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The Comprehensive Analysis of the Environment of the Green Industry in ASEAN: A Case Study on Synergy Complete

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Abstract: *Lately, "going green" has become the main focus or at least one of the many important factors in business world. Not only does it influence the way ones do businesses, but also give rise to new industries that facilitate incorporating this green concept to every aspects of lives. Synergy Complete is an excellent example that implements such idea and holds on to its mission as "Completely Changing the Environmental Landscape". It makes things easier for everyone to recycle. This study explores internal and external factors, adopts relevant models and tools that are crucial for strategic decision-making in green industries such as STEEP analysis and SFAS factor analysis and ensures viable strategies for the company's future success as well as providing general ideas about the environment of the green industries in ASEAN markets.*
Keywords: *Green industries, Environmental Landscape, strategic decision-making*

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I. Introduction

Fifty years ago, governments and businesses were concerned with numbers such as GDP growth rate, interest rates, profitability, inventory turnover etc. The idea of reducing carbon footprint and being environmentally friendly was alien to the world of business. Now, in 2017, it is with folly that businesses neglect to study how their companies can reduce their carbon footprint and operate in an environmentally manner. There are many forces at play – the government and the consumers' primary among them. The 21st century is popularly called the 'Century of Water' due to the seriousness of the global water supply. Ironically, while 70% of the earth is water, fresh water makes up only 0.01% of that supply.

Chemical pollution can have serious consequences on human health. Toxic waste from factories and businesses can enter waterways - these waterways then enter the ocean which means oceans become polluted. Eventually food and water is contaminated. Even with this knowledge companies still use chemicals –for example, hotels use chemicals for laundry, kitchen, housekeeping and cooling towers. Today, however, there are several alternative non-chemical replacements available. One alternative is to replace the chemicals in the cooling towers with non-chemical technologies such as Silver Copper systems, UV systems, Electronic Descaling and Ultra filtration. But using these non-chemicals means companies have to be more diligent in monitoring the result and efficiency of these systems. The year 2017 is significant in the lighting industry because it is the year that a large number of new energy saving lighting products reached the market. LED technologies have matured. Nearly every range of lighting products can be replaced by LED technology which can result in minimum of 40% savings in energy consumption.

Synergy Complete (SC) is a company that aims to bridge the gap between profitability and being environmentally responsible. In fact, one of the selling models used by SC is a guarantee of reducing the water bills by 30% every month. Now the AEC is representing both an opportunity and a

challenge – an opportunity to expand as well as the challenge to compete with new competition. There are many questions that SC will have to decide strategically in the next few years – whether to do market development, product development or both.

II. Review of Literature

Synergy Complete Thailand

SC is the leading water treatment company in Thailand counting over 400 buildings among its impressive clientele - such as all the major five star hotels and shopping malls.

SC Thailand is divided into four main business areas:

1. Synergy Water
2. Synergy Lighting
3. Synergy Cooling
4. Synergy Air

This study adopts different tools in marketing and Strategic Management to thoroughly explore the strategic options available for Synergy Complete's future growth and answer key strategic questions. The tools adopted in this study are: 1. The Steep analysis 2. IFAS Factors 3.EFAS Factors 4.SFAS Factors 5.Porter's 5 forces analysis 6. The Radar Plot

1. Steep Analysis

1.1 Steep SC

1.1.1 Socio-cultural

Population growth: The ASEAN population growth is continuously increasing year by year from 633,148 to 741,214 during 2015 to 2035. However, population growth in ASEAN is slightly lower than the global growth (0.98%). Hence, the share of ASEAN population in the world will reduce from 8.55% in 2015 to 8.37% in 2035.

Environmental awareness: According to Nielsen Global Online survey, it mentioned that people around the world more than a half concern more in environmental pollution. It said that the percentage of global warming concern was 67%, water pollution was 75%, and especially air pollution was 77%.

Literacy rate: It can see from the graph that the adult literacy rate of eight countries in Southeast Asia got higher than 90%, especially Singapore which gets the highest score which is 95.9%. However, Cambodia and Laos got only 73.9% and 72.7% respectively.

Higher education: according to higher education and training world ranking, Singapore gets 2nd rank which is the highest rank among ASEAN countries. On the other hand, Myanmar gets 139th rank which is the lowest in ASEAN countries.

Eco-friendly mind: There is 22% say they will pay more for an ecofriendly product, according to other survey results. In addition, about three in four (76%) global consumers say raw materials influence their decisions on where to shop and what to buy.

1.1.2 Technology

Variable Speed Drive Technology: Equipment with variable speed saves by employing the principle of working only when necessary. When there are more duties, the variable speed will be high. When there are fewer duties, the variable speed will be low. This method enables equipment to operate with high efficiency and saves more energy (20-30%) than a system that runs constantly. That is why variable speed drive technology is being used in a growing number of electrical appliances such as air conditioners, refrigerators, washing machines, water pumps etc.

Technology

High Efficiency Electric Motor Technology: an electric motor is a device that utilizes the highest level of electric power. IEC categorizes motors into 4 grades; the standard motor or IE1, the high efficiency motor or IE2, the premium efficiency motor or IE3. The motor most frequently used

in Thailand is the Standard motor, but the highest efficiency motor or IE4 (with 15% higher efficiency than IE3) is available in the market right now and will soon be the most extensively used.

