Biofuel Experience in Malaysia: Oil Palm

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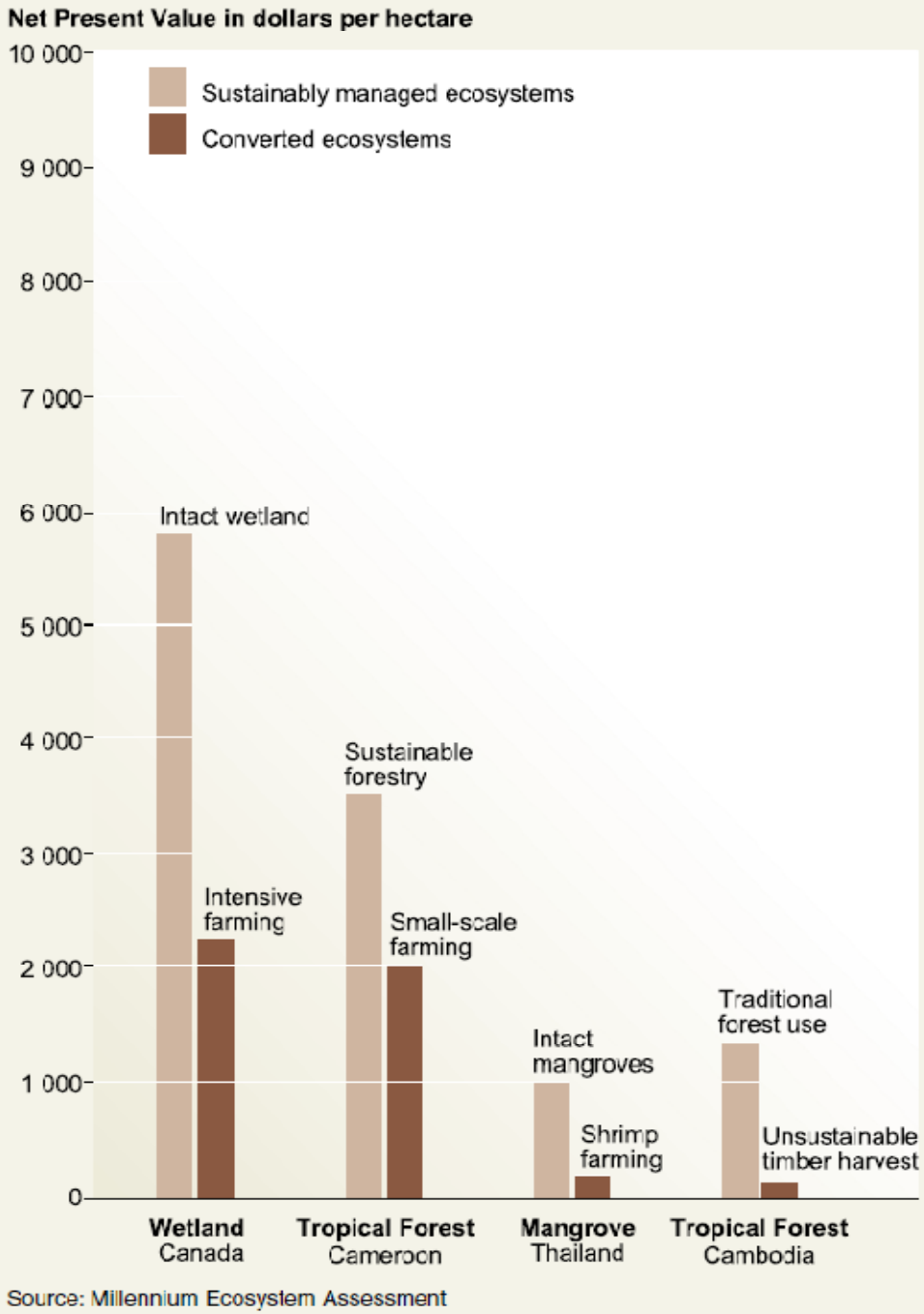
Outline

- Introduction
  - General about Peatlands
- Malaysia biofuel experience
- Challenges



Peatlands provide a range of crucial ecological services:

