PROJECT "PHASING OUT INCANDESCENT LAMPS THROUGH LIGHTING MARKET TRANSFORMATION IN VIET NAM"

STUDY OF INDOOR LIGHTING MARKET IN VIETNAM

Ha Noi, 2013

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ABBREVIATIONS

CFL	Compact Fluorescent Lamp
ESL	Energy Saving Lamp
EVN	Vietnam Electricity
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
IL	Incandescent Lamp
MOC	Ministry of Construction
MOIT	Ministry of Industry and Trade
MONRE	Ministry of Natural Resources and Environment
MOST	Ministry of Science and Technology
VNEEP	Vietnam Electrical Efficiency Program

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INTRODUCTION

Climate change is emerging as the current pressing global issue, with impacts on the socio-economic development of many countries in the world. In order to reduce greenhouse gas (GHG) emissions and prevent the rising of the earth's temperature, energy saving and efficiency in use is one of the solutions that mankind is moving toward. Among them, one solution is replacing Incandescent Lamps (ILs) with Energy Saving Lamps (ESLs). As one of countries affected strongly by climate change Vietnam has signed and ratified the United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol. The Government of Vietnam has been actively taking actions of energy saving and environmental protection in respond to climate change.

With the support from Global Environment Facility (GEF), the United Nations Environment Program (UNEP) has been implementing the project on phasing out ILs in many countries over the world, such as countries in Africa, Middle East, Latin America and Asia. In Vietnam, GEF has supported to carry out the project: "Phasing out incandescent lamps through lighting market transformation in Vietnam" in period of time from 2010-2014. The project aims to reduce greenhouse gas (GHG) emissions through conversion of ILs use into ESLs in Viet Nam.

The project has been developed under the umbrella of the GEF-supported Global Market Transformation for Efficient Lighting Initiative and in close cooperation and coordination with the Ministry of Natural Resources and Environment (MONRE) and UNEP. The Institute of Strategy and Policy on Natural resources and Environment (ISPONRE) is the executing agency of Project.

The project includes 4 short term objectives: (1) Strengthening lighting industry capacity in Viet Nam through technical aid on conversion of IL production lines to ESLs to reduce GHG emissions and environmental protection; (2) Strengthening and harmonizing quality standards on ESLs to comply with international standards; Improving QA/QC capacity; (3) Educating and raising awareness of consumers to promote conversion of ESL market; (4) Strengthening policy and institutional framework to support, encouraging and monitor ESL production, sales and use in the domestic market, comply with the environmental regulations.

To obtain those objectives, there are four components in structure of the Project, including: (i) Local Lighting Capacity Enhancement Program, (ii) Improved Quality Assurance (QA)/Quality control (QA Framework, (iii) ESL Market Development and Consumer Education and Awareness, and (iv) National Policy and Institutional Support Program towards Phasing-out of ILs and Promotion of ESLs.

The indoor lighting market study is one of the first activities of the project, which has been carried out from May to December 2012. This report presents the research's results. The report content consists of 4 main parts: The First Chapter introducing research's objectives, subjects and method used, Chapter 2 giving an overview of light–producing industry in Vietnam, Chapter 3 presenting results of the market investigates and survey implemented and Chapter 4 including suggestions and recommendations.

The research results show that, the total number of ILs in current market (2012) is about 34.5 million units and tend to reduce due to appearance of alternative products that are more popular. With the market capacity of about 450 million bulbs and the number of bulbs replaced annually of approximately 250 million bulbs, Vietnam is a huge consuming market and very potential for producers. Therefore, the market information will be the framework for policy makers to give subsequent decisions that target to lamp-users awareness, attitudes and behaviors. It is also the fundermental to set up supports which promote producers to change to manufacture higher quality products for meeting the market demand.

The Project Management Office is honor to introduce this study report to our readers, which gave an overall picture about the situation of lamp use in households, offices and public buildings in Vietnam.

SUMMARY

Project "Phasing out incandescent lamps through lighting market transformation in Vietnam" funded by the Global Environmental Facility (GEF) has been carried out from 2011 to 2014. The project's overall objective is to reduce greenhouse gas (GHG) emissions through conversion of ILs use into ESLs in Viet Nam.

Study on the indoor lighting market in Vietnam is one of the first activities of the project. The study gathers information on lamps from the general population, local manufacturers and custom administrators. It aims to figure out the market demand and tendency of indoor lamp use in Vietnam, current situation and challenges in changing to use ESLs. Base on getting results, the research is expected to support lamp-producing enterprises in accessing to the market of which tendency is changing to use more ESLs. In addition, the research will provide suggestions/recommendations for policy makers to give proper decisions to encourage producing and using of ESLs.

The research was carried out in 6 provinces/cities nationwide including Hanoi, Lang Son, Hochiminh city, Kien Giang, Binh Dinh and Lam Dong. The research group carried out a survey with 586 households; 52 distributors, 52 business consumers, 7 government offices, 6 lamp suppliers and 6 Building administration offices. Method used were observation, direct interview with producers and managers by survey with questionnaire.

The research results show that with current number of 25 million households in Vietnam and the average number of lamp use per households of around 14.3 bulbs, the total number of lamp used in households is about 359 million bulbs. Additionally, there are around 25 million bulbs used in nearly 1 million enterprises, government offices, and organizations in different economic fields.

Out of the investigated households, there are 60% who are still using ILs with the average number of about 2-3 bulbs per family. 9.6 % of those bulbs has power capacity of over 60W. The total ILs in the market are around 34.5 million bulbs and tend to decrease in the future due to appearance of alternative lighting products that can save energy and be more popular. However, there are still some consumers who are in favor of ILs because of some main reasons: (i) Much cheaper (ii) Heat providing for warming up (iii) Being suitable for different quality of electrical systems (iv) Do not recognize the efficiency of using ESLs. For lamp producers, completely change from producing ILs to ESLs brings numbers of difficulties.

With total market capacity of about 450 million using bulbs and nearly 250 million bulbs replaced annually, Vietnamese market is quite potential for lighting

producers and also be a huge energy consuming market. Therefore, information on demand and behaviors of lamp users will be the fundermental for policy makers to give subsequent decisions that aim to change awareness, attitudes and consuming behaviors of users and to give proper supports to encourage lamp producers in changing to producing higher quality ESLs.

This report also proposed some suggestions and recommendations to state management bodies, Vietnam Electricity (EVN) and other stakeholders to promote the transformation of lighting market to ESLs for the national sustainable development.

CHAPTER I. OBJECTIVES, SUBJECTS AND RESEARCH METHODS

1. Research objectives

Study on indoor lighting market in Vietnam aims to figure out the market demand and trends of indoor lamp use in Vietnam, including consumption reasons of different types of lamp and barriers for changing to use new ones. Then:

- Making suggestions for lamp manufacturers to access a new trend of the lighting market that is moving toward energy saving products.

- Making implications for policy makers to adjust the market moving to the trend that encourages producing and consuming ESLs.

2. Subjects, method and scope of study

2.1 Required information

- Identify the specifics of the market shares regarding to consumption purposes. Factors are influencing on buying behavior of different consumers. The importance of different factors related to products which affects consumer product evaluation and selection?

- The capacity of the lamp market in Vietnam: the market's structures by product types, brand and market segmentations. The trend of lamp use.

- The main competive brands in the Vietnamese market (including imported brands), strengths and weaknesses of each brand, manufacturer and importer.

- The main market trends: What current policies are influencing/inter vening on lighting business? What non-policy factors are influencing the market demand in Vietnam?

- The market-related issues affect on distribution channels: The availability and readiness of middle stakeholders, their requirement, their evaluation on all types of lighting products, their needs and comments when joining distribution channel systems.

- Assessing the influences of policies and regulations to the lighting market and operating activities of the market in Vietnam

- On which segment that market of ILs are focusing? Why this market are still remaining? Does that completely eliminate the ILs market can be done or not ? What is the barrier for this work?

- Who are manufacturers/businesses in the lighting market in Vietnam? Their main strengths? Why do they work on this market? Do they benefit the market's consumption capacity or low cost labors?

- What solution should be considered to save electrical energy in general and lamp use in particular?

2.2. Research subjects

As mentioned above, to gather necessary information related to consumer behavior and business operation of enterprises who are specializing in lighting industry, research group focused on different subjects described in Table 1, including:

- 7 relevant administration agencies, listed in Appendix 1

- 52 distributors including first grade distributors (wholesalers) (grade 2-3 distributors (small and medium stores).

- 586 households

- 52 agencies and enterprises who are also customers

- 6 companies/ enterprises specializing in manufacturing and doing lighting business in Vietnam

- 6 Maintainers of buildings listed in Appendix 3

2.3. Research scope

Geographical scope: 6 following provinces and cities in different regions are selected as samples of lighting market of Vietnam including (1) Hanoi, (2) Lang Son, (3) Ho Chi Minh City, (4) Kien Giang, (5) Binh Dinh, and (6) Lam Dong.

These study samples represent for all regions (the North, the Central Part and the South);different topography (mountain, delta, coast and highland);, urban areas and rural areas; areas with high (such as Hanoi and Ho Chi Minh City) and low electrical consumption (such as Lang Son, Kien Giang). The samples were also divided into two groups of electrical needs that represent for rural areas and agricultural production such as Lang Son and Lam Dong and industrial zone such as Binh Dinh and Ho Chi Minh City.

In addition sampling sellection is also based on different living regions: rural areas and urban areas. Hanoi and Ho Chi Minh City are cities but there are many agricultural areas; Binh Dinh represents Southern Coast with both city (Quy Nhon is Category 3 city) and districts which present rural areas; Lam Dong represents Central Highlands with ethnic minorities; Kien Giang represents South most areas bordered by Cambodia; Lang Son represents Northern mountainous area bordered by China.

Timing: September and October 2012

Scope of application: from 2013 to 2015

2.4. Research method

For each subject, the methods used are different as following:

Table 1. Scale of sample, study method and data analysis

No.	Subject of study	Method of data collection	Scale	Sample method	Location	Method of data analysis and processing	Used tool
1	Relevant State administration agencies	Direct interview	7	Attached list in Appendix 2	Hanoi and some localities	Qualitative synthesis and analysis	Sample PV1
2	Level -2/3 distributors – Small and medium stores	Direct interview or survey questionnaires	52	Select convenient samples	Hanoi, Lang Son, Binh Dinh, Lam Dong, ho Chi Minh City, Kien Giang	Qualitative synthesis and analysis in combination with quantitative ones	Form BH1
3	Households	Questionnaires	588	Random sampling in which structure is denominator next to name of each locality in next item.	Hanoi, Lang Son, Binh Dinh, Lam Dong, Ho Chi Minh City, Kien Giang	Quantitative synthesis, analysis and statistics using software SPSS19	From BH2
4	Agencies and enterprises	Questionnaires	52	Random sampling in which subjects are managers of purchase	Hanoi, Lang Son, Binh Dinh, Lam Dong, HO CHI MINH CITY, Kien Giang	Quantitative synthesis, analysis and statistics using software SPSS19	Form BH3
5	Companies/ enterprises manufacturing, selling lamps in Vietnam	Direct interview or Questionnaires	6	Attached list in Appendix 3	At the companies	Qualitative synthesis and analysis	Form PV4
6	Management Units of buildings	Direct interview	6	Attached list in the table 4	At the Management Units	Qualitative synthesis and analysis	Form PV5

In theory, market studies which collect and analysis external data related to issue of interest, is considered as "process of listening to voice of market and communicate the collected information for suitable management". Market research can be simple as giving comment card to customers or complicated as national survey which use technical questionnaires to get ideas and data analysis. During implementation of this research, research group used the following methods for information collection:

1. Direct observation. The group carried out survey in electrical stores and observe their selling activities with focusing on lamp products. lamp-use status in governmental agencies/organisation is assessed by observing lighting systems. Some households (both in cities and rural areas) were also visited.

2. Direct interview with manufacturers: To obtain understanding of current business activities and mainstreams of the market, direct interviews were carried out with the major lighting manufacturers such as Rang Dong, Phillips, Dien Quang. Wholesale dealers and some grade 2,3 distributors were also interviewed to find out the trend of market demand and selling measures applied in distribution branches.

3. Survey questionnaire: Questionnaire were used to investigate of the lamp use in households and enterprises. The given questions related to actual status of lamp use, behaviors and habits in lamp use and lamp purchase. Factors affecting need and use of lamps, obstacles (if any) which prevent customers from using ESLs were also included in the survey

4. Desktop review with administration agencies: State administration agencies were also subjected to collect documents relating management issues such as data on production, export and import of lighting equipment in Vietnam (and attached list in appendix)

2.5. Method for sampling

As seen in the research plan, sampling households were selected by non-random sampling method (based on product popularity). Base on the basic understanding of households, researchers actively decided if a subject should be selected for sampling to fit research sample structure as required.

Sampling for agencies and enterprises were base on type of business. Some buildings in Hanoi and Ho Chi Minh City were selected to collect information on their lighting system and approaches applied for energy saving. These are typical and modern buildings such as: the highest building in Ho Chi Minh City – Bitexco building with 68 floors, headquarter building of Vietnam Forest Corporation (No. 127 Lo Duc Street) and headquarter building of Hanoi Machinery and Spare Parts Corporation (No. 444 Hoang Hoa Tham Street) (attached list in the following appendix); these buildings have just completed and used from 2011-2012. Moreover, there are also some other office buildings for

lease such as building No. 27 in Hang Bai Street (Hanoi). Direct interviews with subjects like employers, maintainers (installation and operation power system) were conducted to get valuable data for research.

2.6. Data analysis

With information collected in interviews: opinions of parties are qualitatively synthesized and analyzed by inductive method and comparative method in order to find out significance and value of information.

With information collected in survey through questionnaires: collected data is input into computer and processed by software SPSS version 19.0. Result of processing data from three subjects of survey is attached to this report.

The results of data analysis shows linkages between some research areas such as agriculture, planning and investment, construction, architecture, environment and public lighting and indoor lighting. The research group contacted many specialists who are working in the research areas for directly interviewing and inviting them to take part in a project's workshop on October 2012. The workshop implemented by Ministry of Construction and financed by International Finance Corporation under World Bank (WB) discussed about standard of lamps and energy saving lamps in construction in Vietnam. The results obtained helps to process data in more systematic and comprehensive manner.

3. Overview of research samples

3.1. Lighting manufacture and business

3.1.1. Lighting manufacturers and importers

Based on the methods used for market survey and selection criteria to investigate manufacturing and trading enterprises, the research group conducted survey in following enterprises:

Rang Dong Lighting Source and Vacuum Flask Joint Stock Company

Dien Quang Joint Stock Company

Philips Electronics Vietnam

LUXXX Vietnam Co., Ltd

Dai Quang lamp Co., Ltd

OSRAM Vietnam

Besides, the research group also collected secondary information about some other enterprises provided by General Administration of Customs following:

Hoa Thai Lamp Co., Ltd

Woori Vina Co., Ltd

Others

3.1.2. Lamp distributors

Investigation on distribution system was conducted in the following locations: Hanoi, Ho Chi Minh City, Binh Dinh, Lam Dong and Lang Son with total 50 stores and distribution points, retailers and wholesalers. Hanoi accounts for 35.4% and Ho Chi Minh City accounts for 20.1%. This structure ensures geographical and regional structure estimated for Northern mountainous region bordered by China, locations in The Central Highlands and Central Coast (Table 2).

Table 2. Number of significant sampling distributor investigated in different provinces

		Frequency of appearance	Rate	Valuable rate	Total
Significant samples	Hanoi	17	34.0	35.4	35.4
	Ho Chi Minh City	10	20.0	20.8	56.3
	Binh Dinh	8	16.0	16.7	72.9
	Lam Dong	6	12.0	12.5	85.4
	Lang Son	7	14.0	14.6	100.0
	Total	48	96.0	100.0	
Error	System	2	4.0		
Total		**50**	**100.0**		

3.2. Demand of lamp

3.2.1. Household users

A survey was conducted with about 400 households in 6 above-mentioned provinces. However, in the implementation process, caring for low possibility of obtaining useful information, the researcher group decided to scale up to 700 samples. On that basis, the group collected 588 significant responses for analysis, with particular structural form as follows:

About local and regional structure

Ho Chi Minh City accounted for the largest proportion with 38% (224 responses, including 164 votes from the city area and 60 votes from households in regional towns, townships and rural areas)

The second biggest share was Hanoi with 158 votes, accounts for 27%, of which 106 votes in urban areas and 51 votes from the households in the town and rural areas

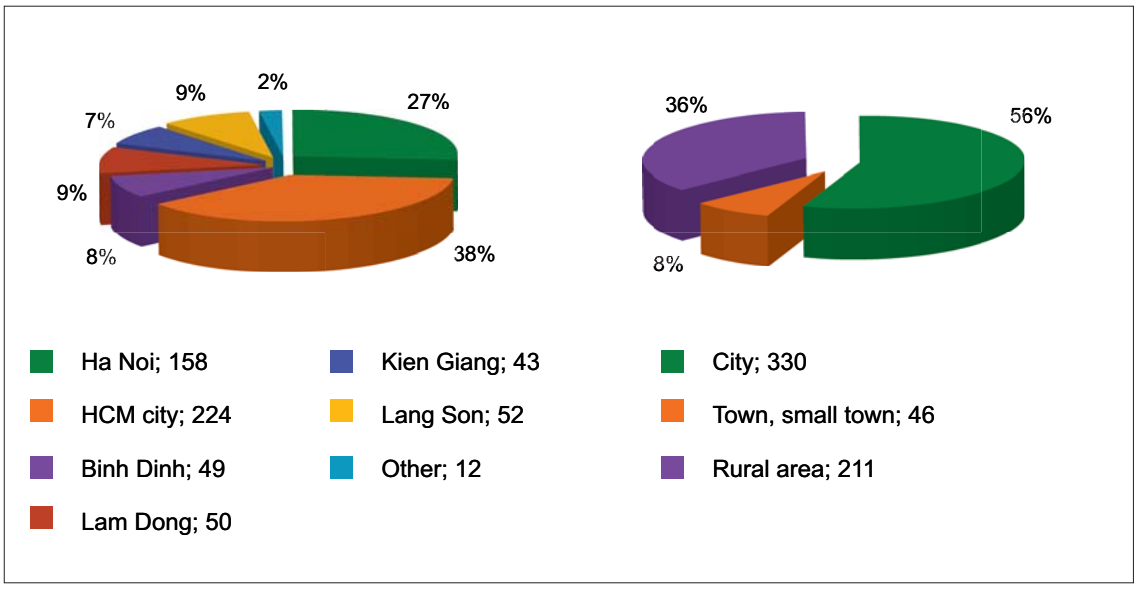


Figure 1. Structure of household samples based on locality

Figure 2. Structure of household samples based on region

Lang Son, Kien Giang, Binh Dinh and Lam Dong have 52, 43, 49 and 50 votes, respectively. The structure of samples basing on living region is shown in the following table (Table 3)

Table 3. Structure of household samples based on locality and living region

	Living area			
	City	Town	Rural areas	Total
Hanoi	106	4	47	157
Ho Chi Minh City	164	18	42	224
Binh Dinh	14	3	32	49
Lam Dong	14	1	35	50
Kien Giang	10	11	22	43
Lang Son	16	6	30	52
Others	6	3	3	12
Total	**330**	**46**	**211**	**587**

There are totally 330 households involving in the research who are living in cities and 257 households living in towns and rural areas. This sampling structure is relatively suitable with sample structure in the research plan.

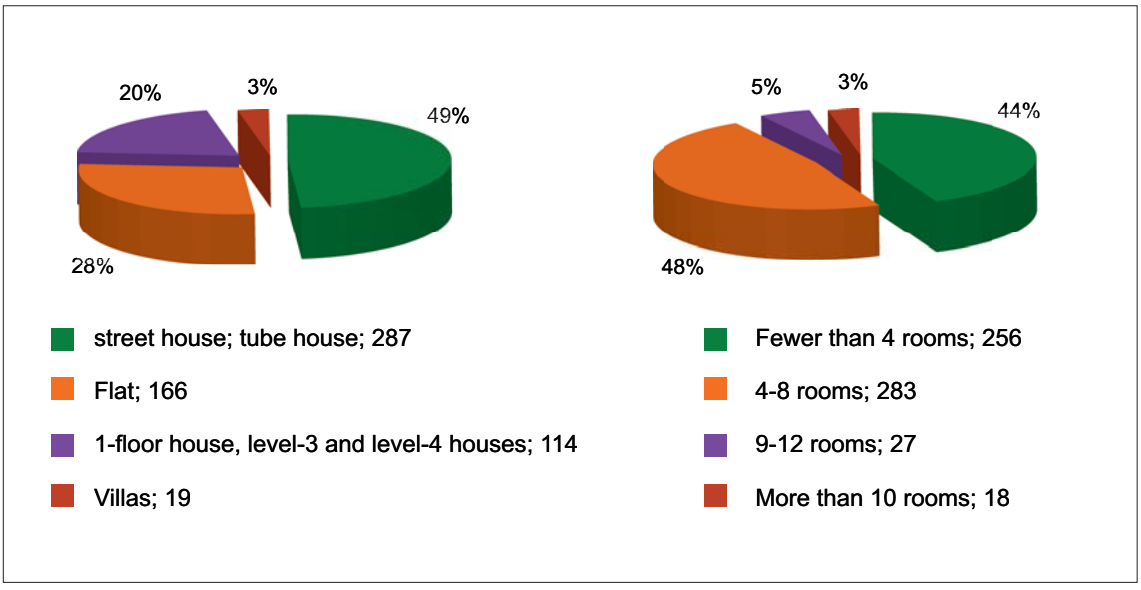


Figure 3. Structure of household samples based on house style

Figure 4. Structure of household samples based on number of rooms

About sampling structure based on house style and number of rooms

49% of households participated in the survey live in urban houses and tube houses. 28% of households live in apartments, 20% live in one-floor houses (grade 3 or 4) and 3% live in villas.

Out of the research sample, 44% of the housesholds have less than 4 rooms (including bedroom, living room and toilet); 48% have 4-8 rooms, 27,5% have 9-12 rooms and 18,3% have more than 10 rooms (villas). This sampling structure is suitable to house-style structure in research locations.

About role of answerer in families and structure based on scale of family

46% of anwerers in the survey are householder, 34% are persons who plays an important position in their families and 23% are dependent persons. It means that 80% of people participating in this survey will have great influence on decisions of their families expenditure and hopefully the ideas gathered from this survey will be represented for lamp consuming behaviour of vast families.

In term of family scale, 60% of households participating the survey have 3-4 members. 26% have from 5-7 members, only 6% of households have over 7 members. This is a structure relatively suitable to general household structure in Vietnam at the moment when most households are full nuclear with only parent and 1-2 (or 3) children; or addition with one elder and a family maid. Therefore, it can be said that, on the scale of family, this research sample can represent for family scale in Vietnam at the moment.

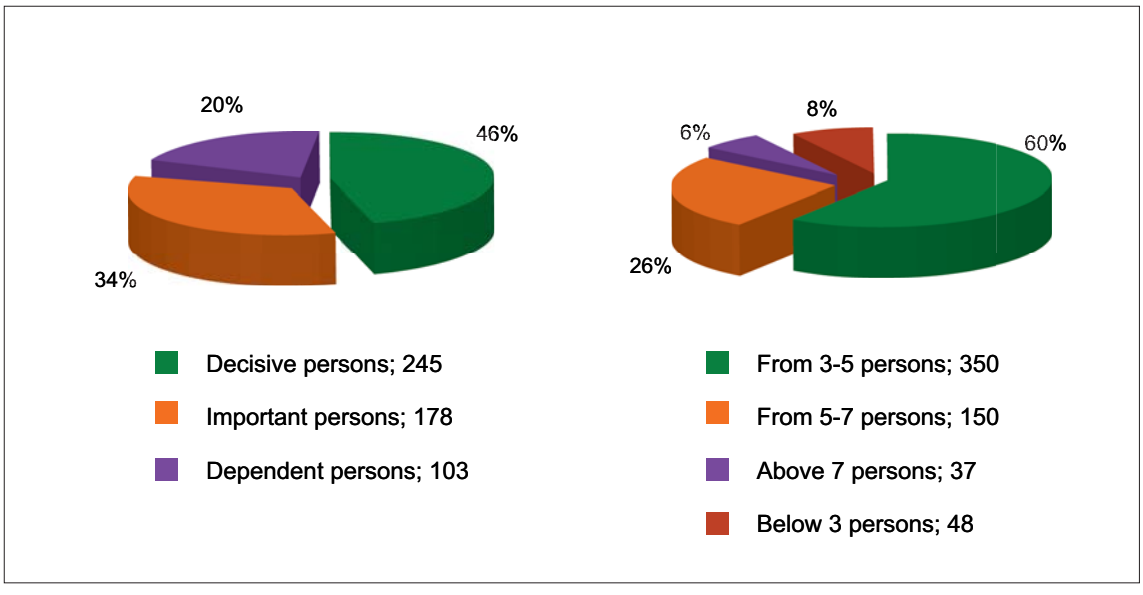


Figure 5. Structure of household samples based on role of interviewer

Figure 6. Structure of household samples based on family scale

About the structure based on estimated family income

Base on the information collected and assessment by observation, the researcher group estimated income of each household, results as following:

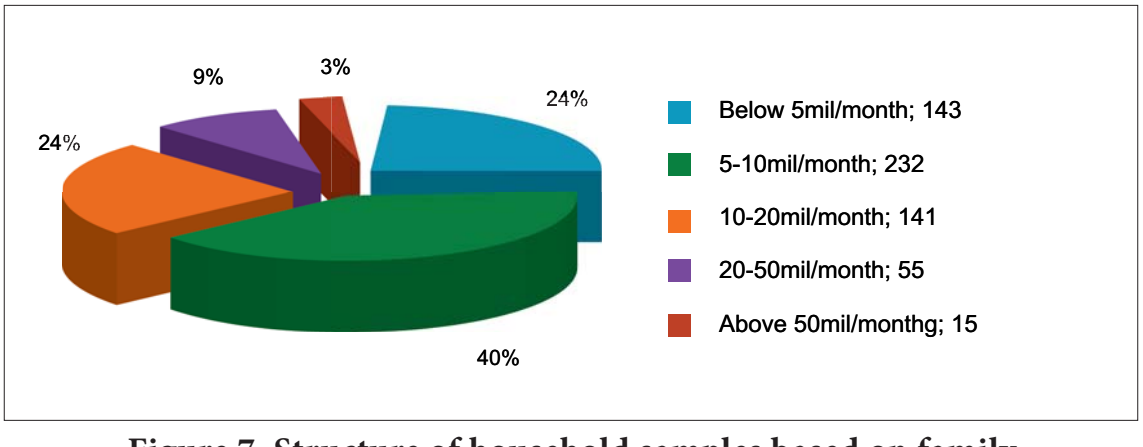


Figure 7. Structure of household samples based on family income (estimated)

About 24% of households have total income of less than 5 million dong/ month. This income is only sufficient for daily life but not saved for families living in cities and saved 20% for families in rural areas. 40% have income of from 5 to 10 million dongs/month, mainly in Hanoi and Ho Chi Minh City. With this income, saving is very little and only enough for arisen spending such as funeral, wedding or simple heath examination. In rural areas, with that income, households can save 20-40%.

Out of the research samples, there are also 3% of families with high income (total income of households is up to 50 million dongs/months). These

households often live in urban houses, villas or apartments. For them, using ESLs is not too important. However, they do not use many ILs due to unsuitability for their space and using purpose.

3.2.2. Lamp use in organisations/agencies

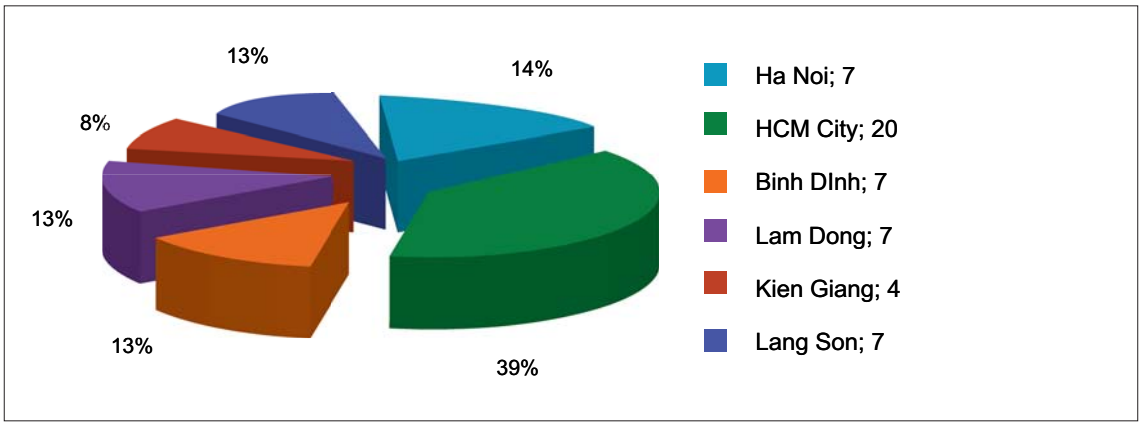


Figure 8. Structure of organizations based to localities

Research locations represented all areas and regions of the country, including: Hanoi and Ho Chi Minh City have research points that were represented for both urban and rural areas. Binh Dinh represents for South Center Vietnam including Quy Nhon as grade 1 city and its districts representing for rural areas; Lam Dong represent for the Highlands including ethnic minorities.

Kien Giang represents for the southern localities in Vietnam and nearby Cambodia; Lang Son represents for the Northern mountainous region nearby China.

Ho Chi Minh accounts for the greatest rate with 20 agencies/organizations equally to 39% of research samples, subsequently, Hanoi with 7 agencies/organizations equally to 14% of research samples; Binh Dinh with 7 agencies/organizations equally to 13% of research samples; Lam Dong with 7 agencies/organizations equally to 13% of research samples; Lang Son with 7 agencies/organizations equally to 13% of research samples and Kien Giang with 4 agencies/organizations equally to 8% of research samples. There are totally 52 research samples which are relatively suitable to structure of samples specified in the research plan.

