

Marketing Analysis of Thai Solar Energy Public Company
Limited



An Independent Study Submitted in Partial Fulfillment of the
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การวิเคราะห์การตลาดของ บริษัท ไทย โซลาร์ เอ็นเนอร์ยี จำกัด (มหาชน)



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คณะเศรษฐศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

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Company Limited
By Mr. Kuan-chin Fuh
Field of Study Business and Managerial Economics
Thesis Advisor Assistant Professor SAN SAMPATTAVANIJA, Ph.D.

Accepted by the FACULTY OF ECONOMICS, Chulalongkorn University in
Partial Fulfillment of the Requirement for the Master of Arts

INDEPENDENT STUDY COMMITTEE

..... Chairman
(Assistant Professor NIPIT WONGPUNYA, Ph.D.)
..... Advisor
(Assistant Professor SAN SAMPATTAVANIJA, Ph.D.)
..... Examiner
(KATIKAR TIPAYALAI, Ph.D.)



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CHULALONGKORN UNIVERSITY

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เพื่อแก้ปัญหาโลกร้อนและราคาน้ำมันที่ผันผวน ทุกประเทศพยายามหาพลังงานทดแทน การเติบโตของพลังงานหมุนเวียนมีการเติบโตอย่างมาก รวมทั้งประเทศไทย พลังงานแสงอาทิตย์เป็นพลังงานที่มีศักยภาพสูงสุดในประเทศไทย TSE เป็นหนึ่งในบริษัทพลังงานแสงอาทิตย์ที่ใหญ่ที่สุดในประเทศไทย เราพยายามให้ TSE เพิ่มจำนวนลูกค้าและกำลังการผลิตพลังงานหมุนเวียนทั้งหมด ด้วยเหตุนี้ TSE สามารถแข่งขันกับบริษัทอื่นและช่วยให้ประเทศไทยและเอเชียตะวันออกเฉียงใต้พัฒนาได้ดีขึ้น ในงานวิจัยนี้ เราทำการวิเคราะห์ SWOT และการวิเคราะห์แรงกดดันทั้งห้าอย่างที่เสนอโดย Dobbs หลังจากการวิเคราะห์ เราได้ให้คำแนะนำหลายประการสำหรับ TSE เพื่อช่วยให้ดีขึ้น ตัวอย่างเช่น การมีตำแหน่งทางการตลาดเฉพาะ เน้นการตลาดออนไลน์เช่นโซเชียลมีเดียหรือ SEO หรือเนื้อหาเว็บไซต์ เข้าร่วมกิจกรรมที่เกี่ยวข้อง และแสวงหาโอกาสในการเปิดเผยบนนิตยสาร การอ้างอิงจากลูกค้า ขยายขอบเขตธุรกิจ และประเทศที่ดำเนินการ หลังจากปฏิบัติตามคำแนะนำดังกล่าวแล้ว TSE สามารถรักษาลูกค้าภาครัฐและขยายบริการไปยังบริษัทเอกชนได้ และสิ่งนี้สามารถช่วยเพิ่มอำนาจต่อรองของ TSE และแข่งขันกับบริษัทอื่นได้



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ลายมือชื่อนิติกร
ลายมือชื่อ อ.ที่ปรึกษาหลัก

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Kuan-chin Fuh : Marketing Analysis of Thai Solar Energy Public Company Limited. Advisor: Asst. Prof. SAN SAMPATTAVANIJA, Ph.D.

To solve the global warming and the fluctuation of oil price, every country tries to find alternative energy. The growth of renewable energy has been growing dramatically, including Thailand. Solar energy is the one that has the highest potential in Thailand. TSE is one of the biggest solar energy companies in Thailand. We try to TSE increase their customer number and total capacity of renewable energy. By this, TSE could compete with other companies and help Thailand and Southeast Asia develop better. In this research, we conducted SWOT analysis and five forces analysis proposed by Dobbs. After the analysis, we gave several recommendations for TSE to help it better. For example, having a dedicated marketing position, focusing online marketing like social media or SEO or website contents, joining related events, and seeking exposure opportunities on magazine, references from the customer, expanding business scope and operating countries. After implementing those recommendations, TSE could keep the government sector customers and extend the service to private sector companies. And this could help to enhance TSE bargain power and compete with other companies.



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Student's

Signature

Advisor's

Signature

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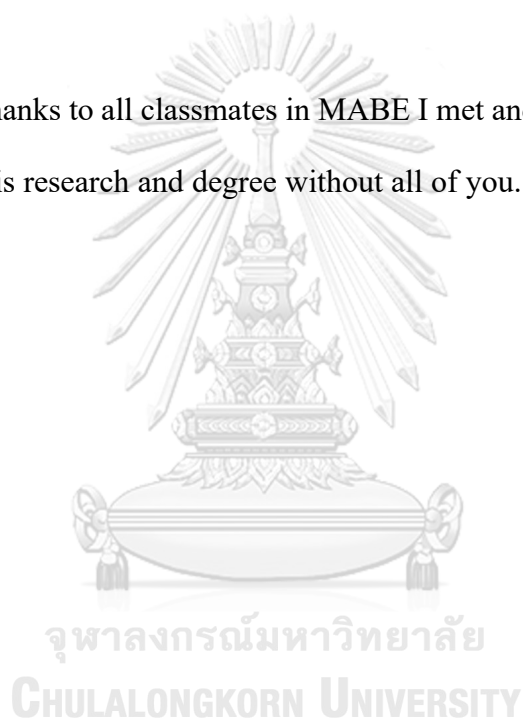


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1.Introduction

As global warming worsens, every country starts to attach importance to the effect it brings to the earth. Many countries have tried to sign a convention or protocol to restrict other countries from producing too much greenhouse gas. For example, the United Nations Framework Convention on Climate Change signed in 1992 and the Kyoto Protocol signed in 1997.

Due to economic growth and population growth, Thailand faces an increase in energy demand of almost 80% in the next 20 years. While Thailand will meet the challenge that the country relies on importing more than 50% of energy, said Adnan Z. Amin, Director-General of the International Renewable Energy Agency (IRENA, 2017).

In the past 20 years, Thailand has continued to be the country that promotes renewable energy. In 2019, the government set a goal of increasing the proportion of renewable energy of total energy to 30% by 2037. Until 2015, natural gas, crude oil, and condensate represented more than 60% of total primary energy production in Thailand. Renewable energy had only 17% of it (Figure 1). Renewable energy generation capacity has grown more than double in the last 10 years, and it is expected to grow triple in the next 20 years. Today, the majority of renewable energy comes from biomass, but it is expected to remain the same and solar will be the first priority target in the next 20 years according to the AEDP targets (IRENA, 2017).

