The Assessment of Renewable Energy Prospect over Riau, Indonesia

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Abstract

Since the crude oil prices were decreased in global market, the renewable energy technology e.g. photovoltaic and wind turbine was disappointed (no profit) over 2014 ~ 2015. The marketing strategy and management risk was developed to increase of income renewable energy technology. The conventional energy and renewable energy technology is very competitive. Based on the problem, this work aimed to obtain the renewable energy prospect using risk management and marketing strategy especially over Riau – Indonesia. The observation data taken from Google trends based on popularity level. The two years data (2014 and 2015) were processed to analyze the result. In validation section showed the technology of renewable energy on Riau have a good profit compared with petroleum, gas and ash (non renewable energy). We also obtained in generally the technology of renewable energy were prospect (in Sumatera - Indonesia) due to the resource of wind and solar intensity is plentiful than non renewable energy.

Keywords: Renewable energy, Management risk, Marketing Strategy, Google trends, and Riau – Indonesia.

1. Introduction

The definition of renewable energy is generally come to the natural energy resources such as wind, rain, tides and sunlight [1]. The conventional energy (non renewable energy) like oil is very popular than natural energy resources during several years ago. In Indonesia the renewable energy resources is very substantial due to this country located in equator area especially in the Riau region. However, the natural resources in this state were abandoned due to the high cost of renewable energy technology. The private and Government Company were bankrupt due to the equipment cost (tools) to take the natural resources not sold except for the research purposes. Hence, in this work aimed to obtain the renewable energy prospect using risk management and marketing strategy especially over Riau – Indonesia.

In the current study of marketing strategy to increase the renewable energy technology based on product were used marketing plan. The advantages in this method were increased the important customer such as university (for research purposes), big company (chevron geothermal) etc. [2]. However, the weakness of marketing plan is not

unpredicted due to the financial condition. The Google trend data were suggested to improve marketing plan [3]. The trends based on popularity were analyzed to predict financial condition. The application of Google trends were improves the marketing strategy in several years ago [4]. The Google trends data based on search engine popularity were used to describe items and goods in the world. Furthermore, the data were maintained risk management if the product from company not sold [5].

In this work, the data parameter take from Google trends over Indonesian country during two years observation (2014 ~ 2015). In order to analyze the Google trends data, the risk management and marketing strategy method were applied in this study to obtain the market of renewable energy product and to manage the risk if the product cannot sell.

2. Methodology

2.1. Data and location

Riau, Indonesia is located in Sumatera Island with the large crude oil, oil palm and rubbers commodity. This state

located at lat: 00° 30' 02" N, long: 101° 44' 56" E (see figure 1). The natural energy resources such as sunlight and wind are dominant in this state due to located near equatorial lines. The economic prospect in this state is expanded over 8.86% per years. However, the natural resources in this state were abandoned due to lack of facilities.

Fig. 1. Indonesia country (green colour is Riau province)

2.2. Data Processing

The observation data downloaded from Google trends based on search engine popularity (see fig.2). The observation data including trends of renewable energy and crude oil trends were used in this work over two years observation (2014 ~ 2015). The observation data was sorted and cleaned using MATLAB program.
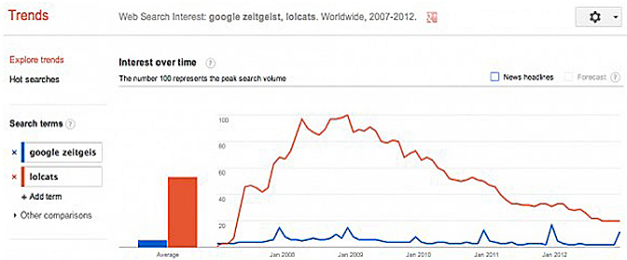

Fig. 2. Google trends observation data

In order to analyze the marketing management and risk management using Google trends data, the popularity data of renewable energy, non renewable energy were plotted to find the good data. Furthermore, the data were analyzed for each category. For example in renewable energy we obtain two resources renewable energy such as sunlight and wind. Afterward, the data were compared and analyzed for each year using marketing management and risk management method. Figure 3 showed the flowchart processing data using marketing management and risk management.
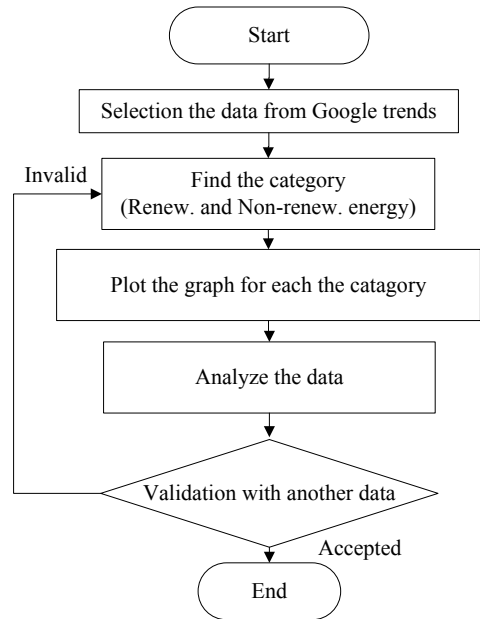

