

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 has ethanol plant, bleached bagasse pulp plant, bagasse pulp mold 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

By-products 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 by-product 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, Bio fertilizer Production and Distribution Business

The Group produces bio soil conditioner production, bio fertilizer and distribution business through KTBF and uses recycling filter cake from sugar production process and sludge from the biogas and ethanol production process to be raw materials in bio soil conditioner and bio fertilizer 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 aims 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 Eco-friendly packaging 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 and powder yeast which are by-products 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 and Bio Fertilizer Business – By-products from the sugar, paper pulp 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 54 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 its registered capital 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 support the company with the training and consultation on the maintenance, repair, and development of farming tools and equipment in order to increase the crop productivity of farmers and in turn supply for business operations.

In 2013, the annual general meeting of shareholders 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 annual general 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 of Directors 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") In 2020, changed its name to KTIS Bio Natural Co., Ltd. ("KTBN") and (3) Lopburi Biopower Company Limited ("LBP") In 2020, changed its name to Enviroment Pulp and Straw Co., Ltd. ("EPAS") to support the business expansion.

In 2014, the Board of Directors 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 (1) KTIS Bio Ethanol Company Limited ("KTBE"), a subsidiary of the Company to jointly invest with Global Green Chemical Public Company Limited in the project (Nakhonsawan Biocomplex: NBC) for eco-friendly chemical business which is located in Takhli district Nakhon Sawan Province under the joint invested subsidiary named GGC KTIS Bio industrial Company Limited (GBKI) (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 production plant from bagasse with a production capacity of 50 tons per day is under a joint invest entity named Enviroment Pulp and Packaging Company Limited ("EPAC"), a subsidiary of the Company which is a project company

Events and major activities in the year 2020

November 11, 2019 - Lopburi Biopower Company Limited ("LBP"), a subsidiary of the Group Changed its name to Enviroment Pulp and Straw Co., Ltd. ("EPAS")

April 14, 2020 - Lopburi Bioethanol Company Limited ("LBE"), a subsidiary of the Group Changed its name to KTIS Bio Natural Co., Ltd. ("KTBN")

April 2, 2020 KTIS Bio Ethanol Co., Ltd. was authorized by the department of Excise to use its alcohol in the production of sanitizing alcohol, and received the license to produce sanitizing alcohol from Thailand's Food and Drug Administration. Therefore, the company has launched the new product which is sanitizing alcohol in forms of liquid and gel. The new product was massively donated to many organizations and was sold to the public with the fair price in the crisis of Covid-19 pandemic.

August 5, 2020 Environment Pulp and Straw Co., Ltd. launched the new product which is bagasse paper straw, and has already distributed to some food and beverage business.

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, 2020)

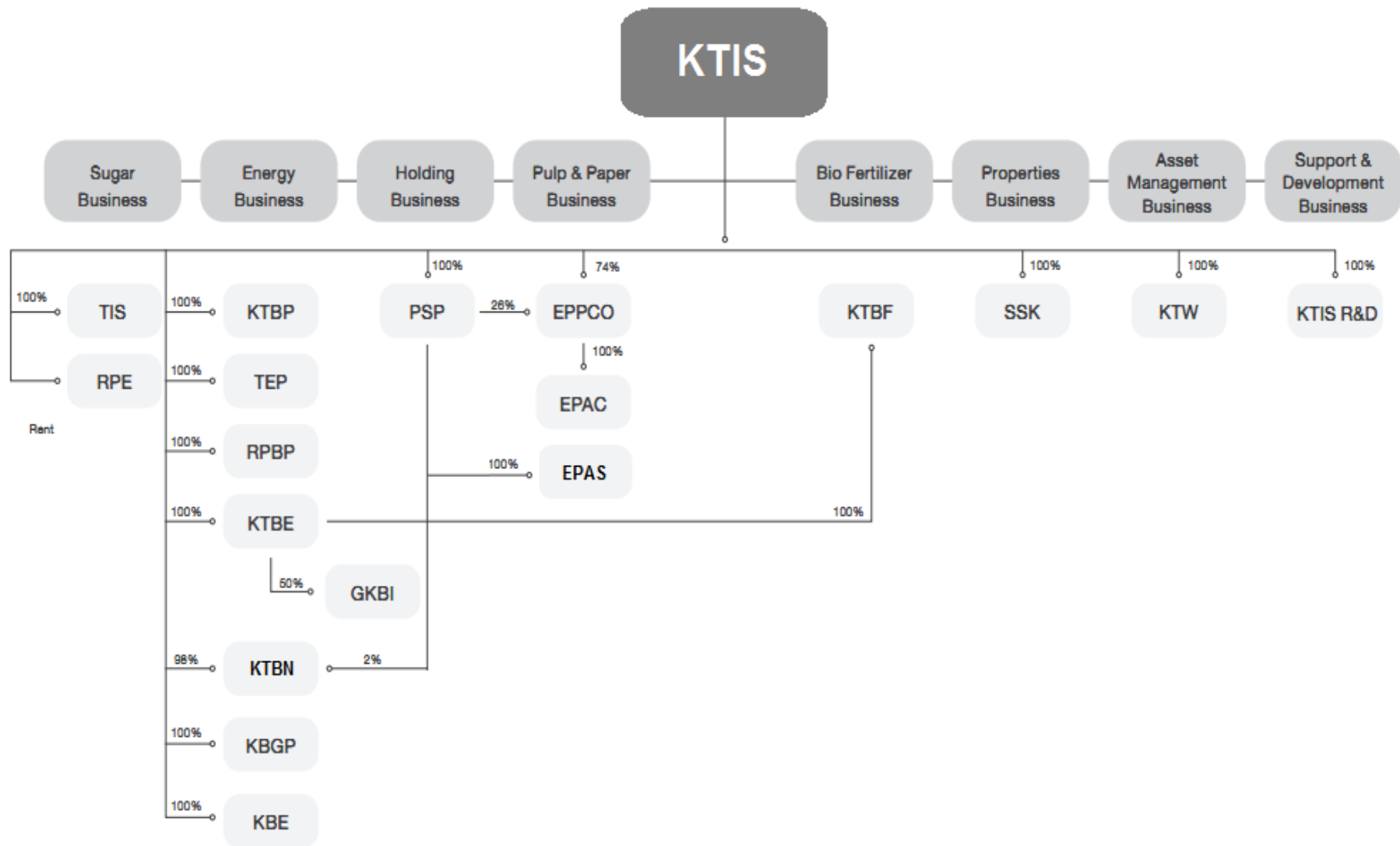
Subsidiary	Type of Business	Shareholding (%)
Thai Identity Sugar Factory Co., Ltd.(TIS)	Sugar production and distribution	100.0
KTIS Bioethanol Co., Ltd. (KTBE)	Molasses-based ethanol production and distribution	100.0
Environment Pulp and Paper Co., Ltd.(EPPCO)	Production and distribution of bleached 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 and bio fertilizer products	100.0 through KTBE
Permsinpattana Co., Ltd.(PSP)	A holding company which holds 26.0% shares of EPPCO	100.0

