Thailand Biofuel policies

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Energy situation in Thailand

Primary Energy Consumption (2013)

- Natural Gas: 45.75%
- Fuel: 36.30%
- Coal/Lignite: 15.63%
- Hydropower: 2.33%

Energy Import (Million Baht)

- Coal/Lignite: 39,733
- Natural Gas: 146,994
- Electricity: 20,168
- Refine Oil: 146,944
- Crude Oil: 1,073,000

Remark – In 2013 Thailand exported crude oil worth 30,297 million baht, refined oil 322,621 million baht and Electricity 4,348 million baht

- 2013 Thailand GDP = 11.897 Trillion baht (NESDB, 2014)

Source – Ministry of Energy, 2014

(Equivalent to 2 million Barrels of crude oil)
Alternative Energy Development Plan

**AEDP**
(2012 - 2021)

- **Solar & Wind**
- **Hydro power**
- **Bioenergy**
- **New energy**

**Target** - 25% of RE in total energy consumption by 2021

**Total electricity target** 13,927 MW

**Total heat target** 9,800 KToe

**Biofuel targets**

<table>
<thead>
<tr>
<th>Biofuel</th>
<th>Ethanol</th>
<th>Biodiesel</th>
<th>Advanced biofuel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9 ML/day</td>
<td>7.20 ML/day</td>
<td>3 ML/day</td>
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</tbody>
</table>
Bioethanol – Target 9 ML/day

Thailand Ethanol Feedstock

**Sugarcane**
- Area 8.3 M.Rai
- Yield 12.1 T/Rai/Year
- Output 100 MT

Molasses 4.6 MT

**Cassava**
- Area 8.65 M.Rai
- Yield 3.5 T/Rai/Year
- Output 30.2 MT

**Ethanol**
- 0.76 MT
- 57 ML
- 629 ML (2.6 ML/day)
- 263 ML

Domestic uses
- Ethanol 2.63 MT
- Export 0.55 MT
- 1.42 MT

Export
- Ethanol 2.63 MT
- 25.28 MT
- 0.76 MT

1 Hectar = 6.25 Rai
# Bioethanol – Target 9 ML/day

## Thailand Production Capacity

<table>
<thead>
<tr>
<th>Feedstock</th>
<th>No. of plants</th>
<th>Total cap. (ML/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molasses</td>
<td>11</td>
<td>2.41</td>
</tr>
<tr>
<td>Cassava</td>
<td>6</td>
<td>1.68</td>
</tr>
<tr>
<td>Molasses and Cassava</td>
<td>4</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>21</strong></td>
<td><strong>4.79</strong></td>
</tr>
</tbody>
</table>

**Current Ethanol Production Plant**
- 11 Molasses
- 6 Cassava/Starch
- 4 Hybrid
Bioethanol – Target 9 ML/day

Gas stations and Vehicles

- E20 stations
- E85 stations

E10 stations are well spread over Thailand

Most cars manufactured since 1995

Most cars manufactured since 2008

All Flex fuel cars (FFV)
Bioethanol – Target 9 ML/day

Ethanol usages

Ethanol usage
ML/day

Phase out ULG 91
(Start Jan 2013)

Source - department of energy business
Bioethanol – Target 9 ML/day

Ethanol policies

**Upstream policy**
- **Yield**
  - Increase feedstock plants’ yields

**Midstream policy**
- **Law & Regulations**
  - Improve related law and regulations

**Downstream policy**
- **Price structure**
  - Manage price structure to give E20/E85 incentives
- **Gas stations**
  - Increase E20/E85 gas stations
- **PR**
  - Continuously raises people awareness of E20/E85
- **E85 cars**
  - Increase incentive for E85 cars using tax structure
Biodiesel – Target 7.2 ML/day

Dept. of Energy Business has announced policy
⇒ Biodiesel B7 (7% B100 blended)
⇒ since January 2014
Biodiesel – Target 7.2 ML/day

Biodiesel policies

There are only some certain area suitable for oil palm plantation in Thailand (e.g. such as Southern and Eastern part)

Oil palm plantation = ~ 7,520 sq.km
= ~ 4.77% arable land in Thailand

CPO 2013
2.13 MT

Bioo consumption 2.88 ML/day
No CPO Import

Domestic Consumption
0.96 MT

Biodiesel Production
0.77 MT

Export
0.57 MT

Stock at year end
0.20 MT

Source: Department of Internal Trade of Thailand, Ministry of Commerce
# Biodiesel – Target 7.2 ML/day

## Biodiesel production capacity

<table>
<thead>
<tr>
<th>Feedstock</th>
<th>Registered capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of factories</td>
</tr>
<tr>
<td>CPO/RBDPO/Palm stearin</td>
<td>9</td>
</tr>
<tr>
<td>Palm stearin</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11</strong></td>
</tr>
</tbody>
</table>

9 CPO/RBD/Stearine
2 RBD/Stearine
Biodiesel – Target 7.2 ML/day

**Biodiesel usage**

Thailand mandated 7% biodiesel (B7) blend for every liter of diesel sold since Jan 2014

**Average daily usage of biodiesel (B100)**

<table>
<thead>
<tr>
<th>Year</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>Q1 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usage</td>
<td>0.17</td>
<td>1.23</td>
<td>1.67</td>
<td>1.65</td>
<td>1.73</td>
<td>2.42</td>
<td>2.88</td>
<td>2.98</td>
</tr>
</tbody>
</table>

Source - Department of energy business
Biodiesel – Target 7.2 ML/day

Biodiesel policies

Biodiesel

• Ministry of Energy launched B7 beginning in Jan 2014

Advanced Biofuel to replace diesel

Synthetic Fuel Technology

- **BHD** (Biohydrogenated Diesel)
- **BTL** (Biomass to Liquid)
- **DME** (Dimethyl Ether)

Replacing petroleum diesel

Ethanol Substitution for Diesel

- **FAEE** (Fatty Acid Ethyl Ester)
- **ED95**
- **Dieselol**
BIOFUELS

BETTER FOR PEOPLE BETTER FOR THE WORLD

Thank you