Competitiveness Issues on Palm Oil Biodiesel

The 3rd Bioenergy Week 2015, GBEP
25th-29th of May 2015
Medan, Indonesia

Paulus Tjakrawan
Indonesia Biofuels Producer Association
The Outline

- Fossil Fuel and Biofuel Industry
- Indonesia Government Policy
- Palm Oil and Biodiesel Industry
- Development
- The Competitiveness
- Challenges and Conclusions
Population, Income and Fuel Consumption Comparison Chart

Source, World Fact, CIA 2014
Oil Reserve and Production Ratio

Total world proved oil reserves reached 1687.9 billion barrels at the end of 2013, sufficient to meet 53.3 years of global production. The largest additions to reserves came from Russia, adding 900 million barrels and Venezuela adding 800 million barrels. OPEC members continue to hold the majority of reserves, accounting for 71.9% of the global total. South & Central America continues to hold the highest R/P ratio. Over the past decade, global proved reserves have increased by 27%, or over 350 billion barrels.

Source. BP 2014
Indonesia Oil and Condensate Production

Source, MEMR 2013
World biofuels production increased by 6.1% in 2013. Increased biofuels output in North America, South and Central America and Asia Pacific outweighed declines in Europe and Eurasia. Global ethanol production increased 6.1%, the first increase in two years. Biodiesel production increased 6.2%, despite declines in South and Central America and Europe and Eurasia.

Source: BP 2014
Figure 3.3. Development of the world biodiesel market

Source: OECD and FAO Secretariats.
The Outline

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- Palm Oil and Biodiesel Industry
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Kebijakan Energi Nasional

**KONDISI SAAT INI**

- **Coal**: 29.4%
- **Gas**: 23.6%
- **Oil**: 41.4%
- **EBT**: 5.6%

**ENERGY ELASTICITY = 1.65**
**NON FOSSIL ENERGY SHARE ≈ 5%**

- **BAURAN ENERGI NASIONAL**: 1176 MIL BOE.
- **RATA-RATA PERTUMBUHAN KONSUMSI ENERGI**: 7% PER TAHUN
- **ELASTISITAS ENERGI = 1.65**
- **ENERGI NON FOSIL (EBT) ≈ 5%**

**by 2025**
- **EBT**: 23%
- **Bioenergi**: 10%

**by 2050**
- **EBT**: 31%
- **Bioenergi**: 14%

**Catatan:**
Berdasarkan draf of Rancangan Peraturan Pemerintah tentang Kebijakan Energi Nasional yang telah disetujui oleh DPR dan dalam proses penandatanganan oleh Presiden RI sebagai pengganti Perpres No. 5/2006.
# Biofuels Mandatory

As Energy and Mineral Resources Minister Regulation No. 12, 2015

<table>
<thead>
<tr>
<th>BIODIESEL B100, Minimum</th>
<th>Apr-15</th>
<th>Jan-16</th>
<th>Jan-20</th>
<th>Jan-25</th>
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<tbody>
<tr>
<td>Household</td>
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<td>Not Decided Yet</td>
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<tr>
<td>Small/Micro Ent. Fishery, Agriculture and Transportation (PSO)</td>
<td>15%</td>
<td>20%</td>
<td>30%</td>
<td>30%</td>
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<tr>
<td>Transportation Non PSO</td>
<td>15%</td>
<td>20%</td>
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<tr>
<td>Industry</td>
<td>15%</td>
<td>20%</td>
<td>30%</td>
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<tr>
<td>Power Gen.</td>
<td>25%</td>
<td>30%</td>
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<thead>
<tr>
<th>BIOETHANOL E100, Minimum</th>
<th>Household</th>
<th>Small/Micro Ent. Fishery, Agriculture and Transportation (PSO)</th>
<th>Transportation Non PSO</th>
<th>Industry</th>
<th>Power Gen.</th>
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<tr>
<td></td>
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<td>1%</td>
<td>2%</td>
<td>5%</td>
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<td>From Total Demand</td>
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<td>From Total Demand</td>
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<thead>
<tr>
<th>BIOOIL O100, Minimum</th>
<th>Household</th>
<th>Industry &amp; Transportation (Low &amp; medium speed engine)</th>
<th>Air Transport</th>
<th>Power Gen.</th>
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<td>Industri</td>
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From Total Demand
# Projection Needs of Biofuel (M KL)

