

Part 1

Business Profile

1. Overview of Business Operation and Policy
1.1 Vision & Mission
Vision

KTIS Group is a leading organization with an outstanding world-class identity. It has maintained good governance, integrated closely with agricultural and industrial industry, maintained social awareness, added values and quality to sugar and its by products, and utilized clean and eco-friendly energy to sustain stability.


Mission

- The company operates its businesses with keen knowledge and experiences, creative ideas and professionalism in order to generate innovation and value to its products and services ranging from upstream to downstream.
- The company creates a sustainable source of raw materials in order to support a fully integrated business network for the production of high-quality products as well as the generation of clean and eco-friendly biomass energy.
- The company conducts its business with high ethics and integrity while maintaining good governance in both existing and new business investments for valuable return in both financial and non-financial forms back to the community, investors, customers, employees, farmers and stakeholders.


1.2 Business Overview

The Company and companies in KTIS group operate a fully-integrated sugar production and distribution business as No. 3 leader in Thailand. In addition to 3 sugar factories, of which 2 are owned by the Company and 1 is leased, the Company also have ethanol plant, bleached bagasse pulp plant, power plant and bio soil conditioner plant.

The Company's businesses can be divided into 2 fields:

1. Sugar Production and Distribution Business

The Company produces sugar and distributes its sugar products to domestic and international customers through KTIS, TIS and KTIS (Branch 3). Sugar products of the Company are refined sugar, white sugar and raw sugar.

2. Downstream Business

Byproducts such as molasses and bagasse from the Company's sugar production process lead to many downstream business opportunities as listed below:

(1) Bleached Bagasse Pulp and Pulp Mold Production and Distribution Business

The Company operates bleached bagasse pulp production and distribution business through EPPCO. The group's pulp factory is located near the Company's sugar plant and can produce pulp from bagasse which is a byproduct from the sugar production process. EPPCO has 3 types of bleached pulp products: dry pulp, wet pulp and packaging products from bagasse pulp (Pulp Mold).

(2) Ethanol Production and Distribution Business

The Company operates ethanol production and distribution business through KTBE and uses molasses derived from the group's sugar factories as a primary raw material. At present, KTBE manufactures and distributes 2 different grades of ethanol products: industrial alcohol and fuel alcohol.

(3) Electricity Generation and Sale Business

At present, the Company's sugar factories and bleached bagasse pulp factories are equipped with electricity and steam generating modules which use bagasse, a byproduct from production processes, as primary feedstock. The electricity and steam generated are used in the production processes of our 3 sugar factories and other factories. The surplus electricity is sold to the Electricity Generating Authority of Thailand (EGAT) and the Provincial Electricity Authorities (PEA) under the power purchase agreements (PPAs). KTBP, TEP and RPBP have also been established to operate the 60MW, 50MW and 50MW biomass power plant which are currently in commercial operation.

(4) Bio Soil Conditioner Production and Distribution Business

The Group produces bio soil conditioner production and distribution business through KTBF and uses recycling filter cake from sugar production process and vinasse from the biogas and ethanol production process to be raw materials in bio soil conditioner products. KTBF has 2 types of bio soil conditioner products: powder and pellet.

1.3 Business Goals

The Company is committed to continuous development to build a solid foundation for its sustainable growth and development and to become a leading organization in vertical integration from Agricultural products to Industrial products by expanding our internal and external business links. The Company aim to create a superior value chain for the Company's businesses which include sugar and sweetener production, biomass power generation, ethanol production, bagasse pulp production, and bio soil conditioner production. All of the Company's products and by-products are eco-friendly and safe for consumers.

Business Goals :

Leader of Cane Business - The Company initiated a wide range of activities with an aim of developing the upstream businesses. Such activities include the cane breeding selection, the application of cane plantation management technology, the technical training for cane farmers, the development of farming tools and machineries, the use of soil conditioner which is a by-product in order to strengthen in security of supplies used in the production process.

Leader of Sugar Business – The Company has consistently invested in the sugar production business. Thanks to its massive production capacity, the Company commercially benefits from the economies of scale driven by its production effectiveness, lower costs of energy, and added value of products. Raw sugar is processed into high quality refined sugar and liquid sucrose for the food industry. This is an example of how the Company adds value to its products and reflect the Company's leadership in the sugar industry.

Leader of Bio Energy Business – With the expansion of its biomass power plant business, the Company has a large-scale electricity production capacity and earned extra income from its power generation business. Bagasse, which is a by-product of the sugar production process and complement the integrated value chain of our industrial and agricultural businesses.

Leader of Bio Product Business – The Company has allocated investment to the development of bagasse pulp products into high-quality and food-grade packages to add value to the Company's business and the society at large.

Leadership of Ethanol Business – For value-added creation, the Company uses molasses to produce fuel-grade and industrial-grade ethanol; and enhances its ethanol production process to effectively generate and make use of bio gas which is a by-product from the ethanol production. As a result, the Company's production and business chains are fully integrated and eco-friendly at every step, and contributes to the Company's leadership in this business.

Leadership in Bio Soil Conditioner Business – By-products from the sugar and ethanol production processes are developed into valuable bio soil conditioner products which are good to enrich the soil quality, the farmers can save farming costs and increase the productivity effectively.

Journey to Sustainable Growth :

(1) Research and Development – The Company has invested in research and development initiatives, focusing on the cane breed improvement, and the development of energy crops, production technologies and machinery to sustain its growth momentum and leadership in the business complex through the diversification of products in consistent with the word “More Than Sugar”. The company’s portfolio includes the cane business, agricultural business, sugar and sweetener manufacturing business, biomass power business, and biomass product business.

(2) Development of Cane Farmers, Cane Farmer Network, and Raw Material Source - The Company has substantially invested in technical and R&D projects with a view to enhance the knowledge of cane farmers and the members of farmer network. In addition, the Company extended financial support to cane farmers to boost productivity in terms of the cane output per rai and the plantation area expansion. In addition to creating greater job opportunities for agricultural workers, the Company has also introduced and integrated advanced farming technologies to develop agriculture to new horizon. Farmers are encouraged to work as partners who help each other.

(3) Personnel Development – Human resources are one of its greatest assets for the Company and employees at all levels are continuously provided with learning opportunities which can help sharpen their functional skills and complement technique. Employees are encouraged to invent and be involved in innovation projects. As a part of its proactive human resources management process, the Company has worked with local and central educational institutes to offer opportunities to learn skills and knowledge relevant to the Company’s business to students to build a pool of qualified candidates.

Journey to Professional Integrity and Corporate Governance :

Corporate Transparency - The Company has in place the Corporate Governance Handbook and has properly disclosed relevant information in accordance with applicable requirements in the spirit of transparency and integrity. As a result, every step of the Company’s processes is verifiable. The Company respects all of its stakeholders which include shareholders, executives, investors, employees, farmers, clients, suppliers, contractors, communities, governmental agencies, etc. In addition, the Company’s activities have been regularly audited by internal auditors and external auditors who are independent.

Contribution to Social, Educational and Environmental Development – The Company has put importance to activities which contribute to the development of the society, education, and environment, and has encouraged relevant parties to join such activities. The Company’s corporate social responsibility programs such as “The Home, Temple, School and Factory Participation Program” which the participated local temples, communities and schools will be trained proper sugar cane farming knowledge. The society will be more wealthy from sugarcane and breeding species.

“The Green Village Program” will also bring benefits for the participated farmers and communities by joining hands in the fire prevention from burning cane during harvesting season. From the program the farmers will get better price by selling unburned cane. The factory will get better cane quality and also the reduction of pollution from smoke of fire on society etc.

Promotion of Health and Occupational Safety – The wellness, life quality, and safety of the employees and surrounding communities are one of the Company’s main focuses which the Company has to strictly comply with the Health and Safety Law. Additional to the Law, the Company set up the teams to visit the community leaders, the religious leaders, including the nearby schools, and provide periodic medical check-up services to the residents of nearby communities. These activities has become the Company normal and continuous practice.

1.4 History and Milestones

Kaset Thai International Sugar Corporation Public Company Limited (“the Company”), formerly known as Kaset Thai Sugar Industry Company Limited, and companies in KTIS group are founded by Mr. Jaroon and Mrs. Hathai Siriviriyakul. With more than 53 years of professional experience in sugar business, KTIS group has extended into integrated sugar production business.

In 2013, the Company has converted into a public limited company and increased its registered capital from Baht 3,274,573,000 to Baht 3,888,000,000. In 2014, the Company has been listed on the Stock Exchange of Thailand which Baht 3,860,000,000 has been paid up and the security symbol “KTIS” on the Stock Exchange of Thailand. In 2015, the Company has increased its registered capital to Baht 3,888,000,010 and paid up capital Baht 3,860,000,010.

At the beginning, the group's sugar business was limited only to a sugar distribution in Nakhonsawan province. In 1967, Mr. Jaroon Siriviriyakul and a group of local distributors in Nakhonsawan province jointly acquired Mahakun Industry Company Limited, which has a sugar factory with the production capacity of 500 tons per day as a core asset, and renamed the company "Ruampol Enterprise Company Limited ("RPE"). With continuous improvement and development, the company's crushing capacity has increased from 500 tons of cane per day to 15,000 tons of cane per day.

In 1981, the Company acquired Thai Identity Sugar Factory Company Limited (TIS) and has continuously increased the production capacity of TIS's sugar plant to the level of 18,000 tons of cane per day.

In 1988, the Company further acquired Kaset Thai Sugar Company Limited which then had the production capacity of 6,000 tons of cane per day. To strengthen the financial structure and liquidity position of Kaset Thai Sugar Company Limited, our leadership has forged business partnership with UT Group Partnership Limited, a Singapore-based company, in 2008 to establish Kaset Thai Sugar Industry Company Limited which has incorporated sugar factory of Kaset Thai Sugar Company Limited in its umbrella and has further expanded its production capacity to stand today as the world's largest sugar factory with the capacity of 55,000 tons of cane per day.

In 2003, the Siriviriyakul family expanded into downstream business by establishing a joint venture with Permsinpattana Company Limited and 2 Singapore-based companies, i.e. King Wan Corporation Limited and Xylem Investment Partnership Limited. The JV was named Environmental Pulp and Paper Company Limited ("EPPCO") to produce bleached pulp from bagasse which is a by-product of the sugar production process. EPPCO can produce up to 100,000 tons of bleached pulp annually.

In 2004, the Siriviriyakul family founded a new company, namely Ekarat Pattana Company Limited ("EPC") under a joint venture with King Wan Industries Partnership Limited, Far East Distillers Partnership Limited and Sinotac Group Partnership Limited which are Singaporean entities to produce and sell ethanol from molasses. EPC has the production capacity of 230,000 liters per day. In 2017, changed its name to KTIS Bio Ethanol Co., Ltd. ("KTBE")

In 2010, the Siriviriyakul family commenced a new project that utilizes bagasse, a by-product from sugar production, for electricity generation. Kaset Thai Bio Power Company Limited ("KTBP") was established to run a 60MW biomass power plant which has commercially operated on 7 October 2013.

In 2011, the Siriviriyakul family furthered the advancement by recycling filter cake from sugar production process and vinasse from the biogas and ethanol production process into bio soil conditioner products. Kaset Thai Bio Fertilizer Company Limited ("KTBF") was established as a wholly-owned subsidiary of EPC in order to expand its integrated sugar business. KTBF has commercially operated and has the production capacity 15,000 tonnes of powder per year, 6,150 tons of pellets per year and 200,000 m³ of water per year. In 2017, changed its name to KTIS Bio Fertiliser Co., Ltd. ("KTBF")

To foster business growth through enhanced cane productivity and quality, in 2012 the Company furthered its cane farming and harvesting by purchasing 40 John Deere cane harvesters from T.K. Equipment Company Limited, an authorized dealer of John Deere in Thailand. As a condition under the cane harvester purchase agreement, John Deere will provide us training and consultation on the maintenance, repair, and development of our farming tools and equipment in order to increase the crop productivity of our farmers and in turn supply for our business operations.

In 2013, the Board and the shareholders' meeting approved the Company's acquisition of Thaiekaluck Power Company Limited ("TEP") to operate a 50MW biomass power plant with bagasse provided directly by TIS. In addition, the Company has established Ruampol Bio Power Company Limited ("RPBP") to operate a 50MW biomass power plant with bagasse provided directly by Ruampol factory.

The Board and the shareholders' meeting also approved the establishment of Sapsirikaset Company Limited ("SSK") to be in charge of the acquisition of lands to support KTIS group's business expansion. In 2013, SSK has purchased a total of 2,629-1-16 rais from parties not related to the Company.

