

Strategic Marketing Plan of LED Lamps towards Resilient Energy Systems

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The resilient energy cannot be only achieved through big project and complicated system, but also by the using of energy-efficient product. One example of energy saving product is LED light claimed to have longer lifespan and higher efficiency than most fluorescent lamps. Due to its potential market it is a chance to increase the usage of LED lamps in Indonesia. However, there is a strong competition because of some brands of LED lamps in the market. To fasten the diffusion of innovation LED lamps to be accepted by the extensive market, especially in Indonesia, this study was conducted to design the appropriate strategic marketing planning for LED lamps. Data obtained from survey that covers interview with the company and questionnaire distribution to actual consumers and retailers was processed to create some analysis, such as market analysis (market demand analysis, consumer analysis, and competitor analysis), strategic marketing plan and tactical marketing strategies. Based on the results of survey the appropriate strategy should be an offensive strategy that consists of a series of tactical marketing strategies: segmentation (geography and demography); targeting (middle-top household consumers); LED positioning (local brand lamps whose quality is not inferior to any other brand); as well as product differentiation and image differentiation. Marketing mix includes product (some wattage variation, longer warranty); price (discounts and competitive pricing); place (multi channel system), as well as the promotion (advertising, banners, sponsorship, and creating event).

Keyword: LED lamps, strategic marketing plan, competitor analysis

Background of the issue

Many countries give concern on resilient energy system that will lead to minimize the environment disruption and to reduce glass house emission. There are many ways for energy efficient, such as using energy saving lamps called LED (Neraca, 2013). An LED lamp is a light-emitting diode (LED) product which is assembled into a lamp (or light bulb) for use in lighting fixtures. LED lamps have a lifespan and electrical efficiency which are several times longer than incandescent lamps, and significantly more efficient than most fluorescent lamps, with some chips able to emit more than 300 lumens per watt (Wikipedia, 2016). The benefits of LED Lighting are endless: energy efficient (80-90 percent), long life span (up to 100,000 hours - more than 11 years), improved durability, low power consumption, compact size (smaller size), fast switching (instantaneous switch-on), brilliant and saturated colors, safety (operating at low voltage), and environmentally friendly (summarized from some internet sources). Because of its benefits the LED lamp market is projected to grow by more than twelve-fold over the next decade, from \$2 billion in the beginning of 2014 to \$25 billion in 2023 (Wikipedia, 2016).

LED lighting market has a bright future. Although there are fluctuations in the economy and the general lighting industry, LED lighting continues to acquire a significant part of the overall lighting market. It was projected that LED lighting market penetration will reach 31 percent of the \$82.1 billion global lighting market in 2015. Europe is the largest geographic market segment—accounting for 23 percent of the global lighting market share, followed by China at 21 percent and the US at 19 percent (LED Journal, 2015).

At the level of the Asia Pacific region, demand for LED lighting is also increasing. In 2012 the penetration of LED lighting in the area was still one percent compared to the population of all types of lamps. It is estimated that in following years LED market share jumped to sixteen percent. Indonesia is the largest market of LED lamps in Asia Pacific with an increasing

number of consumers annually. Although the market share of LED lamps in Indonesia is less than one percent, but LED lights can be accepted by society in line with increased awareness on environmentally friendly technologies and better revenue (Marketers, 2013). It is also expected that the trend of energy saving lamps, i.e. LED, will increase in the future and are projected to reach 400 million units per year (Republika, 2011).

Objectives

Nowadays there are several LED lamp brands in Indonesia, such as Nicolux, Philips, Osram and Chiyoda. As the follower Nicolux, as a local LED lamp, must cope with strong competition because the pioneer entered the market earlier and consumers already recognized their brands. However, based on secondary data, there are still many chances to increase the usage of LED lamps in Indonesia. Therefore this study was conducted with purposes: (1) to design the appropriate strategic marketing planning for Nicolux. (2) to achieve its competitive advantages through tactical marketing strategies. The more Nicolux is sold, the more consumers will be using LED lights that lead to energy savings towards resilient energy system.

