

The Promotion of Biofuels in Transportation Sector in Thailand

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1.

Thailand's Renewable Energy Policy and Plan

2.

Bio-Ethanol in Transportation Sector

3.

Bio-Diesel in Transportation Sector

Thailand's Renewable Energy Policy and Plan

Thailand's 10-Year Alternative Energy Development Plan (Y2012-2021)

Committed to the development of low-carbon society

Government Funding On R & D & D Activities

Alternative Energy Development Plan (AEDP : 2012-2021)

Private-Led Investment

Target 25 % of RE in Total Energy Consumption by Y 2021
(as of end-2013, RE's share of Total Energy Consumption = 10.9 %)

Solar	Wind
3,000 MW	1,800 MW
100 ktoe	
4,800 MW , 100 ktoe	

Bio-Energy		
Biomass	Biogas	MSW
4,800 MW	3,600 MW	400 MW
8,500 ktoe	1,000 ktoe	200 ktoe
8,800 MW , 9,700 ktoe		

Bio-Fuel		
Ethanol	Biodiessel	2 nd gen
9 ML/Day	7.20 ML/Day	3 ML/Day

Hydro	
Mini	Micro
324 MW	

New-Energy	
Tidal wave	Geothermal
2 MW	1 MW
3 MW	

Bio-Ethanol in Transportation Sector

Biofuels in Transportation Sector



Ethanol



Biodiesel



Bio-Jet fuel

Gasohol



ULG
(Unleaded Gasoline)

+



Ethanol

Ethanol can be produced from fermentation of various feedstock



Cassava



Sugarcane



Molasses



Maize



Gasohol



Current status of Bio-Ethanol



Molasses



Cassava

**AEDP Target
2021**

**Ethanol
uses**

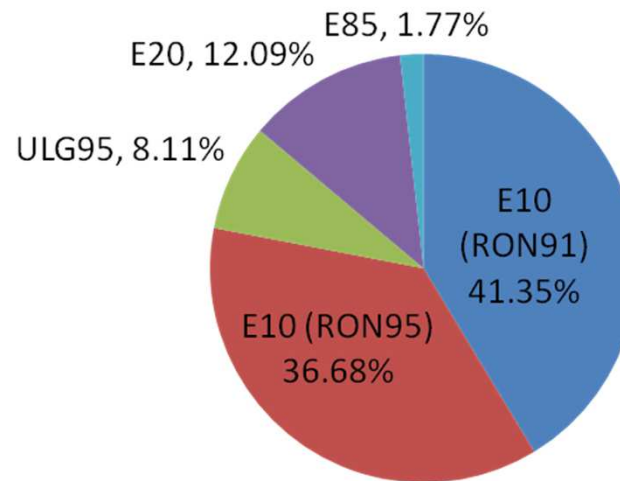
**9×10^6
L/day**

Current level

**Ethanol
uses**

**2.60×10^6
L/day**

**Gasoline blended
(Gasohol)**



91.9%
**Market share
Of "Gasohol"**

Interesting facts

- Plenty of energy plants, cassava and sugarcane : for ethanol production system
- Promote plan of action to increase the usage of ethanol in transportation sector
- Amending the laws and regulations to support ethanol free trade in AEC 2015

Ethanol Production Situation

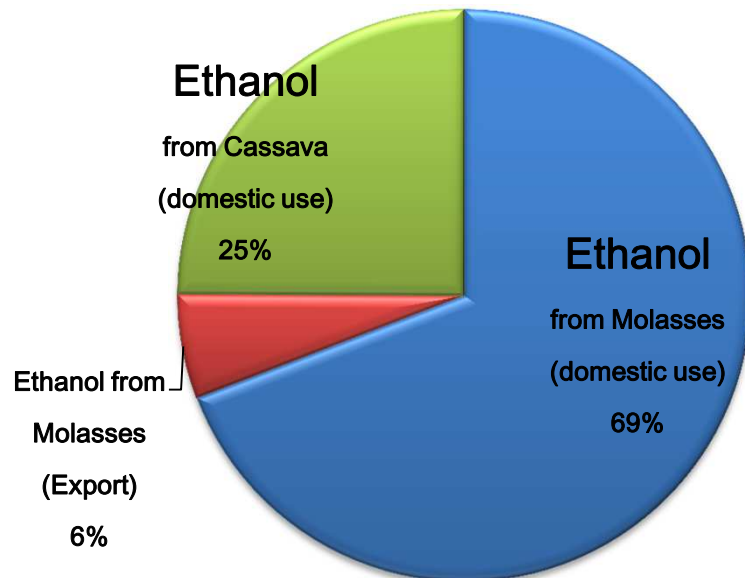


1. Molasses
Sugarcane plantation area
= ~ 1.34 M hectares
= ~ 5.2% of Thailand's
Plantation area



2. Cassavas
Cassava plantation area
= ~ 1.28 M hectares
= ~ 4.9% of Thailand's
Plantation area

Estimation of Ethanol Production Ratio in 2013



Ethanol Production in 2013 = 1,024 MI

- Domestic use 963 MI (2.64 MI/day)
- Export 61 MI (0.17 MI/day)