In 2013, Sumitomo Corporation and Nissin Sugar Company Limited entered into the investment agreement to purchase the Company's ordinary shares worth up to Baht 2,650.0 million via 3S Holding Company Limited. As the companies are globally renowned trader and sugar manufacturer, the Company expects that the trilateral synergy will help strengthen the Company's competitiveness in the global market and business expansion in the Southeast Asia region.

In 2013, the Board approved the establishment of (1) Lopburi International Sugar Company Limited ("LIS"). In 2019, changed its name to Environment Pulp and Packaging Co., Ltd.(EPAC) (2) Lopburi Bioethanol Company Limited ("LBE") and (3) Lopburi Biopower Company Limited ("LBP") to support the business expansion.

In 2014, the Board approved the establishment of (1) KTIS Biogas Power Company Limited ("KBGP") to support the power business expansion, and (2) KTIS Bio Power Company Limited ("KBE") to support the ethanol and biomass power business.

In 2015, the Board of Directors approved the establishment of: (1) Kaset Thai Wiwat Co., Ltd. ("KTW") to support KTIS Group's asset management, and (2) KTIS Research and Development Co., Ltd. ("KTIS R&D") to support KTIS Group's businesses and its growth aspiration.

In 2019, the Board of Directors approved the (1) to KTIS Bio Ethanol Company Limited ("KTBE"), a subsidiary of the Company Has invested in a group of companies Global Green Chemical Public Company Limited in the project (Nakhonsawan Biocomplex: NBC) Environmental Chemistry Business Which is located in Takhli district Nakhon Sawan Province (2) Joint investment with Eurasia Light Industry Equipment Manufacturing Company Limited ("EAMC"), a machine manufacturer for container production from bagasse pulp and distributor of container from bagasse in China. Container plant from bagasse Which has a production capacity of 50 tons per day by having Enviroment Pulp and Packaging Company Limited ("EPAC"), a subsidiary of the Company Is a project company

Events and major activities in the year 2019

November 6, 2018 - Lopburi International Sugar Company Limited ("LIS"), a subsidiary of the Group Changed its name to Enviroment Pulp and Packaging Co., Ltd. ("EPAC")

January 17, 2019 - The Company has become the member of Bon Sucro and has been certified to be the sugar mills that comply with sustainable standard designated by Bon Sucro. The Company is one of the first listed companiest who received this standard certification.

February 8, 2019 - KTIS Bio Fertilizer Co., Ltd. (KTBF) which is the subsidiary of the Company has registered for 2 new trademarks named "Din YIm" (Smiling Soil) and "Sai Duan Job Tong" (The golden hoe and earthworm). The trademark will be used for sale promotion and marketing of fertilizer to serve the variety of farmers'deman

March 13, 2019 - KTIS Bio Ethanol Company Limited ("KTBE"), a subsidiary of the Company Has invested in a group of companies Global Green Chemical Public Company Limited in the project (Nakhonsawan Biocomplex: NBC) Environmental Chemistry Business Which is located in Takhli district Nakhon Sawan Province

May 13, 2019 – The company has approved the joint investment with Eurasia Light Industry Equipment Manufacturing Company Limited ("EAMC"), a machine manufacturer for container production from bagasse pulp and distributor of container from bagasse in China. Container plant from bagasse Which has a production capacity of 50 tons per day by having Enviroment Pulp and Packaging Company Limited ("EPAC"), a subsidiary of the Company Is a project company

Presently, the Company had invested in 16 subsidiaries and leases fixed assets from Ruampol Enterprise Co., Ltd.(RPE) as detailed following : (As at September 30,2019)

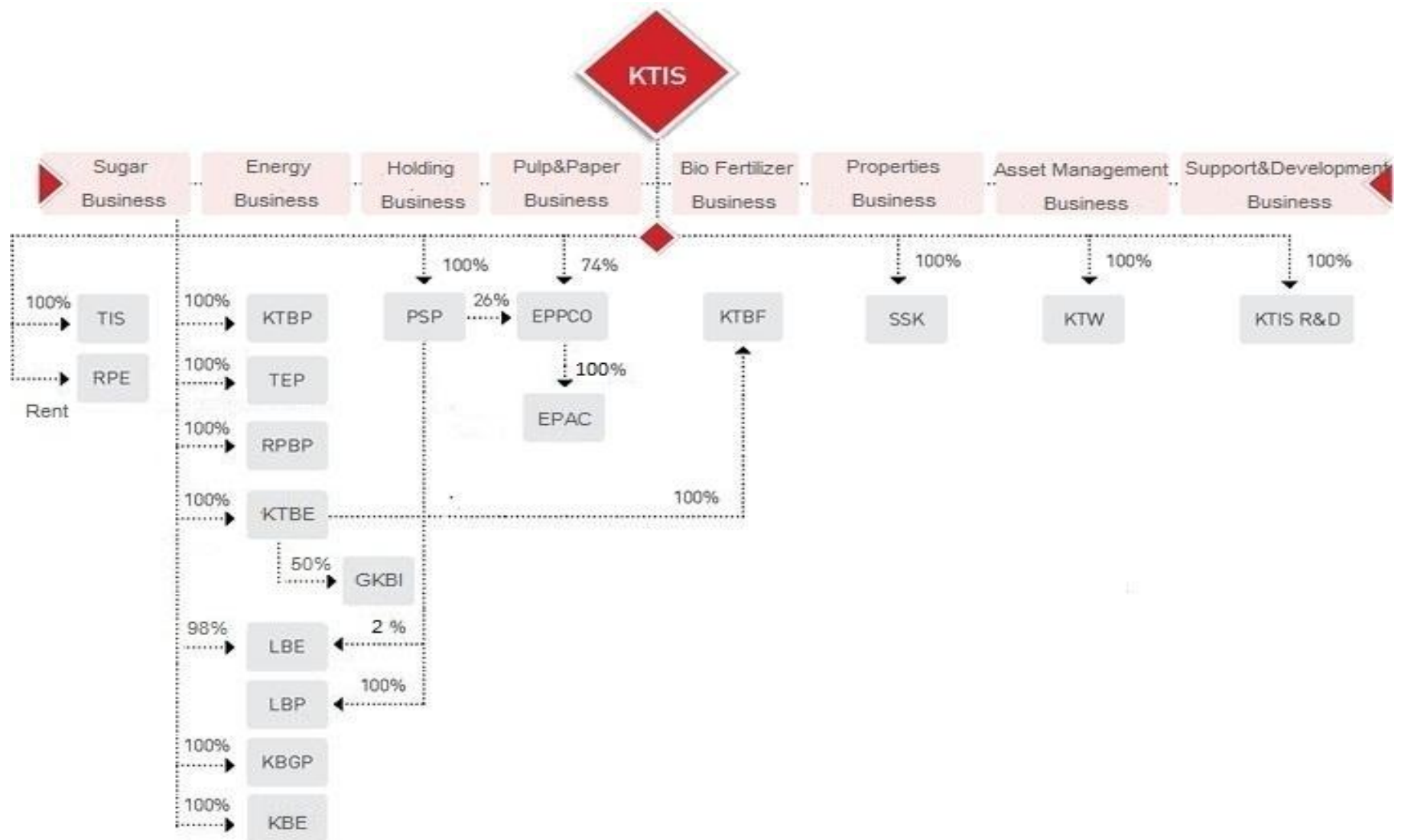
Subsidiary	Type of Business	Shareholding (%)
Thai Identity Sugar Factory Co., Ltd.(TIS)	Sugar production and distribution	100.0
KTIS Bioethanol Co., Ltd. (KTBE)	Molasses-based ethanol production and distribution	100.0
Environment Pulp and Paper Co., Ltd.(EPPCO)	Production and distribution of bleached bagasse pulp and Pulp Mold	100.0 ¹
Environment Pulp and Packaging Co., Ltd.(EPAC)	Production and distribution of Pulp Mold	100.0 through EPPCO
Kaset Thai Bio Power Co., Ltd. (KTBP)	Electricity generation	100.0
Thaiekaluck Power Co., Ltd.(TEP)	Electricity generation	100.0
Ruampol Bio Power Co., Ltd.(RPBP)	Electricity generation	100.0
KTIS Bio Fertiliser Co., Ltd.(KTBF)	Production and distribution of bio soil conditioner products	100.0 through KTBE

Subsidiary	Type of Business	Shareholding (%)
Permsinpattana Co., Ltd.(PSP)	A holding company which holds 26.0% shares of EPPCO	100.0
Sapsirikaset Co., Ltd.(SSK)	Land acquisition to support the group's business expansion	100.0
Lopburi Bioethanol Co., Ltd.(LBE)	Ethanol production and distribution (under consideration)	100.0 ²
Lopburi Biopower Co., Ltd.(LBP)	Electricity generation and sale (under consideration)	100.00 through PSP
KTIS Biogas Power Co., Ltd.(KBGP)	Electricity generation and sale (under consideration)	100.0
KTIS Bio Energy Co., Ltd.(KBE)	Ethanol production and distribution (under consideration)	100.0
Kaset Thai Wiwat Co., Ltd. ("KTW")	Support company's asset management	100.0
KTIS Research and Development Co., Ltd. ("KTIS R&D")	Support company's businesses and its growth aspiration.	100.0
GGC KTIS Bio Industrial Co., Ltd (GKBI)	Joint venture projects in industrial chemicals for environment	50.00 through KTBE

¹Directly holds 74.0% of the total shares and directly holds 26.0% of the total shares through Permsinpattana Co., Ltd.

²Directly holds 98.0% of the total shares and directly holds 2.0% of the total shares through Permsinpattana Co., Ltd.

Diagram1 : Corporate Business Structure (As at September 30,2019)



2. Nature of Business
2.1 Revenue Structure

In 2019, the Company's income from sugar production and distribution was 68.9% of total revenues from sales and services of the Company. Moreover, the business income from the by-products of paper, pulp, ethanol and fertilizer 31.1% of the Company's sales and services. Details for 3 years were as follows:

	2017		2018 (9 months)		2019	
	Revenue (MB)	Percentage	Revenue (MB)	Percentage	Revenue (MB)	Percentage
1. Sugar and molasses sales revenue						
Domestic	5,326.6	30.4	3,878.5	22.4	3,398.5	21.1
International	8,178.0	46.7	9,178.4	53.0	7,708.9	47.8
Total sugar and molasses sales revenue	13,504.6	77.1	13,056.9	75.4	11,107.5	68.9
2. Pulp sales revenue						
Domestic	259.6	1.5	213.2	1.2	304.2	1.9
International	1,001.2	5.7	1,003.4	5.8	1,005.4	6.2
Total pulp sales revenue	1,260.8	7.2	1,216.6	7.0	1,309.5	8.1
3. Ethanol sales revenue						
Domestic	1,654.2	9.4	1,313.4	7.6	1,619.4	10.0
International	-	0.0	-	0.0	0.0	0.0
Total ethanol sales revenue	1,654.2	9.4	1,313.4	7.6	1,619.4	10.0
4. Other sales revenue						
Electricity sales revenue	583.7	3.3	1,131.2	6.5	1,456.8	9.0
Revenue from other sales and services	521.4	3.0	587.5	3.4	636.9	3.9
Total other sales revenue	1,105.1	6.3	1,718.7	9.9	2,093.6	13.0
Total revenue	17,524.6	100.0	17,305.7	100.0	16,130.0	100.0

Source: The Company's financial statements.

Nature of Business
Sugar : Production and Distribution Business

The capacity of the Company's sugar factories is approximately 88,000 tons of sugar cane per day. The Company produces and sales sugar to domestic and international customers. The products can be categorized into 3 types: refined sugar, white sugar, and raw sugar.

(1) Raw Sugar

Raw sugar crystals are dark brown in color and the color index of raw sugar ranges from 1,001- 3,800 ICUMSA¹. This type of sugar must be purified and processed into white sugar or refined sugar and cannot be consumed directly.

The Company specially produces J-spec raw sugar according to the Japanese regulatory standards, for export to Japan and acquires high J-spec raw market share.

¹ ICUMSA is a standard unit for measuring sugar color factor. Sugar with higher purity has lower color index level.

² Polarization is the apparent sucrose content of sugar i.e. sugar with 99.5% polarization value has 99.5% of sucrose in its mass content. A higher level polarization means higher sucrose content or higher level of sugar quality .

(2) White Sugar

White sugar is raw sugar that has been purified to remove impurities in sugar crystals. Its color is lighter than raw sugar, either light brown or white, and ranges from 46 – 1,000 ICUMSA. This type of product is typically used in soft drinks and convenience food businesses as well as household consumption.

