EXPORT ENHANCEMENT PLAN OF COCONUT SHELL CHARCOAL BRIQUETTE BY PT. INDRATMA SAHITAGUNA SEMARANG

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ABSTRACT

Coconut shell charcoal briquettes export has great prospect both from the abundant raw materials availability and the huge world market import quantity. PT. Indratma Sahitaguna Semarang utilizes this briquette to be used as an alternative fuel substitute for oil, gas, and fuel wood that has not been developed by the industry.

This research was carried out to analyze the coconut shell charcoal briquettes export prospects, its production improvement, raw material inventory control, and the marketing activities undertaken to meet the briquette export prospects by PT. Indratma Sahitaguna Semarang in 2017.

The data in this research is historical data from 2011 to 2015. The obtained data sources are from PT. Indratma Sahitaguna Semarang, the FAO UN, Badan Pusat Statistik, journals, books, and other sources. The analysis techniques used in this research are descriptive analysis with trend calculation and Economic Order Quantity (EOQ) Method.

This study shows that PT. Indratma Sahitaguna Semarang has a bright and promising prospect of exporting coconut shell charcoal briquettes. In order to prevent excess quantity of product, this company preferably uses a moderate production patterns so that the excess quantity of product in a given month can be allocated to production in the previous month to be used as finished goods inventory.

PT. Indratma Sahitaguna Semarang is expected to save Total Cost (TC) of Rp 260,175,764 when applying Economic Order Quantity (EOQ) method for planning during 2017. In order to achieve the export prospect, this company preferably conducts marketing activities using STP Strategy.

***Keywords**: Export, Prospect, Briquette, Production, EOQ, STP*

BACKGROUND

Global energy use is rising very rapidly. To that end, both investors and government have been exploring solutions, such as efficiency measures and renewable energy generation as a way to find alternative that exploding demand. One of such wastes is coconut shell which can be processed into environmentally friendly charcoal briquettes for energy conversion.

The world market import quantity for coconut shell charcoal briquettes from year to year has increased due to their awareness for alternative fuels. The export volume of coconut shell charcoal briquettes from Indonesia have increased along with the increasing import quantity of the world market (FAO UN and BPS, 2015).

PT. Indratma Sahitaguna Semarang has the export prospects of coconut shell charcoal briquettes to countries whose importers have imported the commodity before, and some other countries such as China, Sri Lanka, Japan, Singapore, and Malaysia which have not yet imported the commodity.

As exports of coconut shell charcoal briquettes has great potential both from the abundant availability of raw materials and the huge world market import quantity, PT. Indratma Sahitaguna Semarang utilizes coconut shell charcoal in the form of briquettes to be used as an alternative fuel substitute for oil, gas, and fuel wood that has not been developed by the industry. The average increase in the export volume of coconut shell charcoal briquettes by PT. Indratma Sahitaguna Semarang is 5.09% annually (Secondary Data, 2016).

Up to now, PT. Indratma Sahitaguna Semarang has suppliers of coconut shell as raw materials from several areas in West Java, Central Java and East Java. On average, PT. Indratma Sahitaguna Semarang is able to obtain supplies of coconut shells amounting to 435,000 kg per month. As coconut shell charcoal briquettes is derived from the natural resources that can be renewed, so if there is an increase in orders, the availability of raw material can be well planned.

Instead of spoiling the environment, we can make money from that waste. In addition, this business is not significantly affected by changes in the dollar exchange rate, because the raw materials used are not imported. If the dollars exchange rate changes, the effect of the difference lies only in profits.

Reading the descriptions of world energy and its world import quantity of coconut shell charcoal briquette above, there are three problem statements proposed, i.e.

a. How are the export prospects of coconut shell charcoal briquettes by PT. Indratma Sahitaguna Semarang in 2017?

b. What will PT. Indratma Sahitaguna Semarang do on its improvement of the production and inventory control of raw material to meet the export prospects of coconut shell charcoal briquettes in 2017?

c. How are the marketing activities undertaken to meet the export prospects of coconut shell charcoal briquette by PT. Indratma Sahitaguna Semarang in 2017?