1.1.3 Economics

GDP: By 2017, ASEAN will almost reach US$3 trillion point and will be closer to US$4 trillion in 2020.

Per capita Income: The average GDP per capita in ASEAN increased from US$1,640 in 2005 to US$ 3,149 in 2010, almost doubled; and tripled by 2016.

Investment in Clean energy : the trends of all regions has increased since 2009 due to awareness of global warming, but they fall down since 2001 for America, Europe, Middle East and Africa. However, the investment in Asia has increased since 2009

Price of energy resources: Since we use crude oil and natural gas to produce electricity, the price has continuously increased as they are limited and the demand has increased during 2010

Building Investment : 54% of tall buildings are located in Asia by 2013. Moreover, 25% and 22% these buildings are offices and residential respectively, whereas hotel accounted only 5%.

Green building Investment : According to green building market report, there is more than 70% of the industry professionals that completed the questionnaire confirmed that they had in some way been involved with green building in the time period from 2008 to 2017.

Hotel Investment : Southeast Asia is looking like the 'place to be' in Asia for hotel ownership and development, according to the approximately 250 mostly Asia-based hotel leaders who took BHN's survey in July 2012. It mentioned that RevPAR (Revenue per Available Room) growth is expected to be the strongest in SE Asia, with 82% expecting growth.

1.1.4 Ecological

Global warming: The trends over the past 40 years have been decidedly up, with warming approaching 0.4°F per decade. That's still within historical bounds of the past — but just barely. By 2020, warming rates should eclipse historical bounds of the past 1,000 years — and likely at least 2,000 years — and keep rising. If greenhouse gas emissions continue on their current trend, the rate of warming will reach 0.7°F per decade and stay that high until at least 2100. Moreover, more than half of the World Risk Index's most vulnerable to climate change are in Southeast Asia and the Asia Pacific, with the Philippines, Cambodia, Brunei Darussalam and Singapore

1.1.5 Political Legal

ASEAN Socio-Cultural Community (ASCC) Blueprint 2009-2017 : It objective is to enhance regional and international cooperation to address the issue of climate change and its impacts on socioeconomic development, health and the environment, in ASEAN Member States : 1. Encourage ASEAN common understanding on climate change issues and where possible 2. Promote public awareness and advocacy to raise community participation on protecting human health from the potential impact of climate change

Renewable energy policy development : Several countries have established renewable energy targets for electricity and/or transport fuels.

- Thailand raised its overall renewable energy target to 25% of its final energy consumption by 2021.
- Indonesia established a renewable electricity target of 26% by 2025 and a feed-in tariff for biomass and geothermal.
- Malaysia established a FIT scheme with rates to decline by 8% annually for plants smaller than 24kW and by 20% for larger plants and a biofuel target

1.2 Steep Water

1.2.1 Technological

Desalination: It is the process of removing dissolved salts from water, thus producing fresh water from seawater or brackish water. Most of the modern interest in desalination is focused on developing cost-effective ways of providing fresh water for human use. However, the costs of desalinating sea water are generally higher than the alternatives. "At the moment, around 1% of the world's population are dependent on desalinated water to meet their daily needs, but by 2025, the UN expects 14% of the world's population to be encountering water scarcity. Unless people get radically better at water conservation, the desalination industry has a very strong future indeed."

Graywater Recycling Systems: collects water used for showering, clothes washing and dish washing instead of letting it drain into the municipal plumbing system. It often reduces water use by 50 to 70%.

Microfiltration System (MF): Its is used in secondary wastewater effluents to remove turbidity but also to provide treatment for disinfection. At this stage, coagulants (iron or aluminum) may potentially be added to precipitate species such as phosphorus and arsenic which would otherwise have been soluble

Ultrafiltration System (UF): UF excels at the clarification of solutions containing suspended solids, bacteria, and high concentrations of macromolecules, including oil and water, fruit juice, milk and whey, electrocoat paints, pharmaceuticals, poly-vinyl alcohol and indigo, potable water, and tertiary wastewater.

Nanofiltration System: NF functions similarly to reverse osmosis, but is generally targeted to remove only divalent and larger ions. Monovalent ions such as sodium and chloride will pass through a nanofiltrationmembrane, therefore many of its uses involve de-salting of the process stream.

Reverse Osmosis: RO is also used in cheese whey concentration, fruit juice concentration, ice making, car wash reclamation, wastewater volume reduction, and other industrial processes, with the goal of producing a pure filtrate (typically water) or retaining the components.

1.2.2 Ecological

Water Management and Responsibility in Hotels: Cost is a clear factor: water accounts for 10% of utility bills in many hotels. Most hotels pay for the water purchasing fresh water and disposing of it as waste water. Depending on their water efficiency, hotels can reduce the amount of water consumed per guest per night by up to 50% compared with establishments with poor performance in water consumption.

Water Security : In the last two decades, more than 1.7 billion people in the AsiaPacific region have gained access to safe water. Yet, there is acute water shortage in many parts of the region. No developing country in the region is having reliable availability of clean water. As the graph shows, no country in the region made it to level 5 on the water security index.

Number of people who gained access to improved drinking water sources from 1990 to 2010 by MDG region (millions) ,South-Eastern Asia 204 million : The use of piped water to a dwelling, plot or yard is low (30% or less). It includes Oceania, Southern Asia and South-Eastern Asia.

