

Barriers to SE Asia Biofuel Exports to the European and US markets

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16th September 2010*

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Thailand's Economy in 2009

- 65 Millions Population ~1% of World; Per capita 4,338\$, (PPP : 8,500\$)
- GDP US\$273 Billions (553.4 Bn, PPP)
- Agriculture:
 - 11.4 % of GDP
 - 40 % of Employment
- Manufacturing:
 - 44.5 % of GDP
 - 20 % of Employment
- 1st Import Item : Crude Oil (15.6% of import bill)
- Major Agricultural Products & World Rankings
 - Rice 30.2 MT from 11 M. Ha.(1st Exporter)
 - Rubber 3.02 MT from 1.76 M. Ha.(1st Producer&Exporter)
 - Sugarcane 64.4 MT from 1.01 M. Ha.(Export 75%, 2nd)
 - Cassava 27 MT from 1.17 M. Ha.(Export 80% 1st)
 - Oil Palm 6.6 MT from 0.42 M. Ha.(3rd Producer)

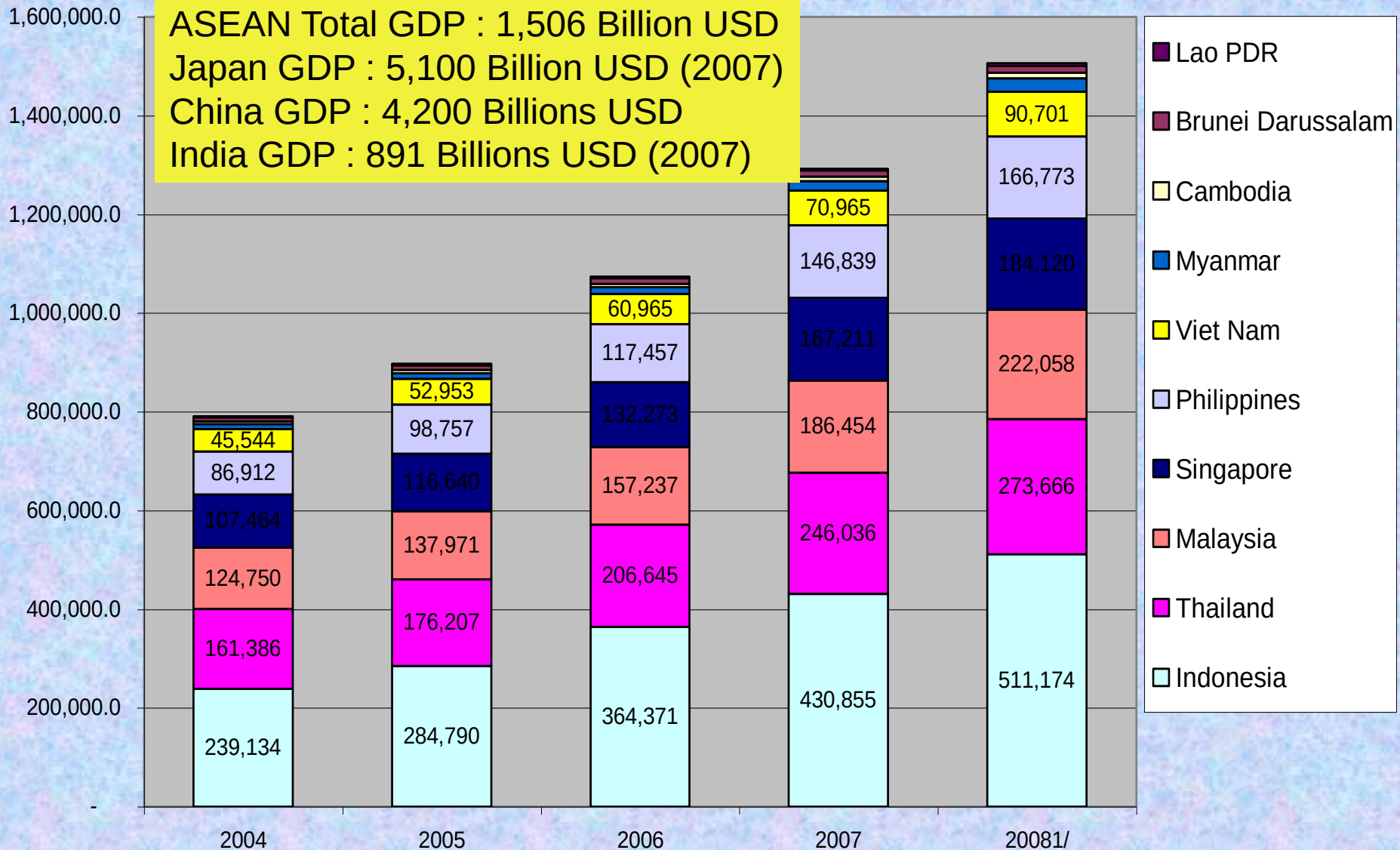


ASEAN GDP in MUSD, Current Market Prices, Data from ASEAN

Total Population : 583 Millions, Ave. GDP Per Capita : 2,581 USD

(GDP PPP 5,320 USD) Total Land Area 4.4 Million Sq.km.

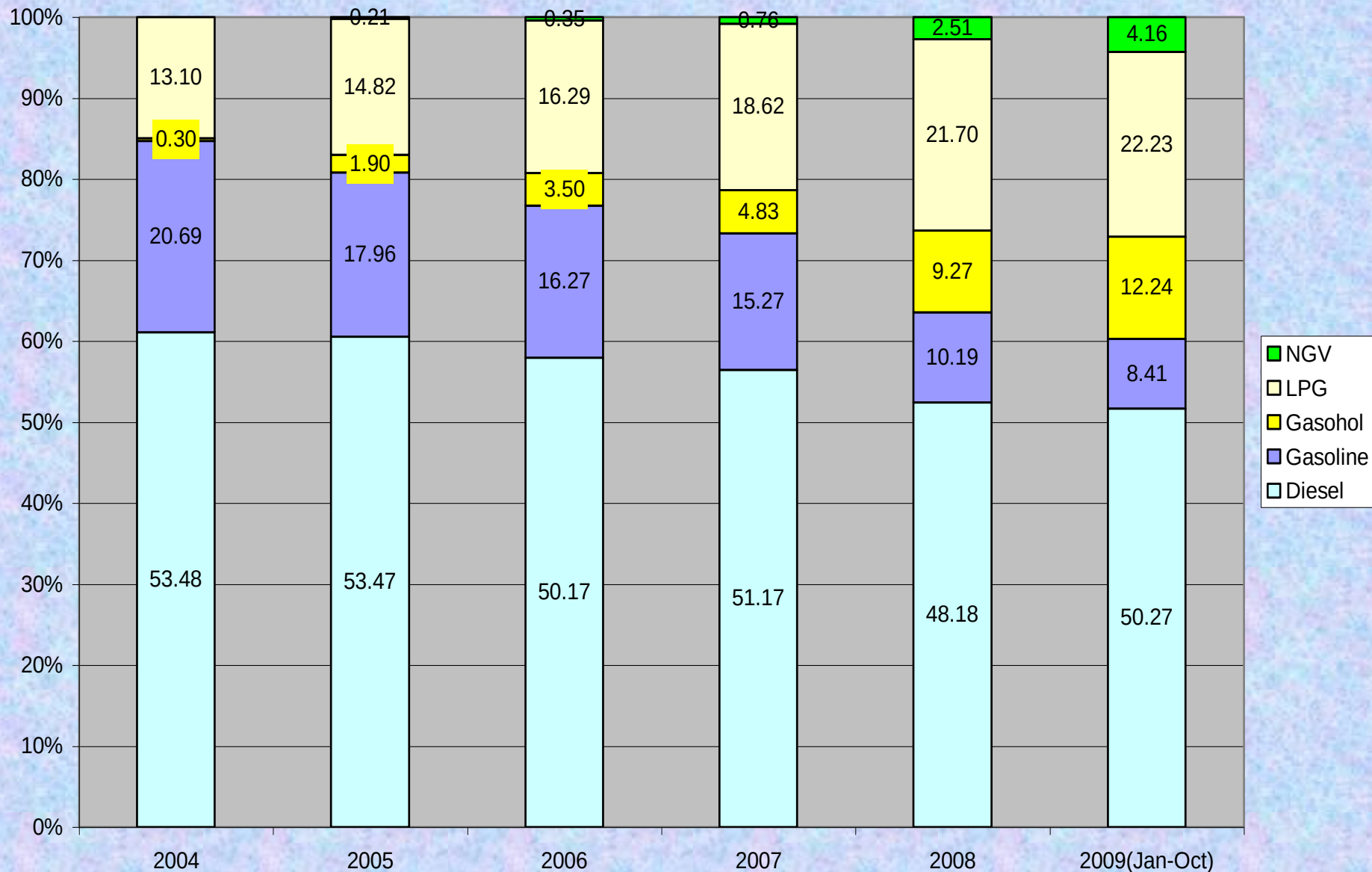
ASEAN Total GDP : 1,506 Billion USD
 Japan GDP : 5,100 Billion USD (2007)
 China GDP : 4,200 Billions USD
 India GDP : 891 Billions USD (2007)



Asia has changed, Thailand has also changed :

- Economic & Social Integration,
- Climate Change Impact,
- The way we live (urbanization) and the way we work also change,
- And so do Agriculture : The backbone !
- Demographic Changes ... Aging society by 2025,

Share of Transportation Fuels in Thailand (Figures in Million Litre/D) Since 2008, All HSD contains 2% of Biodiesel



Thailand's Energy Policy

Presented to the Parliament on Dec 30th 2008

Policy

1

Securing Energy Resources

- Oil
- Natural Gas
- Electricity
- Alternative Energy



Policy

2

Set Renewable Energy as National Agenda

- E85
- Ethanol based oil
- Bio Diesel
- NGV
- Wind /Solar /
Biogas/ Biomass/
Small Hydro
energy



3

Policy

Encouraging Energy Conservation

- Conservation Measure
- Efficiency Standard
- Encouraging Private Investment

Policy

4

Ensure Fair Energy Price

- Price structure reflect its genuine cost
- Develop Services Quality
- Safety in Energy Related business