Subsidiary	Type of Business	Shareholding (%)
Sapsirikaset Co., Ltd.(SSK)	Land acquisition to support the group's business expansion	100.0
KTIS Bio Natural Co., Ltd. (KTCN)	Ethanol production and distribution	100.0 ²
Environment Pulp and Straw Co., Ltd. (EPAS)	Production and distribution of bleached Pulp Mold and Straw	100.00 through PSP
KTIS Biogas Power Co., Ltd.(KBGP)	Electricity generation and sale	100.0
KTIS Bio Energy Co., Ltd.(KBE)	Ethanol production and distribution	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 in bio industry promotion zone	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 30,2020)



2. Nature of Business
2.1 Revenue Structure

In 2020, the Company's income from sugar production and distribution was 71.5 % of total revenues from sales and services of the Company. Moreover, the business income from the by-products of paper, pulp, ethanol and fertilizer 28.5% of the Company's sales and services. Details for 3 years were as follows:

	2018 (9 months)		2019		2020	
	Revenue (MB)	Percentage	Revenue (MB)	Percentage	Revenue (MB)	Percentage
1. Sugar and molasses sales revenue						
Domestic	3,878.5	22.4	3,398.5	21.1	3,905.9	29.2
International	9,178.4	53.0	7,708.9	47.8	5,647.1	42.3
Total sugar and molasses sales revenue	13,056.9	75.4	11,107.5	68.9	9,553.0	71.5
2. Pulp sales revenue						
Domestic	213.2	1.2	304.2	1.9	127.0	0.9
International	1,003.4	5.8	1,005.4	6.2	571.3	4.3
Total pulp sales revenue	1,216.6	7.0	1,309.5	8.1	698.3	5.2
3. Ethanol sales revenue						
Domestic	1,313.4	7.6	1,619.4	10.0	1,359.3	10.2
International	-	0.0	0.0	0.0	-	-
Total ethanol sales revenue	1,313.4	7.6	1,619.4	10.0	1,359.3	10.2
4. Other sales revenue						
Electricity sales revenue	1,131.2	6.5	1,456.8	9.0	1,148.5	8.6
Revenue from other sales and services	587.5	3.4	636.9	3.9	596.2	4.5
Total other sales revenue	1,718.7	9.9	2,093.6	13.0	1,744.7	13.1
Total revenue	17,305.7	100.0	16,130.0	100.0	13,355.3	100

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 42% of the global output in the production year 2019/2020. 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

The Impact of Coronavirus (COVID-19) on Macroeconomic Stability

In conclusion, the global deficit should narrow as a result of consumption changes and depend on the end of the pandemic. Production for the next season will be higher – however we may see disruptions on labour – especially in Thailand and India. In general, the global trade issues should ease with the broadening of origins.

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 hands 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 hands 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 2017/2018, 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 2017/2018 and is still surplus in 2018/2019. Although Brazil sugar production dropped 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 2016/2017. 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 2019/2020, Thai sugar production was 8.294 million tons while domestic consumption was estimated at 2.318 million tons which showed supply was much more than domestic demand and excess sugar about 5.976 million tons would be exported.

In the production year 2019/2020, Thailand have 57 sugar mills and recorded the total sugar output of 8.29 million tons as shown below:

Producer	Number of Sugar Factory of Each Producer	Sugar Output (Ton)	Market Share (%)
Mitr Phol Sugar Group	7	1,610,640.17	19.42
Thai Roong Ruang Sugar Group	10	1,337,207.03	16.12
KTIS Group	3	602,337.29	7.26
Khon Kaen Sugar Group	5	581,910.75	7.02
Cristalla Sugar Group	3	497,415.56	6.00
Korat Industry Sugar Group	2	470,273.98	5.67
Eastern Sugar Group	2	338,097.16	4.08
Thai Kanchanaburi Sugar Group	2	329,827.34	3.98
Banpong Sugar Group	1	315,253.24	3.80

Kumphawapi Sugar Group	2	244,508.16	2.95
Wangkanai Sugar Group	4	223,237.88	2.69
Khonburi Sugar Group	1	188,833.05	2.28
Mitr Kaset Sugar Group	2	177,347.63	2.14
Ratchaburi Sugar Group	2	141,851.84	1.71
Rayong Sugar Group	2	105,878.83	1.28
Others	9	1,129,709.05	13.62
Total	57	8,294,328.96	100.00

Source: 2019/2020 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 Sucro" 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 its human resources and machineries in order to improve the production efficiency, and also planned 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 by-products 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 by-products.

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						
	Dec 31, 2018 (9 months) (Sales Record)		2019 (Sales Record)		2020 (Sales Record)	
	Quantity ¹ (Ton)	%	Quantity ¹ (Ton)	%	Quantity ¹ (Ton)	%
Beverage Industry	72,908.670	52.01	50,607.250	54.81	40,568.03	48.07
Food Industry	20,795.700	14.83	7,616.150	8.25	33,526.00	39.73
Dairy Products Industry	49,146.365	32.92	33,838.05	36.65	7,298.77	8.65
Candy	330.00	0.24	270.20	0.29	3,002.15	3.56
Total	140,180.735	100.00	92,316.65	100.00	84,394.95	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 EPPCO 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 by-product 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 2020, the situation in the pulp and paper market has been on the down side due to the trade war between China and the U.S and China's policy of banning the import of low-quality paper. The Covid-19 pandemic also affected the bagasse price to highly decrease especially short fiber Bleached Eucalyptus Wood Pulp. The average of short fiber pulp in Q3 of 2020 was between 440-450 usd/ton which decreased about 20-30 usd/ton from Q3 of 2019. The price is expected to continuously decrease, if the international trade dispute of 2 major countries cannot be resolved and also the delay of Covid-19 vaccine test which will not be finished within 2020 and affect the great recession to world economic.