Molasses Usage 3.20 M tons

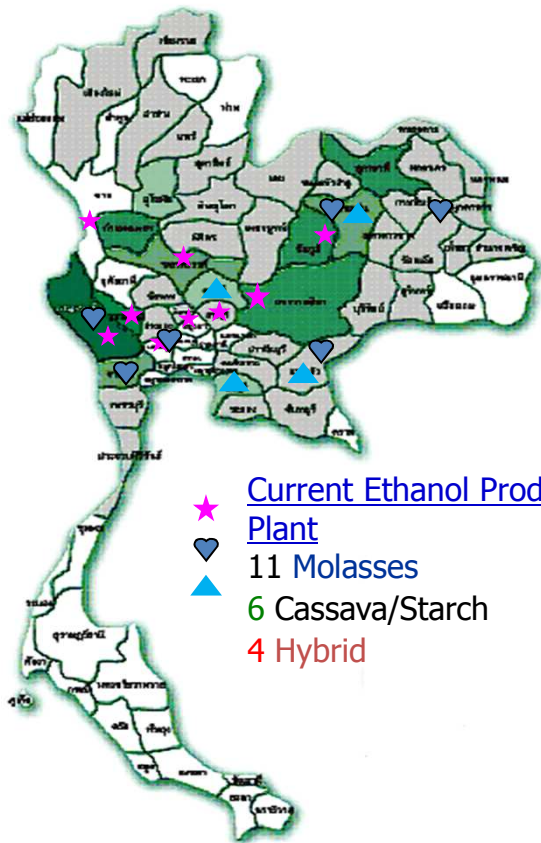


Cassava Usage 1.60 M tons

Production Capacity

Total 4.19 M litres/day

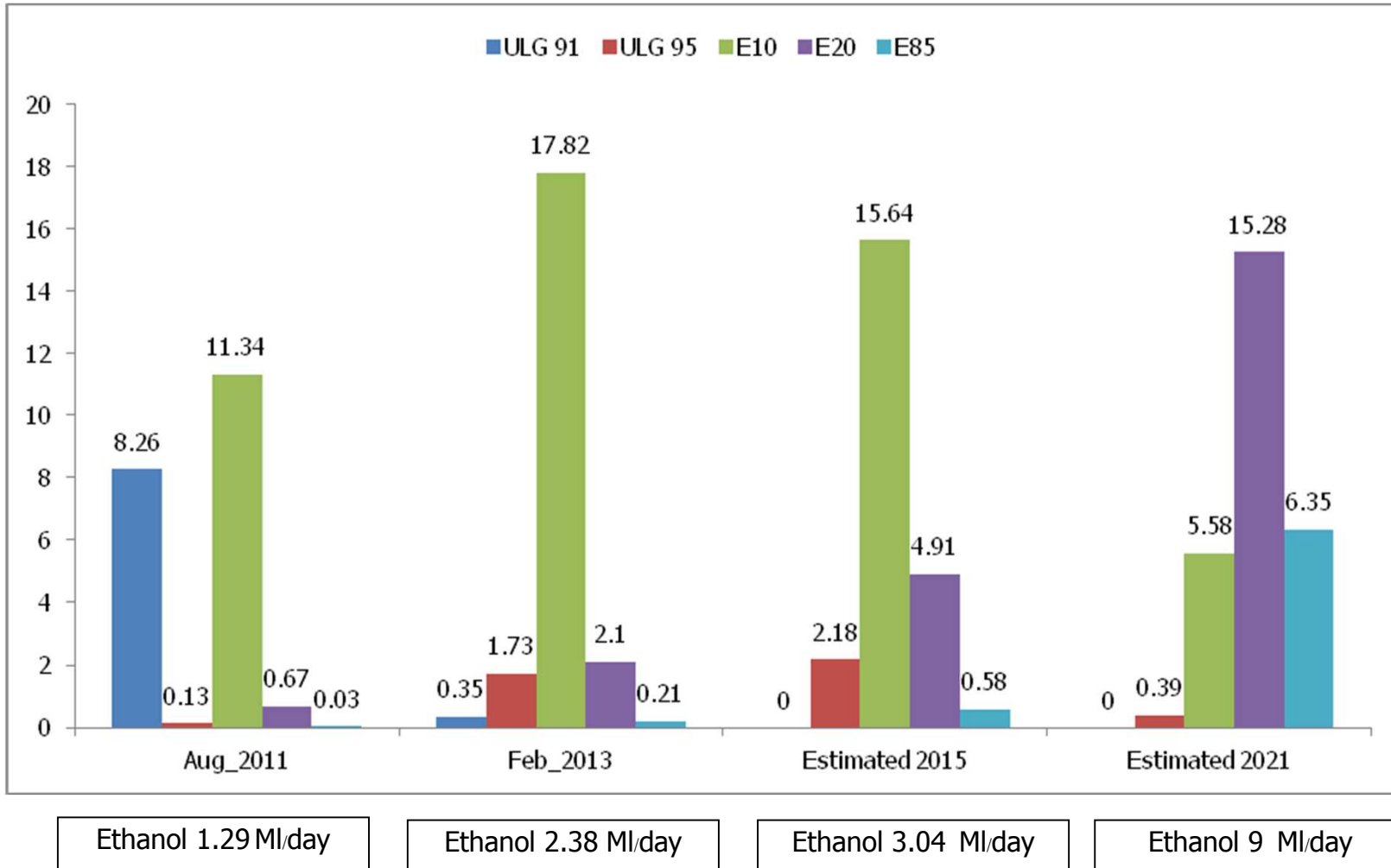
increase 0.30 MI/day from 2012



Raw material	Installed Capacity (MI/day)
Molasses (11 plants)	2.21
Cassava (6 plants)	1.28
Hybrid (4 plants)	0.7
Total (21 plants)	4.19



Estimated Ethanol use



Measures for Supporting Ethanol



- Phase out ULG 91 in Jan.2013
- Promote E10 uses in Motorcycle



- Promote E20 cars by tax incentive (reduce tax 5% than E10)
- ↑ E20 gas stations coverage
- ↑ E20 price competitiveness
pricing E20 lower than E10 by 8% since 2012
- Promote E20 awareness



- Promote E85 cars by new tax rate by 2016
- Promote E85 awareness

Fuel access and price

- ↑ E85 gas stations coverage
- ↑ E85 price competitiveness
pricing E85 lower than E10 by 30% since 2009

Vehicles

- Flex fuel vehicles (FFV) incentives
- Evaluate FFV conversion kits
- Evaluate E85 uses in motorcycles

Way forward

Upstream

- Coordinate with Ministry of Agriculture to improve energy crop yield ex. sugarcane , cassava
- Promote higher efficiency in production process



**Lower
production
cost**

Midstream

- Coordinate with related organization to regulate efficiently ex. The Excise Department
- Develop infrastructure to cut down on logistic cost



