

1. Policy and Overall Business Operation

Overall Picture of Business Operation

Electricity Generating Public Company Limited or EGCO is a holding company. Its main source of revenues is from the dividend income from subsidiaries and share of profits from joint ventures which operates their business in accordance with EGCO's business plan. EGCO aims to develop power projects with either long- term or short-term power purchase agreement ("PPA") both in Thailand and the Asia Pacific region or conduct other related business.

The main responsibilities of EGCO as a holding company are business development, strategic and policy planning, human resources management, accounting and budgeting, and public relations of EGCO Group's companies. Besides, EGCO has also rendered internal audit and legal services to its subsidiaries which mainly take responsibilities on the power generation and sale, service provision, and operation and maintenance.

1.1 Business Target

EGCO focuses to continue building upon its portfolio of power generation assets within both the domestic and Asia Pacific markets by development of new power projects or acquisition of existing power plant projects under the company investment plan which concerns shareholders' return maximization with the acceptable level of risk. In 2019, the Board of Directors considered revising the corporate vision, mission, goals and return on equity as follows:

"To be a sustainable Thai energy company with full commitment to all stakeholders"

In this regard, EGCO has identified its key target as follows:

- 1) Return: Achieve competitive return on equity (ROE)
- 2) Growth: Maintain continuous net profit growth
- 3) Organizational Excellence: Be considerate to society and environment, be considerate to stakeholders, and be active in good corporate governance.

Based on the Company's vision, EGCO targets to enhance its sustainable growth with emphasis on investment in power business in which EGCO has expertise and experiences, as well as operating its business on corporate governance principles with the commitment to social, environment and stakeholders' responsibility. The Company also concerns benefits of shareholders by maintaining the return of equity at least 10%.

To achieve the targets, EGCO drives its business under the three main strategies covering business aspect, social and environment aspect and governance aspect. In term of business, EGCO focuses on well managing existing assets to ensure maximum efficiency, monitoring performance of joint venture assets to make sure their highest performance and

Kulhanok L.

return as planned, managing projects under construction to be complete as scheduled and within the planned budget; and seeking new investment opportunities for long-term income generation. Apart from this, EGCO aims to increase its renewable portion in national and international markets up to 30% of its total portfolio in 2026.

Social and environment strategy will align EGCO business with environment care, decreasing negative impacts and promoting positive impacts on environment throughout business process. EGCO targets to enhance its environmental management and coexistence in harmony with local community. With respect to corporate governance strategy, EGCO conducts its management with good corporate governance representing well management with efficiency, fairness, transparency under the anti-corruption concept, with responsibility towards environment, society and every stakeholder.

1.2 Background and Major Development

EGCO is the first independent power producer in Thailand registered on May 12, 1992 by the Electricity Generating Authority of Thailand (“EGAT”). Such incorporation marked the commencement of the Thai government’s privatization initiatives to allow broader private sector investment in the electricity generating sector. On March 23, 1994, EGCO was transformed into a public company and then listed on the Stock Exchange of Thailand (“SET”) on January 16, 1995.

In order to support the private sector’s role in energy business, EGAT reduced its shareholding in EGCO by divesting part of shares to strategic shareholders. On June 30, 1998, CLP Power International Limited (“CLP”) engaging in energy business in the Asia region and being a subsidiary of CLP Holdings Limited which is listed on Hong Kong Stock Exchange, purchased EGCO’s 78 million shares or 14.92% from EGAT. On July 23, 2008, EGAT transferred the shares to CLP Power Projects (Thailand) Limited (“CLPT”) which engaged in energy business in Thailand and a subsidiary of CLP Power International Limited so that shareholding of EGAT and CLPT in EGCO accounted for 25.41% and 22.42% respectively.

In 2006, CLP, the major shareholder of CLPT changed its shareholding structure by transferring all of its shares in CLPT to OneEnergy Limited (“OneEnergy”). On March 23, 2006, Mitsubishi Corporation (“MC”) engaged in OneEnergy so that it became a joint venture owned by CLP and MC on a 50:50 basis and EGCO informed SET regarding change of CLPT’s major shareholder on March 27, 2006.

On February 23, 2011, EGCO informed SET that it was notified by OneEnergy, a major shareholder of OneEnergy holding 23.49 per cent of the total issued share capital of the Company, that CLP Holdings Limited would divest its approximately 50% effective interest in OneEnergy while Tokyo Electric Power Company (“TEPCO”) would be joining Mitsubishi Corporation (“MC”) as its 50:50 partner.

Kulhanok L.

On May 10, 2019, Kyuden International Europe B.V. (“Kyuden International”), a wholly owned subsidiary of Kyushu Electric Power Co., Ltd. acquired 25% of EGCO’s shares from MC. Thus, Kyuden International indirectly holds 5.985% of voting right of EGCO’s outstanding shares via TEPDIA Generating B.V..

Significant Events in 2019

In 2019, EGCO Group operated 28 power plants in both Thailand and abroad with total contracted capacity of 5,475.07 MW equity. EGCO mainly sold 3,370.95 MW of power to EGAT, 85.07 MW to PEA, 120.78 MW to Industrial Users (IUs) and the rest 1,898.27 MW to overseas customers. Highlights in 2019 were as follows:

1. On January 16, 2019, Gen Plus B.V., a wholly owned subsidiary of EGCO, is completely purchased 49% shares of Paju Energy Services Co., Ltd. (Paju) from SK E&S Co., Ltd. Paju owns and operates a combined cycle gas-fired power plant facility with an installed capacity of 1,823 MW which located in Paju City, Gyeonggi Province, Republic of Korea. The electric power is generated and supplied to Korea Electric Power Corporation (KEPCO), the sole off-taker of wholesale power generation in Republic of Korea, through Korea Power Exchange (KPX) which served as the market operator in Republic of Korea.
2. On July 4, 2019, Paju Energy Services (Paju) invests in Gangdong Fuel Cell Project (Gangdong) with the contracted capacity of 19.8 MW. Gangdong is located on Gangdong district, Seoul Republic of Korea and expected to complete the construction and commence the commercial operation on fourth quarter of 2020. A fuel cell is the electrochemical technology that combines hydrogen from natural gas and oxygen to produce electricity and heat without combustion. The objective of this investment is to fulfil a portion of Renewable Portfolio Standard (RPS) obligation of Paju on a long-term basis. The earning of Gangdong consists of the sale of electricity and thermal energy. Moreover, Gangdong also receives renewable credits in the form of renewable energy certificates (REC) with the respect to its electricity generation output.
3. On September 25, 2019, EGCO signs the shareholder agreement to invest 44.6% of total registered capital in Thai Pipeline Network Company Limited (TPN) with Biggas Technology Co., Ltd. TPN operates oil transportation service business with the pipeline transportation system to the northeastern region of Thailand. This pipeline system is connected to Thai Petroleum pipeline Co., Ltd (Thappline) Terminal in Saraburi to TPN’s owned terminal with storage capacity of 142 million liters in Khon Kaen, through a newly constructed 342.8 kilometers undergrounded pipeline which has an annual transport capacity of approximately 5,443 million liters. The capacity of TPN shall potentially increase to 7,338 million liters. This project is now under construction and will start operation in the fourth quarter of 2021.
4. On September 26, 2019, SBPL power plant (SBPL) managed by San Buenaventura Power Ltd. Co., in which EGCO holds 49% of stakes, has commenced its Commercial operation to supply electricity to the Philippines national grid. SBPL is a coal-fired power plant with the installed capacity of 500 MW, located adjacent to the Quezon

Kulkanok L.

existing plant (QPL) in Mauban, Quezon province of the Philippines, utilizing highly efficient supercritical boiler technology.

5. On October 29, 2019, XPCL hydropower plant (XPCL) managed by Xayaburi Power Co., Ltd. in which EGCO holds 12.50% of stake, commenced its Commercial Operation date. The XPCL power plant is the run-of-river hydropower plant located on the Mekong River in Xayaburi Province of Lao PRD with the installed capacity of 1,285 MW.
6. On December 19, 2019, Greenwing Energy B.V. (Greenwing), a wholly owned subsidiary of EGCO, acquire 25% of stake in Yunlin Holding GmbH (Yunlin) which is a holding company owned 100% of Yunneng Wind Power Co., Ltd. (Yunneng). Yunneng is constructing a 640 MW offshore wind farm project which will be located in the Taiwan Strait approximately 8 km west of the coast of Yunlin Country in Taiwan. The construction of project comprises of 2 phases. The phase 1 comprised of 352 MW schedules the completion in fourth quarter of 2020 and phase 2 comprised of 288 MW schedules the completion in third quarter of 2021. Yunneng has entered into power purchase agreements (PPAs) with Taiwan Power Company (Taipower). Through These PPAs has secured a fixed 20 years feed-in tariff for the sale of electricity.

Kulhanok L.

Kulhanok L.



2. Business Characteristics

Revenue Structure

EGCO Group business comprises a holding company, electricity generation and sale companies, operating and maintenance, engineering and construction companies. The revenue structure of EGCO Group can be summarized in the below table.

Unit : Million Baht

Product Service	Transaction	% Shareholding	2019		2018	
			Revenue	%	Revenue	%
Electricity	BPU	99.99%				
	Capacity Charge		853.08	1.80%	839.39	1.44%
	Energy Charge		4,042.42	8.52%	3,850.55	6.61%
	KLU	99.99%				
	Capacity Charge		431.45	0.91%	392.52	0.67%
	Energy Charge		2,095.91	4.42%	1,839.02	3.16%
	EGCO COGEN	80.00%				
	Capacity Charge		242.59	0.51%	251.73	0.43%
	Energy Charge		1,921.82	4.05%	1,887.09	3.24%
	BRWF	100.00%				
	Energy Charge		876.75	1.85%	995.80	1.71%
	CWF	90.00%				
	Energy Charge		420.02	0.89%	344.01	0.59%
	Solarco	49.00%				
	Energy Charge		387.82	0.82%	359.50	0.62%
	SPP 2	99.99%				
	Energy Charge		51.00	0.11%	48.42	0.08%
	SPP 3	99.99%				
	Energy Charge		51.28	0.11%	49.10	0.08%
	SPP 4	99.99%				
	Energy Charge		36.91	0.08%	34.77	0.06%
	SPP 5	99.99%				
	Energy Charge		52.12	0.11%	50.34	0.09%
	TWF	90.00%				
	Energy Charge		38.08	0.08%	32.95	0.06%
Finance lease income under power purchase agreements	KEGCO	99.99%	3,000.33	6.32%	3,062.51	5.26%
	RG	70.30%	3.39	0.01%	6.23	0.01%
Operating lease income under power purchase agreements	Quezon	100.00%	3,298.23	6.95%	3,432.99	5.90%
Lease service income under power purchase agreements	KEGCO	99.99%	11,875.83	25.02%	10,543.20	18.10%
	RG	70.30%	241.75	0.51%	204.81	0.35%
	Quezon	100.00%	6,893.61	14.53%	6,236.30	10.71%
Service	ESCO	99.99%	559.06	1.18%	997.01	1.71%
	Quezon, PEPOI and QMS	100.00%	137.51	0.29%	63.96	0.11%
Interest Income	EGCO PLUS		341.93	0.72%	482.56	0.83%
	EGCO		142.82	0.30%	131.59	0.23%
	KEGCO		28.94	0.06%	25.93	0.04%
	Quezon		13.41	0.03%	15.04	0.03%
	BRWF		12.98	0.03%	11.24	0.02%
	Solarco		9.71	0.02%	8.95	0.02%
	BPU, CWF, KLU, EGCO COGEN, ESCO, RG, TWF, SPP 2, SPP 3, SPP 4, SPP 5, PEPOI and QMS		34.56	0.07%	23.65	0.04%

Kulhanok L.