Methods

This research was started by a preliminary survey through observation and interview. The next step was data collection, both primary data and secondary data. Primary data was obtained through interview and questionnaire distribution to actual consumers and retailers of Nicolux. Secondary data was gathered through related institutions and internet. Software SPSS was needed to manage data and the results were used for further analysis that included strategic market planning (demand analysis, market analysis and competitive analysis) and tactical marketing strategies which covered the marketing mix (4Ps).

Results

Results of data processing were used to generate some analysis as follows.

Market Analysis

Market analysis was completed to estimate the demand of LED lamps and the variables of LED lamps considered important by consumers. It also describes the positioning of Nicolux in LED lamps market by comparing it to competitors.

- The demand analysis
The demand will be determined based on the secondary data obtained from internet as in the following:
 - During 2012 Indonesia imported 250 million units of energy saving lamps from total demand of 320 million units. The national production of LED lamps should be 200 million units per year, but for this time being it is only 70 millions and the rest of 130 millions is fulfilled by import (Kementerian Perindustrian Republik Indonesia, 2016). It means that national producers can acquire only 20 percents of available market share.
 - The lighting demand of household is 15 million units per year (Berita Satu, 2013). In Singapore LED lamps usage by household is 1:5 that implies there is one house that already use LED lamp among five houses. In China it can be 1:3. Therefore in Indonesia it is projected 1:15 that indicates one fifth of lighting demand can be converted to energy saving lamps (LED). Based on this assumption the estimation of LED demand is $1/15 \times 15,000,000 = 1,000,000$ LED lamp units per year. It is a huge market. If Philips targeted to get 20 percent market share of LED lamps in Indonesia,

there is still 80 percent market share that can be taken which is equivalent to 800,000 units per year.

Based on that information it can be concluded that there is still a big chance to sell LED lamps in Indonesia. Therefore Nicolux has an expectation to grab more market share.

- The consumer analysis

The consumer analysis was performed to identify variables of LED lamps that are considered important by customers. The scale of measurement as specified in Table 1 was created to simplify calculation.

Table 1. The measurement scale for the importance level and the satisfaction level

Scale	The level of importance and the level of satisfaction
1.00 – 2.67	Low
2.68 – 4.35	Medium
4.35 – 6.00	High

The average value of importance level of LED lamps variables can be seen in Table 2.

Table 2. The average value of importance level among 100 actual consumers

Dimension	Variable	Mean	Grand Mean per Dimension
Product	Brand	4.04	4.35
	Light quality	4.91	
	Warranty	4.87	
	Ease of warranty claim	4.41	
	Lamps colour	3.11	
	Watt	3.77	
	Durability	5.46	
Price	Service of complaint	4.20	5.06
	Affordable price	5.08	
	Discount	4.81	
	Competitive price	5.01	
Promotion	Price in accordance with quality	5.33	3.90
	Advertising	3.93	
	Banner	3.71	
	Brochure	3.49	
Place	Product knowledge availability	4.47	4.45
	Product easily obtained	4.65	
	Strategic location of retailers	4.25	

The price dimension got the highest importance level, then place, product, and promotion. But, based on the mean of each variable there were five variables with the highest importance level, i.e. durability, price in accordance with quality, affordable price, competitive price, and light quality. Those results were supported by facts that LED lamps have longer lifetime than other lamp types and can reach 15,000 hours or more. The higher price of LED lamps than other lamp types will not be a problem for consumers as long as it matches to their good quality. However, consumers need affordable price and they will compare it to other lamps because they are likely to buy the cheaper ones.