Thai Solar Energy Company is one of leading renewable energy and solar energy companies in Thailand established in 2008. According to the TSE website, its aim is to provide clean renewable energy to Thailand and Southeast Asia to

help people achieve their goal of decarbonization.

In this research, the method of SWOT analysis and five forces analysis will be used to analyze Thai Solar Energy company (TSE). Through these two analyses, this paper tries to provide TSE recommendations for the future marketing strategy and to help TSE grow their number of customers and the total capacity of electricity. At the same time, it could help the renewable industry in Thailand and Southeast Asia to develop better and go to the next level.

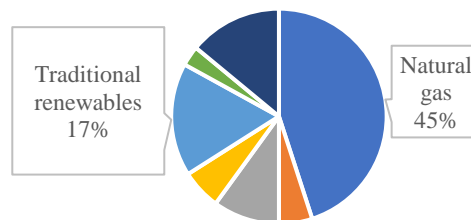


Figure 1 Thailand's total primary energy

Source: EPPO, 2016b

2. Literature Review

2.1 SWOT Analysis

According to Bartels (1976), the first marketing concept could trace back to 1900 when the word 'market' was created. Although a lot of marketing theories and concepts were developed from 1910 to 1920. SWOT analysis, which includes strengths, weaknesses, opportunities, and threats, is one of the most well-known marketing theories in the world. Turner (2002) credited it to Igor Ansoff (1987), while Haberberg (2000) argued that SWOT was a concept used by Harvard researchers in the 1960s. Although we do not know who developed the SWOT analysis, we cannot deny its importance.

SWOT analysis has been used for many academic research or business cases.

It has 4 components, which include Strengths and Weakness for internal, Opportunities, and Threats for external of firms, respectively. By contributing a 2×2 matrix with all 4 components, the owner of the firm could get a basic frame about the kind of strategy they should adapt. But the advantage also could be the disadvantage, it is easy to contribute, but it could not give a clear strategy suggestion. Panagiotou (2003) argued that SWOT analysis is oversimplified and unclear. Haberberg (2000) also added that as time passes, now the market is too complicated, and SWOT analysis could not provide enough information for the manager to decide. Helms and Nixon (2010) stated that sometimes strengths may become weaknesses if not maintained, or opportunities can become threats if not taken.

Although many people argued for the imperfection of SWOT analysis, this does not mean that it is useless. According to Baker (2000), organizations can still benefit if they can use the customer's perspective to contribute to SWOT analysis. Warren (2002) also stated that in the strategy planning process, SWOT analysis is a good tool to start with. Many studies provide recommendations for alternatives to SWOT analysis. Hussey et al. (1997) proposed WOTSUP which added UP which means 'Underlying Planning', and another was to replace weaknesses with faults to become SOFT. Lee and Ko (2006) suggested that they combine this with the balanced scorecard. Nickols and Ledgerwood (2006) proposed another alternative, called a Goal Grid instead of SWOT analysis. It is hard to find the best combination or alternative for SWOT analysis. Although we can observe that many studies conducted or suggested considering Porter's (1980) five forces model with SWOT analysis to include more about the organization's external competitive environment (Ruocco and Proctor, 1994 ; McGrail & Roberts, 2005).

2.2 Five Forces Analysis

Five forces model was invented by Porter in *Competitive Strategy* he published (Porter, 1980). The five forces are powerful buyers, powerful suppliers, competitive rivalry, new entrants, and substitute products. Porter (2008) points out that the five-force model can help individual firms develop strategies for a specific industry. After its release, the five-forces model became an essential theory to be learned by MBA students and business managers. But according to Grundy (2006), there were only 15% to 20% students in strategic management courses of a particular business school familiar with five forces model. While 90% to 95% of the students were familiar with SWOT analysis. Porter (2008) also said by himself that many people often misuse frameworks. Dobbs (2014) stated that one of the reasons is lack of depth in the textbook. He found that only two of the ten leading strategic management textbooks provide enough information and knowledge for the model. Most textbooks only had 4 to 11 pages for the entire concept. Grundy (2006) argued that Porter's five forces model is relatively abstract compared to other models or analyses, such as SWOT analysis, and requires high analytical skills. While Grundy also added that five-forces model could help to simplify microeconomic theory and to emphasize the imperfect market. With the knowledge mentioned above, if the model is used correctly and avoids abuse, it will help us.

2.3 B2B Marketing

In the marketing field, we often divide it into Business-to-Business (B2B) and Business-to-Customers (B2C) marketing. The early B2B marketing concepts can be traced back to the 1890s, while most of the B2B marketing theories were proposed in the past 30 years (Hadjikhani & LaPlaca, 2013). B2B and B2C

marketing have many differences. Habibi et al. (2015) stated that B2B has a slower decision cycle than B2C because B2B needs to engage more decision makers than B2C and makes marketing communications complicated. Furthermore, B2B needs more information before buying because B2B products or services of B2B are more complex than B2C (Jussila et al., 2014). Furthermore, B2B purchasers are more intelligent than B2C purchasers because of higher risk or higher value products (Jerman & Zavrsnik, 2012). From the above, we can see that these differences make B2B and B2C have different marketing strategies. For example, social media is an important tool in marketing strategy. Although B2B marketers are lagging behind B2C marketers in the use of social networks as a marketing tool (Adiele, 2011). In a recent study, it was found that social media could help improve brand images for decision makers that B2B want to target (Rindell & Strandvik, 2010). Therefore, it is important to implement dedicated marketing strategies for B2B companies.

2.4 Marketing in Solar Industry

Most solar energy companies are considered in the B2B industry for the customer like the factory or warehouse, except a small portion is B2C for the individual customer. Solar energy was considered an aggressive action for the community in the past, but now it can help improve investment efficiency and take care of the environment (Mai, 2020). In Germany, advertising is often used to emphasize financial incentives to save money from solar energy, which is then environmentally friendly in all traditional or online communications (Kratschmann and Dütschke, 2021). Ambepitiya (2015) suggested that solar energy should adopt the ‘Green marketing’ strategy that delivers a green message to the target customer

who shares the same value with them. The green message could include information about innovation, prices, technology, and benefits. It is common that developing countries are less aware of the benefits of solar energy (Ambepitiya, 2015). Mai (2020) added that in Vietnam most customers do not understand the product and the efficiency it could bring. He suggested that the solar energy company could use different communication tools for marketing, such as social networks, seminars, press releases, outdoor advertising, and sponsorship. All of these communication tools could help customers have access to information and increase the probability of purchasing.

3. Industry Overview

3.1 Development of the Thai solar industry

Thailand is a country that is really dependent on imported energy from another country. According to the Department of Alternative Energy Development and Efficiency (2014), Thailand imported more than 50% of primary commercial energy from other countries. This high rate made it easy for Thailand to be affected by the price of energy and national security. It is important to reduce Thailand's dependence on imported energy from other countries.