5

Policy

Preserving Environment coupled with Energy Development and Consumption

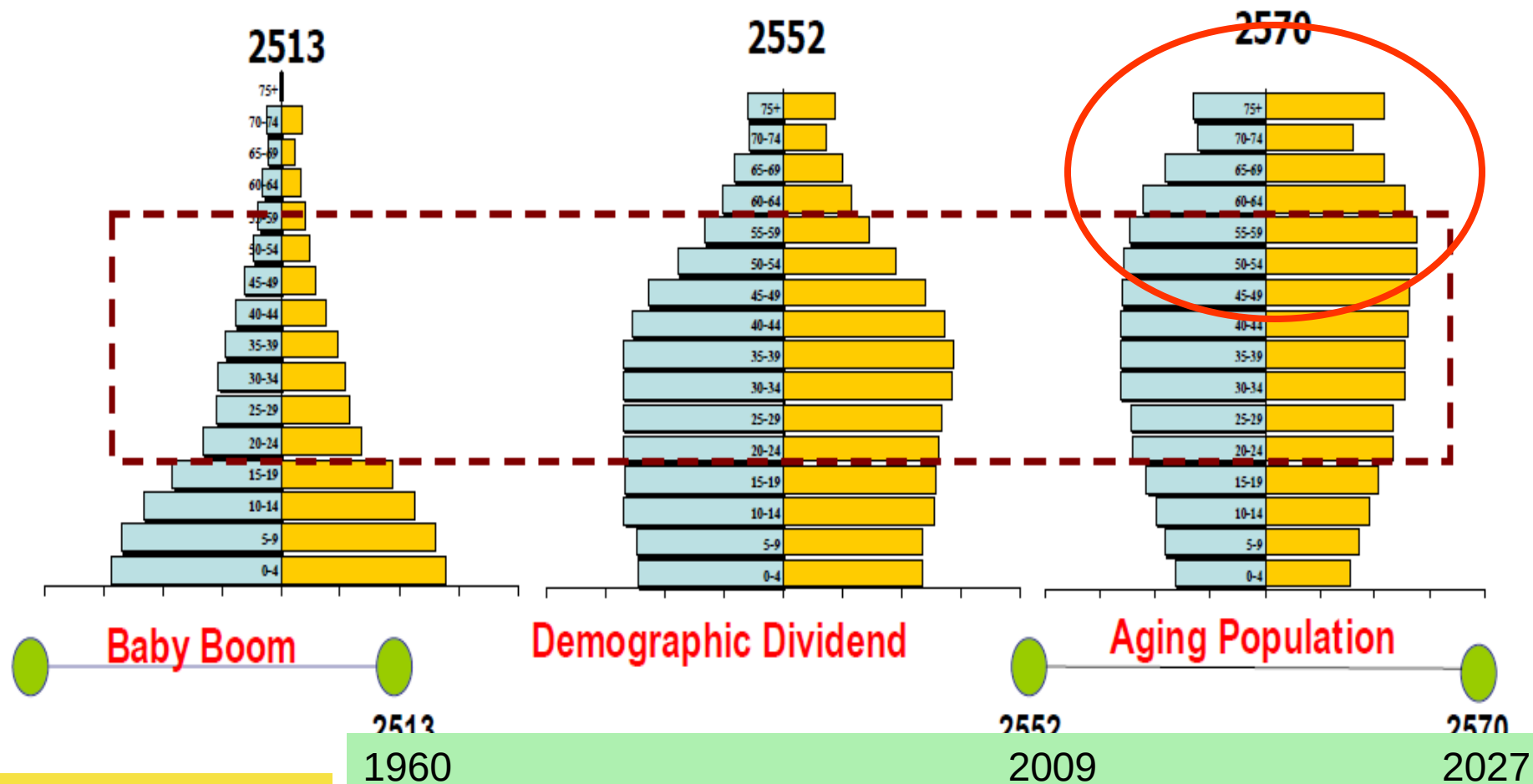
- Green house Emission Reduction
- Support CDM Projects



Drivers

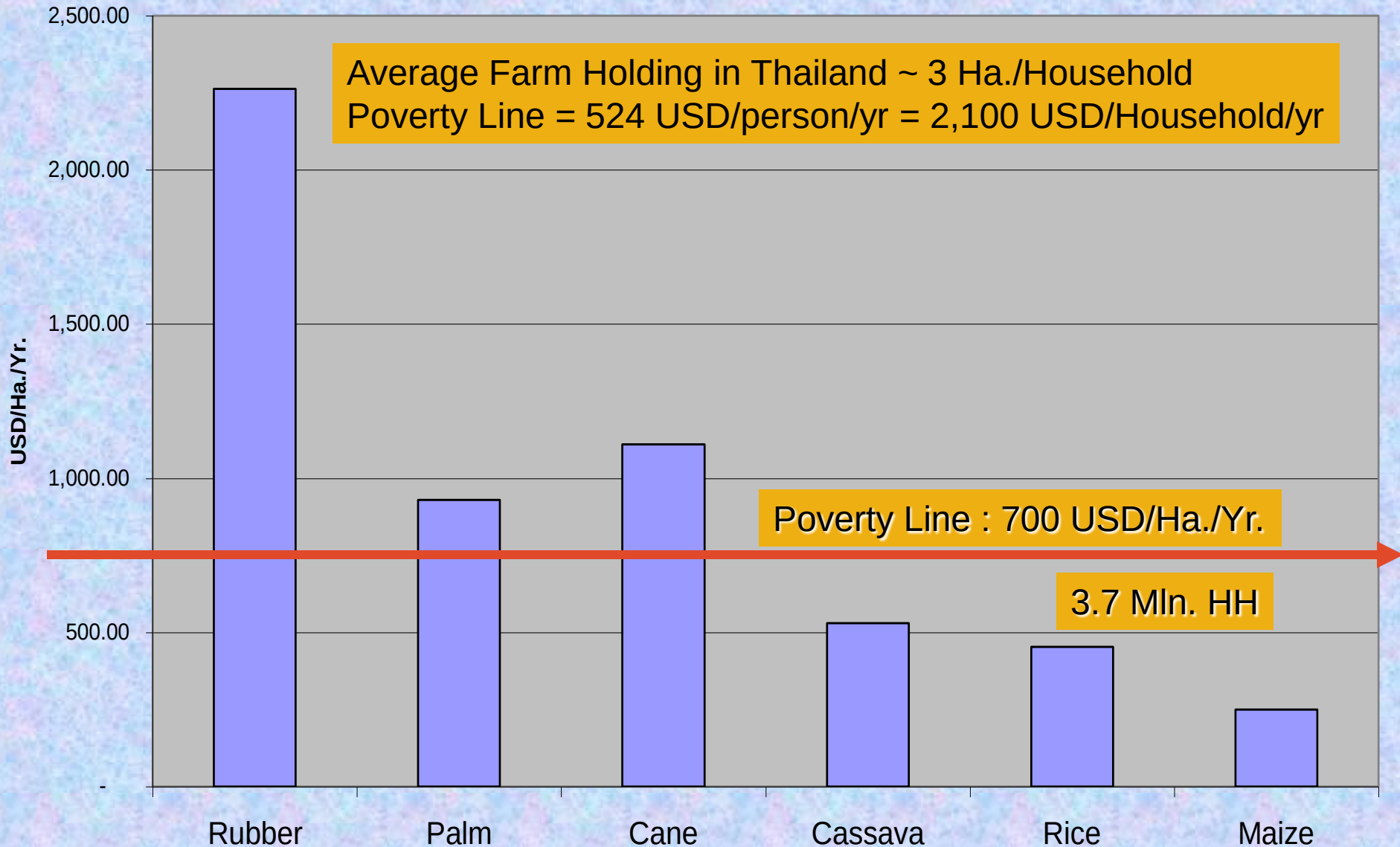
- Agriculture Diversification
 - Alternative end-use from food/feed market
 - Less labour intensive
 - Higher Productivity
- Rural Job Creation
- Bridge Building I : ASEAN/GMS Cross-Border Trades
- Bridge Building II : Low Carbon Society

Labour Force : 36 M strong, but....
Thailand will move into an 'aging society' by 2025,
window of opportunity is closing..