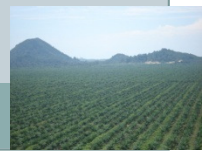
- Hydrological balance (groundwater recharge, water storage, flood regulation)
- Prevents fires (reduces haze)
- Habitats for diverse flora and fauna
- Very large and important carbon store (and sink)

- TEEB and Millenium Ecosystem Assessment show that nature conservation provides higher returns/benefits

… General about Peatlands

- The biodiversity aspects include having endemics and globally threatened species e.g.
  - Orang utans, proboscis monkeys, Sumatran rhinos
  - Ramin, *Shorea* spp., orchids, etc

- The climate change aspect includes it being a carbon store
  - In its natural stage, C is accumulated as organic carbon in dead organic matter in the peat
  - When disturbed by drainage or burning, clearing etc, C is released into the atmosphere
  - Production of 1 tonne of palm oil on a fully drained (hence oxidised) eat can result in CO2 emissions of 10-30 tonnes (Hooijer et al, 2006)



… General on Peatlands

- Drainage of peatlands makes the forest highly susceptible to fire and haze
- The ASEAN Peatland Management Initiative (APMI) was adopted by ASEAN Sr. Tech. Officials on Environment-Haze in 2003 to reduce transboundary haze problem
- In Malaysia, the draft National ActionPlan for Peatlands is being coordinated by the Ministry of NRE

…. Peatlands

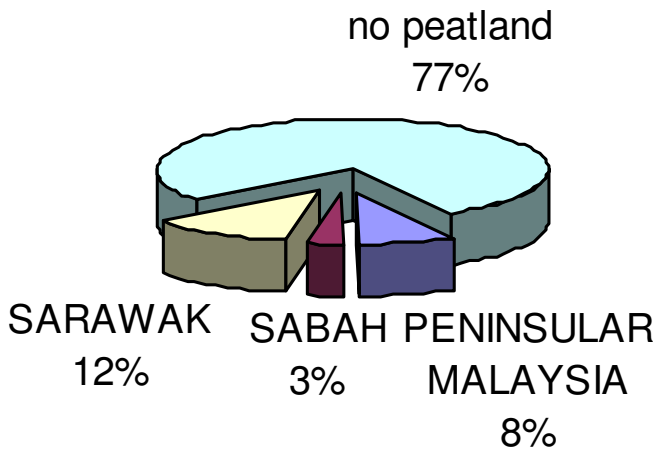
- In the early 1990s, SE Asia peatlands cover ca. 35-40 million ha (APMI, 2003)
- In the 2000s, only ca. 25 million ha is left
- Of these ca. 25 million ha, most peatlands occurs in Indonesia (70%), Malaysia, Thailand, Vietnam, Brunei, Philippines (APMI, 2008)

Malaysia palm oil/biofuel experience

- In Malaysia, estimated peat soil areas cover ca. 2 million ha of its total land cover, of which 23% is under agriculture
- In Sarawak (on Borneo) alone, the TPRI predicted that by 2010, there will be 1 million ha of palm oil plantation (from year 2000 value of ca. 330,000 ha)
- There is a rapid expansion of oil palm plantations, including in sensitive and HCVAs such as peatlands
- Increasing demand of palm oil as a component of biofuel will enforce drainage and degradation of intact peatland areas.