Table 3. The average value of importance level among 21 retailers

Variable	Mean
Product sold in the market	5.52
Brand	4.38
Warranty	5.00
Affordable	5.29
Payment on credit	4.57
Respon to complaint	5.05
Promotion	5.00
Delivery	5.14
Product easily obtained	4.57

There are also some important variable of LED lamps considered by the retailers as shown in Table 3. There were four variables which got the highest mean: (1) product sold in the market, it means that retailers prefer to sell products that can be sold to end user consumers: (2) affordable price, in order to get high margin from the discrepancy between purchase cost and selling price; (3) delivery, the retailers expect the quick delivery to avoid stockout; (4) good response to complaint.

There are some differences between the importance level of variables between actual consumers and retailers as mentioned in Table 4.

Table 4. The mean of importance level between actual consumers and retailers

Actual consumers	Mean	Retailers	Mean
Durability	5.46	Product sold in the market	5.52
Price in accordance with quality	5.33	Affordable price	5.29
Affordable price	5.08	Delivery	5.14
Competitive price	5.01	Respon to complaint	5.05
Light quality	4.91	Warranty	5.00
Warranty	4.87	Promotion	5.00

It can be seen that actual (end user) consumers focus on variables related to product directly, such as durability, quality, price and warranty. But, the retailers give more attention on service given by company, such as delivery, response to complaint and payment. Nonetheless, there is similarity that both of them need warranty and affordable price.

- **Competitive analysis**

Competitive analysis is accomplished through competitive profile matrix (CPM) by comparing Nicolus with Philips and Osram. CPM is a matrix that identifies strengths and weaknesses of the main competitors against a company's strategic position. Critical success factors (CSF) in the CPM include external and internal issues. Thus, the rating refers to the strength and weaknesses, in which: 4=major strength, 3=minor strength, 2=minor weakness and 1=major weakness (David, 2007). The choice of the competitors was based on results of questionnaire which stated that most LED lamps used by actual consumers currently are Philips (56 percent) and Osram (19 percent), while the rest is another brand. Besides, the retailers stated also that LED lamps with the highest sales volume are Philips (76 percent) and Osram (12 percent), and another brands.

The comparison uses the important variables of actual consumers and retailers called critical success factor (CSF) with the results as on Table 5. It can be seen that LED Philips has the highest score (3.082), and then Osram in the second rank with score of

2.881, and the third rank is Nikolux with score of 2.563. It showed that Nicolux gets the lowest score compared to both competitors. Therefore Nicolux needs some improvements on CSF variables.

Table 5. Results of competitive profile matrix

CSFs	Wt	Nicolux		Philips		Osram	
		Rating	Wt'd Score	Rating	Wt'd Score	Rating	Wt'd Score
Product sold in the market	0.124	2	0.248	3	0.372	3	0.372
Brand	0.098	2	0.196	4	0.392	3	0.294
Warranty	0.112	3	0.336	3	0.336	3	0.336
Affordable price	0.119	3	0.357	2	0.238	2	0.238
Payment on credit	0.103	3	0.309	3	0.309	3	0.309
Response to complaint	0.113	3	0.339	3	0.339	3	0.339
Promotion	0.112	2	0.224	3	0.336	3	0.336
Delivery	0.116	3	0.348	3	0.348	3	0.348
Product easily obtained	0.103	2	0.206	4	0.412	3	0.309

Strategic Market Planning

After defining market analysis, the next step is to determine marketing strategy. It is said that LED lamps has a chance to develop in the future. However, the competition in the market of LED lamps is very high. Based on CPM on Table 5 Nicolux obtains the lowest score than its strong competitors. It means that LED lamps market is attractive enough and Nicolux can apply offensive strategic market plan in order to grab more market share. Offensive strategic market plan is divided into two strategies, i.e. market penetration strategies and new market entry strategies (Best, 2000). Market penetration strategies are carried out to increase the existing market share and new market entry strategies relates to market development by entering new market. While there is still an opportunity to get more market share in Indonesia, the suitable strategy for Nicolux is market penetration.

Tactical Marketing Strategies

The further stage is to design tactical marketing strategies that consist of segmentation, targeting, positioning, and differentiation, and also marketing mix (4 Ps).