1.1 Selling Price of Pulp in September 2020

In Chinese market, the selling price of long fiber pulp increased from 530-580 usd/ton in September 2019 to 580-590 usd/ton in September 2020, due to the production capacity decrease of factories in northern America. The price of short fiber pulp decreased from 460-480 usd/ton in September 2019 to 440-450 usd/ton September 2020. For other East Asian markets, the price of long fiber pulp increased from 540-580 usd/ton in September 2019 to 545-585 usd/ton in September 2020, while the short fiber pulp decreased from 460-480 usd/ton in September 2019 to 440-460 usd/ton in September 2020.

Source: PPI ASIA's report as of September 25, 2020

1.2 2021 Global Market Outlook

In 2021, the pulp and paper industry situation trends to slow down from the world economic regression occurred from Covid-19 pandemic which is the vaccine researching stage. The unsettled 25% import tax imposed to Chinese goods entering the U.S. shall deter the trade. Meanwhile the oversupply in bagasse still remains, and the demand for paper has decreased due to lockdown measures. Work from home has changed the working method to be more IT oriented which decreases the demand of paper, and shall make the bagasse price remain low throughout the year.

However, Covid-19 pandemic has cause an expansion of the pure fiber packaging industry in other countries apart from China, for the reason of sanitization and infection prevention. The environmental policy of Northern Europe countries and others will positively affect the bagasse pulp industry.

In 2021, 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 cause the price of paper pulp in the world market remains at low level for the whole year.

2. Domestic Situation

On Q2/2020 the pulp paper and publication index, when compared on (%QoQ) and (%YoY) basis, showed an increase in only in paper pulp that increased 3.60% and 5.30% accordingly, while other pulp and paper products slowed down. In terms of export, the total value when compared on (%QoQ) and (%YoY) basis, decreased except the paper pulp which increased. In terms of import, the total value increased when compared on (%QoQ) basis but decreased when compared on (%YoY) basis.

2.1 Production Situation

In Q2/2020, the production of paper pulp, when compared on (%QoQ) and (%YoY) basis, showed an increase of 3.60% and 5.30% accordingly, and most of the purchase order came from China. While the pulp and paper products decreased in all sectors, after the increase of production in the end of Q1/2020. The Covid-19 pandemic affected the production because of the decline of purchase order from both domestic and international markets.

Index of pulp and paper production



Source : Office of Industrial Economic

2.2 Export Situation of pulp and printing paper

In Q2/2020, the export value amounted to USD 436.44 million. The sections of paper and printing paper decreased 11.43% when compared on (%QoQ) basis. The section of paper pulp increased 36.96% when compared on (%QoQ) basis. 1,11.03% and 7.42% respectively due to the export of pulp made from reused paper and printing paper, which most export goes to China. When compared on (%YoY) basis, the total export value decreased for 15.17% in the sections of paper and printing paper, and increased 35.55% in the sections of paper pulp. The 75% majority of paper pulp export is exported to China.

Export - Import Paper Pulp and Printing Paper



Source : Information and Communication Technology Center, Ministry of Commerce

2.3 Import Situation of pulp and printing paper

In Q2/2020, the import value amounted to USD 636.71 million increased 3.70% when compared on a (%QoQ) basis due to pulp and paper products section after the relief of Covid-19 pandemic in the previous quarter. But when compared on a (%YoY) basis, the total export value decreased for 7.13% in both pulp and paper products section and paper pulp section. However, the domestic demand of paper has increased due to the changes of lifestyle after Covid-19 pandemic. The domestic production capacity could not recover to the previous one, so the import is necessary.

Related Government Policies

Goods and services price authority has determined the price controlled goods list on 4th February 2020. Paper trash and recycle paper were also in such list, which shall have a positive effect to environment and domestic producers. However, some domestic producers need to import paper trash and recycle paper due to the lower price. Therefore, the price controlling measure should be fair to all stakeholders

Industrial production situation

Indicators	2018	2019							2020						
%YoY	Year	Jul	Aug	Sep	Oct	Nov	Dec	Year	Jan	Feb	Mar	Apr	May	Jun	Jul
MPI	3.7	-3.2	-4.4	-5.0	-8.0	-8.0	-4.4	-3.6	-4.0	-4.2	-10.5	-18.2	-23.8	-17.8	-14.7

Industrial Economic Status in July 2020 as considered from the Manufacturing Production Index (MPI) decreased 14.7% compared to the same period of the last year.

Considering the three-month MPI (% YoY) MPI data, it is evident that the industrial production trends to slow down as a decrease 18.2% in April, a decrease 23.8% in May and a decrease 17.8 % in June

Indicators	2019							2020						
%MoM	Jul	Aug	Sep	Oct	Nov	Dec	Year	Jan	Feb	Mar	Apr	May	Jun	Jul
MPI	-0.6	0.6	-3.4	-1.2	1.0	1.8	5.1	-2.9	2.7	-24.7	2.1	4.0	3.1	

For the 3 months of April, May and June, Manufacturing Production Index (MPI) has an exchange rate as follows: decrease 24.67% in April, increase 2.1% in May and increase 4.0% in June.

The industrial sectors which caused the decrease of MPI in July 2020 compared to the same period of last year are:

1. Automobiles and machines sector decreased 53.5% due to Covid-19 pandemic. The worldwide pandemic has affected the trade partner countries' and domestic economy, including the financial institutions' strict loan approval.
2. Petroleum refinery sector decreased 8.1% due to airplane fuel. Covid-19 pandemic has lessen the air travel which has decreased the production and use of petroleum.
3. Sugar sector decreased 57.4% due to very few this year's cane crop. The consequence will be less amount of raw sugar to be converted to white sugar.
4. Beer sector increased 25.0% due to the expedition to compensate the lessen capacity under lockdown period.
5. Chemical fertilizer increased 48.2% due to last year's out of season drought which lessen the demand. The better rainfall this year has helped the farmers plant their crop as usual, therefore, the demand has increased.

source: Office of Industrial Economic, Ministry of Industry.