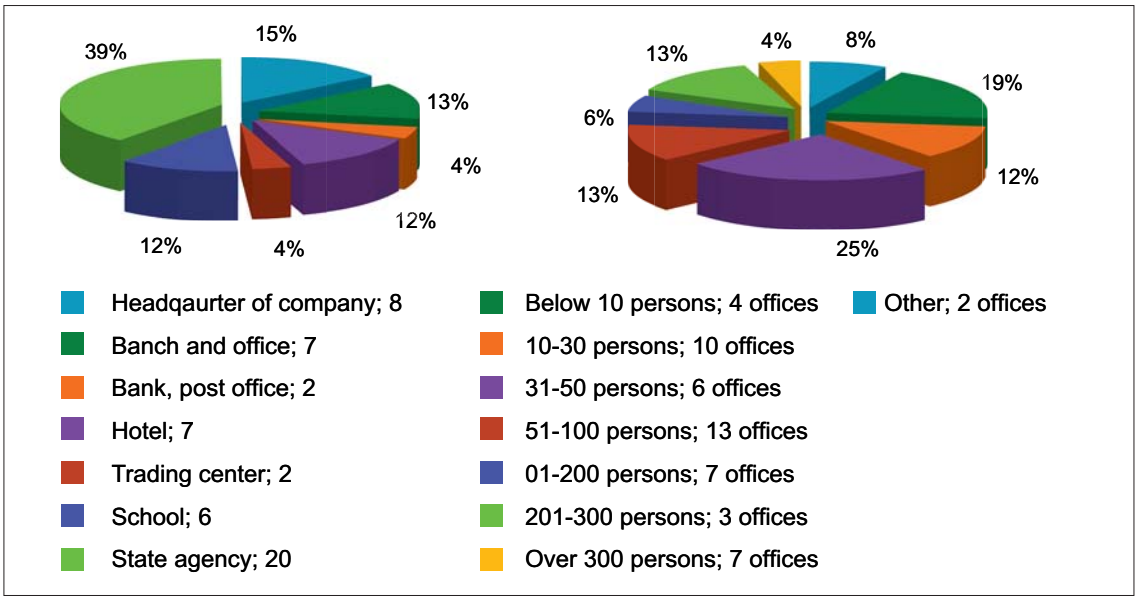


Figure 9. Structure of sampling organisations based on type of organisation

Figure 10. Structure of sampling organisations based on number of labor

The number of employees working in 52 agencies/organizations is performed in the above chart. Only 4 agencies/organizations (8%) have 10 labors; 10 agencies/ organizations (19%) have 10-30 labors; 6 agencies/organizations (12%) have 31-50 labors; 13 agencies/ organizations (25%) have 51-100 labors; 7 agencies/organizations (13%) have 101-200; 3 agencies/organizations (6%) have 201-300; 7 agencies/ organizations (13%) have more than 300 labors; 2 agencies/organizations (4%).

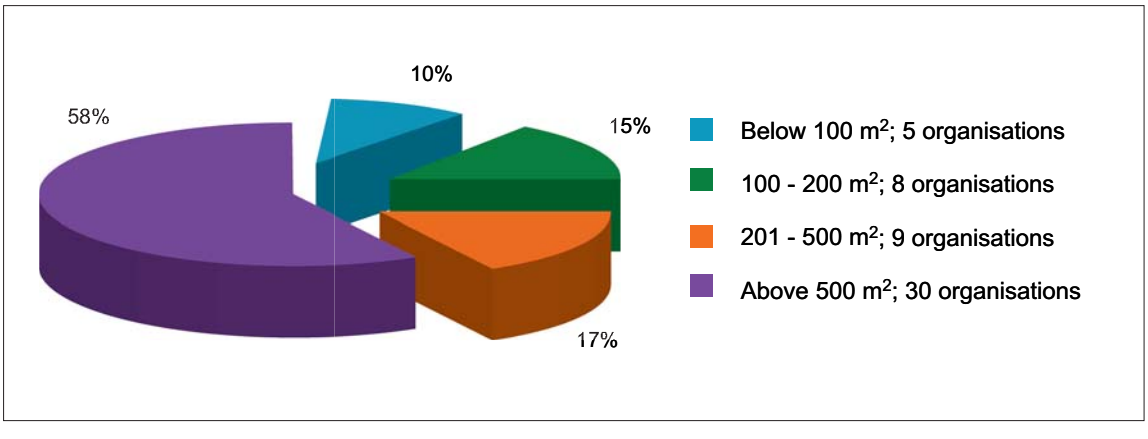


Figure 11. Structure of sampling organisations based on office area

52 agencies/organizations shown in pie-chart 11 were divided into 4 groups which are different from their working area, including: 5 agencies/organizations (10%) have less than 100 m2; 8 agencies/organizations (15%) have 100-20 m2; 9 agencies/organizations (17%) have 201-500 m2and 30 agencies/organizations (58%) have over 500 m2;

These figures related strongly to arrangement of lamps used because the agencies with larger area would use more lamps to provide necessary light for working. The

small size room can use less number of bulbs for saving energy but still provide enough light for all using purpose in the area.

3.2.3. Other customers

Other customers are buildings such as hotels, offices for lease, trading centers and complex buildings. These buildings consume much power of which lighting system can accounts for a great proportion. This research aims to investigate the reality and trend of lamp use in the trading buildings. With the definition and methods mentioned above, the research group conducted a survey in 7 hotels, 4 office buildings and 2 trading centers, 3 complex buildings. Details listed in the appendix.

CHAPTER II. AN OVERVIEW OF THE LIGHTING INDUSTRY IN VIETNAM

1. Socio-Economic Status of Vietnam

Economic growth is relatively high in 2006-2010 and reaches its objectives. GDP growth rate reaches 7.01% annually, much higher than the average growth rate of 4.45% in the period 1986-1990 - a period in our country started implementing innovation campaign; also higher than the average rate of annual increase of 6.95% from 1996 to 2000 but lower than the 5 year average growth rate of 7.51% /year of the 5 year period 2001-2005. Period 2007-2011 compared with 2002-2006, the world economy grew an average 2.7% per year, down 33% ; Vietnamese growth rate in this stage was 6.5%, fell down only 16.7%. Among three economic sector, industrial and construction sector has the highest growth rate of 7.94%/year; services sector increased by 7.73% annually; forestry, agriculture and fishery sector grows by 3.34 %/year.

Growth presented in all economic sectors; growth of every sector also parallel with restructuring and product quality improvement. GDP growth in the period of 2006-2010 is shown in the following table:

Table 4. GDP growth by economic sectors

No.	Criteria	2005	2006	2007	2008	2009	2010	2011
1	GDP/1994 price (billion Vietnam Dong)	425,373	425,373	461,344	490,458	516,568	551,609	584,073
1.1	Agriculture, forestry and fisheries	76,888	79,722	82,717	86,587	88,168	90,613	94,234
1.2	Industry - construction	157,867	174,259	192,065	203,554	214,799	231,336	244,123
1.3	Service	158,276	171,392	186,562	200,317	213,601	229,660	245,716
2	GDP growth rate (%)	8.44	8.23	8.46	6.31	5.32	6.78	5.89
2.1	Agriculture, forestry and fisheries	4.02	3.69	3.76	4.68	1.83	2.78	4.00
2.2	Industry - construction	10.69	10.38	10.22	5.98	5.52	7.7	5.53
2.3	Service	8.48	8.29	8.85	7.37	6.63	7.52	6.99

(Source: Statistical Yearbook of 2011)

Looking at the economic growth in recent years, it is necessary to pay attention to a number of issues in the coming years:

It is said that generally, the national economic growth has not been really stable in recent years. The rate seem high but gaps with other economics in the same region has not been narrow down but increasingly wider. This shows that the efficiency of polices in the last years has not really promoted the general strength of the whole economy in order to obtain mỏe rapid growth. Growth quality, efficiency and competitiveness of the economy are still low and improved slowly. The factor contributing to the growth is mainly material capital. In the 2001-2007, contribution rate of material capital in economic growth was 56.7%. Contribution rate of labor and total factor productivity (TFP) was 18.52% and 24.78%, respectively. Low quality of growth presents in 3 aspects: economy, society and environment: competitiveness of products and the economy is limited and weak, labor productivity is low; social progress is not commensurate with economic growth; pollution is still serious and natural resources are still destroyed whereas no effective remedy has been given.

The economic scale is still small and facing with high risk of lag behind. In 2010, the GDP reached about USD 106.43 billion and GDP per capita was about USD 1,224 still very low compared to the developed countries in the region. The gap between Vietnam and other countries has been shortened, but the risk of an economic downturn is still high.

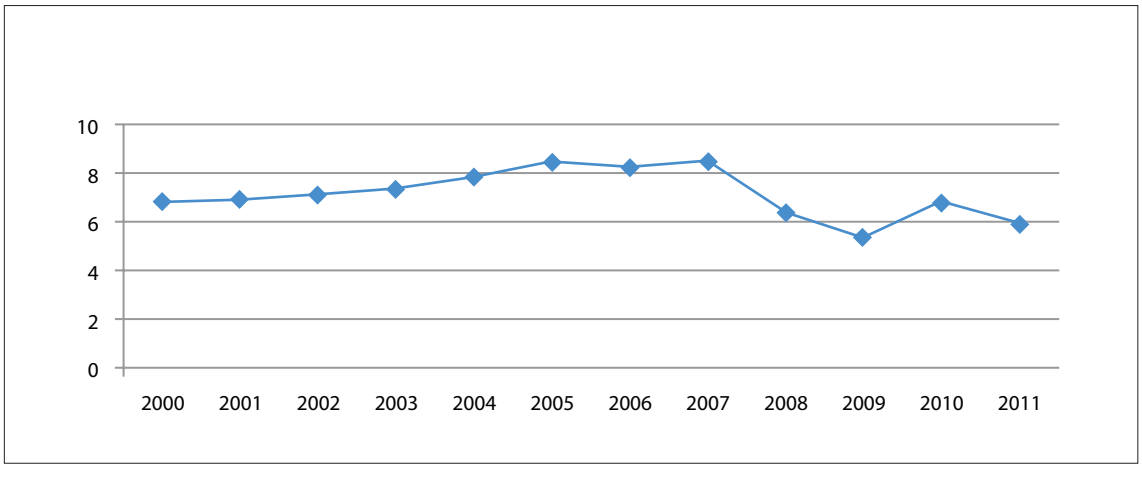


Figure 12. GDP growth rate in the period of 2001-2010

GDP per capita

With the fairly economic growth, life of majority of the population over past years has been significantly improved. Income per capita has increased rapidly from USD 730 in 2006 to USD 843 in 2007, USD 1,052 in 2008 and reached USD 1,224 in 2010.

Basing on the new poverty standard of Vietnam Government (the poverty rate is calculated according to average income of one person per months in the 2006-2010 period, of which a poorer has less than VND 260 thousand for urban area and 200 thousand for rural area), the national poverty rate has decreased rapidly, from about 15.5% in 2006, down to 14.8% in 2007 and 13.4% in 2008. The poverty rate with international standard (rate of households in poverty is calculated in compliance with average spending of one person per month with general poverty standard of the General Department of Statistics and the World Bank for 2006: VND 213 thousand, 2008: VND 280 thousand) decreased from 19.5% in 2004 down to 16.0% in 2006 and decreased down to 14.5% in 2008. Thus, in the three years: 2006-2008 number of households in poverty reduced by 2.5%. This is even more meaningful when poverty standard is gradually raised in accordance with the general poverty standard of the world.

In 2012, the social policy focused on job creation, income increase and poverty reduction. Rate of households in poverty was estimated to decrease by 1.76% in the whole year. Although the plan of 2% was not reached, this was a great effort in the difficult economic condition.

Despite many difficulties, throughout the first nine months of 2012, 1.13 million new jobs were created, estimated at about 1.52 million for the whole year. Unemployment insurance was made for more than 280 thousand of labors. The labor situation in the industrial parks is basically stable. A part of labor has been trained and moved to more new appropriate jobs.

Such result of poverty reduction has been assessed by the World Bank that no country has been achieved poverty reduction dramatically in a short time as Vietnam. Poverty reduction directly created the subsequent positive response on education, health, nutrition consumption and so on. According to the ranking by UNDP in 2009, the HDI of Vietnam has been improved gradually. In 2007 the HDI was 0.725, increasing 0.005 in comparison with 2006 (0.720) and ranked 116/182 countries. Norway was ranked No. 1 with HDI of 0.971 and Niger was ranked 182 with the number of 0.340. It can be seen as an achievement which no country with same income has reached ever before.

Economic growth in the first nine months of 2012 reached 4.73%, estimated at about 5.2% for the whole year - lower than the national plan, but the following quarter is higher than the previous quarter (GDP of the first quarter grew 4%, the second quarter grew 4.66%, the third quarter grew 5.35%), inflation was in control, more stable macroeconomic is a positive sign for sustainable development in the future. Total capital investment in social development was estimated at 29.5% of GDP (34.6% in 2011). Many remedies were made; business situation has been gradually improved. Inventories were reduced (inventory index in March was

34.9%, and in September 2012 was 20.4%). Number of decommissioned, dissolved enterprises declined but is still high compared to the same period. Number of newly registered enterprises increased, but still lower than last year. (For example: 9/2012 there were 51 thousand of new established enterprises, 40 thousand of dissolved or decommissioned enterprises).

Inflation has been initially under control, consumer price index increased by 5.13% in 9 months. In the last months of the year measures will be taken to keep inflation rate of about 8% in the whole year.

Economic Restructuring

By 2010, the share in GDP of agriculture, forestry and fishing decreased to 20.51%; industry and construction sector increased by 41.1%; service sector increased by 38.32%.

Internal structure of the industry has shifted significantly towards industrialization and modernization steps. Structure of industrial production and products has been moving towards increasing share of processing industry and added values. The processing industry has started to take the advantages of domestic material resources to enhance the value of exported products.

Table 5. Restructuring of economy and labor (%)

No.	Industry	2001	2005	2006	2007	2008	2009	2010	2011
	Economic structure	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
1	Agriculture, forestry and fisheries	23.04	20.97	20.40	20.30	22.21	20.91	20.58	22.02
2	Industry and construction	38.23	41.02	41.54	41.58	39.84	40.24	41.1	40.25
3	Service	38.73	38.01	38.06	38.12	37.95	38.85	38.32	37.73

(Source: Statistical Yearbook of 2011, General Department of Statistics)

The structure of the service sector has made the positive move. The traditional service areas such as trade, transport, postal telecommunications, hotels, restaurants quite developed. Particularly, a number of service industries with low intermediate cost rate such as banks, insurance, etc. have grown quite rapidly, contributing to raise the value added of the service sector.

Generally the economic transformation in the past 10 years has been slow and fell to meet requirements of sustainable development. The economic restructure has only concentrated to, increase share of industry and service sector

in GDP; proper attention has not been paid to requirements of restructuring in the direction of modernization as well as development of advanced technology and techniques in all sectors. A lot of industrial devices have outdated technology, high cost, low economic efficiency and high protection required.

Structure of agricultural production and rural economy has not changed significantly yet. The key economic zones has not developed equally with their potentiality, do not willing to develop high-technology and economic restructuring in the direction of modernization to promote the advantages and boost the development of the whole region and spread to other regions.

The restructuring of labor is fraught with spontaneity, instantaneousness, failing to meet the requirements of economic restructuring towards industrialization and modernization. Proportion of agricultural labor is high. The situation which common labor is surplus but lack of skilled labor because trained labor rate is still low, failing to meet the requirements of accessing advanced technologies is a urgent matter required to take a general measures.

The key socio-economic criteria of year 2013:

Economic criteria: Gross domestic product (GDP) increases by about 5.5%. Export turnover increases by about 10%. Deficit rate is about 8%. National budget deficit will not exceed about 4.8% of GDP. Growth rate of Consumer Price Index (CPI) is about 8%. Total capital investment in social development is about 30% of GDP.

Social criteria: Decreasing the national poverty rate by 2%, and by 4% for the poor districts. Creating jobs for about 1.6 million labors, unemployment rate in urban areas is kept less than 4%; the percentage of trained employees reaches 49%.

2. Legal Framework for lighting industry

2.1. The legal framework relating to the lighting field

2.1.1. National legislation system

In recent years , Government of Vietnam has issued several Laws and by law documents relating to lighting field, as follows :

- Energy Saving and Efficiency Act (Law No. 50/2010/QH12) effective from January 01, 2011)

- Decree No. 21/2011/ND-CP dated 29/3/2011 on the "Detailed regulations and measures for implementation of the Law on Energy Saving and Efficiency ";

- Decree No. 73/2011/ND-CP dated 24/08/2011 on "Financial enforcement on the use of energy saving and efficiency" Decision No. 51/2011/QD-TTg dated

September 12, 2011 on "on" List of facilities and equipment subjected to compulsory energy labeling, impose minimum energy efficiency and the implementation roadmaps"; Decision No. 68/2011/QD-TTg dated December 12, 2011 on "Issuing the list of saving-power devices and equipment for which the state-owned offices and entities are allowed to purchase"

- Decision No. 23/2006/QD-BTNMT dated December 26, 2006 on "Promulgating the list of hazardous wastes"

- Circular No. 07/2012/TT-BCT promulgated on April 04, 2012 by the Ministry of Industry and Trade defining the energy labeling for devices and equipment using energy

- Decree No. 79/2009/ND-CP promulgated on September 28, 2009 by the Government on management of urban lighting;

- Circular No. 13/2010/TT-BXD promulgated on August, 2010 by Ministry of Construction on guiding implementation of Circular on management of urban lighting;

- Decision No. 03/2008/QD-BXD promulgated on March 31, 2008 by Ministry of Construction promulgating regulations on contents of drawings and explanatory statements of construction master plans and tasks;

- Development orientation on urban lighting of Vietnam towards 2025 promulgated together with Decision No.1874/QD-TTg signed on October 11, 2010 by the Prime Minister;

- The proposed local policy on development of public lighting focusing on energy efficiency;

- Minimum Energy Performance Standard (MEPS) for lighting products such as compact fluorescent lamps, electromagnetic ballast for fluorescent lamps, electronic ballast for fluorescent tube.

2.1.2. Overview on the implementation of Energy Saving and Efficiency Act and the legal documents mentioned above

It is the first time, The Vietnamese National Assembly promulgated the Law on Energy Saving and Efficiency which was effective from January 01, 2011. This Law includes 12 Chapters, 48 Articles, regulating economical and efficient use of energy; policies and measures to promote economical and efficient use of energy; rights, obligations and responsibilities of organizations, households and individuals in economical and efficient use of energy.

National policy on economical and efficient use of energy is defined in Article 5 of this Law, including:

- Applying the measures of economical and efficient use of energy for socio-economic development is one of top priorities.

- Enhancing financial supports, energy subsidies and the incentives necessary to promote use of energy saving and efficiency.

- Increasing investment , apply diverse forms of mobilizing resources to promote scientific research, development and application of advanced technology in energy -saving and efficiency ; developing use of renewable energy sources that are suitable with conditions and potentialities of Vietnam; contributing to ensure the national energy security and environmental protection.

- Encouraging the use of energy saving facilities and equipments; implementing the roadmap that apply energy labels; gradually removing vehicles and equipment that are in backward technology and low energy efficiency.

- Encouraging to develop consulting services ; reasonable investment for the propaganda and educational programs; supporting organizations, households and individuals who apply measures of energy saving and efficiency in their use.

Five (05) policies on the use of energy saving and efficiency which are defined in Article 5 of Energy Saving and Efficiency Act as mentioned above is very necessary and important. The policies will be presented gradually because the effective time has been only for almost 02 years. On the other hand, due to the limitation of the national budget, it may not to prioritize the application of all measures for economical and efficient use of energy in all fields, including the field of lighting in the same period of time. The related ministries, stakeholders,local authorities and related agencies/organizations have been urgently drafting and issuing documents for guiding the implementation of this Law.

Decree No. 21/ND-CP that detailing the Law and measures for its application. This Decree was promulgated on March 29, 2011. It provides statistic data on energy use; basis of key energy use; economical and efficient use of energy in the units using state budget; energy labeling for devices, equipment using energy; measures to promote economical and efficient use of energy; examination and inspection of economical and efficient use of energy.

Besides, there are some other documents such as:

- Decree No. 73/ND-CP defining handling of administrative violations on economical and efficient use of energy. This Decree was promulgated by the Government on August 24, 2011.

- The Ministry of Industry and Trade promulgated Circular No. 07/2012/TT-BCT on April 04, 2012 defining the energy labeling for devices and equipment using energy. The Ministry of Industry and Trade promulgated Circular No. 07/2012/TT-BCT which regulated "the energy labeling for electrical devices and

equipment". This Circular has a lot of specific regulations such as procedures of registration, assessment, issuance, suspension or revocation of certification, assigning the organizations testing and implementing energy labeling for the devices and equipment on the list of devices and equipment needing energy labeling promulgated by the Prime Minister or voluntarily labeled devices, equipment.

- The Prime Minister promulgated Decision No. 51/2011/QD-TTg on September 12, 2011 gave the list of devices and equipment subject to energy labeling and application of the minimum power capacity and the implementation roadmap. Decision No. 51/QD-TTg specified Group of appliances including: straight fluorescent tube, compact fluorescent lamps, electromagnetic and electronic ballasts for fluorescent lamps; air conditioning, refrigerators, washing machines using in household, electric cooker, electric fan, and television.

Roadmap of energy labeling:

- Voluntary energy labeling is encouraged to perform until December 31, 2012.

- Compulsory energy labeling will be implemented since January 01, 2013.

For lighting market in Vietnam, Decision No.51/QD-TTg, the regulation on energy labeling for fluorescent tubes, compact fluorescent lamps, ferromagnetic ballasts and electronic ballasts aims to improve the quality of lighting products in the market of Vietnam.

In the Decision No.51/QD-TTg, it is issued that since January 01, 2013, producing, importing and marketing of ILs with power capacity higher than 60W are banned, this regulation is consistent with expectations of the users after the last survey of the market research group. Additionally, it also contributes to energy saving and encourage all agencies/organizations, households and individuals to change to use ESLs such as compact lamps and others.

Decision No.51/QD-TTg defined roadmap of minimum energy performance since January 01, 2014 in which banning production and importation of lamps, electromagnetic ballasts and electronic ballasts with energy performance lower than the minimum energy performance. This is also to improve the quality of lighting products that is both appropriated with the Law of Energy Saving and the goal of converting lighting market in Vietnam as proposed in this Project. Ministry of Natural Resources and Environment issued Decision No.23/2006/QD-BTNMT dated 26/12/2006, promulgating the list of hazardous wastes. In the list of hazardous wastes promulgated together with the above Decision, for lighting field, discarding fluorescent lamps (including compact fluorescent) and other wastes containing mercury according to codes: EC Code: 20 01 21; Basel Code (A/ B): A 10 30; Basel Code (Y): Y29

During manufacturing, marketing and using, discarding fluorescent lamps,

compact fluorescent lamps and other waste containing mercury as hazardous waste according to the List of hazardous wastes must be handled in accordance with regulations.

The Prime Minister promulgated the Decision No.68/2011/QD-TTg on 12/22/2011 issuing the list of saving-power devices and equipment which the national-owned offices and entities are allowed to purchase (Table 6)

Table 6. List of energy-labeled lamps, lighting devices

No.	Name of devices, equipment	Applicable label
1	Compact fluorescent lamp	Certification label
2	Vertical fluorescent tube	Certification label
3	Ballast for fluorescent lamp	
	Electromagnetic ballast	Five-star comparison label
	Electronic ballast	Certification label

High quality electronic ballasts can save 30% of energy compared with conventional ferromagnetic ballast due to the energy loses of this ballast is very little and it makes the lamp brighter. Low quality ballasts usually cause radio interference and reduce lamp life because the high frequency and waveform of voltage are not qualified.

Regulations on procurement and roadmap must comply with Article 2 of this Decision: "The units using government budget when purchasing electric devices and equipment on the list attached to this Decision must purchase devices, equipment tagged with energy certification label (Energy star label) or Comparison labels qualifying five-star energy performance"; "The devices and equipment on the list of saving-power devices, equipment will be equipped and purchased since January 01, 2013".

This decision is important for the enterprises which are manufacturing electric lamps and lighting equipment to invest in application of new power-saving technology in order to improve their product quality, and also satisfy user's demands. These users includes all state-owned agencies and organizations that are using state budget to equip lighting equipment for the new-construction works and purchase lighting equipment to replace expired lamps (including public lighting system under local management and head office/office of agencies in the political system of Vietnam from the central to local level).

The implementation of the Law and the legal documents mentioned above should be coordinated synchronously; effective measures between the issue related agencies in the inspection, supervision will contribute to avoid lossing government budget,

facilitate enterprises in general, including manufacturers of lamps and lighting equipment, and develop a sound lighting market.

2.2 Impacts of the national management policies and potentiality for development of the production ESLs in Vietnam

2.2.1 Impacts of the national policies for development of the lighting industry of Vietnam

The national policies on energy saving described above have positively impacted on all field of energy use, including lighting field.

Manufacturers, enterprises trading of all kinds of lamps and lighting equipment including public lighting and household lighting in Vietnam have recognized that elimination of ILs of over 60W is an inevitable trend. Some large scale companies such as Rang Dong Lighting Source and Vacuum Flask JSC, Dien Quang Lamp Joint Stock Company, Philips Electronics Vietnam Co. Ltd have carried out actively several market researches for more investment on new advanced technology in order to produce ESLs since 10 years ago; However, to meet the domestic demand, the two companies: Rang Dong and Dien Quang are currently both producing ESLs and ILs that are still produced by the old production lines. Besides, there are some small companies such as Dai Quang Company in Binh Duong are producing ILs.

On 05/9/2012, the survey team went to work at Dai Quang Company; at this point, the company inventoried 600,000 60W-ILs. The production line of ILs of this company has been invested for a long time. As mentioned above that the Decision of 51/2011/QD-Tag dated 01/01/2013 that prohibits the production, import and trading of ILs with power of greater than 60W so that the policy were initially effective on the market. The companies- Rang Dong and Dien Quang will have to remove their production of ILs to produce ESLs such as compact and fluorescent bulbs.

2.2.2 Potentiality for development of the lighting industry in Vietnam

- It can be said that artificial lighting is indispensable need for all aspects of social and economic life today. In Vietnam, ILs have been introduced into our country over 100 years ago and became very popular for decades.

- Rang Dong Company and Dien Quang Company are two companies manufacturing Ils in Vietnam. They were established almost half of century ago, proving ILs for the society including public and civil lighting areas in Vietnam.

- Banning to manufacture, import and market ILs with capacity of higher than 60W is compliant with situation of Vietnam in current period of time in order to transform the lighting market towards effective lighting and saving energy.

- Actually, there are several enterprises in the lighting industry in Vietnam investing in production line which have applied new technologies for fluorescent lamps, compact fluorescent lamps since about 10 years ago. They introduced new economical products into the market and have been accepted, manufacture scale of these lamp types are being expanded to meet the market demand.

- The Government have recently promulgated a lot of legal documents to create a legal lobby so that the lighting industry of Vietnam could develop, as mentioned in above sections.

- The below part describe the features of lighting products presenting in the market in Vietnam currently:

+ Features of ILs:

Performance - 12 lumen/W

Color Rendering Index - 1A, good

Color temperature - Warm (2,500K - 2,700K)

Lamp lifetime 1 - 2,000 hours

+ Features of some fluorescent lamps manufactured by Rang Dong Company and Dien Quang Company recently are shown in the two following tables:

Table 7. Vertical fluorescent lamps manufactured by Rang Dong Company

Capacity (W)	Lumen (Lm)	Power performance (Lm/W)	Lifetime (hours)	Diameter (mm)	Length (mm)
18(T8)	1300	72	7000	26	600
18(T8)	1050	58	6000	26	600
36(T8)	3200	88	15000	26	1200
36(T8)	2600	72	12000	26	1200
20(T10)	1050	52.5	6000	32	600
40(T10)	2400	60	12000	32	1200
28(T5)	2400	85	8000	16	1180
14(T5)	1150	80	6000	16	550

Table 8. Vertical fluorescent lamps manufactured by Dien Quang Company

Capacity (W)	Lumen (Lm)	Power performance (Lm/W)	Lifetime (hours)	Diameter (mm)	Length (mm)
18(T8)	1,100 -1,280	61-71	8,000-10,000	26	600
32(T8)	2,200 -2,700	83-84	8,000-10,000	26	1,200
36(T8)	2,660 -2,700	72-75	8,000-10,000	26	1,200
20(T10)	1,150 -1,200	55-59	8,000-10,000	32	1,200
40(T10)	2,600 -2,800	65-70	8,000-10,000	32	1,200

Energy performance of compact lamps manufactured by domestic companies is 60Lm/W (five times higher than energy performance of incandescent lamps).

Application of LED lamp application in Vietnam

Today, LED lamps are increasingly popular over the world and used widely in several of economic fields.

Highlights of particular of LED lighting source in comparison with other artificial lighting sources such as incandescent, fluorescent, compact fluorescent and Sodium lamps are: much saving energy (saving about 82% to 93% –energy used); more friendly with environment because it reduce CO2 emission; longer lifetime (about 50,000 hours to 100,000 hours depending on color); LED lamps also are more friendly with human because LED lamp minimizes ultraviolet ray and infrared radiation that can flicker or lead to eye sores.

The primary disadvantage of LED currently is the high initial costs; although experiences of some countries show that the initial investment may be higher but it is costless because LED lifetime is longer. Therefore, considering in medium-term and long-term, the out standing advantages will bring more benegit including in both economic and environmental areas.

In recent years, several domestic companies involved in lighting industry in Vietnam have studied LED technology, imported materials and LED Chip to assemble LED lamp in small scale and brought some LED products to the market, such as desk lamps for student.

Rang Dong Company has cooperated with scientists of Hanoi University of Technology, Institute of Vietnam Materials to research on manufacture of LED Panel basing of importing precious materials and LED chip. They have achieved successes in manufacturing some products to introduce to the market. However, that is also the initial success of Rang Dong Company, offering prospect of applying LED manufacturing technology in Vietnam in the future.

LED lamp market in Vietnam has been moving surprisingly in last some years, especially LED lamps imported from China with low price used for decorations, festivals and advertisement.

3. Specifics of lighting market in Vietnam

3.1. General overview

Lighting market in Vietnam aims to serve to different buyers such as government agencies organizations; households both in urban areas and rural areas, production and , business enterprises; public lighting in over 755 metropolitan areas in 63 provinces and national cities. By December 31, 2010, Vietnam had 11,112 commune-level administration units, including 1403 wards, 624 towns and 9085 communes.

Vietnam has about 25 million households, both in rural and urban areas (of which there are about 18 million rural households, 7 million urban households); their demand of purchasing and using lamps is about 250 million of all kinds of lamp annually.

From the general data, it is realized that lighting market of Vietnam is quite large, including public lighting equipment in urban areas, lamps used in agencies, organizations, households and also imported products and for export. The market will move toward the trend of eliminating low-performance lighting sources including 60W ILs to apply high, effective performance, ESLs which can contribute to protect environment and reduce impact on climate change in Vietnam.

However, not adequate legal enforcement, weak management of poor lamp smuggling in the north border and poor performance of domestic management forces, that result in plenty of poor quality products occurring in the market which are selling professedly in stores in towns and big cities. Besides, monitoring and inspecting activities of administrative organizations are still very weak and lack of severe punishments to control illegal activities in application of energy saving and efficiency.

In summary: In recent years , the state agencies has issued many legal documents related to energy saving and efficiency, including the Energy Saving and Efficiency Act, the bylaw documents issued by Prime Minister and ministries. These documents are gradually completed to contribute to remove the barriers mentioned above. The provisions of these regulations are also gradually presenting in reality playing a role in socio-economic development, including field of lighting manufacturing and trading and partly contributing to reduce glasshouse emission and protect the environment.