Unit : Million Baht

Product Service	Transaction	% Shareholding	2019		2018	
			Revenue	%	Revenue	%
Others	Solarco ^{/A}		932.41	1.96%	881.73	1.51%
	CWF ^{/A}		541.05	1.14%	465.60	0.80%
	SPP 2 ^{/A}		124.80	0.26%	123.22	0.21%
	SPP 3 ^{/A}		126.29	0.27%	126.73	0.22%
	SPP 4 ^{/A}		90.81	0.19%	89.48	0.15%
	SPP 5 ^{/A}		129.38	0.27%	132.11	0.23%
	EGCO PLUS		172.22	0.36%	20.40	0.04%
	EGCO		69.79	0.15%	49.60	0.09%
	KEGCO		49.36	0.10%	5.88	0.01%
	TWF ^{/A}		47.56	0.10%	43.25	0.07%
	PEPOI, ESCO, Quezon, EGCO COGEN, BRWF, RG, BPU, KLU and QMS		26.93	0.06%	15.04	0.03%
Share of profit (loss)	NTPC	35.00%	1,443.32	3.04%	1,576.64	2.71%
	GEC ^{/B}	50.00%	1,305.45	2.75%	1,414.85	2.43%
	PAJU ES ^{/C}	49.00%	1,228.46	2.59%	-	-
	BLCP	50.00%	654.17	1.38%	1,167.65	2.01%
	NED	66.67%	629.72	1.33%	567.82	0.98%
	SEG	20.00%	419.10	0.88%	341.29	0.59%
	SEGSD	11.89%	310.04	0.65%	316.11	0.54%
	SBPL ^{/D}	49.00%	214.03	0.45%	(30.94)	(0.05%)
	XPCL ^{/E}	12.50%	143.92	0.30%	-	-
	GPS	60.00%	143.04	0.30%	131.10	0.23%
	GIDEC ^{/F}	50.00%	-	0.00%	(8.67)	(0.01%)
	MME	40.00%	(42.86)	(0.09%)	29.11	0.05%
	NT1PC	25.00%	(42.86)	(0.09%)	(16.55)	(0.03%)
	TPN ^{/G} and E&E ^{/H}		(0.54)	(0.00%)	-	-
Divestment	Net gain on disposal of Masin-AES ^{/I}		-	0.00%	9,810.05	16.85%
	Net gain on disposal of East Water ^{/J}		-	0.00%	4,358.53	7.48%
	Net gain on disposal of GIDEC ^{/F}		-	0.00%	8.67	0.01%
Dissolution	Net gain on dissolutions of EGCO BVI ^{/K} and TLC ^{/L}		-	0.00%	395.32	0.68%
	Net gain on dissolutions of North Pole ^{/M}		649.11	1.37%	-	-
Total revenues (revenues item in consolidated)			47,460.00	100%	58,235.16	100%

Notes

^{/A} Adder is an income, which is supported by the government.

^{/B} Gulf Cogeneration Co., Ltd. (GCC) is a power plant of Gulf Electric Public Co., Ltd. (GEC), which is EGCO holds a 50% stakes, stopped its operation and electricity sales to EGAT due to the expiration of PPA on September 3, 2019.

^{/C} EGCO acquired 49% stakes in Paju Energy Services Co., Ltd. (PAJU ES) on January 15, 2019.

^{/D} San Buenaventura Power Ltd., Co. (SBPL), which is EGCO holds a 49% stakes. The commercial operation date was on September 26, 2019.

^{/E} Xayaburi Power Co., Ltd. (XPCL), which is EGCO holds a 12.50% stakes. The commercial operation date was on October 29, 2019.

^{/F} EGCO divested all 50% shares in GIDEC Co., Ltd. (GIDEC) on March 15, 2018.

^{/G} EGCO signed a Shareholder's Agreement of Thai Pipeline Network Co., Ltd. (TPN) to acquired 44.60% stakes on September 25, 2019.

^{/H} EGCO Engineering and Service Co., Ltd. (ESCO), a wholly owned subsidiary of EGCO, paid for 40% stakes of registered share capital in E&E Engineering and Service Co., Ltd. (E&E) on May 17, 2019 and October 24, 2019.

^{/I} Gen Plus B.V., a wholly owned subsidiary of EGCO, divested all 49% indirect shares in Masin-AES Pte. Ltd (Masin-AES) on March 20, 2018.

^{/J} EGCO divested all 18.72% shares in Eastern Water Resources Development and Management Public Co., Ltd. (East Water) on March 14, 2018.

^{/K} EGCO International (B.V.I) Limited (EGCO BVI), which is EGCO holds a 100% stakes, registered for dissolution and liquidation on December 26, 2018.

^{/L} PT Tenaga Listrik Cilegon (TLC), which is EGCO holds a 49% stakes, registered for dissolution and liquidation on November 28, 2018.

^{/M} North Pole Investment Co., Ltd. (North Pole), which is EGCO holds a 100% stakes, registered for dissolution and liquidation on December 27, 2018 and October 1, 2019, respectively.

Kulhanok L.

Table 1. EGCO's Business Line:

<u>I. IPP Group</u>
<p>1.1 Khanom Electricity Generating Company Limited (KEGCO) EGCO holds 100% stake in KEGCO, which owns and operates Khanom power plant which is the largest private power plant in the southern Thailand, located in Nakhon Si Thammarat province. It consists of Khanom unit 4 project (KN4) to supply electricity to the national grid. KN4 is a 970 MW combined cycle power plant using natural gas as primary fuel to generate and sell electricity to EGAT under the 25 years PPA.</p> <p>In 2019, KN4 generated and sold 6,518.02 GWh electricity output to EGAT. Its annual average EAF was 96.09%.</p>
<p>1.2 BLCP Power Limited (BLCP) EGCO holds 50% stake in BLCP, which owns and operates an IPP coal-fired power plant located in Rayong province. It is a 1,434MW power plant comprising two identical 717 MW pulverized coal-fired power units using high quality bituminous coal imported from Australia as the primary fuel to generate and sell all electricity output to EGAT under the 25 years PPA.</p> <p>In 2019, BLCP power plant generated and sold 10,912 GWh electricity output to EGAT. Its annual average EAF for unit 1 and unit 2 was 92.98% and 94.57%, respectively.</p>
<p>1.3 Gulf Power Generation Company Limited (GPG) EGCO indirectly holds 50% stake in GPG, which owns and operates an IPP gas-fired power plant, called Kaeng Khoi 2 (KK2), located in Saraburi province. It is a 1,510 MW power plant composed of two 755 MW combined cycle power blocks using natural gas as the primary fuel to generate and sell all electricity output to EGAT under the 25 years PPA.</p> <p>In 2019, KK2 power plant generated and sold 684.10 GWh electricity output to EGAT. Its annual average EAF for block 1 and block 2 was 89.32% and 97.30%, respectively.</p>
<u>II. SPP Group</u>
<p>2.1 EGCO Cogeneration Company Limited (EGCO Cogen) EGCO indirectly holds 80% stake in EGCO Cogen, which owns and operates a SPP cogeneration power plant located in Rayong province. It is a 117 MW cogeneration power plant with steam supply of 30 tons per hour using natural gas as the primary fuel. Under the SPP firm cogeneration program, it generates and sells 60 MW electricity output to EGAT under the 21 years PPA, and remaining electricity along with steam output to Industrial Users (IUs) in Rayong Industrial Park under the long-term PPAs.</p> <p>In 2019, EGCO Cogen power plant generated and sold 686.45 GWh electricity output to EGAT and IUs. Its annual average EAF was 98.74% and the steam output to IUs was 35,905 tons.</p>
<p>2.2 Roi-Et Green Company Limited (RG) EGCO indirectly holds 70.30% stake in RG, which owns and operates a SPP renewable power plant located in Roi-Et province. It is a 9.9 MW biomass-fired power plant using rice husk as the primary fuel. Under the SPP firm renewable program, it generates and sells electricity output to EGAT under the 21 years PPA.</p>

Kulhanok L.

In 2019, Roi-Et Green power plant generated and sold 60.92 GWh electricity output to EGAT. Its annual average EAF was 89.83%.

2.3 Gulf Cogeneration Company Limited (GCC)

EGCO indirectly holds 50% stake in GCC, which owns and operates a SPP cogeneration power plant located in Saraburi province. It is a 110 MW cogeneration power plant with steam supply of 16 tons per hour using natural gas as the primary fuel. Under the SPP firm cogeneration program, it generates and sells 90 MW electricity output to EGAT under the 21 years PPA, and remaining electricity along with steam output to IUs under the long-term PPAs.

In 2019, GCC power plant generated and sold 479.07 GWh electricity output to EGAT and IUs. Its annual average EAF was 99.98% and the steam output to IUs was 78,263.57 tons.

2.4 Nong Khae Cogeneration Company Limited (NKCC)

EGCO indirectly holds 50% stake in NKCC, which owns and operates a SPP cogeneration power plant located in Saraburi province. It is a 126 MW cogeneration power plant with steam of 24 tons per hour using natural gas as the primary fuel. Under the SPP firm cogeneration program, it generates and sells 90 MW electricity output to EGAT under the 21 years PPA, and remaining electricity along with steam output to IUs under the long-term PPAs.

In 2019, NKCC power plant generated and sold 803.31 GWh electricity output to EGAT and IUs. Its annual average EAF was 96.54% and the steam output to IUs was 130,884.20 tons.

2.5 Samutprakarn Cogeneration Company Limited (SCC)

EGCO indirectly holds 50% stake in SCC, which owns and operates a SPP cogeneration power plant located in Samutprakarn province. It is a 126 MW cogeneration power plant with steam of 24 tons per hour using natural gas as the primary fuel. Under the SPP firm cogeneration program, it generates and sells 90 MW electricity output to EGAT under the 21 years PPA, and remaining electricity along with steam output to IUs under the long-term PPAs.

In 2019, SCC power plant generated and sold 764.25 GWh electricity output to EGAT and IUs. Its annual average EAF was 93.23% and the steam output to IUs was 114,466.69 tons.

2.6 Gulf Yala Green Company Limited (GYG)

EGCO indirectly holds 50% stake in GYG, which owns and operates a SPP renewable power plant located in Yala province. It is a 23 MW biomass-fired power plant using para-wood residue as the primary fuel. Under the SPP firm renewable program, it generates and sells electricity output to EGAT under the 25 years PPA.

In 2019, GYG power plant generated and sold 162.67 GWh electricity output to EGAT. Its annual average EAF was 91.88%.

2.7 Chaiphum Wind Farm Company Limited (CWF)

EGCO holds 90% stake in CWF, which owns and operates an 80 MW wind power plant located in Subyai district, Chaiphum province. CWF signed a non-firm PPA with EGAT under Small Power Plant scheme for 5-year term which can be renewed every 5 years.

In 2019, CWF power plant generated and sold 154.58 GWh electricity output to EGAT. Its annual average EAF was 99.63%.

Kulhanok L.

2.8 Natural Energy Development Company Limited (NED) (Lopburi Solar Project)

EGCO holds 66.67% stake in NED, which owns and operates 55 MW thin film solar power plant Lopburi Solar Project (LSP) located in Lopburi province. NED signed anon-firm PPA for LSP with EGAT for the sale of electricity output generated. PPA is automatically renewed every 5 years. In addition to the wholesale tariff referred to EGAT, the projects receive adder 8 baht per kWh, applicable for 10 years from the COD.

In 2019, LSP generated and sold 109.99 GWh electricity output to EGAT. Its annual average availability was 99.99%.

2.9 Klongluang Utilities Company Limited (KLU)

EGCO holds 100% stake in KLU, which owns and operates a SPP cogeneration power plant located in Pathum Thani province. It is a 121 MW cogeneration power plant with steam of 13 tons per hour using natural gas as the primary fuel. Under the SPP firm cogeneration program, it generates and sells 90 MW electricity output to EGAT under the 25 years PPA, and remaining electricity along with steam output to IUs under the long-term PPAs.