Fig. 3. Flowchart processing data

2.3. Marketing Management

In order to achieve the result, the marketing management were used to design business plan. This method has a fundamental goal of increasing sales and achieving the advantages of product. The developing of marketing strategy is depending on external environment (including technology, economic, political and legal aspect). Furthermore, to increased the target marketing company were maintained customer group using similar product. In addition, the marketing strategy is a basic to approach business unit to achieve target marketing. Figure 4 showed flowchart the provision level of marketing development.
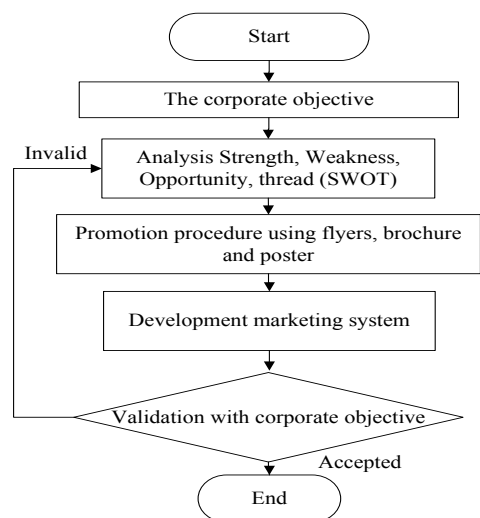

Fig. 4. Provision level Flowchart of marketing development

As can be seen in the figure, the corporate objectives were proposed to achieve the marketing target. Here, SWOT analysis was applied to obtain set point of marketing target. Furthermore, the promotion procedure using flyers, brochure and poster is a tool to increase the customer group (marketing target). Thus, the development marketing system was proposed to maintain costumer group. Afterward, the validation process were used to seen the percentage of to achieve corporate objective.

2.4. Risk Management

The risk management ware defined as development process and resource supervision to estimate minimum loss of project [6]. Furthermore, the advantages of risk management can describe in three categories as follows [7]:

a) The risk management methods were proposed to estimate the company administration (producer) is not fall down (bankrupt).
b) The risk management were suggested to increase income profit
c) The risk management were protected company source (manager, top manager, CEO and customer group) and increasing public image (popularity) product.

In order to protect the product popularity, Figure 5 described of Hazard identification over workplace [8]. Figure 5 shown identification of hazard work is very important assess risk hazard system for management purposes. The controlling hazard risk may reduce hazard work over workplace. Furthermore, the monitoring and review were proposed to evaluate hazard work compared the objective hazard work.
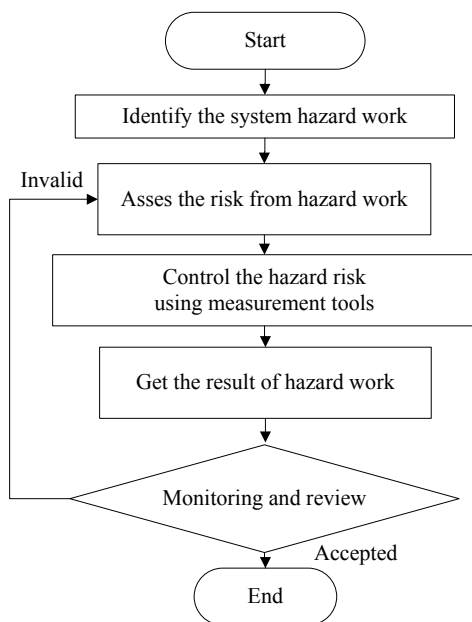

Fig. 5. Hazard identification over workplace

3. Results and Discussion

In order to achieve the result, The Google trends data were used to obtain renewable energy prospect compared non renewable energy (crude oil and ash). Figure 6 showed the pattern of popularity renewable energy compared petroleum and ash commodity. We obtain the non renewable energy such as crude oil was dominant over Indonesia than renewable energy and ash commodity. However, in the 27 July ~ 2 August 2014 and 12 ~ 18 July 2015 the popularity trends of petroleum were decreased until 14 popularity due to the oil trading has cheapest in at this time. Furthermore, in September 2014 and August 2015 the popularity of petroleum were increased while the solar power, wind turbine and ash popularity index has increased. Bali, Yogyakarta, Banten, Central Java and Riau are the famous state over Indonesia where used the renewable energy. However, the facilities to develop and expand the renewable energy resource were limited. Thus, to expand the commodity renewable energy resource the marketing strategy and management risk were proposed to support and monitoring the hazard identification over workplace, respectively.
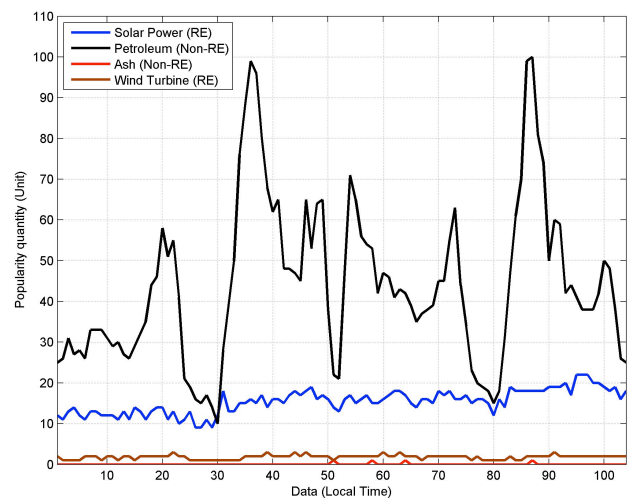