This research was carried out to:

a. Analyze the export prospects of coconut shell charcoal briquettes by PT. Indratma Sahitaguna Semarang in 2017.
b. Find out the improvement of the production and inventory control of raw material to meet the export prospects of coconut shell charcoal briquettes by PT. Indratma Sahitaguna Semarang in 2017.
c. Identify the marketing activities undertaken to meet the export prospects of coconut shell charcoal briquettes by PT. Indratma Sahitaguna Semarang in 2017.

LITERATURE REVIEW

Export. Act No. 2 of 2009 about the Indonesian Export Financing Agency in Sutedi (2014: 8) explained that export is an activity of issuing goods from Indonesia customs area and/or services from the territory of the Republic of Indonesia.
Charcoal Briquettes. Emrich (1985) in Speight (2012: 531) charcoal is a desirable fuel for generating heat, durable, almost smokeless fire.
Prospects. According to Krugman (2003: 121) in Raharja (2012) prospects are opportunities that occur because of their individual efforts in meeting their needs also to make a profit or gain.
Production. Kumar, S. Anil and N. Suresh (2008:3) defined production as the conversion of a step-by-step one form of matter into another form through chemical or mechanical processes to create or improve the usefulness of the product to the user.
Production Patterns. In conjunction with the plan of capacity utilization which is available in the company, it is important to be considered by the company management on the subject of production patterns that will be used within the company (Ahyari, 1999:183). Generally Ahyari (1999: 185-186) divides the pattern of production in the company into three types, namely: Constant Production Patterns, Fluctuated Production Patterns, and Moderate Production Patterns.
Marketing. American Marketing Association in Kotler et al. (2013: 4) defines marketing as an organizational function and a set of processes for creating, communicating, and delivering value to customers and for managing customer relationships in ways that benefit the organization and stakeholders.
Segmenting, Targeting, Positioning (STP). According to Kotler (2007) in Mustain (2012:10) the essence of modern strategic marketing consists of three main steps, namely Segmentation, Determining the Target Market, and Positioning. All three steps are often called STP (Segmenting, Targeting, and Positioning).
Inventory Control of Raw Material. According to Kumar S. Anil and N. Suresh (2008:91) inventories generally refers to the material in stock. It is also called idle resources of a company.

RESEARCH METHODS

Data Collection Technique. The data in this research is historical data which is collected by the measurement of time within a certain time. Time series used in this study is the last 5 years, i.e. from 2011 to 2015. The obtained data source are

from PT. Indratma Sahitaguna Semarang, the FAO UN, the Central Bureau of Statistics, journals, books, and other sources as secondary data. Data collection techniques used in this study was interviews, observation, documentation, and literature review.

Research Variables. In this research has determined four variables, i.e. export prospects, production quantity, marketing activities, and raw material inventory. The indicator of the variables used in this study can be seen in Table 1 below:

TABLE 1
RESEARCH VARIABLES AND INDICATOR OF VARIABLES

Research Variables	Indicator
Export Prospect	The number of export demand from forecasting results
Production Quantity	The number of eligible export products
Marketing Activity	The type and frequency of marketing activities, especially promotion and distribution
Raw Material Inventory	The amount of raw materials needed for production

Source: Design for This Research, 2016.

Analysis Techniques. The analysis techniques used in this research are descriptive analysis with trend calculation and Economic Order Quantity (EOQ) Method.

Descriptive Analysis. According to Fatimah (2013) descriptive analysis is not to question the relationships between variables that are not meant to drawn a generation which explains the antecedent variables which caused something of symptoms or social reality.

Trend Analysis. According to Purwanto S.K. (2011) in Sukoco, Agus and Santirianingrum Soebandhi (2011:150) trend is a tendency to move up or down in the long term which is derived from the average change over time and the value is quite flat or smooth. Trend methods used in this study are:

Semi Average Method. Semi average method in principle is to divide the data into two parts: the first group and the second group. Furthermore, the two groups were used as the basis for the calculation of trends and forecasting. The equations to calculate Semi Average Method is (Munandar, 2010:51):

$$Y' = a + bX$$

Where:
Y'= trend value of forecasting results
a = the average value of the second group

$$b = \frac{(\bar{X} \text{ the second group} - \bar{X} \text{ the first group})}{n}$$

n = the time gap between the average of the first group with the average of the second group
X = time replacement parameters

Moment Trend Method. Moment Trend method uses a different equation with semi average method for estimating the value of a and b in the trend equation:

$$Y' = a + bX$$

Value of a and b is estimated by the following equation (Munandar, 2010:55):

$$\sum Yi = n.a + b.\sum Xi$$
$$\sum XiYi = a.\sum Xi + b.\sum Xi^2$$

The two equations above performs the substitution and elimination

operation to get the value of a and b. In the moment trend method, the value of X in the trend equation calculated by makes the first data as the base year and the value of X = 1.