(3) Refined Sugar

Refined sugar is raw sugar that, similarly to white sugar, has been processed to remove impurities in sugar crystal. Refined sugar has a higher level of purity than white sugar and is crystal white in color with the color index of 0 - 45 ICUMSA. This type of product is suitable for industries which required sugar with high purity index such as pharmaceutical industry and beverage and energy drinks industry.

Details of the Company's sugar products are shown in the table below:

Product	Color (ICUMSA)	Polarization ² (%)	Moisture (%)
J-Spec Raw Sugar	1001 - 3800	96.00 – 97.99	Not exceeding 0.6
Raw Sugar	1001 - 3800	Not less than 98.00	Not exceeding 0.6
White Sugar	46 - 1000	Not less than 99.50	Not exceeding 0.04
Refined Sugar	0 - 45	Not less than 99.80	Not exceeding 0.04

Source: KTIS.

Sugar : Market Conditions and Competition

Global Market Conditions

Sugar is one of the most important commodities in the world. Major sugar producers are Brazil, India, European Union, Thailand and China. Asia is the continent that records the 2nd highest sugar output following the previous crop, accounting for 40.8% of the global output in the production year 2018/2019. Thailand is the world's 3rd largest sugar producer but the domestic sugar consumption rate of Thailand is relatively small for its production. As a result, Thailand can export sugar in large quantity, being the 2nd largest sugar exporting country in the world.

Major Changes in Global Sugar Market in Past Decade

Sugar Trade Liberalization in Brazil

When the sugar trade liberalization was first introduced and the controls were eventually relinquished in Brazil, it had caused structural changes to Brazilian sugar industry and significant increase in the country's sugar exports. As Brazil is the largest exporter in the world market, any factors effect Brazilian sugar industry, will have material impact on the global sugar market such as the movement of Brazilian Real, Brazil's sugar and ethanol policies by Petrobras etc. Since 2018 Brazilian producer has been trying to maximize ethanol production due to world sugar price drop. On the other hand weaker Brazilian Real lower the dollar value of ethanol parity.

Low Sugar Production in EU Countries, but restart sugar export from 2017

In 2004, the World Trade Organization (WTO) ruled that EU's sugar subsidies violated the General Agreement on Tariffs and Trade (GATT) and thus cut its support for EU's sugar production. Therefore, EU's revised sugar Quota system and it limit sugar production and export. However from October 2017, this system was de-regulated and the export was jumped up to 3.8 million tons in 2017/2018 crop from previous 1.5 million tons. On the other hand regarding 2018/2019 crop, the sugar production be expected to reduce by about 3.2 million tons due to dry weather across most of the key growing areas.

Asian Economic Growth

The continuous economic growth of Asian countries, especially China, India and ASEAN countries, led to higher sugar consumption and production of the region. At present, Asia's sugar production is around 70-80 million tons per year while the consumption outpaces the production. Hence the need for sugar imports at more than 20.0 million tons each year.

Sweet Tax

In Thailand sweet tax was installed in October 2017, and Philippines and Malaysia also introduced sweet tax in January

2018 and in July 2019 respectively. Since 2016, WTO recommends to install sweet tax system in order to reduce soft drinks consumption, which leading to obesity. After that USA and Mexico started to install in part of the countries. And so far, India and UK have installed the sweet tax as well. In addition to this, especially in ASEAN, some other countries are considering about this kind of sweet tax system. Which movement might damper the expanding sugar consumption.

Higher Investment in Commodity Markets by Funds and Speculators

During the past 10 years, funds and speculators have increased their investment in commodity markets, especially agricultural commodities and sugar commodities. This has intensified the sugar price volatility and influence from non-fundamental factors, such as macro market, technical indicators, currencies, and ethanol parity.

Sugar Demand and Supply

In 2017/18, the global sugar output was 195.2 million tons, which was the record high number mainly due to big crop in India and Thailand. In 2018/2019, the global sugar output is forecast at approximately 186.3 million tons, which reduced by around 10 million tons mainly due to sugar mix reduction in Brazil. On the other hand the global sugar consumption is expected at around 183.4 million tons as historical high, but the number is still lower than sugar output. The global sugar supply/demand balance turned to big surplus in 2017/18 and is still surplus in 2018/19. Although CS Brazil production drop by maximizing ethanol production since 2018, it was not enough to compensate for the surplus. As a result, the global sugar price headed to downside and touched 10 years low of 9.83c/lb in August 2018, but after that has been remained mainly within a range between 11c/lb to 13c/lb.

In 2019/2020 the global supply/demand balance is expected to be turned deficit since 2016/17. The main reason is that India is expected to reduce its production below 30 million tons, which is around 5 million tons drop from the previous crop and Thailand is also forecast to drop sugar output mainly due to draught. Then the volume of deficit is expected at around 4.7 million tons.

Source: LMC, Monthly Sugar & Sweeteners Update, A supplement to the World Sugar Price View October 2019

In the year 2018/2019, Thai sugar production was 14.58 million tons while domestic consumption was estimated at 2.60 million tons which showed supply was much more than domestic demand and excess sugar about 11.98 million tons would be exported.

In the production year 2018/2019, Thailand have 56 sugar mill and recorded the total sugar output of 14.58 million tons as shown below:

Producer	Number of Sugar Factory of Each Producer	Sugar Output (Ton)	Market Share (%)
Mitr Phol Sugar Group	6	2,921,572.0406	20.04
Thai Roong Ruang Sugar Group	9	2,415,768.2645	16.57
Khon Kaen Sugar Group	5	1,144,412.9429	7.85
KTIS Group	3	1,032,848.9885	7.08
Korat Industry Sugar Group	2	1,000,257.7900	6.86
Cristalla Sugar Group	3	709,281.5000	4.86
Wangkanai Sugar Group	4	685,201.8650	4.70
Banpong Sugar Group	2	576,494.0270	3.95
Thai Kanchanaburi Sugar Group	2	420,091.1200	2.88
Kumphawapi Sugar Group	2	394,218.8800	2.70
Khonburi Sugar Group	1	372,650.3850	2.56
Mitr Kaset Sugar Group	2	300,934.5260	2.06
Ratchaburi Sugar Group	2	210,342.0760	1.44
Rayong Sugar Group	2	185,468.4100	1.27
Others	11	2,211,127.7850	15.16
Total	56	14,580,670.6005	100.00

Source: 2018/2019 Cane and Sugar Production Report as of the End of Cane-Crushing Period (Updated), Office of Cane and Sugar Board.

Sugar : Competitive Strategy
(1) Security of Raw Material Supply

The Company has put importance to investments and developments in terms of academic sectors, service excellence, farmers' knowledge and cultivation system which contribute to better quality of sugar products and plantations. With a reliable source of quality raw material supplies, our sugar business and other downstream businesses are able to proceed for continuous and sustainable growth. Further, the Company has implemented the standard for sustainable agricultural products "Bon Suco" into the Company's plantation area which requires the examination of land before plantation, enrichment and harvest.

(2) Production Efficiency and Cost Reduction

The Company has steadily invested in our human resources and machineries in order to improve our production efficiency, and also planed to increase the sugar production capacity to capture the advantage of economies of scale, which will result in lower average costs. The Company employs a team of engineers who are capable of investing and developing our own machinery at the lower cost than purchases of imported machineries. In addition, this team of engineers can maintain and repair the majority of our machineries without third-party assistance.

(3) Mitigation of Impact of Natural Disasters

Recognizing the threats from natural disasters, such as drought and pest infection, to our raw material supply, the Company has developed several corrective and preventive measures by introducing innovations and techniques derived from the Company's researches and studies for better agricultural productivity. For examples the drip irrigation system which can solve the issue of water supply shortage during the dry season and the biological pest control technique which makes use of natural enemies such as Trichogramma spp., Cotesia sp. and Earwigs.

(4) Development of Value-Added Products

The Company strives to convert byproducts and waste into value-added products in order to increase the value for our shareholders and minimize waste from the sugar production processes. Under the visionary leadership of our management team, we aim to create an eco-friendly supply chain through the application of clean and eco-friendly technologies.

The Company has collaborated with Sumitomo Corporation Co., Ltd., our strategic partner and investor, and other world-class organization in continuously adding value to core products and byproducts.

Sugar : Distribution Channel
(1) Industrial Customers

Industrial customers purchase sugar products with the intent of using them as raw materials in their production process and typically procure sugar products in a large volume under annual purchase agreement. The Company has successfully attracted and retained industrial customers who comprise a large proportion of the Company's sales revenue as a result of the Company's reliability in terms of stable supply, fine quality, and punctual delivery. The industrial customers are as follows,

Type of Industrial Customer						
	2017		Sep 30, 2018 (9 months)		2019	
	(Sales Record)		(Sales Record)		(Sales Record)	
	Quantity ¹ (Ton)	%	Quantity ¹ (Ton)	%	Quantity ¹ (Ton)	%
Beverage Industry	80,532.95	51.42	53,162.52	51.84	50,607.250	54.81
Food Industry	23,123.70	14.76	11,453.80	11.16	7,616.150	8.25
Dairy Products Industry	52,929.30	33.80	37,764.22	36.82	33,838.05	36.65
Candy	30.00	0.02	180.00	0.18	270.20	0.29
Total	156,615.95	100.00	102,560.54	100.00	92,316.65	100.00

Source: KTIS

¹ Consolidated sales of the following 3 sugar factories:

- 1) Sugar factory operated by Kaset Thai International Sugar Corporation Pcl. (KTIS)
- 2) Sugar factory operated by Thai Identity Sugar Co., Ltd. (TIS)
- 3) Sugar factory which KTIS has leased from Ruampol Enterprise Co., Ltd. (RPE) under a long-term lease agreement

(2) Distributors

The Company sells sugar by way of the "ex-factory" method to distributors which comprise a smaller proportion of the Company's sales revenue, compared to industrial customers. This is partially because the Company has to sell sugar to distributors at a discount from monthly average surveyed selling price in the country. The discount rates depend on the prevailing market conditions and demand.

(3) Overseas Customers

Sugar exports to Japan accounts for approximately 60.0% of the Company's total export sales. Most of overseas customers are sugar traders, including well-known companies such as Alvean Sugar, S.L., Wilmar Trading Pte Ltd., Czarnikow Ltd., Cofco Co Ltd., Sumitomo Corporation and Sucden etc.

Bleached Bagasse Pulp and Pulp Mold : Production and Distribution Business

The Company operates bleached bagasse pulp production and distribution business through EPPC which has the production capacity of approximately 100,000 tons per year. The factory is currently the only mill that can produce bleached bagasse pulp which is a byproduct from the Company's sugar production process. EPPCO has 3 types of pulp products: dry pulp, wet pulp and packaging products from bagasse pulp (Pulp Mold)

(1) Dry Pulp

Dry pulp is made from bagasse with a moisture content of about 10 - 12%. It weighs about 250 kilogram per bale and has a brightness of no less than 80% ISO with TAPPI dirt count of less than 10 ppm. Dry pulp is a core product of bleached bagasse pulp business.

(2) Wet Pulp

Wet pulp is made from bagasse with moisture content of about 50. - 52.0%. It weighs about 225 kilograms per bale but has the same brightness and TAPPI dirt count as dry pulp. It can be used more easily than dry pulp in a paper manufacturing process because of its higher moisture content, which saves time in the re-boiling process. However, wet pulp has a shorter storage period than dry pulp and incurs higher transportation costs. Thus, EPPCO distributes wet pulp only to domestic customers.

(3) Packaging products from bagasse pulp (Pulp Mold)

Pulp Mold used bagasse pulp 100% as raw material to produce different types of packaging products at EPPCO factory. The products will be bio-degradation which are Eco friendly products consistent with the demand trend for products that save the environment in both domestic market and worldwide. The products will add value to EPPCO bagasse pulp.

Bleached Bagasse Pulp : Market Conditions and Competition

1. Global Market

In 2019, the situation in pulp and paper market has been in the down side due to the trade war between China and U.S.A and the China's policy of banning the import of low-quality paper. The price of short fiber pulp has decreased significantly especially Bleached Eucalyptus Wood Pulp. The average of short fiber pulp in Q2 of 2019 was between 540-585 usd/ton which decreased about 210-230 usd/ton from Q2 of 2018. The price is expected to fluctuate in this range until the end of 2019. For 2020, the price will continue to decrease, if the super power countries cannot settle down their trade war dispute.

1.1) Selling Price of Pulp in August 2018

In Chinese market, the selling price of long fiber pulp decreased from 860-875 usd/ton in August 2018 to 530-580 usd/ton in August 2019. The price of short fiber pulp decreased from 770-780 usd/ton in August 2018 to 470-500 usd/ton in August 2019. For other East Asian markets, the price of long fiber pulp decreased from 855-895 usd/ton in August 2018 to 530-580 usd/ton in August 2019, while the short fiber pulp decreased from 770-805 usd/ton in August 2018 to 480-520 usd/ton in August 2019.