Thailand is in a good location to receive sunlight throughout the year. The Ministry of Energy made a map (Figure 2) showing the solar potential of Thailand in 1993 (The Department of Alternative Energy Development and Efficiency, 2002). The map showed that the northeast part of Thailand has the highest potential for a solar project. This includes Udon Thani, Ratchasima, etc. The second highest region is the middle region of Thailand. It includes Lop Buri, Ayutthaya, etc. Department of Alternative Energy Development and Efficiency (2002) shows that Thailand has

a high potential in solar energy compared to some regions of the world (Figure 3). For example, Europe has developed very well in solar energy, while it has the lowest potential in it.

With the support of the energy ministry, Thai renewable energy capacity continues to grow in the past 20 years (Figure 4). Solar energy started later than other renewable energy, but in Figure 5 we can see that it has grown dramatically in the last 10 years from 48.6 to 3048.62 MW (IRENA's statistics database). The Thai government implemented the solar home program (SHP) in 2005, but the capacity was not too high investment due to the high cost (Chimres & Wongwises, 2016). In 2007, the government started adding policy when the capacity was 32.25 MW that year and started the FiT program in 2013 with the capacity of 828.5 MW. Both solar energy and renewable energy capacity continue to increase, but we can find that in 2010 solar energy was generated only 1.01% of renewable energy while it was 25.65% in 2021 from Figure 4 and Figure 5. We could tell that solar energy continues to increase and becomes more important than other renewable energy solutions.

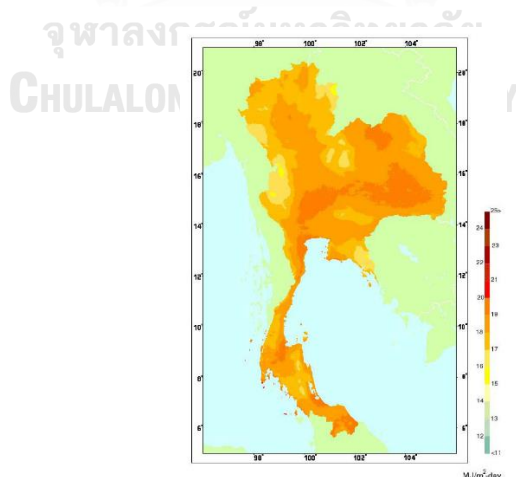


Figure 2. Solar Radiation Map for Thailand

Source: Department of Energy Development

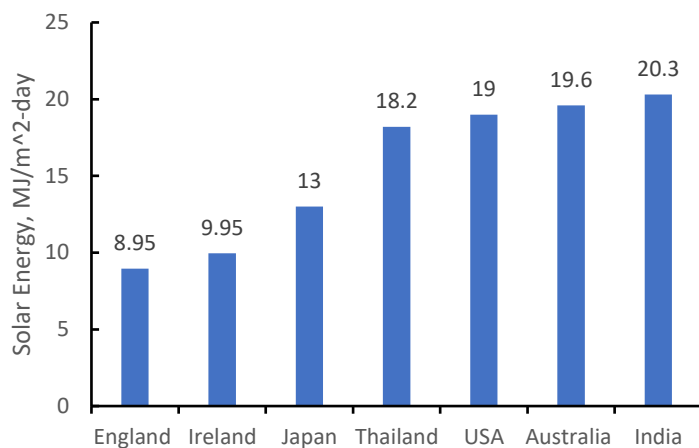


Figure 3 Comparison of Average Daily Solar Radiation Intensity Per Year Compared to Countries

Source: Department of Energy Development

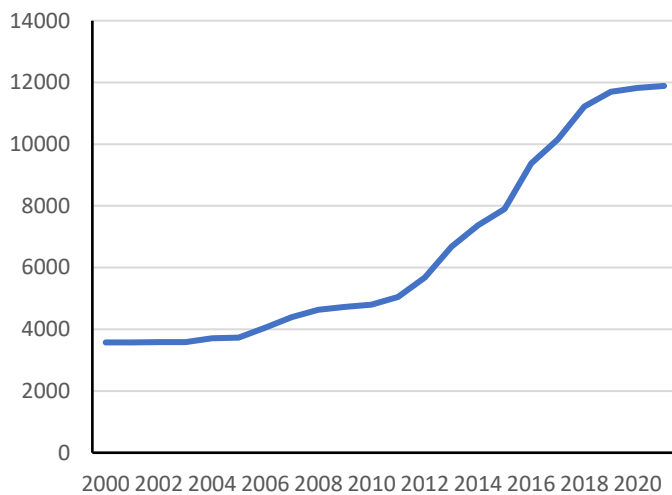


Figure 4 Total Renewable Energy Installed Capacity (MW) (IRENA, 2022)

Source: Based on IRENA's statistics database.

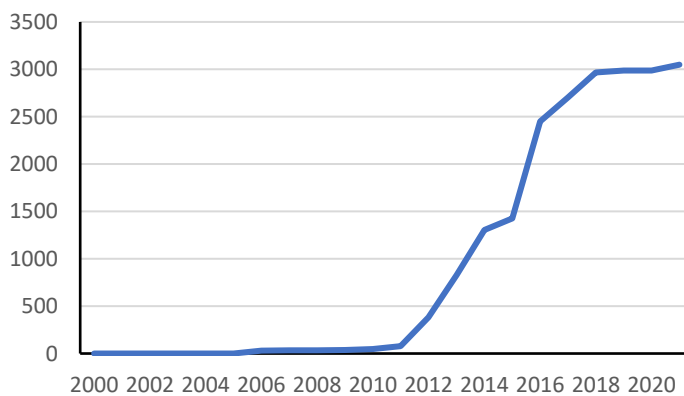


Figure 5 Solar Energy Installed Capacity (MW) (IRENA, 2022)

Source: Based on IRENA's statistics database

3.2 Solar Power Policy in Thailand

To encourage people and companies to produce and use more renewable energy, the Ministry of Energy has provided a feed-in tariff (FiT) to be an incentive. Thailand is the first ASEAN country to provide an electricity price higher than the regular market price (Ismail et al., 2015). The FiT program was first published in 2007 by the National Energy Policy Committee (NEPC). The operator could sell the electricity generated by renewable energy back to the electricity authority at a price higher than the market price. NEPC would also review the FiT rate every time according to technology or policy to offer a reasonable price to the operator (Chimres, N& Wongwises, 2016). In 2010, the FiT rate continued to drop due to the cost of the photovoltaic system, which was also lower than before according to Four Peaks Technology.

