Update of biodiesel specifications in Thailand

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The 2nd APEC Workshop on Guidelines toward High Biodiesel Blend Diesel (eg B20) Specification in the APEC Region

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Outline

• Overview of biodiesel policy in Thailand
• Development of biodiesel specification
• Current initiative for biodiesel blend higher than 7%
Thailand Energy Masterplan

- EEP: Energy efficient Plan (Cabinet approve in Oct. 6, 2015)
- AEDP: Alternative Energy Development plan (Cabinet approve in Oct. 27, 2015)
- Gas plan (Cabinet approve in Oct. 27, 2015)
- Oil plan (Cabinet approve in Oct. 27, 2015)

TIEB
THAILAND INTEGRATED ENERGY BLUEPRINT
AEDP 2015 Targets - Biofuel

**Fuel**

2036 RE Biofuel targets

8,712 ktoe*  
(25.04% of fuel demand)

2016 biofuel usage

1,742 ktoe

- **Ethanol**
  - 2016 usage: 3.67 MLPD

- **Biodiesel**
  - 2016 usage: 3.37 MLPD

- **Pyrolysis oil**
  - 2016 usage: 0.53 MLPD

- **Compressed Biogas (CBG)**
  - 2016 usage: 4,800 TPD

Remark: * ktoe equivalent of biofuel
Related Policies

**2016**
- Phase 2 Thailand excise tax scheme for B10 diesel eco-car
  - Excise tax rate at 12% starting from 1st Jan 2016

**2018**
- Completion of double-track railway infrastructure

**Option B10**
- 2016: 17, 18, 19, 20, 21, 22, 23, 24, 25, 2026: 27, 28, 29, 30, 31, 32, 33, 34, 35, 2036

**B10 Promotion**
- Develop diesel-substitution fuel (both traditional and advanced) in terms of both feasibility and economically
- Develop higher % biodiesel compatible vehicles
- Promote B10 as an optional alternative fuel (Price incentive/Service coverage/Quality control)
- Tax incentives for vehicles that use high % biofuel (2026)
- Mandate B10 (2026)
- Promote B10 usage in transport and industrial sectors
- Promote B100 usage in agricultural machineries

**B20 Promotion**
- Develop and improve new feedstock
- Promote production of advanced biofuel that can be commercially blended in higher percentage
- Promote consumption of higher-blend biodiesel as an optional alternative (Service coverage/Quality Control)
- Excise Tax incentives for vehicles that use high % biofuel
- Promote consumption of biofuel-blended fuel in both transport and industrial sectors
Biodiesel Action Plan

- Increase yield & efficiency of oil palm production - Ministry of Agriculture & Cooperatives
- Implementing excise tax scheme for B10 diesel vehicles - MoF
- Promotion of B10 as an optional alternative fuel (Gas station coverage, Price incentive, Public awareness promotion)
- B10 Specifications Establishment (DOEB) & Price Structure (EPPO)
- B10 utilization test for personal pickup project
- B20 utilization promotion in large truck project
- Pilot study of commercial B100 utilization in agricultural machines project
- H-FAME Development (Production and utilization)
- Public perception/acceptance of using higher % biodiesel campaign
Promotion of B10 as an optional alternative fuel

Common Diesel Car → B7 diesel (Primary)
- 2010 study: common-rail pickups can use B10
- 2015 study: more B10 test on non common-rail cars

Eco-car <1500cc → B10 diesel (Optional)

Key Success Factors:
- B10 specification (DOEB)
- Appropriate price structure (EPPO)
- Gas station coverage (DOEB)
- Public Acceptance (DEDE)
- H-FAME biodiesel upgrade
- Biofuel industry investment promotion

B10 Eco-Car (Excise tax 2016)

B10 Tax Policy Promotion (Ministry of Finance)
Thai biodiesel specification

- Following EN14214 standard
- 1st B100 specification issued in 2005 (for B0 & B5)
  - Oxidation stability > 6 hr, MG < 0.8%wt, water < 0.05%wt
- Revised B100 specification in 2007 (for B2 & B5)
  - Change method:
    ✓ Water from ASTM D2709 to EN ISO12937
    ✓ Total contaminate from ASTM D5452 to EN12662
- Revised B100 specification in 2009 (for B2 & B5)
  - Oxidation stability > 10 hr,
- Mandate blending of B3~5 in 2011
- Mandate blending of B5 in 2012
- Revised B100 specification in 2013
  - MG < 0.7%wt
- Mandate blending of B7 in 2014
Recent problem with too much palm oil stock

- Thai palm oil board chaired by Deputy Prime Ministry has the following resolution to reduce palm oil stock
  - Ministry of Commerce facilitating palm oil export
  - Ministry of Energy increasing B100 stock (from 23 to 63 ML) & finding additional use of biodiesel

- B10 usage in Thai train
  - Joint effort between PTT and SRT (State Railway of Thailand)
  - 6 month trial with BaanLaem-MaeKlong route (Feb – Jul 2018)
  - Estimated 36,000L of B10 will be consumed
National B10 Project

Biodiesel upgrading: H-FAME

Testing of B10 from H-FAME

1. %MG from precipitation test
2. Fuel quality survey
3. TT of H-FAME to local BDF producers
4. Materials compatibility with B10
5. 100,000km on-road test with B10/H-FAME
6. Large-scale demon with B10/H-FAME
Progress of B10 project

• Quality of B100 for B10 on-road test
  – Monoglyceride < 0.4 wt%

• Fuel quality survey
  – Quality of both B100 and diesel (< B7) from production to fuel station are maintained at standard

• 1 ton/day production facility of upgraded B100 (with monoglyceride < 0.4 wt%) is under construction

• Materials compatibility test on rubber/plastic parts to be conducted

• Eight 1-ton pick up trucks to be tested at 100,000km
  – 2 brands: Isuzu & Toyota
  – For each brand, 4 fuels to be test:
    ✓ B7 with conventional FAME
    ✓ B10 with conventional FAME
    ✓ B10 with conventional FAME of low MG (< 0.4 wt%)
    ✓ B10 with H-FAME (MG < 0.4 wt%)
Conclusion

- Thai government aims to promote the usage of biodiesel from palm oil surplus from edible oil consumption
- Biodiesel usage becomes significant fraction of total palm oil production (now similar amount to edible oil consumption)
- Target of B10 is in national plan with current testing efforts among related stakeholders (oil producer, biodiesel producer and car makers)
- Upgrading biodiesel may be a way to gain acceptance from car makers in implementing B10
Thank you