Based on Minister MEM Decree, 12, 2015

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<tbody>
<tr>
<td>Diesel Fuel Demand</td>
<td>34.00</td>
<td>36.72</td>
<td>39.66</td>
<td>42.83</td>
<td>46.26</td>
<td>49.96</td>
<td>53.95</td>
<td>58.27</td>
<td>62.93</td>
<td>67.97</td>
<td>73.40</td>
<td>79.28</td>
</tr>
<tr>
<td>Gasoline Demand</td>
<td>26.00</td>
<td>28.08</td>
<td>30.33</td>
<td>32.75</td>
<td>35.37</td>
<td>38.20</td>
<td>41.26</td>
<td>44.56</td>
<td>48.12</td>
<td>51.97</td>
<td>56.13</td>
<td>60.62</td>
</tr>
<tr>
<td>Bioethanol Demand</td>
<td>0.26</td>
<td>0.28</td>
<td>0.61</td>
<td>0.66</td>
<td>0.71</td>
<td>0.76</td>
<td>2.06</td>
<td>2.23</td>
<td>2.41</td>
<td>2.60</td>
<td>2.81</td>
<td>12.12</td>
</tr>
</tbody>
</table>

Source, APROBI
Government Supporting Regulations

1. National Quality Standard (SNI) for Biodiesel No. 04 – 7182 – 2012
3. Director General for Oil and Gas Decree No. 3674K/24/DJM/2006 on Gasoline Specification for Domestic Market, could be mixed with max 10% Bioethanol
4. Director General for Oil and Gas Decree No. 3675K/24/DJM/2006 on Diesel Fuel Specification for Domestic Market, could be mixed with max 10% Biodiesel
5. Minister Energy and Mineral Resources Regulation No. 32, 2008 for Biofuel Producers and Mandatory to utilize the Biofuel.

Sources, MEMR
The Outline

- Fossil Fuel and Biofuel Industry
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- **Palm Oil and Biodiesel Industry**
- Development
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## Balanced of Indonesian Palm Oil Production

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<tbody>
<tr>
<td>CPO Productions</td>
<td>27,615</td>
<td>28,500</td>
<td>31,000</td>
<td>31,500</td>
</tr>
<tr>
<td>CPKO Productions</td>
<td>2,900</td>
<td>3,000</td>
<td>3,300</td>
<td>3,600</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30,515</strong></td>
<td><strong>31,500</strong></td>
<td><strong>34,300</strong></td>
<td><strong>35,100</strong></td>
</tr>
<tr>
<td>Domestic Consumption</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food &amp; Non Food</td>
<td>6,400</td>
<td>6,600</td>
<td>6,800</td>
<td>6,900</td>
</tr>
<tr>
<td>Biodiesel</td>
<td>669</td>
<td>1,006</td>
<td>1,600</td>
<td>2,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7,069</strong></td>
<td><strong>7,606</strong></td>
<td><strong>8,400</strong></td>
<td><strong>9,400</strong></td>
</tr>
<tr>
<td><strong>EXPORT (Food, Non Food &amp; Biodiesel)</strong></td>
<td><strong>23,446</strong></td>
<td><strong>23,894</strong></td>
<td><strong>25,900</strong></td>
<td><strong>25,700</strong></td>
</tr>
</tbody>
</table>

Sources, GIMNI, Oil World
Biofuel Industries & The Capacity

- **Biodiesel**
  - 23 Companies
  - Feedstock, Palm Oil
- **Ethanol**
  - 13 Companies
  - Feedstock, Molasses & Cassava

**Prospect, 2016 Biodiesel Production Capacities, 8 M kl**

Source, APROBI
Biodiesel Production

Source, Pertamina, EBTKE
Palm Oil Production and Projection

2011 Palm Oil
• Production 23Mton
• Domestic used 6Mton
• Export 17Mton

2015 Palm Oil (Projection)
• Production 30Mton
• Domestic 10Mton
• Export 20Mton

2020 Palm Oil (Projection)
• Production 40Mton
• Domestic 13Mton
• Export 27Mton
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Biodiesel Fact 2014

- **B10 Domestic Utilization**: 1,697 M kl / 10,245 m barrel*
- **Reduced Import of Diesel Fuel**: 15.5%
- **Upstream sector Workforce**: 180,000
- **Reduction of Greenhouse Gas Emissions**: 4,358,518 (-7%)
- **Exporting Capabilities 2014**: 4,509 Mil kl

Sources, APROBI, US EPA

• Assumption of 2013 Diesel Fuel demand is 30 m kl
Biodiesel Prospective 2015

B15 Domestic Prospective Utilization,
2,55 M kl/ 16 M barrel*

Reducing Imports of Diesel Fuel,
24,3%

Upstream sector Workforce,
185,000

Reduction of Greenhouse Gas Emissions,
10 M Ton (-10%) CO2, Eq.