In 2019, KLU generated and sold 769.99 GWh electricity output to EGAT and IU. Its annual average availability was 98.41% and the steam output to IUs was 124,963 tons.

2.10 Banpong Utilities Company Limited (BPU)

EGCO holds 100% stake in BPU, which owns and operates a SPP cogeneration power plant located in Ratchaburi province. It is a 256 MW cogeneration power plant with steam of 100 tons per hour comprising two identical 128 MW using natural gas as the primary fuel. Under the SPP firm cogeneration program, it generates and sells 180 MW electricity output to EGAT under the 25 years PPA, and remaining electricity along with steam output to IUs under the long-term PPAs.

In 2019, BPU generated and sold 1,489.09 GWh electricity output to EGAT and IU. Its annual average availability was 98.23% and the steam output to IUs was 607,844 tons.

III. VSPP Group

3.1 Natural Energy Development Company Limited (NED) (Wang Ploeng Solar Project)

EGCO holds 66.67% stake in NED, which owns and operates 8 MW thin film solar power plant Wang Ploeng Solar Project (WSP) located in Lopburi province. NED signed a non-firm PPA for WSP with PEA for the sale of electricity output generated. PPA is automatically renewed every 5 years with the same as LSP pricing structure.

In 2019, WSP generated and sold 16.51 GWh electricity output to PEA. Its annual average availability was 99.52%.

3.2 SPP Two Company Limited (SPP2)

EGCO holds 100% stake in SPP2, which owns and operates the 8 MW solar power plant located in Saraburi province. SPP2 has entered into a non-firm PPA with PEA under VSPP program. The PPA is automatically renewed every 5 years with the same as NED's pricing structure. SPP2 is equipped with solar tracking system.

In 2019, SPP2 power plant generated and sold 15.73 GWh electricity output to PEA. Its annual average availability was 99.53%.

Kulhanok L.

3.3 SPP Three Company Limited (SPP3)

EGCO holds 100% stake in SPP3, which owns and operates the 8 MW solar power plant located in Srisaket province. SPP3 has entered into a non-firm PPA with PEA under VSPP program. The PPA is automatically renewed every 5 years with the same as NED's pricing structure. SPP3 is equipped with solar tracking system.

In 2019, SPP3 power plant generated and sold 15.93 GWh electricity output to PEA. Its annual average availability was 99.26%.

3.4 SPP Four Company Limited (SPP4)

EGCO holds 100% stake in SPP 4, which owns and operates the 6 MW solar power plant located in Srisaket province. SPP4 has entered into a non-firm PPA with PEA under VSPP program. The PPA is automatically renewed every 5 years with the same as NED's pricing structure. SPP4 is equipped with solar tracking system.

In 2019, SPP4 power plant generated and sold 11.44 GWh electricity output to PEA. Its annual average availability was 99.42%.

3.5 SPP Five Company Limited (SPP5)

EGCO holds 100% stake in SPP 5, which owns and operates the 8 MW solar power plant located in Roi-Et province. SPP5 has entered into a non-firm PPA with PEA under VSPP program. The PPA is automatically renewed every 5 years with the same as NED's pricing structure. SPP5 is equipped with solar tracking system.

In 2019, SPP5 power plant generated and sold 16.21 GWh electricity output to PEA. Its annual average availability was 99.46%.

3.6 G-Power Source Company Limited (GPS)

EGCO holds 60% stake in GPS, which owns and operates 4 solar power plants under 4 non-firm PPAs with the PEA under VSPP program with installed capacity of 6.5 MW each, total capacity of 26 MW. The PPAs are automatically renewed every 5 years with the same as NED's pricing structure. GPS has 4 sites comprising 1) Ta Khit Solar Project, Nakhon Sawan province 2) Ta Sang Solar Project, Nakhon Sawan province 3) Dong Khon Solar Project, Chai Nat province, and 4) Bueng Sam Phan Solar Project, Phetchabun province.

In 2019, all GPS's solar power plants generated and sold 40.67 GWh electricity output to PEA. Its annual average availability was 99.97%.

3.7 Solarco Company Limited (Solarco)

EGCO indirectly holds 49% stake in Solarco, which owns and operates 6 solar power plants located in Nakhorn Pathom and Suphanburi provinces. Solarco has entered into 6 non-firm PPAs with PEA under VSPP program with the installed capacity of 9.5 MW each, total capacity 57 MW. The PPAs are automatically renewed every 5 years with the same as NED's pricing structure. Solarco has 6 power plants, namely 1) Sai Kiew Solar Project, 2) Sai Yai1 Solar Project, 3) Sai Yai2 Solar Project, 4) Sai Phet1 Solar Project, 5) Sai Phet2 Solar Project and 6) Sai Phet3 Solar Project.

In 2019, all Solarco's power plants generated and sold 120.61 GWh electricity output to PEA. Its annual average EAF was 99.96%.

3.8 Theppana Wind Farm Company Limited (TWF)

EGCO holds 90% stake in TWF, which owns and operates the 7.5 MW wind power plant located in Chaiyaphum province. TWF has entered into a non-firm PPA with PEA under VSPP program.

Kulhanok L.

The PPA is automatically renewed every 5 years. In addition to the wholesale tariff referred to EGAT, the project receives adder 3.5 baht per kWh, applicable for 10 years from the COD.

In 2019, TWF power plant generated and sold 13.63 GWh electricity output to PEA. Its annual average EAF was 99.26%.

IV. Overseas Group

4.1 Quezon Power (Philippines) Limited Company (Quezon)

EGCO indirectly holds 100% stake in Quezon, which owns and operates a 502.50 MW pulverized coal-fired power plant using the high-quality coal imported from Indonesia as the primary fuel. Under the 25 years PPA, it generates and sells electricity output to Manila Electric Company (MERALCO), the country's largest power distribution company.

In 2019, Quezon power plant generated and sold 2,792.07 GWh electricity output to MERALCO. Its annual average EAF was 90.00%.

4.2 Nam Theun 2 Power Company Limited (NTPC)

EGCO holds 35% stake in NTPC, which owns and operates a 1,086.80 MW hydroelectric power plant located in Lao PDR. It generates and sells electricity output to EGAT, as well as Electricité du Laos (EDL) under the 25 years PPAs starting from its COD.

In 2019, NTPC power plant generated and sold 4,830.81 GWh electricity output to EGAT and 245.87 GWh electricity output to EDL. Its annual average EAF was 89.32% for EGAT and 97.46% for EDL.

4.3 Star Energy Geothermal Pte Ltd. (SEG)

EGCO indirectly holds 20% stake in SEG, which owns and operates a 227 MW geothermal power plant located in Indonesia. It comprises 2 units of 110 MW and 117 MW. Under the long-term PPA, it generates and sells electricity output to PT PLN (Persero), an Indonesian government-owned electricity corporation.

In 2019, SEG power plant generated and sold 1,860.26 GWh electricity output to its customers. Its annual average AF was 98.20%.

4.4 Boco Rock Wind Farm Pty Limited (BRWF)

EGCO indirectly holds 100% stake in BRWF, which owns and operates a 113 MW wind power plant located in Australia under long-term PPA with EnergyAustralia Pty Ltd.

In 2019, BRWF power plant generated and sold 366.67 GWh electricity output to the Australian Energy Market Operator (AEMO) and EnergyAustralia Pty Ltd. Its annual average EAF was 98.86%.

4.5 Star Energy Geothermal (Salak – Darajat) B.V. (SEGSD)

EGCO indirectly holds 20.07% stake in SEGSD, which owns and operates a 647.27 MW two geothermal power plant projects located in Indonesia. It comprises of Salak project 6 units of 376.80 MW and Darajat project 3 units 270.46 MW. Under the long-term PPA, it generates and sells steam and electricity output to PT PLN (Persero), an Indonesian government-owned electricity corporation.

In 2019, Salak power plant generated and sold 2,892.05 GWh electricity output to its customers. Its annual average AF was 94.16% and Darajat power plant generated and sold 2,012.36 GWh electricity output to its customers. Its annual average AF was 88.44%

4.6 Paju Energy Services company limited (Paju)

EGCO indirectly holds 49% stake in Paju, which owns and operates 1,823 MW of gas fire power plant in Republic of Korea. The main source of fuel is the imported natural gas. The electricity output is generated and sold to Korea Electric Power Corporation (KEPCO), which is the sole off-taker of the wholesale power generation, through the Korea Power Exchange (KPX) which served as the market operator in Republic of Korea.

In 2019, Paju generated and sold 12,439.51 GWh electricity output to KEPCO. Its annual average EAF was 95.08%

4.7 San Buenaventura Power Limited Company (SBPL)

EGCO indirectly holds 49% stake in SBPL, which owns and operates a 500 MW pulverized coal-fired power plant using the high-quality coal imported from Indonesia as the primary fuel. Under the 25 years PPA, it generates and sells electricity output to Manila Electric Company (MERALCO), the country's largest power distribution company.

SBPL commenced its commercial operation on September 26, 2019. In 2019, the power plant generated and sold 852.04 GWh electricity output to MERALCO. Its annual average EAF was 87.27%.

4.8 Xayaburi Power Company Limited (XPCL)

EGCO holds 12.50% stake in XPCL, which owns and operates a 1,285 MW run-of-river hydroelectric power plant located in Lao PDR. It generates and sells electricity output to EGAT, as well as Electricité du Laos (EDL) under the 29 years PPAs starting from its COD.

The XPCL commenced its Commercial Operation on October 29, 2019. In 2019, NTPC power plant generated and sold 798 GWh electricity output to EGAT and 56 GWh electricity output to EDL.

V. Other Businesses

5.1 EGCO Engineering & Service Company Limited (ESCO)

EGCO holds 100% stake in ESCO, which provides operation, maintenance, engineering and construction services to power plants, petrochemical plants, oil refineries and other industries.

5.2 Pearl Energy Philippines Operating, Inc. (PEPOI)

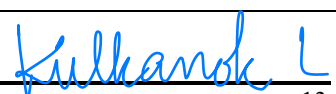
EGCO indirectly holds 100% stake in PEPOI (formally named Covanta Philippines Operating Inc.), which provides operation and maintenance services to Quezon power plant through a long-term operation and maintenance agreement.

5.3 Quezon Management Services Inc. (QMS)

EGCO indirectly holds 100% stake in QMS, which provides management services to Quezon power plant through a long-term management service agreement.

5.4 PT Manambang Muara Enim (MME)

EGCO indirectly holds 40% stake in MME, which owns and operates a coal mining project (an open-pit mine), located in Muara Enim, South Sumatra, Indonesia. It has the concession agreement from Indonesian government for 28 years since March 2010 to March 2038. It has mineable coal reserves of 134 million tons. The sales volume of MME in 2019 was at 0.85 million tons.



2. Business Characteristics

2.1 EGCO's Products and Services

EGCO invests in 2 business types, being power generation business and other business. EGCO's power business are divided into 4 groups namely (1) Independent Power Producer ("IPP") Group, (2) Small Power Producer ("SPP") Group, (3) Very Small Power Producer ("VSPP"), (4) Oversea Power Generation Group. EGCO's other business comprises 3 types of business which are (1) operation and maintenance business, (2) management services business for power plant, and (3) coal mine business. EGCO Business is detailed as follows:

2.1.1 Power Generation Business

Electrical Power is a clean processing power that is easy to use and to transform into other types of energy. Electrical power is vital to all business operations, in industry, agriculture, communication or tourism. To generate sufficient electrical energy to satisfy demand is therefore important. At present, the electricity generation in Thailand is divided into two categories:

1. Non-fuel electricity such as hydro power plants, and natural energy power plants using sources of natural energy like solar power, wind power and geothermal power.
2. Fuel-based electricity such as thermal power plants, gas turbine power plants and combined cycle power plants.

A. Types of Power Plant

The types of power plant operated by the EGCO Group are as follows:

1. A hydro power plant generates electricity by the use of force and water compression to rotate water turbines.

Power plants under this category are NTPC Power Plant and XPCL.