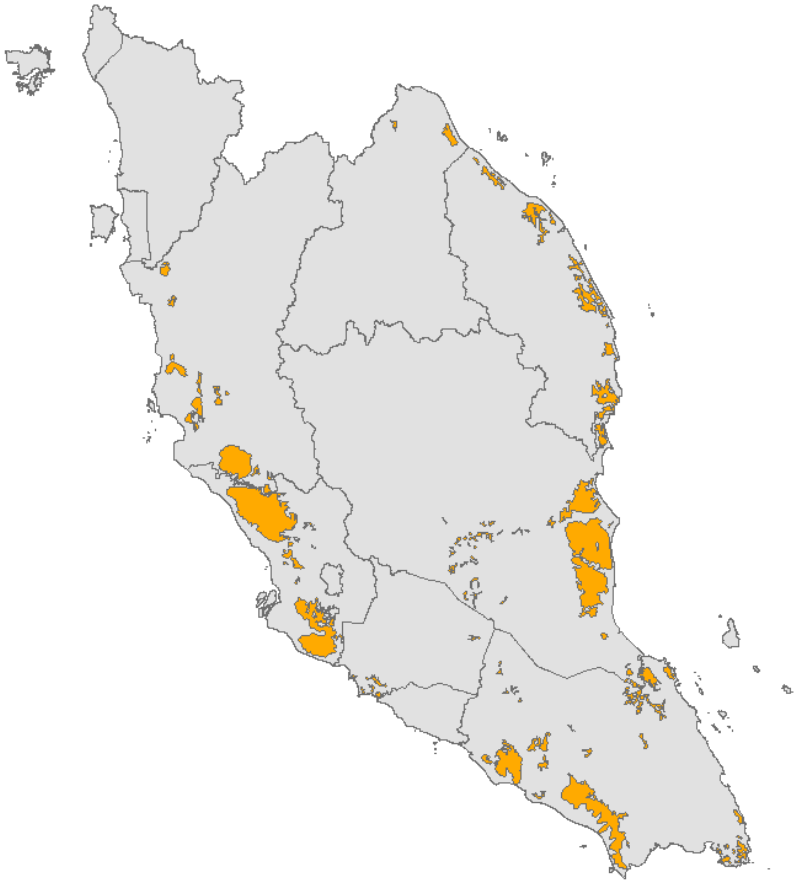
.... Peatlands (Malaysia)