Peerapong & Limmeechokchai (2014) state that the FiT program is one of the most successful renewable energy mechanisms to promote and attract more companies and operators willing to develop a renewable energy project. The biggest challenge for renewable energy is its cost. It costs more than traditional fossil fuels, so most companies would like to choose fossil fuels instead of renewable energy if they did not have any incentives. We could also find the FiT program in other European countries. The reason it is successful is because investors could be guaranteed that they will get a fixed tariff in the long-term period. With this financial incentive, investors are willing to invest because they cannot only take care of the planet, but also get economic benefits.

3.3 Solar Energy Business Models in Thailand

According to Tongsopit et al. (2016), Thailand has three main solar energy

business models. There are the roof rental business model, solar leasing, solar shared saving, or solar power purchase agreement (PPA) business model, respectively.

3.3.1 Roof Rental Business Model

Due to the FiT program announced by the Thai government in 2013, the roof rental business model started to appear. Some companies rented existing roofs from a factory or warehouse, built and installed solar panels on the roof they rented. Selling electricity generated by solar systems they own to the government and earning money from the FiT program. In this business model, the roof owner does not need to pay anything for solar panels or other installation fees. The fees related to it will be paid by the developer company. The roof owner will only get the roof rental fee and will have no liability for it. And another benefit is that the solar panel on the roof could help reduce heat absorption on the roof.

3.3.2 Solar Shared Savings or Solar Power Purchase Agreement (PPA) Business Model

Due to the uncertain Thai government policy, the developer company came up with a new business model to avoid government changing policies such as adjusting the quota of the FiT program or reducing the FiT rate. The developer company will still help the roof owner build, will install the solar system, and will be responsible for all or almost all expenses. The roof owner who wants to save energy expense will use a discount price compared to the market price of the government to buy electricity from the developer company.

Normally, the PPA length is around 20-25 years, and the roof owner could buy electricity from the developer company using 5-10% lower than the market

price. This is a win-win situation between them; the roof owner could enjoy a cheaper price without paying capital expenses and the developer company could ensure a steady cash flow in the next 20-25 years.

3.3.3 Solar leasing

Solar leasing is another kind of solar business model. In this model, mainly has two parts: solar lessor, which help to pay the capital expenses at first and help to install the solar system, solar lessee, who owns the roof and will pay the capital expenses back monthly. The solar renter could choose to consume the electricity by themselves or sell it back to the FiT program. For solar lessees, the money they earn should be higher than the money they pay to the lessor every month.

Thailand has many residuals interested in solar leasing because they could not afford one-time capital expenses at first. ‘Almost 100% of the households that joined the FiT program are rich families’, said Dr. Dusit Krea-ngam (Sano and Tongsopit, 2014). But, on the other hand, families with low income also have a high default risk, which means that they cannot pay the money back.

In general, developers only need to bear the risk that the government could change the policy anytime for the first model. The other two models could still occur even without the FiT program.

3.4 TSE background

Thai Solar Energy Public Company Limited is one of the leading renewable energy and solar energy companies in Thailand established in 2008. According to the TSE website and annual report (TSE, 2021), its aim is to provide clean renewable energy to Thailand and Southeast Asia to help people achieve their goal of decarbonization. Currently, TSE operates in Thailand (145.2 MW) and Japan

(146.5 MW) two countries with a total 291.7 MW capacity. TSE mainly focus on solar energy, there are 269.5 out of 291.7 MW (92.4%) solar energy in the TSE business. This capacity combines 4.76% of the Thai solar energy market share, which is a total of 3048.62 MW mentioned previously (IRENA, 2022). Most of the customers of TSE are the Metropolitan Electricity Authority (MEA) and the Provincial Electricity Authority (PEA), except for one private customer, which is Arelic Hitachi Home Appliance.

There are some other Thai companies that play a major role in the market, which are BCPG and SPCG.

3.4.1 BCPG

BCPG Public Company Limited was established in 2015. BCPG is operating in Asia countries including Thailand, Vietnam, Philippines, Laos, Japan, and Taiwan. It has three types of solutions which are solar, wind and hydro with total 390.6 MW. In Thailand, BCPG has 173.5 MW, which is 5.69% of the Thai solar energy market share. Most of the BCPG customers are government sector, the same as TSE (BCPG, 2022).

3.4.2 SPCG

SPCG Public Company Limited was established in 2011. It is operating in Thailand and Japan two countries. SPCG only focus on solar energy. It is expected to have a 480 MW solar farm in Japan in 2024. It now has 316 MW capacity in Thailand, which is 10.37% of the Thai solar energy market share. Although it only has a government sector customer, the capacity with government is large (SPCG,2021).

4. Methodology

In this research, SWOT analysis was conducted because it can be a good starting process to analyze (Warren, 2002). SWOT analysis which stands for Strengths, Weakness, Opportunities, and Threats. The first two components are for internal analysis and the last two are for external analysis. After analyzing all the components, we could use them to build a 2×2 matrix (Table 1). With this matrix, we could easily tell what kind of strategy we should adapt. We could use different combinations such as strengths and opportunities, opportunities and weakness or weakness and threats to come up with our strategy. However, we need to keep in mind that strengths could become weaknesses if they are not well maintained. And if we do not take the opportunity, it could become our threat as well (Helms & Nixon, 2010).

From several investigations, we know that SWOT analysis sometimes is oversimplified and cannot provide enough information for the firms (Haberberg, 2000; Panagiotou, 2003). Therefore, we conducted Porter's (1980) five forces model from suggestions from various researchers for external analysis of Thai Solar Energy PCL (Ruocco and Proctor, 1994 ; McGrail & Roberts, 2005). Five forces model is used to analyze the external environment of the firm. It consists of five parts that are powerful suppliers, powerful buyers, competitive rivalry, substitute products, and new entrants, respectively. However, the five forces model was criticized easily due to misuse (Porter, 2008). To avoid any misuse, we use the five forces template (Table 2) proposed by Dobbs (2014). He gave an order to all five forces and gave several measures for each force level. Even Porter did not give a specific order to all five forces. The template makes an order for five forces, which

start with competitive rivalry, buyer power, supplier power, new entrants, and substitutes. The order of five forces is based on the familiarity of the students or managers with all five forces. The way to use table 2 this format is that each of the forces has six to eight threats. And we can mark every threat to measure the relative level of it based on the information or data we can access by internet or TSE website and financial report. We will also write down the reason why we give such a relative level under every threat. Next step, we have a box to click if we determine this threat is the driving factor of that force on the left side of every threat. Dobbs stated that using this template could help improve our understanding and to have a deeper understanding of the industry structure using this template. And he also added that this template could be incorporated with SWOT analysis to have a better understanding of the firms.