2. A thermal power plant generates electricity by burning fuel, such as natural gas, coal, or fuel oil, to boil water creating high-pressure steam. The pressure of the steam shall rotate the steam turbine, which attached to the shafts of power generator, generating electricity. This type of plant requires several hours for each start up, from ignition to boiling process and generating electricity, therefore it is suitable as base-load power plant.

Power plants under this category are BLCP Power Plant 1 and 2, Quezon, and SBPL.

Kulhanok L.

3. A combined cycle power plant generates electricity by combining the use of both gas turbine and steam turbine. When the gas turbine generates electricity, exhausted heat from the gas turbine shall be transferred to boil water, creating high-pressure steam. The pressure of the steam shall rotate the steam turbine, which attached to the shafts of power generator, generating electricity concurrently.

Power plants under this category are Khanom Combined Cycle Power Plant 4, GPG Power Plants 1 and 2, Paju Power Plant.

4. A cogeneration power plant is a power plant that produce both electrical power and thermal energy at the same time. The process of production is as same as the process of combined cycle power plant. However, the different point is that cogeneration power plant sale steam from its production process while combined cycle power plant does not.

Power plants of this type are EGCO Cogen Power Plant, GCC Power Plant, NKCC Power Plant, SCC Power Plant, KLU Power Plant and BPU Power Plant.

5. A renewable energy power plant generates electricity from non-conventional power source such as wind energy, solar power, mini hydro, geothermal energy, biomass and other alternative sources. Biomass and other alternative sources, such as wastes and exhausted gas from industrial process, can be used in the same way as fuel in thermal power plant to generate electricity.

Power plants under this type are RG Power Plant using rice husk as fuel, GYG Power Plant using parawood as fuel, NED, GPS, Solarco, SPP 2, SPP 3, SPP 4, and SPP 5 using solar power, TWF, CWF and BRWF using wind power, and SEG and SEGSD using geothermal power.

B. Renewable energy power plant

EGCO group prioritizes the investment in renewable energy sources in order to advocate clean energy for environmental conservation, reduce fossil fuel consumption causing greenhouse gases emission and enhance the reliability of electricity supply. Currently, EGCO has 5 types of renewable energy power plants which are;

1. Solar Power Plant: EGCO group has invested in various types of solar power technology, which identified as follows.
 - Thin film solar technology is adopted in NED. The cumulative irradiation is around 1,900 – 2,000 kWh/m² per year.
 - Polycrystalline with single axis solar tracking system technology i.e. SPP 2, SPP 3, SPP 4, and SPP 5. The cumulative irradiation is around 2,000 – 2,200 kWh/m² per year, respectively.

Kulhanok L.

- Polycrystalline solar technology is adopted in GPS and Solarco. The cumulative irradiation is around 1,900 – 2,000 kWh/m² per year, respectively.

All solar power plants of EGCO group have warranties for main equipment and performance ratio under long-term maintenance service agreement in order to ensure maximum efficiency.

2. Wind farm: EGCO group invest in wind farms both Domestic and International.

- Domestic: Power plants of this type are TWF and CWF. Direct Drive wind turbine technology (Gearless) is adopted in both power plants. The hub height are 100 and 120 meters respectively. These turbines operate at maximum performance of 10.3 meters/sec wind speed.
- International: Power plant of this type is BRWF located in New South Wales, Australia. This wind farm selected the gear system technology of GE with 80 meters of Hub height. The average wind speed is 7.1 meters/sec.

3. Biomass Power Plant: Power plants of this type are RG and GYG which use rice husk and parawood as primary fuel, respectively. The main sources of fuel from the local community and nearby area are sufficient to generate electricity. However, both power plants have fuel reserves for using in unforeseen circumstances.

4. Hydro Power Plant: There are two hydro power plants under EGCO's portfolio, NTPC and XPCL, which use force and compression of water due to the height of water head to generate electricity. NTPC is the reservoir hydro power plant. The reservoir storage are 3,530 million cubic meters with average water inflow from the rain of 7,521 million cubic meters per year. The main factor of generation is water supply to reservoir each year. NTPC has 25 years power purchase agreement with EGAT and Electricité du Laos (EDL). On the other hands, XPCL is a run-of-river hydro power plant. The characteristic of this run-of-river is that the total outflow of water must equal to the natural inflow, meaning that there is no water stored or channels away from the river. The main factor of generation is the flow of water. XPCL has 29 years power purchase agreement with EGAT and Electricité du Laos (EDL).

5. Geothermal Power Plant: Power plant of this type is SEG and SEGSD which use geothermal power to generate electricity. The plant use flash steam technology, with the steam generating electricity by driving the turbine directly. The steam is produced at more than 260°C. Furthermore, the SEG plant was the world's largest single cylinder machine. There are two phase fluid pipelines with central separators, and integrated pressure control.

Kulhanok L.

C. Tariff Rate

EGCO group has power purchase agreements in both Thailand and Asia Pacific region. In Thailand, IPP and SPP mainly sell power to EGAT, while VSPP mainly sells to PEA. Moreover, EGCO group sells power in the republic of Philippines, Laos PDR, Indonesia, Australia and Republic of Korea. The detail is demonstrated as follows:

IPP Group – the rate is divided into the following 2 parts:

1. Availability payment is a payment, which EGAT makes the payment to the power plants on a monthly basis for maintaining the availability of the power plants, regardless of whether the electric power will be supplied to EGAT or not. The availability payment covers financial cost of investment in the power plants, principal repayments and interest, fixed operating and maintenance expenses, administrative expenses, major maintenance cost and return on EGCO's equity.
2. Energy payment is the payment for the actual net electrical output. It covers the variable operating (i.e. fuel cost and fuel management cost) and maintenance expenses.

SPP Group – the rate is divided into the following 2 parts:

1. Capacity payment is charged based on the monthly contracted capacity for EGAT and charged on each customer regardless of whether such customer actually purchase electricity or not. However, the capacity payment applicable to EGAT is different from that applicable to customers in general (industrial users). The capacity payment in case of EGAT is calculated from its long run avoided capacity cost due to its purchase of power from SPPs while the capacity payment applicable to industrial users is calculated from contracted capacity that varies to the tariff structure of PEA.
2. Energy payment is the payment for the actual net electrical energy output. The energy payment charged on EGAT covers the variable operating cost, such as fuel cost, while the energy payment charged on industrial users charged in accordance with the tariff structure of PEA. Besides, the discount rate under power purchase agreement between the power plant and each industrial user is also included in the type of payment.

VSPP Group – the rate is divided into the following 2 parts:

1. Energy payment is the payment for the actual net electrical output. The purchase of power from VSPPs varies to the tariff structure of PEA.
2. The adder from power purchasing price of fuel and technology due to production cost of renewable energy varies to technology, fuel type, production capacity and investment details affecting variety of adder level.

Kulhanok L.

Overseas Group

1. The Philippines

Power tariff from Meralco consists of 4 main components as below:

- Capacity Payment is the remuneration paid by Meralco on a monthly basis. It covers financial cost of investment in the power plant.
- Fixed Operating Payment is the remuneration paid by Meralco on a monthly basis. It covers fixed operating and maintenance expenses of the power plant.
- Variable Operating Payment is the remuneration paid by Meralco on a monthly basis. It covers variable and maintenance expenses.
- Energy payment is the remuneration paid for the electricity actually delivered. The tariff of energy payment is charged under specified formula. The formula is partially on USD and partially on Peso.

2. Laos PDR

Hydro power plant in Laos mainly has long-term electricity sales agreements with EGAT. In the case of Nam theun 2, the tariff is divided into components as below:

- Primary Energy Payment is the remuneration paid by EGAT. It is calculated from the quantity of electricity declared to dispatch during on peak demand.
- Secondary Energy Payment is the remuneration paid by EGAT. It is calculated from the quantity of electricity declared to dispatch during off-peak demand.

For Xayaburi Power plant, its long-term electricity sales agreements for EGAT is similar to Nam Theun 2 power plant, but there is one additional component as below:

- Excess Energy is excess electricity generated when the amount of water is more than expected. Therefore, in that month, the electricity production can be more than the amount of Primary Energy (PE) and Secondary Energy (SE) which the Xayaburi power plant has informed in advance to EGAT of each month. The excess energy will be counted as excess electricity.

3. Indonesia

Power tariff is paid by PT PLN (Persero) to SEG in the term of Energy Payment which is the actual measured quantity of electricity delivered. However, Energy payment will change according to factors in the tariff structure.

4. Australia

For BRWF in Australia, EnergyAustralia pays the Power tariff to BRWF which consisted of 2 components as below:

- Energy Payment is the payment for the actual net electrical output.
- Renewable Green Certificate is the additional payment for the actual net electrical output, which is equivalent to adder.

Kulhanok L.

5. Republic of Korea

In the case of Paju, the power plant generates and sells the electricity to Korea Power Exchange or KPX which is the power pool in Republic of Korea. The tariff consisted of 4 components as below:

- Capacity Payment (CP) is the payment that power plant received from its available capacity. This tariff is a fixed rate and annually declared by KPX. It covers construction cost, operation cost and grid connection cost
- Schedule Energy Payment (SEP) is the payment that power plant received from its energy output that generate as dispatch scheduled by KPX. The tariff rate is real-time and change due to demand of power in the market. This payment covers the fuel cost of power plant.
- Constrained – On (CON) is the payment for the additional generation arising from factors including under-estimation of demand by KPX.
- Constrained – Off (COFF) is the payment for the generation initially assigned but not actually dispatch due to factors including over-estimation of demand by KPX.

The power pool in Republic of Korea is specified as Cost-based pool. For this type of power pool, the merit order will be dispatched based on the cost of generation of each power plant. Power plants will be dispatched in order of lower to higher cost.

D. Rights and Privileges

In addition to the PPA with EGAT and PEA, the Thai Board of Investment (BOI) also granted the tax privileges to all IPPs and SPPs in the Group under the Promotion Certificate Issuance no. 7.36 (Independent Power Producer) and 7.1 (Public utilities and infrastructure), respectively. The significant information is as follows:

Privileges

1. Exemption of corporate income tax (CIT) for net profit from promoted business for 8 years from the first date of income earnings.
2. Reduction of corporate income tax for net profit from investment by 50% of the normal rate for 5 years from the date following the end of the corporate income tax holiday.
3. Exemption of calculating dividend from the promoted business as taxable income throughout the period of corporate income tax holiday.

Conditions:

- Having shareholders who are Thai national holding shares in an aggregate amount of at least 51% of the registered capital.
- Having registered capital of at least as indicated.
- Power plant locating in the indicated areas for 15 years from the first date of operation. Relocation to other areas shall not be made unless with the BOI's prior approval.

Kulhanok L.

Tax privileges to all IPPs are detailed as follows:

Power Plant	Promotion Certificate	Date of Promotion Granted	Privileges (8 Years)	Registered Capital of at Least	Location
KEGCO	No. 2509(2)/2013 dated October 29, 2013	May 17, 2013	January 14, 2016 – January 13, 2024 [/]	6,000 million baht	Nakorn Si Thammarat Province
BLCP	No. 1499/2000 dated August 21, 2000	October 1, 1998	October 1, 2006-September 30, 2014	12,000 million baht	Rayong Province
GPG	No. 1660(2)/2005 dated July 25, 2005	June 3, 2005	November 3 2006 -November 2, 2014	1,850 million baht and shall increase the registered capital of at least Baht 9,030 million and fully paid before commencing the operation	Saraburi Province

Tax privileges to all SPPs are detailed as follows:

Power Plant	Promotion Certificate	Date of Promotion Granted	Privileges	Registered Capital of at Least	Location
EGCO Cogen	No. 1230/1999 dated June 7, 1999 and the revised version No. 5106/2000 (2-1230/2000, 6379/2002), (3-1230/1999), 6753/2002 (4/1230/2002) and 4063/2017 (5-1230/1999) dated May 31, 2000, October 3, 2002, November 2002 and 16 June 2007 ,respectively	June 7, 1999	January 10, 2003-January 9, 2011	Not less than 1 million baht and shall pay up the full amount of register capital of not less than 1,200 million baht before commercial operation date.	Rayong Province
RG	No. 1660(1) 2001 dated October 19, 2001 and revised version No. 6871/2003 (2-1660 (1) 2001)	October 19,2001	October 19, 2001 – October 18, 2009	Not less than 180 million baht and shall pay up the full amount of registered capital before	Roi-Et Province

Kulhanok L.