Least Square Method. Least Squares Method is a method for calculating the value of the trend in the current year and to seek the forecast in the coming period. To calculate the value of trend and forecast, first assess the value of a and b in the equation Y = a + bX. X values are calculated with reference to the guide if:

Odd data then X: ....,-2, -1, 0, 1, 2, ...
Even data then X: ...., -3, -1, 1, 3, ...

Equation to estimate the value of a and b is (Munandar, 2010:57):

$$a = \frac{\sum Y}{n} \qquad b = \frac{\sum XY}{\sum X^2}$$

After the value of a and b is obtained, and then calculate how the trend and forecast values for the desired time.

Forecasting Error Standard. Forecasting Error Standard can be used as a basis in determining the most appropriate forecasting methods to use. The smallest value of Forecasting Error Standard will indicate that the forecasting result is close to the reality. The formula of Forecasting Error Standard is as follows (Sunyoto, 2012:59):

$$Forecasting\ Error\ Standard = \sqrt{\frac{\sum (Y - Y')^2}{n}}$$

Where:
Y = Real Export
Y' = Export Forecasting
n = the amount of data being analyzed

Economic Order Quantity (EOQ). EOQ method is used to determine the order quantity of inventory that minimizes direct costs of inventory storage and inverse cost of ordering supplies. Based on Handoko (2012:340) the formula which is used to obtain the most economical order quantity, i.e.:

$$Q = \sqrt{\frac{2.S.D}{H}}$$

Where:
S = Ordering Cost each time an order (Rp)
H = Carrying costs of raw material per kg (Rp/kg)
D = Demand (kg/period)

Safety Stock and Reorder Point (ROP). To get the value of safety stock, it needs to be seen the data of raw material need per month in a year. With these data, then calculate the standard deviation scores using Excel formula of

= STDEV (columns of the raw material need per month in 2017)

according to Madcoms (2004:250). After the standard deviation is known, the value is multiplied by the safety factor. Safety factor or the Z value can be determined by the policy of company on service level. According to Madcoms (2004:234), Z value can be found using excel formula of

= NORMSINV (service level)

After all values are known, safety stock can be calculated with the following formula (Herjanto, 2003:243):

Safety stock = Z.σ

Based on Herjanto (2003:242) with the safety stock, reorder point can be calculated as follows:

Reorder Point = (average usage rate x lead time) + safety stock

RESEARCH RESULT

The Export. This study uses the data of PT. Indratma Sahitaguna Semarang from 2011 to 2015.

TABLE 2
EXPORT VOLUME OF BRIQUETTE BY PT. INDRATMA SAHITAGUNA SEMARANG FROM 2011 TO 2015

No.	Year	Net Weight (kg)	Increase (%)
1.	2011	450,000	-
2.	2012	540,000	20.00
3.	2013	551,000	2.04
4.	2014	559,000	1.45
5.	2015	570,000	1.97
TOTAL		2,670,000	
AVERAGE		534,000	

Source: Secondary Data, 2016.

The above table shows that PT. Indratma Sahitaguna Semarang has been successfully exporting coconut shell charcoal briquettes of 2,670,000 kgs with an average of 534,000 kgs per year during this period. Broadly speaking, the export volume of coconut shell charcoal briquettes by PT. Indratma Sahitaguna Semarang from 2011 to 2015 always increased although it did not show significant changes.

Export Prospects. Export data of coconut shell charcoal briquettes by PT. Indratma Sahitaguna Semarang from 2011 to 2015 is one of the bases to predict the export prospects of coconut shell charcoal briquettes in subsequent years.

Selection of the Most Appropriate Method of Forecasting. In this section, the author foresees the prospect of exporting coconut shell charcoal briquette by PT. Indratma Sahitaguna Semarang in 2017 using semi-average, moment trend, and least square method.