The Water Quality Association: WQA was created in 1974. The industries devoted to treating and delivering water are complex and varied.

Leadership in Energy & Environmental Design (LEED): is a green building certification program that recognizes best-in-class building strategies and practices.

1.2.3 Political

United Nation: UN has established many programs for conserving world water as the following: World Water Day

- Human values in Water, Sanitation and Hygiene Education Program (HVWSHE)
- The Mekong Region Water and Sanitation (MEK-WATSAN) Initiative
- Water and Sanitation Program (WSP): Economic Sanitation Initiative-East Asia
- Water and Sanitation Program (WSP): Economic Sanitation Initiative-South Asia

1.3 Steep Air

1.3.1 Technological

HVAC: the technology of indoor and vehicular environmental comfort. Its goal is to provide thermal comfort and acceptable indoor air quality. HVAC system design is a sub discipline of mechanical engineering, based on the principles of thermodynamics, fluid mechanics, and heat transfer. Refrigeration is sometimes added to the field's abbreviation as HVAC&R or HVACR, or ventilating is dropped as in HACR (such as the designation of HACR-rated circuit breakers). HVAC is important in the design of medium to large industrial and office buildings such as skyscrapers and in marine environments such as aquariums , where safe and healthy building conditions are regulated with respect to temperature and humidity, using fresh air from outdoors.

DOE's National Renewable Energy Laboratory : It has combined three classic methods of cooling down the air into one invention that could save 50 to 90 percent of consumers monthly electricity bill on air conditioning. DEVap uses water and liquid desiccant to draw in the outside air, exhaust some of it and return cool, dry air to the area being cooled

1.3.2 Economics

Electric energy consumption: It continued to rise at a strong pace (+6-7%) to meet energy demand related to high economic growth. Moreover, the average energy use per person increased 10% while world population increased 27%.

ASEAN energy overlook : It mentions that most of ASEAN countries use non-renewable resource such as coal, oil and natural gas to produce electricity which accounted for 80.4%. Moreover, the demand of imported natural gas also increase. However, some countries has project to invest in renewable energy. For example, Thailand plans to invest in solar energy by 2021.

1.3.3 Ecological

The Kyoto Protocol : It set out specific commitments by individual developed countries to reduced emissions by an average of 5.2% below 1990 levels by the period 2008-2012. However, it would take three further meetings until the "Marrakesh Accords" were agreed, which provide sufficient detail on the procedures for pursuing objectives set out in the Kyoto Protocol.

Asia's Air Pollution : Of the 15 largest cities on the planet with the worst air pollution 12 are in Asia. Suspended particulate levels in Delhi, Beijing, Karachi, and Jakarta are many times higher than recommended by the World Health Organization.

Carbon Dioxide Emission : As Southeast Asia is the production base of the world, so carbon dioxide emissions are expected to surge in Southeast Asia over the next twenty years according to the Energy Information Administration's Emissions of Greenhouse Gases in the United States 2004.

1.3.4 Political Legal

Better Air Quality Conference 2014 : Clean Air Asia is pleased to announce an open Call for Abstracts for the "Integrated Conference of Better Air Quality (BAQ) 2014 and Intergovernmental 8th Regional Environmentally Sustainable Transport (EST) Forum in Asia" It significantly reduce air pollution and greenhouse gases from energy, industry, transport, and area sources, (b) improve the

management of air quality and greenhouse gases, and (c) ensure a safe, equitable, environment and people-friendly transport system by accelerating the shift towards more environmentally sustainable transport.

1.4 Steep Lighting

1.4.1 Economics

Lighting market growth: It is predicted that the revenue of the global LED market for buildings will rise from $9.46 billion in 2013 to a total of $25.4 billion by 2017. This represents a compound annual growth rate (CAGR) in the overall market over this 5 year period of 22%. Growth in India will be the highest at approximately 31% CAGR, but from a very low base, and penetration rates there are likely to remain relative low. The rest of Asia (with the exception of Japan) will experience growth of around 24% due to positive legislation, new construction, and government incentives.

1.4.2 Technological

LED bulb: There are several benefits:

- Reduces energy costs at least 75% less energy than incandescent lighting
- Reduces cooling costs — LEDs produce very little heat.
- Reduces maintenance costs — lasts 35 to 50 times longer than incandescent lighting and about 2 to 5 times longer than fluorescent lighting.
- The purchase price is higher than most other, but the higher efficiency may make total cost of ownership lower.

Smart light: It is a lighting technology designed for energy efficiency. This may include high efficiency fixtures and automated controls that make adjustments based on conditions such as occupancy or daylight availability.

1.4.3 Political Legal

Government policy: Thai government has implemented new policy to reduce the number of energy consumption due to the shortage of energy resources such as natural gas which is imported from Myanmar.

1.5 Steep Cooling

1.5.1 Technological

High Efficiency Water Cooling Technology: Today, a water cooler using magnetic bearing technology is available. It uses the earth's magnetic field to lift up the axle and reduce friction. It also requires no oil for lubrication since lubricating oil mixed in with the refrigerants provides cooling capability 8% lower. Therefore, these efficient new water coolers need much less energy. The cooler manufacturers of more than 4 companies are using this new technology for coolers selling in the market right now.