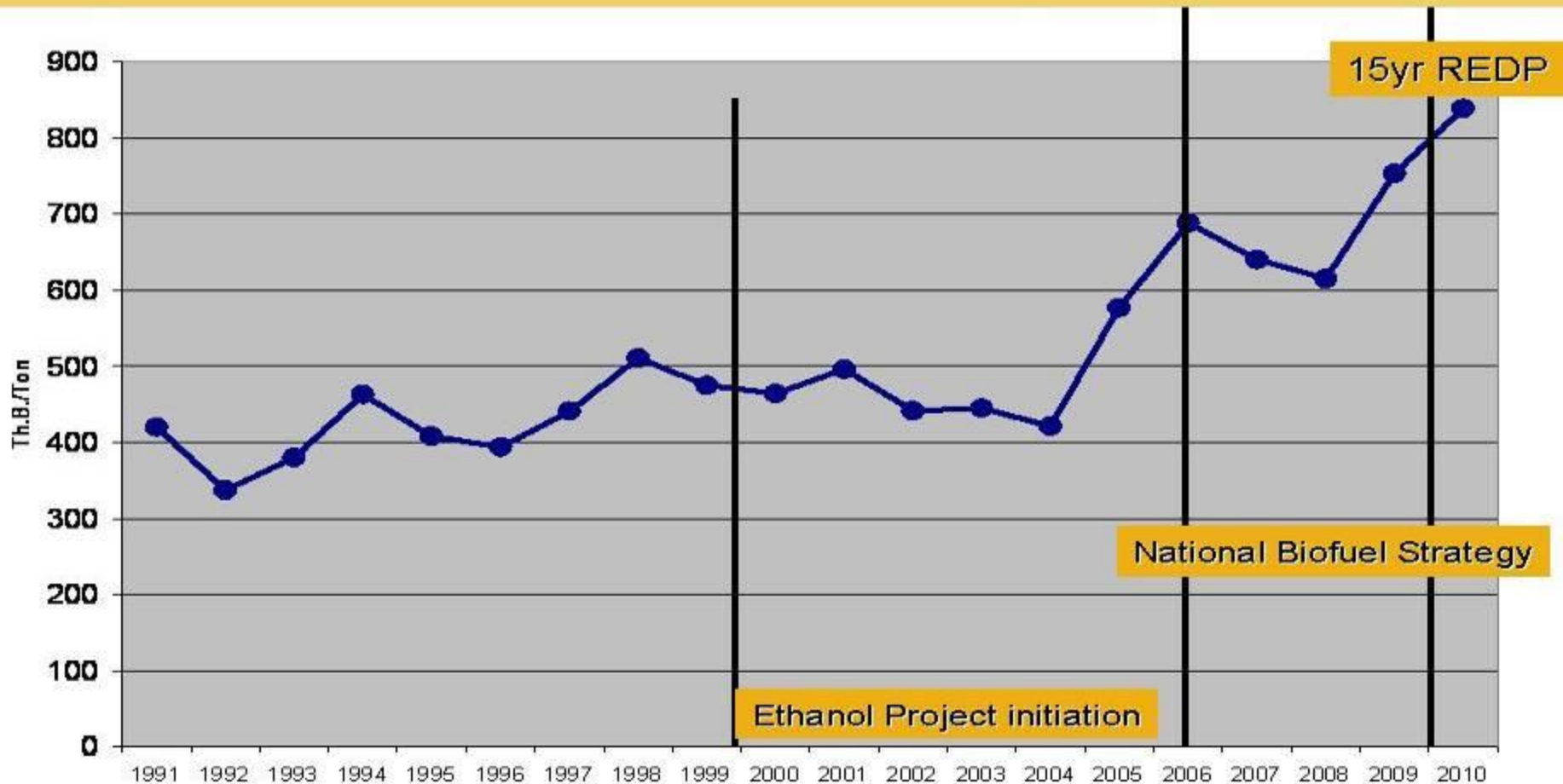
Net Farm Crop Income USD/Ha/Yr

Data from OAE, MOAC

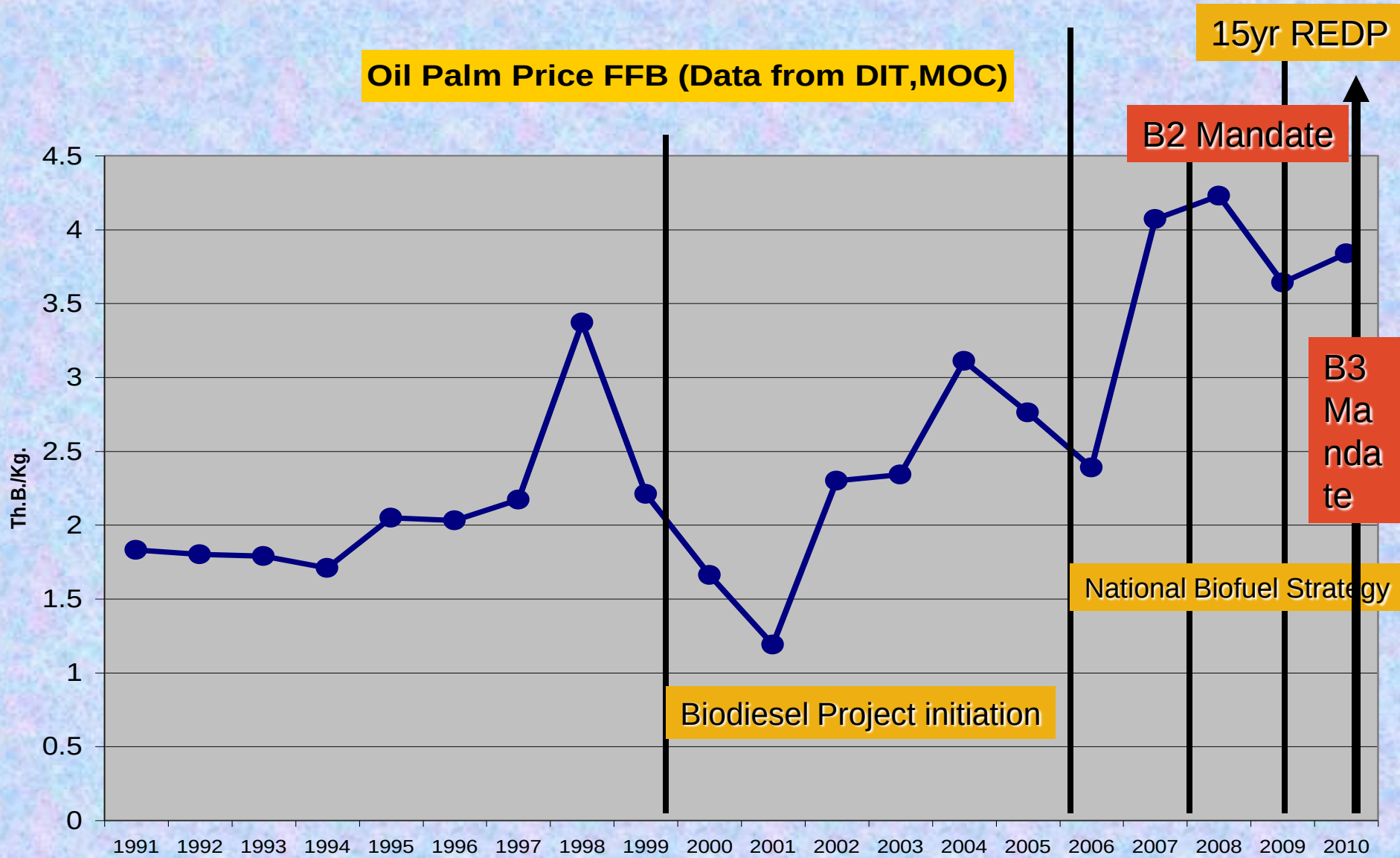


New Equation into the old ag. commodity

Sugar Cane, Farm Gate, Th.B./Ton

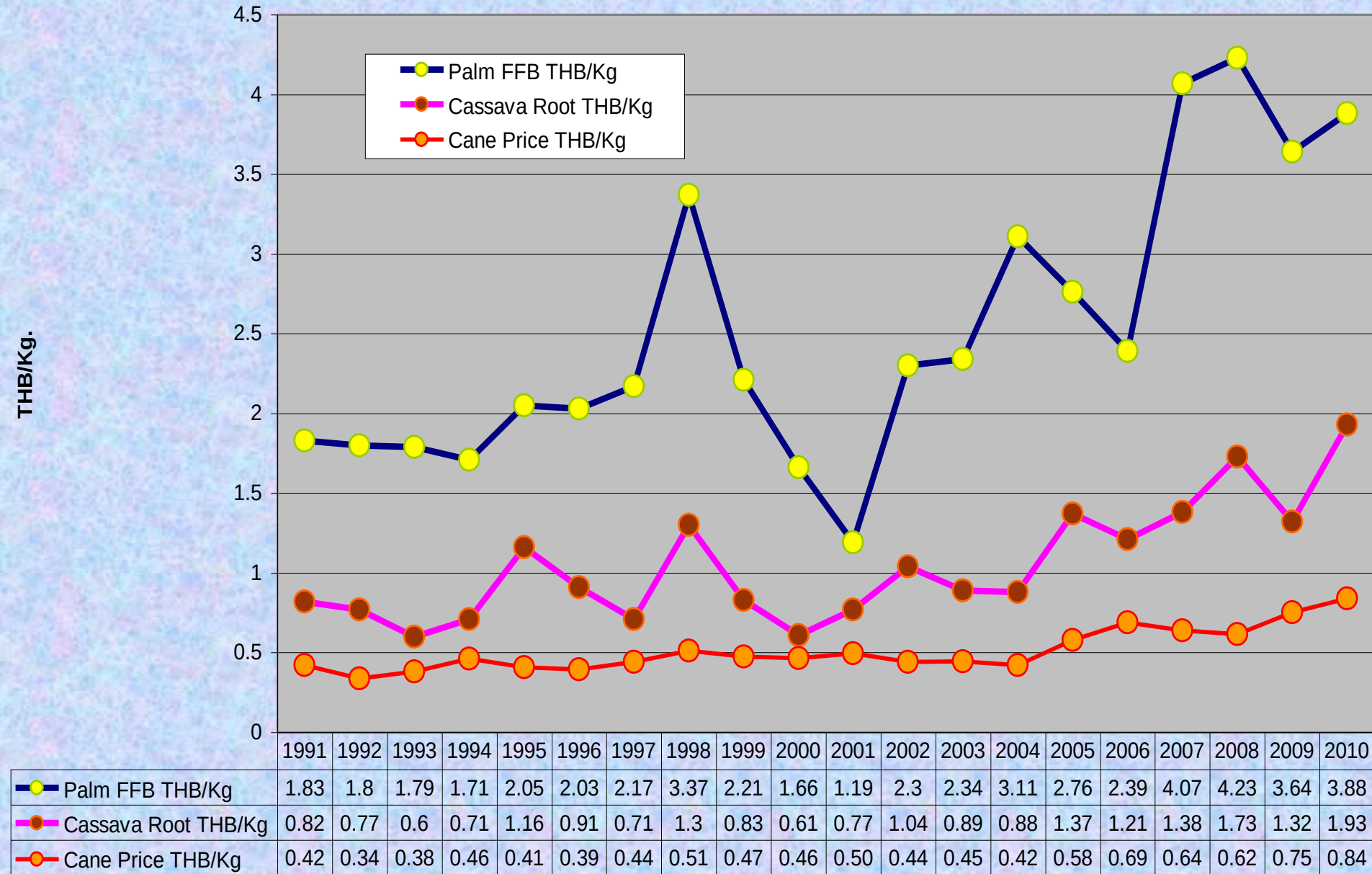


New Equation into the old ag. commodity

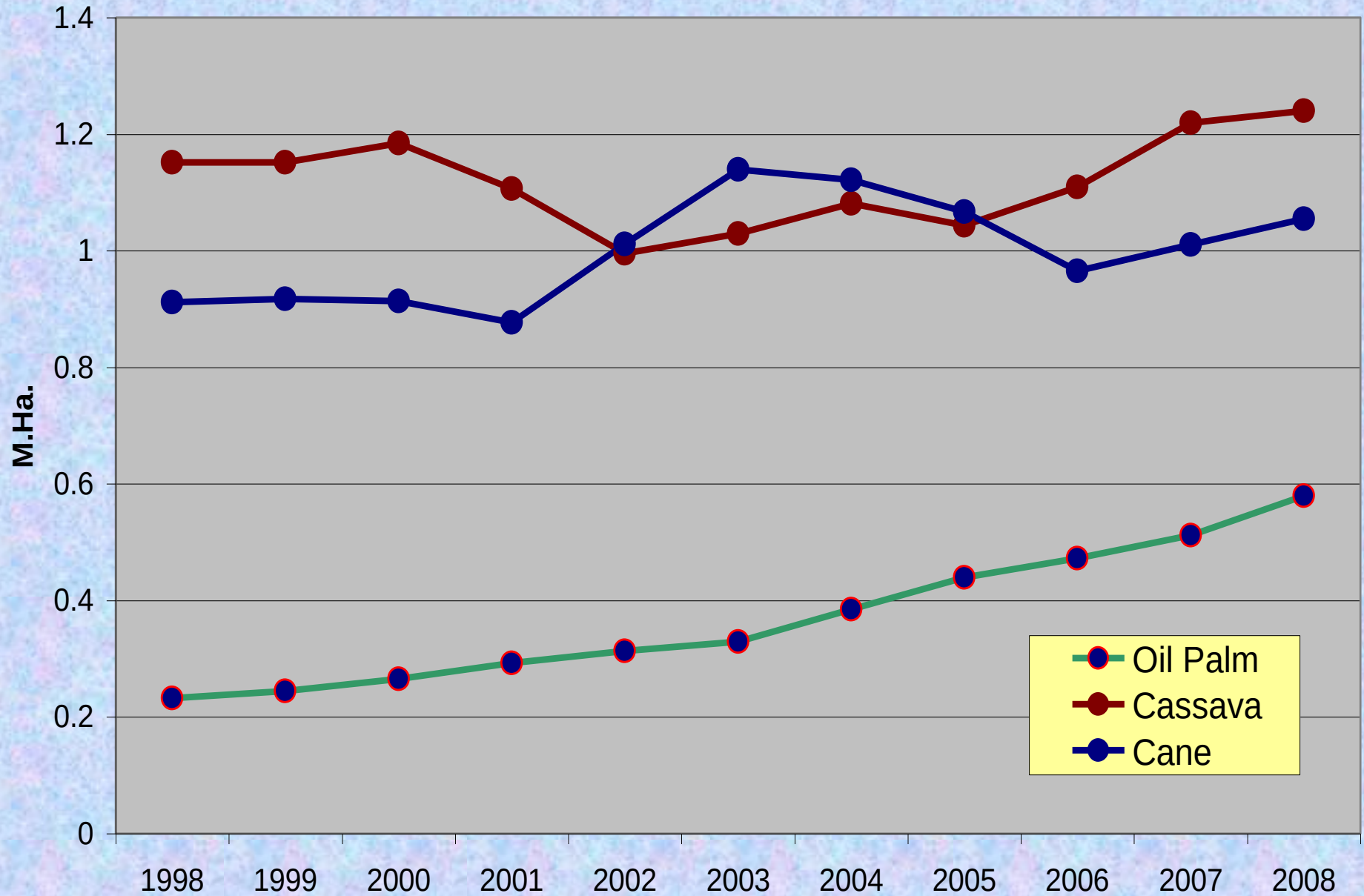