Bagasse pulp market situation 2020, and trends in 2021 .

The domestic and international demand for bagasse pulp in 2020 has declined due to the economy which has been affected by Covid-19 pandemic. However, the environmental policy that is strictly implemented in European countries, which includes the prohibition of plastic and foam packaging, will increase the demand of environmental-friendly packaging. The demand for take away packaging also increased due to lockdown measures of many countries. Therefore, the demand for bagasse pulp is high.

However, some food producer, especially those in China, have tried to reduce the cost by increasing the ratio of short-fiber wood pulp into their production.

or 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 2020, 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 715 usd/ton in September 2019 to 680 usd/ton in September 2020. The order has also declined with the trend of the world economy.

In 2020, the world economy and the domestic economy will continue to regress, if the trade war could not be settled, and Covid-19 vaccine is not completed. 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 largest paper pulp manufacturers in 2020 were as follows,

Manufacturer.	Capacity of production (' 000 tons).	The type of the raw materials.
Double A	427	Eucalyptus wood.
Phoenix Pulp & Paper	252	Eucalyptus wood.
Panjapol Pulp Industry	110	Eucalyptus wood.
Thai Paper	290	Eucalyptus wood.
EPPCO	100	Bagasse
Fiber Pattana	56	Bagasse
EcoFriendly Thai	5	Recycle pulp
Total	1,208	Palm leaves.

Source: 2020 – 2022 Directory of the Thai Pulp and Paper Industries Association (TPPIA)

Market situation of packaging products from bagasse pulp (pulp mold) 2019/2020

The growth of demand for Eco friendly packaging products, especially from bagasse pulp increases continuously, especially when the demand of packaging is increasing in Covid-19 pandemic.

The packaging for take away food is in a high demand, and is expected to be continuously high, together with the growth of food delivery business that grows with consumers' demand

For Thailand, While a demand for packaging is continuously growing under Covid-19 pandemic. The promotion and encouragement from government and private sectors has helped expand the domestic market of environment-friendly packaging in 2020, and trends to expand in 2020. KTIS has a policy to invest in pulp mold plant expansion to cover the growth of such demand. The project is estimated to be completed within 2021, and the consumer will be more accessible to pulp mold goods.

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 substantially 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 80.0% 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. The other 10% is a direct sale to paper manufacturers. 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.

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, 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 ways than Original Equipment Manufacturer (OEM) or selling directly under its own brand abroad. In 2020 the Company sold pulp mold products about USD 2,250 per ton and in 2021 the price is expected to be not less than 2020.

(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 (Quality equivalent to pharmaceutical grade) and fuel alcohol.

Ethanol : Market Conditions and Competition

1. Global Market Situation

Ethanol Price The average U.S. ethanol price is USD 1.47 per gallon or approximately 12.11 Baht per liter, and has decreased in the period of April and May since the lock down in many states. Brazil Ethanol price of all grades has

decreased due price competition in petroleum. The estimation of cane portion used in ethanol production is less than 60% and focuses on making profit in sugar production.

Production The ethanol production has decreased from last year from 113.7 billion liters to 101.7 billion liters due to Covid-19 pandemic and many counties' lockdown. The U.S. ethanol plants have decreased their production capacity from the 1st quarter of 2019 to the 1st quarter of 2020 from 59.7 billion liters to 53.2 billion liters, which is an 11% decrease. Brazil has increased its portion of sugar production more than ethanol for profit, since the decrease of benzine price and Brazilian Real depreciation.

Cost of Production The U.S. has enacted HEROES Act to support biofuel producers under the pandemic of Covid-19 by fund support under Higher Blender Infrastructure Incentive Program to increase ethanol blended benzene nozzles and increase E15 gasohol used in the U.S.

Export The U.S. ethanol export increased 14% from last year from 5.6 billion liters due to the decrease of fuel oil consumption in end user markets in Brazil and Canada, including the decrease of oil price.

Source : Thailand ethanol situation reports, office of bio industry promotion, Cane and Sugar office.

Ethanol : Domestic Market Conditions

Ethanol Price The domestic reference price has increased due to increased raw material price. The average Thai ethanol is 23.02 Baht per liter which increases from the same period of last year's quarter.

Production The estimated production of Thailand ethanol in 2020 has decreased 10% from last year which is 1.45 billion liters due to Covid-19 pandemic. In the beginning of March 2020, the Excise Department has issued the regulation about the procedure, method and condition of zero tax for Converted Alcohol over 80 degree for hand sanitizer. However, the sale of alcohol hand sanitizer resulted in 1-2% of total ethanol production capacity.

Demand The demand of ethanol use in Thailand in 2020 decreased 5% from last year which is an average 4.2 million liters per day due to Covid-19 pandemic.

After the government authority (the Excise Department) has allowed the alcohol to be used for hand sanitizer, the demand has highly increased since 16 March 2020. The demand for alcohol for health purpose from ethanol plants are as follows:

	Amount of alcohol produced by ethanol plant in the market(liter)		
	non-commercial	commercial	Total
March 2020	1,485,023.75	9,937,642.00	11,422,665.75
April 2020	2,381,839.00	13,129,040.00	15,510,879.00
May 2020	256,179.00	2,156,652.00	2,412,831.00
June 2020	24,327.00	554,100.00	578,427.00
July 2020	13,268.00	107,428.00	120,696.00
August 2020	13,849.00	28,600.00	42,449.00
September 2020	638.00	40,000.00	40,638.00
Toatal	4,175,123.75	25,953,462.00	30,128,585.75

Source: The Excise Department, Ministry of Finance

In 2020 (as of 2020), Thailand has the running ethanol plants of 26 plants with the total registered capacity of 6.035 million liters per day, and the major ethanol producers are as follows:

The circumstance of installed capacity of Thailand ethanol plat

	Producer	Capacity registered with the Excise Department (liter/day)	Raw material
1	Mitr Phol Biofuel Co.,Ltd. (Chaibabhum)	500,000	Molasses
2	E 85 Co.,Ltd.	500,000	Cassava/Starch
3	Ubol Bio Ethanol Co.,Ltd. (Public)	400,000	Cassava/Chip
4	Thai Agro Energy Co.,Ltd.	350,000	Chip/Molasses

5	Upvenger Co.,Ltd.	340,000	Chip
6	Mitr Phol Biofuel Co.,Ltd.(Kuchinarai/Kalasin)	320,000	Molasses
7	Thai Rungruang Power Co.,Ltd.	300,000	Molasses
8	KSL Green Innovation Co.,Ltd. (Public) (Bor Ploy)	300,000	Molasses
9	Tai Ping Co.,Ltd.	300,000	Cassava
10	KI Ethanol Co.,Ltd.	250,000	Molasses
	others	2,745,000	
	Total current capacity	6,305,000	

Source : Department of Alternative Energy Development and Efficiency

Ethanol Competition 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 PTTOR Plc., Thai Oil Plc. and Shell Company Of Thailand etc. As of 31 December 2019, revenue from domestic sales of fuel alcohol accounted for 100% of the total sale revenue.

Due to Covid-19 pandemic, the Excise Department has allowed the sale of ethanol for sanitizer production which has increased the income of the company.

(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.

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 by-product 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 available to be sold to grid.

Market and Competition

(1) Domestic Market and Industry

Energy Policy and Planning Office, Ministry of Energy, is currently in the process of creating a draft of the amendment of Thailand Power Development Plan : PDP 2018 (revised version) which is in the process of being proposed to the cabinet.

The framework of the admendment of the renewable energy based powerplants

- Change the target of electricity purchase from some certain types of renewable energy based and maintain the total target of 18,696 MW.
 - Decrease the target of whole picture electricity production of solar cells.
 - Increase the target of electricity production of EGAT's small hydro power plants for 69 MW. (24 projects)
 - Increase the target of electricity production of biogas power plants (energy crop)
- Increase the community power plants policy for fundamental economic (biomass, biogas (waste water), biogas (energy crop))
- Delay the PALANGPRACHARATH southern biomass power plants project which its grid connection was planned in 2021-2022 with the capacity of 60 MW to be in 2023-2024 with the capacity of 60 MW
- Expedite the purchase of electricity from wind farm which was planned to begin in 2034 to begin in 2022.
- The assumption of the purchase from renewable energy based power plants (non-community power plants) after the year of 2024 shall be the same assumption in PDP 2018

Guidelines for studying the main power plants to be more appropriate

- NPS power plants machinery no. 1-4 with the total capacity of 540 MW shall be changed the type of fuel from coal to gas and connected to the grid in November 2027
- Mae Moe power plants no.8 or 9's discharge shall be postponed from the end of 2021 to the end 2024 to stabilise the voltage at 230 kV while Mae Moe power plants no.3 shall be completed within 2024
- Mae Moe power plants no.12-13 's discharge shall be postponed from the beginning of 2025 to the end 2025

The benefit of PDP2018 adjustment (The amendment to be in accordance with community power plants for the fundamental economic)

- Encourage the community to sustainably participate in the production, consumption and distribution of electricity
- Encourage the community to power plants
- Encourage RE power plants according to the potential of fuel, and according to the electricity demand of each area.
- Create the security of the electricity system in the area, and decrease the government's burden to build grid and distribution systems.
- Encourage the fundamental economy to generate income to the community by the sale of RE fuel which is agricultural material and by the sale of electricity.

- Create community acceptance of the nation's power plants development project.
- Reduce CO2 emission in PDP2018 to be in accordance with COP21 agreement.
- Develop Grid Modernization and Smart Grid for efficient transmission and distribution system to cover the future technology.
- Develop an electricity network to cover the power trade of the region, and the center of ASEAN Grid Connectivity.

(2) Situation of domestic electricity demand

As of 30th September 2020, in 2020, the Net Peak Generation Requirement (GRP) of the EGAT system has a value of 27,159.40 MW, which occurred on September 17, 2020 (19.30 hrs.), Which decreased from the previous month of 75.10 MW, and is 0.28% lower.

(3) Domestic power generation

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	15,096 MW	26.75%
Coal / Lignite Power Plant	1,200 MW	2.13%
Alternative Energy Power Plant	6,900 MW	12.23%
Import	5,857 MW	10.38%
Conservation Measures	4,000 MW	7.09%
<u>Total</u>	<u>56,431</u> MW	

Classified by power producer

As at July 2020 ended, the power generating capacity was at 43,034 MW, of which excluded Very Small Power Producer (VSPP), as following details:

EGAT	16,034.83 MW	35.26%
Independent Power Producer (IPP)	14,248.50 MW	31.33%
Small Power Producer (SPP)	9,473.94 MW	20.83%
Import	5,720.60 MW	12.58%
<u>Total</u>	<u>45,477.87</u> MW	-

Classified by fuel type

accumulated from January-August 2020, Million GWH

Natural gas	7,8195.92 GWH	59.94%
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Coal / Lignite	30,429.81 GWH	23.33%
Renewable (Hydro, other)	20,137.93 GWH	15.44%
Fuel oil	408.85 GWH	0.31%
Diesel	115.71 GWH	0.09%
(Lao, Malaysia, Lam Takhong Power Station)	1,169.19 GWH	0.90%
Total	130,457.41 GWH	-

Note: excluding Very Small Power Producer (VSPP)

The Proportion of Renewable Energy for Electricity Generation

Renewable energy	Unit	Target 2036	2016	2017	2018	2019	Target 2020
Solar	MW	6,000.00	2,446.12	2,697.26	2,962.44	2,982.62	2,982.62
Wind	MW	3,002.00	507.04	627.82	1,102.82	1,506.82	1,506.82
Small hydro power	MW	376.00	182.12	182.28	187.72	187.85	189.00
Biomass	MW	5,570.00	2,814.70	3,157.28	3,372.94	3,410.14	3,465.38
Bio gas	MW	1,280.00	434.86	475.42	505.24	529.98	542.26
Waste	MW	550.00	145.28	191.47	317.82	314.67	324.44
Large hydro power	MW	2,906.40	2,906.40	2,906.40	2,919.66	2,919.66	2,919.66
Total	MW	19,684.40	9,436.52	10,237.93	11,368.64	11,851.56	11,930.46

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 as per the cabinet's resolution on 11 June 2019 to reduce sugarcane burning, more fresh sugarcane is 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 Conditioner and Bio Fertilizer: production and distribution business

The Company has its own bio soil amendment manufacturing plant in Nakhonsawan which processes by-product from sugar production such as filter cake into bio soil amendment and bio fertilizer products in variety forms of 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. In 2020, KTBF has registered its bio fertilizer in both forms of powder and pellet under the trademark "Phaya Kodchasarn" (The great elephant), which is the new products produced and sold to the company's sugarcane farmers. The plant production capacity is at 50,000 tons of powder product and 10,000 tons of pellet product.