TABLE 3
FORECASTING ERROR STANDARD AND FORECASTING RESULT IN 2017

Method	Forecasting Error Standard	Forecasting Result in 2017 (Kg)
Semi Average	23,275.53	629,500
Moment Trend	22,776.74	637,600
Least Square	22,776.74	637,600

Source: Processed Secondary Data, 2016.

The above table shows that the most suitable method to forecast the export prospect of coconut shell charcoal briquettes by PT. Indratma Sahitaguna Semarang is moment trend and least square methods. Thus, the forecasting result of export prospect in 2017 is **637,600 kgs.** Seeing from the results of forecasting, export volume of coconut shell charcoal briquettes by PT. Indratma Sahitaguna Semarang is forecast to increase in 2017. It shows that PT. Indratma Sahitaguna Semarang has the prospect of exporting coconut shell charcoal briquettes which is bright and promising in the future, though the actual exports of coconut shell charcoal briquettes has just started since 2011.

Production Plan. Yamit (1998) in Pratiwi, Yuni and Ismanto (2011:

110) thinks that the production process is defined as an activity involving manpower, materials, and equipment to produce useful products.

Product Quantity. This study uses data from PT. Indratma Sahitaguna Semarang in 2015.

TABLE 4
PRODUCT QUANTITY PER MONTH OF BRIQUETTES BY PT. INDRATMA SAHITAGUNA SEMARANG IN 2015

No.	Month	Kgs	Production Distribution (%)
1.	Jan	19,000	3.00
2.	Feb	40,000	6.31
3.	Mar	46,000	7.26
4.	Apr	70,000	11.04
5.	May	60,000	9.46
6.	Jun	84,000	13.25
7.	Jul	20,000	3.16
8.	Aug	40,000	6.31
9.	Sep	42,000	6.63
10.	Oct	60,000	9.46
11.	Nov	63,000	9.94
12.	Dec	90,000	14.20
TOTAL		634,000	100

Source: Secondary Data, 2016

The above table shows that PT. Indratma Sahitaguna Semarang in 2015 using fluctuated production patterns, i.e. the amount of production every month follows the fluctuations in demand. In short, the production pattern in 2015 affects the finished goods inventory which will be relatively the same every month, it is caused by changes in the number of sales will be followed directly by changes in the level of production.

Production Plan in 2017. PT. Indratma Sahitaguna Semarang usually adds its product amounting to 2,000 kgs per container or about 10% as a backup in case the coconut shell charcoal briquettes do not qualify for selection by the grader of the buyer. Thus, the calculation of production plan for exports in 2017 is as follows:

$$Export\ in\ 2017 = \frac{637{,}600\ kg}{18{,}000\ kg/cont} = \mathbf{35\ cont}$$

Product reserves in 2017 = 35 container x 2,000 kgs = **70,000 kgs**.

Production plan for export in 2017 = 637,600 kgs + 70,000 kgs = **707,600 kgs**. Thus, the production plan for export in 2017 is estimated to be of **707,600 kgs.**

Production Plan per Month in 2017. The following is the calculation of the monthly production plan by using the percentage of production distribution per month in 2015 as its base.

Production Plan in January 2017 = 3.00% x 707,600 kgs = **21,207 kgs.** The overall calculation can be seen in the table below:

TABLE 5
PRODUCTION PLAN OF BIQUETTE BY PT. INDRATMA SAHITAGUNA SEMARANG PER MONTH IN 2017

Month	2015		2017
	Kgs	Production Distribution (%)	Kgs
Jan	19,000	3.00	21,207
Feb	40,000	6.31	44,642
Mar	46,000	7.26	51,343
Apr	70,000	11.04	78,126
May	60,000	9.46	66,967
Jun	84,000	13.24	93,750
Jul	20,000	3.16	22,325
Aug	40,000	6.31	44,642
Sept	42,000	6.63	46,879
Oct	60,000	9.46	66,967
Nov	63,000	9.94	70,314
Dec	90,000	14.20	100,451
Total	634,000	100	707,600

Source: Processed Secondary Data, 2016.