Source: PPI ASIA's report as of September 3, 2018

1.2) 2020 Global Market Outlook

In 2020, the pulp and paper industry situation trends to slow down from the world economic regression, especially the Eco-friendly packaging products in China that is effected by 25% increase of import duty imposed in U.S.A., so the price decrease and will not rise drastically. It is forecasted that there will be more expansion of industry of food container made from pure fiber in non-China countries. Further, the policies from other counties such countries in EU. shall positively affect the pulp industry.

In 2019, there is not any investment to expand short pulp production from Eucalyptus in South America while the demand for paper pulp in this region will be gradually stable and causes price of paper pulp in the world market remains at low level for the whole year.

(2) The Country Situation.

On Q1/2019 the pulp paper and publication export index showed an increase in paper pulp, cardboard and printing paper which goes in the same direction with the export. The export value decreases in the sections of paper pulp, paper and printing paper especially in China and southeast Asia countries which are important export countries. Further, the increase of import in pulp and paper products also affects the value of export.

2.1) Production Situation

In Q1/2018, the production index compared on QOQ% basis showed a decrease in paper pulp, cardboard and printing paper at 1.25%, 11.49% and 1.49% respectively. When compare on YOY% basis, the index decreased in all sections which are paper pulp, cardboard, Kraft paper, corrugated paper and printing paper 0.44%, 12.67%, 0.39%, 0.95% and 5.56% respectively from the decrease of domestic demand and the high volume import of pulp and paper products.

2.2) Export Situation of pulp and printing paper

In Q1/2019, the export value amounted to USD 496.68 million which reduced 12.94% QOQ, the sections of pulp, paper and printing paper decreased 29.3%, 11.03% and 7.42% respectively due to the export of pulp made from reused paper and printing paper. The export of pulp, paper and printing paper compared on YOY% basis increased 10.71% due to the slowdown import from China and southeast Asia countries.

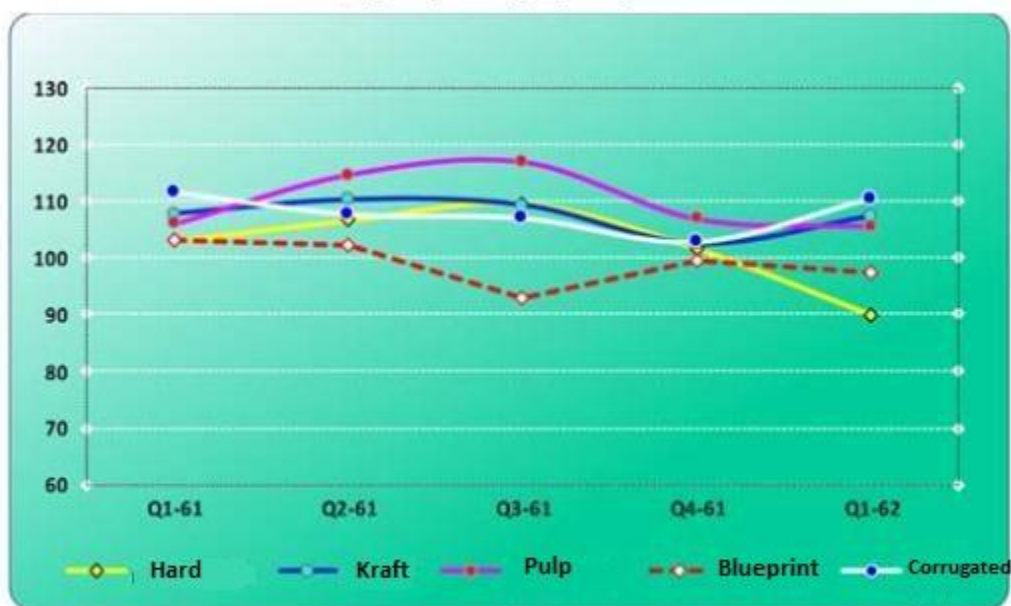
2.3) Import Situation of pulp and printing paper

In Q1/2019, the import value amounted to USD 725.27 million increased 8.05% QOQ and increased 6.01% YOY due to the increase of import of pulp and paper products which could not be domestically produced. The import of books and publication reduced 5.7% and 1.8% QOQ respectively as the printing media are substituted by digital media.

Related Government Policies

Pulp is one of 52 items of goods that the price control restriction is cancelled by the cabinet resolution due to the market stability and normality which the competition should be encouraged. The pulp producers and entrepreneur should closely update the price situation.

Index of pulp and paper production



Source : Office of Industrial Economic

Export - Import Paper Pulp and Printing Paper



Source : Information and Communication Technology Center, Ministry of Commerce

Production of Industry Sector Situation

Indicators	2017	2018									2019				
%YoY	Year	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Jan	Feb	Mar	Apr	May
MPI*	1.8	4.9	4.9	4.8	2.3	-0.1	5.7	0.8	1.2	3.6	0.6	-1.3	-2.7	1.5	-4.0

** MPI revised the industry index for the year 2019 by categorizing the industrial products according to the Thai Industrial Standard Classification 2009 (ISIC 2009) into 21 categories, 68 industrial sectors, 255 industrial products and indexes using the Laspeyres, base year 2016, Weighted Average with Value Added, Product Value, Value of sales and inventory value. According to the 2017 Business and Industrial Census of the National Statistical Office.

Industrial Economic Status in May 2019 as considered from Manufacturing Production Index (MPI) decreased 4.0% compared to the same period of the last year due to the regression of export for 5.8%.

Considering the three-month MPI (% YoY) MPI data, it is evident that the industrial production trends to slow down continuously as a decrease 1.3% in February, 2.7% in March and slightly decrease 1.5% in April.

Indicators	2018								2019				
%MoM	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
MPI*	14.9	-1.5	-2.8	1.7	-2.7	2.1	0.9	-1.9	4.7	-2.6	9.5	-17.4	8.63

For the 3 months of February, March and May, Manufacturing Production Index (MPI) has an exchange rate as follows: decrease 2.6% in March, increase 9.5% in April and decrease 17.4% in May. This circumstance is normal in these months due to less production because of less working days.

Bagasse pulp market situation 2019, and trends in 2020.

Demand for bagasse pulp both domestically and internationally continues. The environmental policies of serious ban on plastic and foam utensils in European countries and Tokyo Olympic 2020 which focuses on environmental issues will increase the demand of eco-friendly products and bagasse pulp. The bagasse pulp producers in China, Iran, India and Thailand will benefit from such demand but there will be more price competition. The severe decrease of short fiber pulp Eucalyptus Wood Pulp and the expansion of bagasse pulp production capacity in China and Iran to cover an increasing

demand are the major factors that affect the decrease of bagasse pulp. The price competition is increasing to maintain the market share especially in China bagasse pulp market. Therefore, Chinese manufacturers have implemented cost cutting by adding more portion of short fiber wood pulp in to their products due to the cheaper price.

The unsettled trade war between the United States and China impacts of food packaging products made from bagasse pulp. By raising the tax rate to 25%, the trade in such products has slowed down as both trading partners need time to adjust themselves for these measurements, the consequence will be the higher price in U.S.A market.

For the company's own customers, there is still continuous demand for bagasse pulp. This group of customers produce environmentally-friendly packaging products and require bagasse pulp as raw material in order to create environmental image of the product in the printing paper and sanitary paper.

In 2019, the Company has adjusted down its sales price of bagasse pulp according to the price of world pulp by decreasing an average FOB price of 745 usd/ton in August 2018 to 715 usd/ton in August 2019. There were continuous orders from domestic market and overseas markets.

In 2020, the world economy and the domestic economy will continue to regress, if the trade war could not be settled. The demand for bagasse pulp will continue to grow, especially overseas exports that results from environmental policies in EU countries which focus on the environmental friendly products, from the expansion of the production of the environmental packaging industry in country and abroad and the expansion of KTIS' bagasse pulp utensils production line .

The company's bagasse pulp production in 2020 is expected to be at the same quantity in 2019 and costs of production will be controlled more or less. The sale price is expected to be lower than the average selling price in 2018 as the price being adjusted according to the world market.

The largest paper pulp manufacturers in 2019 were as follows,

Manufacturer.	Capacity of production (' 000 tons).	The type of the raw materials.
Double A	560	Eucalyptus wood.
Phoenix Pulp & Paper	240	Eucalyptus wood.
Panjapal Pulp Industry	110	Eucalyptus wood.
SCG Paper	107	Eucalyptus CTMP
EPPCO	100	Bagasse
Siam Cellulose	86	Eucalyptus wood.
Fiber Pattana	20	UHT box
Thai Gorilla Pulp	9	Palm leaves.
Total	1,232	

Source : 2016-2018 Directory of the Thai Pulp and Paper Industries Association (TPPIA).

Market situation of packaging products from bagasse pulp (pulp mold) 2018/2019

The growth of demand for Eco friendly packaging products, especially from bagasse pulp increases continuously. The large producers in China still have the production expansion plan to supply for the world's growing demand.

Thailand presently has a growing demand of pulp mold due to the encouragement and promotion from government and private sector that help drive the growth in 2019 and shall continue to grow in 2020. Therefore, the Company decided to expand the production capacity, the new factory will have the capacity of 50 tons per day, to serve the increasing demand and make the products become more accessible by consumers.

Bleached Bagasse Pulp : Competitive Strategy

(1) Reliable Raw Material Source

EPPCO has a strong raw material security as its bagasse supply is primarily provided by the Company and factories in KTIS group which altogether record the cane-crushing capacity of more than 10,000,000 tons of cane per year. This enables EPPCO to effectively plan its bagasse-based production in advance.

With the raw material security, EPPCO can provide its clients with reasonable assurance of EPPCO's ability to satisfy their demand.

(2) Low Cost of Raw Materials

EPPCO has lower production costs, compared to other pulp manufacturers, largely thanks to the short distance between EPPCO factory and the Company's factories being EPPCO's suppliers. The delivery of supply through conveyor belt system instead of trucks will lead to substantial save transportation costs.

(3) Environmental Friendliness

Bleached bagasse pulp of EPPCO is virgin pulp which is made from bagasse and thus is environmentally friendly. The increasing environmental awareness has led to the rise in demand for EPPCO's eco-friendly products. EPPCO's bleached bagasse pulp factory is the first pulping factory that is awarded the ISO 22000 food safety accreditation and the GMP&HACCP certification from SGS (Thailand) Co., Ltd. which guarantee that its products are safe for consumption and can be used as raw material for food packaging production.

Bleached Bagasse Pulp : Distribution Channel
(1) Domestic Distribution

EPPCO distributes bleached bagasse pulp directly to industrial customers on a monthly basis or as agreed with customers. Strategic customers of EPPCO include major leading paper product manufacturers in Thailand using eco-friendly pulp in their operations such as SCG Paper Pcl., Kimberly-Clark (Thailand) Co., Ltd., Berli Jucker Co. Ltd., Cellox Co. Ltd. and Biodegradable Packaging for Environment Co. Ltd. To promote customer satisfaction, EPPCO has technical sales personnel who are highly knowledgeable and can provide customers with useful information for correct and efficient use of bleached bagasse pulp.

(2) Overseas Customers

Generally, distribution of bleached bagasse pulp to international markets is made through brokers. Our sales through spot contracts comprise approximately 90.0% of our total export sales while the remaining 10.0% is under long-term contracts. To mitigate associated risks, our selection of brokers is based on their ability to penetrate markets which have strong pulp demands and their credibility. EPPCO's management team has implemented proactive marketing activities such as participation in trade expos to attract new customers. Sales through brokers enable EPPCO to determine the price and quantity of the product it intends to sell at its discretion, without having to negotiate with the end customers. EPPCO's revenue is primarily from international sales which accounted for approximately 70-78% of its total revenue during the year. EPPCO's brokers include leading international companies such as Zhejiang Welbon Pulp and Paper Group, Ecoplus Paper and Packaging (HK) Co., Ltd., OG Corporation etc.

Pulp Mold products : Distribution channel

The sales proportion target is **about 90-95% for the foreign market and 5-10% for domestic market at the beginning**. The demand of domestic and foreign countries for eco-friendly products are still high, so the company continues to develop the type and variety of products to cope with the needs of consumers both domestically and abroad in the future.

(1) Export Sales

As the markets for Eco friendly packaging products are in Europe and America, so the company has to sell through the experienced sale agents and distributors for large volume distribution in order to reach the dealers and consumers which are better way than Original Equipment Manufacturer (OEM) or selling directly under its own brand abroad. In 2019 the Company sold pulp mold products about USD 2,250 per ton and in 2020 the price is expected to be not less than 2019.