Fig. 2 : Percentage of Peat Soil Areas in Malaysia

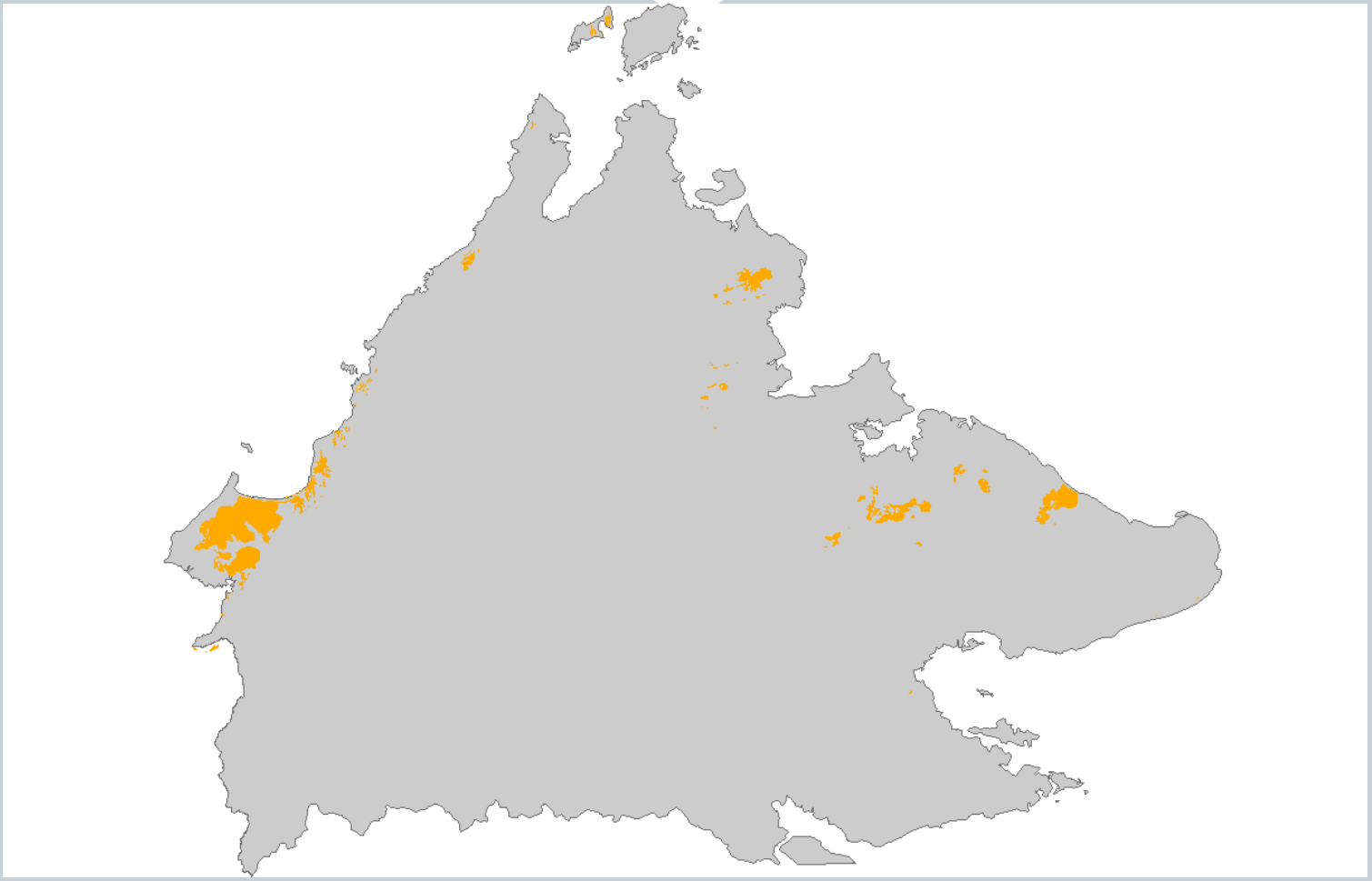


In Malaysia, estimated peat soil areas cover ca. 2 million ha of its total land cover