Power Plant	Promotion Certificate	Date of Promotion Granted	Privileges	Registered Capital of at Least	Location
	dated November 7, 2003			commercial operation date	
GCC	No. 1279/1997 dated May 2, 1997 and 3 revised versions - No. 4553/1999 (2-1279/1997) dated April 8, 1999 - No 6013/1999 (3-1279/1997) dated December 2, 1999 - No. 5279/2000 (4-1279/1997) dated June 20, 2000	Mar 5, 1997	July 21, 1998 - July 20, 2006	N/A	Saraburi Province
NKCC	No. 1594/1998 dated December 28, 1998 and a revised version, No. 4735/2001 (2-1594/1998) dated March 7, 2001	July 9, 1997	June 1, 2000 - May 31, 2008	N/A	Saraburi Province
SCC	No. 1761/1997 dated December 15, 1997 and a revised version, No. 4100/2000 (2-1761/1998) dated January 17, 2000	July 9, 1997	April 1, 1999 – March 31, 2007	N/A	Samut Prakan Province
GYG	No. 1549(2)/2004 dated July 9, 2004	November 19, 2003	November 7, 2006-November 6, 2014	Not less than 200 million baht and shall increase the registered capital of at least Baht 200	Yala Province

Kulhanok L.

Power Plant	Promotion Certificate	Date of Promotion Granted	Privileges	Registered Capital of at Least	Location
				million and fully paid before commencing the operation	
NED (LSP)	No. 1443(1)/2010 dated April 12, 2010	March 10, 2010	December 22, 2011 - December 21, 2019	Not less than 1,990 million baht	Lopburi Province
CWF	No. 2433(1)/2014 dated July 18, 2014	November 21, 2014	December 16, 2016 – December 15, 2024	Not less than 1,514 million baht	Chaiyaphum Province
KLU	No. 58-2443-0-00-1-0 dated November 9, 2015	May 29, 2015	May 29, 2015 – May 28, 2023	Not less than 1,000 million baht	Pathum Thani Province
BPU	No. 59-0294-0-00-1-0 dated February 24, 2016 and No. 59-0295-0-00-1-0 dated February 24, 2016	May 29, 2015 and May 29, 2015	4 September 2017 – 3 September 2025 and 28 August 2017 – 27 August 2025	Not less than 2,000 million baht	Ratchaburi Province

Tax privileges to all VSPPs are detailed as follows:

Power Plant	Promotion Certificate	Date of Promotion Granted	Privileges	Registered Capital of at Least	Location
SPP2	No. 1502(1)/2011 dated April 26, 2011	May 7, 2010	May 2, 2012 - May 3, 2020	Not less than 196.7 million baht	Saraburi Province
SPP3	No. 1503(1)/2011 dated April 26, 2011	May 7, 2010	February 21, 2012 - February 22, 2020	Not less than 197.5 million baht	Srisaket Province
SPP4	No. 1504(1)/2011 dated April 26, 2011	April 27, 2010	January 24, 2012 - January 25, 2020	Not less than 148.7 million baht	Srisaket Province and Ubon Ratchathani Province
SPP5	No. 1505(1)/2011 dated April 26,	May 7, 2010	June 22, 2012 - June 23, 2020	Not less than 198.4 million	Roi Et Province

Kulhanok L.

Power Plant	Promotion Certificate	Date of Promotion Granted	Privileges	Registered Capital of at Least	Location
	2011			baht	
GPS (Ta Khit)	No. 1884(1)/2011 dated June 28, 2011	March 22, 2011	March 1, 2012 - February 28, 2020	Not less than 750 million baht	Nakhon Sawan Province
GPS (Ta Sang)	No. 1883(1)/2011 dated June 28, 2011	March 22, 2011	March 2, 2012 - March 1, 2020	Not less than 750 million baht	Nakhon Sawan Province
GPS (Dong Khon)	No. 1882(1)/2011 dated June 28, 2011	March 22, 2011	March 5, 2012 - March 4, 2020	Not less than 750 million baht	Chai Nat Province
GPS (Bueng Sam Phan)	No. 1881(1)/2011 dated June 28, 2011	March 22, 2011	February 1, 2013 - January 31, 2021	Not less than 750 million baht	Petchabun Province
NED (WSP)	No. 1142(1)/2011 dated February 3, 2011	July 9, 2010	May 2, 2013 - May 1, 2021	Not less than 2,281 million baht	Lopburi Province
TWF	No. 2499(1)/2012 dated October 10, 2012	June 26, 2012	July 18, 2013 - July 17, 2021	Not less than 114 million baht	Chaiyaphum Province
Solarco (Sai Yai 1)	No. 1181(1)/2013 dated February 5, 2013	December 26, 2012	November 18, 2013 - November 17, 2021	Not less than 825 million baht	Nakhon Pathom Province
Solarco (Sai Yai 2)	No. 1182(1)/2013 dated February 5, 2013	December 26, 2012	November 18, 2013 - November 17, 2021	Not less than 825 million baht	Nakhon Pathom Province
Solarco (Sai Kyo)	No. 1183(1)/2013 dated February 5, 2013	December 26, 2012	December 16, 2013 - December 15, 2021	Not less than 825 million baht	Suphan Buri Province
Solarco (Sai Phet 1)	No. 1184(1)/2013 dated February 5, 2013	December 26, 2012	December 16, 2013 - December 15, 2021	Not less than 1,650 million baht	Nakhon Pathom Province
Solarco (Sai Phet 2)	No. 1186(1)/2013 dated February 5, 2013	December 26, 2012	December 16, 2013 - December 15, 2021	Not less than 1,650 million baht	Nakhon Pathom Province
Solarco	No. 1185(1)/2013	December 26,	November 18,	Not less than	Nakhon

Power Plant	Promotion Certificate	Date of Promotion Granted	Privileges	Registered Capital of at Least	Location
(Sai Phet 3)	dated February 5, 2013	2012	2013 - November 17, 2021	1,650 million baht	Pathom Province

Notes

^{/1} KEGCO has no authorization for the reduction of corporate income tax by 50% of the normal rate for 5 years from the date following the end of the corporate income tax holiday.

E. Products and Services

Electricity

The company has the policy to supply electricity or to provide related services with high quality. The Company will honor its promise to the customers and will continue to operate its business safely with environmental friendliness. In this regard, the description of the service of IPPs in EGCO Group, the major power plants in EGCO Group, is provided as an example:

1) Capacity, Net Generation and Capacity Factor

The capacity, net generation and capacity factor of IPPs during 2017-2019 is as shown below:

	Units	2019	2018	2017
KEGCO				
Contracted Capacity ^{/1}	MW	930	930	930
Net generation ^{/2}	Million kWh	6,518	6,807	6,205
Capacity Factor (%)	%	80.01	83.56	76.16
Increasing rate of net generation (%)	%	(4.25)	9.71	N/A
BLCP				
Contracted Capacity ^{/1}	MW	1,346.50	1,346.50	1,346.50
Net generation ^{/2}	Million kWh	10,912	10,384	10,092
Capacity Factor (%)	%	93.78	99.05	97.89
Increasing rate of net generation (%)	%	5.08	2.89	(0.71)
GPG				
Contracted Capacity ^{/1}	MW	1,468	1,468	1,468
Net generation ^{/2}	Million kWh	684	135	1,360
Capacity Factor (%) ^{/3}	%	5.32	1.05	10.58

Kulkanok L.

	Units	2019	2018	2017
Increasing rate of net generation (%) ^{/4}	%	406.74	(90.09)	(47.89)

Notes

^{/1} Contracted Capacity is the capacity of generation that EGAT agrees to purchase from each power plant.

^{/2} Net Generation is the total amount of electricity that each power plant generates and sells to EGAT in each year.

^{/3} Capacity Factor is computed by Net generation over in that year over the maximum available energy

^{/4} Increasing Rate of Generation is the rate of variation in generation of each power plant compared to the previous year.

2) **Raw Material**

In case of fuel-based electricity, major raw material for power generation is fuel, which comprises natural gas and coal which are primary fuels and diesel oil, the secondary fuel, other raw materials required for the generating process are water and chemicals, water treatment agent and fuel additive. Major raw materials for power generating can be summarized as follows:

(1) **Natural gas**

Natural gas is a primary fuel used for both thermal and combined cycle plants. Both KEGCO and GPG are supplied fuel by PTT under the contracted amount and price as indicated in the Fuel Supply Agreement between PTT and the power plant. The fuel cost will be passed through in the Energy Payment based on the contracted heat rate as stated in the PPA with EGAT

(2) **Coal**

Bituminous coal is the primary fuel for BLCP power plant. This high quality coal is shipped to the deep sea port of BLCP from overseas contracted suppliers. Its price varies from shipment to shipment depending on its calorific value. According to PPA with EGAT, BLCP is obliged to stock the coal for 30 days continuous operation.

(3) **Diesel oil**

Diesel oil is reserved to cope with primary oil shortage and for use in case of machinery test-run and for operation after repair and maintenance. According to the PPAs, KEGCO and GPG have to make available diesel oil reserve to serve 3 days of full generation. They will operate the facility with the use of diesel oil only upon the instruction of EGAT. Moreover, diesel oil is used in BLCP for a start-up or lower-than 25% operation load, so the diesel oil is only reserved as necessary each year.

(4) **Water**

Each power plant procures the water for consumption as detailed below:

Kulhanok L.

KEGCO's primary source of water used in the thermal plant comes from Ban Klang canal and the secondary source comes from Tha Tok canal. A reservoir had been built to accommodate water reserve of 0.4 million cubic meters upon area of 79 rai along the Ban Klang canal, situated about 10 kilometers away from the power plant. It can well cope with shortage of water during dry season. Moreover, an additional reservoir, Ban Bang Koo, situated 6 kilometers from the power plant with the capacity of 0.4 million cubic meters upon area of 114 rai.

BLCP purchases the water from the Industrial Estate Authority of Thailand ("IEAT") with the reserve of 3-day service. Moreover, BLCP has the desalination plant as the backup source to be used in case of IEAT's incapability to provide its service, to meet the need of water use.

GPG's primary source of water used in the power plant comes from Pasak River. A reservoir has also been built to accommodate water reserve of 1.3 million cubic meters upon area of 120 rai. Within this reserved capacity, the power plant is able to sustain its normal operation for 30 days. Moreover, GPG has water treatment plant to produce tap water with the capacity of 54,413 cubic meters per day.

(5) Chemicals

Most chemicals used in power plants are for improving water quality, such as, Ammonia and Sodium triphosphate for boilers, and Hydrochloric acid (HCL), Sulfuric acid (H₂SO₄) and Sodium hydroxide (NaOH) for use in water purification system, as well as Aluminum Chlorohydrate (ACH) and Sodium hypochlorite (NaOCl) for tap water system.

Other Businesses

There are 3 types of other business comprise 1) operation and maintenance business, being EGCO Engineering & Service Co., Ltd. ("ESCO") and Pearl Energy Philippines Operating, Inc. ("PEPOI"); 2) management services business for power plant, being Quezon Management Services Inc. ("QMS"); and 3) coal mine business, being PT Manabung Maura Enim Co., Ltd. ("MME").

1) Operation and Maintenance Business – ESCO, E&E, and PEPOI

A. ESCO

ESCO is EGCO's wholly owned subsidiary which provides operation, maintenance, engineering and construction services to power plants, petrochemical plants, oil refineries and other industries.