Nanocap Technologies: It has announced the Nanocap Process, which uses capillary condensation and then osmosis through a semi-permeable membrane to dry air, which cools air down to the dew point to get water vapor to condense and drip off refrigerated coils, then heats the air back up to a comfortable temperature. Nanocap's process eliminates cooling and reheating the air. Therefore, it can save energy 20-35 percent during typical air conditioning use.

Air conditioner consumption: In Asia, where up to 40% of a household's annual electricity bill is attributed to AC usage, air conditioners are important household appliances. The hot and humid summer weather in places like Hong Kong, Singapore, Taiwan and Japan can often feel inescapable, even at home.

2. IFAS Factors

IFAS Factors	Weight	Rating	Score	Comment
Strengths: 1. Highly providing customer benefit	0.2	4	0.8	**1. Providing good customer service and warranty** • Weekly visit by synergy engineer for servicing • Warranty for all components and software which ranges between 3 to 5 years • Cloud application which customers can track their cooling water condition, water usage and energy performances online **2. Does not require the investment from the customer** • Amarin Boulevard Hotel pays only 11 Baht per unit for water cost to SC instead of paying 16 Baht per unit to metropolitan waterworks authority. **3. Promoting customer reputation through television, magazines and internet**
2. Highly focus on CSR (Environmental friendly vision and mission)	0.05	3	0.15	SC has started the business with the belief that the combining of green technology and optimized technology program could significantly *reduce energy, water, operation cost and pollution. Therefore, SC has focus on CSR activities which aim to reduce the greenhouse gases to reduce global warming as well as highlighting companies* who help the earth by conserving energy throughout a campaign to educate people how to reduce energy consumption and their annual publication CSR. *SC has completed all 4 goals .*
3. First mover advantage in Thailand	0.2	4	0.8	It is the leading building management industry in Thailand with its advance technologies such as Air-logic, Cool-Logic and water recycling. With these technologies, it could reduce the large number of water and electric consumption. For example, *Theptarin Hospital Bangkok can save 360,000 kWh per year or $50,000 per year for electric bill reduction after installing synergy's technologies.*
4. Location advantage	0.1	3.5	0.35	Since synergy complete is also located in Bangkok, it allows synergy to capture more customers in the city. It is because *there are 117 skyscrapers over 100 meters (330 ft) tall in Bangkok, with 37 under constructions* as of 2012 and also is the economic center of Thailand.
5. Good R&D	0.075	3	0.225	Before any installation, SC will do the research the customers that their waste water reach standard level or not. With this process, it can guarantee that the sewage will be recycled and is environmental friendly before releasing. Therefore, SC will get good reputation and also can attract more customers. *SC has 2 R&D team in Hong Kong and Bangkok for updating products.*
6. Good payment for employees	0.025	2.5	0.0625	SC staffs operate under a Key Performance Index system which is the basic of the monthly bonus. The *employees can increase their pay by up to 80% based on their KPI number.*
Weaknesses: 1. Focus on B2B (hotel and shopping mall)	0.15	3.5	0.525	SC targeted markets are *hotel and shopping mall which is not grow so much in Thailand.* However, the growth of condominium in Bangkok expected to grow 100,000 units in 2014 which show that there is a lot of water and electricity consumption and opportunity to expand the customer base.
2. Not enough employees	0.15	3	0.15	SC *has only 150 employees* and every day SC has to send its employees to check and service 400 buildings in Thailand, so it is really difficult to service the customers with only 150 people.

3. Expensive and unacceptable condition	0.15	4	0.6	The cost of lighting product from *SC is almost 50% higher than competitors* . Basically, one LED is about 200-300 baht, but the *company is 500 baht*. Due to Synergy complete condition, the company requires high number of light bulbs, about 2,000 per one project • According to the Amarin hotel, *SC will charge about 70 % from saving cost for one year and then 50% in four year later* which can make the hotel has to spend more to get profit.
TOTAL	**1.00**		**3.67**	

3. EFAS Factors

IFAS Factors	Weight	Rating	Score	Comment
Opportunities: 1. The rising trend in environmental awareness	0.2	4	0.8	As the number of secondary school enrolments has increased to 80%, it affects the *number of environmental awareness also increased to 67% for global warming, water pollution fir 75% and air pollution 77%*. Therefore, • Life expectation in SE Asia increases slightly. For example, the life expectation in Thailand has *increased to 75.75 years in 2015 from 72.4 years in 2014.* • Many countries have decided to invest in renewable energy. For example, Greater Mekong countries expect to develop hydropower for electricity, the *growth in hydropower is 7.1% and Philippine has approved 3 wind farms for electricity*.
2. Per capita income in ASEAN countries	0.05	3	0.15	The average GDP per capita in ASEAN increased from US$1,640 in 2005 to *US$ 3,149 in 2010, almost doubled; and will triple by 2016*. By 2015, ASEAN will pass the US$1.25 per day poverty line.
3. Environmental policy	0.1	3.5	0.35	There are many organizations that come to protect the environment such as **ASCC blueprint and Kyoto Protocol**. The main aim is to *encourage common understanding on climate change issues and to promote public awareness and advocacy to raise community participation on protecting human health* from the potential impact of climate change. Moreover, it set out specific commitments by individual developed countries to *reduced emissions by an average of 5.2% below 1990 levels by the period 2008-2012*.