Food&Energy Crop Price Statistics in Thailand

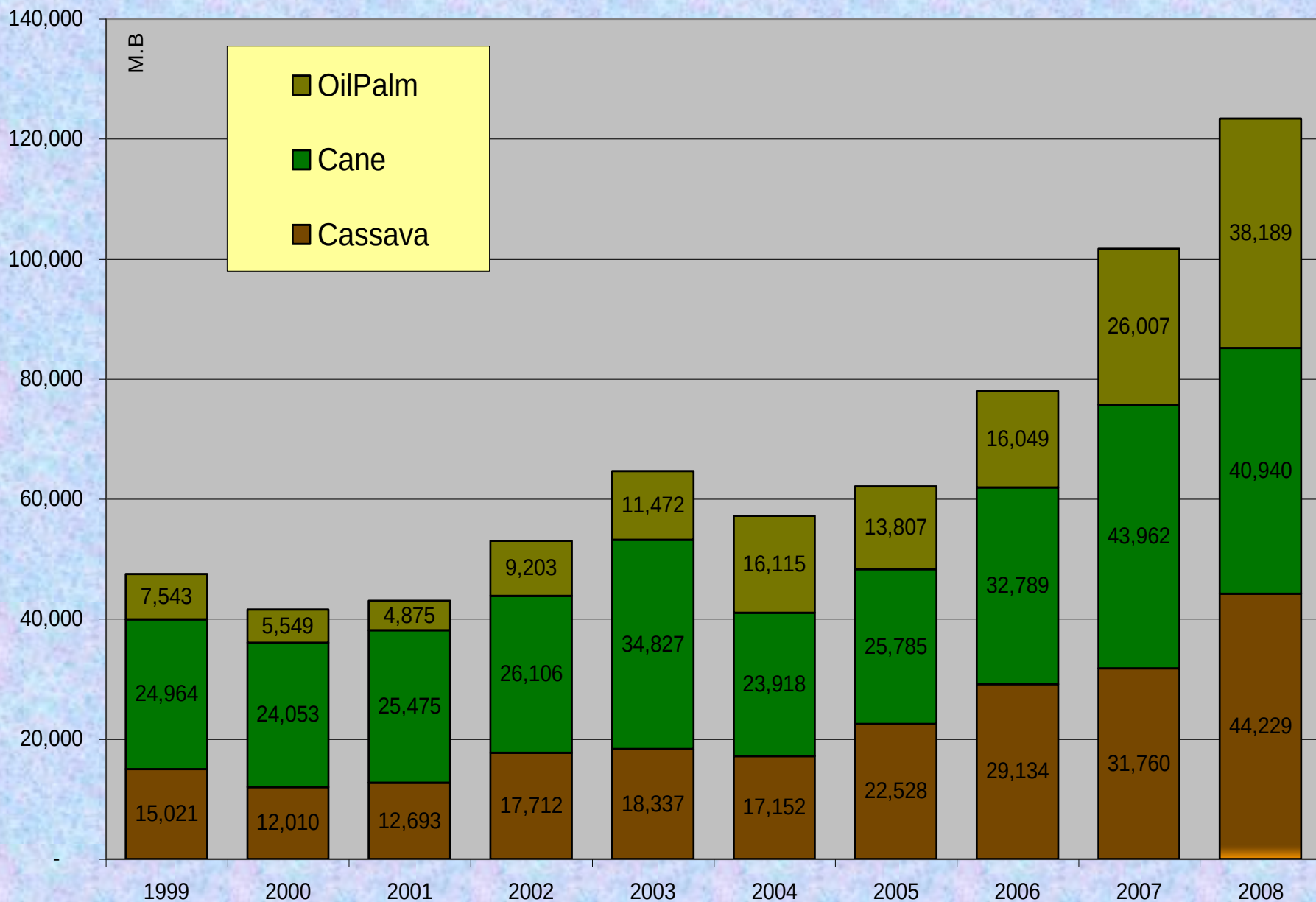
Data from OAE, MOAC.



Energy Crop Plantation Areas in Thailand (M.Ha., data from OAE, MOAC)



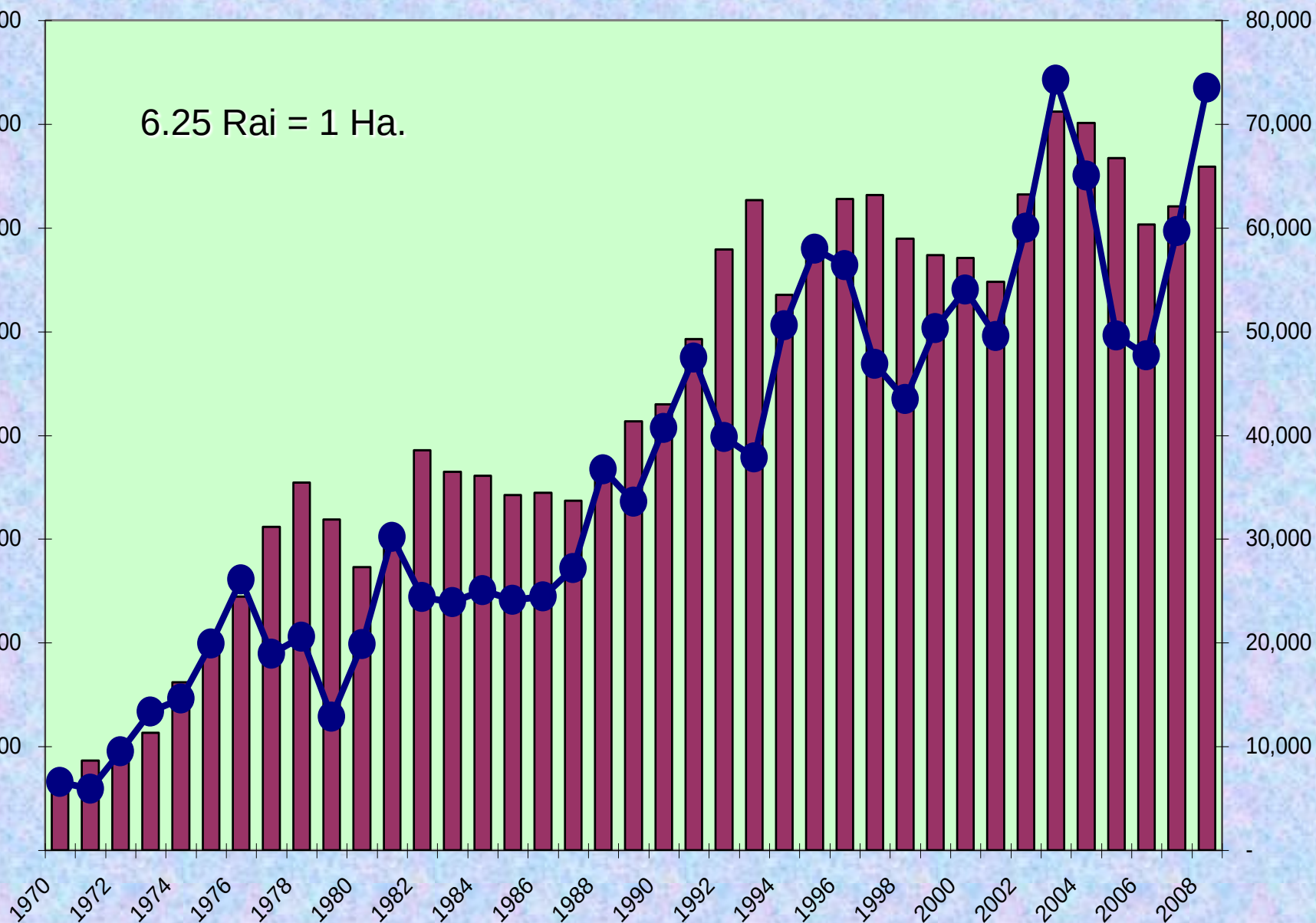
Food/Feed/Fuel Crop at Farmgate Values in Million Baht (Data from OAE,MOAC)