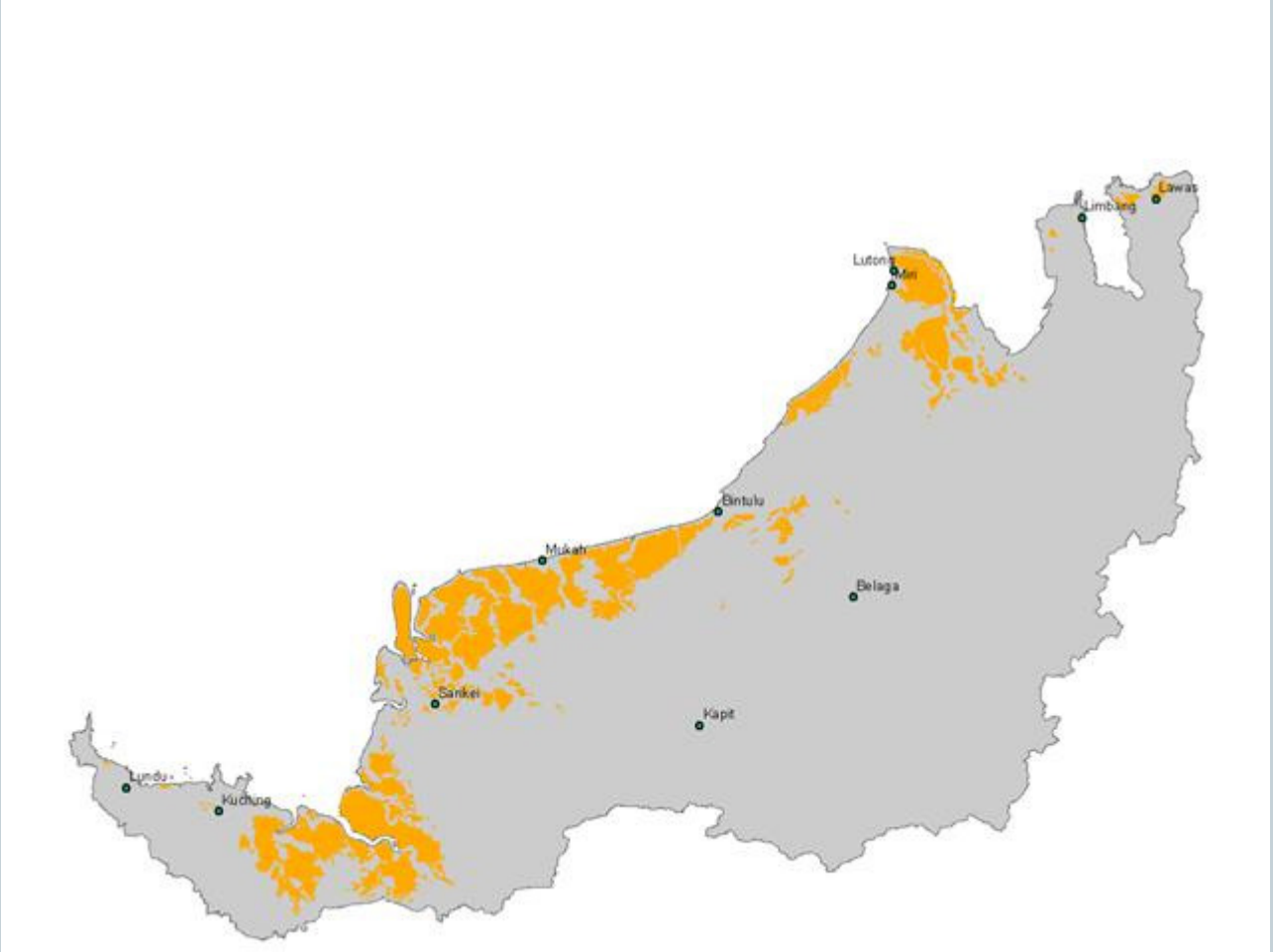
Peatlands in Peninsular Malaysia



Peatlands in Sabah

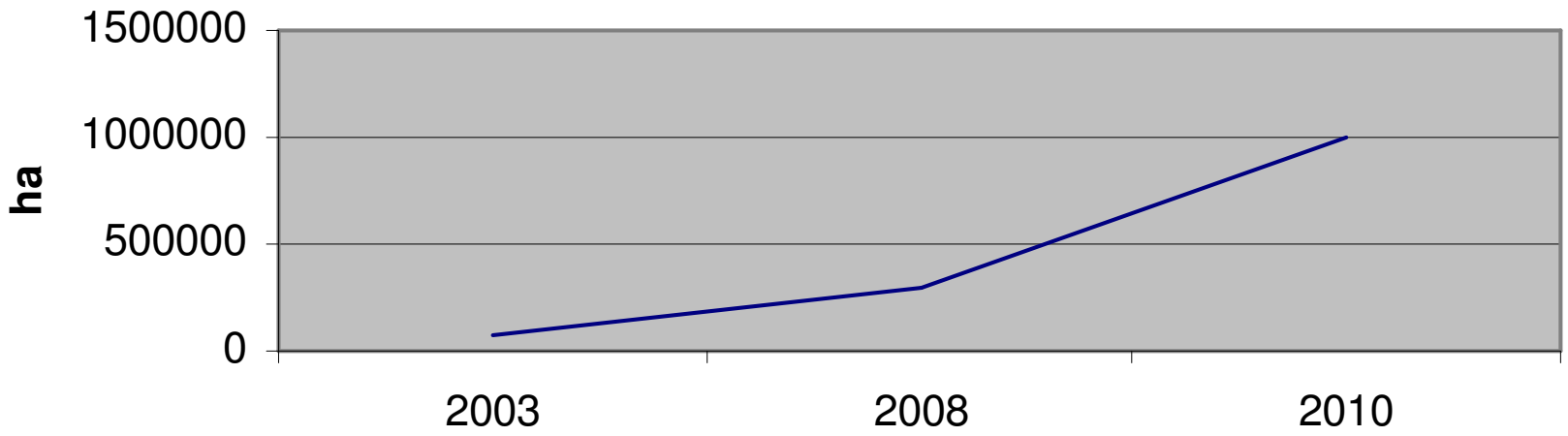


Peatlands in Sarawak



…. Peatlands (Sarawak)