After the quantity of products per month for production in 2017 is planned, PT. Indratma Sahitaguna Semarang could be considered a potential of production factor which is owned, such as workers availability, supply of raw materials, and machine capacity in order to meet the quantity of the products which are planned.

Workers Availability. During this time, the company employs a total of 20 workers who are able to produce as much as 180 kgs of briquettes per day; workers employed under a contract system and empower local communities. With an average working day per month is 25 days, in a month the workers can produce coconut shell charcoal briquette a maximum of 90,000 kgs. With the change in production according to production plan in 2017 as shown in the table 5, PT. Indratma Sahitaguna Semarang requires additional manpower in order to remain capable of producing in June and December. Having regard to the presence of people in the factory environment that can be used as workers, then with the change in production will not be a problem for the company to add some workers.

Supply of Raw Materials. 15 suppliers are able to supply an average of 29,000 kgs of raw material per month each supplier; it means that in one month PT. Indratma Sahitaguna Semarang can obtain the raw material supply as much as 435,000 kg. With the changes in the production according to production plans in 2017 as shown in the table 5, PT. Indratma Sahitaguna Semarang requires additional raw materials in order to remain able to produce in June and December. Having regard to the existence of suppliers who have been able to meet the supply of coconut shell charcoal, then with the changes in production will not be a problem for the company to obtain supplies of raw materials.

Machine Capacity. As has been stated before, PT. Indratma Sahitaguna Semarang has a machine production capacity of coconut shell charcoal briquettes as much as maximum 90 tons per month, but table 5 shows that in 2017 there are excess of product quantity in June amounted to 93,750 kgs and in December amounted to 100,451 kgs. If using production pattern which has been used, then the production plan in June and December 2017 can not be met due to the exceed of machine production capacity. Thus, the company can use the most efficient production patterns in order to achieve production plan for export in 2017.

Determining Production Patterns. Since it is impossible to use fluctuated production patterns as used by the company over the years due to the exceed of machine production capacity, then PT. Indratma Sahitaguna Semarang can use constant or moderate production patterns which are the most efficient as an alternative of production plan per month in 2017.

Constant/stable Production Pattern.

Production Plan per Month in 2017

$$\frac{707{,}600\ kg}{12\ months} = 58{,}968\ kgs$$

So that the quantities of production per month in 2017 are as seen in the following table:

TABLE 6
PRODUCT QUANTITY PLAN PER MONTH IN 2017 USING CONSTANT PRODUCTION PATTERN (IN KGS)

No.	Month	Product Quantity
1.	January	58,968
2.	February	58,968
3.	March	58,968
4.	April	58,968
5.	May	58,968
6.	June	58,968
7.	July	58,968
8.	August	58,968
9.	September	58,968
10.	October	58,968
11.	November	58,968
12.	December	58,968
Total		707,600

Source: Processed Secondary Data, 2016.

Moderate Production Pattern. *The Excess of Product Quantity in June 2017 = 93,750 kgs – 90,000 kgs =* ***3,750 kgs.***

3,750 kgs of product quantity in June 2017 will be allocated to the production plan in May 2017 to become finished goods inventory, so that the product quantity plan in May 2017 will amount to:

Product Quantity Plan in May 2017 = 66,967 kgs + 3,750 kgs = ***70,717 kgs.***

While the calculations for the excess of product quantity in December 2017 is:

The Excess of Product Quantity in December 2017 = 100,451 kgs - 90,000 kgs = ***10,451 kgs.***

10,451 kgs of product quantity in December 2017 will be allocated to the production plan in November 2017 to become finished goods inventory, so that the product quantity plan in November 2017 is estimated to be of:

Product Quantity Plan in November 2017 = 70,314 kgs + 10,451 kgs = ***80,765 kgs.***

Thus, the production plans of coconut shell charcoal briquette by PT. Indratma Sahitaguna Semarang per month in 2017 using moderate production pattern are as seen in the following table:

TABLE 7
PRODUCT QUANTITY PLAN PER MONTH IN 2017 USING MODERATE PRODUCTION PATTERN (IN KGS)

No.	Month	Product Quantity Plan	Moderate Product Quantity Plan
1.	Jan	21,207	21,207
2.	Feb	44,642	44,642
3.	Mar	51,343	51,343
4.	Apr	78,126	78,126
5.	May	66,967	70,717
6.	Jun	93,750	90,000
7.	Jul	22,325	22,325
8.	Aug	44,642	44,642
9.	Sep	46,879	46,879
10.	Oct	66,967	66,967
11.	Nov	70,314	80,765
12.	Dec	100,451	90,000
Total		707,600	707,600

Source: Processed Secondary Data, 2016.