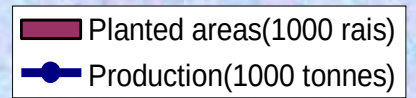
Sugarcane Area and Production in Thailand (Data : OAE)

■ Planted areas(1000 rais)
● Production(1000 tonnes)

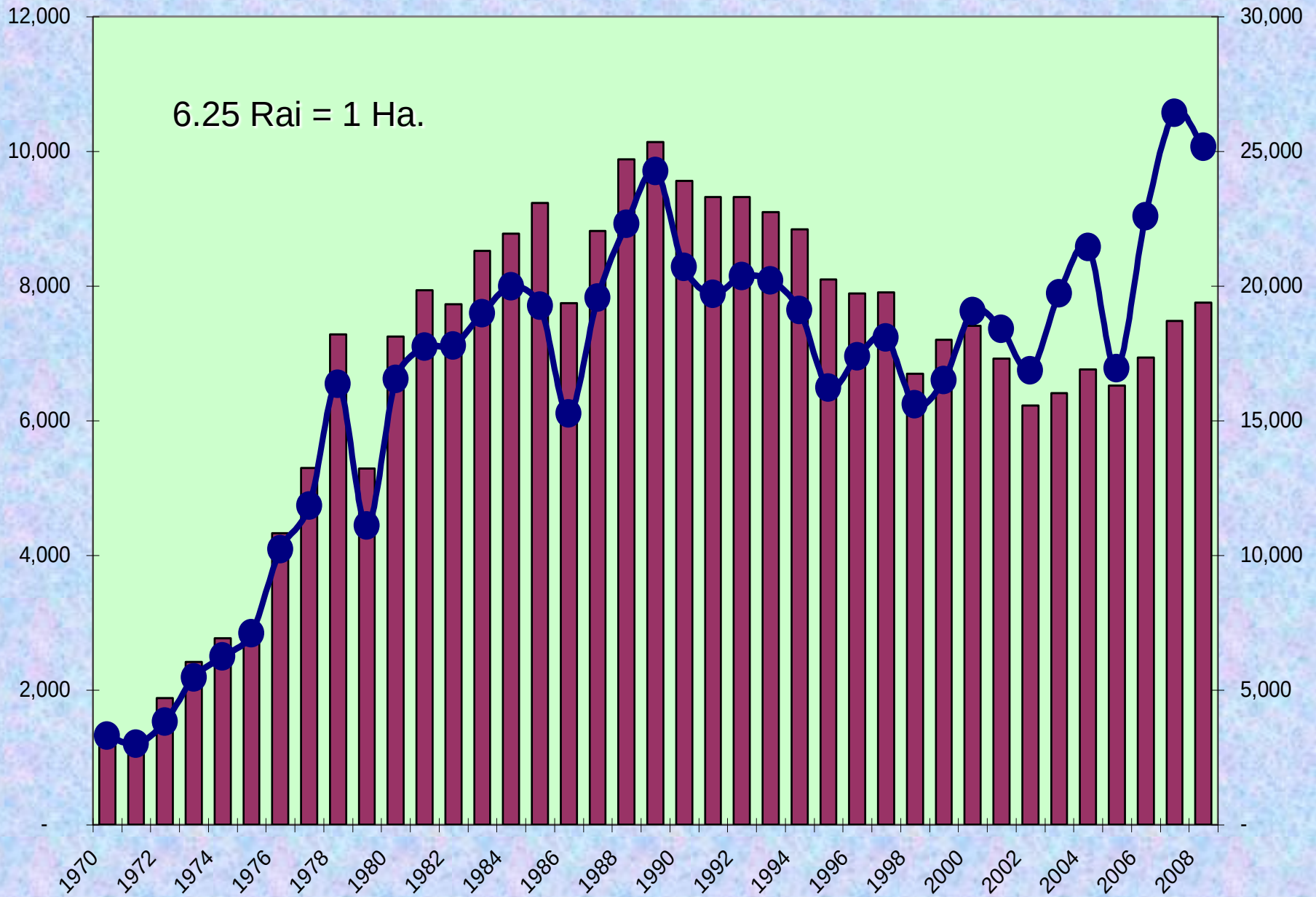
6.25 Rai = 1 Ha.



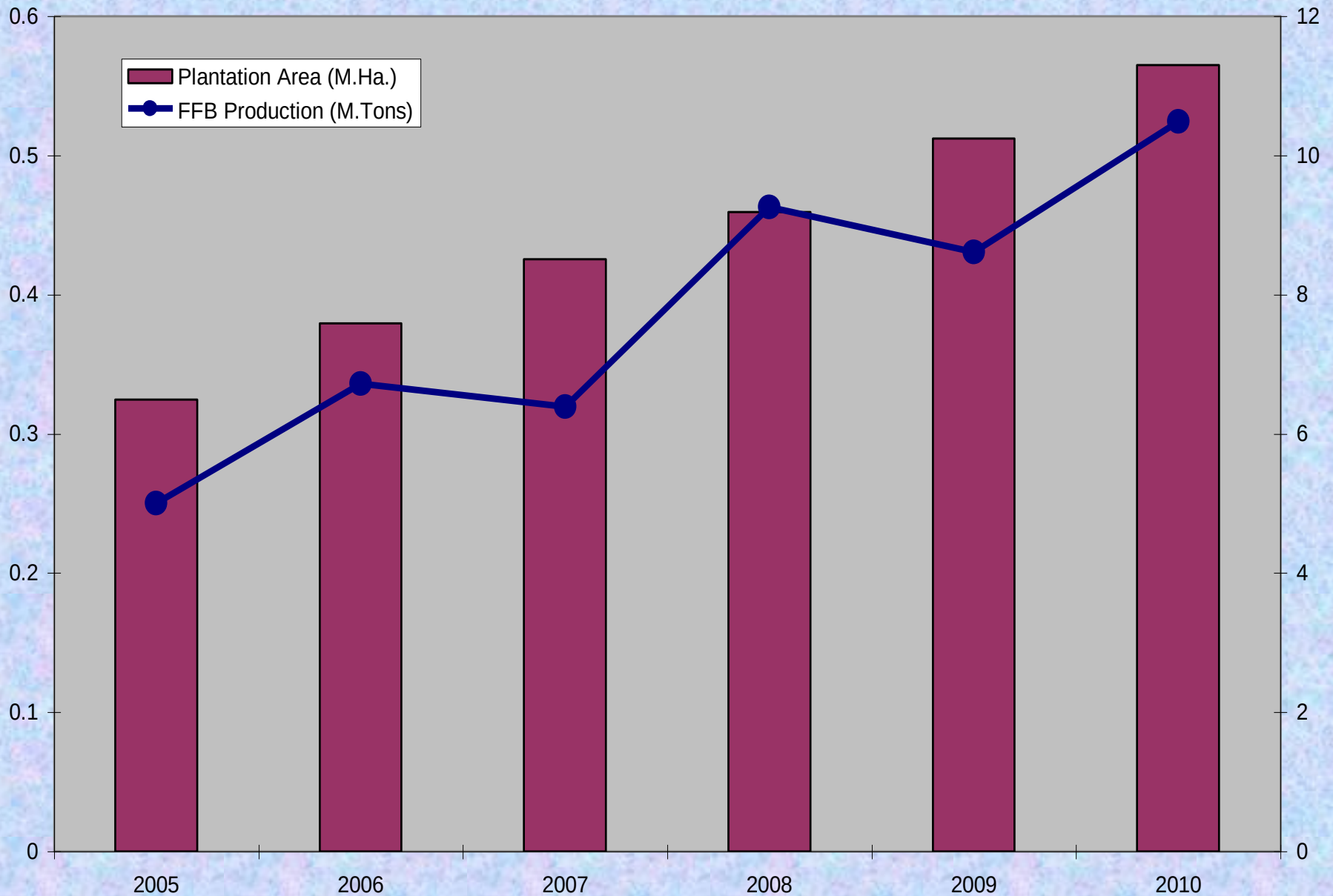
Cassava Area and Production in Thailand (Data:OAE)



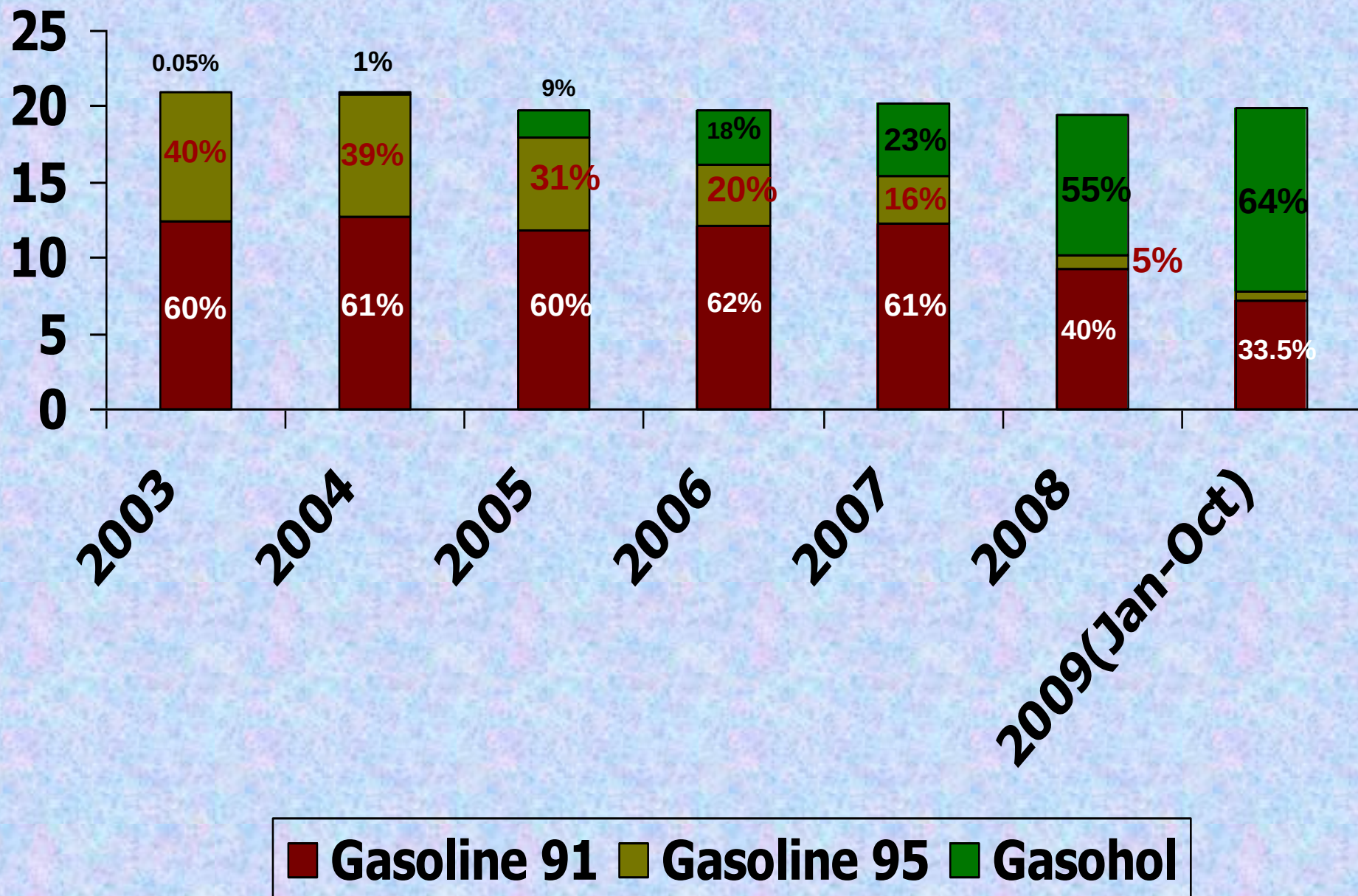
6.25 Rai = 1 Ha.