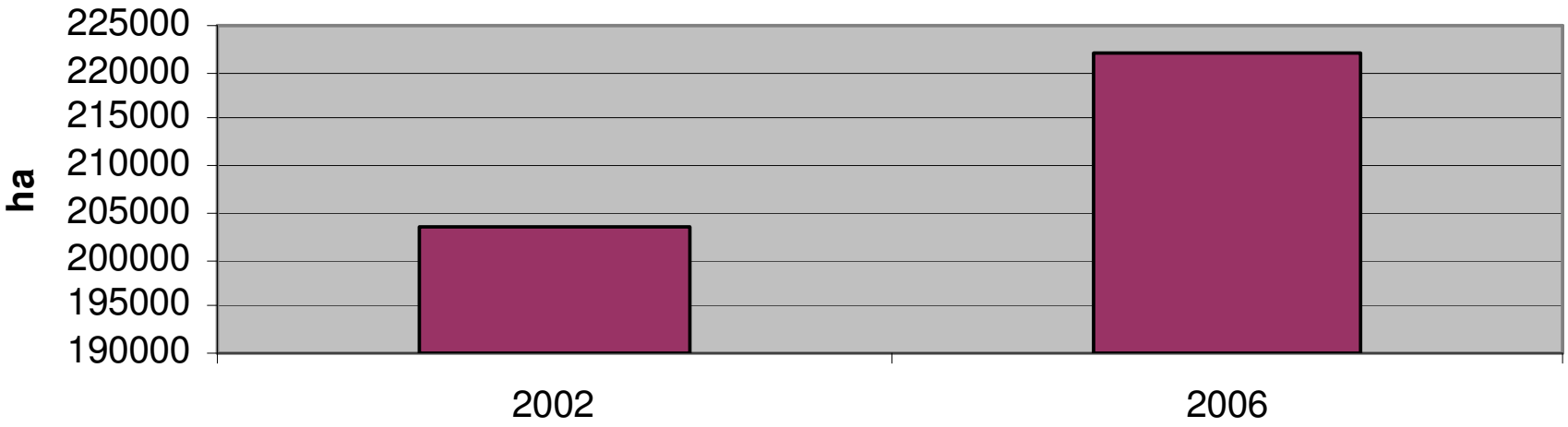
Fig. 7: Development of Oil Palm Plantations on Peat soil in Sarawak (2003-predicted for 2010)



Source: Tropical Peat Research Institute, 2009

Peatlands (Peninsular Malaysia)

Fig. 5: Development of Oil Palm Plantations on Peat soil in Peninsular Malaysia (2002-2006)



Biofuel feedstocks

- In Malaysia, the major biofuel feedstock in palm oil
- Comparisons with other biofuel feedstocks (GOFB, 2009):
- **currently, oil palm has the highest yield (ca. 6000 L per ha)**
- Sunflower seeds has ca. 4000 L per ha
- Rapeseed ca. 1300L per ha
- Soyabean (440 L per ha)
- The high yield from oil palm means the additional oil produced can be arguably be used for non-food purposes e.g. biofuel?

RSPO and certification of sustainable palm oil (?)

- RSPO = Roundtable for Sustainable Palm Oil
-]In the effort to promote sustainability of production of palm oil, a certification system has been introduced
- With generic and national Principles and Criteria (P&C)
- However, Life Cycle Analysis (LCA) has not been comprehensive
- LCA does not include important impacts such as GHGs, etc (under hot discussion in RSPO)

…. Malaysian Biofuel

- Malaysia launched its Biofuel Industry Act in 2007
  - Aim is to promote the biofuel industry
  - Ministry of Plantation Industries and Commodities is in charge
  - Malaysia mandatory blending level of 5% (B5) has recently been announced to 3% (B3)
  - Malaysia biofuel production is geared mainly towards export
  - Large plantations and smallholders

…. Malaysian Biofuel

- For export to the EU, however, the emissions saving must adhere to the Renewable Energy Directive
- Currently, the GHG savings required is 35%, but will be increased up to 60% by 2018
- For exporting countries such as Malaysia and Indonesia, this may seem like a trade barrier
- GHGs inclusion in an expanded LCA system boundary is being hotly discussed in the RSPO
- However, it is crucial to include C released from degradation of soil, deforestation, burning/fire, etc

Challenges

- Indubitably, in this case biofuel for export has driven sensitive areas (HCVAs including peatlands) to be affected by plantation expansion
- Challenges remain on:
- Minimization of peatlands and other HCVAs damage, in order to maintain crucial economic system
- Research on second and third generation biofuels that can minimize the effects above are urged
- Increase prodcution or yield – but must beware of high yields GMOs (genome for oil palm sequenced)
- Look for good business model to promote really sustainable certified palm oil (gold standard, which has comprehensive LCAs)

THANK YOU

for your kind attention