Therefore, the whole analysis was mainly based on the TSE website, the TSE annual report (TSE,2021), and the author's own experience of working in the renewable industry. We will first use the Dobbs (2014) five forces template to analyze the external environment of TSE and follow by SWOT analysis for the internal environment of TSE. After these two analyzes, we can have a deeper analysis and a better understanding of both internal and external TSE. We will give some marketing strategy suggestions to TSE and try to help TSE increase their customer quantity and total installed capacity.

	Helpful	Harmful
Internal	Strengths	Weaknesses
External	Opportunities	Threats

Table 1 Conceptual Framework of SWOT analysis

DF	Threat Levels										
	Low			Threat Levels					High		
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>Few/Leader</i>			Existing Competitors					<i>Numerous/Balanced</i>		
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>High</i>			Industry Growth					<i>Slow/Negative</i>		
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>Low</i>			Fixed and/or Storage Costs					<i>High</i>		
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>High</i>			Product Differentiation					<i>Low</i>		
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>High</i>			Switching Costs					<i>Low</i>		
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>Small Increments</i>			Capacity Expansion					<i>Large Increments</i>		
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>Low</i>			Exit Barriers					<i>High</i>		

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Threats
Opportunities

Table 2 Example frame of five forces analysis

5. Five Forces Analysis

The following is five forces analysis based on Dobbs' template (Dobbs, 2014).

5.1 Threat of Competitive Rivalry

DF	Threat Levels										
	Low			Threat Levels					High		
<input checked="" type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>Few/Leader</i>			<i>Existing Competitors</i>					<i>Numerous/Balanced</i>		
	<i>Today Thailand has many renewable energy companies including domestic company like SPCG group and BCPG group. For the international one has Berkeley Energy Commercial Industrial Solutions (BECIS) (Modor Intelligence, 2022).</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>High</i>			<i>Industry Growth</i>					<i>Slow/Negative</i>		
	<i>The renewable energy capacity has grown 4 times in the past 20 years in Thailand and 75 times for the solar energy in the past 10 years (IRENA's statistics database).</i>										
<input checked="" type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>Low</i>			<i>Fixed and/or Storage Costs</i>					<i>High</i>		
	<i>Power purchase agreement (PPA) will require the developer company to invest a lot in the beginning and get the money back in the future (TSE,2021).</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>High</i>			<i>Product Differentiation</i>					<i>Low</i>		
	<i>For the product, it does not differ a lot. There are many solar panel suppliers but only one or two major company to supply such as the Jinko company (Jinko, 2022).</i>										
<input checked="" type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>High</i>			<i>Switching Costs</i>					<i>Low</i>		
	<i>For the power purchase agreement, it usually is 20-25 years. It is hard to switch to another after signing the contract. It costs a lot to break the contract (TSE, 2021).</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>Small Increments</i>			<i>Capacity Expansion</i>					<i>Large Increments</i>		
	<i>Although the renewable industry and solar energy have grown a lot in recent decades, they still have a lot of potential to grow in Thailand (Chimres & Wongwises, 2016).</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>Low</i>			<i>Exit Barriers</i>					<i>High</i>		
	<i>Same as customers, developer companies also hard to exit due to the length of contract once they sign up PPA. It costs a lot to break the contract (TSE, 2021).</i>										

Threats
1. More and more large international renewable energy companies want to join the Thai market.
2. If the company does not have strong enough financial back up, then easy to face the consequence of breaking the contract.
Opportunities
1. Seeking different cooperation with other companies, such as banks or funding for financial services, to grow the business.



5.2 Threats of Buyer Groups

DF	Threat Levels										
	Low			Threat Levels					High		
<input checked="" type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	Single/Few			Buyer Orders					Large Volumes		
	<p><i>In renewable industry, one project usually needs to invest a lot of capital and length also around 20 years. One customer normally has only one order, but sometimes they will have phase 2 or 3 later.</i></p>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	Low			Buyer Information					High		
	<p><i>Most of the buyers are from the government sector or other industrial and commercial companies. They have less understanding and information about renewable energy. The main priority for them is the reduction of electricity fees and CO2 emissions (TSE,2021).</i></p>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	Highly Differentiated			Industry Products					Standardized		
	<p><i>The product itself is not too much. However, it could be varied due to the different solutions presented by the developer company.</i></p>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	High			Buyer Switching Costs					Low		
	<p><i>The buyer switching costs are very high. Because the contract could be 20-25 years and it costs a lot if the buyer wants to break the contract.</i></p>										
<input checked="" type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	Low %			Overall Buyer Costs					High %		
	<p><i>For the buyer cost is very low, most buyers do not need to spend any capital expense and can enjoy lower electricity price than the market price (Tongsopit et al., 2016).</i></p>										
<input checked="" type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	High Profits			Buyer Profitability					Operating Losses		
	<p><i>The buyer could use 5%-10% less than market price to buy electricity from the developer company if they sign the power purchase agreement (Tongsopit et al., 2016).</i></p>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	High Impact			Buyer Product/Service					Low Impact		
	<p><i>For the buyer product, it has not a high impact to developer company. But one thing important is that customers should have enough space to install solar panel.</i></p>										

Threats
1. Threats from buyer groups are relatively low. But some customers do not have enough space to install the equipment
Opportunities
1. Using marketing channels to let customers know that they can have renewable energy without CAPEX (capital expenses) and can easily save their money. 2. Having a good relationship with the customer to create customer loyalty and have phase 2 or the same company in another country.



5.3 Threat of supplier groups

DF	Threat Levels										
	Low				0			High			
<input checked="" type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>Many Organizations</i>				Supplier Concentration			<i>Few Organization</i>			
	<i>The supplier concentration is very low. For example, the biggest solar panel supplier Jinko has around 40% market share, so it provides to many solar energy companies at the same time (CSIMarket, 2022).</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>High %</i>				Supplier Volume/Profit			<i>Low %</i>			
	<i>Supplier volume usually very large, once they choose the supplier, they will use their material for all customers. For one customer, he would need a lot of solar panels and other material.</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>Not Feasible</i>			Supplier Forward Integration			<i>Credible Threat</i>				
	<i>Using solar energy, for example, some of the companies produce solar panels and also provide solar energy to the customer. But it is not common, and the developer company was required to provide different solutions.</i>										
<input checked="" type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>Standardized</i>			Supplier Products			<i>Highly Differentiated</i>				
	<i>Most of supplier products are standardized, but they are different from other suppliers in quality (TSE, 2021).</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>Low</i>				Industry Switching Costs			<i>High</i>			
	<i>The renewable industry, is a unique industry so it is hard to switch it and cost high.</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>Many Viable Options</i>				Supplier Substitutes			<i>No Viable Options</i>			
	<i>It has many suppliers, but only has few major players in the world. Developers do not have many options of supplier (Jinko, 2022).</i>										

Threats
1. There are only few major suppliers in some materials like solar panels. It will cost a lot if they decide to increase the price.
Opportunities
1. Seeking suppliers for long-term cooperation. For example, signing a long-term contract to ensure steady supply of materials and price due to the large quantity of demand.