Bio Fertilizer 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 that the use of 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 Fertilizer Amendment: Competitive Strategy

KTBF has targets and policies to encourage its 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 Fertilizer: 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 1 million Baht. KTRD later increased its registered capital up to 10 million Baht on 27 December 2016, and up to 20 million Baht 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.

Since 2016-2020, KTRD has been doing the research for the group with 29 projects and with more than 90 million Baht total budget. The research and development in raw material aspect focuses on the cane breed development such as the project to develop the new cane breed which is suitable to specific environment and contain local disease and pest tolerance. The new cane breed is expected to be available to contracting farmer in 2022, and is expected to create the increase cane yield and quality and the security of raw material of sugar business and continuing business.

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.

KTRD's future plan is to provide the services for the group such as the laboratory analytic services for soil, fertilizer and water, laboratory analytic services for cane and sugar quality, the production of disease-free cane breed through the method of tissue culture and through the monitor of white leaf of sugarcane disease, microbial culture service and bio-refinery laboratory service. The company also responds for patent registration, the group research collection and advancement.

Joint research with government and private sectors in 2020

In 2020, KTIS Research and Development Co., Ltd. conducted the joint research projects with 3 institutions for 5 projects with the total budget of 9.055 with following detail:

Mahidol University

1. Enhancement of drought tolerant in sugarcane by growth promoting bacteria : A field study
2. Developing Biometrics by Unmanned aerial vehicle for Monitoring Sugarcane Yield Estimation
3. The study of evapotranspiration and crop coefficient of sugarcane under climate change by Bowen ratio and Lysimeter

King Mongkut's University of Technology North Bangkok

1. Application of multi-layered PTA hardfacing on agriculture part

Naresuan University

1. Utilization and Development of Sugarcane Stubble Splitter on *Platy pleura cespiticola* Boulard Management and Ratoon Cane Improvement

3. Risk Factors

External Risk

1. Risk from fluctuation of foreign exchange rates

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 used 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 Company realized such risk, therefore it has established the financial risk management committee to monitor and determine the framework and plan financial management to protect the risk that may occur. The financial tools are implemented such as forward contract, option contract including natural hedge by repayment of foreign currency debt by the same currency derived from income.

The risk protection from such exchange rate can have either positive or negative figures 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 additional action plans to prevent negative effects, not more than an acceptable amount of money.

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, the world economy, fuel prices, production and consumption figures, demands, supplies and stocks on a daily basis.

However, the significant dependency on the income from sugar business. Therefore, the Company was severely affected by the fluctuation of sugar price in the 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 sell 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)

The attempt to amend the Sugarcane and Sugar Act B.E. 2527 is not yet achieved, so currently the sugar industry is still under the Sugarcane and Sugar Act B.E. 2527. Meanwhile, the burnt cane reduction measure from the cabinet resolution is ongoing loosen implemented. The allowance for the burnt sugar cane in each sugar mill of 2019/2020 determined by Cane and Sugar Committee is not more than 50%, the allowance of upcoming 2020/2021 shall be not more than 20% according to the cabinet resolution, and shall be not more than 5% in 2021/2022. But the cane farmers have been continuously facing the drought crisis, so the limitation of burnt cane in 2021/2021 shall be difficult to implement.

Further, the measure of production efficiency control, which imposes each sugar mill to produce sugar at 94 NT not less than 90 kg, has a problem of the determination of sampling method for contamination. Therefore, there is not a concrete and fair method for sugar mills.

To minimize the risk in changes of regulations, the company has been working with sugar mills associations, sugar cane farmers association and cane farmers to find the solution to reduce burnt cane and to create cane farmer's understanding that the fresh cane harvest shall benefit with higher income. Further, the usage of cane harvesters is also encouraged to be enough with the fresh cane harvest, and other equipment is added to decrease loss in a sugar production process and increase higher yield, including cane quality control to be suitable for sugar production.

5. The risk of government policy's uncertainty (Ethanol business) and changes in energy policy.

For the domestic ethanol usage which was supported by government under AEDP2018 plan, there has been the decrease of ethanol usage target in logistic section from 11.3 million liters per day to 7.5 million liters per day in 2037, and the support of E20 gasohol to be a base benzine gasoline. Moreover, there shall be the decrease of financial compensation to subsidise gasoline which contains biofuel for E20 gasoline and E85 gasoline from Oil Fuel Fund within 7 years to maximize the subsidisation.

In the beginning of 2020, the Covid-19 pandemic caused the Excise Department to allow ethanol plants to use Converted Alcohol over 80 degree to produce the hand sanitizer for public benefit and for sale that shall end in 30 September 2020. Therefore, 26 ethanol plants can sell converted ethanol to produce hand sanitizer.

From the estimation of domestic ethanol industry, the current average growth rate shall be 2-3% (4.3-4.5 million liters per day), but due to the drought situation which caused raw material, molasses and capsava, in the production year of 2019/2020 to be scarce and high price and Covid-19 pandemic caused the ethanol production to be lower than estimated. There shall be an oversupply situation and cause more plants to shut down because the demand is lower than expected. Since the production capacity is over 6.3 million liters per day while the daily consumption is 4-4.5 million liters per day. Meanwhile, the Excise Department has allowed ethanol plants to use Converted Alcohol over 80 degree to produce the hand sanitizer but it results only 1-2% of total ethanol production.