(2) Domestic Sales.

Domestic customers are environmental oriented group which the company has many distribution channels as follows,

- Large retail and modern trade stores (Big C, Lotus, Makro, The Mall, TOP, Central, Department Store, Seven Eleven) under own brand and/or OEM for large retail stores.
- Provincial wholesalers of packaging products, and sale agents across the country.
- Direct sales to organizations, government agencies, hospital, schools, universities and other institutions.
- Online Marketing (under development).

Ethanol : Production and Distribution Business

The Company operates ethanol production and distribution business through KTIS Bioethanol Co.,Ltd (KTBE) and uses molasses derived from the Company's sugar factories as a primary raw material with the maximum production capacity of 230,000 liters per day or 75,900,000 liters per year. Presently, it produces and distributes only industrial alcohol and fuel alcohol.

Ethanol : Market Conditions and Competition
Global Market Situation

Ethanol Price The US ethanol price fell due to higher supply but lower demand. The ethanol average price in USA was Baht 15.70 per liter, decreased 20% YOY but remained unchanged from the previous quarter, while the ethanol prices for all grades in Brazil fell, in line with decreases in crude oil price. The average price of fuel-grade hydrous ethanol in Brazil was Baht 14.3 per liter, decreased 2.1% YOY but rose up 1.4% QOQ. The world ethanol price trends to increase following the forecast of rising crude oil price. The ethanol price in Brazil is forecasted to increase due to a shift to sugar reflecting upward trends of world sugar prices while lower sugarcane volume for the 2019/2020 crushing season.

Production The US ethanol production slightly increased with an average volume of 167.3 million liters per day in Q2/2019, increased 2.3% YOY, whereas Brazil's ethanol production was 117.1 million liters per day, decreased 3.6% YOY as a result of lower sugarcane volume from the previous year.

Cost of Production The cost of production in USA remained at the same level as the previous year of Baht 15.6 per liter (or USD 0.44 per liter).

Consumption The US consumption was approximately 149.1 million liters per day, decreased 9.1% YOY due to ethanol price increased, whereas Brazil's consumption was approximately 86.1 million liters per day, increased 20.4% YOY due to ethanol price decreased, together with higher cars registered.

Export In Q2/2019 (April-May), US export was 946.4 million liters, decreased 3.1% YOY, of which mainly exported to Brazil. While Brazil's export in Q2/2019 was 305.9 million liters increased 12.5% YOY, of which mainly exported to the US.

Source : the ethanol price situation reports, Thailand's Q2/2019 Bank of Thailand .

Ethanol : Domestic Market Conditions

Ethanol Price In Q2/2019 domestic ethanol reference price was Baht 21.90 per liter, decreased 7.2% YOY and 1.8% QOQ, in line with lower raw material costs and a decrease in world crude oil price. Domestic ethanol price for the next quarter is expected to maintain the same level as the previous year due to lower costs of molasses and cassava as raw materials, specifically higher cassava supply pushes cassava price down.

Production Thailand's ethanol production in Q2/2019 was at 4.2 million liters per day, increased 24.4% YOY, which mainly increased by ethanol production from cassava as lower production cost, thereby speed up production for stock.

Cost of Production Costs of ethanol production decreased due to higher raw material supplies. Cost of molasses was Baht 22.1 per liter, decreased 14.4% YOY, whereas costs of cassava pellets and cassava chips were Baht 22.0 per liter and Baht 22.9 per liter, decreased 16.3% YOY and 19.3% YOY respectively.

Consumption Thailand's ethanol consumption was 4.4 million liters per day, increased 8.4% YOY, in line with higher sale of gasohol E20 and E85 which increased 14.7% YOY, and 13.8% YOY respectively.

In 2019 (as of March 2019), Thailand had 26 ethanol factories which total production capacity was 6.250 million liters per day while the total consumption was 4.4 million liters per day. The major ethanol producers are:

	Company	Capacity (Liter/day)	Production Material
1	Mitr Phol BioFuel Co., Ltd.(Chaiyaphum)	500,000	Molasses
2	E85 Co., Ltd.	500,000	Cassava /Starch
3	Ubon Bio Ethanol Co.,Ltd	400,000	Cassava /Cassava Chips
4	T. P. K. Ethanol Co.,LTD Phase 1	340,000	Cassava Chips
5	Mitr Phol BioFuel Co., Ltd.(Kuchinarai ,Kalasin)	320,000	Molasses
6	Thai Roong Ruang Energy Co.,LTD.	300,000	Molasses

	Company	Capacity (Liter/day)	Production Material
7	KSL Green Innovation Pcl. (Bo Ploi)	300,000	Molasses
8	K I Ethanol Co.,Ltd	250,000	Molasses
9	KTIS Bioethanol Co.,Ltd	230,000	Molasses
10	Maesod Clean Energy Co., Ltd.	230,000	Cane juice
	Other	2,880,000	
	Total	6,250,000	

Source : Department of Alternative Energy Development and Efficiency

Ethanol : Competitive Strategy

(1) Product Variety

KTBE offers a wide range of products for different needs of customers in each industry. KTBE's ethanol plant is licensed to produce 3 different grades of ethanol products: potable alcohol, industrial alcohol and fuel alcohol. The product variety has contributed to competitive advantage in international markets over many other ethanol plants in Thailand which mostly are licensed to produce only fuel alcohol production for domestic distribution.

(2) Reliable Product Delivery

KTBE's punctual and reliable product delivery to customers is one of its key strengths. With steady molasses supply from factories in KTIS Company for its ethanol production process, KTBE is safe from the raw material shortage issue and can punctually deliver products which are confident by its customers.

(3) Product Quality

Committed to achieving excellent quality standards, KTBE has continuously attempted to develop the quality of its products. All ethanol products of KTBE are therefore meet regulatory quality standards. In addition, KTBE's distillation columns have been developed to accommodate the production of Korean B grade ethanol which is high quality product commonly sold in the international market.

(4) Marketing Strategy

Recognizing the intensifying competition in the energy industry, KTBE has proactively formulated and implemented marketing strategy to grow its customer base, especially in offshore markets. This includes KTBE's regular participation in meetings and training courses arranged for domestic and international ethanol producers to reap benefits from opportunities to meet with customers and intermediaries as well as to continuously expand its customer base.

Ethanol : Distribution Channel

(1) Domestic Customers

KTBE produces ethanol with 99.5% purity for domestic oil dealers to use for blending as biofuels to support the government's policy to promote the consumption of alternative energy and the reduction of imported fuels and crude oil. KTBE's major customers, defined as "traders" under Section 7², are PTT Plc., Thai Oil Plc. and Shell Company Of Thailand etc. As of 31 December 2017, revenue from domestic sales of fuel alcohol accounted for 100% of the total sale revenue.

(2) Overseas Customers

KTBE's ethanol products are sold to overseas customers through distributors. Previously, KTBE exported industrial alcohol with 95.5% purity and fuel alcohol with 99.5% purity to overseas markets.

Following the implementation of the Ministry of Energy's policy to discontinue 91-octane gasoline sale on 1 January 2013, the rate of domestic ethanol consumption has risen and KTBE has not exported fuel alcohol and industrial alcohol to overseas markets.

² Under Section 7, Chapter 1 Fuel Trade and Transportation of the Fuel Trade Act B.E. 2543, fuel traders whose total fuel trade volume, either in a particular fuel type or all types combined, equals 100,000 metric tons per year or higher, or fuel traders of only liquefied petroleum gas whose total trade volume equals 50,000 metric tons per year or higher must hold license granted by the Minister.

Electricity : Generation and Distribution Business

The Company's sugar factories, bagasse pulp mill, ethanol plant and biomass power plants are equipped with electricity and steam generating modules which use bagasse, a byproduct from sugar production, as primary feedstock. The electricity and steam generated are used in the production processes of our 3 sugar factories and other factories. The surplus electricity is sold to the Electricity Generating Authority of Thailand (EGAT) and the Provincial Electricity Authorities (PEA) under the power purchase agreements (PPAs) which the present selling contracts are under both Feed-in Tariff term and adder term, with the total capacity of 152 MWh.

Additionally, the Company has joined the investment with Global Green Chemicals Public Company Limited or GGC to develop "Nakhon Sawan Bio- Complex" through a joint venture named GCC KTIS Bio Industrial Co.,Ltd., to run a sugarcane crushing factory, which produces ethanol from sugarcane juice, and an 85 MWh power plant, of which to be used internally and 34 MWh sold to grid.

Electricity : Market and Competition
(1) Domestic Market and Industry

The Thailand Power Development Plan (PDP) 2018 consists of 4 principles, as follows:

- 1) Power plants in accordance with government policy to promote renewable sources of energy i.e. Municipal Solid Waste and Biomass-based Pracharath Power Project for three southernmost provinces
- 2) Fossil Fuel Power Plants which consist of EGAT power plants, Independent Power Producer (IPP) Small Power Producer (SPP), imported electricity, as follows:
 - (1) Set up main power plants to ensure energy stability in all 7 areas, namely Northern, North-Eastern, East, Western, Central, Southern, and metropolitan.
 - (2) Set up main power plants to ensure the reliability and security of the provincial power system where Electricity Generating Authority of Thailand (EGAT) is the power system administrator.
- 3) Power plants in accordance with the Alternative Energy Development Plan (AEDP) which consist of bio-gas, solar power, floating solar and hydro power, and other renewable energy, with targets to renew Power Purchase Agreement annually, and to stabilize retail selling prices with the electricity costs from production lines of not exceed Grid Parity.
- 4) Energy Conservation policy under Energy Efficiency Plan will consider only conservation measures with quality and price-competitiveness, which means prices will not exceed grid parity.

(2) Domestic Electricity Consumption Situation

In 2019, the Net Peak Generation Requirement (GRP) of the EGAT system has a value of 30,853.20 megawatts, which occurred on May 2, 2019 (22.27 hrs.), Which is 8.88% higher than in 2018.

(3) Domestic Electricity Generation Capacity

Under the new Power Development Plan (PDP) 2018–2037, Thailand's power production capacity from 3 systems will stand at 77,211 MW, with a new power generating capacity of 56,431 MW, up from 46,090 MW in 2017 and a retired power generating capacity of 25,310 MW during 2018-2037.

Details of the new power generating capacity of 56,431 MW are as shown below:

Classified by type of Power Plant

Renewable Energy Power Plant	20,766 MW	36.80%
Pump Storage Hydro Plant	500 MW	0.89%
Co-generation Power Plant	2,112 MW	3.76%
Combined Cycle Power Plant	13,156 MW	23.31%
Coal / Lignite Power Plant	1,740 MW	3.08%
Alternative Energy Power Plant	8,300 MW	14.71%
Import	5,857 MW	10.38%
Energy Conservation Measures	4,000 MW	7.09%
Total	56,431 MW	

Classified by power producer

As at July 2019-ended, the power generating capacity was at 43,034 MW, of which excluded Very Small Power Producer (VSPP), as following details:

EGAT	14,565.58 MW	33.90%
Independent Power Producer (IPP)	14,948.50 MW	34.74%
Small Power Producer (SPP)	9,618.32 MW	22.35%
Import	3,877.60 MW	9.01%
Other energy sources	28,444.42 MW	66.10%
Total	43,034.00 MW	

Classified by fuel type

Natural gas	72,644.50 GWH	61.75%
Coal / Lignite	26,888.86 GWH	22.85%
Renewable (Hydro, other)	796.15 GWH	0.68%
Fuel oil	118.05 GWH	0.10%
Diesel	16,261.29 GWH	13.82%
Others (Lao, Malaysia, Lam Takhong Power Station)	927.42 GWH	0.79%
Total	117,636.27 GWH	

Note: excluding Very Small Power Producer (VSPP)

The Proportion of Renewable Energy for Electricity Generation

Renewable energy	Unit	Target 2036	2015	2016	2017	2018	2019 target
Wind	MW	3,002.00	233.90	507.04	627.82	1,017.82	1,506.82
Solar	MW	6,000.00	1,419.58	2,446.12	2,697.26	2,812.62	2,982.43
Waste	MW	550.00	131.68	145.28	191.47	317.82	317.82
Bio gas	MW	1,280.00	372.51	434.86	475.42	500.15	517.86
Small hydro power	MW	376.00	172.12	182.12	182.28	187.72	187.79
Bio mass	MW	5,570.00	2,726.60	2814.70	3,157.28	3,289.84	3,380.44
Large hydro power	MW	2,906.40	2,906.40	2,906.40	2,906.40	2,919.66	2,919.66
Total	MW	19,684.40	7,962.79	9,436.52	10,237.93	11,045.63	11,812.82

Electricity : Competitive Strategy

In addition to the production efficiency which the Company has consistently enhanced through the continuous improvement of the electricity generation process, feedstock is also another key success factor for the electricity business as bagasse from sugar production is the main feedstock source. The company, therefore, set out the energy saving policy to reduce production loss, which resulted in more bagasse as raw material for electricity generation. Additionally, the company encouraged more cultivations of sugarcane both vertically and horizontally for more sugarcane volume. Meanwhile, the cabinet's resolution on 11 June 2019 to reduce sugarcane burning, thus more fresh sugarcane delivered to the sugar mills, and cane trash can be used as feedstock for power plant. Meanwhile, the company has also researched on a variety of energy crops to identify additional feedstock sources. These will be beneficial to farmers and our Company to increase revenues and reduce electricity production costs at the same time.