Kulkanok L.

Service

Power Plant Operation and Maintenance Services (O&M)

ESCO aims to provide comprehensive operation and maintenance services with high efficiency, i.e., high equivalent availability factor and low heat rate with reasonable O&M cost. ESCO has extensive experiences to provide a full scope services to both thermal and combined cycle plants

Maintenance Services

ESCO has extensive expertise in mechanical maintenance, electrical maintenance, and control and instruments maintenance services and can be on called on 24-hour basis. With the strong and competent workforce, ESCO can provide a variety of professional maintenance services for power, petrochemical and oil & gas industries which covers the following areas:

- Planned Outage maintenance
- Contract maintenance services
- Individual equipment maintenance
- Field service and emergency troubleshooting

Engineering & Construction Services

ESCO has a qualified team of engineer to provide services on civil, mechanical, electrical and control and the testing and installation. The particular strength lies in installation and conducting test on power plant main system such as gas turbine, steam turbine, generator, HRSG, boiler and balance of plant. ESCO services also cover turnkey of small to medium projects such as pumping stations and power distribution substations.

In addition, ESCO also provides other services such as on demand side management, technical and field testing and technical training, etc.

B. E&E

EGCO indirectly holds 40% stake in E&E Engineering and Service Company Limited, which provides operation and maintenance services to NT1PC power plant through a long-term operation and maintenance agreement and provides the various service to other power plants and industries in the Laos PDR.

C. PEPOI

EGCO holds 100% stake in PEPOI, which provides operation and maintenance services for Quezon and SBPL power plant through a long-term operation and maintenance agreement.

Kulkanok L.

2) Management Services Business for Power Plant – QMS

EGCO holds 100% stake in QMS, which provides management services for Quezon and SBPL power plant through a long-term management service agreement.

3) Coal mining company - MME

EGCO indirectly holds 40% stake in MME, which owns and operates a coal mining project (an open-pit mine), located in Muara Enim, South Sumatra, Indonesia. It is awarded a concession agreement from Indonesian government for 28 years since March 2010 to March 2038. It has mineable coal reserves of 134 million tons.

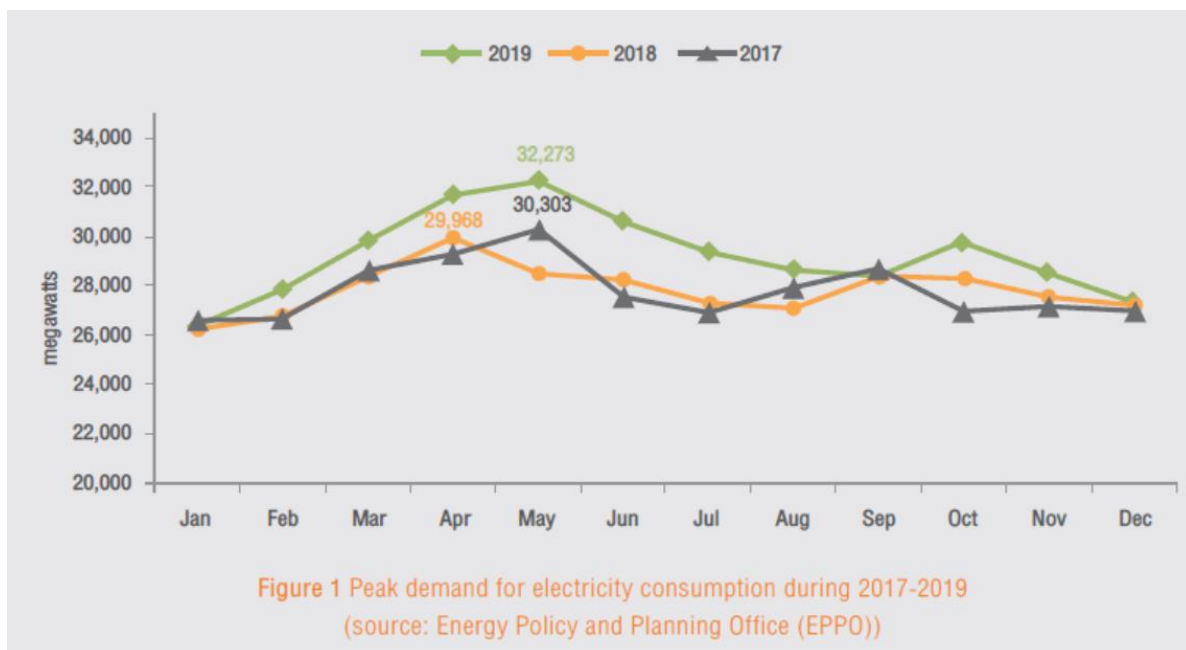
2.2 Power Industry and Competition

1. Economic and Electricity industry situation in Thailand

Thailand's economy expanded by 2.4 percent in 2019, lower than 2018. The downside was mainly stemmed from the impact of export contraction affected by the global economic slowdown, prolonged US-China trade tension and the Baht appreciation. As for economic outlook in 2020, National Economic and Social Development Council (NESDC) forecasted Thailand's economy to expand by 1.5-2.5 percent, softening from 2019 due to impacts from the coronavirus (Covid-19) outbreak, the drought conditions and the delay in FY2020 budget. However, the economy will be supported by a gradual global economic recovery following easing trade tensions and reduced risks of a no-deal Brexit as well as a favorable expansion of private consumption and investment of both private and public.

For electricity industry situation in 2019, Thailand's peak demand in Electricity Generating Authority of Thailand (EGAT)'s system was 30,853 megawatts, occurred on May 2, 2019 at 10.27 pm, higher than the peak demand of 28,338 megawatts in 2018 by 8.9 percent while the peak demand in 3 power authorities system (EGAT, Metropolitan Electricity Authority (MEA) and, Provincial Electricity Authority (PEA)) was 32,273 megawatts, occurred on May 3, 2019 at 02.27 pm, increased from the peak demand of 29,968 megawatts in 2018 by 7.7 percent. This is a result of higher temperature from previous year and increasing electricity consumption from private sectors. Peak demand for electricity consumption is shown in Figure 1. At the same time, electricity consumption of the country in EGAT's system as of December 2019, including electricity consumption outside EGAT's system as of November 2019 stood at 210,752 gigawatt-hours which were 6,446 gigawatt-hours or 3.2 percent rising from 204,306 gigawatt-hours in 2018. A surge in electricity consumption was mainly consequence from high temperature.

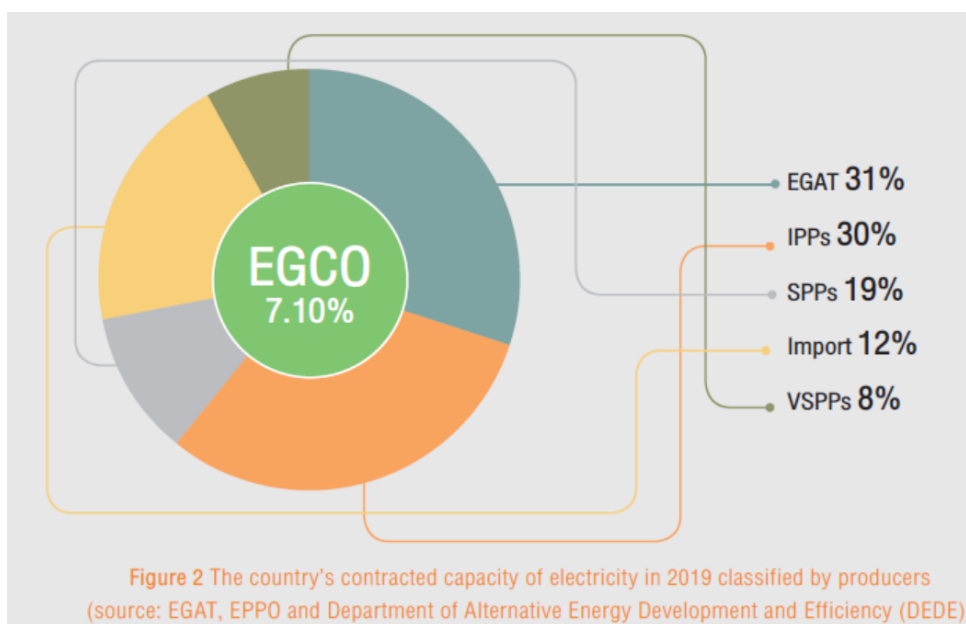
Kulhanok L.



As of December 31, 2019, the country's contracted capacity in 3 power authorities system was 49,304 megawatts, 15,130 megawatts or 30.7 percent of which were generated by EGAT power plants, and the remaining from other producers as follows:

- Independent Power Producers (IPPs) 14,948 megawatts or 30.3 percent
- Small Power Producers (SPPs) 9,498 megawatts or 19.3 percent
- Import from neighboring countries 9,721 megawatts or 11.6 percent
- Very Small Power Producers (VSPPs) as of April 2019 4,007 megawatts or 8.1 percent

EGCO's contracted capacity of electricity sold to EGAT and PEA was 3,440 megawatts, representing 7.10 percent of the country's contracted capacity in three power authority's system, as presented in Figure 2



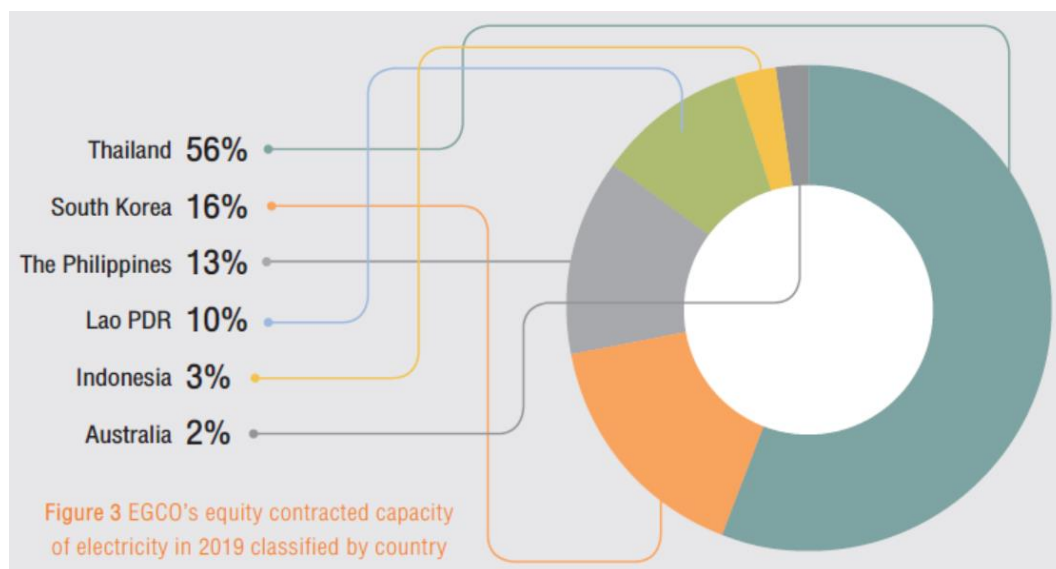
In the recent year, Thailand's power development plan for 2018 to 2037 (PDP 2018) was approved by the National Energy Policy Council (NEPC) on January 24, 2019 and by the cabinet

on April 30, 2019. The PDP 2018 focuses on the use of natural gas as primary fuel for power generation as well as the increase proportion in renewable energy, especially household solar rooftops. In addition, Ministry of Energy has launched the Energy for All scheme, which aims to enable private companies to form joint ventures with local communities to operate renewable power projects in remote areas.

Regarding the Alternative Energy Development Plan for 2018 (AEDP 2018), AEDP 2018 are under arrangement to be synchronized with PDP 2018. According to the latest amendment of the AEDP 2018, the electricity generation from renewable energy sources will contribute a total of 29,411 megawatts by 2037. According to the Department of Alternative Energy Development and Efficiency (DEDE), the current status of renewable energy power plants as of October 2019, which achieved COD was 11,844 megawatts, increased from which of 2018 by 475 megawatts or 4.2 percent.