2015 Export Capabilities
4,3 M kl

Sources, APROBI, US EPA

• Assumption of 2013 Diesel Fuel demand is 34 m kl
Implementation

- **Diesel fuel PSO (Public Service Obligation)**
  - B10 Biodiesel, in Jawa, Madura, Bali, Sumatra islands
  - B15, 2015

- **Diesel fuel Non PSO**
  - 2014 Minimum B10
  - B15, 2015

**B20 ROAD TEST**

- Under the coordination of Directorate General New and Renewable Energy, the road test of 40,000 kilometer was done in West Java Province.
- It is continuing till 100,000 km by some Car manufactures
- Involving some brands and models of vehicle.
Indonesia Biofuels Industry Outlook
To develop the Advanced Biofuels

- **Product**
  - Bio Butanol
  - Bio Jet Fuel, Bio Avtur
  - Hydrogenated Biodiesel
  - Biomass-based Biofuels
- **Feedstock**
  - Cellulose, hemicellulose, or lignin
  - Micro algae
  - Biomass, Crop residue
- **Technology**
  - Unique technologies and processes that transform a wide range of plant, waste, and cellulosic molecules into hydrocarbon molecules like those produced at conventional refineries
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*All oils usage in bio-fuels production have increased more than nine-fold.*
*Since 2003/04, palm oil’s usage in bio-fuels production has gone from zero to 1.8 million tons.*
*15% of all oil is taken out of the food chain due to bio-fuels, causing the need for more palm oil for all uses.*

Source: Oil World
• **Palm/Palm Kernel Oil accounts for 5% of all land in vegetable oil production globally.**
• **Yet, Palm/Palm Kernel Oil amounts to 38% of all vegetable oils produced globally.**

*Palm & Palm Kernel Oil harvested area are combined, as production comes from the same harvested area.*

Source: Oil World
Combined Palm/Palm Kernel Oil yields nearly six times the next highest vegetable oil on a per hectare basis.

Rapeseed Oil produces 0.75 tons per hectare compared to 4.05 for palm/palm kernel oils combined.

Palm/Palm Kernel Oils' yield has steadily increased since 2000/01 from 3.5 to over 4.0 tons per hectare.

Source: Oil World
Crude Oil & CPO Price Comparison Graphic
Vegetable Oil Price Comparison Chart

Source, IndexMundi
Palm Oil Biodiesel Advantages

• Oxidation Stability
  – ASTM D6751-15, 3 Hours
  – EN 14214-2012, 6 Hours
  – SNI 7182-2012, 6 Hours. (Actual value, minimum 15 Hours)

• Indonesia Sustainable Palm Oil (ISPO) Standard
  – Mandatory for Palm Oil Producers
  – There are criteria for the sustainability, including the Methane Capture
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Challenges

- Government consistencies to support the Biofuel development
- Black campaign against the Palm Industries
- Trade Barriers
  - EU Renewable Energy Directive
    - Increasing the GHG emissions saving threshold
    - ILUC
  - Anti Dumping & Anti Subsidy cases by EU
    - EU Self Inflicted Injury, only using less than B6 and 45% of their Biodiesel production capacity.
    - Historically, palm based biodiesel price always lower than Rapeseed based biodiesel and Soy oil
  - Palm Oil Biodiesel Pathway, RFS2 EPA, US
Conclusions

• The Palm Oil is the most Competitive Feedstock for Biodiesel.
• The Indonesia Government has encouraged Palm Oil downstream industries
• Indonesian Biodiesel production installed capacity is currently sufficient for the domestic needs of B15.
• We have done a lot of research, it can be concluded that the Indonesian biofuel eligible to,
  • significantly reducing greenhouse gas emissions and sustainable,
  • employment opportunities,
  • supporting the availability and resilience of the Indonesian energy
• It is needed to have the Government consistency and stake holder supports to implement the Indonesia Bioenergy Program.
• We are facing serious discrimination and trade barriers and we will fight to get a more just trade scheme
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THANKYOU & HAVE A NICE DAY