Electricity : Distribution Channel

Steam and electricity generated by the Company's power plants are used in our sugar factories and while the surplus electricity is sold to EGAT or PEA according to each power plant's contract.

Bio Soil Amendment : production and distribution business
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The Company has its own bio soil amendment manufacturing plant in Nakhonsawan which processes filter cake and vinasse into bio soil amendment products; powder product and pellet product. KTIS Bio Fertiliser Company Limited (KTBF) was established at Taklee District, Tambon Nongpho, Nakhonsawan as arm of the Company's integrated sugar business. The plant produces and supplies bio soil amendment products to the Company's sugarcane farmers at 50,000 tons of powder product, 10,000 tons of pellet product.

Bio Soil Amendment: Market and Competition

Although the Bioeconomy as a part the government's Thailand 4.0 policy, which focuses on adding value to major economic crops i.e. sugarcane, rice, cassava etc., could help increase overall crop productions during the previous year. But the global sugar price, however, declined and caused the price of sugarcane decreased. So the sugarcane farmers had to control their costs of production which led to careful usage of chemical fertilizers and soil amendments. Most of them still believed to use chemical fertilizer for their crops in prior to bio fertilizers and bio soil amendments as it works faster. However, the company has developed strategies to promote the use of bio soil amendments together with chemical fertilizers which will reduce costs by using less chemical fertilizer, increase productivity and maintain soil quality for sustainable sugarcane plantation.

Bio Soil Amendment: Competitive Strategy

KTBF has targets and policies to encourage our contracted sugar cane farmers to use standard quality and cheap bio soil amendment for reducing their costs of production and also increasing their production yield per hectare that result to more revenues. The main policies are as follows,

- (1) The Company and farmers jointly analyze the bio soil amendment to identify which KTBF's products are suitable for their plantation.
- (2) As raw materials used in the bio soil amendment production are sourced among the Company, the products are sold at cheap price. Farmers can thus reduce their costs and increase productivity.
- (3) The Company treats the packaging as a priority, uses colored sacks and double seals for better durability.
- (4) The Company offers delivery services for its bio soil amendment products.
- (5) Periodic plant touring programs for the targeted farmers to see the production process and provide knowledge for proper products usage.
- (6) Run the demonstration farms so that the farmers are able to see the productivity resulted from the usage of bio soil amendment products.
- (7) The Company advertises its products and activities through advertising media and local radio stations,
- (8) The Company conducts the products requirement surveys from contracted farmers in order to make production plan.
- (9) The Company has many research projects coordinated with the Institute of science and technology of Thailand for developing the production standards to create the customer confidence.

Bio Soil Amendment: Distribution Channel

- (1) Sale to contracted cane farmers of the Company.
- (2) Sale to general customers.
- (3) Sale to merchants, agricultural cooperatives, Bank for Agriculture and Agricultural Cooperatives BAAC

Support business

KTIS Research and Development Co., Ltd. (KTRD) was founded in 2015 with the initial registered capital of Baht 1 million. KTRD later increased its registered capital up to Baht 10 million on 27 December 2016, and up to Baht 20 million on 26 January 2018, of which 100% of its total shares held by KTIS.

KTRD's VISION

KTRD aims to support KTIS's businesses, its growth, efficiency and sustainability in 3 aspects of developments, namely raw materials, production processes, and products.

KTRD has been conducting 6 research and development projects, valued Baht 35.8 million during 2018/2019, together with 19 projects, valued Baht 43.8 million during 2016/2017 and 2017/2018, which makes a total of 25 projects, valued Baht 79.6 million since 2016.

KTRD's research and development projects related to raw material development involve the project to develop a new sugarcane breed (KTIS 14) with high productivity to suit certain farming conditions, of which is expected to be launched to its contracted cane farmer in the next 2-3 years. Meanwhile, research and development projects in terms of products entail the study of the impact of planting soil and wastewater on tarramba and nepier, to which treated wastewater provides important nutrients for plant growth as well as helps reduce transportation costs, and the mature plants can be used in its biomass power plant. The product development concerned projects also includes the use of wastewater to formulate organic fertilizer that is suitable for sugarcane plantings.

During 2016-2019, KTRD has signed 10 Memoranda of Understanding (MoU) with 10 leading research and development institutions, specifically King Mongkut's University of Technology Thonburi, Chiang Mai University, Naresuan University, Thailand Institute of Scientific and Technological Research (TISTR), Khon Kaen University, Kasetsart University, Global Green Chemicals Public Company Limited, PTT Public Company Limited, and Thammasat University, with which conducted 6 research and development projects in 2018/2019, valued Baht 10.8 million

Research and development

Special interest projects

1. Development of sugarcane breeds to suit its cane farmers' farming conditions
2. Soil structure improvement and proper use of fertilizers to enhance crop yield and reduce costs
3. Efficient water use in agriculture to enhance crop yield and reduce costs of plantings
4. Agricultural machinery development
5. Waste utilization and waste-to-value creation in sugar and its byproduct industry

Raw material development and support plans

1. Research and select appropriate sugarcane breeds that suit its contracted cane farmers' farming conditions to maximize yield and productivity
2. Research on efficient water management system in cane plantings to maximize productivity
3. Research for the appropriate fertilizer formulae for cane plantation.
4. Research and trial the use of unmanned aerial vehicle, satellite imagery and artificial intelligence (AI) to monitor and assess cane quality and productivity, as well as evaluate damage from cane pest and diseases
5. Research on certain bacteria to help promote plant growth under drought stress condition
6. Use of nanotechnology to inhibit dispersed bacteria and reduce infection rate for productivity increase

Process development and support plans

1. Research or explore maintenance process optimization in sugar production to improve efficiency and reduce costs
2. Development of agricultural parts and tools to expand equipment lifetime and reduce investment costs
3. Research on certain bacteria that suit the ethanol production process
4. Improvement of molasses quality to maximize efficiency of ethanol production
5. Research or explore how to maintain fertilizer quality until packing
6. Improvement of pelleted fertilizer heat-dried process to minimize loss of organic matters
7. Improvement of disc granulator to get uniform pellets and minimize waste from fertilizer pellet production
8. Research on optimization of power consumption to increase efficiency and reduce costs of sugar production
9. Research on storage system to avoid excessive degradation of bagasse
10. Process improvement and process optimization

Product development and support plans

1. Research and trial the use of treated wastewater to increase the yield of sugarcane and other crops i.e. tarramba, and nepier
2. Research and trial to maximize the utilization of carbon dioxide from ethanol fermentation process and wastewater treatment process, thus reduce carbon dioxide emission pollution
3. Research on the utilization of treated wastewater from bagasse pulp production process to derive high value compounds for cosmetic industry
4. Research on extract of sugarcane leaves to derive high value compounds utilized in cosmetics applications
5. Research on the utilization and value creation of bagasse pit and coal
6. Improvement of organic fertilizer formulae and bio-chemical fertilizer formulae
7. Improvement of fertilizer formulae from sugar and byproduct industrial waste
8. Development of knowledge based system and new products in response to markets and to create domestic advantage and global competitiveness
9. Research and development of new green products using advanced technology and enhance researches for sustainable growth.

3. Risk Factors

Risks associated with the Company's operations

1. The risk of fluctuation in foreign exchange

In the past year, Thai Baht currency was volatile compared to the US currency. The dramatic currency fluctuation has directly affected the group's business because more than 60% of its revenue is from exports of sugar products and the downstream businesses' eco-friendly products, and machinery imports. Therefore, company's income and investment expenses are also affected by the fluctuation of the exchange rate.

Moreover, the cost of sugar cane which is the major raw material of the sugar industry is determined by *Thai Sugar cane and Sugar Co., Ltd. (TCSC)* through its export of sugar. The export price composes of selling price and dollar exchange rate. The income after expenses from the sale of sugar made by TCSC and other sugar mills shall be the net income of the industry, such net income shall be distributed to the sugar cane farmers and the sugar mills in the proportion of 70:30 respectively in the form of sugar cane price paid to sugar cane farmers by sugar mills. Therefore, the exporting sugar mills at least must fix the export price and the exchange rate at equal rate to TCSC's rate which is the benchmark, so the actual income of the sugar mill shall not be less than the benchmarked income use in the calculation of income distribution to sugar cane farmers. If any sugar mill could sell with the lower price than the selling price made by TCSC, such sugar mill shall pay the higher than the standard price for sugar cane and bear the higher than the standard cost of production.)

The risk protection from such exchange rate can have either positive or negative figure which will be recorded in the annual financial statements as the gain and loss on exchange rate. This is because of the difference between fixed forward rate and the spot rates on the goods delivery dates under the Accounting Standard Basis. The Company is aware of the risk protection policy without speculation.

2. Risks of World Sugar Price Volatility

Sugar is a product with high price volatility due to the movement of many factors such as weather conditions, production, consumption, supply-demand by which the fluctuation of world sugar prices depends on supply and demand of the producing countries and the consumer countries and also includes the fund speculation in futures commodity markets, economic factors, and fuel prices which correlate with the ethanol price used as automobiles' fuel made from sugar and molasses. All the aforementioned factors significantly affect the volatility of world sugar price.

The price volatility in the global market may adversely affect the Company's sales, particularly export sales, while the domestic sales are not directly impacted. As the cane prices rely on the sugar prices, so the low cane prices will demotivate cane farmers and cause them to reduce cane planting or cane caring, hence lower cane supply available for sugar production.

To reduce the risks associated with the high volatility of sugar prices in the global market, the Company has the Pricing Policy to control the pricing volume to be close to Quota B pricing volume determined by the export of TCSC. The sugar price will determine the sugar cane price which is the main cost of sugar production. The Company has additionally action plans to prevent negative effects not more than certain amounts for next year.

The Company also has a working team consisting of experts and officers from the international leading trading company, to monitor and manage the prices of exported sugar. The working team's analysts keep abreast of the sugar prices in global markets, i.e. the New York No 11 sugar futures market and the London refined sugar futures market, the world economy, fuel prices, production and consumption figures, demands, supplies and stocks on a daily basis.

Previously the Company significantly relied on the income from sugar business. Therefore, the Company was severely affected by the fluctuation of sugar price in world market. To handle such uncertainty, the Company has adjusted the direction of its business by diversification to businesses that could be synergized with the Company's potential such as biomass power plants which shall reduce the sole dependency of the Company's performance on sugar business.

3. International Trade Barriers Risk

At present, the major sugar export market of the Company is Japan. Therefore, changes in trade barriers introduced by importing countries such as tariffs and tax policies, sugar import quota, national rules, or trade membership agreements shall directly and adversely affect the income derived from the export. As risk mitigation measures, the Company keeps abreast of the news from various sources, concludes the future contracts in order to manage production planning, inventory and logistics management to ship products on time, and cooperate with Sumitomo Corporation which is our major strategic partner on analyzing and determining the best approaches to deal with or alleviate unfavorable impact in the way that will best benefit the Company.

Normally, raw sugar import of Japan was J-Spec grade for many years, and KTIS group is one of the major exporters for J-Spec raw sugar. After Japan has trade agreements with Australia, Japan has therefore reduced the import of J-Spec raw sugar and started to import more Hi-pol raw sugar from Australia, the Company has improved the machine so that

it can produce more Hi-pol raw sugar and reduce J-Spec raw sugar to serve the market demand and additionally selling more super refined sugar than normal refined sugar in order to get a higher price.

Further, the Company keeps updating news of trading countries from the traders to assess the situation and mitigate negative effects. The Company has been working with Sumitomo Corporation to cooperation for the maximum advantages of the Company.