TABLE 8
ENDING INVENTORY USING CONSTANT AND MODERATE PRODUCTION PATTERN IN 2017 (IN KGS)

Month	Constant Production Pattern	Moderate Production Pattern
January	42,189	4,428
February	60,888	8,801

March	72,875	13,163
April	60,253	19,699
May	58,817	30,012
June	32,772	34,999
July	71,605	37,189
August	90,304	41,562
September	106,765	45,934
October	105,329	52,497
November	100,537	69,502
December	70,017	70,014

Source: Processed Secondary Data, 2016.

The above table shows that the ending inventory using constant production pattern in 2017 is estimated to be of 70,017 kgs, while using moderate production pattern in 2017 will amount to 70,014 kgs, so it can be decided that the most efficient production patterns in 2017 is using a **moderate production pattern**.

Inventory Controls of Raw Materials. Inventory control in PT. Indratma Sahitaguna Semarang is a method of recording and reporting the movement of raw materials within a company, from material stock room, through any of the manufacturing processes to the finished product stage.

Controls of Raw Materials Quantity. Control of raw materials quantity by PT. Indratma Sahitaguna Semarang is as follows:

Analysis of Raw Material Needs. As stated earlier, PT. Indratma Sahitaguna Semarang usually add its production amounting to 2,000 kgs per container as a backup, in case the coconut shell charcoal briquettes do not qualify for selection by the grader of the buyer. So far, PT. Indratma Sahitaguna Semarang requires 1.3 kgs of coconut shell charcoal to produce 1 kg coconut shell charcoal briquettes. The calculation of raw material needs according to production forecast in 2017 is as follows:

Raw material needs in 2017 = 1.3 x 707,600 kgs = ***919,880 kgs.***

So that the raw material needs for production in 2017 will amount to **919,880 kgs**. To get the number of raw material needs per month in 2017, the author uses the product quantity plan per month in 2017 as shown in Table 7 as its base. The following is the calculation of the monthly raw material needs by using the production quantity plan per month in 2017 as its base.

Raw material needs in January 2017 = 1.3 x 21,207 kgs = ***27,569 kgs.***

The overall calculation can be seen in the table below:

TABLE 9
RAW MATERIAL NEEDS OF CHARCOAL BY PT. INDRATMA SAHITAGUNA SEMARANG PER MONTH IN 2017

No.	Month	2017	
		Production (Kgs)	Raw Material (Kgs)
1.	Jan	21,207	27,569
2.	Feb	44,642	58,035
3.	Mar	51,343	66,746
4.	Apr	78,126	101,564
5.	May	70,717	91,932
6.	Jun	90,000	117,000
7.	Jul	22,325	29,022
8.	Aug	44,642	58,035
9.	Sep	46,879	60,942
10.	Oct	66,967	87,057
11.	Nov	80,765	104,995
12.	Dec	90,000	117,000
Total		707,600	919,880

Source: Processed Secondary Data, 2016.

Calculation of Economic Order Quantity (EOQ). Total quantity of

raw materials, ordering cost per order, and carrying cost per kg in PT. Indratma Sahitaguna Semarang can be seen in the following table.

TABLE 10
TOTAL QUANTITY OF RAW MATERIALS, ORDERING COST PER ORDER, AND CARRYING COST PER KG

Year	Quantity (Kgs)	Ordering Cost per Order (Rp)	Carrying Cost per Kg (Rp)
2011	650,000	6,210,409	99.23
2012	780,000	6,965,571	98.97
2013	796,900	5,865,034	98.78
2014	812,500	5,986,759	99.85
2015	824,200	6,278,179	99.71
2017*	919,880	5,923,882	99.72

Source: Secondary Data, 2016

Ordering cost per order and carrying cost per kg in 2017 are foreseen by the least squares method to calculate the EOQ in 2017.