**Lower
Logistic cost**

Downstream

Oil price management

Encourage FFV

Increase gas station

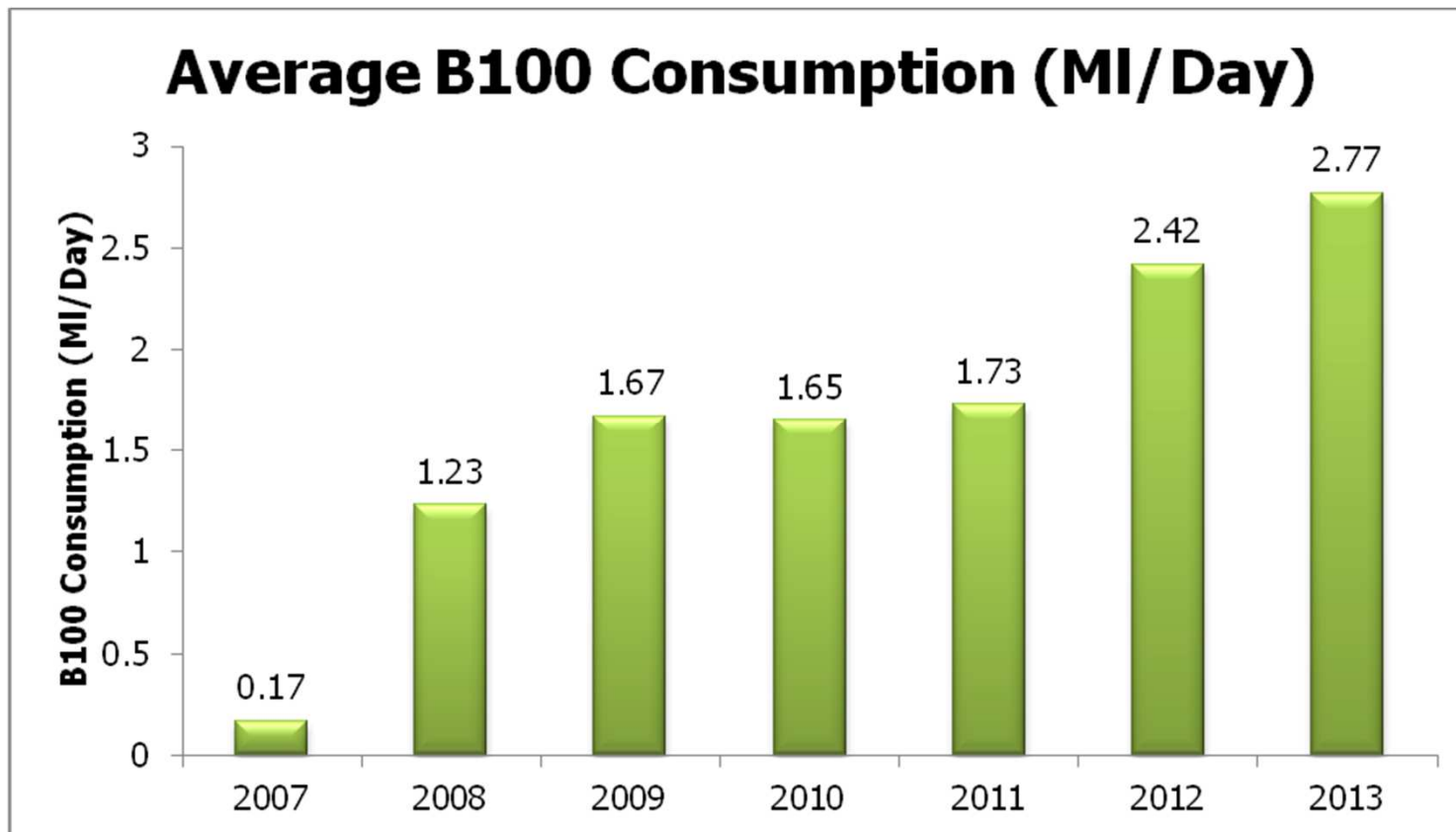