3.2.Lamp supplier

The industry manufacturing lighting equipment in Vietnam has been developed rapidly together with economic development of Vietnam in recent years. There are a lot of domestic and foreign trademarks with diversifies types of products in order to meet demands of lighting market of Vietnam in recent years.

3.2.1. Lamp manufacturers and enterprises

Lighting industry in Vietnam currently has several features classified by scale, lighting equipment products, technology level as follows:

Companies with large scale and diversified products are:

- Rang Dong Lighting Source and Vacuum Flask JSC
- Dien Quang Lamp Joint Stock Company
- Philips Electronics Vietnam Co. Ltd
- LUXXX Vietnam Co. Ltd
- Wooree Vina Co., Ltd

Companies with small scale are:

- Dai Quang Lamp Production Co., Ltd
- Hoa Thai Production and Trading Co., Ltd
- Minh Hung Production and Trading Co., Ltd
- Duhal Industry & Trading Joint Stock Company

Beside above enterprises, there are several enterprises which mainly import and trade lighting equipment in Vietnam market such as OSRAM Vietnam Co., Ltd, New Vision Lamp Co., Ltd - trading NVC lighting brand lamp and some other domestic enterprises.

3.2.2. Types of lamps and capacity of lighting market in Vietnam

In Vietnam's lighting market currently, there are various types of lamp from low quality to high quality.

Indoor lighting equipments: For indoor lamp type, domestic products are mainly used such as fluorescent lamps (types T5, T8, T10), compact lamp, incandescent lamps and LED lamps (currently used in trade buildings).

Outdoor lighting equipment: For outdoor lighting equipment, due to limited production capacity of domestic manufacturers, most of outdoor lighting equipment is imported. Currently high-pressure mercury lamp has been replaced gradually by

Sodium lamps, Metal Halide lamps and LED lamps are used to decorate the outside of buildings.

Basing on the results of the survey and direct interviews with the General Administration of Customs on the import and export of lighting equipment in the market and domestic production, the total market capacity was showed that, in 2011, the total number of lamps produced by domestic manufacturers and quota importers, excluding non-quota importers in Vietnam's market is about 408 million lamps of which domestic manufacturers produced about 374 million lamps and non-quota lamps imported of about 34 million lamps.

With such number of lamps, domestic manufacturers exported about 237 million lamps and sold about 131 million lamps to the domestic market and with import quantity of about 34 million lamps, lamp consumption in the market of Vietnam is about 171 million lamps. Specific details of every lamp manufacturer will be presented in the next section.

According to the direct survey results from 6 domestic manufacturers, ILs were accounted for 38.2% of the total number of lamps manufactured in 2011, fluorescent lamps were accounted for 28.6% and compact fluorescent lamps accounted for 33.1%.

The share percentage of the domestic manufacturer is presented in the Figure 13 below.

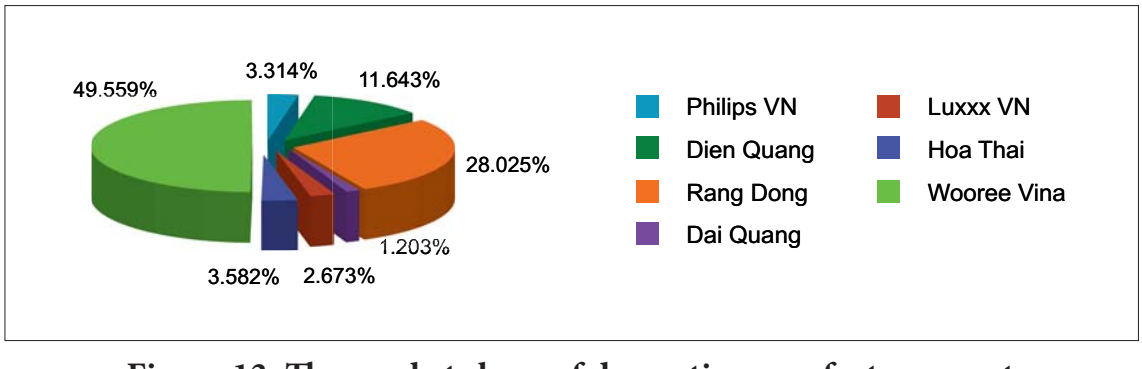


Figure 13. The market share of domestic manufacturers out of total production

Figure 13 above shows that the largest lamp manufacturers in Vietnam is Wooree Vina Co., Ltd with share of 49.6% of total production, followed by Rang Dong Lighting Source and Vacuum Flask JSC with share of 28%, next one is Dien Quang Lamp Joint Stock Company with share of 11.6%, followed by other companies such as Hoa Thai Production and Trading Co., Ltd (3.6%), Philips Electronics Vietnam Co., Ltd. (3.3%), LUXXX Vietnam Co. Ltd (2.7%), and Dai Quang Lamp Production Co., Ltd (1.2%).

However, in the above manufacturers, Wooree Vina Co., Ltd manufactured about 185 million lamps in 2011 but just only for exported. Hence, the actual market share of the manufacturers for domestic market changed as shown in Figure 14 below.

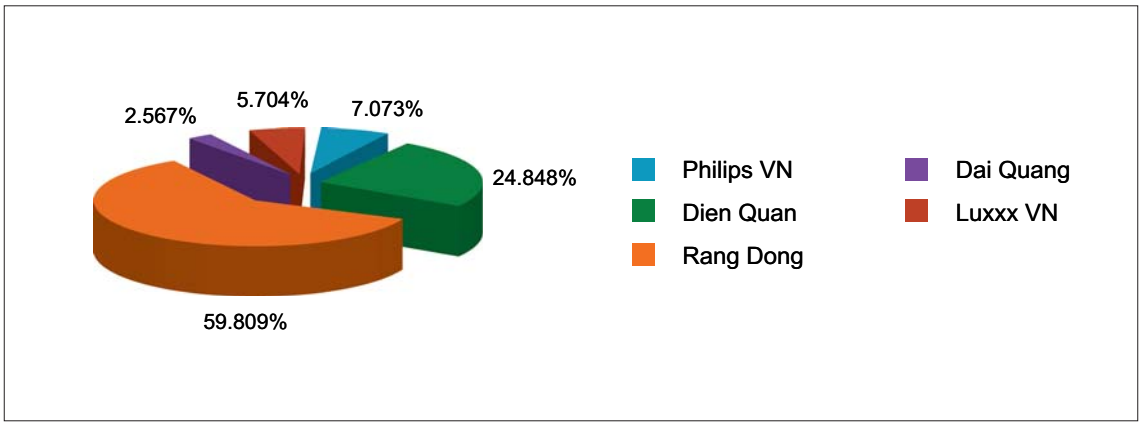


Figure 14. Actual share of manufacturers providing for domestic market

Figure 14 shows that Rang Dong Lighting Source and Vacuum Flask JSC hold the largest share with nearly 60% of manufactured indoor lamps, followed by Dien Quang Lamp Joint Stock Company accounting for 24.8%, Philips Electronics Vietnam Co., Ltd. (7.1%), LUXXX Vietnam Co. Ltd (5.7%) and finally Dai Quang Lamp Production Co., Ltd with share of 2.6%. This figure excludes Hoa Thai Production and Trading Co., Ltd because this company mainly manufactured small lamps, lamps for motorcycle; and lighting products of this company are mainly for export.

CHAPTER III. SURVEY FINDINGS

1. Lamp suppliers

1.1. Domestic manufacturers

1.1.1. Rang Dong Lighting Source and Vacuum Flask JSC

Introduction

Rang Dong Lighting Source and Vacuum Flask JSC was established in 1958, the main activities of the company is manufacturing and trading lighting products and lighting equipments. Over 50 years of development, quality of the company's products has been trusted by Vietnamese consumers. Currently the company is producing all kinds of lamps such as ILs, fluorescent lamps, compact fluorescent lamps, lamps for street lighting and other lighting equipment. The table below presents types of lighting products of the company.

Table 9: Types of lighting product of Rang Dong Company

No.	Product type	Capacity (W)	Lifetime (hours)	Socket
1	**Incandescent lamp**			
	Type 1	60	1000	G80
	Type 2	25 - 60	1000	E27, E14
	Type 3	25 -300	1000	E27/B22,E40
	Type 4	25 - 60	1000	E27/B22,E40
2	**Compact fluorescent lamp**			
	U shaped	5 -20	6000	E27/B22
	High-capacity U shaped	40 - 100	6000	E27/E40
	Twisted type	7 - 20	6000	E27/B22
	High-capacity twisted type	26 - 65	6000	E27/E40
3	**Fluorescent**			
	T5-14	14	6000	G5
	T5-28	28	8000	G5
	T8-18	18	7000	G23
	T8-36	36	15000	G23
	T10-20	20	6000	G23
	T10-40	40	12000	G23

(Source: Rang Dong Lighting Source and Vacuum Flask JSC)

Production capacity

Rang Dong Lighting Source and Vacuum Flask JSC currently has two companies producing all kinds of lamps such as incandescent lamps, fluorescent lamps, compact fluorescent lamps, street lamps and other lighting equipment. The following table presents the production capacity of Rang Dong Lighting Source and Vacuum Flask JSC.

Table 10. Production capacity of Rang Dong Company

No.	Production line	Unit	Quantity	Capacity
1	Production line of incandescent lamps	Products/year	8	60,000,000
2	Production line of fluorescent lamps	Products/year	4	30,000,000
3	Production line of compact fluorescent lamps	Products/year	7	40,000,000
4	Production line of headlamps	Products/year	3	7,000,000
5	Production line of electronic ballasts	Products/year	2	4,000,000
6	Production line of electromagnetic ballasts	Products/year	2	4,000,000
7	Production line of desk lamps	Products/year	1	1,000,000
8	Production line of high-pressure lamps	Products/year	2	500,000
9	Production line of fluorescent tubes	Tons/day	2	20
10	Production line of glass lamps	Tons/day	2	10
11	Production line of non-lead glass tubes	Tons/day	3	19

(Source: Capacity Profile of Rang Dong Lamp Source and Vacuum Flask JSC)

Lamp manufacturing status

According to the survey result, Rang Dong Lighting Source and Vacuum Flask JSC currently manufacture many types of lighting product such as ILs, fluorescent lamps, compact fluorescent lamps, high-pressure lamps, and LED with output as in the table below. The table below presents the output and actual sales in the past years.

Table 11. Manufacturing output and sales of lighting products in 2011

No.	Product name	Unit	Manufacturing output	Sales
1	Incandescent	1000	56,330	52,181
2	Fluorescent	1000	21,077	15,495
3	Compact fluorescent	1000	27,452	27,539

(Source: Rang Dong Lighting Source and Vacuum Flask JSC, 2012)

Distribution system

Distribution system of Rang Dong Lighting Source and Vacuum Flask JSC covers all the provinces and cities of Vietnam with 11 branches, 300 wholesalers and 6000 stores across the country. This is presented clearly that products of Rang Dong Lighting Source and Vacuum Flask JSC are very polular in Vietnam's market.

The company also get a great share in international market such as the ASEAN countries, South Korea, South America, and others.

1.1.2. Dien Quang Lamp Joint Stock Company

Introduction

Dien Quang Lamp Joint Stock Company (Dien Quang) was established in 1973, the main activities of the company is manufacturing and trading in lighting products and lighting equipment. Over 35 years, the company has been constantly improving their product quality and their service quality. Currently, the company is producing various types of lighting products such as ILs, fluorescent lamps, compact fluorescent lamps and other lighting equipment. The table below presents types of the company's products.

Table 12. Types of lighting products of Dien Quang Company

STT	Product type	Capacity (W)	Lifetime (hours)	Socket
1	**Incandescent lamp**			
	Round lamp	25 - 200	1000	E27/B22,E40
	Mushroom lamp	25 - 60	1000	E27/B22,E40
2	**Compact fluorescent lamp**			
	U shaped	5 - 20	6000	E27/B22
	High-capacity U shaped	40 - 110	6000	E27/E40
	Twisted type	5 - 26	6000	E27/B22

No.	Product type	Capacity (W)	Lifetime (hours)	Socket
3	**Fluorescent**			
	Double wing	36	8000	G5
	T8-18	18	8000	G23
	T8-36	36	8000	G23
	T10-20	20	6000	G23
	T10-40	40	6000	G23

(Source: Dien Quang Lamp Joint Stock Company, 2012)

Production capacity

Dien Quang Lamp Joint Stock Company currently has four factories producing electrical lamps such as incandescent lamps, fluorescent lamps, compact fluorescent lamps and other lighting equipment. The following table presents the production capacity of Dien Quang Lamp Joint Stock Company.

Table 13. Production capacity of Dien Quang Company

No.	Production line	Production (millions/year)	Capacity
1	Production line of incandescent lamps	2	15
2	Production line of fluorescent lamps	4	25
3	Production line of compact fluorescent lamps	8	40

(Source: Capacity Profile of Dien Quang Lamp Joint Stock Company, 2012)

Lighting manufacturing status

The table below presents the output and actual sales in the past years.

Table 14: Actual manufacturing output and sales of lamp products of the company

STT	Tên sản phẩm	Unit	Manufacturing output		Sales	
			2010	2011	2010	2011
1	Incandescent	1000	10.991	10.492	11.665	9.443
2	Fluorescent	1000	17.955	17.355	17.079	12.985
3	Compact fluorescent	1000	15.735	15.025	14.820	15.233

Source: Dien Quang Lamp Joint Stock Company, 2012

1.1.3. Philips Electronics Vietnam Co. Ltd

Introduction

Philips Electronics Vietnam Co., Ltd. operated officially in Vietnam with the construction investment project of lighting factory in Dong Nai Province in 2002. The factory is equipped with modern production lines and experiences of over 100 years working in lighting industry of the Philips Group.

Currently the company is producing all kinds of lighting products such as fluorescent lamps and compact fluorescent lamps. The table below presents types of the company's product.

Table 15. Types of Philips Company's product

No.	Product type	Capacity (W)	Lifetime (hours)	Socket
1	**Compact fluorescent lamp**			
	U shaped	3 - 23	8000	E27
	High-capacity U shaped	35 - 70	8000	E27
	Standard type	5 - 18	6000	E27
	Globe type	5 - 18	6000	E27
	Twisted type	5 - 42	8000	E27
	Candle shaped type	5&8	6000	E27
	Bean shaped type	14&18	6000	E27
	Circle shaped type	25	8000	E27
	Pointing type	8 - 23	6000	E27
2	**Fluorescent**			
	T5-14	14	15000	G5
	T5-28	28	15000	G5
	T8-18	18	13000	G23
	T8-36	36	13000	G23

Source: Philips Electronics Vietnam Co. Ltd, 2012

Production capacity

Philips Electronics Vietnam Co. Ltd now mainly produces two types of lighting products that are fluorescent lamps and compact fluorescent lamps. Besides, they also imports products of the Philips Group from the neighboring countries to sell in the domestic market. The following table presents the production capacity of Philips Electronics Vietnam Co. Ltd.

Table 16. Production capacity of Philips Company

No.	Production line	Unit	Quantity	Capacity
1	Production line of fluorescent lamps	Products/year	2	12,000,000
2	Production line of compact fluorescent lamps	Products/year	1	6,000,000

(Source: Philips Electronics Vietnam Co. Ltd, 2012)

Lighting manufacturing status

Manufacturing output and actual sales of Philips Electronics Vietnam Co. Ltd in the last years are shown in the table below.

Table 17. Actual manufacturing output and sales of lighting products of the company

No.	Product name	Unit	Manufacturing output		Sales	
			2010	2011	2010	2011
1	Incandescent	1000 lamps			51	76
2	Fluorescent	1000 lamps	10,000	7,300	12,000	17,600
3	Compact fluorescent	1000 lamps	4,000	5,100	6,000	7,100
4	LED	1000 lamps			2.1	8.6
5	Others	1000 lamps			210	238

(Source: Philips Electronics Vietnam Co. Ltd, 2012)

Distribution system

Philip company distributed their products through 4 representatives in 4 regions (Northern, Central, Eastern and South-Western) and stores.

1.1.4. Other companies

On the base of aggregating data after survey process, the market research group classified some other companies here as small-scale enterprises and their lamp types have not been clearly defined as follows:

Dai Quang Lamp Production Co., Ltd

Dai Quang Lamp Production Co., Ltd was established since 1997. Since then, the company manufactures two types of lighting products such as fluorescent

lamps and ILs. But now the company only produces two types of products that are fluorescent and compact fluorescent lamps. Production line of ILs was replaced by the compact fluorescent lamps. Currently the production capacity of this company is 3 million fluorescent lamps and 6 million compact fluorescent lamps annually.

The company's current key product is compact fluorescent lamps and sales of the product are now about 3 million units. Production line of compact fluorescent lamps of the company is mainly to assemble importing components and lighting tubes. The company's products are consumed domestically and exported.

Hoa Thai Production and Trading Co., Ltd

Hoa Thai Production and Trading Co., Ltd was established since 1997. Hoa Thai Production and Trading Co., Ltd specialize in the production of indoor lamps for domestic consumption and export.

Main products of the company are: Motorcycle lamps (front, rear, trafic lamp, and penlamp), Household lighting products (1w bulbs, 5W bulbs, 25W-40W-60W decorative lamps, and 15W refrigerator lamp), Christmas decorative lamp wire, and the largest number of consumed bulbs are compact fluorescent lamps.

The most remarkable characteristic of lighting manufacturing of the Company is that the main materials must be imported. Company's products are sold throughout the country (Northern-Central-Southern) and exported to the countries of Asia, the Middle East and other countries in the world.

During survey process, because the market research groups did not directly investigate Hoa Thai Production and Trading Co., Ltd, the information about the company's production capacity was obtained the statistics of the General Department of Customs. In 2011 the company exported about 13 million all kind of lighting products.

LUXXX Vietnam Co. Ltd

LUXXX Vietnam Co. Ltd was established in 2003. It is a subsidiary of Yankon Lighting Co., Ltd of China. The company produces various kinds of compact fluorescent lamps; the production capacity of the company consists of three production lines of compact fluorescent lamps with output of 20 million lamps/year.

Activities of the company mainly are assembling importing lighting components from the parent company in China. The company's products are also for domestic consumption and export, however, almost are exported. According to statistics from the General Department of Customs in 2011 the company imported over 10 million compact fluorescent lamp tubes.

Wooree Vina Co., Ltd

Wooree Vina Co., Ltd is a subsidiary of Wooree Lighting Company of Korea. Company Wooree Vina also mostly assembles lighting products by importing components from the holding company. Company's products are mainly to export back to Korea and other countries in the ASEAN area, China. According to data of the General Department of Customs, Wooree Vina Co., Ltd exported about 185 million all kinds of lighting product. Due to indirect manufacturing survey, there is no data on production capacity and product categories of lamping manufactured by the Company.

The specific information on the export of the manufacturers and companies trading lamping products are presented in the Appendix 5.

1.2. Importers

Beside the lighting products manufactured domestically, there are also the lighting products imported by enterprises into Vietnamese market for consumption. Importers of lighting products include manufacturers of lighting equipment (Philips, OSRAM, Dien Quang, etc.) and other business enterprises. During process of market research survey, the research group directly surveyed OSRAM Vietnam Co., Ltd. The information on import of lighting products was collected from the General Administration of Customs.

1.2.1. OSRAM Vietnam Co., Ltd

OSRAM first appeared in Vietnam in 1994 in Ho Chi Minh City, and presented in Hanoi in 2000. As an oversea representative office, OSRAM Vietnam operates under the control of OSRAM Singapore a subsidiary of branch system of German OSRAM.

OSRAM provides products and lighting solutions for commercial, industrial and consumption sectors, to meet all demand from common lighting to specialized lighting. Products of OSRAM include: ILs, halogen lamps, compact fluorescent lamps, fluorescent tube lamps, high-pressure lamps, lamps for stage, specialized lighting products, LED lamps, electronic ballasts, lighting control systems, components and manufacturing machines of lighting products.

Table 18. Import and sale quantity of lighting products of the company

No.	Product name	Unit	Sales	
			2010	2011
1	Incandescent	1000 lamps	650	550
2	Fluorescent	1000 lamps	750	1500
3	Compact fluorescent	1000 lamps	650	250
4	LED	1000 lamps	3.2	3.6

(Source: OSRAM Vietnam Co., Ltd)

1.2.2 Other enterprises

Lighting products in Vietnam's market are very diversity and imported from various countries (Europe, USA, China and other countries in the ASEAN region, and others). According to data of the General Department of Customs, total number of ILs, fluorescent lamps and compact fluorescent lamps imported to Vietnam was about 34 million lighting products in 2011, of which ILs were nearly 600 thousand units, fluorescent lamps were about over15 million units and compact fluorescent lamps were about 19 million units. Products made by China accounted for a big proportion of imported products. Detailed specific quantity of lighting products are presented in the appendices

1.3. Wholesalers and retailers

As said above, a the survey of intermediary system for distributing lighting products was conducted in Hanoi, Ho Chi Minh City, Binh Dinh, Lam Dong and Lang Son, at more than 50 stores including retailers and wholesalers. The most distributing points in this survey were allocated in Hanoi accounting for 35.4% and in Ho Chi Minh City, accounting for 20.1%.

About experience of distributors involving lighting market: the largest number of distributors (30%) focuses on group having from 5-10 year seniority, 28% of intermediate distributors have done business for from10 to 20 years and 10% of them having over 20 year of experieces. There is only one agent having less than 2 year of experience. This result shows that quality and characteristics of study samples of intermediate distribution is trusted and received data of this group is reliable. The survey interview shows that respondents have firmly information about the manufacturers and the distributions system. They understand every detail of characteristics, habits and purchase methods of their customers. They also understand clearly the manufacturers' distribution policy, the variance of price, the level of availability of products in the market, consumer trends and

also the government policy on lighting products in the market for last decades (see detailed table).

Type of business: the proportion of retailing stores surveyed is highest, accounting for nearly 70%. 14% of distributors are private enterprises; the rest is household businesses. In fact, it is quite easy now to register as a limited liability company in the business. This also ensures that the implementation of the transaction of wholesale, retail, tax declaration, tax receipts is easily validated and creates convenience for the customers on payment procedures (see detailed table).

Table 19. Type of business

		Total observed objects	Ratio	Valid ratio	Cumulative ratio
Valid	Retail stores	34	68.0	70.8	70.8
	Private enterprises	7	14.0	14.6	85.4
	Companies	3	6.0	6.3	91.7
	Business households	3	6.0	6.3	97.9
	others	1	2.0	2.1	100.0
	Total	48	96.0	100.0	
Invalid		2	4.0		
Total		50	100.0		

About business result calculated under number of lighting products sold monthly: the survey samples shows that: ¼ of total retailing stores only sell less than 100 products/1month, 35% of total retail stores only sell from 100 to 200 products/ month, 10% out of them sell from 200 to 300 units/ month and about 10% of thoes could sell from 100.000 to 500.000 products/ month. In fact, bulbs are bulky and fragile good, so the majority of intermediate distributors do not want to build up storage areas; however private enterprises and limited liability companies are very dynamic. If they have big customers, or achieve distribution agreements for a the projects, construction or office buildings, the number and types of products and product quality requirements will be quickly provided and shipped directly from the manufacturers or from the level 1 distributors, the regional distributors to the customers.

All intermediaries in the distribution system surveyed diverse their business: In comparison with electrical materials, water industries and even with essential goods such as locks, door hinges and electrical equipment, stationery, school equipment, brands of lighting products are diversified, however it mainly focuses on some great brands as follows: Rang Dong (92.6%), Dien Quang (76%), Philips (76%), Osram (28%).

About power and types of lighting products: all the stores diverse products, they sell all types of lighting products such as incandescent lamps, compact, fluorescent and LED lamp with the power of less than 10W, 10-20W, 20-40W, 40-60W and 60W. Therefore, the sellers can easily sastisfy customers' demand.

Besides, the role of retailers is very important. Sellers can influence on the customer's decision when they giving advices in using lighting products. Customers are often highly evaluated and considered seriously the information given by sellers. Therefore, the sellers at retail points play the role as filters.

On the other hand, at retail stores, available products are often limited, price of each product is not quite high so that the customers often pay immediately by cash. Therefore, the impacts of policies of the manufacturers for ensuring the flow in distribution channel such as: material flow, payment, promotion-expense are very important and considered as the motivation of the promoting policy in the distribution channels.

Concerns of the intermediaries in the distribution channel system: is expressed in following table:

Table 20. Concerns in business activities

	Total observed objects	The least	The most	Average	Standard deviation
Marketable products	39	1	5	4.23	1.327
Profit per each product	37	1	5	4.24	1.090
Brand of the product	37	1	5	4.24	1.188
Origin	40	1	5	4.00	1.432
Purchasing deferred payment goods	38	1	5	3.37	1.567
Warranty	42	1	5	3.40	1.515
Other post-sales services	36	1	5	3.31	1.348
Low price	38	1	5	3.63	1.324
Universal level	35	1	5	3.80	1.256
The goods received subsidies by the State	35	1	5	2.80	1.530

Specifically:

- “Profit per each product” is the first attention, it associates with criteria on “The brand of the product” is evaluated at grade of 4.24 out of 5 marking scheme.

- Two factors above will ensure that the intermediary distributors will "focus on marketable products" and this is evaluated at grade of 4.23 out of 5 marking scheme.

- In addition, factors received highly grade (grade of 4.23 out of 5 marking scheme) is "the Origin of the product" reflecting the logic and reliability of survey sample from the intermediaries group in the lighting distribution system.

The data above reflects the nature of small business in the lighting distribution system because the ratio of profit per each product is usually not high; therefore the brand of the product becomes major concerned factor and ensures the products marketable. Besides, users also begin paying attention on transparent original products.

It is surprising that the intermediate distributors pay the least attention on the government subsidies such as types of products received government subsidies (the lowest evaluated mark: 2.8 out of 5 marking scheme; and the least number of surveyed people who pay attention). The fact shows a reality that the encouraging or subsidizing policies only affect distributing intermediaries through promotional campaigns, sales promotion programs when the manufacturers organize for the intermediaries to implement "running program" and when they directly relate to their material or financial benefits. For example: for each order of over 100 products, customers will be offered some attached products or discount some proportion of the total payment.

The attention on product quality of the intermediaries in distribution channel is showed in following table:

Table 21. The attention on product quality

	Total observed objects	The least	The most	Average	Standard deviation
Aim of using the lamp	41	1	5	4.05	1.359
Shape of the product	34	1	5	3.74	1.082
Size	39	1	5	3.77	1.307
Brand	39	1	5	4.21	1.260
Origin	38	1	5	4.32	1.188
Durability/ useful life	42	1	5	4.33	1.337
Color of lamp	43	1	5	3.60	1.365
Luminescence efficiency	40	1	5	3.25	1.498
Power consumption	42	1	5	3.95	1.361
Calorific density	35	1	5	3.23	1.330
Price	41	1	5	3.93	1.490
Installation cost	35	1	5	2.49	1.483
Replacement Cost	34	1	5	2.56	1.521
Universal level	32	1	5	3.28	1.250
Easy to purchase	36	1	5	3.97	1.183
Encouraged by the State	36	1	5	2.61	1.498
Other factors ……..	11	1	4	1.64	1.206

The table above shows the survey's finding that concerns of distributing intermediaries on product quality will be decided by the following factors:

- Durability and useful life: grade of 4.33 out of 5 marking scheme

- Origin of product: grade of 4.32 out of 5 marking scheme

According to the product quality evaluation of the distributors, two these factors are considered as the most important factors and ensure and express consistently. Next, it is logical to attend to the brand of the product (grade of 4.21 out of 5 marking scheme). The aim of using the product which also relates to product quality has ranked 4.05 out of 5 marking scheme. It means that different types of lighting product and lighting purposes (such as indoor lighting, outdoor lighting, heating or decorating) will relate closely to quality

and life cycle of each product. This raises awareness that sellers play an important role in gravity distribution channel.

Findings on the least concern relating to product quality of intermediaries following:

- Installation cost: 2.49/5

- Replacement Cost: 2.56/5

- Subsidized by the State: 2.61/5

Although the attention is still above average level, but there are two explanations for these factors. Firstly, installtion and replacement cost in this group is not much. Lighting products is essential demands for daily life, it is not too complicated product, it is simple to purchase and use it, and the customers have not to consider its price when purchasing a product. Secondly, subsidies by the government were not concerned much so that the governmental policies has not affected much to this market. This again confirms the logic of survey data analyzed above and raises a question on effects of policies on real life.

General comments on distribution system of lighting products in Vietnam

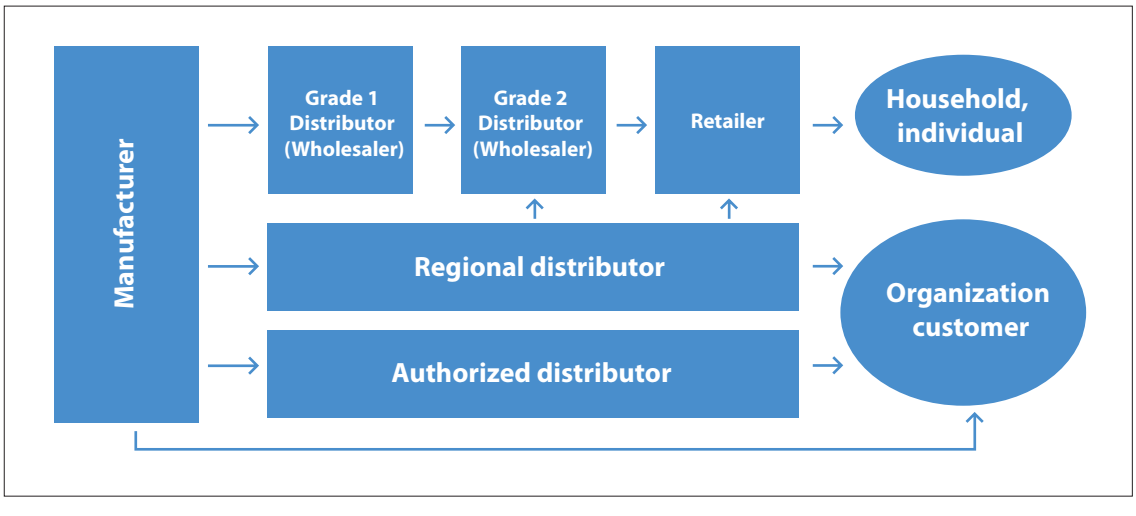


Figure 15. The distribution system of lighting product

It is fact that figuring out the structure of distribution system of lighting market in Vietnam is quite complicated issue. It is due to Distribution system is one of important factors affecting to competitiveness of each product in the market so that all the information of intermediate distributors, organizational structure, sales policies for smooth flow in the distribution channels is often banned to access by the most manufacturers and importers.

The chart above shows that if the lamp distribution system is not controlled by a management, conflicts still arise when regional distributor and the first grade distributor both affect to grade 2 distributors at the same time; and in case of both grade 2 distributors and regional distributor tend to retailers. In addition, conflicts still arise in this lighting distribution system when the benefit of the manufacturers, regional distributors and authorized distributors may conflict because of the project customers and organization customers.