4. Advanced technology	0.1	3.5	0.35	At recent years, there are many technologies which help to increase the capacity and efficiency of machine and *can save energy approximately 20 to 30%* such as **LED bulb**, **HVAC** and **Nanocap** technology. Therefore, SC has applied these technologies to increase the capacity of its products.
5. Economic Integration	0.075	3	0.225	By 2015, AEC will be fully implemented. This will help SC to expand their market within the region and *attract more customers who concern in environment, accounted 67%.* Moreover, there is no tariff and free flow of resource within the region.
6. Increasing in building and hotel in SE Asia	0.05	3.5	0.175	Southeast Asia is looking like the 'place to be' in Asia for hotel ownership and development, according to the approximately 250 mostly Asia-based hotel leaders who took BHN's survey in July 2012. • It mentioned that RevPAR (Revenue per Available Room) growth is expected to be the strongest in SE Asia, with 82% expecting growth, especially in Myanmar which accounted $1.9 billion. • There are 54% of tall buildings which are located in Asia by 2013. *25% and 22% these buildings are offices and residential respectively, whereas hotel accounted only 5%.*
Weaknesses: 1. Low cost of water	0.05	3.5	0.175	*Water supply tariff rate in Thailand is 10.20 Baht from 0-10 unit for residents, 17 Baht for SME, 18 Baht for industry.* They classify as cheap when comparing with Singapore where water cost is 1.170 convert to Thai Baht is 23.75. Therefore, Thai people would not concern in water supply and use it inefficiently.
2. A few competitors in competitive market	0.15	4	0.6	Even there are *a few competitors in Thailand, but the competition in lighting is very intense*. • It is because there are the *huge numbers of Chinese factories and the others manufacturing LED bulbs* which are consistently high quality and prices remain relatively low, approximately 100 to 200 Baht per bulb. • *ECM* which is one competitors spec specialized in water treatment, ranging from wastewater recycle system, desalination system and so on. Its customers mostly are factories in petroleum and textile industry and there is social responsibility during the flood in Bangkok in 2011 by giving the drinking water which is result of their water treatment for free.
3. Require high investment	0.125	3.5	0.4375	To be environmental friendly, *it required a lot of investment especially water recycle plant and chiller plant which is very important equipment*. Therefore, most building are not fully equipped or not equipped because it is not seen as a core part of production process.
4. Desalination	0.1	3.75	0.375	It is the process of removing dissolved salts from water, thus producing fresh water from seawater or brackish water. Most of the modern interest in desalination *is focused on developing cost-effective ways of providing fresh water for human use. However, the costs of desalinating sea water are generally higher than* the alternatives. Moreover, the competitors such as ECM have already applied this technology with their product.
TOTAL	**1.00**		**3.63**	

4. SFAS Factors

IFAS Factors	Weight	Rating	Score	Duration	Comment
S. Highly providing customer benefit	0.2	4	0.8	XX, XXX	***1. Providing good customer service and warranty*** ▪ *Weekly visit* by synergy engineer for servicing • Warranty for all components and software which ranges between 3 to 5 years • Cloud application which customers can track their cooling water condition, water usage and energy performances online ***2. Does not require the investment from the customer*** • Amarin Boulevard Hotel *pays only 11 Baht per unit for water cost to SC* instead of paying 16 Baht per unit to metropolitan waterworks authority. ***3. Promoting customer reputation through television, magazines and internet***
S. First mover advantage in Thailand	0.1	3	0.3	X,XX	It is the leading building management industry in Thailand with its advance technologies such as Air-logic, Cool-Logic and water recycling. With these technologies, it could reduce the large number of water and electric consumption. For example, *Theptarin Hospital Bangkok can save 360,000 kWh per year or $50,000 per year for electric bill reduction after installing synergy's technologies*.
S. Good payment for employees	0.1	3		XX	SC staffs operate under a Key Performance Index system which is the basic of the monthly bonus. *The employees can increase their pay by up to 80% based on their KPI number.*
W. Focus on B2B (hotel and shopping mall)	0.1	3	0.3	XX	SC targeted markets are hotel and shopping mall which is not grow so much in Thailand. However, the *growth of condominium in Bangkok expected to grow 100,000 units* in 2014 which show that there is a lot of water and electricity consumption and opportunity to expand the customer base.
W. Expensive and unacceptable condition	0.15	3.5	0.525	X,XX	The cost of lighting product from *SC is almost 50% higher than competitors* . Basically, one LED is about 200-300 baht, but the *company is 500 baht*. Due to Synergy complete condition, the company requires high number of light bulbs, about 2,000 per one project • According to the Amarin hotel, *SC will charge about 70 % from saving cost for one year and then 50% in four year later* which can make the hotel has to spend more to get profit.
O. The rising trend in environmental awareness	0.2	4	0.8	XX	As the number of *secondary school enrolments has increased to 80%,* it affects *the number of environmental awareness also increased to 67% for global warming, water pollution fir 75% and air pollution 77%*. Therefore, • Life expectation in SE Asia increases slightly. For example, the life expectation in Thailand *has increased to 75.75 years in 2015 from 72.4 years in 2014*. • Many countries have decided to invest in renewable energy. For example, Greater Mekong countries expect to develop hydropower for electricity, the *growth in hydropower is 7.1%* and *Philippine has approved 3 wind farms for electricity*.