According to such risk from government's change, the group company, as the member of Thai Ethanol Trader Association, has met with relevant authorities such as Energy Policy and Planning Office, Department of Alternative Energy Development and Efficiency to expedite the ethanol consumption to be suitable with production capacity through each kind of gasoline price mechanism and the money paid from and received in Oil Fuel Fund to support E20 to be standard fuel and to cancel gasohol 91, and also met with the Excise Department about the allowance of the usage of Converted Alcohol over 80 degree in other industries.

However, even the ethanol consumption decreases, the group company still prioritize the procurement of raw material so that the company can provide enough produce to serve the demand, and is capable to produce high quality alcohol for export by the relationship with international traders, the capability of port and storage facilities for export and the expertise in exporting process which was practiced many times. The company could also product the hand sanitizer 70% in both spray and gel to increase revenue. Meanwhile the consequence of price competition is more severe than last year. All aforementioned measures shall reduce risk from government's change, or shall mitigate, minimize or terminate such negative consequences.

6. Risk of sugar domestic trade.

Covid-19 has caused the clear severe consequences to public healthiness and decline economy, the domestic sugar consumption has declined from last year. The cancellation of domestic distribution quota system and the cancellation of price control caused the domestic market competition to be more severe, because the domestic price is always higher than export price. The company has continuously set up the policy to decrease the cost of production to maintain competitiveness, further has set up an improvement and development of the variety of products to fit customer's needs, and the most important is to participate in customers development and cost reduction which shall satisfy customers. The company also seeks for the distribution channels that shall increase the market share..

Internal Risk

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

In the production year 2019/2020, the company's sugar mills, as well as other nationwide sugar mills, were affected by less than expected cane amounts. The amounts of nationwide cane decreased from the production year of 2018/2019 of 130 millions tons and decreased from the estimated nationwide cane amount of 2019/2020 from government authority from 110 million tons to actual amounts of 74 million tons. Although the company has anticipated that the cane amounts shall reduce due to drought and decreased plantation area, some risk mitigation measures are quite less effective such as fertilizer support at the end of August and the beginning of September 2019 due to no rainfall after such period.

However, in terms of cane quality of the production year 2019/2020, it is quite clear that it is better than the production year of 2018/2019. It results in positive consequences in production (sugar amount per ton cane) and in the company's performance. It shows the achievement of the determined measures such as fresh cane harvest to reduce burnt cane and the harvest and cane logistic management.

In 2020, the company's plantation area has decreased due to continuously serious drought from the end of 2019 until April 2020. The rainfall after such a period is not enough for the water consumption of cane and the rainfall dispersion is not comprehensive. In some areas, the rainfall is good and causes good yield but in some areas the rainfall is not good and causes the bad yield. Cane farmers decided to demolish the cane to restore the soil, or change to plant another plant until the suitable circumstance for cane plantation occurs again. The estimation of the production year 2020/2021 is that nationwide cane shall have higher yield per Rai than last year but the cane amount shall be the same or decrease. The total estimated nationwide cane of the production year 2020/2021 shall be 65-70 million tons.

To mitigate such risk, the company has issued following measures

1. The increase of cane production in some plantations that are worthy. The data from Thai Meteorological Department expected that the rainfall shall continue to the end of the year and expected that the storm shall enter into Thailand. Although some cane plantation areas could not be rehabilitated but some other plantation could be and the focus of rehabilitation shall be
 - A. New cane plantation in 2020 either drought cane and raining cane
 - B. Some cane plantations which are rehabilitable
 - C. Some plantations that could be watered by a specific consideration and the follow up of the progress to achieve the goal.
2. The encouragement of fresh cane harvest in the year of 2019/2020, once sugar mills received fresh cane, it significantly resulted in more sugar production per ton cane. In year 2020/2021, the government has determined the percentage of the fresh cane that each mill shall take into the process, the company has fully complied with such policy by
 - A. Meet with cane farmers to create understanding and acknowledge cane farmer's preparation for the fresh cane harvestment.
 - B. Arrange the cane harvesters of sugar mills and cane farmers to support fresh cane harvest, since the cane harvesters can harvest fresh cane without burning canes.
 - C. Educate and encourage the procurement and the use of cane leaf pruning machines for the cane farmers who still use the labor for the harvest.
 - D. Prevent cane burning which intentionally or negligently or accidentally occurred, or occurred by the abuse.
 - F. Purchase and store the cane leaf to increase income from fresh cane harvest to cane farmers and

entrepreneurs.

3. The contract farming is increased, either the increase of ton cane from the currently contracted cane farmers who grow more cane or the non-contracted in year of 2019/2020 cane farmers who actually grow cane. The latter group of cane farmers used to have contract farming with the company in previous years. But due to the long milling period in 2017/2018 from December 2017 to the end of May 2018, such cane farmers decided not to get the contract farming in year 2018/2019. However, when such cane farmers realized that there is a demand of the company together with a demand of GKBI milling plant, they decided to get the farming contract with the company with no concern of long milling period.
4. The appropriate first milling date is carefully determined. When the cane amount is not so high and shall not cause the long milling period until the shortage of harvesting labor in Songkarn festival in April. The determination of the year 2020/2021 appropriate first milling date shall let the cane get the benefit from rainfall and additional fertilizers which shall increase productivity and quality of cane.

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

After the production year 2019/2020, the cane farmers have unpaid debt due to the preliminary cane price at 750 Baht per ton at 10 CCS. according to the government regulation, and due to low productivity of cane caused by long period of drought. The encouragement of fresh cane harvestment and cane quality promotion to increase CCS. and to resolve some unpaid debt. Although these unpaid debts are not non-performing debt, but they also affect the performance of the company. Therefore, the suitable measure is required to mitigate the risk from non-performing debt. Such measure together with cane farmers' income additional to initial cane price such CCS for fresh cane fee, government subsidy which is 85 Baht per ton for every ton cane and 92 Baht for freshly harvested cane, income from service of cane harvest and logistic shall reduce the unpaid debt after the crushing season.