EOQ in 2017 =

$$\sqrt{\frac{2\ x\ 5{,}923{,}882\ x\ 919{,}880}{99.72}} = 330{,}592\ kgs$$

Thus, total economic order of raw material each time an order in 2017 will amount to **330,592 kgs**, with a frequency of raw material order which is required by the company are:

$$\frac{919{,}880\ kgs}{330{,}592\ kgs} = 2.78 \sim 3\ times$$

and will reorder every

$$\frac{360\ days}{3} = 120\ days \sim 4\ months$$

Determination of Safety Stock. In this case the company determines the service level of 90%, it means that 90% of raw material orders can be met, while 10% could not. From the Ms. Excel calculation, Standard deviation (σ) = 31,243.14 and Safety factor (Z) = 1.28.

Safety Stock = 1.28 x 31,243.14 = 40,040 kgs. Thus, safety stock that must exist in 2017 will amount to **40,040 kgs.**

Determination of Reorder Point (ROP). Lead time which is required by PT. Indratma Sahitaguna Semarang between the times of ordering raw materials with the arrival of raw materials which are ordered is for one day.

$$ROP = \left(\frac{919{,}880\ kgs}{360\ days}\ x\ 1\ day\right) + 40{,}040\ kgs$$

= 42,595 kgs.

Thus, in 2017 PT. Indratma Sahitaguna Semarang should do reorder when the inventory of raw materials will amount to **42,595 kgs.**

TC according to EOQ Method. According to table 10 known that: Raw material quantity in 2017 = 919,880 kgs, Ordering cost per order in 2017 = Rp 5,923,882, Carrying cost per kg in 2017 = Rp 99.72, EOQ in 2017 = 330,592 kgs

$$TC = 99.72\frac{330{,}592}{2} + 5{,}923{,}882\frac{919{,}880}{330{,}592}$$

= Rp 32,966,658

Thus, total inventory costs incurred by the company according to EOQ method in 2017 will amount to **Rp 32,966,658**.

TC according to the Formula of the Company. During this time, PT. Indratma Sahitaguna Semarang calculates the total cost of inventory using the average inventory at the plant by using the following formula:

TC = (S x F) + (H x D)

Where :

S = Ordering cost per order (Rp)

F = Frequency of purchase (Times)

H = Carrying cost per kg (Rp)

D = Raw material need per year (Kgs)

Based on forecasting result using least square method, the order frequency in 2017 is 34 times. So, TC according to calculations by PT. Indratma Sahitaguna Semarang is as follows:

TC = (Rp 5,923,882 x 34 times) + (Rp 99.72 x 919,880)

= **Rp 293,142,442**

Therefore, when applying Economic Order Quantity (EOQ) method, PT. Indratma Sahitaguna Semarang is expected to save Total Cost (TC) of **Rp 260,175,764** for planning during 2017.

Segmenting. During this time, PT. Indratma Sahitaguna Semarang doesn't do market segmentation especially on a geographic basis.

TABLE 11
SEGMENTING STRATEGY PLAN OF MARKETING ACTIVITIES BY PT. INDRATMA SAHITAGUNA SEMARANG IN 2017

	Mid. East	Europe	America	East Asia
Industry	1	2	3	4
Re-sell	5	6	7	8

Source: Processed Secondary Data, 2016

From the table above, shows that there are eight segments of the market for export of coconut shell charcoal briquette by PT. Indratma Sahitaguna Semarang. This company can offer differentiated marketing to groups of different segments; this will facilitate PT. Indratma Sahitaguna Semarang in conducting marketing activities so that the export plan of coconut shell charcoal briquettes in 2017 can be achieved.

Targeting. During this time, PT. Indratma Sahitaguna Semarang has chosen the Middle East and Europe as a target market because based on experience, the buyer who often buy coconut shell charcoal briquette from this company came from that area.

The export enhancement plan can be done by seeking additional market areas, based on market segmentation plan on the table 11; PT. Indratma Sahitaguna Semarang can seek additional market areas in America especially in the United States and East Asia especially in Japan.

The research result shows that both the US and Japan have implemented the Go Green lifestyle to its residents, this means that the coconut shell charcoal briquettes from PT. Indratma Sahitaguna Semarang will be well received in both countries. Meanwhile, if viewed from the distance, Indonesia to Japan has a shorter distance compared to the United States. This means that the costs to be incurred to send the charcoal briquettes to Japan will be cheaper, so the company will be able to provide competitive prices.