O. A few competitors in competitive market	0.15	4	0.6	XX	Even there are **a few competitors in Thailand, but the competition in lighting is very intense**. • It is because *there are the huge numbers of Chinese factories and the others manufacturing LED bulbs* which are consistently high quality and prices remain relatively low, *approximately 100 to 200 Baht* per bulb. • **ECM** which is one competitors spec specialized in water treatment, ranging from wastewater recycle system, desalination system and so on. Its customers mostly are factories in petroleum and textile industry and there is social responsibility during the flood in Bangkok in 2011 by giving the drinking water which is result of their water treatment for free.
TOTAL	**1**		**3.63**		

5. Porter's 5 forces analysis

51% of the architects, engineers, contractors, owners and consultants participating in the study anticipate that more than 60% of their work will be green by 2017, up from 28% of firms in 2015.Moreover, the growth of green is not limited to one geographic region or economic state - it is spreading throughout the global construction marketplace.

According to the U.S. Green Building Council, total revenue across the industry should grow to $245 billion by 2017. This as well has become the competitive force that influence the firm's ability to generate profit.

Advantage of being Technological leadership in WATER &COOLING : Technological pioneers can protect their R&D through patents. However, in most industries, patents are easy to invent around, or have transitory value given the pace of technological change. With their short life-cycles, patent-races can actually prove to be the downfall of a slower moving first-mover firm.

The threat of new entrants : High

- What SC really produces is neither a tangible product nor machine, but a service of saving energy through recycling. Therefore, the more SC helps the hotel to save through water recycling, the more saving in costs.
- SC's brand name is quite well-known for its unique service, especially water treatment, with its outstanding after-sales service in which SC helps to supervise every steps of the installation thoroughly
- Initial capital investment in SC's products is high. SC's products are a combination of advanced technology, sophisticated software and thorough installation process which require an ample sum of initial capital investment.
- Technology Protection: Thai laws comply with international intellectual property standards as established by TRIPS

Threat of substitute products: Moderate

According to the Public Health and Safety Organization, in areas where traditional wastewater treatment methods cannot be used, especially in environmentally sensitive areas or where water is in short supply, several alternative treatments exist for both residential and commercial wastewater treatment applications to address a growing need exists for alternative technologies for both residential and commercial wastewater treatment: Composting Toilets, Electric Incinerating Toilets, Onsite Water Reuse Treatment Systems, Residential Wastewater Treatment Systems

There are new innovations that could negatively affect SC's Lighting: Net-connected LED, programmable light bulbs, the smart bulb with a computer chip and wireless technology

These can represent some substitute products to SC's water treatment products. However, since SC's main targeted customers range from big commercial buildings like big five stars hotels to shopping malls, these substitute products are not much of a threat to SC's water treatment product. Moreover, although these substitute products are significantly cheaper than SC's products, their quality and functionality are inferior to SC's products.

Bargaining power of buyers: Moderate

- According to the interview with Mr. Peerachet of Sheraton Hotel, during the last 7-8 years, there has been increasing number of competitors in the industry. Somehow, other competitors have higher investment cost of over million baht and as well as the switching cost is pretty high.
- SC provided an option for customer to choose as well when it comes to business which this attracts customer and also ways to keep customer to not change the product or service to the competitors. We believe that with the technology know-how it is hard for competitor to seek in and copy it or hack it if they continue on from SC.
- Most customers does not pose a significant threat of backward integration because SC possesses advanced in both technologies and software.

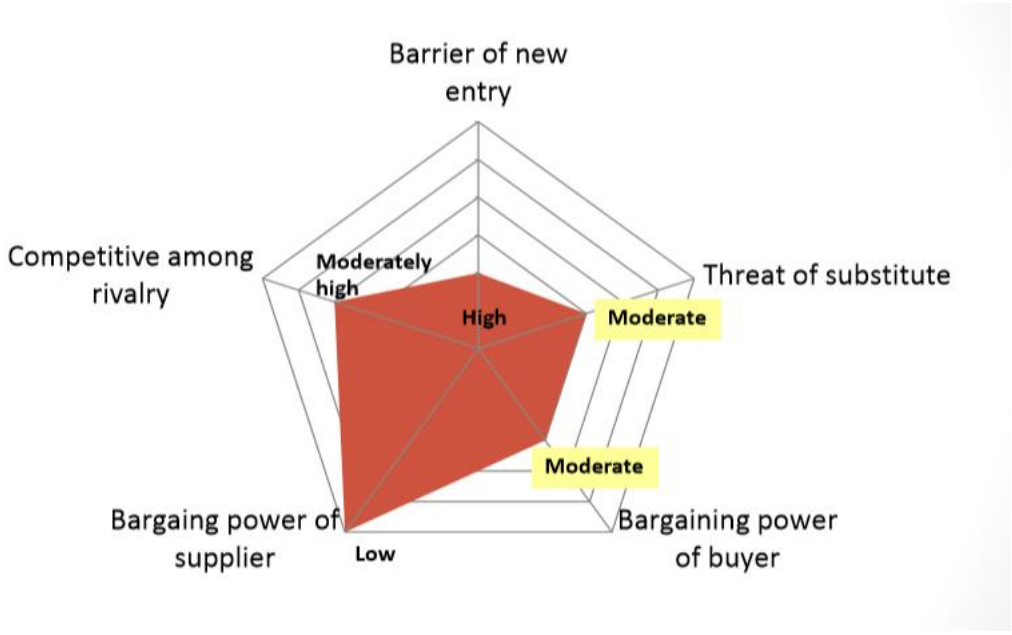
Bargaining power of supplier: Low

- Synergy Complete's mainly focuses are on business to business model in which it operates as a developer of green technologies with optimized software program.
- SC established partnerships with over 500 buildings, factories, hospitals, hotels and shopping malls
- Its service range from installing equipment to maintenance and after sales services.
- The areas of business activities are in both upstream and downstream

Competitive rivalry within an industry: Moderately High

- Despite the benefit of SC's water recycle system, many building still do not choose to recycle water which leads to a slow industry growth.
- The water projects require high financial savings and high fixed cost to adopt the water recycle plants which leads to high exit barriers.
- New innovations in the lighting front that could throw the Lighting industry into a total upheaval.
- The Net-connected LED lights and programmable light bulbs are the new innovative products that have low switching cost for customers and can lead to more strategic diversity among competitors within the industry.
- The switching cost of cooling and air for customers is quite high because both products are offered in a package.

Radar Plot



6. Strategic analysis and implications

SC has done an excellent job in choosing the current set of strategies:

- Had its mission set on accelerating buildings transition to use optimized green energy and water solutions for sustainable utility management and environmental protection
- SC sees Thailand as an ideal place for water treatment and became the leading water treatment company in Thailand with over 400 buildings as its clientele.
- Made a clear distinction of its four main products: Cooling, Air, Water and Lighting with its main target customers as commercial facilities and focuses on the B2B business model.

SC should develop its strategy further to achieve synergy between products sections : flow of know-how between each business sections can lead to new business creation.

SC can choose to become a green construction company:

- Although SC has clearly set its mission, but it has not made itself clear enough on which industry it will be in.
- Eco-friendly construction will lure talent from every sector and is now growing rapidly and made its way on the list of the top industries of 2016 as housing market has recovered.
- SC can utilize its great technologies, software and people to renovate green buildings.
- Pay Attention more to the CSR. CSR seem to be the face of the company but rewarding customer by putting them on magazine for making the building green would not push or encourage other industries to turn green.

Should SC manufacture their own products by adopting Vertical Integration strategy:

- Reduce costs across various parts of production, ensures tighter quality control, and ensures a better flow and control of information across the supply chain.
- Reduce or eliminate the leverage that suppliers or buyers have over the firm. The process allows a company to improve profitability by stripping out the middleman, sometimes taking the form of wholesalers and retailers.

Forward integration: Concerns the purchase or building of a distributor, allowing the company to move closer to the consumer through distribution centers and retailers

- Help to solve the problem of substandard quality of SC's service
- Focusing on more marketing
- Mind into services

Nearly 80% of the enterprises design their products themselves, rather than using the products of another organization.

Multiple Technology suppliers Enable SC to focus on its core business(accelerate buildings transition to use optimized green energy for sustainable utility management and environmental protection) rather than doing multiple tasks at the same time.

The tasks of assembling raw materials and machines will be outsourced to more efficient suppliers For example, SC can outsource production facilities in Bangkok which produces both fullscale Ultra Filtration and Reverse Osmosis plants to more efficient suppliers.

The HR strategy is 'lean and neat' – keep less staff who work efficiently which then translate into a healthy net profit.

SC has two Research & Development hubs in Hong Kong and Bangkok. Their main focuses are on updating products that serve as essential cost effective filters around the globe. The filters are used for producing potable water, industrial process water, boiler feed water, industrial waste water or sewage treatment. This has shown that Water treatment and cooling systems are the main focuses of SC's R&D activities whereas R&D SC Air and SC Lighting are not as essential. This means that SC's core competencies in R&D lies in Water treatment and cooling in which SC's internal team is already working on and should be kept in-house, whereas SC Air and SC Lighting should be outsourced which will give SC more speed to launch its products in the market and dramatically reduce risk of completion. Regarding the Intellectual Property Rights issue, Hong Kong and Thailand are also parties to key IP conventions3 aimed at creating an equal, standardized IP protection system throughout the world. Therefore, SC should keep its key skills sets in-house to invest in further projects in the future.