Oil Palm Production in Thailand

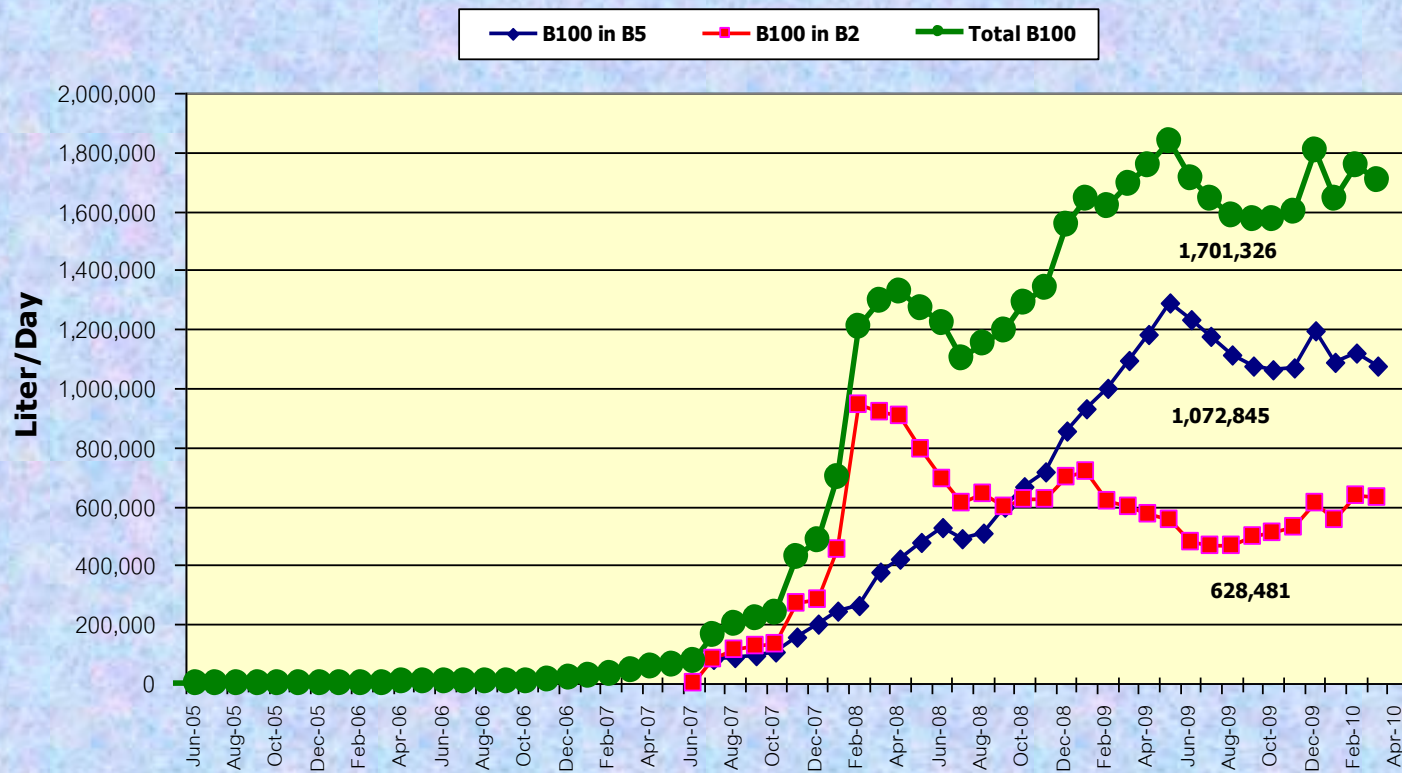


Gasoline and Gasohol Consumption in Thailand, ML/Day

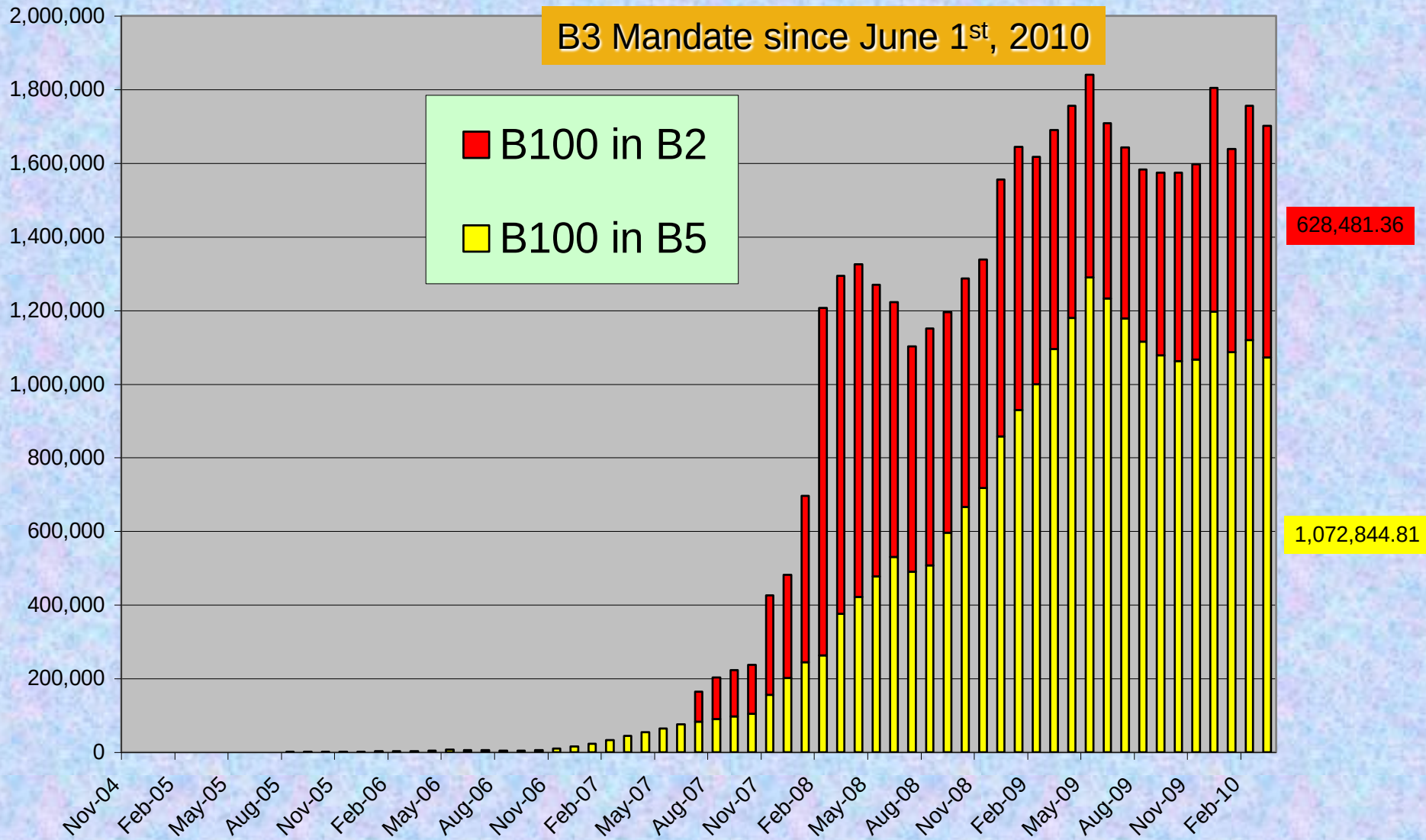


Biodiesel Consumption Volume (Apr. 2010)