4. Risks of changes in government policies (Sugar production and distribution business)

Although, the concept to amend Sugar cane and Sugar Act B.E. 2527 began in the previous government term, but the cabinet of such government did not approve such concept, and such concept could not be presented into the legislative within its term. Therefore, the work of the sugar cane and sugar committee (CCS) is still governed by the current Sugar cane and Sugar Act B.E. 2527 until the ministry of industry should get the approval from the cabinet and later present to the parliament for the amendment of the law. Until now, the control, monitor and regulation issuance by the sugar cane and sugar committee (CCS), which governed by the current law, shall affect the cost and the performance of the company. The examples are the profit-sharing system which shall be calculated into sugar cane price, exporting regulation, domestic sugar price adjustment. Any amendment of the law shall definitely affect the performance of the company

Although the burnt cane reduction campaign by a penalty of burnt cane Baht 30 per kilogram and award to fresh cane Baht 120 per kilogram, the cabinet has additionally issued the resolution on 11th June 2019 to reduce the amount of burnt sugar cane to 5% within 3 years. The allowance for the burnt sugar cane in sugar mill will be 30% of all sugar cane received in the production year 2019/2020. Such allowance will be 20% of all sugar cane in the production year 2020/2021, and such allowance will be 5% of all sugar cane in the production year 2021/2022. Further, the measure of production efficiency control, which imposes each sugar mill to produce sugar at 94 NT not less than 90 kg, will be definitely implemented in the production year 2019/2020.

To minimize the risk in changes of regulations, the company has been working with sugar mills associations and sugar cane farmers association to create understanding with the authorities and reflect the necessity of both sugar mills and sugar cane farmers to the authorities. The company and sugar cane farmers association have been working with all contracting sugar cane farmers to comply with burnt sugar cane reduction measure, and support sugar cane farmers to obtain equipment for fresh sugar cane harvest. Such action will annually increase fresh sugar cane delivered to the company's mills which also significantly increases the production efficiency. To minimize the risk in the production, the company has significantly invested in the renovation of its machinery. Further, the company has issued the policy for sugar cane receiving process to create the aptness in terms of the sugar cane quantity taken per day, sugar cane quality, sugar cane contamination and minimization of sugar cane logistic time

5. Risk from sugar competition

The government has abolished the domestic sugar quota system since January 15, 2018. The free sale of domestic sugar has caused serious competition. Further, the government introduced the excise tax based on sugar quantity (sugar tax), so the domestic consumption by industrial sector did not grow as it should be although the production capacity has slightly increased. Moreover, the price in world market decrease continuously, the sale of the company has slowed down for these aforementioned factors. To handle such incident, the company has adjusted the strategy of domestic and international sale, by focusing on the improvement of products and services, cost reduction, improvement and development to serve the customer's need and also participated in the improvement and cost reduction processes of customers. And, such actions have satisfied the customers.)

6. Risk from the uncertainty of government policies (ethanol business) and changes in energy policy.

Ethanol is a biofuel that has been clearly promoted and has target to be used as a combination of gasohol in the Alternative Energy Development Plan (AEDP). On 6th April 2019, the Royal Thai Government gazette published the announcement from the Prime Minister Office about the country reform plan on 11 issues which included energy issue that contains 20 years plan of energy for logistic. The relevant topic to ethanol is to increase the goal of ethanol consumption up to 11.3 million liters per day. The goal for 2036 is to increase the ethanol consumption up to 20% of average fuel consumption. Currently the ethanol consumption is 13% of average fuel consumption or average 4.4 million liters per day.

Over time, the growth of ethanol consumption was not consistent with the production and causes excess supply . As new ethanol plants occurred in 2019, the total production capacity of the country increased to 6.3 million liters per day whereas the actual average of production is 5.0 million liters per day and the quantity of molasses in the industry has slightly decreases. As the cost of ethanol production from molasses reduced in the same direction as the molasses volume, the consequence affected the company is the more severe price competition in ethanol market than the last year)

Since the risk from the changes of the policy, the company as a membership of Thai Ethanol Manufacturing Association has consulted with the government agencies responsible for energy policy such as Office of Energy Policy and Planning (EPP), The Department of Alternative Energy Development and Efficiency (DEDE) and Biofuels Development Office etc. in order to accelerate the increase of ethanol consumption in consistent with production capacity through the fuel retail

prices mechanism and funds paid into the oil fund for higher mixture of ethanol in gasoline i.e. E20 and E85 etc. and cancellation of gasohol 91.

However, if the domestic ethanol market became worse, the Company could produce high-quality alcohol for the international market as its good foreign customer relationship and Logistics plus high experience in export procedures.

Internal Risks

1. The Procurement Risk of Raw Material(Sugarcane) both quantity and quality.

The drought in Thailand has been existed since the end of 2018 until the end of April 2019, and even in May 2019 the rainfall is not enough for sugar cane. Many sugar cane plantations were changed into other crops and the yield of remaining plantation significantly decreased. Rainfall in May 2019 is less than the standard, and the additional rainfall in August and September has slightly increased the quantity of sugar cane. The estimation of sugar cane plantation in the production year 2019/2020 shall be much decreased from 2018/2019 which shows the same outcome with the survey and sugar cane allocation made by the Sugar Cane Committee. Meanwhile the company anticipates that the reduction of sugar cane shall result in the reduction of sugar, and also affects that performance of the company. Further the competition of sugar cane procurement to maintain the market share may increase the cost of production.

To mitigate such risk the company has implemented these measures

1. To promote the harvest of fresh sugar cane, the company has been seriously explaining to sugar cane farmers about the agenda and promoting such agenda by the introduction of sugar cane harvesters, the arrangement of special financing by **Bank for Agriculture and Agricultural Cooperatives** to the purchase equipment for fresh sugar cane harvest, the implementation of fresh sugar cane receiving measure. The consequences are to prevent sugar cane from weight losing as being burnt and to increase of sugar cane quality.
2. The company seriously promoted the fertilization in the end of rainfall period between August to September, so the sugar cane shall grow by the combination of fertilizer and rainfall.
3. The management of harvest and logistic to reduce lead time from the harvest to the mill, the management shall help preserve the sugar contained in the sugar cane and the mill shall get the good quality raw material.
4. The determination of the appropriate production date, as the estimated quantity of sugar cane is not so much, the company can determine the operation date to be later. The consequences are that the sugar cane can sufficiently grow by later rainfall, fertilization and no rushing harvest, and the quality of sugar cane is expected to increase due to the later operation date.
5. The decrease of machinery load due to the less quantity and the more fresh sugar cane received, such measure shall increase the agility of the mill, reduce the lead time of sugar cane logistic which shall preserve the quality of sugar cane and prevent weight loss of sugar cane.
6. The investment in GKBI factory located in Nakhon Sawan Bio Complex, GKBI factory also uses sugar cane as its raw material. Therefore, it is the increase of sugar cane milling capacity. The new factory is determined to operate in the production year of 2020/2021, and it gains the interest from sugar cane farmers as the new opportunity. Therefore, the company increased the sugar cane purchase agreement by determine that the sugar cane farmer must deliver sugar cane for the company in the production year of 2019/2020 as a condition precedent of the agreement with GKBI.)

2. The risk of bad debts from advance payment for sugar cane procurement.

Due to the down side of the price in world market and the changes in domestic selling system since 2018, the estimation of sugar cane price for the production year of 2020/2021 will not be better than the previous year. The estimated yield, which is decreased due to low amount of rainfall, also decreases the income of sugar cane farmers and their debt repayment capability. Therefore, the company has determined the measure to manage the bad debt advance payment for sugar cane procurement as follows:

1. To select and survey prospected land for plantation before financing, further there are other measure to mitigate the default such as collateral requirement, and joint investment.
2. To increase sugar cane farmers' income such as the increase of quantity and quality of sugar cane by fresh sugar cane harvest regarding to the cabinet resolution, the management of mill's machinery capacity, the determination of the appropriate production date and management of harvest and logistic, these measures shall increase the weight and quality of harvested sugar cane which means more income of sugar cane farmers. The fresh sugar cane harvest shall result in additional payment for fresh harvest and the burnt sugar cane's price will be reduced.
3. To manage the defaulting sugar cane farmers whom the company suspended the support, the defaulting sugar cane farmers whom considered to suspend the support will be asked to repay their debt within a year or there will be the collateral enforcement to prevent the risk of non-performing debt.)

3. Risk of raw material shortages in pulp production.

Many countries have already canceled the use of utensils made of foam and plastic. As the company uses bagasse as the fuel of power plants and the remaining bagasse as the raw material for pulp manufacturing which caused an insufficiency of raw material in pulp mill, nowadays the company has developed the efficiency of the machinery to

reduce the consumption of bagasse which results in more raw material for pulp manufacturing. Therefore, the company could respond to the increase of demand for both bleached and unbleached pulp. The company also serves the need of clients by the development of the machinery of pulp mill for the higher yield and the research for the substitutable raw material.

4. Risk of raw material shortages in producing electricity.

The Company still maintains its policy and focus on the electricity generation and distribution business, especially during the high volatility of sugar price. The electricity distribution of the Company was sold to the Electricity Generating Authority of Thailand and the Provincial Electricity Authority. The advantage of the company is the electricity sale contract with high volume of purchase. As the bagasse is the fuel of electricity production, the insufficient fuel shall cause the company to lose its income and affects the fuel insufficiency in sugar manufacturing process. So KTIS group has focused on expanding the sugar cane volume both vertically and horizontally in order to increase the amount of cane for sugar production and get more bagasse. In addition, the Company has invested in the improvement of machinery and production process to save more energy, both in sugar factories and electricity power plants in order to obtain more bagasse. Meanwhile, we have our subsidiary, KTIS Research and Development Co.,Ltd ("KTIS R&D"), to continuous study and research for alternative energy corps in order to prevent such risks and create the stability of electricity production and distribution business for future sustainable growth

4. Assets for Business Operations
4.1 Core Operating Assets of the company and its subsidiaries

As of September 30, 2019, the company and its subsidiaries have core operating assets, as follows:

Items	Net Book Value (THB Million)	Ownership	Encumbrance
1. Land and land improvement 9,480 rai 0 Ngan 66.77 square wah.	387.41	owner	partly as Collateral Loan
2. Building and buildings improvements	1,768.43	owner	partly as Collateral Loan
3. Machinery and tooling	5,628.43	owner	Partly as Collateral Loan
4. Motor Vehicles	108.43	owner	Partly as Collateral Loan
5. Furniture, fixtures and office equipment	31.20	owner	-
6. Motor vehicles	612.84	owner	-
7. Assets under installation	990.04	owner	-
Total	9,526.80		

Note Items 1-4 are partly as collateral with the financial institutions for short and long term loans.

Intangible assets

Asset	Objective
Computer software	Computer program for work, which includes accounting software program, farmland record and sugar production, etc.

Trademarks

Trademark	Objective	Registration Date
	For refined sugar, sugar and raw sugar.	27 February 2013

Promotion privileges

By virtue of provisions of the Industrial Investment Promotion act of B.E. 2520, the subsidiaries were granted privileges by the Board of Investment which included exemption from payment of income tax for certain operations. The details of each privilege are as follows:

1. Certificate No.	1095(1)/2555	2590(5)/2556	1557(1)/2558	59-1195-0-00-1-0	59-0348-0-13-2-0	59-0268-0-00-2-0	61-0899-0-00-2-0	60-0887-0-00-1-0
2. Promotional privileges for	Electricity generating from biomass	Production of biological fertilisers or organic fertilisers	Electricity generating and stream production from biomass	Packaging for foods (Biodegradable)	Electricity generating and stream production from biomass	Biogas	Biogas	Production of organic fertilisers

3. The significant privileges are								
3.1 Exemption of corporate income tax for net income from promotional privileges and exemption of income tax on dividends paid from the profit of the operations throughout the period in which the corporate income tax is exempted	8 years	8 years	8 years	8 years	8 years	8 years	8 years	8 years
3.2 A fifty percent reduction of the normal rate of corporate income tax on net income derived from the promoted operations for a period of five years after the expiration of the above corporate income tax exemption period.	Received	Not received	Received	Not received	Received	Not received	Not received	Not received
4. Date of first earning operation income	7-Oct-13	Not yet Commence	7-Jul-16	31-Oct-16	26-May-17	Not yet Commence	Not yet Commence	Not yet Commence

4.2 Policy on Investment in Subsidiaries and Associate Companies

It is the Company's policy to invest only in businesses that are related to its core business and are beneficial to or support for the business operations of the Company in order to capture new sources of revenue and leverage its profitability. The Company will nominate an appropriate proportion of its representative directors to the boards of its subsidiaries or associate companies to oversee and steer their businesses towards the right direction and the best benefits of the Company.