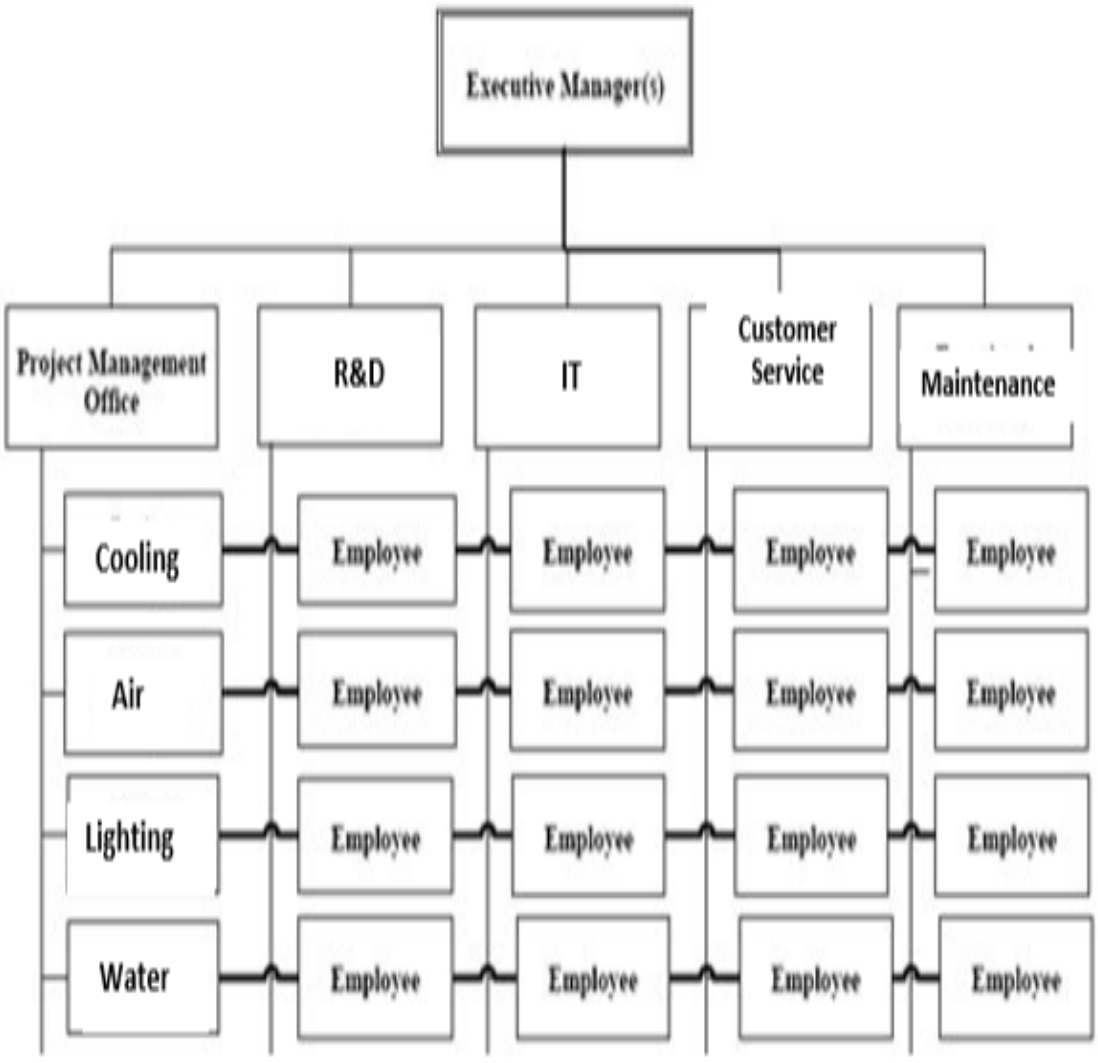
The Porter's competitive strategy SC is using for Water and Cooling is differentiation focus:

- The competitive strategy SC has adopted has proven to be quite successful for its Cooling and Air as they become SC's most popular products. All the hard work in R&D of SC's Cooling as well as the in-depth Air-Logic system package has paid off for SC because the differentiation in Technology system which has sustained it from competitors.
- SC's water belong to differentiated, BUT the demand was not strong enough and the target segment becomes structurally unattractive.

The Porter's competitive strategy SC is using for Air and Lighting is differentiation:

- SC's Air still remains differentiated from its competitors with its complex Air-Logic System packages that comprise of analytical software program, optimization equipment, warranty, installation, connection and optimizing of all components.
- SC's Lighting products are quite similar to those of its competitors, according to the interview, SC's Lighting products are still more costly, comprehensive and offered in a full turnkey package that includes the supply of LEDs, delivery. installation and warranty. its segment becomes overwhelmed by the more broadly targeted competitors like Phillip.

SC can best organize themselves to make use of potential synergies in offering all 4 products, while allowing different product group to be sufficiently different to be successful by applying a Matrix Structure in order to make use of potential synergies.



- Allows each unit support each other.
- Help the company achieve synergies which can reduce cost, generate more profit, business area and so on.
- Allow each product work separately and still be different.
- Some of them can share the same technology and can work more efficiently together such as water and cooling, over 16,000 m3 can be saved. Customers can save up to B600,000 a year.
- SC staffs operate under a KPI system – Key Performance Index • This KPI is the basis of the monthly bonus – an employee can increase their pay by up to 80% based on their KPI number. Thus, they can take advantage from this system by working temporarily or permanently across unit.
- The company can use the same engineer and technology team together by sharing information to make better performance. Moreover, the company's products are related to each other, R&D can work together in order to share target market, such as hotels, shopping malls and so on, together.
- SC is a new entry for air system market, so it has not enough reference for customers. The company can use temporary cross-functional task forces which is used for introducing new product.

III. Conclusion

Given the above implications, there lies many opportunities and room for growth in green industries in ASEAN market. However, as the Porter's 5 forces analysis has been analyzed and shown in the Radar plot which suggests that the intensity to operate in the industries is quite high and the attractiveness of the market will intensify the competition and subsequently bring about stricter rules and regulations, making it more difficult and complex to run business within the industries. Although the study above has adopted many tools and models to facilitate strategic decision-makings, there are still other factors which have not been taken into account and there could still be changes in external factors which require companies to constantly adapt.

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