- **Segmentation and targeting**
Segmentation of Nicolux is based on the geography and demography. A reason for geography segmentation is because nowadays Nicolux focuses on the market lamps in Indonesia to grab national market share. Demography segmentation is based on the social class of consumers. The target market of Nicolux is middle-top household consumers in East Java, Madura, and Bali that use LED lamps for household consumption.
- **Product positioning and differentiation**
Nicolux can apply positioning strategy "the same for the less". It is local LED lamp with similar quality with competitors but having a cheaper price. The differentiation is on the product itself with higher efficiency than others. It can also develop image differentiation with a perception that Nicolux relates to energy saving because of its superior efficiency and lower price.

- **Product**
Nicolux can consider the five variables that are considered important by actual consumers, i.e. durability, light quality, warranty, ease of warranty claim, and response to complaint. Indeed Nicolux offers core benefit as LED lamps for lighting. But, it can provide more value as actual product by developing some wattage variations, such as 5 watt, 6 watt, 8 watt, and so on. Furthermore, its warranty can be one year as an augmented product instead of only 6 months.
- **Price**
Price is considered significantly by actual consumers and retailers in choosing LED lamps. Therefore Nicolux can do some improvements related to pricing, such as giving discounts for big volume purchase, competitive pricing and value added pricing by setting higher price for more benefits.
- **Place**
Based on market analysis it can be recognized that product easily was important for actual consumers. Similarly, retailers considered that delivery is significant. This means that the location of the sale or distribution of Nicolux must be precise so that consumers can get it easily and retailers will have no problem with stock out. The mixed channel system can be suggested as collaboration between direct channel and indirect channel. Direct channel is accomplished through online via website and facebook and indirect channel is done through retailers. With those ways consumers can obtain the product easily.
- **Promotion**
Some effort should be carried out to communicate the product to consumers. Moreover, based on questionnaire results there was only 24 respondents among 100 respondents who ever heard about Nicolux and only 4 of 100 respondents use Nicolux. For that reason some suggestions should be done to generate the brand awareness of Nicolux. It can advertise the product through print media and electronic media. It can also put banners in front of the retailers. Moreover, it can create sponsorship on some events related to energy saving, such as Road Show Green n Clean collaborated with Surabaya Government. This event can be as media to inform product knowledge to public. The more consumers know about Nicolux, the more consumers who want to try it.

Conclusion

Because of its benefits LED lamps usage in Indonesia is projected to grow. Most LED lamps current demand is covered by imported lamps. Therefore there is an opportunity for local manufacturer to fulfil the gap. As the follower, Nicolux, as a local LED lamp, should compete with some brands that are familiar and already recognized by consumers. Nicolux can choose offensive strategies to design strategic marketing plan and to implement tactical marketing strategies. From the analysis it can be suggested some improvements on variables considered important by actual consumers and retailers. Through the developments Nicolux will achieve competitive advantages and can deal with the tight competition very well. Those strategies can widespread the usage of LED lamps, especially in Indonesia, that can lead to energy saving.

References

- Berita Satu (2013). *Penggunaan lampu led di property Indonesia masih minim*, <http://www.beritasatu.com/interior/134414-penggunaan-lampu-led-di-properti-indonesia-masih-minim.html>, accessed on 2nd May 2016.
- Best, R. J. (2000). *Market-Based Management*. Edisi 2. New Jersey: Prentice Hall, Inc.