5. Legal Dispute

As of September 30, 2019, the Company and its subsidiary had dispute which Lawsuit regarding the request for the repayment from the Sugarcane and Sugar Committee and the Sugarcane and Sugar Fund. According to the Sugarcane and Sugar Act B.E. 2527 (the "**Act**"), the sugar factory is required to contribute an equal amount of the differences between the net income and the final cane price combined with the final cost of the sugar's production and distribution to the Sugarcane and Sugar Fund (the "**Fund**") as prescribed by the Sugarcane and Sugar Committee (the "**Committee**") (which is called the Fund for Stability Maintenance of Sugarcane and Sugar Industry). The Company, therefore, has submitted the Fund for Stability Maintenance of Sugarcane and Sugar Industry from the production season 2007/2008 to 2013/2014 inclusive. Also, the Thai Identity Sugar Factory Co., Ltd. (the "**Subsidiary**") has submitted the Fund for Stability Maintenance of Sugarcane and Sugar Industry from the production season 1996/1997 to 2013/2014 inclusive.

Later, the Company has considered the situation in legal aspect and found that the money demanded by the Committee at the fixed rate was not in conformity with the Act, thus, the Fund has no right to receive such contribution. Therefore, on 11 September 2017, the Company and the Subsidiary filed a complaint against the Committee and the Fund at the Supreme Administrative Court for preservation of the Company and the Subsidiary's right as the black case no. 1463/2560 and 1464/2560 respectively by requesting the amount which is not considered as the Fund for Stability Maintenance of Sugarcane and Sugar according to Section 27 (3) of the Act to be returned in the total of THB 544,527,508.65 and THB 379,579,218.84 respectively in total THB 924,106,727.49.

6. General Information and Other Information
6.1 Company Information

Company Information	: Kaset Thai International Sugar Corporation Public Company Limited (the "Company")
Type of Business	: Production and distribution of sugar and connected secondary businesses such as the production and distribution of bleached white paper pulp, ethanol and electricity
BKK office	: 24 Aekphol Bldg., Vibhavadi Rangsit Rd., Ratchadaphisek, Din Daeng, Bangkok
Head office and Factory	: 1/1 Moo 14 Nong Pho Sub-District, Taklee District, Nakhonsawan Province, Thailand
Factory (Branch 3)	: 1 Moo 7 Banmakhua Sub-District, Muang District, Nakhonsawan Province, Thailand
Registration number	: 0107556000116
Telephone	: (66) 2692-0869 to 73
Facsimile	: (66) 2246-9125 , (66) 2692-0876 , (66) 2246-9140
Homepage	: www.ktisgroup.com
Company Secretary	: Mr.Poomrerk Wangpreedaertkul Tel. (66) 2692-0869 to 73 ext. 175
Investor Relations and Corporate Communications	: Ms.Monathy Ploisook Tel. (66) 2692-0869 to 73 ext. 193 ext. 26
E-mail	: ir@ktisgroup.com
Registered capital	: 3,888,000,010 Baht
Paid up Registered Capital	: 3,860,000,010 Baht

6.2 Subsidiary Information

Sugar Business:	Thai Identity Sugar Factory Co., Ltd.
Business Type:	Production and distribution of sugar
Registered Share Capital	1,215,000,000 Baht
Paid-up Share Capital	1,215,000,000 Baht
BKK office:	24 Aekphol Bldg., Vibhavadi Rangsit Rd., Ratchadaphisek, Din Daeng, Bangkok Telephone (66) 2692-0869 to 73
Factory:	42/1 Moo 8 Ban Hardsuatan, Kungtapao Sub-District, Muang District, Uttaradit Province Telephone (66) 5544-9010 to 1, (66) 5540-7241

Paper Pulp Business:	Environment Pulp and Packaging Co.,Ltd
Business Type:	Production and distribution of Packaging from bagasse
Registered Share Capital	650,000,000 Baht
Paid-up Share Capital	650,000,000 Baht
BKK office:	(1) 24 Aekphol Bldg., Vibhavadi Rangsit Rd., Ratchadaphisek, Din Daeng, Bangkok Telephone (66) 2692-0869 to 73
	(2) 133 Vibhavadi Rangsit Rd., Samsennai, Phayathai, Bangkok Telephone (66) 2692-0869 to 73
Factory:	888 Moo 1 Nong Pho Sub-District, Taklee District, Nakhonsawan Province Telephone (66) 56-338-338, (66) 62-310-0314 to 6

Energy Business:	Kaset Thai Bio Power Co., Ltd.
Business Type:	Production and distribution of electricity
Registered Share Capital	1,260,000,000 Baht
Paid-up Share Capital	1,260,000,000 Baht
BKK office:	24 Aekphol Bldg., Vibhavadi Rangsit Rd., Ratchadaphisek, Din Daeng, Bangkok Telephone (66) 2692-0869 to 73
Factory:	555 Moo 14 Nong Pho Sub-District, Taklee District, Nakhonsawan Province Telephone (66) 62-310-0311 to 5 ext 200

Energy Business:	Ruamphol Bio Power Co.,Ltd
Business Type:	Production and distribution of electricity
Registered Share Capital	395,000,000 Baht
Paid-up Share Capital	395,000,000 Baht
BKK office:	24 Aekphol Bldg., Vibhavadi Rangsit Rd., Ratchadaphisek, Din Daeng, Bangkok Telephone (66) 2692-0869 to 73
Factory:	128 Moo 7 Banmakhua Sub-District, Muang District, Nakhonsawan Province Telephone (66) 56-207-225 to 8

Energy Business:	Thaiekaluck Power Co.,Ltd
Business Type:	Production and distribution of electricity
Registered Share Capital	350,000,000 Baht
Paid-up Share Capital	350,000,000 Baht
BKK office:	24 Aekphol Bldg., Vibhavadi Rangsit Rd., Ratchadaphisek, Din Daeng, Bangkok Telephone (66) 2692-0869 to 73
Factory:	42/2 Moo 8 Ban Hardsuatan, Kungtapao Sub-District, Muang District, Uttaradit Province Telephone (66) 55-449-010 to 1, (66) 55-407-241

Energy Business:	Lopburi Biopower Co.,Ltd
Business Type:	Production and distribution of electricity
Registered Share Capital	2,000,000 Baht
Paid-up Share Capital	2,000,000 Baht
BKK office:	24 Aekphol Bldg., Vibhavadi Rangsit Rd., Ratchadaphisek, Din Daeng, Bangkok Telephone (66) 2692-0869 to 73

Energy Business:	KTIS Biogass Power Co.,Ltd
Business Type:	Production and distribution of electricity
Registered Share Capital	1,000,000 Baht
Paid-up Share Capital	1,000,000 Baht
BKK office:	24 Aekphol Bldg., Vibhavadi Rangsit Rd., Ratchadaphisek, Din Daeng, Bangkok Telephone (66) 2692-0869 to 73

Paper Pulp Business:	Environment Pulp and Paper Co., Ltd.
Business Type:	Production and distribution of bleached paper pulp
Registered Share Capital	2,400,000,000 Baht
Paid-up Share Capital	2,400,000,000 Baht
BKK office:	(1) 24 Aekphol Bldg., Vibhavadi Rangsit Rd., Ratchadaphisek, Din Daeng, Bangkok Telephone (66) 2692-0869 to 73 (2) 133 Vibhavadi Rangsit Rd., Samsennai, Phayathai, Bangkok Telephone (66) 2692-0869 to 73
Factory:	9/9 Moo 1 Attavipach Rd., Nong Pho Sub-District, Taklee District, Nakhonsawan Province Telephone (66) 56-338-338, (66) 62-310-0314 to 6

Fertilizer Business:	KTIS Bio Fertiliser Co.,Ltd
Business Type:	Production and distribution of fertilizers and soil
Registered Share Capital	35,000,000 Baht
Paid-up Share Capital	35,000,000 Baht
BKK office:	24 Aekphol Bldg., Vibhavadi Rangsit Rd., Ratchadaphisek, Din Daeng, Bangkok Telephone (66) 2692-0869 to 73
Factory:	888 moo 14 Nong Pho Sub-District, Taklee District, Nakhonsawan Province Telephone (66) 93-182-0800

Energy Business:	KTIS Bioethanol Co., Ltd.
Business Type:	Production and distribution of ethanol
Registered Share Capital	256,000,000 Baht
Paid-up Share Capital	256,000,000 Baht
BKK office:	(1) 24 Aekphol Bldg., Vibhavadi Rangsit Rd., Ratchadaphisek, Din Daeng, Bangkok Telephone (66) 2692-0869 to 73
	(2) 133 Vibhavadi Rangsit Rd., Samsennai, Phayathai, Bangkok Telephone (66) 2692-0869 to 73
Factory:	9 Moo 14 Nong Pho Sub-District, Taklee District, Nakhonsawan Province Telephone (66) 62-310-2406

Energy Business:	KTIS Bio Energy Co.,Ltd
Business Type:	Production and distribution of ethanol
Registered Share Capital	20,000,000 Baht
Paid-up Share Capital	20,000,000 Baht
BKK office:	24 Aekphol Bldg., Vibhavadi Rangsit Rd., Ratchadaphisek, Din Daeng, Bangkok Telephone (66) 2692-0869 to 73

Energy Business:	Lopburi Bioethanol Co.,Ltd
Business Type:	Production and distribution of ethanol
Registered Share Capital	50,000,000 Baht
Paid-up Share Capital	12,500,000 Baht
BKK office:	24 Aekphol Bldg., Vibhavadi Rangsit Rd., Ratchadaphisek, Din Daeng, Bangkok Telephone (66) 2692-0869 to 73

Holding Business:	Permsinpattana Co., Ltd.
Business Type:	Shareholders engagement, which currently holds 26.0 per cent in EPPCO
Registered Share Capital	317,000,000 Baht
Paid-up Share Capital	317,000,000 Baht
BKK office:	24 Aekphol Bldg., Vibhavadi Rangsit Rd., Ratchadaphisek, Din Daeng, Bangkok Telephone (66) 2692-0869 to 73

Property Business:	Sapsirikaset Co.,Ltd
Business Type:	Real estate investment
Registered Share Capital	311,000,000 Baht
Paid-up Share Capital	311,000,000 Baht
BKK office:	24 Aekphol Bldg., Vibhavadi Rangsit Rd., Ratchadaphisek, Din Daeng, Bangkok Telephone (66) 2692-0869 to 73

Asset management Business:	Kaset Thai Wiwat Co., Ltd.
Business Type:	Support company's asset management
Registered Share Capital	61,000,000 Baht
Paid-up Share Capital	61,000,000 Baht
BKK office:	24 Aekphol Bldg., Vibhavadi Rangsit Rd., Ratchadaphisek, Din Daeng, Bangkok Telephone (66) 2692-0869 to 73

Support and Development Business:	KTIS Research and Development Co., Ltd.
Business Type:	Support company's businesses and its growth aspiration.
Registered Share Capital	20,000,000 Baht
Paid-up Share Capital	20,000,000 Baht
BKK office:	24 Aekphol Bldg., Vibhavadi Rangsit Rd., Ratchadaphisek, Din Daeng, Bangkok Telephone (66) 2692-0869 to 73
Factory:	99 Moo 14 Nong Pho Sub-District, Taklee District, Nakhonsawan Province Telephone (66) 62-310-2406 ext133 , (66)92-279-9210

6.3 Other References

SEC	Securities and Exchange Commission, Thailand 333/3 Vibhavadi Rangsit Road, Chomphon, Chatuchak, Bangkok 10900, Thailand Telephone: (66) 2695-9999 Facimile : (66) 2695-9660 Email: info@sec.or.th website : www.sec.or.th
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SET	The Stock Exchange of Thailand 93 Ratchadapisek Road., Dindaeng, Bangkok 10400, Thailand. Telephone: (66) 2009-9000 Facimile: (66) 2009-9991 SET Contact Center : (66) 2009-9999 Email: SETCallCenter@set.or.th webset : www.set.or.th
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Registrar	Thailand Securities Depository Co., Ltd. 93 Ratchadapisek Road., Dindaeng, Bangkok 10400, Thailand. Telephone: (66) 2009-9000 Facimile: (66) 2009-9991 SET Contact Center : (66) 2009-9999 Email: SETContactCenter@set.or.th webset : www.set.or.th/tsd
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Auditor	EY Office Limited 137-136/193 Lake Ratchada Office Complex, 33 th Floor New Ratchadapisek Road, Klongtoei, Bangkok, 10110, Thailand Telephone: (66) 2264-0777, (66)2661-9190 Facimile: (66) 2264-0789 to 90 Email: ernstyoung.thailand@th.ey.com webset : www.ey.com
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Legal Advisor	Kudan and Partners Co., Ltd 127 Gaysorn Tower, 23 th Floor, Unit Ratchdamri Road, Lumpini, Pathumwan, Bangkok, 10330, Thailand Telephone: (66) 2838-1750 Facimile: (66) 2838-1795
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