Public relations

**Increase
Ethanol
Usage**

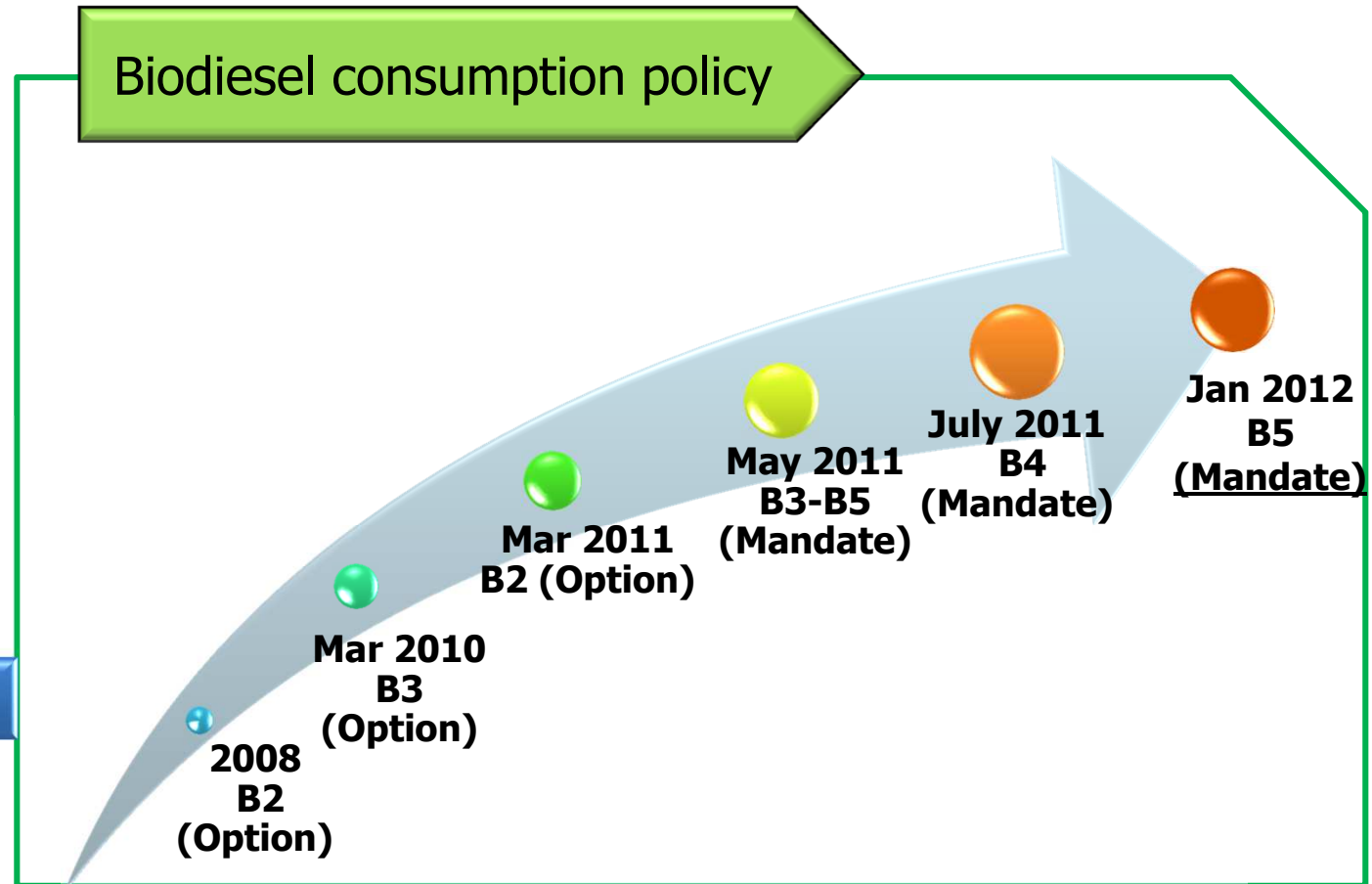
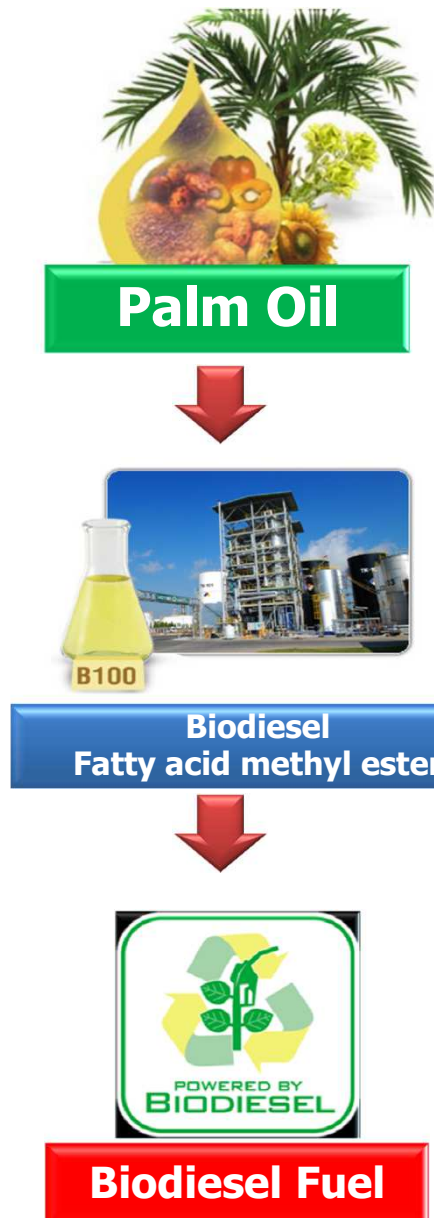


Bio-Diesel in Transportation Sector

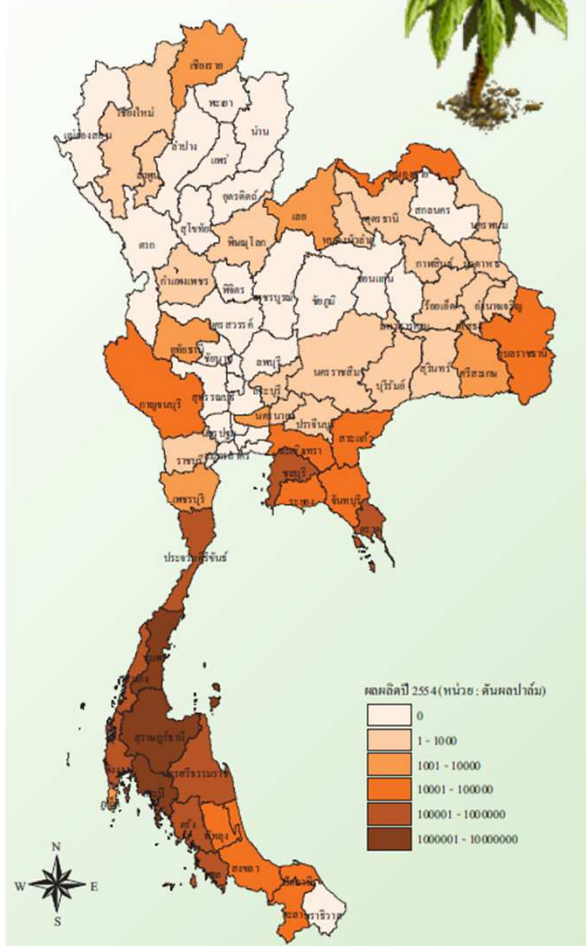
Current status of Biodiesel



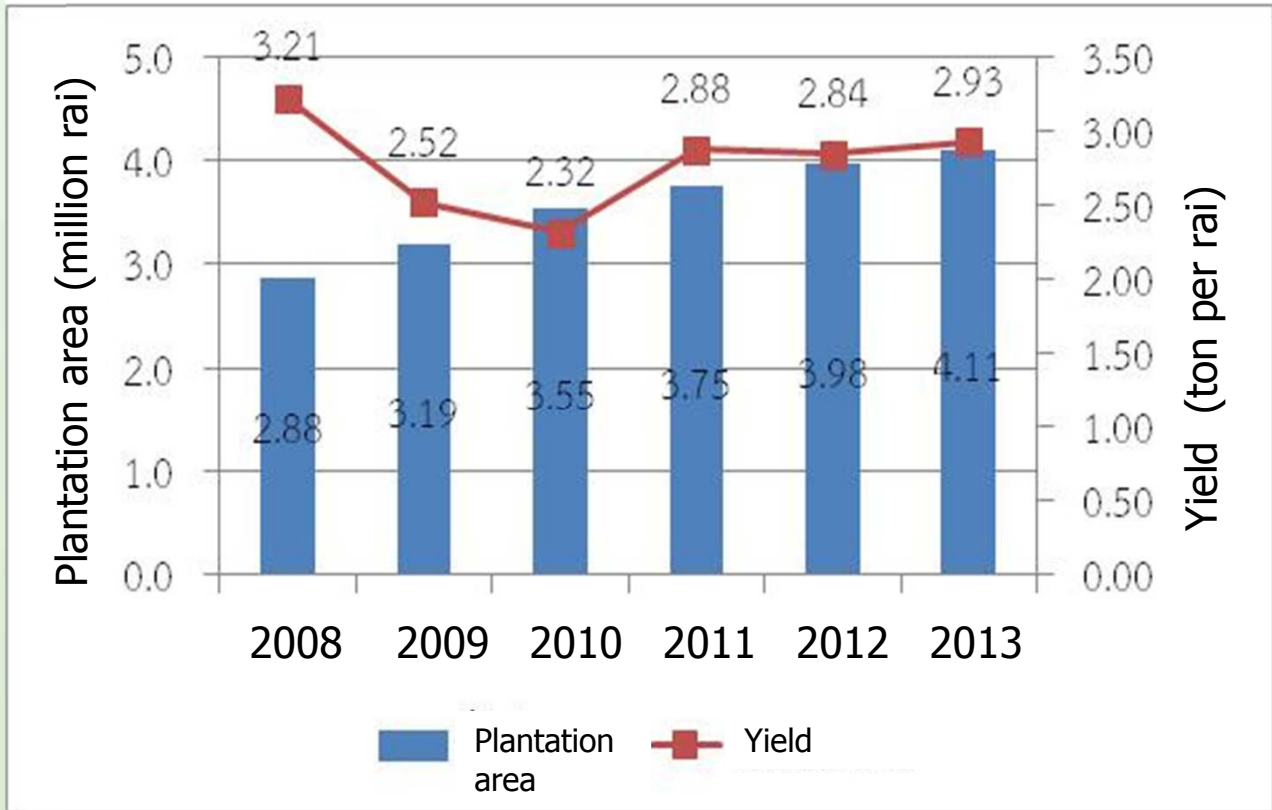
Source : Department of Energy Business , Ministry of Energy



Dept. of Energy Business has announced policy
⇒ **Biodiesel B5 (5% B100 blended)**
⇒ **since January 2012**



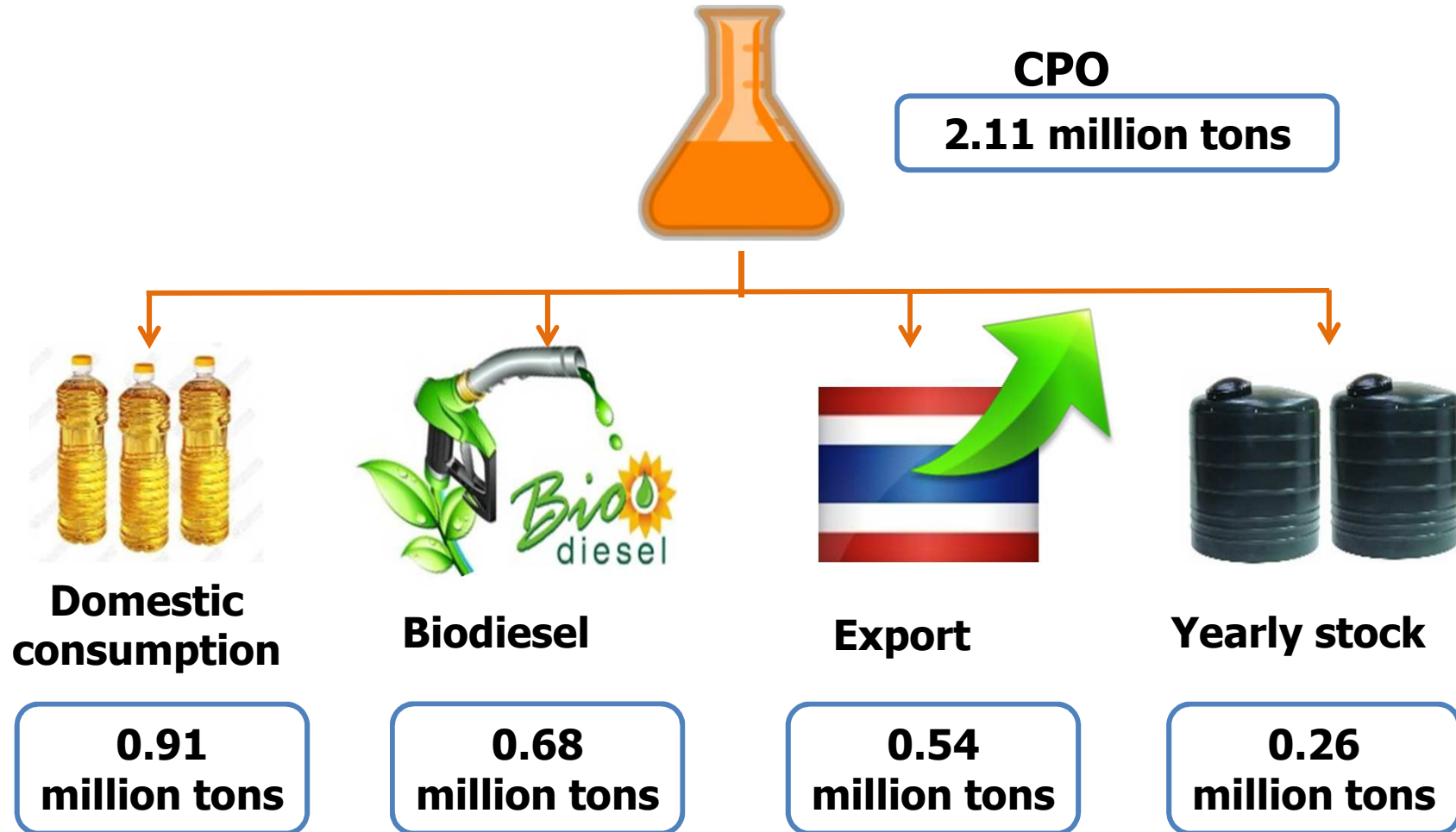
**Plantation Area and Average yield per rai
(1 hectare = 6.25 Rai)**