Thus, the company may choose Japan as the additional target market that will be entered in addition to optimizing the existing markets in the Middle East and Europe to achieve the export of briquettes in 2017 as had been predicted.

Positioning. During this time, PT. Indratma Sahitaguna Semarang has positioned the company as a producer of coconut shell charcoal briquette for big brands that sell briquettes abroad but do not have their own factories.

To achieve the export of briquettes in 2017 as has been predicted, PT. Indratma Sahitaguna Semarang could position the company according to the target market which is already planned, and identifying competitive

advantage compared to companies with similar businesses.

From the results of targeting strategy, PT. Indratma Sahitaguna Semarang selects manufacturers or industry (both goods and services) and traders in the Middle East, Europe, and Japan as a target market. Exporting countries of coconut shell charcoal briquettes which became the main competitor for Indonesia is the Philippines and India, because in both countries also produce a lot of coconut shell and has a relatively low production costs. If viewed from the distance, the Philippines to Japan has a shorter distance than the distance from Indonesia to Japan. It makes the cost incurred by the company to export charcoal briquettes will be more expensive than the costs incurred by a competitor in the Philippines, so PT. Indratma Sahitaguna Semarang can not provide a competitive price compared to competitors from the Philippines to the Japanese market.

Meanwhile, India to the Middle East and Europe has a shorter distance than the distance from Indonesia to the Middle East and Europe. On that basis, the company can not do the positioning strategy on the basis of price. Therefore, PT. Indratma Sahitaguna Semarang can perform positioning strategy with emphasis on the quality of the charcoal briquettes which meets the standards of quality briquettes in Japan.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions. The conclusions that can be drawn based on the research that has been done on export enhancement plan of coconut shell charcoal briquette by PT. Indratma Sahitaguna Semarang are as follows:

a. The export volume of charcoal briquettes from 2011 to 2015 always increased although it did not show significant changes. Thus charcoal briquette has a bright and promising prospect to be exported by Indratma.

b. The production plan for export in 2017 will not be a problem for the company to add some workers and obtain supplies of raw materials, but there is a problem on a machine. Thus Moderate Production Pattern is more efficient than Constant Production. EOQ method is more efficient than what the company had done.

c. PT. Indratma Sahitaguna Semarang doesn't do market segmentation especially on a geographic basis. The company still conducts marketing activities which aimed at the state anywhere that requires coconut shell charcoal briquette. PT. Indratma Sahitaguna Semarang has chosen the Middle East and Europe as a target market because based on experience, the buyer who often buy coconut shell charcoal briquette from this company came from that area. PT. Indratma Sahitaguna Semarang has positioned the company as producer of coconut shell charcoal briquette for big brands that sell briquettes abroad but does not have their own factories; however they can not do the positioning strategy on the basis of price.

Recommendations. The recommendations which can be given based on the research that has been done on the export enhancement plan of coconut shell

charcoal briquette by PT. Indratma Sahitaguna Semarang are as follows:

a. PT. Indratma Sahitaguna Semarang should make good export enhancement plans of coconut shell charcoal briquette, so the bright and promising prospects for the export of this charcoal briquette in 2017 which has been predicted can be achieved.

b. In order to prevent excess quantity of product each month that had been planned in 2017, PT. Indratma Sahitaguna Semarang preferably uses a moderate production pattern. In order to save on total cost (TC) for raw material inventory control plan in 2017, PT. Indratma Sahitaguna Semarang preferably uses the EOQ method.

c. PT. Indratma Sahitaguna Semarang should perform segmentation strategy based on geographic and buying motives. PT. Indratma Sahitaguna Semarang preferably chooses Japan as the additional target market that will be entered in addition to optimizing the existing markets in the Middle East and Europe. PT. Indratma should export both to manufacturers or industry (both goods and services) and to traders in the Middle East, Europe, and Japan as the target market. In order to achieve the export of briquettes in 2017 as had been predicted, PT. Indratma Sahitaguna Semarang preferably performs positioning strategy with emphasis on the quality of the charcoal briquettes which meets the standards of briquettes quality in Japan.

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