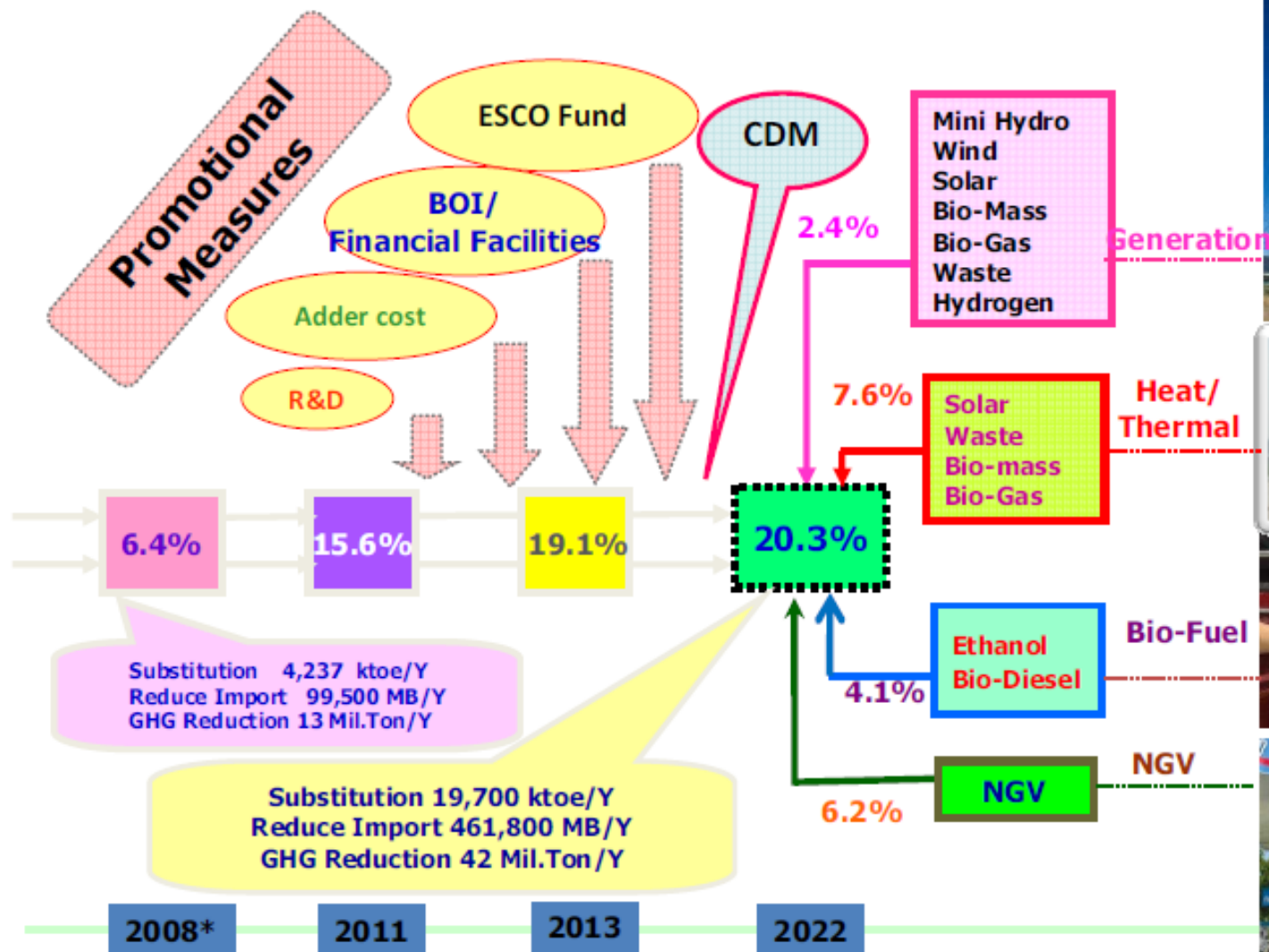
- **B5 Volume Sale 21.56 ML/day (B100 1.078 ML/day)**
- **Diesel(B2) Volume Sale 24.82 ML/day (B100 0.496 ML/day)**
- **Total volume of B100 1.574 ML/day**
- **B3 Mandate since June 1st, 2010 : B100 Vol. 1.9 ML/day**



Biodiesel Consumption in Thailand ML/day

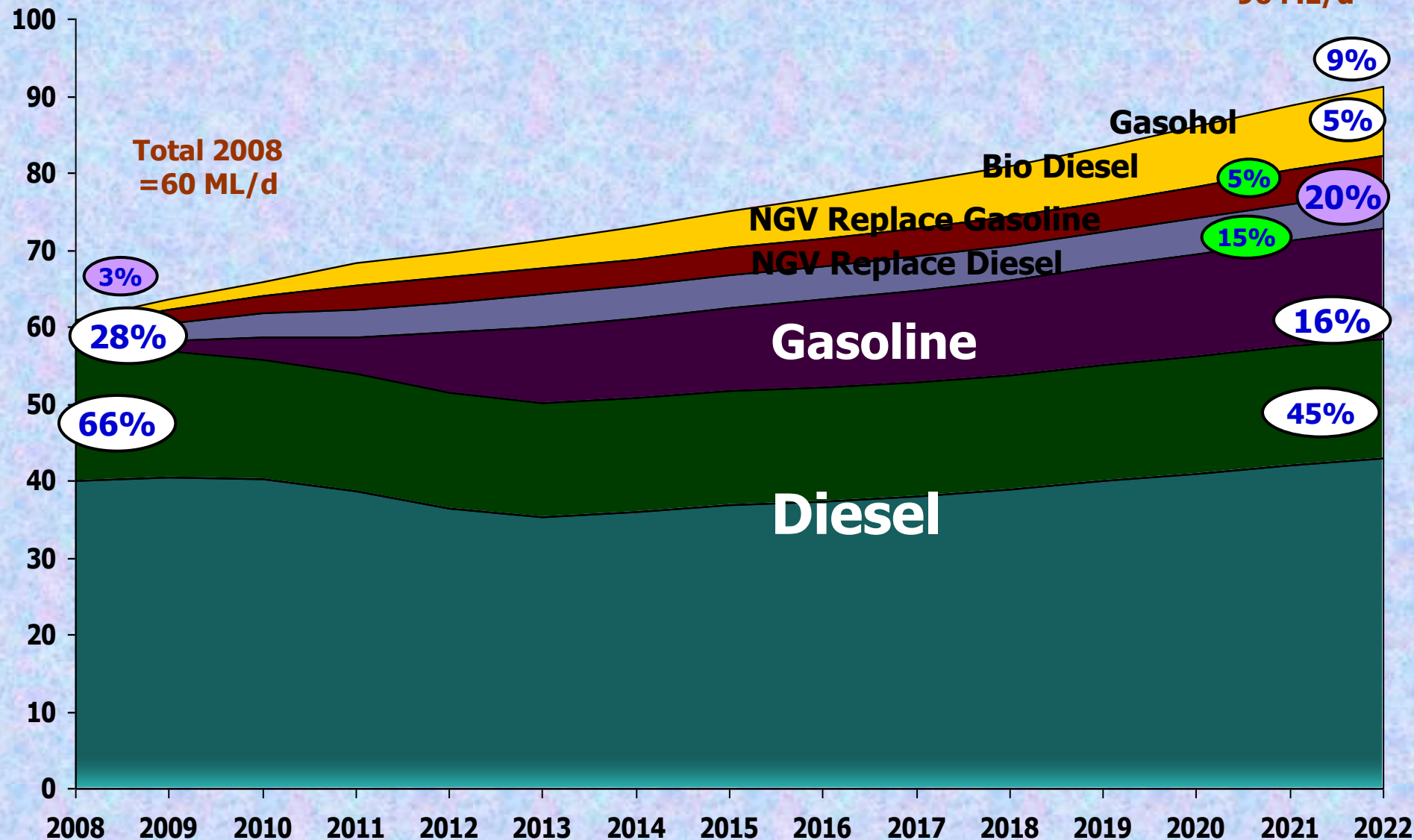


Renewable Energy Development Plan (REDP) 2008-2022



Alternative Energy Targets for Road Transport Sector of Thailand 2008 -2022

Million Litre/Day





Ethanol Production in 2010
19 Plants : 2.9 ML/day
Consumption : 1.3 ML/day

MAE SOD
CLEAN ENERGY



Oleochemical Plant, Rayong

BDF Plants : 14

Production capacity : 5.9 ML/day

Consumption : 1.9 ML/day



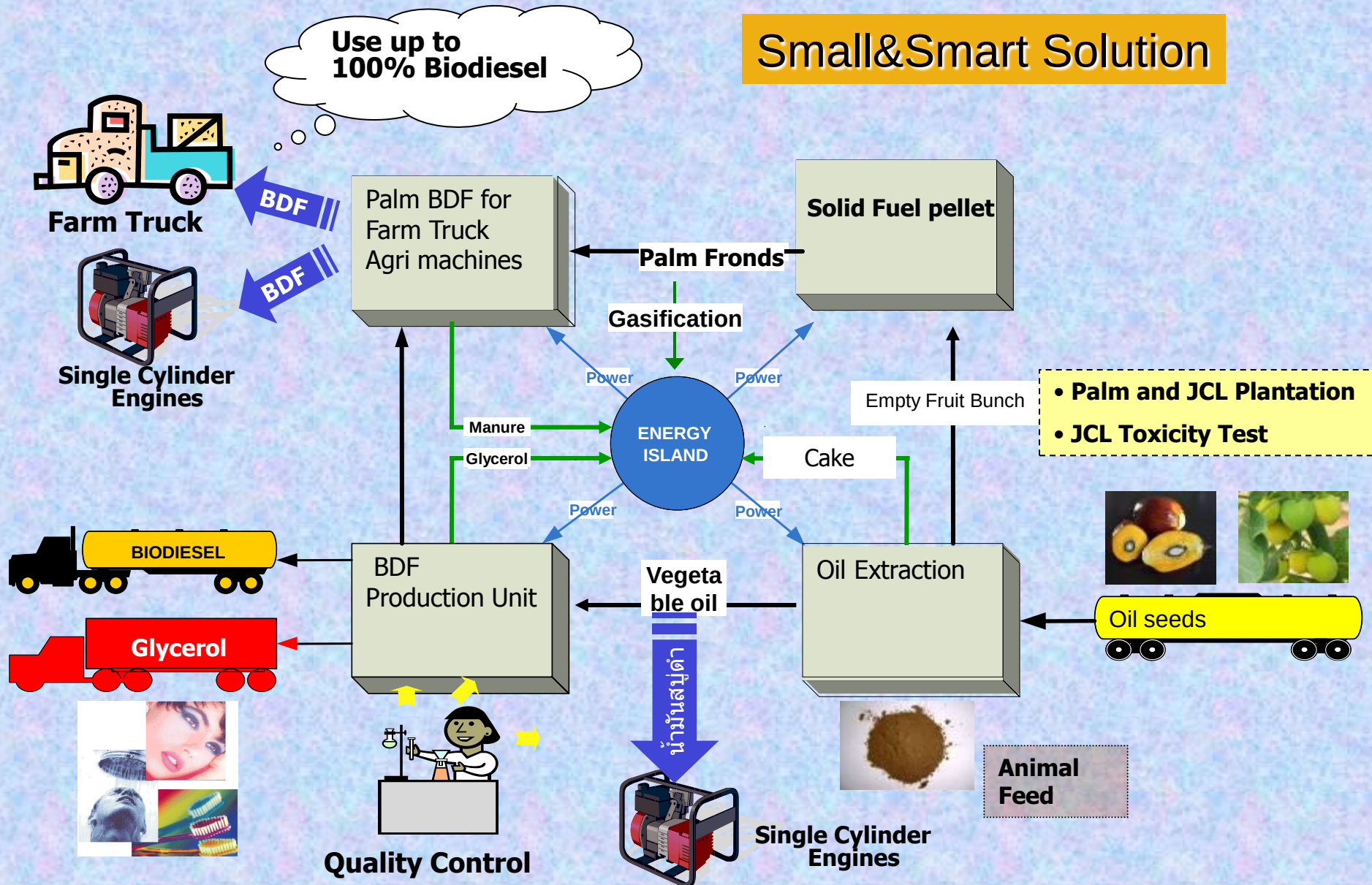
Vertical integration among petroleum refiners
& oil palm complex (TOL-PTTCh, PBC-RPC, BCP)

