Ignatius Kristia Adikurnia - Biofuel in Indonesia

Biofuel from palm oil in Indonesia

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Introduction

Biofuels have been gaining popularity because of the increasing oil prices and the growing concern about global warming. It is the only one renewable resources which has a potential to replace fossil fuel. To produce biofuel different resources can be used, for example Brazil is turning sugarcane into ethanol or Indonesia made biofuel from palm oil (Lim et al. 2016).

Description of the product

Biofuel is a kind of transport fuels which is provided in liquid, gaseous and solid form. It is predominantly produced from biomass. Most biofuels are produced from agricultural food crops such as corn and sugar-bets but also from palm oil. There are several advantages of using and producing biofuel for countries. First biofuel is easily available from common biomass sources. It represents a carbon dioxide cycle in combustion and las it has a considerable environmentally-friendly potential. The biggest different between biofuel and petroleum is oxygen content. Biofuels have oxygen levels from 10 % to 45 %. In comparison petroleum is composed of 83% to 85% of carbon (Demirbas 2008).

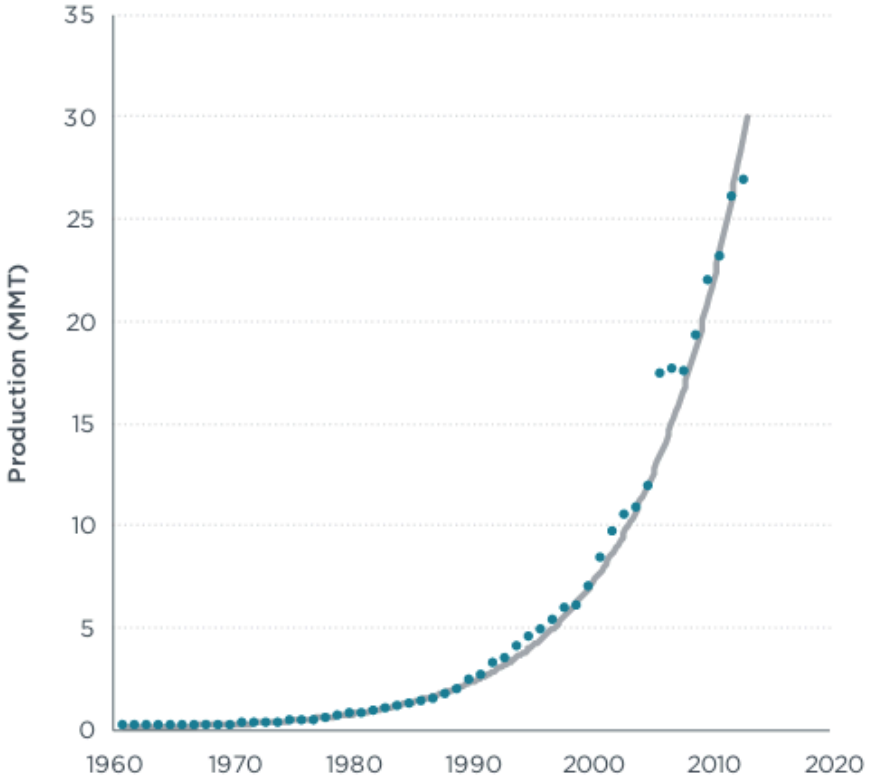
The term “biofuel” includes among others biogas, biodiesel and bioethanol. The last two are the main kinds of biofuel. There exist various technics and methods of production for every kind of biofuel. As agricultural country, Indonesia has a big opportunity to produce biofuel from biomass. With its resources, Indonesia can mainly produce biodiesel (Lim et al. 2016).

Description of the market.

Indonesia started to sell biofuel domestically in 2006 through the state-owned oil company PT Pertamina. This company is the only company who can sell fuel in Indonesia. The biofuel is called BioSolar and is a mix of 2.5% biodiesel and 97.5% mineral diesel fuel. This fuel is now the only diesel fuel available on the market. Biofuel development in Indonesia focused on feedstocks that came from oil palm (Casson et al. 2014). Indonesia is the world’s leading producer of palm oil (Malins et al. 2016).