5.4 Threat of new entrants

DF	Threat Levels										
	Low							High			
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	High			Supply-Side Economies of Scale				Low			
	<i>Supply-side economies-of-scale are relatively high. Only a few suppliers to play an important role in this industry (Jinko, 2022).</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	High Network Effects			Demand-Side Benefits of Scale				Low Network Effects			
	<i>Due to the length of the contract and project size, it requires high effect of the network with demand-side and need to build a good relationship with customers (TSE,2021).</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	High			Switching Costs				Low			
	<i>The switching costs are very high. Because the company needs huge investment in it.</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	High			Capital Requirements				Low			
	<i>In renewable industry, usually require high capital investment at first. So, the company either has huge capital or needs support from partners or shareholders.</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	First Mover Benefits			Incumbency				Late Mover Benefits			
	<i>We now have many well-known renewable energy companies for both international or domestic (Modor Intelligence, 2022). Customers tend to choose a big company with good reputation.</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	Limited Access			Distribution Channels				Easy Access			
	<i>Distribution channels in the B2B industry are limited. B2B channels are less than the B2C industry, although B2B could use some of the B2C channels (Habibi et al., 2015).</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	Regulations			Government Policy				Subsidies			
	<i>The government is trying to promote renewable energy, especially solar energy because of its high potential. Thailand has the FiT program as financial incentives (Ismail et al., 2015). However, the rate of the FiT program has dropped in recent years.</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	Retaliatory			Anticipated Incumbent Response				Welcoming			
	<i>It does not anticipate having aggressive retaliatory action to new entrants, but new entrants are hard to compete with existing large-scale companies.</i>										

Threats
1. Even the Thai government has a subsidy policy, but the entry barrier is high for new entrants to the entry renewable industry.
Opportunities
1. Use the advantage of first mover and the existing government customers as good examples for potential customers. Keep the entry barrier for other new entrants.



5.5 Threat of substituents

DF	Threat Levels										
	Low			Threat Levels					High		
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>More Expensive</i>			Price/Indirect Costs					<i>Less Expensive</i>		
	<i>The indirect cost is relatively high. for the TSE financial report in 2021, the administrative cost consists of 16.5% of total revenue (TSE, 2021)</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>Low</i>			Buyer Price Sensitivity					<i>High</i>		
	<i>Buyers are price sensitive. Normally they don't need to afford capital expense, but they care about the price of electricity they can save.</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>High</i>			Buyer Switching Costs					<i>Low</i>		
	<i>The buyer switching costs are very high. Because the contract could be 20-25 years and it costs a lot if the buyer wants to break the contract.</i>										
<input type="checkbox"/>	-5	-4	-3	-2	-1	0	1	2	3	4	5
	<i>Risk Avoidance</i>			Buyer Profile					<i>Risk Seeking</i>		
	<i>The buyer normally seeks an electric bill reduction. They don't want to bear the risk.</i>										

Threats
1. Buyers are price sensitive. They may choose other developers if they could offer cheaper electricity price.
Opportunities
1. Using marketing tools to convey to customers the value by quality, not only the price competition.

6. SWOT analysis

6.1 Strengths

6.1.1 Government support

Solar energy received a lot of government support as well as other renewable energy such as the FiT program to earn more profit and to borrow money from government with favorable interest rates.

6.1.2 High quality control

TSE has a strict Engineering, Procurement, and Construction (EPC) contractor selection process and only chooses world-class contractors with an expert team to ensure that TSE could provide the best services (TSE, 2021).

6.1.3 Expand Investment Abroad

TSE has a total of 35 projects in Thailand and Japan. In Thailand, there are 33 projects with capacity of 145.2 MW, two other projects in Japan with 146.5 MW. TSE started investing in Japan in 2015 and is still expanding its services (TSE, 2021).

6.2 Weakness

6.2.1 High cost of raw material

TSE indicated in their annual report that raw material supply is still the constraint of industry growth (TSE, 2021). For the solar panel, sometimes the battery may need to be purchased from abroad.

6.2.2 High financial leverage

Praewpun (2021) stated that TSE was in a risky place due to high financial leverage for the past few years. It may be risky and also make investors and customers afraid of having a business relationship.

6.2.3 Limitation of capacity

According to Praewpun (2021), different places have different regulations and laws to limit the capacity of every solar plant or solar farm. Another is geographically, it may be due to the size of land and rooftop or the difficulty of installing on the mountain.

6.2.4 Long repayment period

In renewable industry, generally, long payback period. The contract between TSE and the customer could be at least 10 to 25 years and TSE usually needs to pay the initial capital expense (CAPEX). It requires TSE to spend a large amount of financial cost at an early stage and receive the money back later on.

6.3 Opportunities

6.3.1 Expand operation to more countries

According to the TSE website, TSE operates in only two countries, Thailand and Japan. This means it still has many countries where TSE could try to expand their investment and services.

6.3.2 Cost Management

Technology has improved a lot in the past decades and also for solar energy. It is expected to continue to improve in the future and reduce cost or efficiency.

6.3.3 Increasing MEA and PEA output

Now TSE is mainly performing type of projects of Metropolitan Electricity Authority (MEA) and Provincial Electricity Authority (PEA) in Thailand (TSE, 2021). Furthermore, the Thai government is trying to promote renewable energy (IRENA, 2017). It is possible to increase more MEA and PEA kinds of projects in Thailand.

6.3.4 Substitute of oil

Oil is not unlimited, and the price fluctuates especially during international events like wars or political issues. Government and companies tend to look for other renewable energy to replace oil.