Biorefinery Concept

Small&Smart Solution



**Use up to
100% Biodiesel**



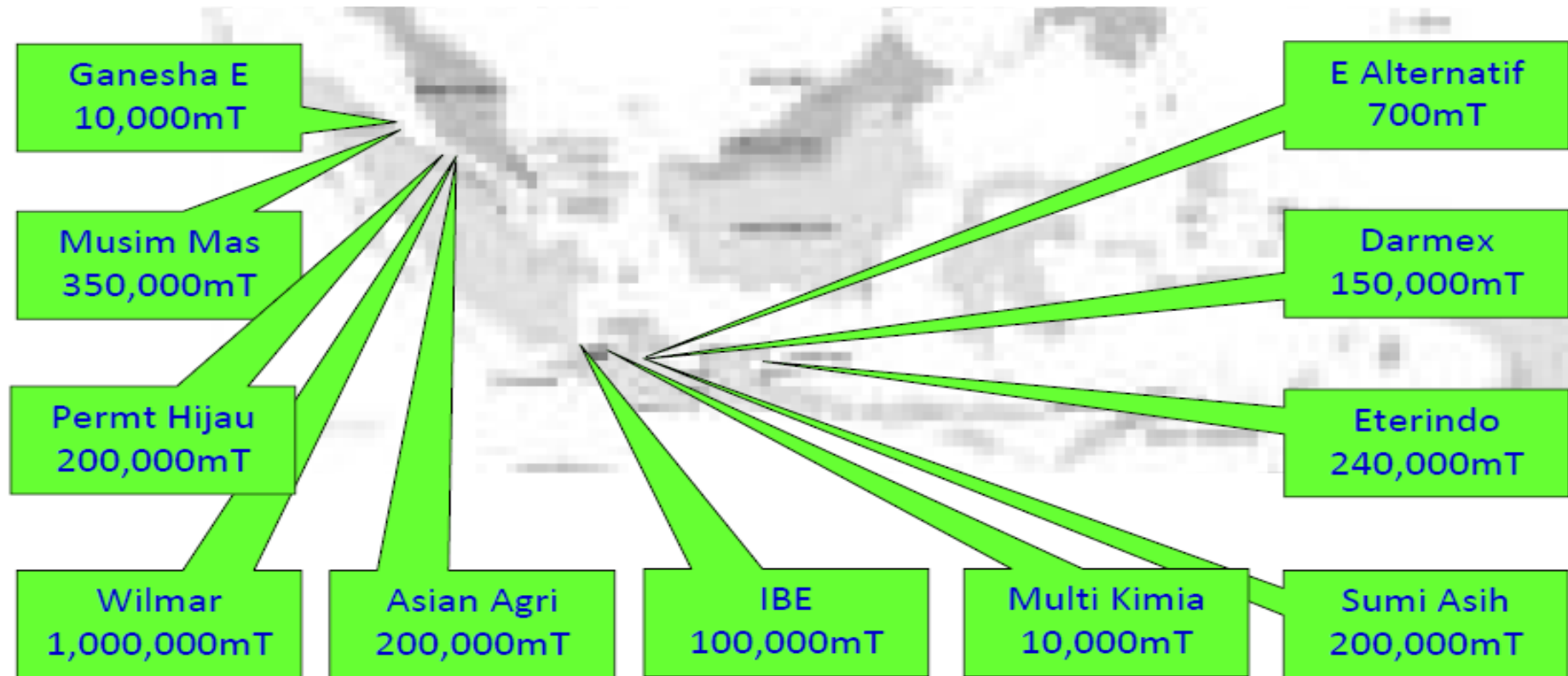
Oil Palm Expansion in Acidic Areas
FFB Yield 30 Tons/Ha. in 2008
FFB Yield 36 Tons/Ha in 2009.
Planted Oct.2004





- Farm Co-op,
- Conversion technology,
- Microgrid
- B100 Own-use,
- Animal Feed- farm use,
- Sell excess to refiners for food, fuel,
- Small & Smart = Beautiful & Competitive

BIODIESEL INDUSTRY CAPACITIES



Source : APROBI 2008

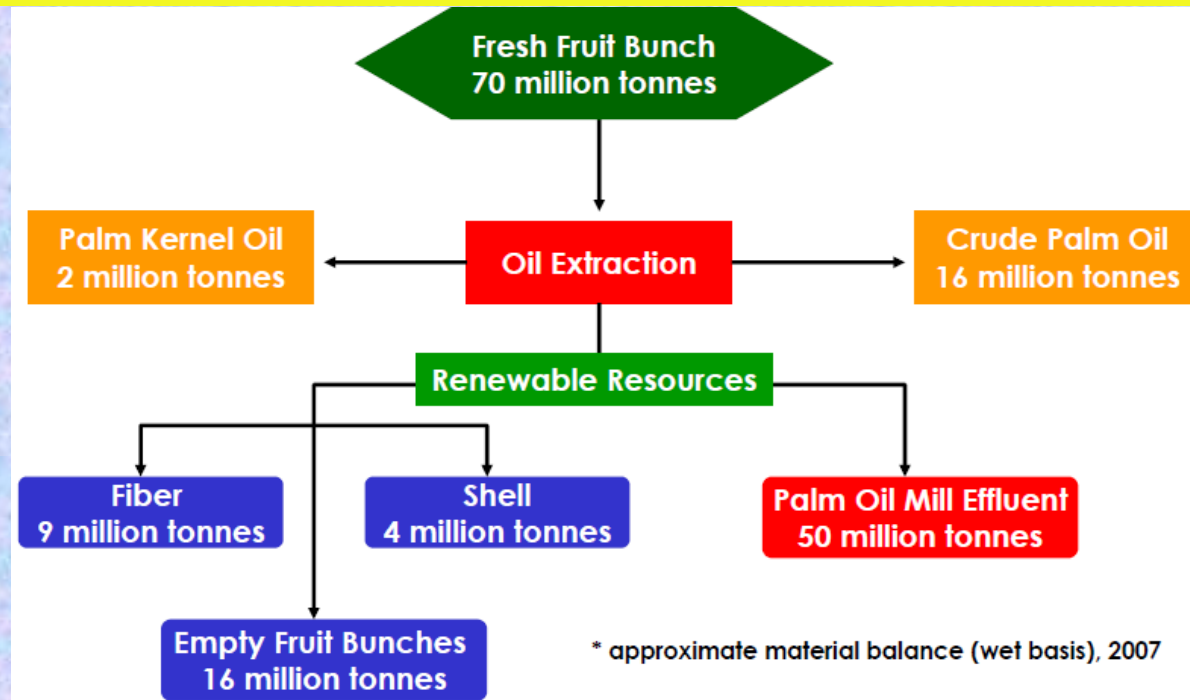
12

Indonesia : Biodiesel Plants 11 plants, 2.5 Million Tons/yr
Source T.Soerawidjaja, Bioenergy Forum 2009

Malaysian Oil Palm Industrial Complex

from M. Ali Hassan et al, 5th Asian Biomass Workshop, 2009

- Now 4 million hectares of oil palm (10% of Malaysia land area)
- 400 mills throughout Malaysia (self-sufficient in energy.. excess)
- Highest oil yielding crop in the world
- Excellent R&D by PORIM/MPOB
- Palm oil - Malaysia's gift to the world
- USD 13 billion export in 2007
- More than 500,000 people employed
- Poverty alleviation
- Land ownership & stable income
- FELDA's success story!



Biodiesel Industry (Installed Capacity)

2006 : 150,000 tonnes

2007 : 600,000 tonnes

2008 : 1.46 mln. tonnes

2009 : 2.65 mln. tonnes

Thailand's renewable energy sector

- Transportation bioenergy is just part of a larger programs in energy development in the age of energy security and climate change adaptation,
- SPP(10-90MWe)/VSPP(<10 MWe) regulation started in 1993, now 16% of power generation
- Commoditization of biomass residues :
Price signal works !

Biomass Sector

- Potential for 4,400 MWe and 7,000 KTOE heat
- 2010:Existing capacity : 2,454 MWe and 3,320 KTOE
- Target for 2022 : 3,700 MWe and 6,760 KTOE
- This is existing 'BAU' with no export projection!
- Expandable Potentials
 - Oil Palm Acreage Expansion : 1 Million Acres by 2013,
 - Rubber Acreage Expansion
 - Pulp & Paper Wastes
 - Forest Industry Development : Forest Residues : 100 MWe potentials for local community



Agriculture Residues



Way forward

- Roles & significance of Small Holder Best Practice : Small & Smart Solutions,
- Some of the extreme poverty : 'Bottom Billions', < 1 USD (PPP) / day are in the Greater Mekong Subregion....Too ill, too weak, too poor, too deep in political conflict to climb up the ladder of Development,
- Small Holder Empowerment = Poverty Reduction
- Biofuel can be the 1st step, then congregate and develop onto higher values products :starch, sugar and oleochemical platform,
- *Capacity buildings & (Fair) Trade* instead of *Food Aid*
- ASEAN Common Market 2015.
- South-South Actions

Barriers to Export

- Standard Harmonization :-
 - NTB's or Consumer Protections ?
 - CFPP
 - Perceived compatability with existing vehicles
- Free Trades Agreements
 - Japan & Brazil Alliance
 - US and Caribbean Zones
 - AFTA ?
- Logistics Bottlenecks
- The Big Big Barrier : Ag. Subsidies !