The already existed non-performing loan prevention measure, which minimize problems from contracting farming, are as follows:

1. The screening of contracting farmers. The screening process includes the background check, entrepreneurship check, asset check and asset of guarantor checks in a case of personal or collective guarantee. Furthermore, the screening focuses on plantation areas, labor support, agriculture tools and machinery.
2. The reduction of risk occurred from contract farming. Although the unpaid debt is not a non-performing debt, such debt also affects the company. The less the unpaid debt remains, the less the non-performing loan would occur. Therefore, the company emphasizes on the importance and strict implementation of such measures which includes the screening for appropriate plantation areas, the academic training for cane plantation, the monitor and suggestion of cane maintenance and the audit of previous crops.
3. The income increase from fresh cane harvest. According to the secretary of Cane and Sugar Office's policy, the fresh cane shall get a higher price than burnt cane for 200 Baht per ton, and the government subsidisation shall be exclusively granted to freshly harvested cane and not to burnt cane.
4. The arrangement of cane farmers' debt tracking system. After the production year of 2119/2020, the debt tracking under the new system has delivered a satisfying outcome. The assignment, which assigned the local operator to respond for debt collection under performance indicator, resulted in better outcome. Since the local operators have the knowledge about cane farmers and their activity which includes their asset and business, their spouse, their personal guarantor, the debt collection could be done on time which performs better than previous debt collection by central operators. Such new debt collection system shall be implemented from 2021 onward.

3. The risk of raw material scarcity in pulp production

The drought has decreased the total amount of nationwide cane, and significantly affected the company seriously. The decreased amount of cane means the decreased amount of bagasse derived from the milling process. While some of the bagasse shall be used to generate electricity, the remaining amount of bagasse for pulp production is not enough for the demand. The company, therefore, has continuously improved the efficiency of machinery to reduce production cost and increase production yield. The value added development has been researched to add higher value to bagasse.

The company has invested in environment-friendly pulp mould business to add value to bagasse under the entity named Environment Pulp and Packaging Co.,Ltd with the registered capital of 650 million Baht and 50 tons per day capacity or 850 million pieces per year capacity. The business shall fulfill the demand for environment-friendly varieties of products which shall replace the demand of foam and plastic products. The first product is estimated to be in the market in the first quarter of 2021. The company estimated that this business shall generate annual income more than 1 billions Baht and be a part of global environment conservation as well. Further the company has also studied and run the pilot plant of the straw from bagasse paper production, to cover the decrease of plastic straw in upcoming future.

4. The risk of raw material scarcity in electricity generation

The company has been prioritizing the electricity business since it has very low pricing volatility, is very less competitive. The company has entered into electricity sale agreements with Electricity Generating Authority of Thailand and Provincial Electricity Authority. Such electricity generation uses biomass from bagasse as raw material which is green energy. While the amount of cane has decreased which also decrease the amount of bagasse which may not be enough for electricity production, the company has researched the use of alternative agriculture material such as cane leaf, corn trunk, sorghum trunk. Such alternative material shall increase electricity generation capacity and farmers' income. While KTIS R&D, which is the company's subsidiary, focuses on research of alternative biomass plants to create the security and sustainability of company's electricity sale.

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

As of September 30, 2020, the company and its subsidiaries have core operating assets, as follows:






Items	Net Book Value (THB Million)	Ownership	Encumbrance
1. Land and land improvement 9,653 rai 0 Ngan 92.47 square wah.	387.48	owner	partly as Collateral Loan
2. Building and buildings improvements	1,729.78	owner	partly as Collateral Loan
3. Machinery and tooling	5,415.59	owner	Partly as Collateral Loan
4. Motor Vehicles	90.05	owner	-
5. Furniture, fixtures and office equipment	31.90	owner	-
6. Motor vehicles	521.68	owner	-
7. Assets under installation	1,123.17	owner	-
Total	9,299.67		

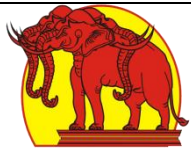
Note Items 1-4 are partly as collateral with the financial institutions for short and long term loans.

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
	Used as a trademark for refined sugar. White sugar Raw sugar and syrup	16 June 2016
	Chemical fertilizers, organic chemical fertilizers	21 September 2017
	Chemical fertilizers, organic chemical fertilizers	21 September 2017
	Soil stabilizer	21 September 2017

 ตราพาณิชย์สาร	Organic fertilizers, organic chemical fertilizers, chemical fertilizers	4 July 2018
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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, 2020, the Company and its subsidiary had the dispute which is a series of 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 considered that the money which is collected on fix rate is not the legitimate money collection made by the Committee and the Fund does not have legitimate authority to retain such money. Therefore, the Company and its subsidiary decided to file the lawsuit against the Committee and the Fund to the Central Administrative Court.

Kaset Thai International Sugar Corporation Co., Ltd. (Public)

Undecided case no. 1463/2560 and decided case no. 193/2563 matter: the request for the repayment of the money which is not the Fund for Stability Maintenance of Sugarcane and Sugar Industry under section 27(3) of Sugarcane and Sugar Act B.E. 2527 and which the company has submitted the Fund for Stability Maintenance of Sugarcane and Sugar Industry from the production season 2007/2008 to 2013/2014 for the amount of 544,527,508.65 Baht.

This case is currently in the appeal procedure in the Supreme Administrative Court undecided case no. AorRor 90/2563.

Thai Identity Sugar Co., Ltd.

Undecided case no. 1464/2560 and decided case no. 194/2563 matter: the request for the repayment of the money which is not the Fund for Stability Maintenance of Sugarcane and Sugar Industry under section 27(3) of Sugarcane and Sugar Act B.E. 2527 and which Thai Identity Sugar 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 for the amount of 379,579,218.84 Baht.

This case is currently in the appeal procedure in the Supreme Administrative Court undecided case no. AorRor 91/2563.

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	3,600,000,000 Baht
Paid-up Share Capital	3,600,000,000 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:	Environment Pulp and Straw Co., Ltd.
Business Type:	Production and distribution of Packaging from bagasse
Registered Share Capital	2,000,000 Baht
Paid-up Share Capital	2,000,000 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:	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:	(1) 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
	(2) 200 Moo 6 Phayuha Sub-District, Phayuhakeeree 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:	KTIS BIO Natural Co.,Ltd
Business Type:	Production and distribution of alcohol
Registered Share Capital	50,000,000 Baht
Paid-up Share Capital	12,500,000 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

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:	133 Vibhavadi Rangsit Rd., Samsennai, Phayathai, 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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