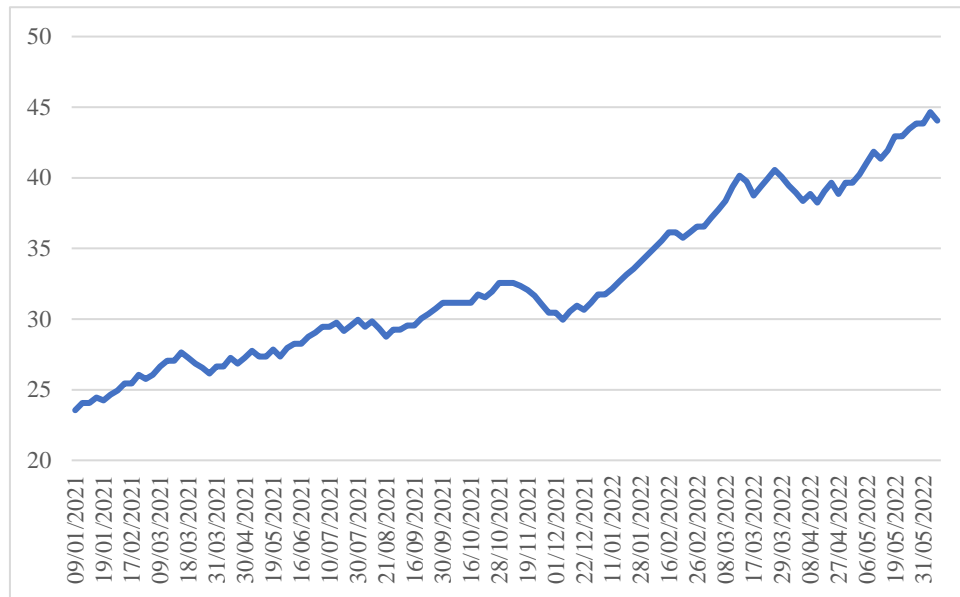


Figure 6 Thailand 95 oil price Baht/per liter from 2021 to 2022

Source: Bangchak Corporation

6.4 Threats

6.4.1 Intensive competition

As the renewable energy industry, more and more competitors have appeared. And Thailand not only have Thai local company, but some well-known global companies have also been to Thailand to join the competition.

6.4.2 Regulation in Thailand

Thailand is continuing to change the regulations for solar energy and other renewable energy, increasing uncertainty. Furthermore, for the incentive program, the details of the FiT program have changed many times since it was released (Tongsopit et al. , 2016).

7. Discussion and Recommendation

From the five forces and SWOT analysis we conducted above for Thai Solar Energy Company, we could give some recommendations related to the TSE marketing strategy based on our analysis. Before most of TSE's customers are Provincial Electricity Authority (PEA) and Metropolitan Electricity Authority (MEA), there is only one private sector customer with 8 MW capacity. The annual TSE report stated that TSE will seek more customers from private sector signing a Power Purchase Agreement (PPA) (TSE, 2021). Therefore, most of our strategy recommendations will focus more on potential private sector customers.

7.1 Marketing position

We can find that in TSE organization structure (Figure 7) does not have job function related to marketing. This is because TSE customers only have government authority before, so we see the position of government relation. However, it is important to have a marketing position to support different kinds of marketing tasks and activities if TSE wants to increase the number of private sector customers. It could hire one to two people first and form a marketing later if the marketing daily task starts to increase. For the marketing task details could be found in the next two recommendations.

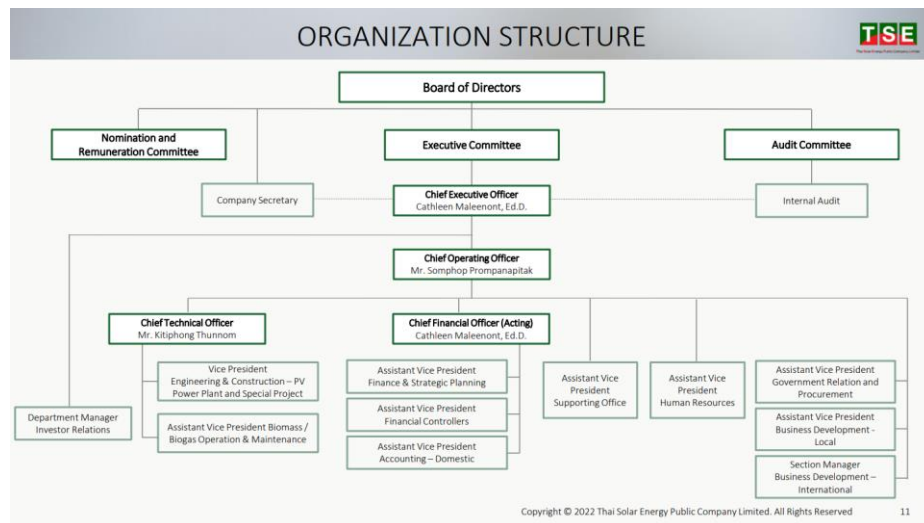


Figure 7 TSE Organization Structure

Source: TSE (2022)

7.2 Digital marketing

7.2.1 Social media

TSE is a B2B company. Many people think that social networks only work for the B2C industry, but Rindell & Strandvik (2010) argued that social networks could help improve brand image for decision makers. The social media tools for B2C and B2B are slightly different. B2C usually uses Facebook, Instagram, and Twitter. And the most common tool for B2B is LinkedIn. According to the LinkedIn website, it has 780 million members around the world. And LinkedIn is a specific social media for professional using. From the analysis we did previously, TSE could use LinkedIn as an important tool if they want to seize the opportunity of private sector company. TSE should create an official LinkedIn account and use it as an important marketing tool for other companies.

7.2.2 Other digital marketing

In addition to LinkedIn, TSE should focus on Google Search Engine Optimization (SEO). When the content of the website is SEO friendly, the ranking of the website or information will be higher at the same time. TSE could also use

could email marketing or hold webinars for the potential customer. Many companies are misunderstanding that renewable energy is an aggressive action and need to invest a large amount at the beginning. According to Tongsopit et al. (2016), signing a PPA agreement does not require any CAPEX, and the customer could save money at the same time. It is important to use marketing tools to communicate the message to the private companies who don't understand renewable energy. It could be a great opportunity to do business development after they know the benefit of renewable energy.

7.3 Website case study and testimonial

We can see from website is another important tool for TSE. TSE now has a great website with lots of content and has both Thai and English. However, TSE should emphasize more about the customer side if they want to have more private sector customers same as we analyze previously in opportunities part. In the strength of TSE, we found that TSE has a great relationship and did well with government sector customers. This could be a good starting point. And the only private sector customer TSE has is Arelic Hitachi Home Appliance (Thailand) Company Limited, which is also a well-known company. TSE could write a case study on how they help customers achieve their goal no matter whether they save money or reduce CO₂. Especially because of fluctuation of oil price, many companies try to seek alternative options as we analyze in opportunities part. Customers could also share their great experience working with TSE such as why they choose TSE and why they can trust TSE. This could help TSE promote itself and show that TSE is a company worth trusting and relying on. For the private sector, companies always want to find a reliable partner because the duration of the contract

could be 20 – 25 years and need to bear a huge cost if breaking the contract as we mentioned in the five forces analysis.