Fig. 6. The popularity index of Renewable energy (RE) and Non-Renewable energy (Non-RE) over Indonesia

In order to increase the RE source prospect over Riau Indonesia, the popularity index were analyzed and compared using Google trend data in validation process. Figure 7 showed the popularity index of RE source and Non-RE source over Riau, Indonesia.
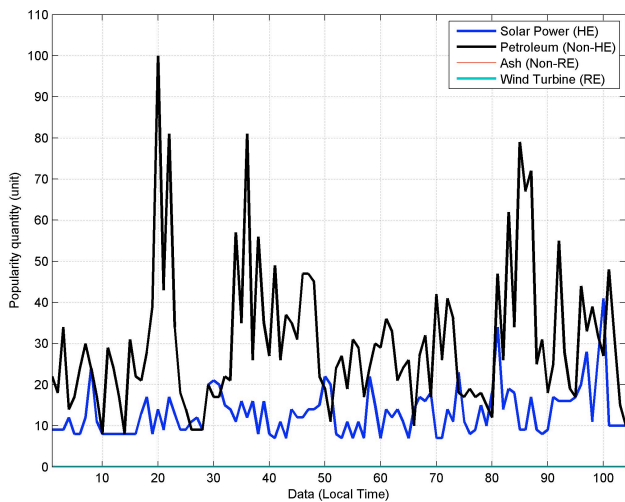
Fig. 7. The popularity index of RE source and Non-RE source over Riau, Indonesia

As can be seen in the figure, the popularity of petroleum was dominant over Riau, Indonesia while the ash and wind turbine were decreased too. Based on the result, the second palace is dominated solar power same like figure 6. Thus, to increase marketing strategy index the solar power was proposed to increase RE prospect. Afterward, the analysis SWOT was used to see the marketing aspect including promotion procedure using poster, brochure, and flyers. The development system to increase quantity of product RE especially solar power (photovoltaic) is based on customer satisfaction, service, thrush, and loyalty between producer and customer. The solar power (photovoltaic) is high technology and maintenance cost. However, the benefit of this equipment such as reduced air pollution and eco energy. The risk management was applied to study hazard identification in workplace especially over Riau, Indonesia. Here, the risk management were increased income (profit) and protect the company resource if the hazard are controlled and monitored under system. The hazard means internal and external factor that can be disturbing management company. Take for example; the economics condition and politics in Indonesia is unstable were affected the Rupiah fall down between 15,000 IDR/1 USD. This is very crucial for the government industry whose produce goods like photovoltaic. Based on situation, the products (photovoltaic) were cheapest and the status of company is bankrupt or the entire employee was fired. Furthermore, to protect the employee, company must have achievement to develop monitoring and review system.

4. Conclusion

The studies of assessment of renewable energy prospect over Riau, Indonesia were successfully. The Google trends application was performed in this study to analyze variation renewable energy and non renewable energy source. The result showed Riau is one state in Indonesia that has potential renewable energy resource (solar power) compared ash and wind turbine. However, the Petroleum (Non-Renewable energy) was dominant in this state. The data showed 27 July ~ 2 August 2014 and 12 ~ 18 July 2015 the popularity trends of petroleum were decreased until 14 popularities due to the oil trading. Therefore, the solar powers were used to improve petroleum energy. Thus, the government or private company who develop solar power (photovoltaic) was decreased during two years ago (2014~2015). However, the marketing strategy and risk management was used to increase profit and protect the company resource.

For future work, the marketing strategy and risk management was combined to obtain the strategy model. The benefits of this model are increase profit and protect the employee.

Acknowledgments

References

[1] IEA Key World Energy Statistics Statistics, 2007. Available on http://coprocem.org/documents/key_stats_2007.pdf
[2] P.R. Dickson, J.L. Ginter, Market segmentation, product differentiation, and marketing strategy, 1987, pp. 1-10.
[3] T. Preis, S.M. Helen, H. Eugene, Quantifying trading behavior in financial markets using Google Trends, 2013.
[4] B.Y. Shih, C. Chen-Yuan, C. Zih-Siang, An empirical study of an internet marketing strategy for search engine optimization, 2013, pp. 528-540.
[5] S. Lee, A.C. Shafe, M.R. Cowie, UK stroke incidence, mortality and cardiovascular risk management 1999–2008: time-trend analysis from the General Practice Research Database, 2011, pp. 0-269.
[6] S.J. Lowder, Risk Management: key to profitability, The cratered accounted ant in Australia, 1982.
[7] H. Darmawi, Management resiko, Bumi Aksara, Jakarta, 2005.
[8] H. Comcare, Identify hazard in workplace: a guide for hazard in the workplace, Canberra, Commonwealth of Australia, 2004.