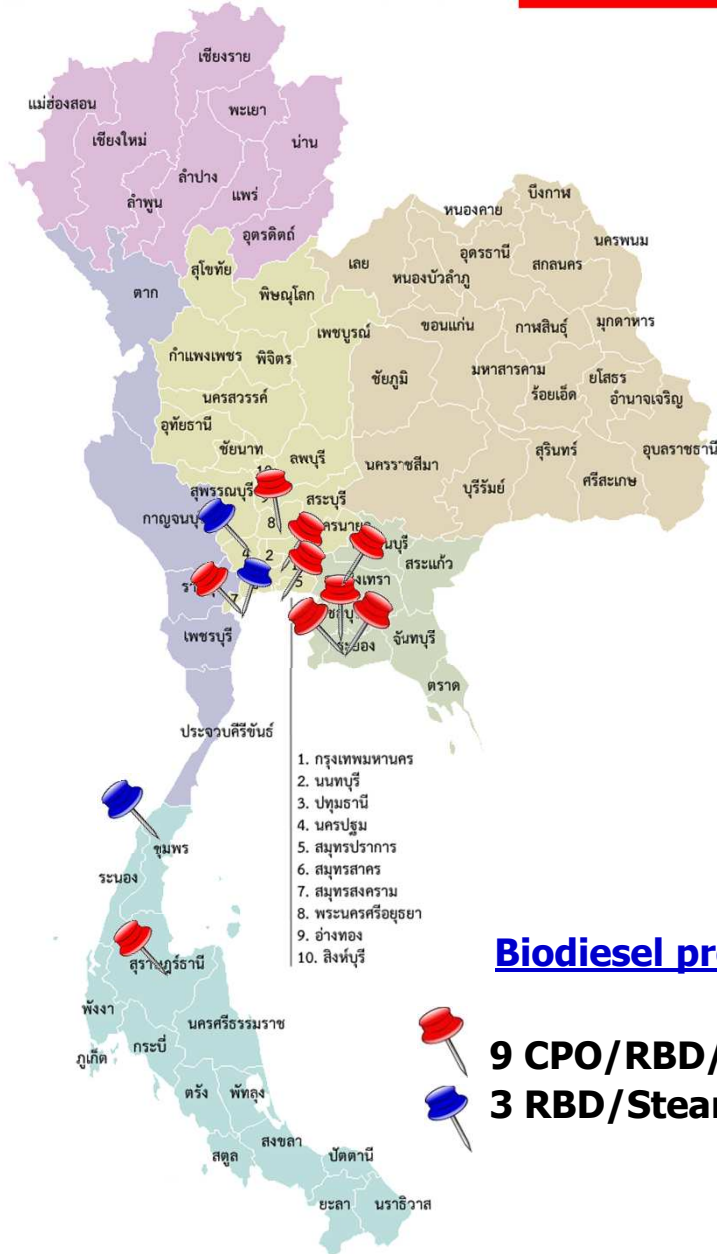
Palm Oil Plantation Area

Source : Office of Agricultural Economics 2013

Palm Oil Use in Thailand



Biodiesel production factory

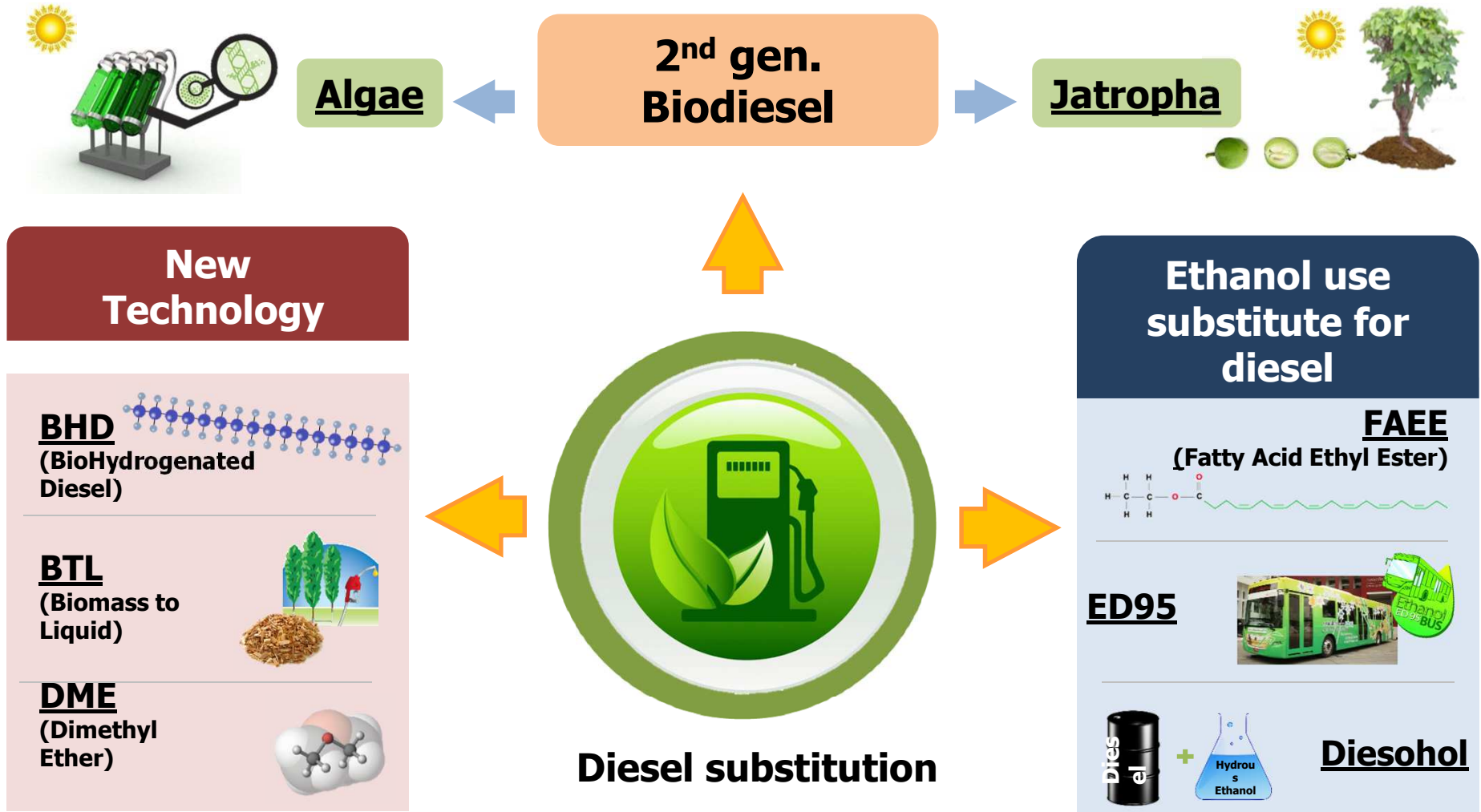


Raw material	Registration	
	factory	Capacity (ML/day)
CPO/RBDPO/Stearin	9	4.46
RBDPO/Stearine	3	0.50
Total	12	4.96

Source - Department of Energy Business, Mar 2013

**Current biodiesel
production capacity is
4.96 ML/day**

2nd gen. Biodiesel R & D



Biodiesel (FAME)

- **Ministry of Energy** has announced B7 from 1st January 2014

Bio-Hydrogenated Diesel (BHD)

- **Ministry of Energy** encourage BHD production factories and promote BHD use 1 million litres per day within 2017
- **Department of Energy Business** Regulate BHD Standard
- **Energy Policy and Planning Office** Restructure BHD price
- **Department of Alternative Energy Development and Efficiency** coordinate overall palm oil management

Government agencies Cooperation

M.of Agriculture
and cooperatives

Develop yield and increase oil content

Ministry of
Commerce

Palm Oil Stock Management and coordinate with DEDE

M. Of science
and Technology

Develop technology for alternative raw material
Ex. Algae , Jatropha and Develop 2nd generation
technology in order to lower production cost



Thank you for Your attention