7.4 Off-line media marketing

7.4.1 Event

TSE should try to get more exposure from different types of physical event. Now the COVID situation is getting better, many events, like exhibitions and conferences start to be held. TSE not only need to join exhibitions and conferences related to renewable energy, it also need to join any kind of activities that have potential customer there. For example, automotive industry or Food and Beverage (F&B) industry or other industry that will have factory or spaces for installing solar panel or other solutions. It is important to have more exposure to those of potential customers if TSE is targeting a private sector customer. It is a great opportunity to show potential customers what TSE could help and the ability of TSE.

Another event TSE can do is the ceremony. TSE could do a ceremony when signing the power purchase agreement (PPA) or have a ceremony when the commercial operating date (COD). The ceremony was held not only to celebrate what TSE has done and also to promote how they could help customers reduce their electricity costs or reduce carbon emission. When having a ceremony, one could use a press release (PR) to release to different types of media tools to increase exposure.

7.4.2 Magazine

Another tool that TSE could use is the magazine. TSE could buy advertising in the magazine but not the normal magazine for everyone to read. It should focus on a specific type of professional magazine because TSE is in the B2B industry. There are some magazines related to environmental issues or renewable energy. And

exposure in this kind of magazines would be efficient for the target customer.

7.5 References for the customer

Another important tool to get customers is by references. References are an effective tool to get the customers, while company should take good care of existing customers, and therefore, the customers will recommend others to come. This could be a recommendation of customers by themselves or collaboration of on-line and offline media by TSE itself. Word of mouth is more effective than what the company says by itself.

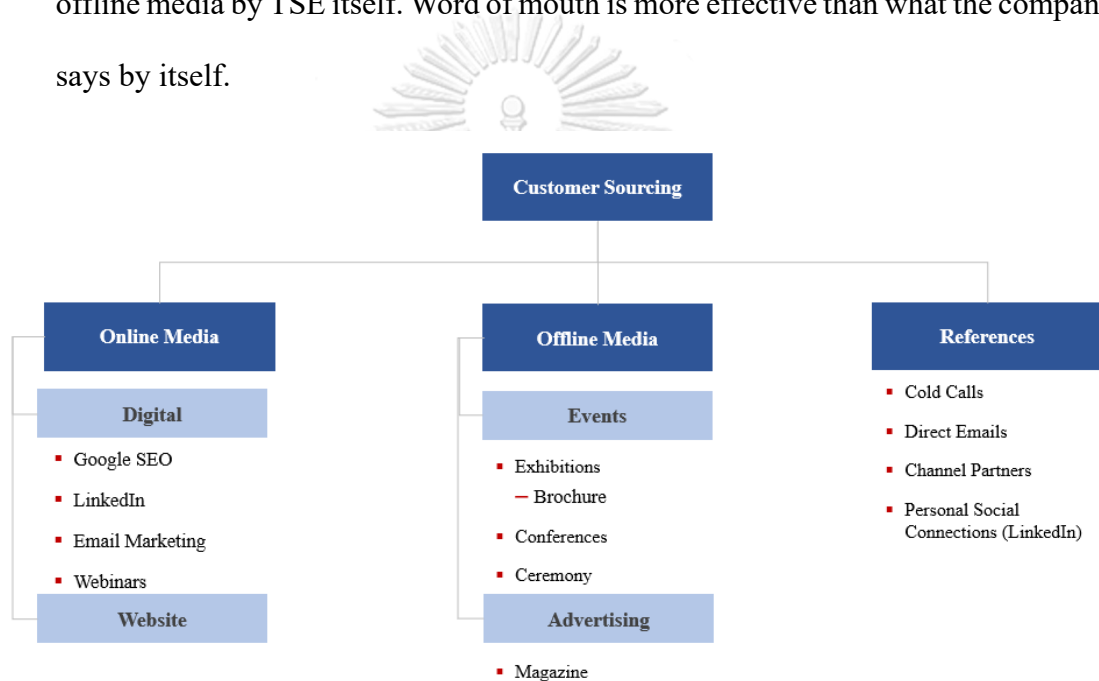


Figure 8 Customer sourcing for a renewable energy company

Source: Author

7.6 Expanding business scope and operating country

Today, most of the TSE business still focus on different types of solar energy, including solar roof, solar farm, and solar floating. TSE only has 3 biomass projects with capacity 22.2 MW out of a total of 291.7 MW of TSE business (TSE, 2021). In the TSE annual report, it stated that it is trying to expand its business to biogas, biomass, waste energy, wind energy, etc. There are Thailand and Japan for the

countries where TSE is operating. There are only 2 projects that out of total 35 projects TSE has. TSE has done well with government sector customers in Thailand. In the future, TSE should expand to more countries to seek more opportunities. It is common for an international company partner with a renewable energy company in a different company. By expanding business scope and operating country, TSE could break limitation of capacity for only government sector or only Thailand of weakness TSE has it now. And TSE could have bigger power to bargain with supplier and compete with other international companies, which could solve weakness and threats of TSE has.

8. Conclusions

In this research, we conducted SWOT analysis and five forces analysis to analyze Thai Solar Energy (TSE). After the analysis, we try to give TSE marketing strategy recommendations. To get more customers from the private sector, TSE should pay more attention to marketing activities compared to before. The first TSE should hire a dedicated marketing position to support the marketing task. Next, TSE should develop a digital marketing strategy, such as creating an official LinkedIn account and doing Google SEO. Another important online media is the website. TSE has done a great development on the website, but they should highlight customers and use customer testimonials to show that TSE is trustworthy and rely on. For the offline media, TSE should try to get more exposure in different kinds of activities and magazines not only for renewable energy ones. The last is references from customers. All the strategies must be implemented together to have the best effect.

By all the strategies mentioned above, TSE would have more opportunity to

reach customers. At the same time, TSE also needs to expand more solutions like wind energy and waste energy and seek more opportunities abroad, like it did in Japan. After having more customers, TSE will have the ability to compete with other international companies and will have bargain power with a few major suppliers.

Due to global warming and the fluctuation of oil prices. It is necessary to develop renewable energy. The renewable industry has grown dramatically, especially for solar energy in the past 10 years. By this research we try to help TSE to increase their customer number and the total capacity of electricity. Meanwhile, helping TSE could help the renewable industry in Thailand and Southeast Asia to develop better and take the next level.

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VITA

NAME	Kuan-Chin, Fuh
DATE OF BIRTH	12 November 1996
PLACE OF BIRTH	Taiwan
INSTITUTIONS ATTENDED	- Master of Arts in Business and Managerial Economics, Faculty of Economics, Chulalongkorn University, Thailand - Bachelor of Business Administration, National Cheng Kung University, Taiwan
HOME ADDRESS	55/218, Mori Haus, Sukhumvit 77, Phra Khanong Nuea, Watthana, Bangkok 10110



จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY