

## Fiscal Policy for Renewable Energy Sources and Its Economic Impact

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**Abstract**— Indonesia is the largest producers of palm oil. Along with the increasing demand for renewable energy source, palm oil will turn to be a very important commodity in the future. The palm oil industry will gain more value-added if they export the commodities in processed materials rather than raw materials. On the other hands palm oil industry more likely to export raw material, because there's no incentives for them to export processed materials. Therefore, to give an incentive to palm oil industry, the government of Indonesia should give fiscal incentives to encourage palm oil industry to produce processed materials. The purpose of this study is to identify the appropriate fiscal policy to palm oil industry and to estimate the economic impact due to the implementation of fiscal incentives policy. The methodology used in this research is analysis using Social Accounting Matrix (SAM) that can give an overview the impact of policy implementation to factors of production, an institution such as government and household, and other sectors including palm oil sectors itself. The result of this study that is the proposed fiscal policy in palm oil industry was fiscal incentives in the form of VAT exemption. Economic impact analysis that came from SAM indicates that implementation of the policy has an overall positive impact to factors of production, institution and sector.

**Keywords**— Fiscal Policy; Palm Oil; Renewable Energy; Fiscal Incentive; Social Accounting Matrix.

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### I. INTRODUCTION

Indonesia is the largest palm oil producer in the world. In 2012, Indonesia produces 25.7 million tons of crude palm oil (CPO) and increase to 26.2 million tons CPO in 2013. According to [1], starting from 2006 Indonesia had become the leader of CPO producers around the world which its production accounted for 16.05 million tons CPO. The second largest CPO producer is Malaysia which accounted for 15.881 million tons CPO produced in 2006. Executive Director of The Association of Indonesia Palm Oil Producers (GAPKI) stated that Indonesia is estimated will produce about 27.5 to 28 million tons of CPO by the end of 2014. The raising productions of Indonesia CPO due to most of palm oil plantation in Indonesia are in mature stage recently, with total about 6.2 million hectares of palm oil plantation which produce on average 3.7 tons CPO per hectare. Increased production of Indonesia's CPO is also supported by the breadth of the oil palm plantations continue to rise

Indonesia's CPO production is mostly exported to foreign countries, including Japan, China, Malaysia, Middle Asia, America, and some European countries. Over the last five years, an average of Indonesian CPO exports reached 48% of total palm oil exports in the countries of the world, namely in a row from 2009 to 2013 was 16.8 million tons,

16.3 million tons, 16, 4 million tons, 18.8 million tons and 20.6 million tons, according to data released by [2]. As in [3], CPO and its derivatives highest estimated only about 25 percent is consumed by the domestic market in the country. So far, Indonesia's CPO export products in the form of crude palm oil and its derivatives are treated simply. Exports of CPO as raw material product and unprocessed palm oil as its derivatives product will give only small value added for Indonesia economy.

Palm oil industry has an important role in Indonesia economy as it create jobs, employment, new business field, and factor that raise the income of people especially at rural areas.

In addition, as the largest producer of palm oil in the world, Indonesia can get added value and benefit from the significant multiplier effect on the economy bigger by developing downstream processing of palm oil and its derivatives, given the potential of Indonesian palm oil which is still very large for developed.

Related potentials of palm oil in Indonesia, the development of palm oil-based biodiesel industry, as the derivative products of palm oil industry, has prompted the Indonesian government to give more attention to development efforts forward. Since 2006 has initiated the development of the biodiesel industry in Indonesia along with the issuance of Presidential Decree No. 5 of 2006 on

National Energy Policy. That decree sets energy mix increased use of biofuels in Indonesia with the provision of at least 5 percent in 2025, where one of the sources of energy biofuel is derived from Palm oil-based Biodiesel. According to [4], in 2007 the share of total production to total Indonesian Biodiesel's production amounted to 15 percent, then increased to 33 percent in 2011 with a total production of 1.3 million tons of biodiesel in the year.

Now days, gas stations in Indonesia has been sold diesel engine fuel as a mix of Biodiesel and petro diesel called Biosolar. Biosolar consists of mixture of 7 percent of biodiesel and 93 percent of petro diesel fuel.

The biodiesel industry as a source of new and renewable energy development in Indonesia is also encouraged by the government's policy to increase the use of biofuels through Minister of Energy Mineral and Resources Regulation No. 25 of 2013, In that regulation there is a obligations use of biofuels as a fuel for the transportation, industrial and commercial, and power generation. In that regulation there is also a regulation about phasing minimum obligations as a mixed use of Biodiesel fuel from 2013 to 2025 with the obligatory use of biodiesel as a fuel mixture of petro diesel that it will create a domestic market for the biodiesel industry as the derivative products from palm oil industry so that it can provide added value greater for the Indonesian economy. In 2014 itself, the mandatory blending quota is 10 percent from the whole total consumption of biodiesel in Indonesia.

Reference [5] states, the government estimates that biodiesel production in 2013 amounted to 2.8 million tons, up from 2.2 million tons in 2012, while the installed capacity of biodiesel production in Indonesia amounted to 5.6 million tons per year. Since the enactment of mandatory minimum biodiesel utilization as fuel mixture, then the required CPO enough to be processed into biodiesel.

CPO industry in Indonesia as the main supplier of raw material for biodiesel feel the need for government assistance in order to be able to run and support the mandatory use of biodiesel as a renewable energy source and a substitute for fossil fuel. Among businessmen in the oil palm sector for incentives in the form of interest relief and tax relief. With these incentives CPO industry will be able to increase its production capacity and meet the demand for palm oil industry, the derivative palm oil products can increase and it can make added value to palm oil industry.

In addition, the CPO industry in its efforts to meet the needs of the biodiesel industry, was experiencing financial constraints in terms of the company. As in [6], Deputy Minister of Economic Affairs, Agriculture and Marine Resources, Krisnamurthi said one of the problems that arise from the decrease in the price of CPO is the presence of more severe financial pressure for the oil companies so that the company's cash flow becomes more important. Therefore, the Directorate General of Taxation (DGT) are required to accelerate the process of tax refunds (refund of excess tax payments) to the oil company to help the company's cash flow during prices of crude palm oil (CPO) decreased. That fiscal constraints are considered to cause disruption of cash flow so that businesses are not able to maintain biofuel production and supply their products

optimally. Refund application period on VAT (VAT refund) which takes longer time.

The mandate to SOEs as VAT collector such as Pertamina and PLN on submission of taxable goods and services over CPO companies will result that CPO companies must paid VAT liabilities in early of the transaction and they cannot use the mechanism of VAT payment without VAT input and output VAT. Thus, the palm oil companies feel that their company's cash flow affected by this mechanism. It will resulting in decreasing companies' performance, and can eventually lead to a decrease in their CPO production. To overcome these obstacles, the government is expected to provide fiscal incentives for companies that make delivery of CPO as raw material for biodiesel production in order to supply the biodiesel industry. Therefore, this paper tries to identify policies to provide proper fiscal incentive for CPO industry, and analyze the impact that occurred on the Indonesian economy when the policy pursued by the government.

This paper in part two will review CPO industry and fiscal policy for it's development. This review consists of the role of palm oil and biodiesel industry in Indonesia as a driver of Indonesia economy and the mandatory quota for biodiesel utilization to create its domestic demand and market, the VAT regulation in Indonesia, the fiscal incentives that can be given to the CPO industry, and the reason based on economic theory why they need an incentive provided on the CPO industry. In part three will explain the methodology used in this paper, while part four is a discussion of the simulation results. In the last section will conclude the results of the analysis and implications of the implementation of the Government's policy.

## II. CPO INDUSTRY AND FISCAL POLICY FOR ITS DEVELOPMENT

### A. CPO and Biodiesel Industry in Indonesia

The role of the palm oil industry to the economy of Indonesia described in [3],[4], and [7]. Mentioned that the palm oil industry generates economic and social development in Indonesia is significant, because the palm oil industry is a significant contributor to the income of the rural communities in Indonesia. In addition, palm oil is the second largest agricultural product in Indonesia that can provide jobs for more than 6 million inhabitants (2008 data). Development of oil palm plantations provide trickle down effect for the economy in the form of additional employment opportunities, business field, and increase farmers' income communities in order to alleviate poverty and it relates back to the future for the industry and other sectors.

Reference [8] stated that oil palm industry is superior sector and its contribution to non-oil export has an important share for Indonesia. This industry has increasing on trend every year. The CPO's derivative industry need to be prioritized as industry policy program, because Indonesia should not be a raw material product exporter only. If Indonesia' CPO always exported as raw material, this condition indicate that national industry is still underdeveloped and it has no progress. There is no value added for the whole industry and economy, if this condition still exists. The role of palm oil industry on Indonesia

economic growth can be seen from its contribution to Indonesia GDP share. In 2006, the palm oil industry's share only about 2.41 percent to Indonesia GDP. Infrastructure development and incentives from government are factors which this sector of industry needed most.

### *B. VAT and Fiscal Incentives for Renewable Energy Resource*

CPO Company complained that they face constraints, regarding of their financial condition, which could burden their production of CPO and they have asked the government to overcome it by giving production-based incentive such as tax relaxing to CPO industries. The problem is the lack of cash flow independency. This happened because of some conditionally cash inflow stagnation due to their VAT refunds longer time to be returned from the state treasury.

As in [9], VAT mechanism in Indonesia is by using input-output VAT mechanism. From the vendors' point of view, an output VAT is charged to buyers if vendors of taxable goods or services sell it, on the other hand, this payment is an input VAT for the buyers. If the accumulated output VAT exceeds the accumulated input VAT, then the vendor as taxable enterprise must pay the VAT liabilities. If the VAT mechanism resulting negative amount of VAT which are being paid by the taxable enterprises, then the overpaid VAT could be refunded. The time interval of VAT payments and refunds may affect the company's cash planning. VAT refund can be made for input VAT paid for the goods with zero tariff (such as exports) and, in some circumstances, for the VAT paid by the non-VAT enterprises. VAT refund is a big part of the VAT system, the amount of VAT refund paid to a taxpayer generally is about 25 to 80 percent of the VAT levied, that is why the VAT refund can be very large and it is becoming an important issue especially for a large multinational taxpayers. VAT refund process in Indonesia reputed to be relatively slow-moving by international observers, though risk-based analysis audit has been conducted since 2009. This retardation of VAT refund process ensued problem for the firm cash flow.

Another constraint faced by CPO companies is if they have submission or sales transaction of taxable goods, which is CPO, to SOEs, they cannot credit their input VAT through their input-output VAT mechanism. This is because SOEs, which is act as VAT collector, will charge VAT from the transaction to CPO companies. In this case, CPO companies must pay their VAT liabilities in early time of the transaction. Due to this condition, CPO Companies have to allocate their cash in hand earlier than their normal selling transaction which is could disrupt the cash flow of the firm.

Studies conducted in several countries related the development of renewable energy, which palm oil is considered as one of renewable energy resource, the effect of incentives that is given to renewable energy resources; type of incentives; and its impact to economic will be showed as in following discussion. As in [10], when the concern about biofuels become globally as it related to the security of energy supply and climate change, policy makers put this issue as their focus of energy policies' decisions. Policy makers realize that typically the production costs of biofuels are much higher than fossil fuels, although biofuel programs

can offer feasible opportunities, such as an increasing of value added in agricultural sector; contributing to rural employment and development; and creating energy supply diversification, for certain developing countries. Peters and Thielmann, based on data from India and Tanzania, suggested that developing countries must be carefully examined their biofuel programs implementation, such as social and environmental problems must be taken into account, to avoid welfare loss in their society. To promote the domestic demand of biofuels to substitute fossil fuels, tax exemptions and mandatory blending quotas are policies that are chosen by the government in developing countries to generate economies of scale.

Reference [11] shows the United States experience with the energy-based tax incentives to support energy industry development. Tax incentives and subsidies mostly use by policy makers to deal with complex challenges regarding to develop renewable energy market and its technology in U. S. Tax incentives, especially federal tax incentives, used to overcome the high initial start up costs, to minimize the high risk related with new industries, and to signal to taxpayers support for the industries. Tax incentives, if properly structured and place for long term, can play an important role in sustainable energy future. In addition, several critical factors that hinder the public's moving from using nonrenewable to renewable fuels such as the low price of gasoline compared to high price of alternative fuels, the domestic supply sufficiency problem, and the lack of infrastructure that support the use of alternative fuels must be tackled also.

Refer to problems face by CPO companies regarding to their financial condition, firms can coupe the problems if they are successfully manage their cash flow. The allocation of sufficient cash in hand by firms and its importance is based on the theory in financial management area. According to [12], cash management plays a major role in finance area because proper cash management is important for effective utilization of cash and also helps to fulfill the short-term liquidity position of the concern. Cash is needed by business concern to make payments for acquisition of resources and services for transaction. Cash is the money which can be disbursed immediately with no restriction. Management cash consists of cash inflow and outflows.

As in [13], cash often called a nonearning asset. Cash is needed to pay for labor and raw materials, to buy fixed assets, to pay taxes, to service debt, to pay dividends, and so on. Firms hold cash for transactions, precautionary, and compensating balances reason. In [14], an effective and efficient management of cash for the survival and growth of organization is very important factor. Cash management that is managed in appropriate way will result in reducing the finance cost of the organization and also reducing expenses in general because of timely allocation base on precedence items.

Refers to the previous discussion, in order to make smooth and strengthen the cash flow of CPO companies, fiscal policy in the form of tax incentives and other supporting policy seems to be the appropriate government intervention in the market which is given to CPO companies.

### III. METHODOLOGY

Methodology used in this study to analyze the impact that occurred on the Indonesian economy when the policy pursued by the government was Social Accounting Matrix (SAM) multiplier. A SAM is a series of accounts in each of which incomings and outgoings or income and expenditure must balance. What is “incoming” into one account must be “outgoing” from another account. A SAM is resembles traditional national accounts as in [15].

Account for transactions within an economy can be presented in matrix as well as double entry format such a matrix is known as a SAM and must be square. Within it each row records the details of receipts by each particular account while the columns follow the same ordering as the rows record the corresponding expenditures. Thus the entry in row  $i$ , column  $j$ , represents receipts by account  $i$  from account  $j$  or alternatively, expenditures by account  $j$  that are paid to account  $i$ , as in [16].

Reference [17] mention that SAM is a framework that summarizes the data economic and social variables of a country within a certain time, its a comprehensive and integrated data. Therefore, SAM is not only able to describes the economic and social conditions but also capable to describe the relationship between economic variables and social variables.

The data in particular country for a particular year have been organized in the form of a SAM, which can reflecting the country’s economic structure in a static image. In this study we used secondary data SAM year 2008 that came from Central Agency on Statistics.

Reference [18] shows that the basic framework of SAM is a 4x4 partition matrix as shown in Figure 1. The accounts in SAM are grouped into endogenous and exogenous accounts. The main endogenous accounts are divided into three blocks: production factor, institutional, and production activity blocks. The row shows income, while the column shows expenditure. Sub-matrix  $T_{ij}$  shows the income of the account in row  $i$  from the account of column  $j$ . Vector  $y_i$  shows the total incomes of all accounts, and vector  $y'_j$  shows the total expenditure account of all accounts. In addition, SAM requires that the vector  $y_i$  is the same as vector  $y'_j$ , or in other words  $y'_j$  is a transpose of  $y_i$ , for every  $i = j$ .

Figure 1 shows about the relation in SAM as in [19] :

FIGURE 1

SOCIAL ACCOUNTING MATRIX

		Expenditures					Total
		Endogenous Accounts			Exog.		
		Factors	Households	Productions Activities	Sum of Other Accounts		
Receipts	Endogenous Accounts	Factors	0	0	$T_{13}$	$X_1$	$Y_1$
		Households	$T_{21}$	$T_{22}$	0	$X_2$	$Y_2$
		Productions Activities	0	$T_{32}$	$T_{33}$	$X_3$	$Y_3$
	Exog accounts	$I'_1$	$I'_2$	$I'_3$	$t$	$Y_x$	
Totals		$Y'_1$	$Y'_2$	$Y'_3$	$Y_x$		

#### A. Accounting Multiplier matrix.

Framework in SAM can be manipulated and gives a multiplier for economy. We can use the multiplier matrix to calculate the impact that will occur for every policy that going to implemented.

Accounting multiplier matrix in a SAM framework captures the overall impacts of changes in a particular sector on other sector within the economy. Its also used to explain the impacts of changes in exogenous accounts on endogenous accounts as in [18]

The accounting multiplier matrix, which is a standard inversion of the  $(I-A)$  matrix can be derived from the basic SAM framework like this equation:

$$y = Ay + x \leftrightarrow y = (I - A)^{-1}x \leftrightarrow y = M_a x \quad [1]$$

$$\text{where } y = \begin{bmatrix} y_1 \\ y_2 \\ y_3 \end{bmatrix} = A = \begin{bmatrix} 0 & 0 & A_{13} \\ A_{21} & A_{22} & 0 \\ 0 & A_{32} & A_{33} \end{bmatrix}; x = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} \quad [2]$$

$$\text{and then } y = \left[ I - \begin{bmatrix} 0 & 0 & A_{13} \\ A_{21} & A_{22} & 0 \\ 0 & A_{32} & A_{33} \end{bmatrix} \right]^{-1} x \quad [3]$$

In this equation,  $A$  contains coefficients that show the direct impacts of a change in one sector on other sectors by a backward linkages approach. The  $M_a = (I - A)^{-1}$  is known as a multiplier matrix account, which shows the global impacts of changes in a particular economic sector on other sectors by a backward linkages approach as in [18].

#### B. Decomposing SAM Multipliers

The matrix of accounting multiplier shows what the impact of an external shock on any given sector of the economy will ultimately be, after all the repercussions have worked themselves out. It is a comparison of how the economy looks before and after a change in economy policy concerning tax rates or public investment, or an alteration in some other external condition such as level of export demand as in [20]

Reference [20] shown us there is more than one way to analyzing the SAM multiplier. First, the process by which the multiplier effect accumulate round by round will be examined. Second, a procedure developed by Pyatt and Round as in [17], there are three submultiplier, each of which alone calculates shock effects as they travel through subsections of the total matrix. The result is a multiplicative decomposition of the SAM invers coefficients. And third, a variation decomposition provided by Stone as in [21]. In this study we used decomposition provided by Stone.

Reference [17] mention that Stone proposed an additive variation of the decomposition developed by Pyatt and Round, in which the decomposition becomes additive rather than multiplicative. Conceptually, Stone’s decomposition is simpler than Pyatt and Round’s. We denote Stone’s three submultipliers as  $N_1, N_2, N_3$ , they are :

1. Own or intragroup effects :  $N_1 = M_1$
2. Extragroups effects ( off diagonal matrix ) :  $N_2 = M_2 M_3 M_1 - M_3 M_1$
3. Closed loop or intergroup effects (diagonal) :  $N_3 = M_3 M_1 - M_1$

Matrix form for  $M_1, M_2$  and  $M_3$  :

$$M_1 = \begin{bmatrix} (I - A)^{-1} & 0 & 0 \\ 0 & I & 0 \\ 0 & 0 & (I - H)^{-1} \end{bmatrix} \quad [4]$$

$$M_2 = \begin{bmatrix} I & (I-A)^{-1}C(I-H)^{-1}Y & (I-A)^{-1}C \\ V & I & V(I-A)^{-1}C \\ (I-H)^{-1}YV & (I-H)^{-1}Y & I \end{bmatrix} \quad [5]$$

$$M_3 = \begin{bmatrix} [I - (I-A)^{-1}C(I-H)^{-1}YV]^{-1} & 0 & 0 \\ 0 & [I - V(I-A)^{-1}C(I-H)^{-1}Y]^{-1} & 0 \\ 0 & 0 & [I - (I-H)^{-1}YV(I-A)^{-1}C]^{-1} \end{bmatrix}$$

Where :

S = matrix of SAM direct coefficients

A = matrix of technical coefficients

V = matrix of value added (VA) coefficients

Y = matrix of VA distribution coefficients

C = matrix of expenditure coefficients

H = matrix of institutional and household distribution coefficients

In this study we calculate accounting multiplier matrix to find out the economy impact from policy implementation, and also calculate intragroup effects, extragroup effects and intergroup effects from policy implementation.

#### IV. RESULT

##### A. Fiscal Incentives for Palm Oil Industry

To increase the portion of biodiesel in diesel, we need to have sufficient raw material inventory for the CPO. So far, the efforts to increase the supply of palm oil for domestic need is done by imposing export tax for CPO. It is also a way to create industry for a derivative palm oil products.

Trade Minister Mari Elka Pangestu said export duty instrument is not the only incentive used by the government to develop programs that related to the oil palm industry value added. Besides export duty, other instruments are used as incentives is the fiscal incentives as "tax allowance" or tax breaks. [22]. If fiscal incentives policy can be implemented, it is expected that sufficient CPO for domestic market can be accomplished, therefore it can encourage the establishment of industry for derivative palm oil product and increase value-added for palm oil industry and at the end will be able to speed up the process for using the biofuels.

Besides that, from the financial side of the oil palm company, ensuring the cash flow within the company to overcome the fluctuations of the world price of crude palm oil production, also affect the ability of the company production. Deputy Minister for Economic Affairs, Agriculture and Marine Division, Bayu Krisnamurthi, said that one of the problems that rise from the decrease in the CPO price is financial pressure for the oil companies, so the company's cash flow becomes more important. Therefore, the Directorate General of Taxation (DGT) are required to accelerate the process of tax refunds (refund of excess tax payments) to the oil company to help the company's cash flow during the time when CPO price lower. [6]

There are several VAT facilities in Indonesia, which are non-charged VAT, VAT exempt, non levied VAT and VAT 0% (zero percent). In addition there are some other incentive mechanisms used by the Indonesian government to encourage certain business sectors that are strategic to the Indonesian economy.

Some of the proposed fiscal incentives in this study are fiscal incentives using specific mechanism and VAT facilities that can help entrepreneurs in Crude Palm Oil (CPO) industries to ensure the company's cash flow, and expected can increase the production and supply of CPO are:

1. Change VAT refund mechanism to research mechanism, rather than investigation mechanism.
2. Exceptions for State-Owned Enterprises (SOEs) that have Biofuel (BBN) transaction with CPO company, as a VAT collector.
3. Determination of CPO as the object of the tax payable was not collected.

The first recommendation for fiscal incentives, that is to change VAT refund mechanism to research mechanism can be done if in the Finance Minister Regulation No.71/PMK.03/2010 there is an additional criteria for CPO entrepreneur to be a low-risk VAT enterprises.

The second policy proposal can be implemented with revisions on PMK No. 136 / PMK.03 / 2012 on Amendment PMK No 85 / PMK.03 / 2012 about Appointment of State Owned Enterprises For Collecting, Deposit, And Reporting Value Added Tax or Value Added Tax and Sales Tax on Luxury Goods, And Collecting, Depositing, and Reporting Procedures. The regulation must be added with an exceptions to State-Owned Enterprises (SOEs) that have Biofuel (BBN) transaction with CPO company, as a VAT collector.

Third fiscal incentives that can be given is the determination of CPO as the object of the tax payable was not collected. VAT input for the object of the tax payable was not collected can be credited. CPO transaction can be included in the criteria "to encourage national development by helping the availability of strategic goods or ensure clean water and electricity that is needed by the community, according to the explanation of paragraph 1 of Article 16B of the VAT Act No.42 year 2009.

However fiscal incentives that we proposed in this study have to be evaluated periodically. If the palm oil industry already developed well, then we have to make evaluation whether the industry still need these fiscal incentives.

##### B. Multiplier Analysis

There are two scenario in this study, which are :

1. Implementation for first or second policy recommendation. It is expected can increase the CPO output about 2,9 million metric tonne to meet the CPO need in 2014.
2. Implementation for third policy recommendation. It is expected can increase the CPO output about 2,9 million metric tonne to meet the CPO need in 2014. Along with that, the policy that determine CPO as the object of the tax payable was not collected will be set. It means that VAT from CPO must be reduced from government revenue in SAM. We assumed that the VAT from CPO must be reduced as big as VAT rate which is 10 percent from the increasing in CPO output.

The SAM that we used in this study is matrix 105 x 105 with only 24 sectors, the shock in scenario we put it in food, beverage and tobacco industry sector. Because according to BPS, CPO industry included in that sector classification as in [24]

### C. Economy Impact From Policy Implementation

There are two scenario in this study, scenario 1 if there is a policy implementation for first or second policy recommendation. It is expected can increase the CPO output about 2,9 million metric tonne to meet the CPO need in 2014. The result from simulation using scenario 1 shown in table 1.

TABLE I  
ECONOMY IMPACT FROM SCENARIO 1

Classification	Impact (Billion IDR)	Impact (%)
Production Factors	44,820	0.87%
Institutions	53,844	0.77%
Production Activities	223,662	0.91%
Total	322,325	0.88%

Source : Author's calculation

We can see from table 1 the economy impact from accounting multiplier are positive to all agents in economy, the overall economy impact is about 322.325 billion IDR or about 0,88 percent increasing from baseline. The biggest economy impact from the shock is increasing in production activities about 223.662 billion IDR or about 0,91 percent. Production factors also get the economy impact about 44.820 billion IDR or about 0,87 percent. Institutions have the smallest economy impact, about 53.844 billion IDR or only about 0,77 percent from baseline

TABLE II  
ECONOMY IMPACT FOR EACH CLASSIFICATION CLASSIFICATION FROM SCENARIO 1

Classification		Changes (%)
Production Factors	Agriculture	1.67%
	Labour	
	Non-agriculture unskilled	0.74%
	Clerical and services	0.96%
	Professional workers	0.71%
Non-labour		0.70%
Institutions	Household	
	Agriculture	1.10%
	Non-Agriculture	0.84%
Company		0.69%
Government		0.48%
Production Activities	Sector	0.89%
	Trade Margins	1.21%
	Transport Margins	0.83%
	Domestic Comodity	0.95%
	Import Comodity	0.58%

Source : Author's calculation

If we divided the economy impact from accounting multiplier into each classification, as we seen in table 2, then the biggest impact in production factors is agricultural labour, its increase about 1,67 percent from baseline. Accounting multiplier in this study using backward linkages approach, thus the increasing in CPO industry will affect the agricultural sector as a providers of raw materials.

Institutions that have the biggest economy impact is agricultural households, its increasing about 1,1 percent. The increasing for agricultural households as a result on increasing in agricultural labour in production factors. For production activities classification, the biggest economy impact occur in trade margins. It can be consequences from

the shock in scenario that we applied in food, beverage and tobacco industry sector.

The economy impact can be divided into three stages of effects, which are intragroup effects, extragroup effects and intergroup effects. The first stages is direct influence that calculate the economy impact from shock in one block to its own block, the result shown in next table.

TABLE III  
ECONOMY IMPACT FROM INTRAGROUP EFFECTS

Classification	Impact (Billion IDR)	Impact (%)
Production Factors	-	
Institutions	-	
Production Activities	110,815	0.95%
Total	110,815	

Source : Author's calculation

In table 3 we can see that intragroup effects from the increasing of output in CPO that occur in production activities is about 110.815 billion IDR or about 0,95 percent from baseline. The biggest impact amongs sectors are agricultural crops sector and food, beverages and tobacco industry. The raw material for CPO industry came from agricultural crops sector and classification for CPO industry is food, beverages and tobacco industry.

Economy impact for extragroup effects, that occur to another block in economy because of the increasing of output in CPO can be seen in next Table.

TABLE IV  
ECONOMY IMPACT FROM EXTRAGROUP EFFECTS

Classification	Impact (Billion IDR)	Impact (%)
Production Factors	44,820	0.87%
Institutions	53,844	0.91%
Production Activities	-	
Total	98,663	

Source : Author's calculation

In table 4 institution have the biggest impact if we compare with baseline, about 53.844 billion IDR or 0,91 percent, while production factors have an increasing about 44.820 billion IDR or about 0,87 percent from baseline.

Impact in institution mostly in non labor or professional agriculture household. While in production factor the biggest impact happen in unpaid or professional agriculture labor. The impact for each agent in Economy inline with overall impact that we describe earlier.

The third stages of economic impact in this study which is intergroup effect, the impact from other agent in economy rotating back to production activities and make last multiplier in economy. The intergroup effect from this study we can see in next table.

TABLE V  
ECONOMY IMPACT FROM INTERGROUP EFFECT

Classification	Impact (Billion IDR)	Impact (%)
Production Factors	-	
Institutions	-	
Production Activities	112,847	1.01%
Total	112,847	

Economy impact from intergroup effect in table 5, create an increasing in production activities about 112.847 billion IDR or about 1,01 percent. The intergroup effect on its own block is more bigger than the intragroup effect, because the impact from two other block affect back production activities block.

The other scenario in this study is the implementation of third policy recommendation. It is expected can increase the CPO output about 2,9 million metric tonne to meet the CPO need in 2014. Along with that, the policy that determine CPO as the object of the tax payable was not collected will be set. It means that VAT from CPO must be reduced from government revenue in SAM. We assumed that the VAT from CPO must be reduced as big as VAT rate which is 10 percent from the increasing in CPO output.

The economy impact from other scenario can be seen in next table.

TABLE VI  
ECONOMY IMPACT FROM SCENARIO 2

Classification	Impact (Billion IDR)	Impact (%)
Production Factors	44,621	0.86%
Institutions	53,233	0.76%
Production Activities	222,772	0.91%
Total	320,625	0.87%

Source : Author's calculation

Overall the economy impact from scenario 2 as we can see in table 6, have positive impact for production factors, institutions and production activities. Overall impact about 320.625 billion IDR or about 0,87 percent. The biggest impact occur in production activities, its increasing about 222.772 billion IDR or about 0,91 percent. Production factors have an economy impact about 44.621 billion IDR or about 0,86 percent and institution get impact about 53.233 billion IDR or about 0,76 percent.

TABLE VII  
ECONOMY IMPACT FOR EACH CLASSIFICATION FROM SCENARIO 2

Classification		Changes (%)	
Production Factors	Agriculture	1.67%	
	Labour	Non-agriculture unskilled	0.74%
		Clerical and services	0.96%
		Professional workers	0.70%
		Non-labour	0.70%
Institutions	Agriculture	1.09%	
	Household	Non-Agriculture	0.84%
	Company		0.68%
	Government		0.46%
Production Activities	Sector	0.89%	
	Trade Margins	1.21%	
	Transport Margins	0.83%	
	Domestic Comodity	0.94%	
	Import Comodity	0.58%	

Source : Author's calculation

Table 7 shown us that overall economy impact for each classification from scenario 2 inline with the impact in scenario 1, it means the policy that determine CPO as the

object of the tax payable was not collected, did not have major impact in Economy.

Classification in production factors that have the biggest impact is agricultural labour, its have the same impact with scenario 1. Institutions that have the biggest impact is agricultural households, the impact is slightly less than impact in scenario 1. And for Production activities also have the same impact with scenario 1.

The result from both scenario 1 and 2, give positive impact mostly on agricultural household and labour. Reference [25] shown us that in 2012 agricultural sector have the biggest labour proportion from all sector. From 110,8 million labour, about 38,88 million or about 35 percent work in agricultural sector, it means that policy recommendation in this study will affect most of the population in Indonesia.

## V. CONCLUSIONS

Both scenario in this study tends to give positive impact to economy, to overall economy agents, production factors, institution and production activities. It means fiscal policy that we proposed in scenario 2, eventhough it will reduce government revenue, but at the end it will increase the overall economy in Indonesia.

The biggest impact in this study goes to agricultural household and labour. From all labour force in Indonesia about 35 percent work in agricultural sector. It means policy recommendation in this study makes most of people in Indonesia better off.

Policy recommendation in this study align with government policy for pro poor, pro job and pro growth. Because the result from this study give positive impact to production factors for pro job policy, to institution for pro poor policy and to production activities for pro growth policy.

However there are many aspects that we have to considered in order to optimize the use of renewable energy. Not only fiscal policy can improve their industry, but also other policy like infrastructure policy and subsidy policy that make price of gasoline lower than alternative fuels. If other policy goes along with fiscal policy, it will be gives a better result to optimize output in renewable energy industry particularly CPO.

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