In fact, this group of products is served for essential needs, however it is unnecessary to buy regularly; therefore the effects of the retailers on customers are the most important factor. The customers can select the type and brand of lighting product, however, if the sellers provide advice for them, they will be ready to follow. Therefore, the level of availability of products at the store when customers purchase products plays a role as important as the advice of the sellers. So the manufacturers should build up policies on controlling and managing staffs of distribution channel, affecting actively to retailers, they can control the demand of using suitable types of lighting products. All impacts of controlling distribution channel through "promoting strategy" will have significant effects in the market. Especially in rural areas (accounting high proportion of the country's population), this is more important.

There were a situation (in constructing and shopping season at the end of year 2011) that the product, a famous lighting brand in Vietnam, got "problem" caused by technical errors from the manufacturer, however, the distribution system completely “hushed up” this problem in the market. Of course, the manufacturers also had to work with the mass media to "freeze" this problem and immediately ensure the interests of intermediate distributors, big customers by exchanging false products and providing maximum warranty when their customers complaint to retailers.

2. Demand of lighting products

2.1. Civil field

As mentioned above, the survey was conducted with 588 households in six provinces. The results are presented specifically following.

The number of indoor lamps in each household

When being asked about the number of indoor lamps in the family, 280 households (48%) have less than 10 units; 206 households have from 10 to 20 units (36%). Only 2% of households surveyed have more than 50 units. This shows that despite of the economic development, the demand of lighting products must also rely on the structure of the house. We can see that the average number of lamps used in each household is about 14.7 units. With the market scale of about 25 million households,

the quantity of the lamps used in the households in Vietnam is about 367 million units.

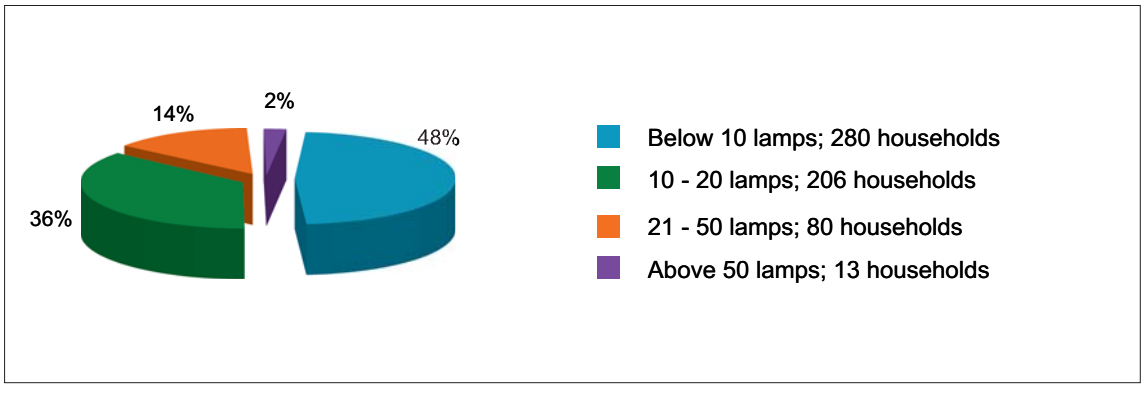
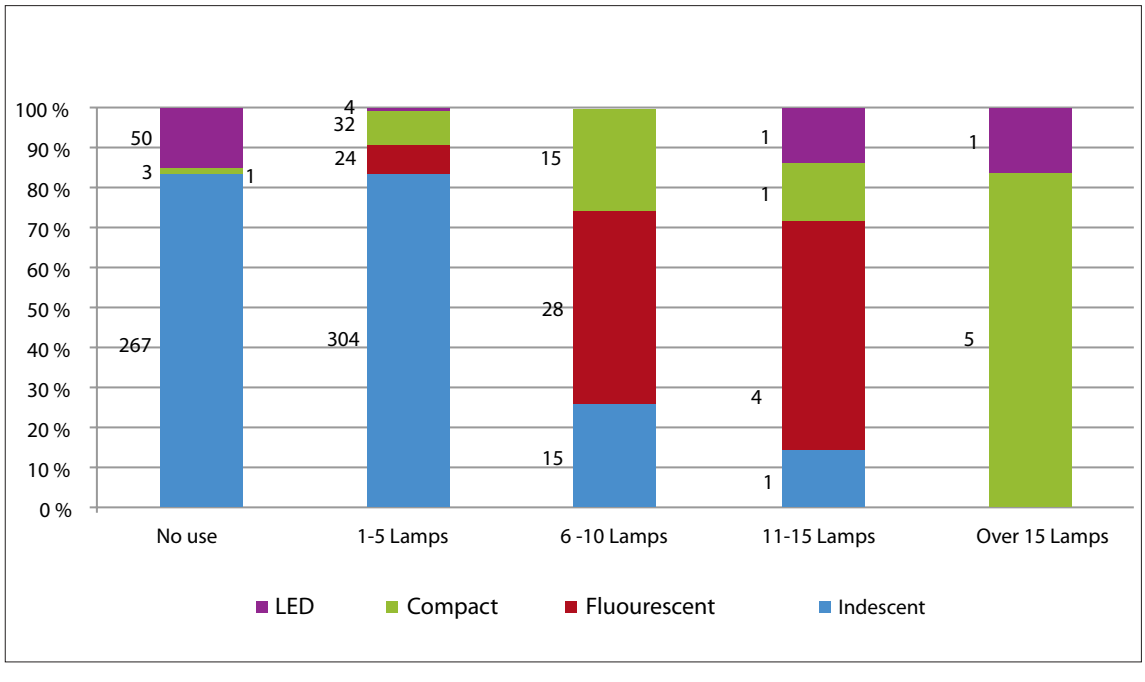


Figure 16. Number of the lamps used in each household

The number of the lamps used in each household

Most lamps being used in the households are fluorescent lamps.



Figue17. The number of the lamps used in each household

We can see that 267 household has not used ILs. The rest of 320 households still use them, however the number of incandescent lamps is only from 1 to 5 units per household, and they are usually installed them at stairs, toilets. There are 15 households having from 6 to 10 lamps and 1 household having more than 11 ILs, however these households are in rural areas and they reply in aquaculture and one household is located in urban area and in their villa, ILs are used in the garden for decoration.

The number of fluorescent lamps used in the households is very large, 24 households having from 1 to 5 units, 28 households having from 6 to 10 units and 4 households having from 11 to 15 units. No household has more than 15 fluorescent lamps and only one household does not use them.

About compact lamps, 60% of total households have from 1 to 5 units, 21% of them have from 6 to 10 units and 5 households (accounting for about 9% total people answering this question) have 15 units.

In 56 households questioned, up to 50 households do not have LED lamps, 4 households use from 1 to 5 units and one household use more than 15 units.

The rate of types of lighting product using in the households

About the rate of different lighting products used in the households, there are 275 households using ILs with less than 20 ones, 45 households using from 20 to 40% of total lighting units and 12 households (as mentioned above, they use ILs for livestock and cultivated production) using over 80% of total number of lamp used. The following chart shows that most households are using fluorescent lamps, 162/265 respondents said that over 80% of total number of lamp used are the fluorescent lamps. The next type of lamps used having high rate is compact ones and after that LED lamps. Only a few of the households use many ILs.

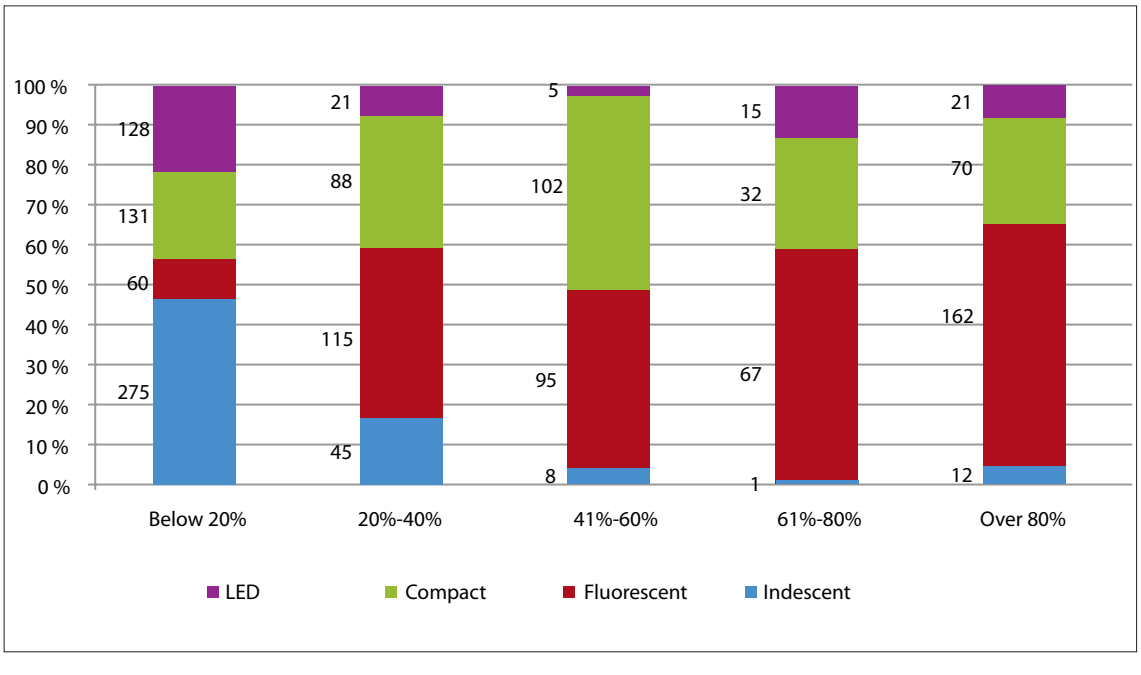


Figure 18. The rate of types of lamps used in households

The structure of lamp used relating to lamp capacity

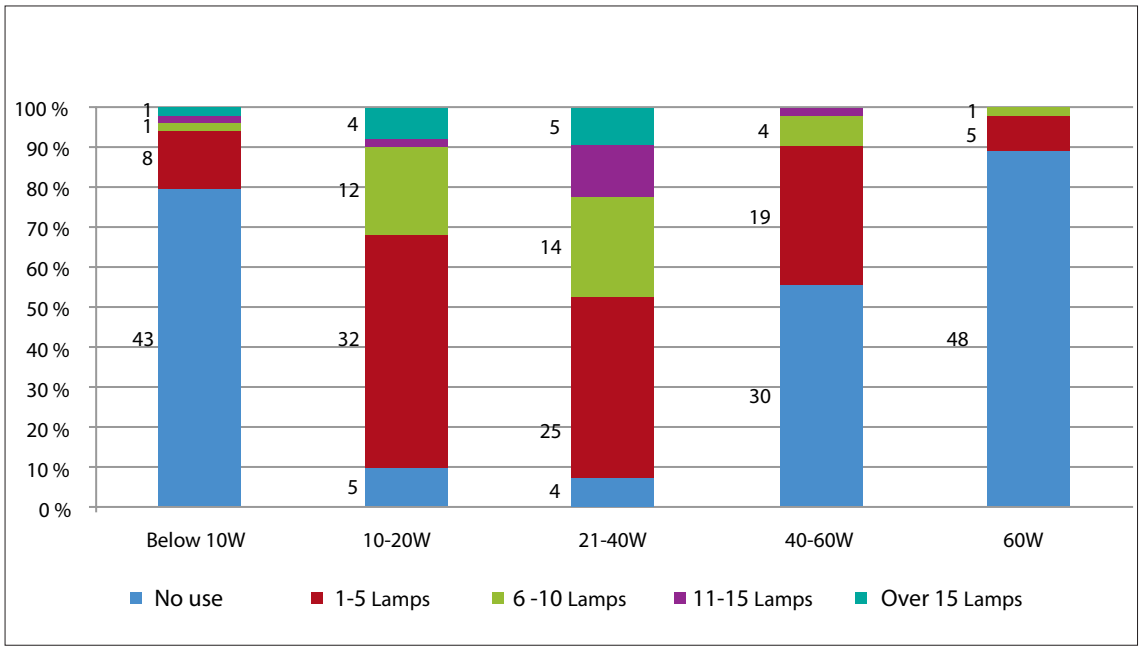


Figure 19. The number of lamps based on the power used in the households

It can be seen that the power of lamps used most is from 10 to 60W, especially from 40-60W .

The rate of lamps based on the power

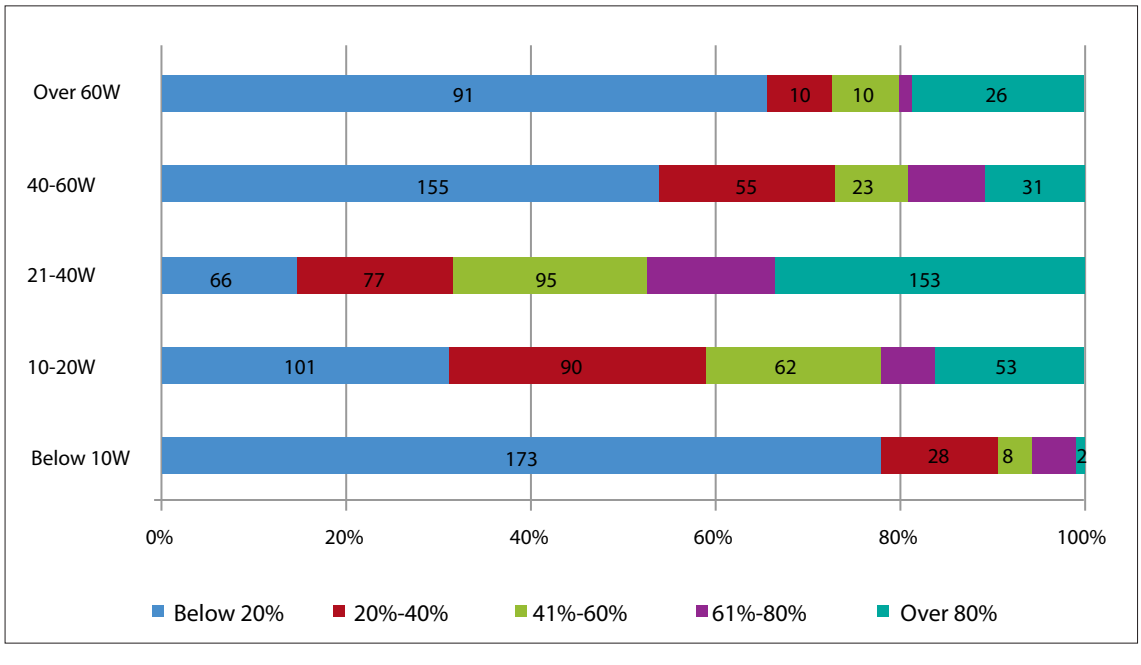


Figure 20. The structure of used lamps relating to lamp capacity in households

The confirmation above continues to be emphasized by the chart above. The chart shows that most lamp used is from 20-60W.

2.1.1. People who decide to purchase lamps

In the family, people who decide to buy lamps for use often have the biggest influence on selecting type of lamp used. The following chart shows that people who decide to buy lamps are usually the house's owner or their wives/husbands. In some cases, the others in the family buy lamps but normally for typical demands such as sleeping lamps or desk lamps.

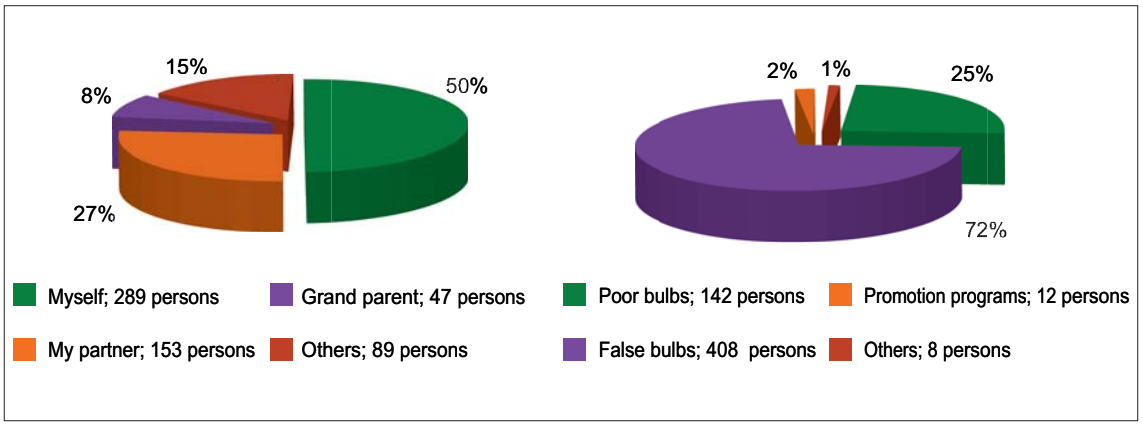


Figure 21. Decision making people

Figure 22. Time for buying lamp

In most cases, people buy new lamps when the old one was broken (72%)or too old (lighting ability is weak). Very few people buy lamps when having promotion programs. Some people say that they buy lamps when building new rooms or new house. Thus, we can see that demand for the lamps often lead people to buy them immediately and these activities are influenced by external factors - when the lamps are broken or weaken. Communication campains for using lamp often only affect consumers' awareness, but not influence the behavior of customers immediately .

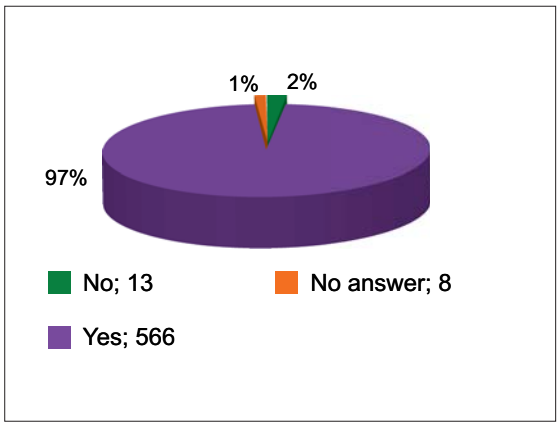


Figure 23. Paying attention to saving electricity in lamp use

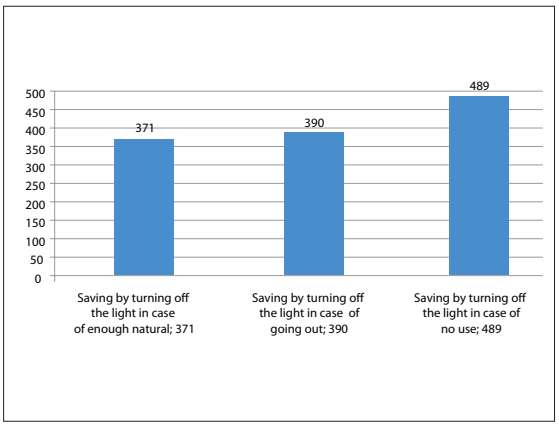


Figure 24. The behaviors expressing attention to saving electricity in lamp use

Up to 97% of the respondents pay attention to saving electricity in lamp use and only 2% of them do not pay attention to this.

Among 566 people (97%) paying attention to saving electricity in lamp use, 371 people save electricity by turning off the lamps using when the natural lamp is enough; 390 people save it by turning off the lamps when they are not in the room and 489 people save by turning off the lamps when they do not use. In summary, the regular method of saving electricity the most people use is turning off the lamps when they are not in use .

2.1.2. Factors influence on buying ILs

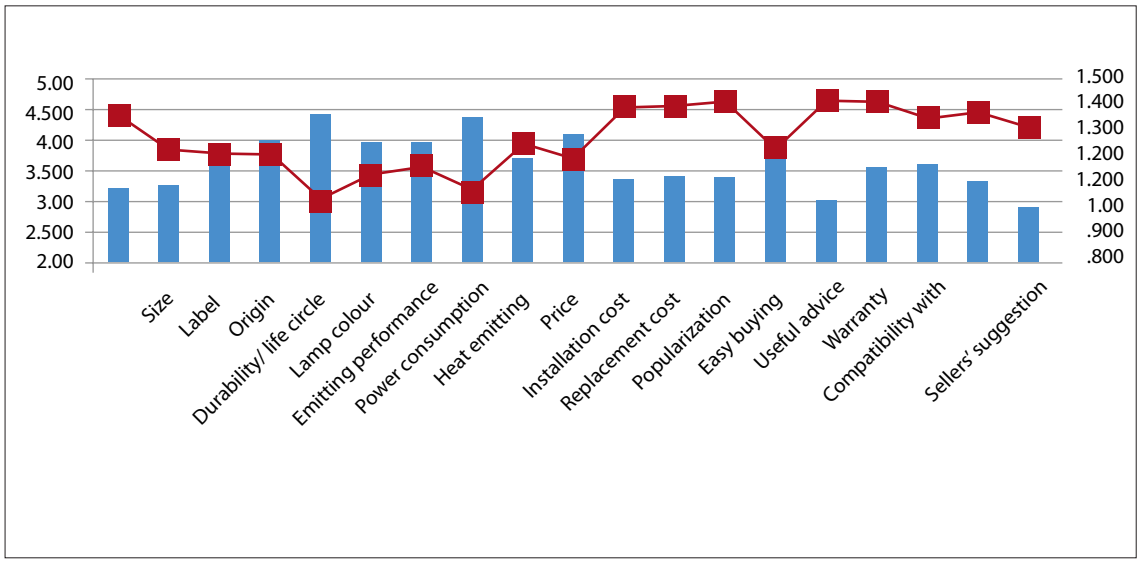


Figure 25. The factors influence on buying ILs of households

When asking about factors concerned by families when buying ILs, we can see that the factors to which consumers pay the most attention are durability/ life cycle of ILs, the next factors are its power consumption level and price.

The following factors contain its origin, colour, emitting performance and convenience to buy. The factors to which consumers pay less attention are seller's suggestions, useful advices or installation costs, its size.

2.1.3. Reasons for the use of ILs so far

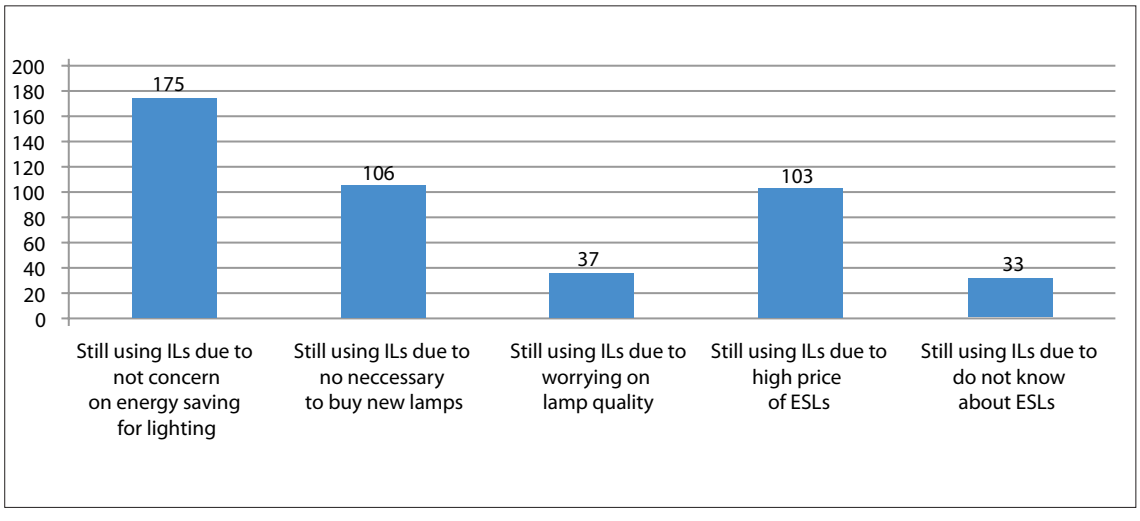


Figure 26. The reasons for the use of ILs in households so far

When asking about reason why they still use ILs so far, 175 people say that they use ILs in frequently, so they think the use of ILs does not make power consumption increase. They think power consumption is due to refrigerators, induction cookers or air-conditioners.

In addition, some ILs in use can continue to be used; or simply, price of ILs is cheaper than price of other types. Few other people think that light of ILs is natural light.

33 people say because they have very few information about ESLs they continue to use ILs.

2.1.4. Type of lamp appropriate for general lighting

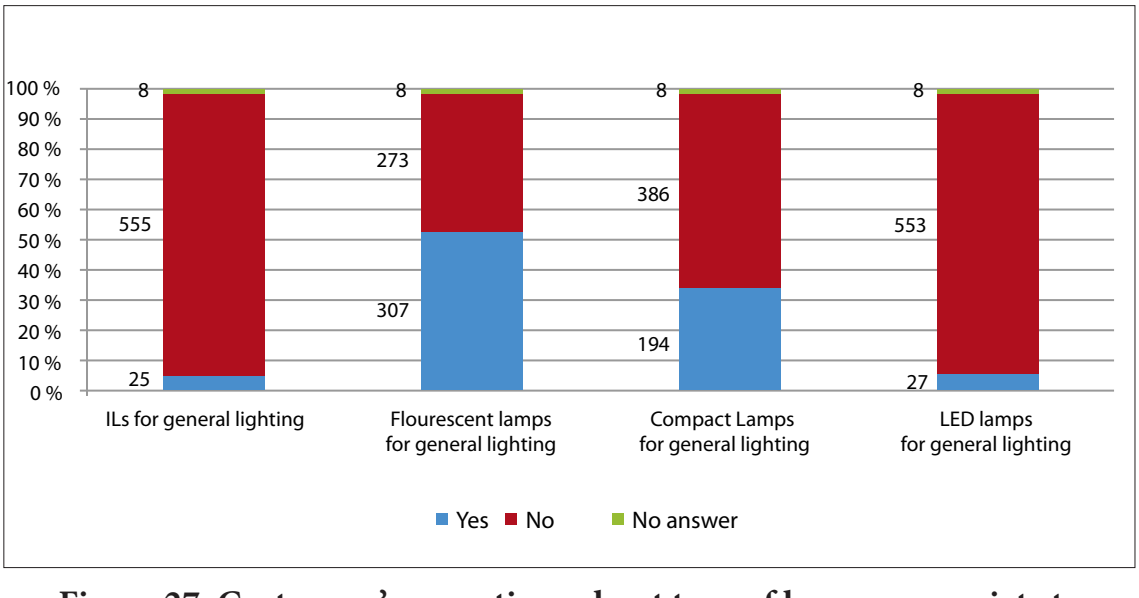


Figure 27. Customers' suggestions about type of lamp appropriate to general lighting

When asking which type of lamp most appropriate to purpose of general lighting, almost answers is fluorescent lamp.

2.1.5. Capacity appropriate to purpose of general lighting

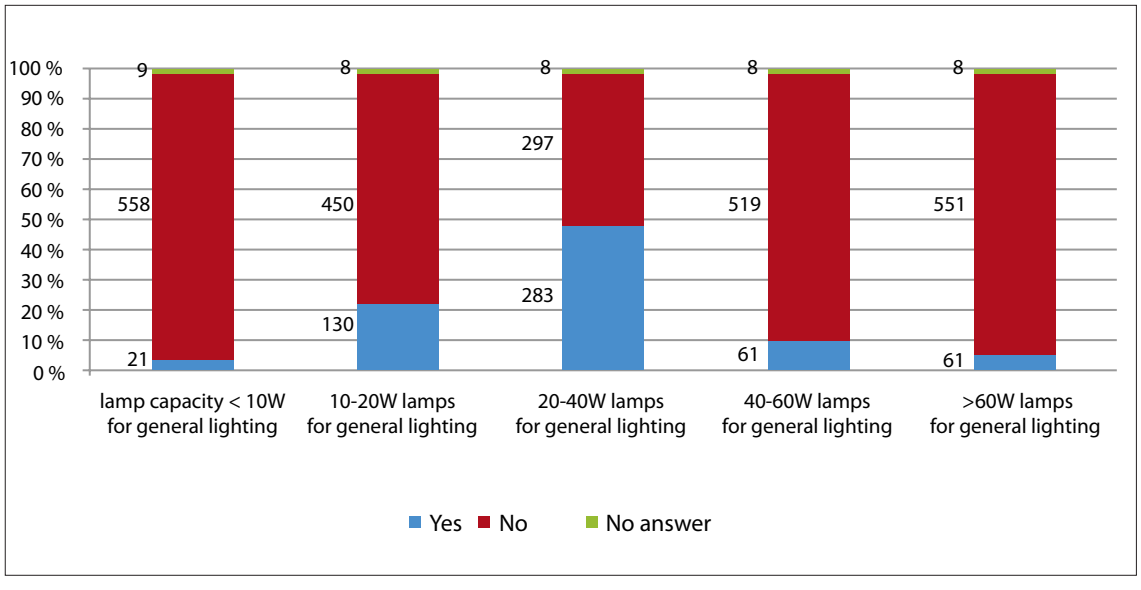


Figure 28. Customers' suggestions about capacity appropriate to purpose of general lighting

The capacity appropriate to purpose of general lighting is 20W to 40W - fluorescent lamp.

2.1.6. Type of lamps appropriate for other purposes

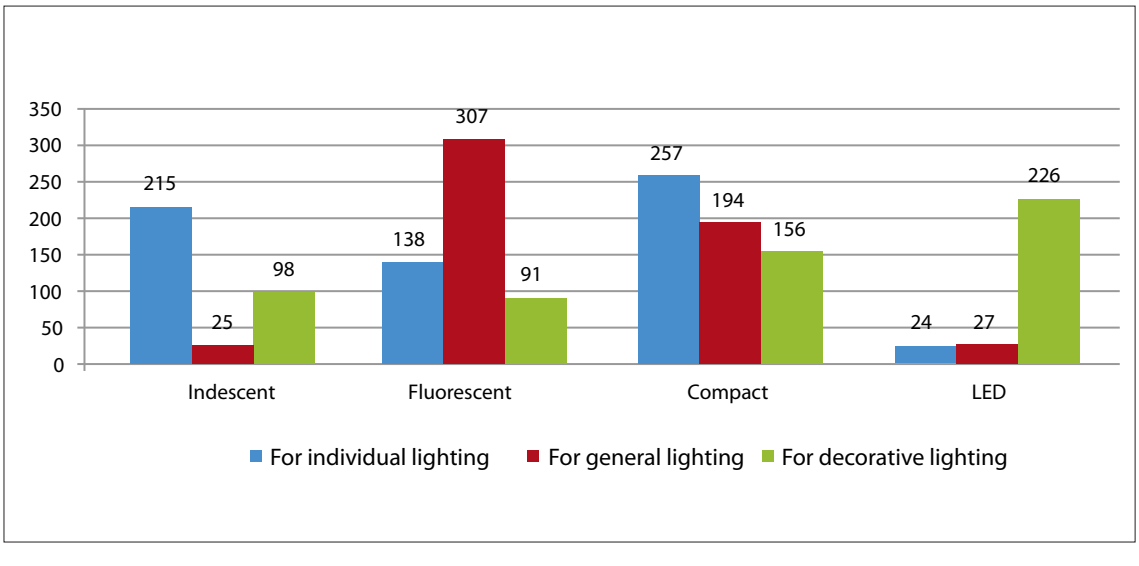


Figure 29. Types of lamp used for other purposes

ILs are considered to be most appropriate for individuals, fluorescent lamps are considered to be most appropriate to general lighting and LED is considered to be most appropriate to decorative lighting.

2.1.7. Capacity appropriate to different purposes

The lamp capacity is considered to be most appropriate to decorative purpose is less than 10W or maximum is up to 20W. The 20-40W lamps should be used for general lighting, and the 10-20W lamps should be used for individuals.

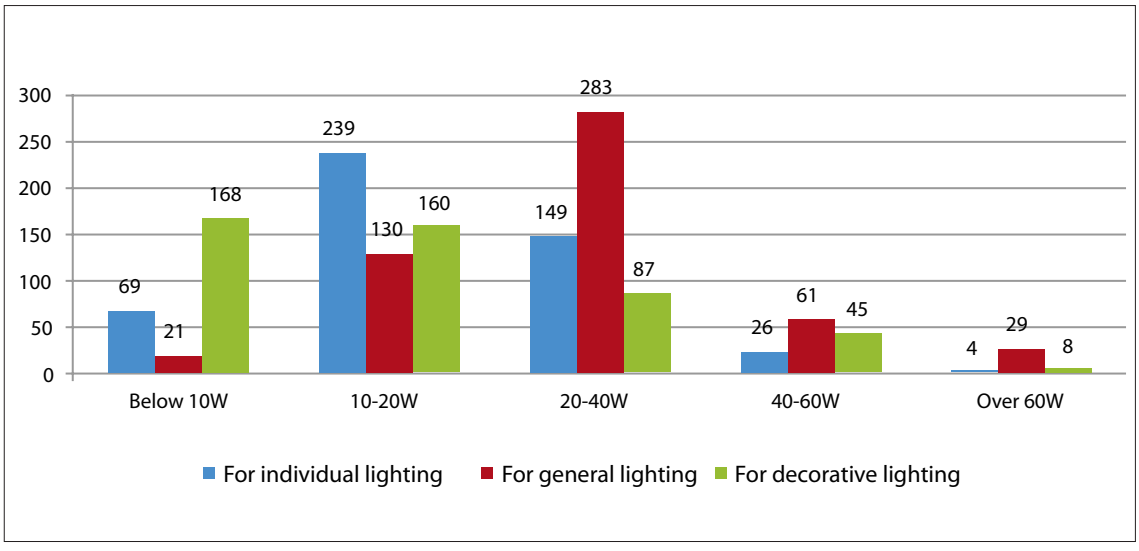


Figure 30. Capacity appropriate to different purposes of lighting

2.1.8. Unoriginal lighting products

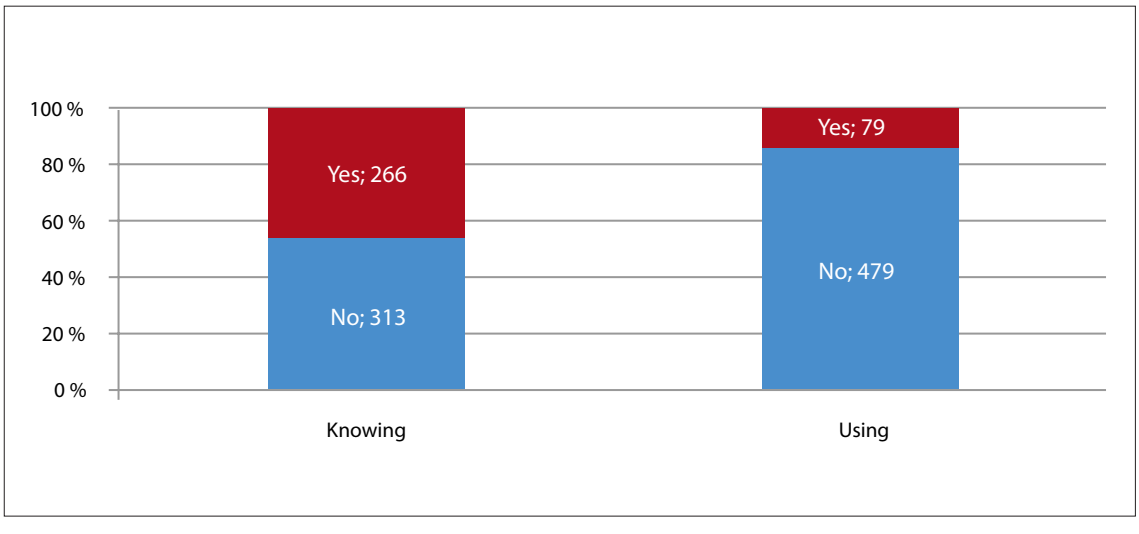


Figure 31. Awareness and use of unoriginal lighting products

There are 266 people aware of unoriginal lighting products but only 79 people use them.

Advantages

The biggest advantage of unoriginal lighting products is effective cost, next is nice looking and various designs.

Table 22. Advantages of unoriginal lighting products

Nhận định	Frequency	Rate	Rate/the number of answers	Rate of Accumulation
Effective cost	291	49.5	93.9	93.9
Various design	13	2.2	4.2	98.1
Nice design	3	0.5	1.0	99.0
High level brightness	2	0.3	0.6	99.7
Easy to buy	1	0.2	0.3	100.0
Total	310	52.7	100.0	
No answer	278	47.3		
	588	100.0		

Disadvantages

The biggest disadvantage of unoriginal lighting products is quickly degraded or damaged after a short using time, low quality with poor brightness. Comparing with customers' requirements, it is said that unoriginal lighting products are not popular.

Table 23. Disadvantages of unoriginal lighting products

Comments	Frequency	Rate (%)	Rate/the number of answers (%)	Rate of Accumulation (%)
Quickly damaged	246	41.8	78.1	78.1
Expensive	1	0.2	0.3	78.4
Low-level	62	10.5	19.7	98.1
Low-level brightness	4	0.7	1.3	99.4
Few people use	1	0.2	0.3	99.7
High power consumption	1	0.2	0.3	100.0
Quickly degraded	315	53.6	100.0	
Expensive	273	46.4		
	588	100.0		

2.1.9. Effects of media tools on rising community's awareness and behavior

When asking about media instrument that can be use for rising the community awareness, almost customers say that the most relevant mean is through school students. Other means such as leaflets, manuals, fairs or press trips are less effective.

Table 24. Effects of media tools on rising community's awareness and behavior

Hình thức truyền thông	Observation	Minimum	Maximum	Average	Standard deviation
Panels on major roads, at airports, stations, on buses.	557	1	5	3.2801	0.98030
Leaflets "Benefits of energy saving lamps" provided for households and free at airports, on buses.	563	1	5	2.7300	1.21743
Information about benefits of energy saving lamps printed in notebooks of students.	571	1	**5**	3.8774	1.92464
Information about benefits of energy saving lamps printed in pocketbooks/working books of government's or businesses' officials	575	1	5	2.6122	0.95044
Very short films (5 minutes) broadcasted at primetime on VTV1 and local channels.	404	1	5	2.9629	1.25669
Writing contest for school students about "Energy saving and habit change of using indoor lamps" nationwide.	480	1	5	3.6437	0.92074
Fairs between businesses and manufacturers.	392	1	5	2.7092	0.90019
Ambassador of program "Energy saving and habit change of indoor lamp use" (likely singer, miss…)	444	1	5	2.9437	1.00741
Setting up hotline to provide with information about program of Energy saving and habit change of indoor lamp use.	416	1	5	2.7861	1.10416

	Observation	Minimum	Maximum	Average	Standard deviation
Documentary about "Energy saving and habit change of indoor lamp use" broadcasted on TV, at meetings, workshops.	274	1	5	3.1095	0.95064
Online forum "Energy saving and habit change of indoor lamp use"	460	1	5	3.0326	0.94109
Introducing content of "Energy saving and habit change of indoor lamp use" on TV programs.	272	1	5	2.9338	1.01794
Establishing forum on some popular social networks in Vietnam such as Facebook, twitter, zingme, yume… for officials, students.	377	1	5	3.1645	0.96454
Organizing press trips	339	1	5	2.7021	1.13954

There are differences of customer's assessment among different localities. Lam Dong customers has highly appreciated information of benefits of ESLs which is printed in students' notebooks. Whileas Kien Giang's customers gave high scores for TV programs on introducing to use ESLs.

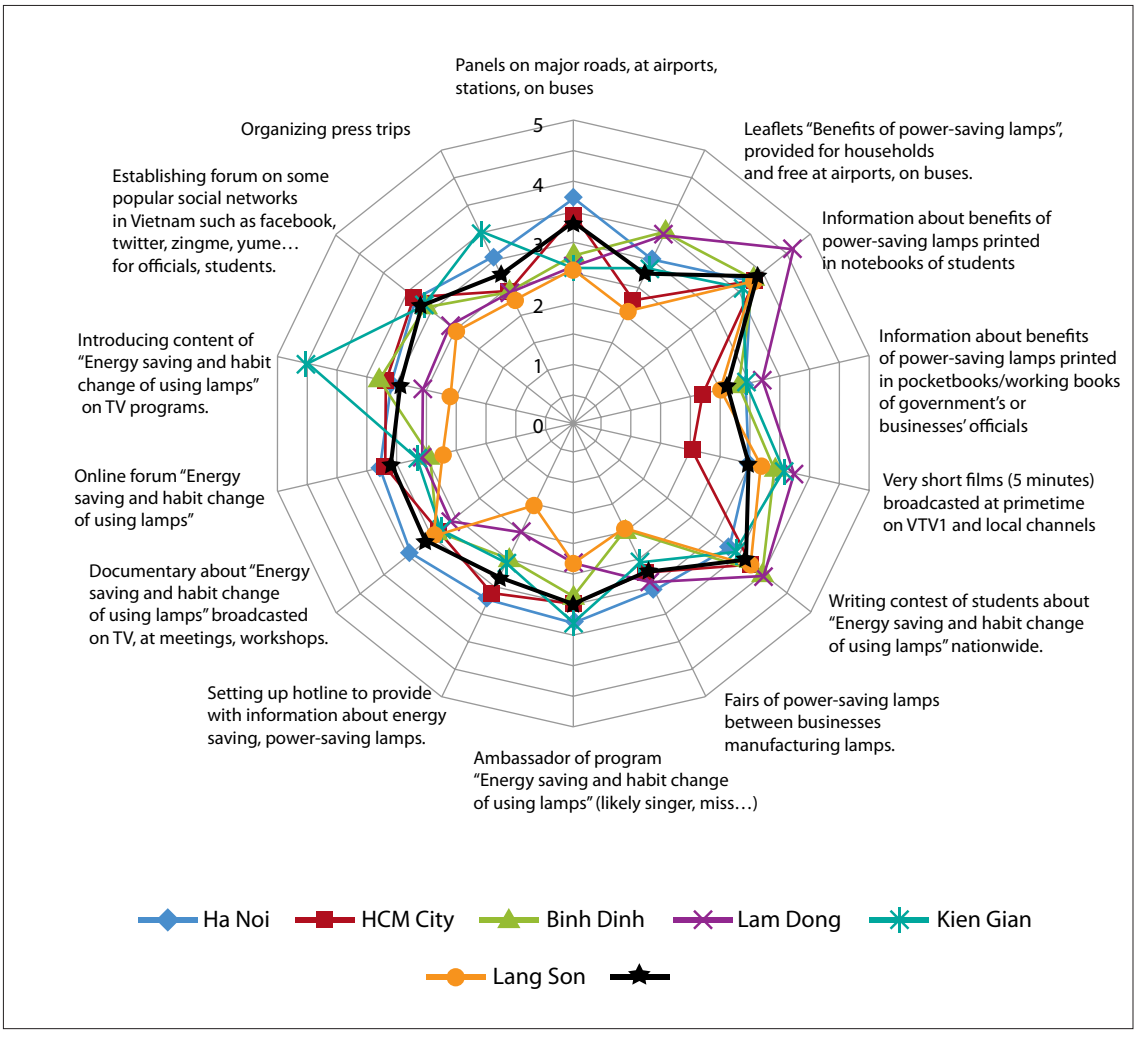


Figure 32. Differences among localities in appreciating relevant level of media tools

2.2. Agencies and organizations

2.2.1. Structure of lamp use

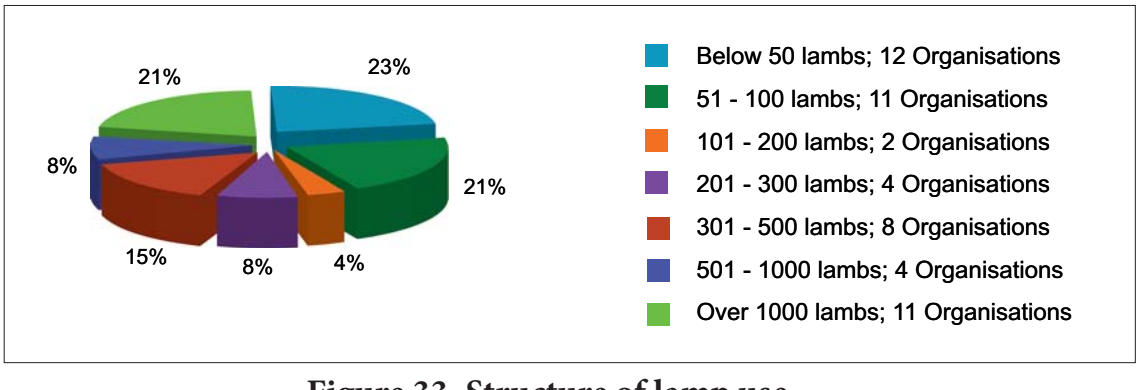


Figure 33. Structure of lamp use

Figure 33 shows structure of lamp used in 52 agencies/organizations based on answer sheets of BH3 model: 7 groups use different quantity of lighting product: 12 agencies/organizations use less than 50 units (accounting for 21%), 11 agencies/organizations use from 51 to 100 units (accounting for 21%), 2 agencies/organizations use from 101 to 200 units (accounting for 4%), 4 agencies/organizations use from 201 to 300 units (accounting for 8%), 8 agencies/organizations use from 301 to 500 units (accounting for 15%), 4 agencies/organizations use from 501 to 1000 units (accounting for 4%), 11 agencies/organizations use greater than 1000 units (accounting for 21%).

Types of lamp used in agencies/ organizations

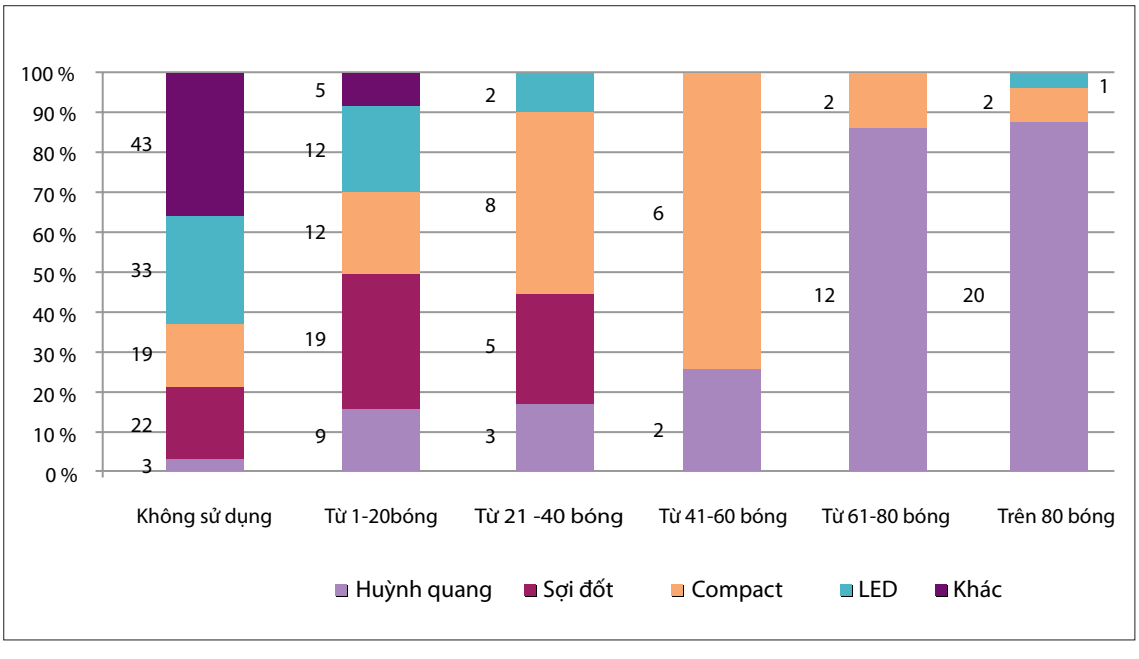


Figure 34. Types of lamp used in agencies/organizations

Figure 34 shows that fluorescent lamps are most used in agencies/organizations using large quantity of lamp (greater than 60 lamps). In agencies/organizations using small quantity of 1 to 20 lamps, ILs are most used, next is compact lamps and LED. In agencies/organizations using from 21 to 60 lamps, compact lamps are mainly used.

2.2.2. Lamp capacities in use

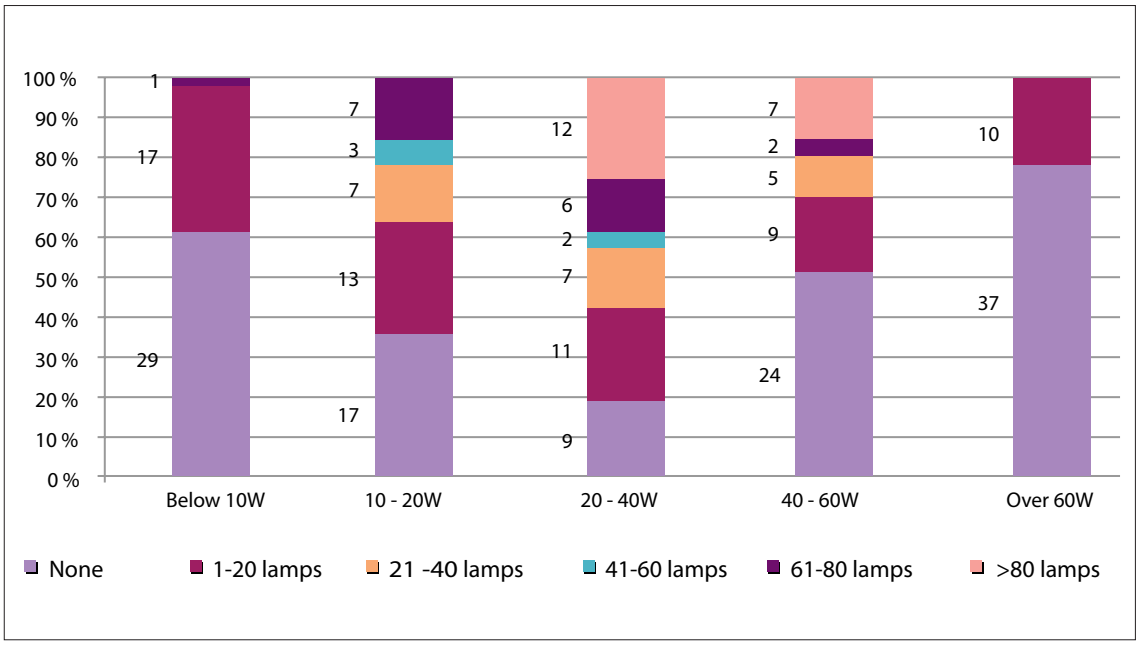


Figure 35. Types of lamp being in use in agencies/organizations according to their capacities

For the lamps with lighting capacity below 10W, there are 17 agencies/organizations using from 1 to 20 bulbs. For the lamps with lighting capacity 10-20 W, the organizations which require 1 to 20 bulbs use this kind of lamp most, next is agencies/organizations with use of 21 to 40 lamps, and the others with over 80 lamps used. 20-40W lamps are mainly used by agencies/organizations that need more than 80 lamps or by agencies/organizations of which need is from 1 to 20 lamps. Over 60W lamps are used much by agencies/organizations with quantity from 1 to 20 units in use.

Type of most common used lamp is 20-40W lamps. They are used by 38 agencies/organizations because they are appropriate to purpose of general lighting.

2.2.3. Lighting purpose

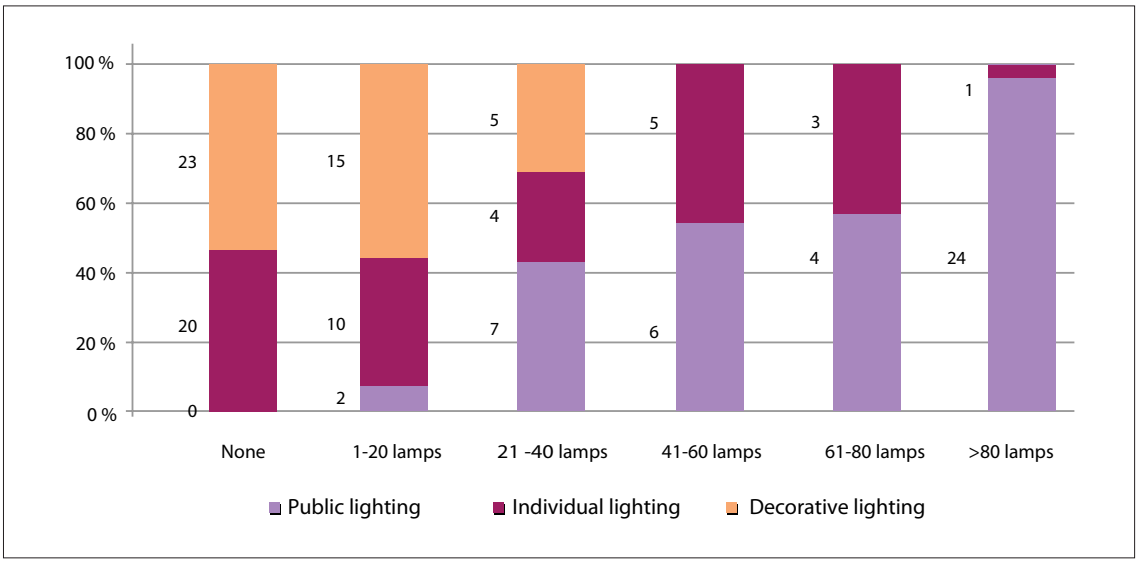


Figure 36. Lamp use relating to lighting purposes in agencies/organizations

Agencies/organizations often use from 1 to 20 lamp mainly for decorative purpose, next for working of individuals. The other agencies/organizations with quantity over 20 lamps use mainly lamps for general lighting.

2.2.4. Purchasing behaviors

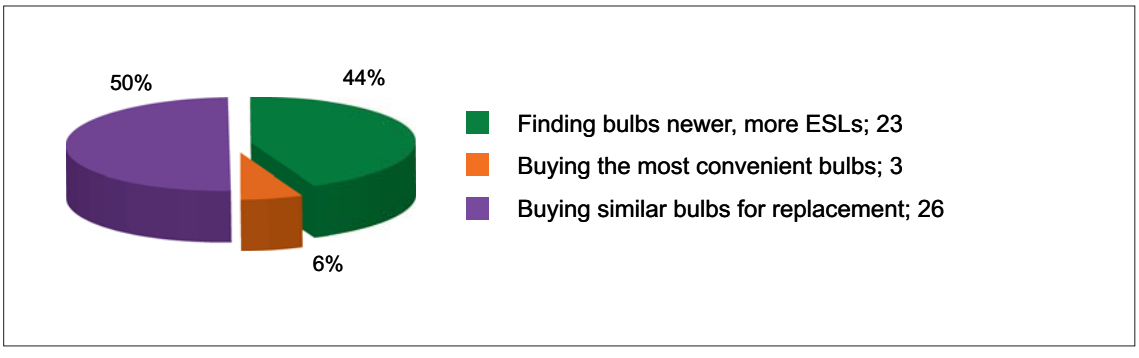


Figure 37. Buying lamp for replacement

On the chart of buying lamps for replacement, 50% of the agencies/organizations shall buy similar products to replace, 44% of the agencies/organizations looking to buy new products with less energy consumption, 6% agencies/organizations shall find the most convenient lamps for replacement.

Who decides to buy new lamp for replacement?

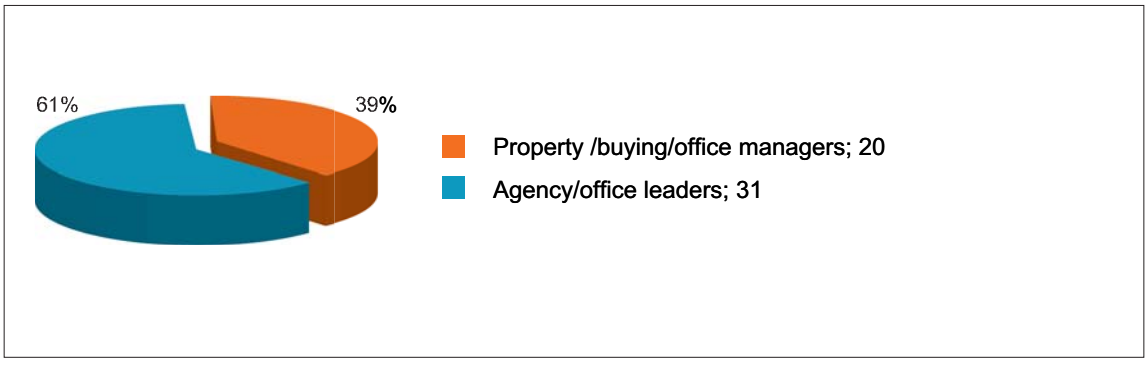


Figure 38. Buying decision makers

Figure 38 shows that 39% in decision makers of the agencies/organizations deciding to buy new lamps are property managers, head of administration office.

Factors affecting on purchasing activities

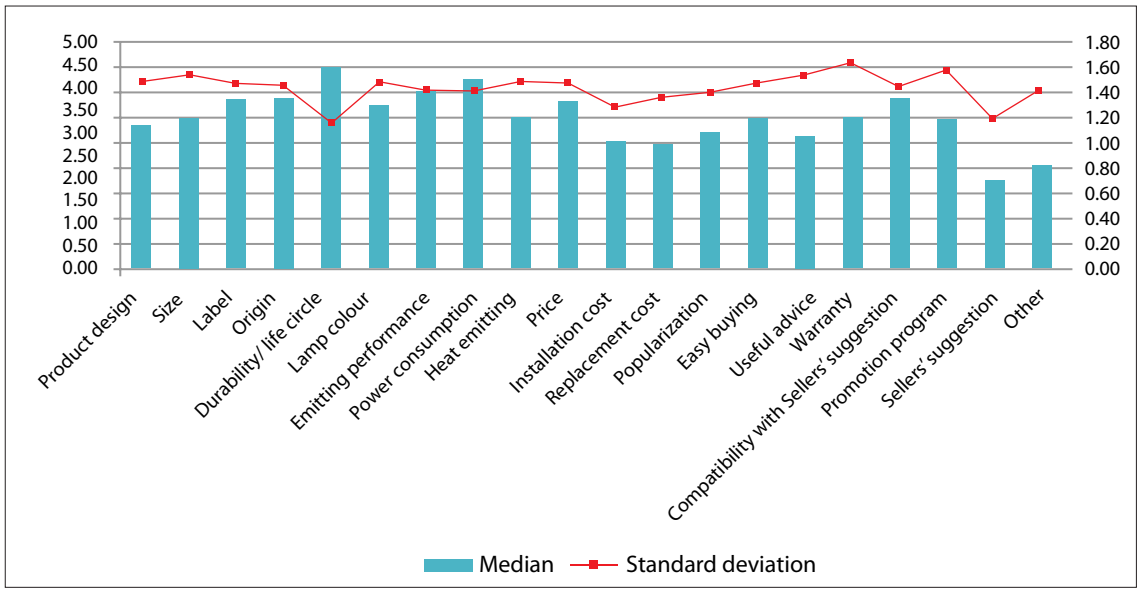


Figure 39. Factors affecting on lamp purchasing activities of agencies/organizations

Researching on concerns of agencies/organizations when buying lamps revealed that the most concerned factors are lamps' durability/life, energy consumption and compatibility with available systems. Other factors such as seller suggestion, replacement cost got less attention from these organizations.

2.2.6. Concerns on energy saving for lighting

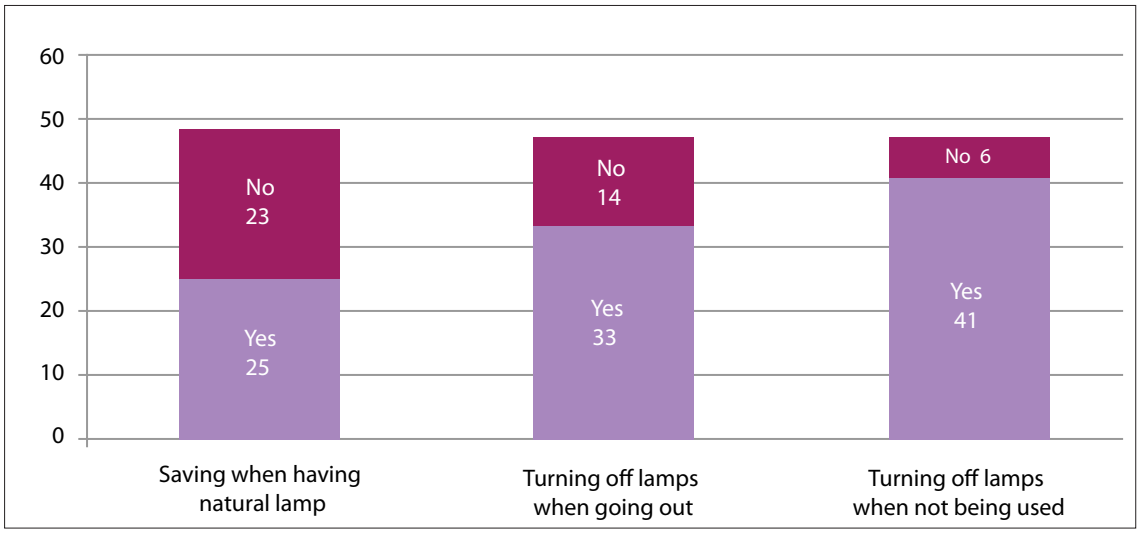


Figure 40. Actions express the concern about energy- saving in lighting of agencies/organizations

92% of the agencies/organisations asked express their concerns on about energy related issues in lighting and 8% did not.

Out of 48 agencies/organisations (92%) concerning about energy-saving in lighting, 25 agencies/organisations express their concerns by turning off the lamps used when having natural lamps, 33 agencies/organisations by turning off the lamps when going out, 41 agencies/organisations by turning off the lamps when not being used. It can be said that the most common activity for energy saving in agnecies/organisations is turning off the lamps when not being used.

Reasons for agencies/organizations remaining to use ILs

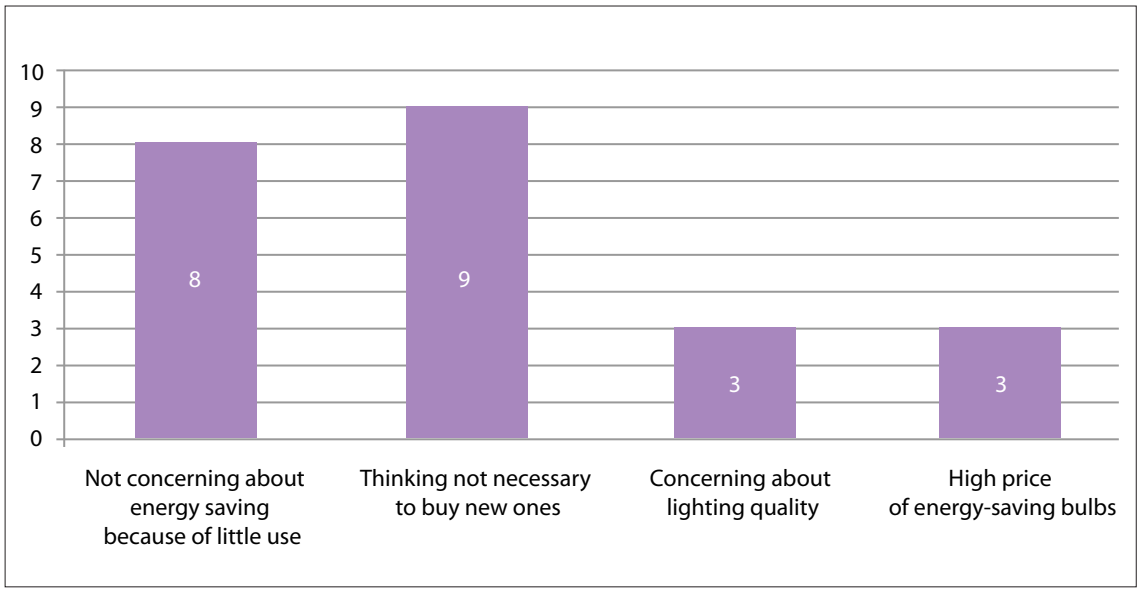


Figure 41. Reasons for agencies/organizations remaining to use incandescent lamps

When asked about reasons for remaining to use ILs, 8 agencies/organizations said that they thought ILs might not increase consumed electricity amount because of little using.

9 agencies/organizations thought that it was not necessary to buy new ones and 3 agencies/organizations were concerning about lighting quality and high price of energy saving lamps.

2.2.7. Selecting types of lighting products used for different purposes

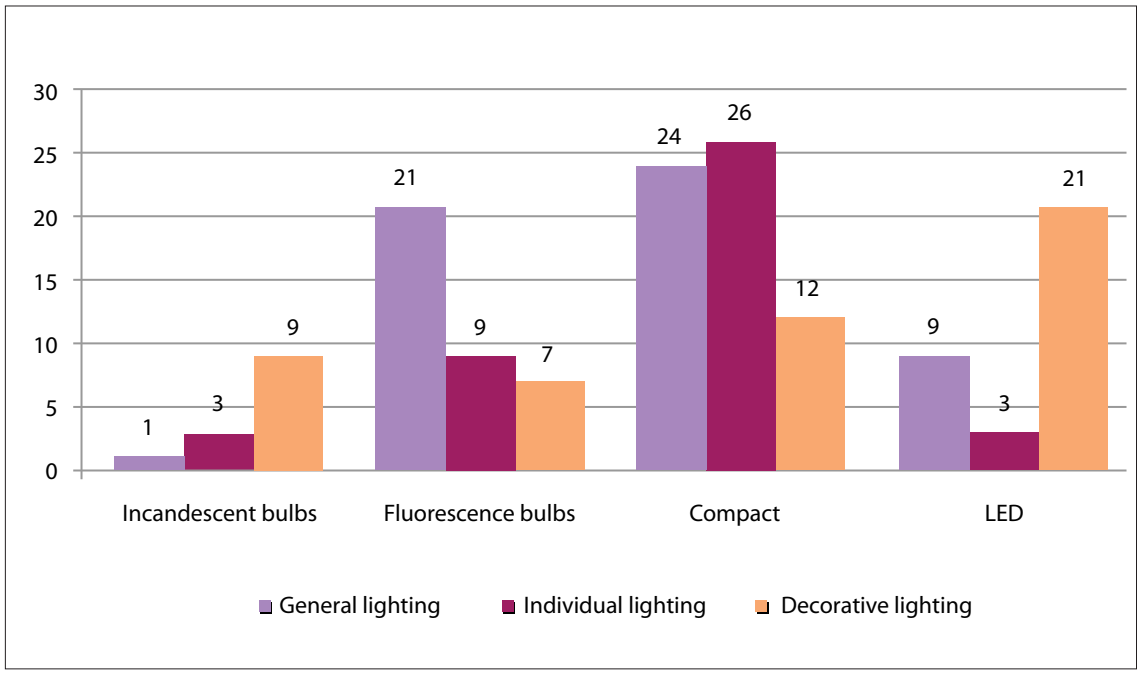


Figure 42. Types of lighting products used for different purposes in agencies/organization

Fluorescence lamps are the most suitable for general lighting purpose, while compact lamps are suitable for personal lighting purpose and can be used for general lighting, LED lamps can mostly be used for decorative lighting.

2.2.8. Selecting lamp capacity for lighting purposes

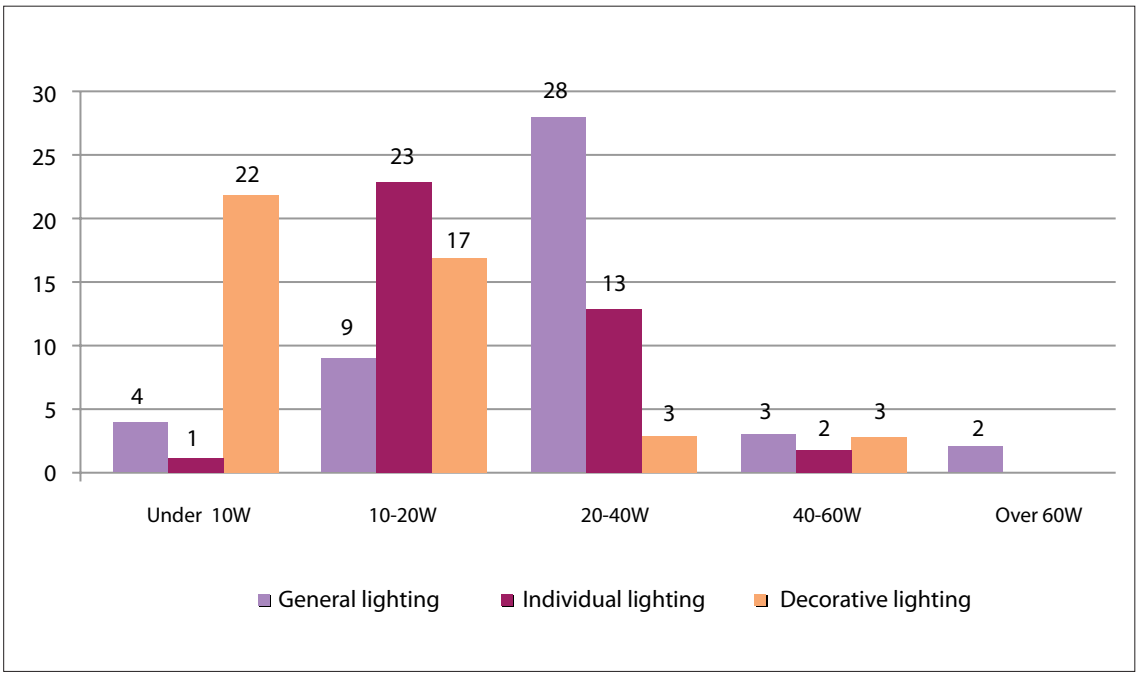


Figure 43. Capacity for different lighting purposes

The most suitable capacity for decorative lighting is under 10 W or up to 20W. 20 to 40 W fluorescence lamps should be used for general lighting whereas 10 to 20 W lamps are used for personal purpose. For decorative lighting purpose, in addition to LED lamps, ILs which have the capacity under 60W can be used in large hotels because they can be adjusted according to guests' order.

2.2.9. Awareness of unoriginal lighting products

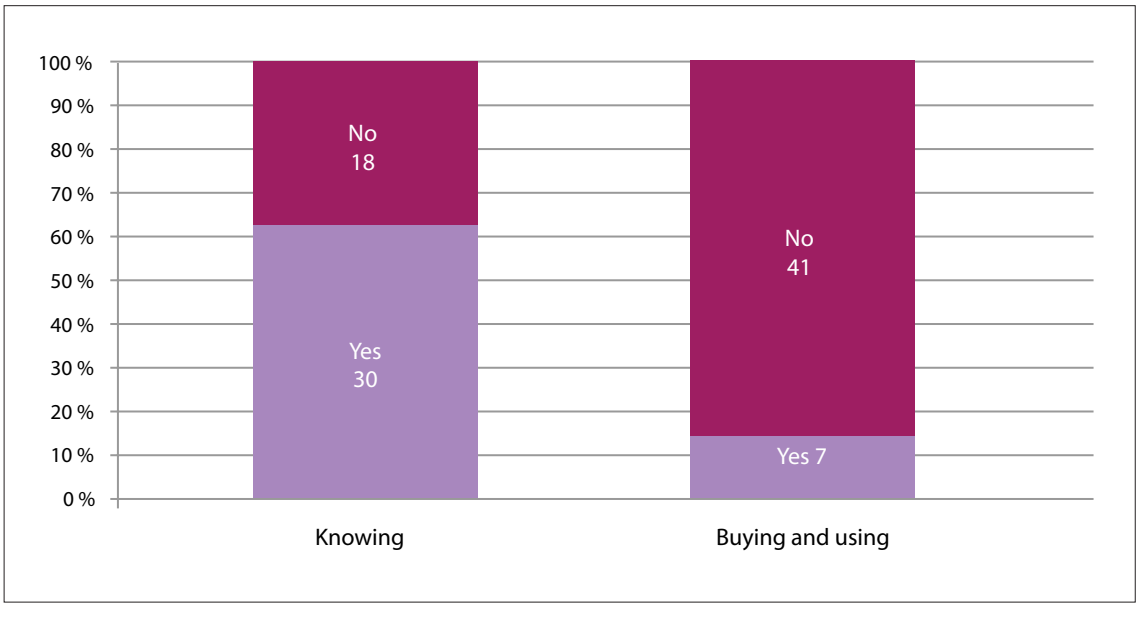


Figure 44. Awareness of unoriginal lamps

According to figure 44, there are 30 agencies/organizations who know about unoriginal lamps, but only 7 agencies/organizations that do not know about unoriginal lamps bought and are using them currently.

2.2.9. Information of interviewers

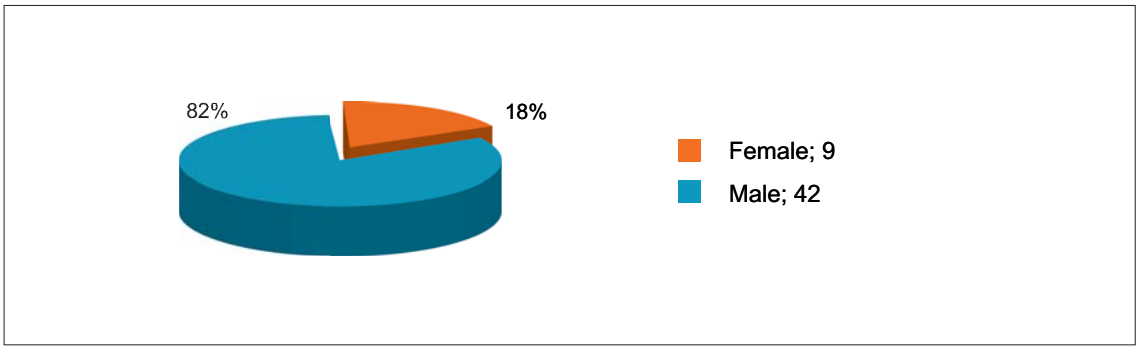


Figure 45. Gender rate of interviewers

As seen on the chart, 18 % of representatives of agencies/organization answering the survey are female, the rest are male.

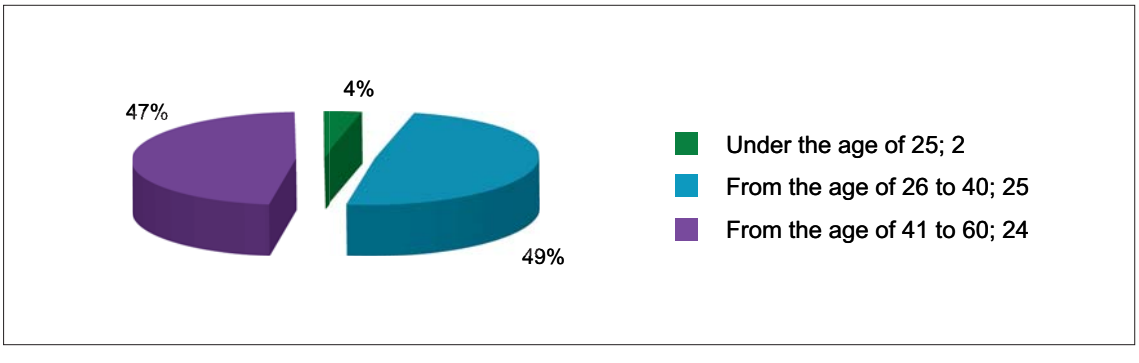


Figure 46. Age rate of interviewers

On the chart, only 4 % of representatives of agencies/organization answering the survey are under the age of 25, 49% of the representatives of agencies/ organization answering the survey are from the age of 26 to 40, the remaining are from the age of 41 to 60

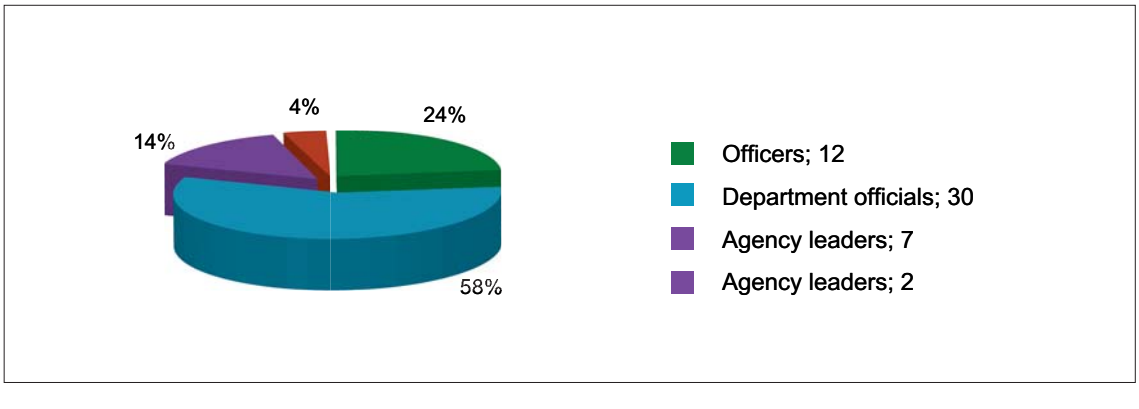


Figure 47. Working position of interviewers

24% of agencies/organizations' representatives answering the survey are Junior officers.

58% of agencies/organizations' representatives answering the survey are department leaders.

14% of agencies/organizations' representatives answering the survey are heads of organisation

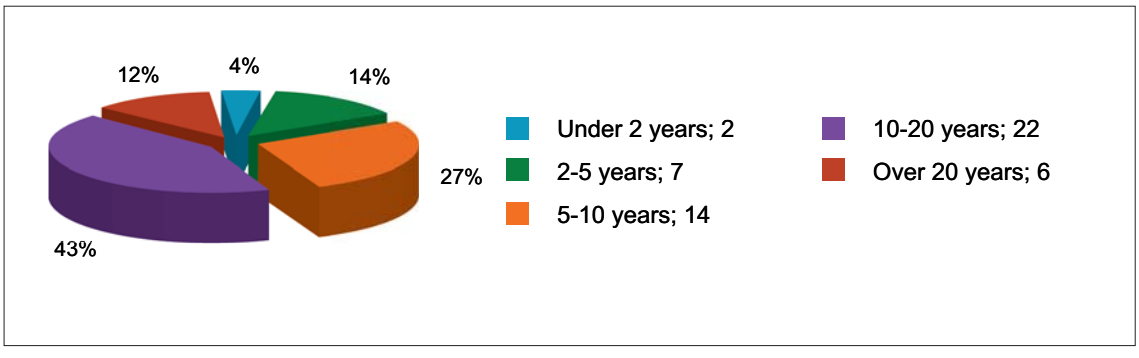


Figure 48. Working experience of interviewers

As the chart above, 4% of agencies/organizations' representatives answering the survey have working experience of less than 2 years.

14% of agencies/organizations' representatives answering the survey have working experience of from 2 to 5 years

28% of agencies/organizations' representatives answering the survey have working experience of from 5 to 10 years.

42% of agencies/organizations' representatives answering the survey have working experience of 10 to 20 years.

The remaining has working experience of over 20 years.

2.3. Commercial buildings

The use of lighting equipment in commercial buildings was divided in accordance with functions of the building because each building type has different characteristics relating to their current activities and business purposes.

During the research, an survey was carried out in several buildings with different functions:

- Hotels
- Offices for lease
- Commercial Centers
- Complex buildings

2.3.1 Hotels

Hotels are often operated 24/24h, providing the following services: accomodation services, restaurant, renting rooms for conference, seminars, wedding, birthday party; entertainment services such as pools, massage, gym, karaoke.

In the hotels, lighting systems use various lighting products with different purposes such as for decoration, lighting in living room, bedroom, outdoor lighting ... These hotels often use fluorescent lamps, compact, halogen, metal halide, LED, ILs.

As the survey's results, the existing lighting systems of the hotels are using many highly efficiency lighting products so that despite a large number of lamps used, energy consumption of the hotels remains efficient. With aim of inproving the elegance and courtesy for meeting rooms and restaurants, lighting systems in lobby areas or ceiling are decorated with many bulbs, chandeliers and ceiling lamps.

Figure 49. Lighting systems in hotels

Besides, many hotels still use ILs that are low capacity (below 60W) mainly for decorative purposes.

According to the energy audit reports, lighting systems of hotels often account for about 10 - 15% out of the total electricity consumption

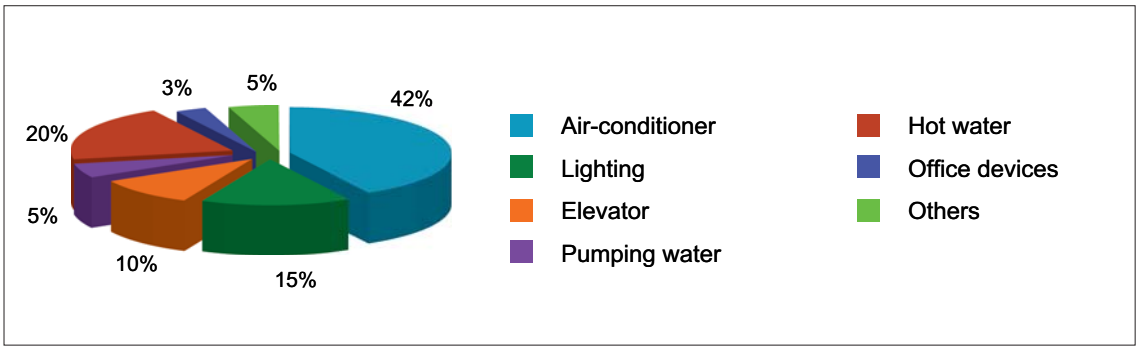


Figure 50. Structure of electricity consumption in hotels

2.3.2. Office for lease

Office buildings are often used for offices' lease. The offices here are often representatives of domestic companies and foreign enterprises. The operating time ranges of about 10 to 14 hours a day. They are often large energy consumers who should be concerned and supported to improve their performance in energy efficiency.

The lighting system in the buildings are often large capacity. Lighting system in office area were set up with fluorescent lamps T8 and T10 which are provided mainly from domestic firms such as Rang Dong and Dien Quang. Each set usually has 2 or 3 bulbs inside a lighting trough and uses various lamps with ballast that provide high brightness and save energy. Some places use lamps of exported energy saving lamps that use ballasts with capacitor in each luminaries.

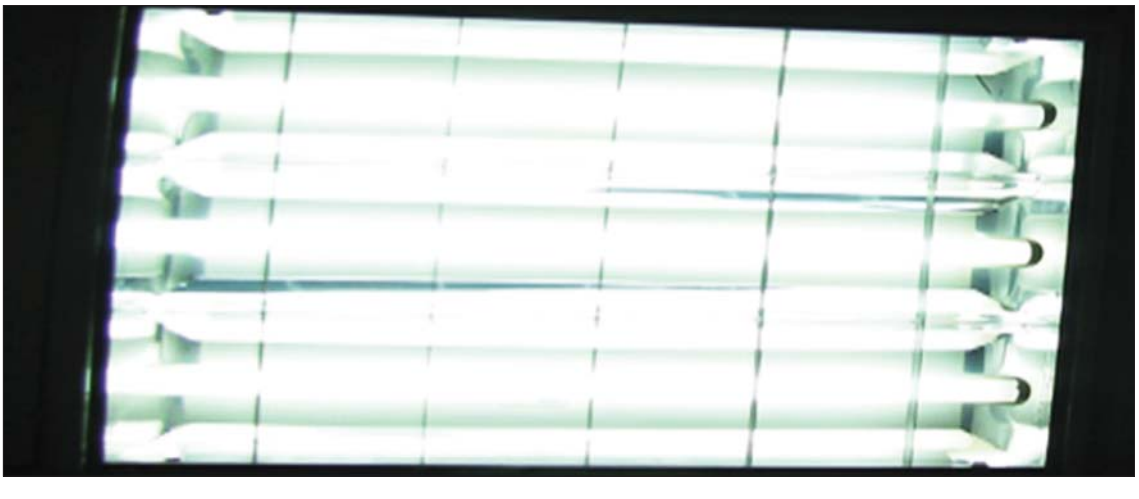


Figure 51. Set of fluorescent lamps are installed in offices

At the lobby of the office buildings, compact lamps used are often with the capacity of 13W and 18W. During the day time, the external lobbies use natural light, therefore all the lamps there are switched off even though power consumption of compact lamps is small. At internal lobbies, lighting are used sufficiently and under control of the building management.

Figure 52. Lobby lighting with compact lamps

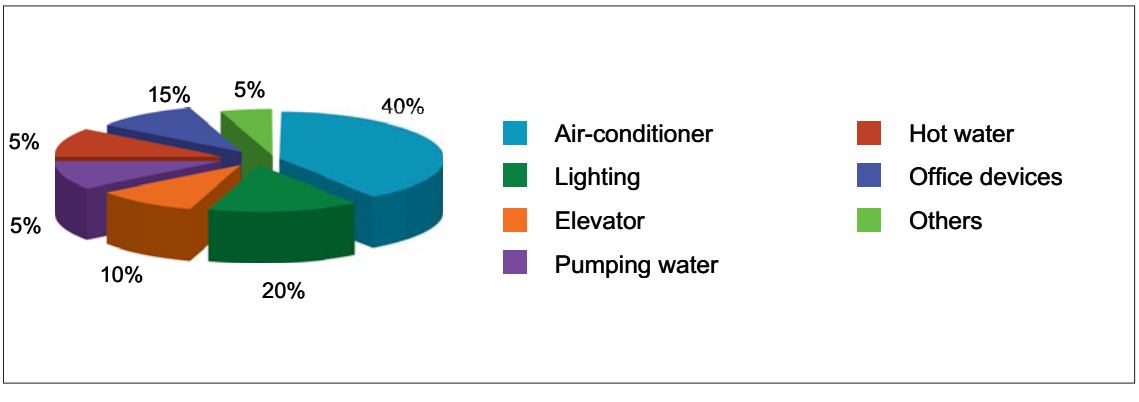


Figure 53. Structure of electricity consumption of electrical devices in office

2.3.3. Commercial centers

Commercial Center is the place where occur many trading, transaction activities; In these buildings, there are also offices for lease. Operation time of these buildings ranges from 10 to 14 hours a day.

Similar to office buildings, lighting systems accounts for about 15-20% out of the total power consumption of the building. In the general area, lighting is used in accordance with the general design of the buildings, the fluorescent and compact lamps are used commonly. In addition to general lighting systems, the shopping areas are often designed for shining demonstrated products. This use requires high brightness therefore the 25W to 50W lamps and compact lamps are often used there.

2.3.4. Complex building

The complex buildings has many functions such as apartment, supermarkets, small trading center, restaurants, offices, entertainment area. The operation time is 24/24 hours.

Lighting systems of buildings are similar to those of office buildings and commercial centers, almost the buildings has just been built in recent years so that fluorescent, compact, halogen lamps are used for office, commercial areas, basements and lobbies. Only apartment area still use Ils but the lighting of this area is not much.

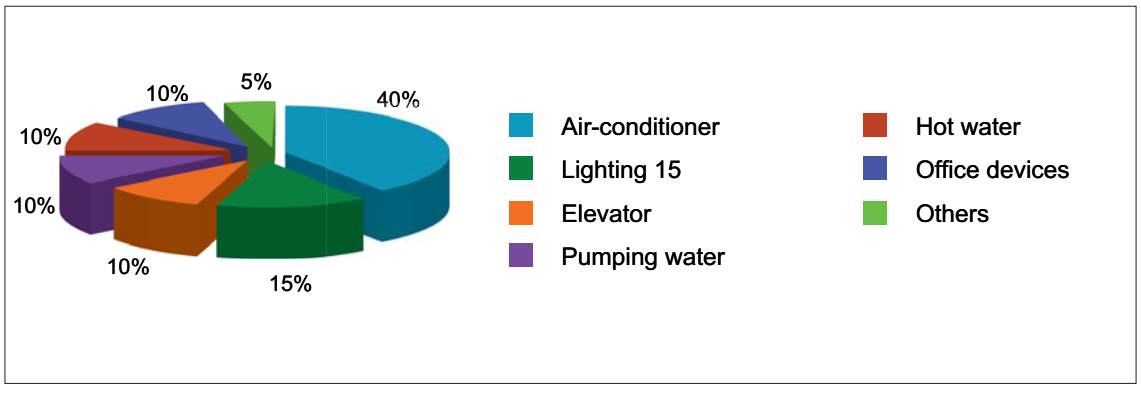


Figure 54. Structure of electricity consumption of devices in complex building

CHAPTER IV. SUGGESTIONS AND RECOMMENDATIONS

1. Summary survey's findings

1.1. Demands of the indoor lighting market in Vietnam

It is said that, with approximately 25 million households and the average lamps used in each family of around 14.3 bulbs so that the total number lamps in use at household level is nearly 359 million bulbs. Additionally, about 25 millions other bulbs are using in business enterprises, offices and agencies working in different fields. The total market capacity is 385 millions of different types of bulb. Of which, there are about 60% of total households investigated are using ILs and the average number of this lamp used of about 2.3 bulbs for one household. The total number of ILs in the market are increasingly decreased because the consumers tend to replace the fired or broken bulbs to compact fluorescent lamp to advocate the use of energy-efficient bulbs, especially as the price of compact ball dropped and the quality is much improved over .

The proportion of over 60W ILs used in domestic demand is about 9.6%. In some rural areas, people are still in favor of ILs due to two main reasons: (1) ILs price is relatively cheap (about 7000 dong/bulb); (2) In cold winter, ILs can provide heat and warm up the atmosphere around. However, there are some ideas commend that ILs can be still used because they work quickly and large voltage tolerances. Moreover, in reality, many customers also confirmed that the durability of ILs is longer than compact bulbs

Since the awareness, paying ability and that the quality of different types of lamp in the market are not quite different, the market demand of compact lamps are more interested in T10 fluorescent lamps and ILs.

1.2 Production capacity of domestic manufacturers and importers:

As presented earlier, annually, Vietnam produce and import approximately 408 million lamps of which 34 million lamps are imported and the remaining 374 million lamps are manufactured. With this output, domestic manufacturers export about 237 million lamps and keeping the other 171 million for Vietnamese market. In addition to 34 million bulbs were officially imported, there is a supply of bulbs from other sources (non-quota imports, float...). Regarding types of lamps, manufacturers annually produce approximately 38.8% of ILs, 26.8% and 34.4% of fluorescent and compact fluorescent lamps, respectively.

1.3 Major factors affecting the lighting industry in Vietnam

As the research results, the researchers have figured out some major factors affecting the market including firstly: the regulation framework relating to

energy use efficiency; secondly: the relationship of market demand and supply of lighting products (product quality, price, efficiency); and finally the marketing activities for high-efficient lighting products.

Legislation and policy framework

Over the last few years, the lighting industry in Vietnam has seen significant changes in related policies and laws such as the Law on energy efficiency or regulations on the use of high-efficiency devices. With these legal documents, there have been fundamental changes in household use of highly efficient lighting devices. These include the switch from incandescent lamps into compact fluorescent lamps, from fluorescent lamps T10 to T8, T5 and recently LED lamps. Changes have also been seen in commercial use with the switch from high-pressure mercury lamps into Metal Halide and Sodium lamps. The switch in usage has resulted in changes in technologies employed by domestic manufacturers and importers.

Supply-Demand relationship

In favor of promotion of energy use efficiency and due to increasing energy price over the last few years, manufacturing and commercial services sectors and also at household level have made fundamental and positive changes in energy use to reduce energy costs by switching into higher-efficiency devices.

This is clearly shown in the increasing use of highly-efficient lighting devices. However, in order to meet current demand for lighting devices on Vietnam market, the product quality and efficiency should be enhanced and product price should be more reasonable.

Propaganda, promotion and awareness improvement

The recent popularity of compact fluorescent lamps among Vietnamese users results from intensive and extensive media propaganda (such as TV, radio and conferences) targeting at both rural and urban areas. Lamp sales program of Vietnam Electricity group is among the most effective programs to promote people's use of compact fluorescent lamps. This indicates that propaganda plays an important role in promoting energy efficiency.

Issues managed by Ministry of Industry and Trade: Policy for labeling; national energy-efficient standards; and producing quota

There have been a number of strict legal documents which ensure a healthy market of ESLs in Vietnam. The establishment of testing laboratories and agencies aims to monitor the manufacturing process and product supply, ensuring both quantity and quality; protect consumers and create a healthy competitive environment for manufacturers. However, inadequate capacity

among the involved administration agencies are still occuring, especially in post-testing stage and market management. Besides, autonomy among manufacturers also makes it difficult for the authorities to manage this market, for examples, in reporting process, the accuracy of reported data, timetable for reporting.

Issues managed by Ministry of Construction: Construction designing standards, Interior and exterior lighting system relating to national energy effiency policy

In fact, the regulations on construction designing standards has been proposed in Vietnam. Althought the proposal given in 2005 has not been issued but it has been applied for long time. On October 03, 2012, the Ministry of Construction, International Finance Corporation (IFC) and World Bank (WB) organized a workshop to report on the implementation of construction designing standards related to national energy policy.

At the conference, there were a lot of arguments that were concerned by many agencies. From the construction investors' point of view, some suggested that certain overlapping regulations should be abolished because of their infeasibility and unnecessity. They mentioned that once someone rented a building for office, they obviously had to save electricity and use energy efficiently. From the designers' standpoint, architecture and construction practice has shown that regions with different climate should have different construction designing standards and then the energy-efficiency standards are accordingly different. The local authorities on construction management pointed out that it is unreasonable to set the standards for just buildings with area of above 500m2. Why it is proposed over 600m2 (?) They also wonder how the departments in charge have enough staff for management, monitoring, inspection and testing. However, in Hanoi and Ho Chi Minh City, this restriction is compulsory because of the building density and limited area of the inner city.

EVN management: from perspectives of electricity provider

Vietnam Electricity Group has been involving in several power saving campaigns. They are donor of many programes such as changing incandescent lamps for compact fluorescent lamps programs, media programs for saving energy by turning off not in used lamps; offer 1 million VND for customers who buy solar water heater (in combination with Son Ha Company).

However, from perspectives of a business, EVN also has to fulfill its profit targets. Therefore, they need proper policies, measures and steps. These must be in accordance with the country's economic situation in which there is basically no truly competition in power distribution and supply as well as the unresolved problem of unplanned power production and consumption.

1.4. Opportunities and impacts of removing incandescent lamps

1.4.1. Opportunities

Since the Energy Saving and Efficiency act which has been affected from 01/01/2011 and Decree number 51/ND-CP of the government dated 12/9/2011, issued that devices, including lighting devices have to be labeled, subjected to the minimum efficiency and set implementation schedule. These are the advantages for lighting market in Vietnam to switch from low-efficient to highly-efficient lighting products.

Particularly for ILs, Decree No. 51/ND-CP stipulated that from 01/01/2013, import, production and circulation of ILs which has over 60W capacity are not allowed. This provides a legal measures to change the structure of lighting market in Vietnam.

Beside factors relating to the legal framework, propaganda campaigns to replace ILs in Vietnam have been actively implemented and have brought about positive results. The programs include lamp sales of Vietnam Electricity Group (which is considered a successful program in eliminating ILs in the world), propaganda on compact fluorescent lamps of provincial Vietnam Women's Unions under the national program on energy efficiency. Through these programs, there have been changed the awareness of household on use of compact fluorescent lamps. This is also a chance for manufacturers in Vietnam to transform from incandescent technological lines into those of high-efficiency lamps.

1.4.2. Impacts

The research does not aim at studying the impacts of eliminating ILs which require specific investigation and assessment (such as the cost of line switching, employment, etc.). The research only focuses on the general assessments of the program such as national benefits (resources, environment) from lower energy costs. However, the elimination of ILs in the Vietnam should be properly planned so that lamp manufacturers are prepared to change technological lines.

2. Suggestions and recommendations for phasing out ILs in Vietnam

According to the survey findings, the research group suggest and give some following recommendations:

2.1.For Government and administration agencies

To implement the road map for removal of ILs and use of ESLs to contribute to green growth strategy of the Government and global sustainable growth, the Government and administration agencies should have some actions including:

- Establish a road map to remove ILs.

- Support domestic producers through policies and mechanisms so that they can transform their production in Vietnam

- Identify minimum efficiency for substitute lamps (compact fluorescent lamps, fluorescent lamps)

- Implement compulsory labeling for lamp products. Market control should be strict to avoid production and import of low efficiency lamps to Vietnam markets; this is a very important element to conversion of ILs.

- Communicate and encourage users to use high efficient lamps.

- Continue financial assistance for poor and especially disadvantageous households in mountainous, highland, island areas and ethnic minorities to s ubstitute ILs with ESLs as stipulated in Provision 2, Article 5, Energy Saving and Efficiency Act: "support in terms of finance, energy price and necessary priority policies to promote energy saving and efficient use. This is an important policy by the Government to promote all organizations, individuals, and households to save and use energy effectively in lighting area.

- MOF may consider applying low import tax rate for materials and equipment which are not available in the country for production of certified high efficiency lamps and equipment: Certified label (energy stars) or equivalent label with 5 star energy label.

- MOIT may consider issuing policies for supporting energy price for local producers of certified high efficiency lamps and equipment: Certified label (energy stars) or equivalent label with 5 star energy label.

- MONRE should identify specific standards to limit mercury residue to lowest level (near zero) when the lamps reach their life time.

- MOC needs to issue circular to guide the application of planning and design of building to match national standards, natural conditions to reduce energy consumption for lamp and installation of high efficiency lamps in state offices.

- General Department of Customs and Department of Market should have effective measures to limit illegal import of the low efficiency lighting equipment through the north border and strengthen the control of selling low quality and no origin lamps.

- Law reinforcement agencies should conduct strict penalties for law violations related to illegal import of low quality lamps.

2.2. For producers and sellers

- Domestic producers should establish road map to convert technologies to

comply with government regulations, should not be delayed and not fully implemented these regulations;.

- One important factor influence the successful conversion of lamp use behavior is the quality improvement of energy saving lamps because initial price of energy saving lamps is much higher than incandescent ones. Highly initial cost requires lower use cost. Therefore, it is necessary to improve quality, durability, lighting capacity and low consumption of energy. Moreover, in the future it is necessary to research and invest to lower sales price of the products. It is possible to conduct market segmentation and create different products for different types of customers.

2.3. For users

- Raise awareness of using energy saving lamps

- Promote energy saving programs in all households, organizations and enterprises

CONCLUSION

With aim of providing an overall picture of lighting market and challenges in changing to use ESLs in Vietnam, the research group carried out an research survey with 586 households, 52 distributors, 52 business enterprises, 7 administrator agencies, 6 lamp producers, 6 building maintaining administrators in 6 provinces/cities all around the nation including Hanoi, Lang Son, HCM City, Binh Dinh and Lam Dong.

The research results show that, with around 25 million households in Vietnam currently and the average lamp used for one family of about 14.3 bulbs, the total number of lamp used at household level is approximately 359 million bulbs. In addition, 25 million of other bulbs are using in nearly 1 million enterprises, organizations, institutes working in various economic fields. Therefore, the total capacity of indoor lamp use estimated is about 384 million of various bulbs.

However, there are 60% of total households still currently using ILs with average number of about 2.3 bulbs per household of which 9.6 % has power capacity over 60W. The total ILs in the market are around 34.5 million bulbs and tend to decrease in the future due to appearance of alternative lighting products that can save energy and be popular. However, there are still some consumers who are in favor of ILs since for some main reasons: (i) Much cheaper (ii) Heat providing for warming up (iii) Being suitable for different quality of electrical systems (iv) Do not recognize any save when using saving energy lamps. For lamp producers, complete change from producing ILs to ESLs brings numbers of difficulties.

With total market capacity of about 450 million using bulbs and alternative products of about 250 million bulbs, Vietnamese market is quite potential for lamp producers and also be a huge energy consuming market. In order to implement the road map to replace ILs to use ESLs, the research group propose and suggest some following recommendations:

1. Government and functional government department should establish a road map to phase out ILs, giving supports for domestic producers to change to produce ESLs; fixing minimum efficiency for alternative lamps (compact fluorescent lamps, fluorescent lamps); Implement compulsory labeling for lamp products; Implement proper market management.

2. Vietnam Electricity (EVN), Vietnam Electrical Efficiency Program (VNEEP) should continue to carry out advocacy campains to encourage organizations and individuals to use high ESLs; financial support for families in mountainous , island and ethnic minority areas to eliminate incandescent bulbs and change to use ESLs.

3. Domestic manufacturers should actively converted to produce energy-saving lamp bulbs because it is the mainstream on over the world . On the other hand,

lamp producing firms also need to improve product quality of energy saving products, improve the image of the product in the consumer's perception.

4 . For the project, this study also has some limitations on the number of samples and sampling locations. The researchers propose that in the near future , by the end of the project, the project should have further studies and surveys to reassess changes of the market

ANNEX

Annex 1 LIST OF STATE MANAGEMENT AGENCIES TO INTERVIEW

No	Company name	Tool
1	Institute of Energy – MOIT	PV01. A
2	Vietnam electricity	
3	General Department of Taxation	PV01.c
4	Vietnam Customs	PV01.d
5	Office for Energy Saving – MOIT	PV01.e
6	Department of Infrastructure, MOC	
7	Department of Science and Technology, MOC	

Annex 2 LIST OF COMPANIES MANUFACTURING AND TRADING LAMP BULBS TO INTERVIEW

No	Company name
1	Rang Dong Lamp Source and Vacuum Flask Joint Stock Company
2	Dien Quang Joint Stock Company
3	Philips Electronics Vietnam
4	Osram Viet Nam
5	Dai Quang lamp Co., Ltd
6	LUXX Viet Nam Co., Ltd

Annex 3: List of building to interview

No.	Name of building
1	Bitexco, HCM city
2	Machinco, Ha Noi
3	Vietnam Forestry Building
4	27 Hang Bai
5	Vincom Tower B
6	Melia Tower

Annex 4. IMPLEMENTATION PLAN

- Start time: 01/08/2012
- End Time: 30/10/2012

No	Major implementing content, task	Result
I	**Preparation**	
1	Team meeting, unify the approach	Unified approach
2	Guide collaborators in research implementation	Collaborators will completely understand the tasks and the approach
3	Arrange meetings with state management agencies in the list	Meeting schedule
4	Arrange meetings with 1 distributors	Meeting schedule
5	List 50 2/3 distributors	List of 50 units
6	Arrange meetings with 50 2/3 distributors	Meeting schedule
7	List 50 consumers which are agencies and enterprises	List of 50 units
8	List 10 consumers which are construction companies/contractors	List of 10 units
9	Determine the structure of households through size, area and type of house	Structure of households through size, area and type of house
10	Arrange meetings with producers in the lighting sector	Meeting schedule
II	**Information collection**	
11	Direct interview	Meeting minutes/ Answered questionnaires
	Management agencies	
	1 distributors	
	Construction contractors	
	Lamps producers	
12	Send questionnaires, arrange schedule for meetings or receive information of 2/3 distributors	50 answered questionnaires as required

No	Major implementing content, task	Result
13	Collect information from households	500 answered questionnaires (Northern: 200, Southern: 200, Central 100)
14	Collect information from consumers who are agencies and enterprises	100 answered questionnaires
III	**Processing, report writing**	
15	Cleanse data	Cleansed data
16	Input date	Data sheet
17	Run data, discuss data processing	Result of data processing
18	Create report	Draft report
19	Complete report	Report

Annex 4. Questionnaires

Annex 4.1 QUESTIONNAIRE FOR COMPANIES MANUFACTURING AND TRADING LIGHTING PRODUCTS

Form PV1: QUESTIONNAIRE FOR COMPANIES MANUFACTURING AND TRADING LIGHTING BULBS

In order to collect market information which is fundamental for the project on phasing out incandescent lamps to support lamp manufacturers in Vietnam, enhance production capacity as well as develop the Vietnamese market for energy saving lamps, please fill out the following form fully and exactly. The confidentiality of the information is assured.

I. GENERAL INFORMATION

1. Company's name: .....

2. Address: .....

3. Establishment year: .....

4. Year of initial lamp produce: .....

5. Business field: ……

6. Actual size and development plan: .....

	2007	2008	2009	2010	2011	2012	2015	2020
Number of employees (persons)								
Revenue (million VNĐ)								

II.INFORMATION ON BUSINESS ACTIVITIES

7. Proportion of sales(%) according to products' types in recent years

	2007	2008	2009	2010	2011	2012	2015	2020
From lighting bulbs								
From products related to lighting bulbs								
From products unrelated to lamp bulbs								
Total	100%	100%	100%	100%	100%	100%	100%	100%

8. Manufacturing outputs, sales and revenues from indoor lamp bulbs:

	2007	2008	2009	2010	2011	2012	2015	2020
Manufacturing output (thousand units)								
Incandescence								
Fluorescence								
Compact								
LED								
Others								
Sales (thousand units)								
Incandescence								
Fluorescence								
Compact								
LED								
Others								

9. What are your export markets? Correlative outputs of the past years and future plan?

Market (Country)	2007	2008	2009	2010	2011	2012	2015	2020

10. Proportion of domestic consumption according to number of bulbs

	2007	2008	2009	2010	2011	2012	2015	2020
Incandescence								
Fluorescence								
Compact								
LED								
Others								
Total	100%	100%	100%	100%	100%	100%	100%	100%

11. Information on technology lines for the production of incandescent lamps

STT		Line 1	Line 2	Line 3	Line 4	Line 5
1	Year of purchase					
2	Year of initial utilization					
3	Installed capacity					
4	Used capacity					
5	Supplier					
6	Origin					
7	Depreciation term					
8	Power of manufactured lamps?					

12. Information on technology lines for the production of fluorescent lamps

STT		Line 1	Line 2	Line 3	Line 4	Line 5
1	Year of purchase					
2	Year of initial utilization					
3	Installed capacity					
4	Used capacity					
5	Supplier					
6	Origin					
7	Depreciation term					
8	Power of manufactured lamps?					

13. Information on technology lines for the production of compact lamps

STT		Line 1	Line 2	Line 3	Line 4	Line 5
1	Year of purchase					
2	Year of initial utilization					
3	Installed capacity					
4	Used capacity					
5	Supplier					
6	Origin					
7	Depreciation term					
8	Power of manufactured lamps?					

14. Information on technology lines for the production of LED lamps

STT		Line 1	Line 2	Line 3	Line 4	Line 5
1	Year of purchase					
2	Year of initial utilization					
3	Installed capacity					
4	Used capacity					
5	Supplier					
6	Origin					
7	Depreciation term					
8	Power of manufactured lamps?					

15. In the future, in which technology line for the production do you intend to invest more in? How many lines? Capacity?

No.	Technology of production line	Number of line	Gross capacity	Which plant? Where	Capacity of manufac-tured lamp	Notes
1	Incandescent lamp					
2	Fluorescent lamp					
3	Compact					
4	LED					
5	Others					

16. In regard to incandescent lamps, what is the power of the lamps that you are and will be producing?

No.	Power	Current production (1000 pcs)			Production tendency		
		2009	2010	2011	Increased	Remained unchanged	Decreased
1	0-25W				1	2	3
2	25-40W				1	2	3
3	40-60W				1	2	3
4	> 60W				1	2	3

17. In regard to fluorescent lamps, what is the power of the lamps that you are and will be producing?

No.	Power	Current production (1000 pcs)			Production tendency		
		2009	2010	2011	Increased	Remained unchanged	Decreased
1	T10 - 40W				1	2	3
2	T10 - 20W				1	2	3
3	T8 - 36W				1	2	3
4	T8 - 18W				1	2	3
5	T5 - 28W				1	2	3
6	T5 - 14W				1	2	3
7	T3				1	2	3
8	Khác				1	2	3

17. In regard to fluorescent lamps, what is the power of the lamps that you are and will be producing?

No.	Power	Current production (1000 pcs)			Production tendency		
		2009	2010	2011	Increased	Remained unchanged	Decreased
1	0-10W				1	2	3
2	10-20W				1	2	3
3	20-40W				1	2	3
4	40-60W				1	2	3
5	60-100W				1	2	3
6	Over 100W				1	2	3
7	Others				1	2	3

19. In regard to LED lamps, what is the power of the lamps that you are and will be producing?

No.	Power	Current production (1000 pcs)			Production tendency		
		2009	2010	2011	Increased	Remained unchanged	Decreased
1	3W				1	2	3
2	4W				1	2	3
3	5W				1	2	3

No.	Power	Current production (1000 pcs)			Production tendency		
		2009	2010	2011	Increased	Remained unchanged	Decreased
4	6W				1	2	3
5	7W				1	2	3
6	8W				1	2	3
7	9W				1	2	3
8	10W				1	2	3
9	>10W				1	2	3
10	Others				1	2	3

20. Please provide information on your market share in each of the following types in terms of units sold (current status and potential)

	2007	2008	2009	2010	2011	2012	2015	2020
Incandescent lamp								
Fluorescent lamp								
Compact lamp								
LED lamp								
Others								

III. VALUE CHAIN OF LAMP BULB MANUFACTURING AND BUSINESS

21. In order to manufacture lamp bulbs, Which main raw materials companies need to buy? Who are suppliers and manufacturers of main raw materials?

No.	Name of main raw materials (Listed as lower important level)	Origins	For bulbs (Tick)			
			Incandescent lamp	Fluorescent lamp	Compact	LED
1						
2						
3						
4						
5						
6						

22. Which difficulties your company encounter when you buy those materials?(In the order of question 17, enter number in column A; assess difficulty levels ascend from 1 to 5 in column B)

No.	Common difficulties related to materials	Difficulty levels ascend from 1 to 5 in column B: 1- Not difficult; 5: Very difficult					A (no of materials listed in question 17)
1	A few suppliers	1	2	3	4	5	
2	Pre-ordered for a long time	1	2	3	4	5	
3	Suppliers often deliver slowly	1	2	3	4	5	
4	Suppliers don't implement Just-In-Time	1	2	3	4	5	
5	Unstable quality of products	1	2	3	4	5	
6	Support services are not ensured	1	2	3	4	5	
7	Unstable price	1	2	3	4	5	
8	High price, difficult to negotiate	1	2	3	4	5	
9	So little information and inaccurate information	1	2	3	4	5	
10	Other difficulties: ……	1	2	3	4	5	

23. Which problems there are in process of lamp bulb manufacturing and business of company?

No.	Common difficulties related to materials	Difficulty levels ascend from 1 to 5 in column B: 1- Not difficult; 5: Very difficult				
1	Developing strategy isn't clear	1	2	3	4	5
2	Cumbersome structure	1	2	3	4	5
3	Management quality isn't high	1	2	3	4	5
4	Backward technology	1	2	3	4	5
5	Hard design, few models	1	2	3	4	5
6	Monotonous mould	1	2	3	4	5
7	Diverse market demand	1	2	3	4	5

No.	Common difficulties related to materials	Difficulty levels ascend from 1 to 5 in column B: 1- Not difficult; 5: Very difficult				
8	Saturated market demand	1	2	3	4	5
9	Customers tend to prefer foreign products	1	2	3	4	5
10	Scarce sources of goods	1	2	3	4	5
11	Low-quality of labours	1	2	3	4	5
12	Attitudes of labours are not good	1	2	3	4	5
13	Lack of capital	1	2	3	4	5
14	Difficulty in accessing capital	1	2	3	4	5
15	Not finding strategic partners	1	2	3	4	5
16	More and more competitors	1	2	3	4	5
17	More and more powerful competitors	1	2	3	4	5
18	Trademarks are losing their value	1	2	3	4	5
19	Fakes and counterfeiters	1	2	3	4	5
20	High operating expense (management and marketing)	1	2	3	4	5
21	Increased disposal cost of waste	1	2	3	4	5
22	High price and hard to compete	1	2	3	4	5
23	Ineffective distributing channels	1	2	3	4	5
24	The amount of product inventory is too large	1	2	3	4	5
25	Ineffective communication	1	2	3	4	5
26	Large communication expense	1	2	3	4	5
27	Policies of energy saving	1	2	3	4	5
28	Local government don't support	1	2	3	4	5
29	Change of tax and other policies	1	2	3	4	5
30	Other difficulties: ……	1	2	3	4	5

24. List 10 provinces/cities where your lamp bulbs sell the most. Sales, market shares and the largest competitors in these provinces

No.	City/Province (descending order of sale)	Share in the lamp bulb market (%)	The largest com-petitors	For bulbs (Tick)			
				Incandes-cent lamp	Fluorescent lamp	Compact	LED
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

25. Your product distribution channels in the domestic market are:

☐ Direct, account for … % of revenue ☐ Indirect, account for … % of revenue

☐ Direct, account for … % of output ☐ Indirect, account for … % of output

Of which, *a direct channel is one which has intermediaries* (retailers, wholesales, industrial intermediaries); *a indirect channel is one which has one or more intermediaries* (op. cit.) in the distribution process.

26. How do customers affect to distribution channels? Circle if direct channel is more favored and circle if indirect channel is more favored and circle when no channels are more favored

27. For direct channel, Which objects the company trend towards? Please indicate how much you agree with the following comments about the difficulties when delivering to each customer group (please add)? Level of agreement with the statement ascends from 1 to 5.

No	Comments on the difficulties often encounter in direct distribution channel	Level of agreement with the statement ascends from 1 to 5.		
		Household	Organizations/ Agencies	Construction Contractors
1	Difficult to identify customers exactly			
2	Difficult to identify decider			
3	Difficult to contact decider			
4	Slow payment and stagnant capital			
5	Estate market slow down and demand in this market reduces			
6	Company's sales force is still small			
	Company's sales force is still weak to reach customers			

28. For indirect channel, to appreciate the difficulties in selling products of the company? The level of agreement ascends from 1 to 5

No.	Comments on the difficulties often encounter in indirect distribution channel	Level of agreement with the statement ascends from 1 to 5. (1 - Disagree; 3 – Neutral; 5 – Very agree).				
1	Difficult to find a professional industrial distributors					
2	Professional distributors are often arrogant, require more financial interests					
3	Professional distributors often persist on capital debts					
4	Difficult to bring new products to the industrial distribution professional					
5	Distributors are often arrogant, require more financial interests					

No.	Comments on the difficulties often encounter in indirect distribution channel	Level of agreement with the statement ascends from 1 to 5. (1 - Disagree; 3 – Neutral; 5 – Very agree).				
6	Distributors often persist on capital debts					
7	Distributors refuse to sell new products					
8	Scale of retailers tend to be small, they are not willing to enter new product					
9	Retailers often persist on capital debts for a long time					
10	Distributors often don't cooperate					
11	Distributors often happen conflicts					
12	Other difficulties: ……					

29. List advantages and disadvantages in distributing products through different channels?

Channel	Advantages	Disadvantages
Direct		
Indirect		

IV. SALES FORCE OF COMPANY

30. Sales force of company is structured by

☐ Product ☐ Trademark

☐ Customer ☐ Geography ☐ Others

31. The size of the existing sales force and expected (number of people, listed by structure

	2007	2008	2009	2010	2011	2012	2015	2020
Total								

32. Please evaluate the company's personnel policies by showing level of agreement with the following remarks

No.	Comments on the difficulties often encounter in indirect distribution channel	Level of agreement with the statement ascends from 1 to 5. (1 - Disagree; 3 – Neutral; 5 – Very agree).				
	Recruitment Policy					
1	Fair Recruitment	1	2	3	4	5
2	Priority in the relationship	1	2	3	4	5
3	priority in the degrees	1	2	3	4	5
4	Report recruitment criteria clearly	1	2	3	4	5
5	Recruitment based on job requirements	1	2	3	4	5
	Education					
6	Educating new employees is very good	1	2	3	4	5
7	Annual education	1	2	3	4	5
8	Educating of new products is very good	1	2	3	4	5
	Training					
9	Training is required compulsorily	1	2	3	4	5
10	Training at the scene	1	2	3	4	5
11	Effective training	1	2	3	4	5
	Treatment					
12	Stable income	1	2	3	4	5
13	High income	1	2	3	4	5

No.	Comments on the difficulties often encounter in indirect distribution channel	Level of agreement with the statement ascends from 1 to 5. (1 - Disagree; 3 – Neutral; 5 – Very agree).				
14	Good remuneration policies	1	2	3	4	5
15	Attractive encouraging policies	1	2	3	4	5
16	Fair	1	2	3	4	5

33. Please evaluate the sales force by showing level of agreement with these remarks?

No.	Remarks	Level of agreement with the statement ascends from 1 to 5. (1 - Disagree; 3 – Neutral; 5 – Very agree).				
	Regarding to sales job					
1	pressure job	1	2	3	4	5
2	exciting job	1	2	3	4	5
3	good advancement opportunities	1	2	3	4	5
4	High Income Opportunity	1	2	3	4	5
	Regarding to qualification of sales force					
5	Understand the overall market is very good	1	2	3	4	5
6	Very quick in grasping behavior and buying habits of each customer	1	2	3	4	5
7	Understand the technical characteristics of each type of bulb products	1	2	3	4	5
8	Clearly understand and explain the characteristics and advantages of energy saving bulbs	1	2	3	4	5
9	Ability to advise customers to choose products	1	2	3	4	5
10	Clearly understand of the products and competitors: products, advantages and disadvantages of each type	1	2	3	4	5
11	Understand the company's policies	1	2	3	4	5

No.	Remarks	Level of agreement with the statement ascends from 1 to 5. (1 - Disagree; 3 – Neutral; 5 – Very agree).				
12 13	Good communication skills, presentation skills, negotiation	1	2	3	4	5
14	Effective sales techniques	1	2	3	4	5
15	Very good crisis management techniques	1	2	3	4	5
16	**Attitude to work**					
	Very positive attitude toward the company	1	2	3	4	5
	Very good attitudes to products	1	2	3	4	5
	Enjoy working	1	2	3	4	5
	Enjoy sales job	1	2	3	4	5
	Good team work	1	2	3	4	5
	Compliance regimes and policies	1	2	3	4	5
	Initiative, creative in work	1	2	3	4	5
	Responsibilities with work and clients	1	2	3	4	5
	Results of work					
	High working efficiency	1	2	3	4	5
	Other remarks	1	2	3	4	5

34. The main tasks (Assessed according to increased level of importance from 1 to 5)

No.	Remarks	Level of agreement with the statement ascends from 1 to 5. (1 - Disagree; 3 – Neutral; 5 – Very agree).				
1	Sales	1	2	3	4	5
2	Collecting money	1	2	3	4	5
3	Collect market's information	1	2	3	4	5
4	Collect competitors' information	1	2	3	4	5
5	Distribution channel management	1	2	3	4	5

No.	Remarks	Level of agreement with the statement ascends from 1 to 5. (1 - Disagree; 3 – Neutral; 5 – Very agree).				
6	Market Development	1	2	3	4	5
7	Build relationships with customers	1	2	3	4	5
8	Others...	1	2	3	4	5

35. Completion level (assessed according to increased level of completion from 1 to 5)?

No.	Remarks	Level of agreement with the statement ascends from 1 to 5. (1 - Disagree; 3 – Neutral; 5 – Very agree).				
1	Sales	1	2	3	4	5
2	Collecting money	1	2	3	4	5
3	Collect market's information	1	2	3	4	5
4	Collect competitors' information	1	2	3	4	5
5	Distribution channel management	1	2	3	4	5
6	Market Development	1	2	3	4	5
7	Build relationships with customers	1	2	3	4	5
8	Others...	1	2	3	4	5

36. Annual transfer rate

☐ Under 5% ☐ 5-10% ☐ 10-20% ☐ 20-30% ☐ Over 30%

37. Please list the main policy of the company for customers and for each product type (in order to support sales activities)

Agencies, organizations				
Policy	**For bulbs (Tick)**			
	Incandescent lamp	**Fluorescent lamp**	**Compact**	**LED**

Construction contractors				
Policy	**For bulbs (Tick)**			
	Incandescent lamp	**Fluorescent lamp**	**Compact**	**LED**

Wholesalers / big-scale agents				
Policy	**For bulbs (Tick)**			
	Incandescent lamp	**Fluorescent lamp**	**Compact**	**LED**

Retailers				
Policy	**For bulbs (Tick)**			
	Incandescent lamp	**Fluorescent lamp**	**Compact**	**LED**

Sales staff				
Policy	**For bulbs (Tick)**			
	Incandescent lamp	**Fluorescent lamp**	**Compact**	**LED**

24. List 10 provinces/cities where your lamp bulbs sell the most. Sales, market shares and the largest competitors in these provinces

Type of market	**Interest/ consume**	**For bulbs (Tick)**				**Note/ Explanation**
		Incandes-cent lamp	**Fluorescent lamp**	**Compact**	**LED**	
House holds	Interest					
	Consume					
Agencies, organizations	Interest					
	Consume					
Construction contractors	Interest					
	Consume					

39. Please provide information on how consumers are concerned about the following elements whilst purchasing lamp bulbs. Assess through ascending orders from 1 to 5.

For household consumer							
No.	**Element**	**Level of concern (1- No concern; 5 Strong concern). List of other element (if available).**					**Customers' expectancy**
1	Product design						
2	Size						
3	Brand						
4	Origin						
5	Durability/Lifespan						
6	Lamp colour						

No.	Element	Level of concern (1- No concern; 5 Strong concern). List of other element (if available).					Customers' expectancy
7	Power						
8	Luminous efficacy						
9	Electricity consumption						
10	Heat generation						
11	Price						
12	Installation cost						
13	Replacement cost						
14	Popularity level						
15	Convenience in purchasing						
16	Service and technical consultation						
17	Warranty						
18	Compatibility with existing systems						
For agency/organization customers							
No.	**Element**	**Level of concern (1- No concern; 5 Strong concern). List of other element (if available).**					**Customers' expectancy**
1	Product design						
2	Size						
3	Brand						
4	Origin						
5	Durability/Lifespan						
6	Lamp colour						
7	Power						
8	Luminous efficacy						
9	Electricity consumption						
10	Heat generation						

No.	Element	Level of concern (1- No concern; 5 Strong concern). List of other element (if available).					Customers' expectancy
11	Discount rate						
12	Installation cost						
13	Replacement cost						
14	Popularity level						
15	Convenience in purchasing						
16	Service and technical consultation						
17	Warranty						
18	Compatibility with existing systems						
19	Others						
For construction contractor customers							
No.	**Element**	**Level of concern (1- No concern; 5 Strong concern). List of other element (if available).**					**Customers' expectancy**
1	Product design						
2	Size						
3	Brand						
4	Origin						
5	Durability/Lifespan						
6	Lamp colour						
7	Power						
8	Luminous efficacy						
9	Electricity consumption						
10	Heat generation						
11	Discount rate						
12	Installation cost						
13	Replacement cost						
14	Popularity level						

No.	Element	Level of concern (1- No concern; 5 Strong concern). List of other element (if available).					Customers' expectancy
15	Convenience in purchasing						
16	Service and technical consultation						
17	Warranty						
18	Compatibility with existing systems						
19	Construction type						
20	Others						
For intermediaries							
No.	**Element**	**Level of concern (1- No concern; 5 Strong concern). List of other element (if available).**					**Customers' expectancy**
1	Product design						
2	Size						
3	Brand						
4	Origin						
5	Durability/Lifespan						
6	Lamp colour						
7	Power						
8	Luminous efficacy						
9	Electricity consumption						
10	Heat generation						
11	Discount rate						
12	Installation cost						
13	Popularity level						
14	Sales velocity						
15	Discount rate						
16	Warranty terms						
17	Payment terms						

2 AWARENESS OF COMPETITORS AND CAPACITY FOR COMPETITION

40. Who are your competitors in the lamp bulb business in Vietnam?

Domestic lamp bulb manufacturers

Producers who manufacture or import lamp bulbs to the Vietnamese market

Both producers who manufacture or import lamp bulbs and lamp bulbs which are unofficially imported to Vietnam

Other opinions: .....

.....

41. Please list and identify the pros and cons of your major competitors

No.	Competitor (company or brand)	Strengths	Weakness

Annex 4.2. Questionnaire for tier 1 distributors

Form PV2: Questionnaire for tier 1 distributors

Ladies and gentlemen! In order to transfer the lighting market in Vietnam to a tendency which phases out incandescent lamps, we wish to collect your opinions on current lighting equipment business! Please answer the following question by ticking or circling around your choices. The confidentiality of the information is assured!

I. General information on distributors

1. Type of organization:

☐ Importer ☐ Retailer ☐ Others …

☐ Distributor ☐ Large-scale retailer

2. Your head office:

☐ Hanoi ☐ City/province in the northern (except for Hanoi)

☐ Danang ☐ City/province in the central (except for Danang)

☐ Tp. HCM ☐ City/province in the southern (except for Tp. HCM)

3. Your lamp bulb market (more than one choice is possible)

☐ Hanoi ☐ City/province in the northern (except for Hanoi)

☐ Danang ☐ City/province in the central (except for Danang)

☐ Tp. HCM ☐ City/province in the southern (except for Tp. HCM)

II. Lighting bulb and equipment business

4. Which brands of lamp equipment and bulbs do you distribute?

☐ Rang Dong ☐ Osram ☐ Paragon

☐ Dien Quang ☐ Megaman ☐ Thorn

☐ Philips ☐ OPPLE

☐ Others....

5. What are the sales of these brands (according to the number of products)?

Rang Đong	%	Osram	%	Paragon	%
Đien Quang	%	Megaman	%	Thorn	%
Philips	%	OPPLE	%	Others....	%

Which product do you trade? (more than one choice is possible)

Corridor lighting	Corridor lighting	Indoor lighting	Personal lighting	Indoor decoration	Outdoor decoration
Incandescence					
Fluorescence					
Compact					
LED					
Others ……					

7. Proportions of your consumers (according to the amount of sales):

Subordinate distributors	%	Construction contractors	%
Retailers	%	Others	%

35. Completion level (assessed according to increased level of completion from 1 to 5)?

No.	Element	Level of concern (1- No concern; 5 Strong concern)				
1	Sales velocity					
2	Profit per unit					
3	Brand					
4	Origin					
5	Payment terms					
6	Warranty terms					
7	After purchase services					
8	Bulb price					
9	Installation cost					
10	Replacement cost					
11	Popularity level					
12	Convenience in purchasing					
13	Facility and technique					
14	Warranty terms					
15	Government support					

9. How concerned are you about the following elements of the quality of lamp bulbs?

No.	Element	Level of concern (1- No concern; 5 Strong concern)				
1	Purposes of consumption					
2	Product design					
3	Size					
4	Brand					
5	Origin					
6	Durability/Lifespan					
7	Lamp colour					
8	Luminous efficacy					
9	Electricity consumption					
10	Heat generation					
11	Others					

10. In sales consultation, which elements do you often suggest consumers to be concerned about?

No.	Element	Level of concern (1- No concern; 5 Strong concern)					How do you concern about the lamp bulb?
1	Purpose of consumption						
2	Product design						
3	Size						
4	Brand						
5	Origin						
6	Durability/Lifespan						
7	Lamp colour						
8	Luminous efficacy						
9	Electricity consumption						
10	Heat generation						
11	Bulb price						

No.	Element	Level of concern (1- No concern; 5 Strong concern)					How do you concern about the lamp bulb?
12	Installation cost						
13	Replacement cost						
14	Popularity level						
15	Convenience in purchasing						
16	Facility and technique						
17	Warranty terms						
18	Government support						
19	Others ……..						

11. What is the current tendency of bulb consumption in new constructions:

Type of bulb	Corridor lighting	Indoor lighting	Personal lighting	Indoor decoration	Outdoor decoration
Incandescence					
Fluorescence					
Compact					
LED					
Others ……					

12. In your opinion, which bulbs should be used for each of the following lighting purposes?

Type of bulb	Corridor lighting	Indoor lighting	Personal lighting	Indoor decoration	Outdoor decoration
Incandescence					
Fluorescence					
Compact					
LED					
Others ……					

35. Completion level (assessed according to increased level of completion from 1 to 5)?

No.	Element	Level of influence ascends from 1 to 5, 1- no influence, 5- important influence				
1	Purposes of consumption					
2	Spatial requirements for bulbs					
3	Installation costs					
4	Price of bulbs					
5	Durability/Lifespan					
6	Electricity consumption					
7	Lamp colour					
8	Popularity level					
9						

13. Do you have any suggestions for lamp bulb manufacturers in Vietnam in order to increase the ability of energy saving bulbs to compete?

III. Information on respondents

16. Gender:

☐ Male ☐ Female

17. Age

☐ Under 25 ☐ 26-40 ☐ 41-60 ☐ Over 60

18. Position

☐ Employee ☐ Department officer ☐ Leader ☐ Others

19. Working experience

☐ Under 2 years ☐ 2-5 years ☐ 5-10 years

☐ 10-20 years ☐ Over 20 year

Annex 4.3. Questionnaire for retailers

Form BH01 - Questionnaire for retailers (small-scale)

Ladies and gentlemen! In order to transfer lighting market in Vietnam to a tendency which phases out incandescent lamps, we wish to collect your opinions on your current lighting equipment business! Please answer the following question by ticking ☐ or circling around your choices. The confidentiality of the information is assured!

I. General information on retailer

1. Market area: Province.....

☐ City ☐ Town, sub-town ☐ Countryside

2. Type of business

☐ Retail shop ☐ Private enterprise ☐ Company

☐ Household ☐ .....

II. Lighting bulb and equipment business

3. Your customers:

Household	%	Agency	%	Others....	%

4. Your annual sales? ..... unit

5. Proportion of sales through types of bulb

Type of bulb	Percentage %
Incandescence	%
Fluorescence	%
Compact	%
LED	%
Others ……	%

Power	Percentage %
< 10W	%
10-20W	%
20-40W	%
40-60W	%
> 60W	%

6. Which brands of lamp equipment and bulbs do you distribute?

☐ Rạng Đông ☐ Osram ☐ Paragon

☐ Điện Quang ☐ Megaman ☐ Thorn

☐ Philips ☐ OPPLE ☐ Others....

7. What are the sales of these brands (according to the number of products)?

Rang Đong	%	Osram	%	Paragon	%
Đien Quang	%	Megaman	%	Thorn	%
Philips	%	OPPLE	%	Others....	%

8. What are the purposes of your products (more than one choice is possible)

Type of bulb	Corridor lighting	Indoor lighting	Personal lighting	Indoor decoration	Outdoor decoration
Incandescence					
Fluorescence					
Compact					
LED					
Others ……					

35. Completion level (assessed according to increased level of completion from 1 to 5)?

No.	Element	Level of concern (1- No concern; 5 Strong concern)				
1	Sales velocity					
2	Profit per unit					
3	Brand					
4	Origin					
5	Payment terms					
6	Warranty terms					
7	After purchase services					
8	Bulb price					
9	Installation cost					
10	Replacement cost					
11	Popularity level					
12	Government support					
13	Others					

10. Which subsequent elements are your customers concerned about when purchasing lighting bulbs?

No.	Element	Level of concern (1- No concern; 5 Strong concern)				
1	Purpose of consumption					
2	Product design					
3	Size					
4	Brand					
5	Origin					
6	Durability/Lifespan					
7	Lamp colour					
8	Luminous efficacy					
9	Electricity consumption					
10	Heat generation					
11	Bulb price					
12	Installation cost					
13	Replacement cost					
14	Popularity level					
15	Convenience in purchasing					
16	Government support					
17	Others ……..					

11. In sales consultations, which elements do you often suggest consumers to be concerned about?

No.	Element	Level of concern (1- No concern; 5 Strong concern)					How do you concern about the lamp bulb?
12	Installation cost						
13	Replacement cost						
14	Popularity level						
15	Convenience in purchasing						
16	Facility and technique						

No.	Element	Level of concern (1- No concern; 5 Strong concern)					How do you concern about the lamp bulb?
17	Warranty terms						
18	Government support						
19	Others ……..						

12. What is the current tendency of bulb consumption in households?

Type of bulb	Corridor lighting	Indoor lighting	Personal lighting	Indoor decoration	Outdoor decoration
Incandescence					
Fluorescence					
Compact					
LED					
Others ……					

13. In your opinion, which bulbs should be used for different lighting purposes?

Type of bulb	Corridor lighting	Indoor lighting	Personal lighting	Indoor decoration	Outdoor decoration
Incandescence					
Fluorescence					
Compact					
LED					
Others ……					

14. Do you aware of unofficially imported products from China?

☐ No ☐ Yes

15. Do you sell unofficially imported products from China ?

☐ No ☐ Yes quantitiy: unit/month

16. Your assessment in advantages and disadvantages of unofficially imported products from China ?

- Advantages

- Disadvantages:

17. Do you have any suggestions for lamp bulb manufacturers in Vietnam in order to increase competition capacity of energy saving bulbs?

III. Information on respondents

18. Gender:

☐ Male ☐ Female

19. Age

☐ Under 25 ☐ 26-40 ☐ 41-60 ☐ Over 60

20. Position

☐ Staff ☐ Shop owner ☐ Others

21. Experience in lighting bulb business

Under 2 years ☐ 2-5 years ☐ 5-10 years

☐ 10-20 years ☐ Over 20 year

Annex 4.4. Questionnaire for agencies and organizations

Form BH3 - Questionnaire for agencies and organizations

(in the role as consumer)

Note: Respondents are in asset management departments in agencies/organizations (Equipment management department, Purchase/Sales department, Materials department, administration department, etc.)

For the purpose of figuring out solutions on saving lighting energy, we are collecting information on lamp bulb utilization in agencies and organizations. We wish to receive your answers to the following questions. The confidentiality of the information is assured.

Thank you very much!

I. General information on agency/organization

1. Type of agency/organization:

☐ School ☐ Head office ☐ Bank, post office ☐ Others…

☐ Government agency ☐ Representative office/trading room

☐ Introduction/purchase products shop ☐ Others…

2. Number of human resources in current agency/organization:

☐ Under 10 people ☐ 10-30 people

☐ 31-50 people ☐ 51-100 people

☐ 101-200 ☐ 201-300

☐ Over 300 people ☐ Others….

3. Current size?

☐ Under 100m2 ☐ 100-200m2

☐ 201-500m2 ☐ Over 500m2

4. How many lamp bulbs are being used?

☐ Less than 20 units ☐ 20-50 units

☐ 51-100 units ☐ 101-200 units

☐ 201-300 units ☐ 301-500 units

☐ 501-1000 units ☐ More than 1000 units

5. Your current office is:

☐ New construction within 3 years

☐ New construction within 3-5 recent years

☐ New construction within 5 -10 recent years

☐ Revision of an old office

☐ Revision of an old house

☐ No information

II. Current status of lamp bulb utilization

6. Which bulbs are being used in your organization/agency? Proportion of each type?

Type of bulb	**Proportion %**
Incandescence	
Fluorescence	
Compact	
LED	
Others ……	
Total	**100%**

Power	**Proportion %**
Under 10W	
10-20W	
20-40W	
40-60W	
Over 60W	
Total	**100%**

Purpose	**Proportion %**
General lighting	
Personal lighting	
Indoor decoration	
Outdoor decoration	
Others ……..	
Total	**100%**

7. Is lamp utilization inevitable in your organization/agency?

☐ Of course ☐ Yes in general ☐ No information ☐ No

III. Information on bulb purchasing behavior

8. When current bulb is broken, your agency/organization will:

☐ Replace by a similar bulb ☐ Replace by a more convenient bulb

☐ Replace by a new, energy saving bulb ☐ No information

9. Who makes decisions on replacing bulbs in your agency/organization?

☐ Anybody who recognizes problems with current bulbs

☐ Agency/office leader ☐ Assist manager ☐ Others…..

10. How are you concerned about the following elements when purchasing lighting bulbs?

No.	Element	Level of concern (1- No concern; 5 Strong concern)				
1	Product design					
2	Size					
3	Brand					
4	Origin					
5	Durability/Lifespan					
6	Lamp colour					
7	Luminous efficacy					
8	Electricity consumption					
9	Heat generation					
10	Bulb price					
11	Installation cost					
12	Replacement cost					
13	Popularity level					
14	Convenience in purchasing					
15	Service and technical consultation					
16	Warranty terms					
17	Compatible with existing system					
18	Government support					
19	Sellers' suggestion					
20	Others ……..					

11. Does your office/agency have regulations on saving lighting power?

☐ None ☐ Turn lamps off when there is enough lamp

☐ Turn lamps off before leaving room ☐ ……

☐ Turn lamps off when not using ☐ ……..

12. Which barriers make your agency/organization keep on utilizing incandescent lamps?

☐ No pressure in saving power ☐ High transfer cost

☐ Don't think buying new bulbs is necessary ☐ Have no awareness on energy saving lamps

☐ High cost of energy saving lamps ☐ Concern about lamp quality

☐ Concern about durability ☐ Others……

13. In your opinion, which bulbs should be used for lighting?

For general lighting	
Type of bulb	power
Incandescence	< 10W
Fluorescence	10-20W
Compact	20-40W
LED	40-60W
Others ……	> 60W

For personal lighting	
Type of bulb	power
incandescence	< 10W
Fluorescence	10-20W
Compact	20-40W
LED	40-60W
Others ……	> 60W

For decoration	
Type of bulb	power
incandescence	< 10W
Fluorescence	10-20W
Compact	20-40W
LED	40-60W
Others ……	> 60W

41. Please list and identify the pros and cons of your major competitors

Type of bulb	Advantage	Disadvantage
Incandescence		
Fluorescence		
Compact		
LED		

15. Do you have any suggestions for lamp bulb manufacturers in Vietnam in order to enhance the lamps' quality and greater satisfy your agency/organization's requirements?

16. Do you aware of unofficially imported products from China?

☐ No ☐ Yes

17. Do you sell unofficially imported products from China ?

☐ No ☐ Yes quantity: unit/month

18. Your assessment in advantages and disadvantages of unofficially imported products from China ?

- Advantages

- Disadvantages:

V. Information on respondents

19. Gender: ☐ Male ☐ Female

20. Age ☐ Under 25 ☐ 26-40 ☐ 41-60 ☐ Over 60

21. Position ☐ Employee ☐ Department officer

☐ Leader ☐ Others

22. Working experience

Under 2 years ☐ 2-5 years ☐5-10 years ☐10-20 years ☐Over 20 year

Annex 4.5. Questionnaire for households consuming electricity

Form BH2 - Questionnaire for households consuming electricity

Ladies and gentlemen!

We are conducting an overall survey in order to figure out solutions on efficient lighting, that help households save money on lighting energy. We wish to collect your opinion through these following questions.

Please tick ☐ or circle around your choices, or fill in the blank squares with your opinions. Information is collected only for research purposes.

I. General information

1. Your living place: ……

2. Your house is in:

☐ City ☐ Town, sub-town ☐ Countryside ☐ Others…

3. Type of your house

☐ Villa ☐ Tube house ☐ Apartment ☐ Others...

4. Type of your family

☐ 3-generation family ☐ 2-generation family

☐ 1-generation family ☐ Others

5. Household size:

☐ Less than 3 people ☐ 3-5 people

☐ 5-7 people ☐ More than 7 people

6. Your role in family:

☐ Head ☐ Having important infuence

☐ Dependent person ☐ Others…

II. Demand of lamp bulb consumption

7. How many rooms are there in your house (including bed room, living room, kitchen, dining room, rest room, etc)?

☐ Less than 4 rooms ☐ 4-8 rooms

☐ 9-12 rooms ☐ More than 10 rooms

8. How many bulbs are there in your house (including bed room, living room, kitchen, dining room, rest room, etc)?

☐ Less than 10 units ☐ 10-20 units

☐ 20-50 units ☐ More than 50 units

9. Proportion of bulbs (including bed room, living room, kitchen, dining room, rest room, etc)?

No.	Type of bulb	Amount (unit)	Less than 20%	20-40%	41-60%	61-80%	More than 80%
I	**According to structure**						
1	Incandescence						
2	Fluorescence						
3	Compact						
4	LED						
5	Others ……						
II	**According to power**						
1	Under 10W						
2	10-20W						
3	20-40W						
4	40-60W						
5	Over 60W						
III	**According to consumption purpose**						
1	General lighting						
2	Personal lighting						
3	Indoor decoration						
4	Outdoor decoration						
5	Others……						

10. How are you concerned about the following elements when purchasing lighting bulbs?

No.	Element	Level of concern (1- No concern; 5 Strong concern)				
1	Product design					
2	Size					
3	Brand					
4	Origin					
5	Durability/Lifespan					
6	Lamp colour					
7	Luminous efficacy					
8	Electricity consumption					
9	Heat generation					
10	Bulb price					
11	Installation cost					
12	Replacement cost					
13	Popularity level					
14	Convenience in purchasing					
15	Facility and technique					
16	Warranty terms					
17	Compatible with existing systems					
18	Government support					
19	Suggestion of seller					
20	Others ……..					

11. Who makes decision in your family when purchasing lamp bulbs:

☐ You ☐ Your husband/wife

☐ Your mother/father ☐ Others…

12. When do you purchase a new lamp bulb?

☐ Current bulb is old (reducing luminance) ☐ Current bulb is broken

☐ Have introduction ☐ Others…

13. Does your family set up requirements for saving lighting power?

☐ No ☐ Yes ☐ Turn lamps off when there is enough lamp

☐ Details ☐ Turn lamps off when leaving rooms

☐ Turn lamps off when they are not used

☐ Others .....

14. Why do you keep on using incandescent lamps?

☐ Little consumption so there is no pressure in saving power

☐ High cost of changing into energy saving lamps

☐ Don't think buying new bulbs is necessary

☐ High cost of buying energy saving lamps

☐ Have no awareness on energy saving lamps

☐ Concern about lighting quality

☐ Concern about durability

☐ Others……

13. In your opinion, which bulbs should be used for lighting?

For general lighting	
Type of bulb	**power**
Incandescence	< 10W
Fluorescence	10-20W
Compact	20-40W
LED	40-60W
Others ……	> 60W

For personal lighting	
Type of bulb	**power**
incandescence	< 10W
Fluorescence	10-20W
Compact	20-40W
LED	40-60W
Others ……	> 60W

For decoration	
Type of bulb	**power**
incandescence	< 10W
Fluorescence	10-20W
Compact	20-40W
LED	40-60W
Others ……	> 60W

16. List of advantages and disadvantages of various type of bulbs that you aware of.

Type of bulb	Advantage	Disadvantage
Incandescence		
Fluorescence		
Compact		
LED		

17. Do you aware of unofficially imported products from China?

☐ No ☐ Yes

18. Do you sell unofficially imported products from China ?

☐ No ☐ Yes quantitiy: unit/month

19. Your assessment in advantages and disadvantages of unofficially imported products from China ?

- Advantages

- Disadvantages:

III. Information on respondents

20. Gender:

☐ Male ☐ Female

21. Age

☐ Under 25 ☐ 6-40 ☐ 41-60 Over 60

22. Occupation

☐ Teacher ☐ Government officer

☐ Police, soldier ☐ Staff of bank, joint – venture company

☐ ☐ Others

Annex 5 - Tables

Annex 5.1. List of imported quantity of all kinds of bulbs

No.	Companies	Incandes-cence	Fluores-cence	Compact
1	Industrial joint-stock Company And Lighting Equipment Duhal	92,300	0	74,000
2	Lighting Equipment joint-stock Company Anh Sao	91,840	187,709	166,228
3	Philips Electronics Co., Ltd Vietnam	181,303	12,211,390	4,464,903
4	Travel-Services-Trade Co., Ltd. Hd& H	6,400	0	3,280
5	LG ELECTRONICS Co., Ltd. Vietnam	18,688	0	0
6	Ship factory Co., Ltd HYUNDAI - VINASHIN	4,943	7,724	0
7	Tan Phuoc Loc Co., Ltd.	9,500	100,325	8,320
8	Thien An Trade and export import Co., Ltd	1,000	0	58,410
9	Thanh Cong Trade and export import Co., Ltd	3,240	0	3,500
10	Đien Pho Sang Commerce Co., Ltd.	3,000	5,000	2,000
	HAIER Co., Ltd Vietnam	16,500	0	0
11	Rinnai Co., Ltd Vietnam	9,000	0	0
12	Dang Duong Commerce &services Co., Ltd	129,240	0	155,221
13	Services-Trade- Export import Co., Ltd HTQ	1,430	0	13,320
14	Lighting and Urban Equipment Co., Ltd	1,000	150,247	156,224
15 16	Toan Thinh Commerce &services Co., Ltd	960	0	0

No.	Companies	Incandes-cence	Fluores-cence	Compact
17	Dien Quang Lamp Joint Stock Com-pany	0	97,700	0
18	Hai Thanh Mineral Joint Stock Company	0	40,800	0
19	OPPLE Joint Stock Company Vietnam	0	1,200	3,100
20	Trang Vy International Joint Stock Company	0	114,230	0
21	Tan Hoa Joint Stock Company	0	93,072	135,320
22	Intimex Corporation Joint Stock Company	0	220,000	43,653
23	Van Long commerce & investment Joint Stock Company	0	1,440	0
24	Thang Long commerce & lighting services Joint Stock Company	0	26,300	2,000
25	Viet Hoa Joint Stock Company	0	5,821	0
26	Lighting equipment Joint Stock Company NANO - Phuoc Thanh	0	2,585	2,480
27	Viet Phap equipment Joint Stock Company	0	2,240	0
28	Travel material Joint Stock Company	0	182,001	0
29	Energy saving solutions and information technology JSC	0	6,440	00
30	SILVER SHORES investment and development Co., Ltd	0	2,583	437
31	HBC investment and export-import Co., Ltd	0	2,975	1,400
32	Cuong Hien Co., Ltd	0	25,003	3,619
33	HOA SEN textile Co., Ltd	0	4,628	0
34	Hung Nghiep Formosa Co., Ltd	0	1,340	0

No.	Companies	Incandes-cence	Fluores-cence	Compact
35	Ken Do Co., Ltd	0	2,541	0
36	BHS Technical Co., Ltd	0	6	7,000
37	Chan Lien Co., Ltd	0	20,960	16,660
38	189 Co., Ltd	0	1,510	242
39	Ha Thanh Co., Ltd	0	12500	0
40	Viet Quoc Transportation Co., Ltd	0	34,950	0
41	Nhat Linh Co., Ltd	0	20,210	0
42	Trade - Services - Transportation - Import-Export Co., Ltd Giang Nam	0	5,998	9,000
43	Trade - Services Co., Ltd Dien Quang	0	92,200	0
44	Trade - Services – Manufacturing Co., Ltd Vinh Hung Phat	0	13,235	5,680
45	Trade - Services Co., Ltd Thien Nhat Tao	0	3,800	0
46	Trade - Services Co., Ltd A&H	0	13,442	0
47	Electronics-trade Co., Ltd Binh Minh	0	465,690	0
48	Tuyen Duong Co., Ltd	0	22,920	7,000
49	Shipbuilding Co., Ltd Pha Rung	0	1,178	0
50	Phuong Chung construction joint-stock company	0	2,000	0
51	Electric technical services Co., Ltd A Dong	0	1,940	0
52	Industrial Co., Ltd Saigon	0	5,367	0
53	Thuy Phu Trade - Services Co., Ltd	0	1,000	0
54	Den Hoa Trade - Services Co., Ltd	0	8,047	0
55	Quy Dat Trade - Services Co., Ltd	0	10,500	0
56	Tin Hoc Gia Nghi Trade - Services Co., Ltd	0	5,443	0

No.	Companies	Incandes-cence	Fluores-cence	Compact
57	Dai Dong private enterprise	0	102,800	0
58	Commercial and residential center Hanoi	0	1,995	0
59	Branch of Trade - Services Co., Ltd Phuong Ha	0	8,310	0
60	Branch of Trade - Services Co., Ltd Hai Dang Quang (Hanoi)	0	28,495	156,500
61	Young Fast Optoelectronics Co., Ltd (Vietnam)	0	2,660	0
62	Branch of Trade – Services-export-import Co., Ltd Viet Anh	0	4,520	0
63	Minh Hung Long Co., Ltd	0	26,900	0
64	Diec Chi Quyen Co., Ltd	0	1,900	4,740
65	Garment Export Company SSV	0	6,352	0
66	See Well investment Co., Ltd	0	3,500	0
67	Hang Van Co., Ltd	0	13,130	0
68	Hau Phong Co., Ltd	0	25,000	0
69	Hong Bao construction Co., Ltd	0	25,608	47,810
70	Xuan Loc Tho Co., Ltd	0	102,120	0
71	Chanh Kiet Co., Ltd	0	112,508	0
72	Chan Dong commercial Co., Ltd	0	550	0
73	Chang Shin Vietnam Co., Ltd	0	9,503	6,274
74	Tuan An windows Joint –Stock Company	0	2,000	0
75	Hai Dao Joint –Stock Company	0	0	1,600
76	Huu Du Trade - Services Co., Ltd	0	0	362,300
77	Dung Ha Co., Ltd	0	0	2,700
78	Panasonic Co., Ltd Vietnam	0	0	486,840
79	Dai Do Co., Ltd	0	0	177,550

No.	Companies	Incandes-cence	Fluores-cence	Compact
80	Ngoc Son Co., Ltd	0	0	7,500
81	Thanh Tien Trade - Services Co., Ltd	0	0	67,457
82	Yen Thanh Trade - Services Co., Ltd	0	0	3,940
83	Kien Hoa Export Import-Trade Co., Ltd	0	0	116,825
84	Quang Anh Export Import Co., Ltd	0	0	7,860
85	Huu Nghi Export Import Co., Ltd	0	0	17,682
86	Anh Duong Export Import Co., Ltd	0	0	2,910
87	Phuc Thanh Dat Export Import Co., Ltd	0	0	1,100
88	Phu Thinh Hung Export Import Co., Ltd	0	0	542,842
89	HAILONG Vietnam Synthetic fiber Export Import Co., Ltd	0	0	1,095
90	Phu Dat investment &development Co., Ltd	0	0	81,536
91	Viet Truong Export-Import private enterprise	0	0	21,960
92	VCCI Hai Phong Co., Ltd	0	0	4,100
93	Thanh Dat printing joint-stock com-pany	0	0	4,500
94	Huy Hung Commerce-Services-Export Import Co., Ltd	0	0	3,800
95	Ht Group Commerce-Export Import Co., Ltd	0	0	1,200
96	Van Anh Co., Ltd	0	0	4,105
97	Dai Phat electronics joint-stock company	0	0	7,000
98	Bach Tuyen engineering Co., Ltd	0	0	77,000
99	SUMIDENSO Vietnam Co., Ltd	0	0	3,550

No.	Companies	Incandes-cence	Fluores-cence	Compact
100	Van My Phu Co., Ltd	0	0	82,560
101	Hung Long Commercial Co., Ltd	0	0	4,700
102	Trung Luc Co., Ltd	0	0	22,000
103	Hoang Sinh Co., Ltd	0	0	143,000
104	Sao Khue Commerce-Export Import Co., Ltd	0	0	61,483
105	Branch of Nguyen Duy Co., Ltd	0	0	1,160
106	N.C.T manufacturing &export import commercial joint-stock company	0	0	2,529
107	POH HUAT VN joint-stock	0	0	18,271
108	Investment construction &technol-ogy joint-stock company Vietnam	0	0	4,225
109	Hong Phuc Electrical Equipment And Lighting Joint-stock company	0	0	15,900
110	Thanh Long Lighting Co., Ltd	0	0	64,150
111	Minh Khoa Mechanical and Electrical Co., Ltd	0	0	172,170
112	Ha Nam Commercial Services Import & Export Co., Ltd.	0	0	14,330
113	Bao Toan Co., Ltd	0	0	2,565
114	Chau Sa Trading services Co., Ltd	0	0	14,200
115	Phu Minh Thanh Trading services Co., Ltd	0	0	40,800
116	Minh Chanh Trading services Co., Ltd	0	0	33,100
117	Trang Phuong Co., Ltd	0	0	5,170
118	Canh Thien Trading Co., Ltd	0	0	1,000
119	Thanh Dat Trading and tour services one-member Co., Ltd	0	0	400

No.	Companies	Incandes-cence	Fluores-cence	Compact
120	Gia Nguyen Transport and Trading Co., Ltd	0	0	1,000
121	Phu An Co., Ltd	0	0	136,625
122	Huy Phuc Import Export & Trading Co., Ltd	0	0	2,300
123	LUXXX Vietnam Co., Ltd	0	0	10,162,645
124	Megaman Vietnam Co., Ltd	0	0	65,764
125	Khang Trinh Auto Technology and trading Services Co., Ltd	0	0	255,255
126	Minh Do trading Services Co., Ltd	0	0	3,420
127	Hong Loan Co., Ltd	0	0	1,300
128	Thang Loi International Import Export Co. Ltd	0	0	9,600
129	Song Hanh trading Services Co., Ltd	0	0	1,170
130	Vuong Thinh Phat trading Services Co., Ltd	0	0	14,750
131	Dieu Huong trading Services Co., Ltd	0	0	14,000
132	Le Hung trading private enterprise	0	0	2,200
133	Truong Thinh Phat Co., Ltd	0	0	56,676
134	Van Thanh Bac Transportation Export Import Co. Ltd	0	0	1,680
135	**Total**	**570,344**	**14,716,041**	**18,999,771**

Annex 5.2. List of exported quantity of all kinds of bulbs

No.	Companies	Incandes-cence	Fluores-cence	Compact	Other
1	Rang Dong Lamp Source and Vacuum Flask Joint Stock Company	26498770	4901450	145620	0
2	Dien Quang Joint Stock Company	27000	4804825	107660	0
3	Philips Electronics Vietnam	32080	85412	351678	0
4	Hoa Thai manufactur-ing-trading Co., Ltd	0	0	0	13403650
5	Wooree Vina Co., Ltd	0	0	0	185429393
6	Ha Noi Pearl Lighting Co., Ltd	87490	0	0	0
7	Viet Anh Investment - Construction - Import – Export Joint Stock Company	192	37296	27207	71
8	Hung Ta Vietnam Co., Ltd	0	0	5000	290
9	Nam Viet Phat trading-services-technique Joint Stock Company	0	196500	0	0
10	Vi Na Ngan My Co., Ltd	0	441540	0	0
11	Truong Son Electrical Equipment Co., Ltd	0	267200	0	0
12	Sao Tho trading Co., Ltd	0	139875	0	0
13	Hai Đang Quang trading Co., Ltd	0	450	0	0
14	Van Anh trading services Co., Ltd	0	0	4105	0
15	Thien An Co., Ltd	0	0	1008	0
16	**Total**	**26645532**	**10874548**	**642278**	**198833404**

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