
- **Significant impact on the stability of biodiversity and balance of ecosystem** on which we rely so heavily for our natural resources.

- YSD previously supported Big 9 through **Tabin Wildlife Sanctuary** where **8 of these animals (except Malayan Tiger)** can be found in Tabin. Support includes a variety of initiatives to ensure the protection and preservation of wildlife in Tabin.
- Today, YSD focuses on **specific projects for each of the Big 9 species**.



FOUNDATION

Concluding remarks

- Palm oil will continue to be a major source of oils and fats (food security)
- As food source it can be sustainable and can comply with certification requirements
- Potential of palm oil for use as a biofuel source
- Stumbling block from unfair conclusions stating that palm oil biodiesel cannot meet threshold values for sustainability in EU and US
- New wave is to utilize biomass as RE
- Research to utilize palm biomass to make high value products
- Management of biodiversity and meeting conservation challenges could do with sustained expertise
- We are fortunate for the commitment of Malaysian Government to of these challenges and will continue to move forward

MPOC/SABAH WILDLIFE DEPT. COLLABORATION
Instrumental in setting up the region's first WILDLIFE RESCUE Unit (WRU)



27 6 2007

Solutions

- **Government policy: State Action Plans, Management plans, cabinet papers, new laws...**



Rhinoceros Action Plan



2011 - 2015



Sabah Wildlife Department
Ministry of Tourism, Culture and Environment



Orang-utan Action Plan



2011 - 2015



Sabah Wildlife Department
Ministry of Tourism, Culture and Environment



Elephant Action Plan



2011 - 2015



Sabah Wildlife Department
Ministry of Tourism, Culture and Environment

Elephant Rescues and Translocations





BORNEO ELEPHANT SANCTUARY



THANK YOU