- David, F. R. (2007). *Strategic Management: Concepts and Cases*. Edisi 11. New Jersey: Pearson Education, Inc.
- Kementerian Perindustrian Republik Indonesia (2016). *Indonesia impor 250 juta lampu tiap tahun*, <http://kemenperin.go.id/artikel/6194/Indonesia-Impor-250-Juta-Lampu-Tiap-Tahun>, accessed on 2nd May 2016.
- LED Journal (2015). *Global LED Lighting Trends Reveal Significant Growth and Product Development*, <http://www.ledjournal.com/main/blogs/global-led-lighting-trends-reveal-significant-growth-and-product-development/#sthash.97tdu6D2.dpuf>, accessed on 3rd May 2016.
- Led Lamps. (2016). *Benefits of LED lighting*, <http://www.led-lamps.net.au/led-basics/benefits-of-led-lighting>, accessed on 2nd May 2016.
- Marketers (2013). *Era lampu LED sudah dekat*, <http://marketeers.com/index.php/article/era-lampu-le-sudah-dekat.html>, accessed on 2nd May 2016.
- Neraca (2013). *Lampu LED pilihan cerdas menghemat energi*, <http://www.neraca.co.id/article/33135/lampu-led-pilihan-cerdas-menghemat-energi>, accessed on 2nd May 2016.
- Office of Energy Efficiency & Renewable Energy (2016). *LED lighting forecast*, <http://www.energy.gov/eere/ssl/led-lighting-forecast>, accessed on 3rd May 2016.
- Republika (2011). *Pasar lampu penerangan hemat energi capai 80 persen*, <http://www.republika.co.id/berita/trendtek/elektronika/11/12/02/lvklcy-pasar-lampu-penerangan-hemat-energi-capai-80-persen>, accessed on 2nd May 2016.
- Wikipedia (2016). *LED lamp*, https://en.wikipedia.org/wiki/LED_lamp, accessed on 2nd May 2016.



PROCEEDINGS

2016 ASIAN ALUMNI WORKSHOP ON RESILIENCE IN ENERGY SYSTEM

Association of Indonesia Alumni of University of Flensburg
in collaboration with
Europa Universität Flensburg

Jakarta – Indonesia, 20 June 2016

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Foreword

Prof. Dr. Bernd Möller, head of the EEM programme at the University of Flensburg, Germany

The present book of proceedings from the Asian Alumni workshop on May 16-20 in Bandung, Indonesia, summarizes the significant input of participating alumni of German universities. Thanks to the great effort of the organizing Alumni from the SESAM/EEM program of the University of Flensburg, a large variety of contributions was collected and processed into this book. What lies between the call for abstracts in February 2016 and the present publication is the enormous body of work put into organizing and managing the conference with thirty-seven participants in Bandung.

Every Alumni event of the SESAM/EEM program is like a family gathering, where former students of this program and their colleagues from other DAAD-funded studies in Germany meet. The format is that of a scientific conference, where Alumni present their current work and discussions are highly encouraged in the sessions and in the breaks in-between.

The selection of papers presented documents that Asia, being the World's focal point of economic development, also is a continent where solutions to problems associated with growth, energy use and the environment are being developed. The invited professionals from governments, industry, research and non-governmental organizations have shared their significant experience during the conference, and bring home the lessons collectively learned.

The theme of the alumni workshop was "Resilient energy systems", understanding resilience as the ability to cope with dramatic change. Two main areas that experience substantial change these years are the fast economic development in many countries as well as the changes to ecosystems. Resilient energy systems will have to cope with issues resulting from these changes, like increased inequality, increased vulnerability to climate change, and a large number of associated challenges.

Specifically, the workshop has been divided into seven topic areas, six of them addressing subjects like energy planning, energy system resilience, renewable energy, entrepreneurship, energy efficiency and education. The seventh topic addressed the continuation and further development of alumni networking. In the present book of proceedings the reader will find the papers presented at the alumni conference, as a documentation of the enormous work effort behind, and as an inspiration for making new contacts and seeking new forms of collaboration.

It is through alumni conferences like this that a "life-long learning" relationship between a university program and its former graduates can be maintained. Past workshops and this one in Bandung offer great opportunities for alumni to keep up to date, to network, and to share feed-back with their Alma Mater on the basis of professional careers and the experiences from the real world.