In 2006 Indonesia also started to sell bioethanol (made from sugarcane molasses or cassava root) and gasoline mixture fuel, but the production deceased in 2010 (Casson et al. 2014).

The expansion of palm oil happened between 1986 to 1998 when the government stimulated private sector investments. In 1997 the economic crises happened in Indonesia, and this led to another encouragement of palm oil plantation expansion because of their profitability. The palm oil industry continues to expand, and by 2011 approximately 9 million ha of oil palm plantations established in Indonesia. The expanding of this industry is happen because of domestic goals for increasing biodiesel blending, but it causes also carbon losses through deforestation and peat degradation (Marlins et al. 2016).



Indonesia palm oil production since 1960 (FAOSTAT, 2016)

source: Kharina A. et al. 2016. *Biofuels policy in Indonesia: Overview and status report.* [availabale from: https://www.theicct.org/sites/default/files/publications/Indonesia%20Biofuels%20Policy_ICCT_08082016.pdf], last access: 28.01.2019.

Indonesia exports almost half of the palm oil products (Malins et al. 2016) and derivatives mainly for food and industrial purposes. It was the only potential bioenergy and biofuel feedstock in late 1990s, when the mineral oil prices increased (Casson et al. 2014).

In 2006, two biodiesel plants with a production capacity of 215 million liter were established in Indonesia. By 2012, the number of biodiesel plant increased to 26 plants with total production capacity of 3.78 million tons. The production capacity of those plants was only 42% of the running capacity, since some companies prefer to produce CPO (crude palm oil) for food rather than for fuel purposes. In 2012, the biodiesel production was 1.6 million tons. Roughly, around 5.5% of Indonesias total oil palm area produced CPO for biodiesel. 72% of the CPO production was exported to China, EU, and US (Casson et al. 2014).

Descriptions of Policy measures

Since 2006, the government promotes the production of biofuel through regulations. They targeted 2% of biofuel energy mix share in 2010 and 5% in 2025. In 2006 the government established a biofuel task force to promote and establish a biofuel industry in Indonesia (Casson et al. 2014). Munthe (2018) reported that since September 1st 2018, all subsidized diesel engine vehicles and heavy machinery are committed to use biodiesel blended fuels.

To increase the total crop plantation area, the government gives farmers and companies access to credit and land leases for plantations. The allowed area for the leases is doubled for those located in Papua. Conversion of forest is permitted when ensuring that the remaining forest cover is sufficient. Conversion of protected forest is also allowed if biophysical conditions are no longer met (Casson et al. 2014).

Incentives in form of subsidies are given primarily to oil palm, sugarcane, corn, sorghum, and cassava farmers. Their income tax is reduced and the government guarantees that there are no operational losses. Foreign investors are allowed to hold 95% of the shares in oil palm plantations. They are encouraged to produce, purchase, sell, export, and import biofuel. By 2020, heavy industries and other commercial sectors are required to use at least 12% biodiesel of their total energy consumption (Casson et al. 2014).

Subsidies and taxes are used to control and promote biofuel consumption and production. Subsidies for consumers to use biofuels have been increased from 1000 IDR/liter in 2009 to 3000 IDR/liter in 2012 and the trend is still increasing (Taylor 2013). Export taxes are used to control domestic supplies of CPO for domestic biofuel production (9% as of 2013).

Evaluation of the measures.

The rising price of CPO encouraged producers in Indonesia to export rather than to produce biodiesel because of the profitability. The high export

tax (25%) was not enough to discourage the practice of exporting. I believe taxation is not a good option for Indonesia. The level of law enforcement for those who are evading taxes is never enough. In 2018 Perkasa (2018) reported that the Indonesian Corruption Eradication Commission found approximately 63.000 cases of tax evasion and dubious payment in palm oil sector.

The rising CPO price has also led to an increase in domestic biodiesel cost production, making the subsidies for biodiesel consumers ineffective. The regulations have also been seen as one driver of deforestation and forest degradation by promoting expansion of oil palm plantation.

But the palm oil industry provides a vast resource which is not entirely utilized. A sustainable palm management has to be established. For example, most of the residues of the palms should be left in the field to give nutrients and carbon back to the soil and protecting soil fertility. To establish a new way of palm management opens a more efficient and environmental-friendly production.

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