2. Electricity industry in target countries

Due to limited growth prospect for domestic electricity industry, EGCO has expanded the investment in Asia-Pacific countries such as Philippines, Lao PDR, Indonesia, Australia and South Korea where the Company has established business bases. Investment of EGCO in each country is shown in Figure 3. In addition, EGCO has also been seeking for further investment opportunities in other target countries such as Vietnam, Myanmar, Cambodia and Taiwan. EGCO has consistently kept monitoring and analyzing electricity industry situation to explore investment opportunities in those targeted countries. The overall industry situations of which are as briefed below;



2.1 The Philippines

The Philippines's economy had expanded 6.2 percent from previous year. The Philippines currently has installed capacity of 24,000 megawatts, which are primarily from coal-fired power. Peak demand in the Philippines is expected to increase 5.4 percent annually. The Philippines plan to expand its capacity by 39,000 megawatts by 2026, which focus on power generation from coal-fired power plant. Additionally, the Philippines set target renewable energy generation of 26,000 megawatts by 2026, which supports the power generation from solar and wind power.

Kulhanok L.

2.2 Lao People's Democratic Republic (Lao PDR)

Lao PDR had a GDP growth of 6.5 percent from prior year, supported by investments in large infrastructure projects. Lao PDR's installed capacity is approximately 8,800 megawatts. Because of its abundant water resource and mountainous geography, the electricity generation is mainly from hydropower plants. With an aim to be the Battery of Asia, the electricity generation for export to neighboring countries such as Thailand and Vietnam are approximately 65 percent of total capacity. The demand growth of whole country is forecasted to grow 13.2 percent annually. Furthermore, Lao PDR's promotes the investment in power generation from hydropower and alternative renewable energies, such as solar and wind from private sectors, both domestic and overseas.

Presently, Thailand has signed Memorandum of Understanding (MOU) to purchase electricity of 9,000 megawatts from Lao PDR.

2.3 Indonesia

Indonesia's GDP has grown by 5.2 percent from previous year. Indonesia's installed capacity is approximately 63,000 megawatts. Coal-fired and natural gas power plants play a significant role as base load generation. Demand growth is forecasted to increase 6.5 percent annually. According to 2019-2028 Power Supply Business Plan (RUPTL), the government plans to expand its electricity generating capacity by 56,000 megawatts. The new RUPTL prioritizes the use of renewable energy sources, as well as domestic use of gas. In overall, the additional electricity generating capacity is mainly from coal, gas, geothermal and hydropower, which are the major resources.

2.4 Australia

Australia had a GDP growth of 2.8 percent from prior year. Australia's installed capacity is approximately 57,000 megawatts, mainly supplied by aging coal-fired power plants and renewable energy. In recent years, solar, wind and gas generation increased drastically, while coal-fired generation declined because of the reduction in its average availability and displacement by solar during the day. Due to energy efficiency and a continuous increase in rooftop PV capacity, demand growth in Australia is estimated to be flat over the 20-year outlook period. Furthermore, the government of Australia puts an effort to increase renewable energy generation to 33,000 gigawatt-hours by 2020, which focus on power generation from wind power and rooftop PV. Power generation from wind power and rooftop PV are forecasted to be more than double from present by 2029.

2.5 Vietnam

Vietnam's economy has expanded by 7.1 percent, supported by rapid growth of population and foreign investors. The installed capacity of Vietnam is approximately 48,000 megawatts, which are primarily from coal-fired power and hydropower. Demand growth is estimated to increase 8.4 percent annually. According to revision of power master plan VII, Vietnam's electricity generating capacity is forecasted to increase to 130,000 megawatts by 2030. Additionally, the government of Vietnam aims to develop power generation from renewable energy to achieve target of 48,000 megawatts by 2030, which promotes investment from solar power, hydropower and wind power.

Currently, Vietnam is drafting on its power master plan VIII, which expected to replace their coal-focused power plants with schemes favoring cleaner sources, including

Kulhanok L.

renewables and LNG. Furthermore, Vietnam wholesale electricity market (VWEM) has officially come into operation since January 2019, as part of its commitment to the power sector's reforms aimed to attract foreign capital inflows.

2.6 Myanmar

Myanmar's GDP growth expanded by 6.2 percent from previous year. Myanmar's installed capacity is approximately 5,700 megawatts, which are mainly generated by hydropower plants. However, the current supply is not sufficient to meet country's demand, which is forecasted to increase 9.6 percent annually. Additionally, as 60 percent of households are not connected to the national grid, relying on local solutions such as diesel generators and solar rooftop, the government puts an effort to achieve 100 percent electrification by 2030 by increasing energy access in rural areas and securing reliable supply in urban areas and Special Economic Zones (SEZs) through joint investment with foreign investors. With this regard, Myanmar plans to expand its electricity generating capacity to 14,000 megawatts in 2030, which focuses on the development of hydropower plants and coal-fired plants. Thailand has signed Memorandum of Understanding (MoU) for the purchase of electricity from Myanmar, expiration in 2020 with no specific capacity.

2.7 Cambodia

Cambodia's economy had a GDP growth of 7.5 percent from prior year. The installed capacity of Cambodia is approximately 2,700 megawatts. Hydro and coal are primary source of fuel supply in Cambodia. Demand growth in Cambodia is forecasted to increase 9.5 percent annually. The government has a policy to connect all villages to the national grid by 2020 and import more energy from neighboring countries to fulfil its growing demand. Cambodia plans to increase 2,600 megawatts of electricity generating capacity, which promote power generation from hydropower and coal-fired power. Thailand has signed Memorandum of Understanding (MoU) for the purchase of electricity from Cambodia, with no specific capacity.

2.8 South Korea

The economy of South Korea expanded by 2.7 percent, compared with previous year. South Korea's installed capacity is approximately 120,000 megawatts, which are significantly from natural gas and coal-fired power. Demand growth is estimated to increase 1.3 percent annually. South Korea electricity market is cost based pool. The Korea Power Exchange (KPX) functions as the independent electricity market operator in Korea. In this role, KPX acts as the clearing house for power sales and purchases. It controls real time dispatch of all generators which is set daily on a merit cost basis. South Korea's electricity generating capacity is estimated to increase to 174,000 megawatts. The government plans to shift away from coal-fired and nuclear power towards LNG and renewables. Moreover, South Korea promotes the development of renewable energy to achieve 20 percent of total capacity by 2030, with target of 31,000 megawatts and 15,000 megawatts from solar power and wind power respectively.

2.9 Taiwan

Taiwan's economy has grown by 2.6 percent from previous year. Taiwan's installed capacity is approximately 45,000 megawatts, which are mostly generated from natural gas and coal-fired power. Demand growth is forecasted to increase 1.5 percent annually. The government of Taiwan plans to expand 34,000 megawatts of electricity generating capacity with emphasis on development of natural gas power plant while reducing the dependence on coal-fired power plants. Presently, the government has set the goal of

Kulhanok L.

achieving a nuclear-free homeland and increasing the ratio of renewable energy generation to 20 percent by 2025. Power generation from renewable energy focusing on solar and wind in Taiwan is expected to be 27,000 megawatts by 2025

3. Competition

In 2019, power industry shows intensified competition. Due to limited growth prospect for domestic electricity industry, peers are actively exploring opportunities and expanding investment in overseas, which led to high competition in this region. Additionally, peers extended the investment to energy related business as well as new business for business diversification and coping with disruptive technologies. Despite the high competition in power industry, EGCO has successfully expanded its investment as follows;

- EGCO expanded its portfolio with new investment in 19.8 MW Gangdong Fuel Cell Project in Gangdong-gu, Seoul, South Korea., which EGCO holds 49% ownership interest.
- EGCO extended to other energy-related business through investment in Thai Pipeline Network Co., Ltd., which involves the operation of oil pipeline extension to the northeast of Thailand, opening new opportunity in the oil pipeline business with good and long-term investment return.
- Two projects under construction, being San Buenaventura power plant, a coal-fired power project in the Philippines and Xayaburi power plant, a hydropower project in Lao PDR had commenced their operations in October 2019. These strengthen EGCO's existing footholds in the Philippines and Lao PDR.
- EGCO successfully signed Share Purchase Agreement to hold 25% stake in 640 MW Yunlin offshore wind farm in Taiwan. Commissioning of the Project will occur in phases, with phase 1 comprising 352 MW scheduled for completion in the 4th quarter of 2020, and phase 2 comprising 288 MW scheduled for completion in the 3rd quarter of 2021.

These investments would not only enhance business growth but also provide economic value added to EGCO. EGCO is satisfactorily competitive in power business, which was resulted by several key success factors including, but not limited to:

- **Human resources**

Competence and expertise of EGCO's personnel, experiences of its Board members, and good relationship with business alliances are the keys. EGCO personnel have dependable capabilities and experiences in power industry. Board members are competent persons from diverse business areas, many of whom are knowledgeable and long-time experienced in energy and electricity areas. Moreover, EGCO is committed to improving competency of its employees at all levels to ensure they have the competence and expertise to support EGCO Group's continuous business expansion.

- **EGCO's trustworthy**

EGCO continuously expands its investments to ultimately support sustainable growth and maximizes shareholders' value. Project selection criteria have been set to ensure quality investment, that generates good returns at an acceptable risk level. This led to satisfactory financial status, liquidity, and profit growth, which helped the company earn creditability and trustworthy from banks and financial institutions in financially supporting its ongoing investments.

- **Good relationship with communities surrounding power plants**

As power generation may cause impact to nearby communities, EGCO always operates its business with regard to participation in the community and society development starting from the communities in the vicinity of power plants, covering openly disclosure of factual information and promotion of appropriate participation

Kulhanok L.

of the society before construction, under construction, and after completion of construction of power plants. EGCO's group power plants initiated and implemented community development projects under the "framework of improvement of quality of life of the communities surrounding the power plants", which ensures that the relationship between EGCO Group's power plants and communities are mutually beneficial.

- **Innovation**

Innovation for sustainability at EGCO Group is one of the most important elements that drives forward the company's business operations not only for distinctive competitive advantage but also towards a sustainable future. EGCO aims to promote internal innovation and encourage creativity and innovative mindsets for EGCO's employees, which can be applied to work process, increase work efficiency and obtain the competitive advantages over competitors.

2.3 Undelivered works

There are 2 power plant projects under developing as follows:

Power Plant Project	Province/ Country	Fuel Type	EGCO Shares (%)	Equity Contracted Capacity (MWe)	SCOD
1. Nam Theun 1	Laos PDR	Hydro	25.00	161.08	2022
2. Guangdong	South Korea	Liquefied Natural Gas	49.00	9.7	2020

Kulhanok L.

3. Risk Factors

In 2019, EGCO Group officially confirmed the importance of risk management by creating the Risk Oversight Committee (ROC) via a resolution from its board of directors. The establishment of this committee was effective on September 20, 2019 and it is comprised of five experienced directors from the fields of risk management, law, finance and banking, engineering, and the energy business.

The board of directors established the committee's main duties and responsibilities which were to consider, review, and provide recommendations on enterprise risk management (ERM) policy and framework; to set corporate risk appetite and risk tolerance level; to confirm the key risks, their impacts, and possibilities; ERM plan and process; to provide recommendations and support to the EGCO Group's Board of Directors; and to appropriately and efficiently supervise the managing of various risks relating to business operations. Additionally, they are to regularly report to the board on the results of their risk assessments and implemented risk reductions.

At the management level, our Risk Management Committee is comprised of top executives with the president serving as the chairman of the committee; all senior executive vice presidents are members and the Executive Vice President of Asset Management is the secretary. The Risk Management Committee's main duties and responsibilities are to manage EGCO Group's risk management in order to comply with risk management policies and guidelines, promote and support ERM policy, and to regularly report to the ROC and the board of directors. In the case of potential significant risk factors, the Risk Management Committee shall promptly report to the ROC and the board.