Susy M. Simarangkir, Head of Committee

Dear Authors, esteemed Readers,

The Association of Indonesian Alumni of University of Flensburg was established in 2015 as a response to the 25th Anniversary of University of Flensburg to organizing a workshop on Resilient Energy System. Eighteen Indonesian alumni are now working in various sectors, such as government institutions, NGO, oil and gas company, international agency, consultant and others and in a prominent position.

We bring up Resilient Energy System as the theme of the workshop because the challenge of providing reliable and affordable energy to fulfill the growing demand becomes stringent, not only in developing country but around the globe, more severe due to the climate change. The climate is progressively changing creating new challenges for energy systems including energy supply and demand. Resilience in energy systems implies to a system that can ensure secure balance between energy supply and demand despite internal and external development such as climate change. The options in mitigation and adaption can alleviate the climate change impact but no single option can be successful by itself.

Energy planning and policy, business and entrepreneurship models, renewable energy, energy efficiency, energy systems and education in environment are the chosen areas to be shared and discussed in the workshop. Thirty-seven participants from 7 Asian countries and 1 European country shared their knowledge and ideas taken from their in-depth experiences on the selected topic and this Proceeding is the compilation of papers written by participants.

The workshop also would like also to develop and strengthen the bond among German alumni. We believe we all can do better when we work together and it is unsurprisingly one solution in one country may be implemented successfully in other country. I trust also that this will be an impetus to stimulate further study and research in all these areas.

We thank all authors for their contributions.

Table of Contents

Foreword	3
CHAPTER 1. ENERGY PLANNING AND POLICY FOR RESILIENT ENERGY SYSTEM.....	6
Renewable Energy Development Strategy in Indonesia	7
The key to regional energy planning towards a 100% renewable electricity system for ASEAN	13
CHAPTER 2. ENERGY SYSTEM RESILIENCE TO ECONOMIC DYNAMICS AND CLIMATE CHANGE.....	21
Energy System Resilience to Economic Dynamic and Climate Change (Focusing on Local Adaption Plan for Action of Nepal)	22
Towards a Framework for Resilient Monitoring & Control Systems Design: An Application in Network of Power Systems	26
Cross Border Energy Cooperation: A structural energy security approach in Asia addressing SDG	32
CHAPTER 3. RENEWABLE ENERGY.....	51
Solar powered safe drinking water supply schemes for climate vulnerable and salinity affected off-grid coastal people	52
Solar Power Based Mgiri Technologies for Agriculture and Agroprocessing Industries And Its Impacts	62
Powering Agriculture Waste for Sustainable Power Generation in Indonesia	70
Biogas Development in Nepal: Experiences from the Private Sectors.....	77
Design of Renewable Energy Data Measurement Instrument for Archipelago Area.....	85
Utilization of Jaboi Geothermal Resources by Using Binary Cycle Power Plant.....	91
CHAPTER 4. BUSINESS AND ENTREPRENEURSHIP MODELS FOR RESILIENT AND SUSTAINABLE ENERGY SYSTEMS	101
The Application of Balanced Scorecard In Business Canvas Model To Link The Sustainable Energy to Enterprise Strategies.....	102
Strategic Marketing Plan of LED Lamps towards Resilient Energy Systems	111
IDCOL: An Organization for Financing Resilient and Sustainable Energy Systems.....	119
Accelerated Commercialization of Photovoltaic Water Pumping System in Nepal	126
CHAPTER 5. EDUCATION FOR ENVIRONMENTAL SUSTAINABILITY AND RESILIENCE....	130
Promoting the Greening Curriculum	131
Model Community for Zero Waste Management by 3Rs.....	137
CHAPTER 6. ENERGY EFFICIENCY IN INDUSTRY, HOUSEHOLD, TRANSPORTATION AND BUILDINGS	145
Application of Mini Compressors to Recover Gas Flaring	146
CHAPTER 7. ALUMNI NETWORK	157
Flensburg Association for Energy Management - Nepal (FAEM –Nepal): The Past, Present and Future.....	158