Additionally, EGCO Group has a Risk Assessment Division which functions as the secretary of the Risk Management Committee and the ROC. This division is responsible for monitoring and reporting the company's risk management practice, cooperating with the risk owners on risk identification, risk assessment, risk response, and reporting matters about risk management practice to the Risk Management Committee. In 2019, there were six meetings with the Risk Management Committee and three meetings with the ROC to make sure that the risk management processes are implemented throughout the organization and all divisions are fully aware of risk management's importance. EGCO Group also announced its risk management philosophy which states:

EGCO Group believes that despite the risks implicit in doing business, we strive to manage risk efficiently with consideration of balancing risk and return for all stakeholders' benefits. Our risk management shall increase the opportunities for achieving corporate goals and creating sustainable corporate values.

Our philosophy aims to be applied throughout our organization in order to support ERM, which follows the risk management framework set by the board of directors.



In 2019, EGCO Group applied the Committee of Sponsoring Organizations of the Treadway Commission Enterprise Risk Management (COSO ERM) framework which was classified as strategic risk management, operating risk management, financial risk management, and compliance risk management. We recently updated our “Risk Management Manual” to be in line with the 2017 COSO ERM. Moreover, EGCO Group established its key risk indicators (KRIs) which comprised the leading and indicators in risk management and also encouraged their employees to appropriately utilize these KRIs with their operations.

EGCO Group realizes that risk management culture in an organization is a key factor to achieve ERM, therefore it has been promoting the importance of ERM by using various channels such as annual risk seminars, the Risk Management Manual, journals and news, risk management activities, EGCO radio, EGCO billboards, and EGCO GroupNet. Additionally, the company’s high-level executives and directors play significant roles in promoting risk management throughout the organization in accordance with the “tone at the top” model. The company is now in the process of developing eLearning applications to instruct employees about the advantages of applying COSO ERM in their future business operations.

The following is a summary of EGCO Group’s key risk factors and relevant mitigation measures.

1. Investment Expansion Risk

EGCO Group invests in the energy business and its related businesses in both domestic and overseas markets. The primary source of income are dividends from the subsidiaries and joint ventures. To maintain and increase shareholder value, our strategic plan includes the continuous investment in new projects. Such acquisition and development projects may entail the following risks that may affect the company’s investment target.

1.1 Risk from Project Selection

EGCO Group plans to expand its investments to maintain continuous growth. Potential domestic and overseas projects are listed in the yearly investment plan—including the expansion of electricity generation of fossil fuels and renewable energy. Since the project selection process is of great importance, we have assigned this task to the Business Development Unit. This unit analyzes the related factors including economic policies, political and social policies of the targeted countries, economic situations, industry, financial costs, equipment and construction costs, and governmental laws and regulations. Moreover, the analysis of the changing environmental factors (sensitivity analysis) that affect the projects is taken into consideration, so that the risk prevention and compensation are accounted for in the return of the investment analysis.

Furthermore, EGCO Group has identified new investment opportunities that must be reviewed and scrutinized by the EGCO Management Committee and the Investment Committee in order to ensure that all material risks are identified and well-managed before the new investment opportunities are proposed to the board of directors.



In 2019, EGCO Group successfully invested in the following three new projects:

- On June 21, 2019, the board of directors approved the acquisition, through Paju Energy Service Co. Ltd., in which EGCO Group owns a 49% ownership interest, in the 19.8 MW Gandong Fuel Cell Power Plant in South Korea. The project's construction is expected to commence in August 2019 and the Commercial Operation Date (COD) is scheduled for the fourth quarter of 2020.
- In September 2019, EGCO Group entered into a share purchase and subscription agreement and shareholders' agreement respectively to acquire 44.6% ownership interest in the Thai Pipeline Network Company Limited (TPN). TPN has invested in a newly constructed 342.8 km extension of a petroleum underground pipeline system to the northeastern region of Thailand; it will be connected to a terminal with a storage capacity of 142 million L in Khon Kaen Province. The project is now under construction and will begin operating in the fourth quarter of 2021.
- On December 19, 2019, Greenwing Energy B.V., a wholly-owned subsidiary of EGCO Group, entered into a share purchase agreement to acquire 25% ownership interest in Yunlin Holding GmbH, which owns 100% of Yunneng Wind Power Co., Ltd. of Taiwan. Yunneng is a 640 MW offshore wind farm that is currently under construction.

1.2 Risk from Overseas Asset Management

Overseas investments create opportunities for the long-term growth of EGCO Group. Nevertheless, various factors may impact the performance of such assets such as economic circumstance, political factors, business environment, and local community. These factors are still present in EGCO Group's earnings forecast and can be possibly affected by the unfamiliar business environment of each country. In order to mitigate these risks, EGCO Group engages competent personnel who have experience in such specific markets to work on these overseas assets so that they are efficiently managed and the targeted profits are met.

EGCO Group has assigned an executive to work at the power plants such as Nam Theun 1 Power Co., Ltd. ("NT1PC"); Nam Theun 2 Power Co., Ltd. ("NTPC"); Quezon Power (Philippines) Ltd., Co. ("Quezon"); San Buenaventura Power Ltd. Co. ("SBPL"); and New Growth Plus B.V. ("NGP"). Additionally, we have hired external specialists who are familiar with Australia's economy to work at Boco Rock Wind Farm Pty Ltd. ("Boco Rock").

Along with delegating the right people to work in overseas power plants, EGCO Group has also appointed competent representative directors from the levels of senior vice president and senior executive vice president from the following three fields: business development, financial accounting, and asset management. They will be directors in power plants where EGCO Group holds an ownership interest under the shareholder agreement and the Article of Association. These representative directors are responsible for policy

Kulhanok L.

administration and supervising these companies to effectively carry out its business operation following the management principles that are in line with the company's policies.

2. Construction Project Management Risk

EGCO Group is well aware of the risk from project construction delays which can be caused by contractors' irresponsibility, local community conflicts, or natural disasters. The measures that can be taken to lower the likelihood and impacts of such risks include the selection of reputable engineering, procurement, and construction (EPC) contractors with binding contracts; proactive community relations activities; and the securing of insurance policies which cover the impacts from natural disasters. EGCO Group assigns a project management team to closely monitor a project's progress to guarantee that it is completed as scheduled.

In 2019, there were five projects under construction. The construction of the coal-powered San Buenaventura Power Plant in the Philippines and the Xayaburi Hydroelectric Power Project in Laos were completed and achieved their CODs in 2018 as scheduled. The remaining three projects are still under construction, specifically the Nam Thuen 1 Hydropower Plant in Laos, the Gangdong Fuel Cell Power Plant in South Korea, and the extension of the petroleum pipeline system to the northeastern region of Thailand. These ongoing projects have a well-managed construction staff and are expected to be completed and achieve their COD as scheduled.

3. Operating Risks

3.1 The Risk of Obtaining Lower-forecasted Earnings

EGCO Group has been giving high priority to the risks related to their operating assets, so as to verify that these invested assets meet their expected performance and therefore the Asset Management Unit has been assigned to follow up and monitor the performance of each one. These accounting objectives comprise the analysis and comparison between the actual return and the planned target. The measures imposed to lessen relevant risks are as follows:

- The establishment of asset management policies and, whenever possible, the delegation of management's representatives and personnel to be directors or managers of subsidiaries and operating projects.
- The preparation of joint venture performance analyses that are then reported to senior management and to the board of directors so they can take appropriate actions in a timely manner.
- The coordination with partners for collaborative auditing activities in invested companies to ensure the adequacy and the effectiveness of their internal control systems.

In 2019, EGCO Group had the ability to manage the risks and achieve their target's return on investment (ROI).

Kulhanok L.

3.2 Plant Performance Risks

To be fully compliant with their power purchase agreements (PPAs), EGCO Group's power plants have an opportunity to deal with plant performance risks that are caused by employees, equipment, natural disasters, or management approaches. The significant performance risks are summarized below.

3.2.1. Risk from Power Plant Efficiency

PPAs stipulate various power plant efficiency indicators such as heat rate and failure to meet their performance requirements. Unmaintainable efficiency indicators will result in a higher cost of electricity generation than those specified within the contract. The cause of such risks can be maintenance malpractice in power plants. Therefore, EGCO Group sets the plant management policy and systems so that preventive maintenance is carried out continuously in a professional manner. Working procedures implemented by plant management also confirms that all relevant risks are under control. These procedures are as follows:

- Regular inspections and maintenance by skillful employees.
- Installation of monitoring systems for critical equipment in power generation systems. These monitors will provide advance notification if a problem occurs with the equipment such as the vibration monitoring system of the gas turbine and the monitoring system for pressure and temperature of the steam entering the steam turbine.
- Provide the necessary inventory reserves which include machinery spare parts, chemicals, lubricants, and various supplies used in maintenance. These items should be sufficient for use and maintenance under proper inventory management.
- The implementation of the Quality Management System (ISO 9001:2015) in 14 power plants to ensure their quality operation as well as to comply with PPAs such as Khanom, GPG, GCC, KCC, SCC, GYG, NED SPP Two, SPP Three, SPP Four, SPP Five, GPS, Solarco, and SEG.
- The continuous development of employee competency.

Last year, the execution of such mitigation measures resulted in the satisfactory performance of our power plants.

3.2.2. Risk from Raw Water Shortage

Raw water shortage can result in power plant shutdown caused by climate change or the delay of the rainy season. Using water in operations may affect the public and environment. Consequently, EGCO Group's power plants have to assess their yearly water usage, analyze their water situation, plan the power plant's water usage, and reserve the sufficient water quantities by having their own reservoir. Moreover, the "3Rs" principle (Reduce, Reuse, and Recycle), has been administered by EGCO Group for maximizing their water usage efficiency and for reducing the environmental and public effects. However, in previous years, there were no raw water shortage problems and public water consumption.

Kulhanok L.

3.2.3. Risk from Fuel Shortage

A fuel shortage can result in plant shutdowns, revenue shortfalls, or levied fines. A shortage of coal and biomass fuel, in particular, could be caused by the increasing demand or the impact from a disaster which then may result in price fluctuation.

The following measures have been implemented to prevent and reduce these risks:

- EGCO Group's coal-fired power plants—SBPL, BLCP, and Quezon—have a long-term coal supply agreement which is adequate for power generation. The suppliers are obliged to supply their coal with the quantity and quality specified in the agreement. Plus, each power plant has reserved the coal to sufficiently operate for a 30-day, 30-day, and a 45-day continuous operation respectively.
- EGCO Group's biomass power plants that use rice husks and rubberwood scraps as fuel for electricity generation may face a fuel risk from inadequate supply and pricing volatility due to the uncertain nature of agricultural products. To mitigate such a risk, the power plants expanded their fuel-sourcing areas and procured large amounts of the materials in the high season at lower prices. The Roi-Et Green Power Project, which uses rice husks, and the Gulf Yala Green power plant, which consumes rubberwood scraps, also reserve fuel sufficient enough for 20-day and 14-day continuous operations respectively. Furthermore, Roi-Et Green has added alternative fuels such as sawdust and cassava rhizome to mix with the rice husk; similarly, Gulf Yala has included chopped rubberwood roots to mix with the rubberwood scraps for fuel cost reduction and the diversification of fuel risk in electricity generation.

3.2.4. Safety, Health, Environmental, and Social Risk that Must Comply with International Standards

EGCO Group realizes that the electricity generation process could incur certain risks in the safety, health, staff environment, and surrounding communities. Notably, management has taken the following actions to alleviate any potential negative impacts and reduce the likelihood of the following risks:

- Follow EGCO Group's Corporate Social Responsibility policy.
- Conform to the requirements of safety, health, and environment management manuals in which the guidelines have specified for implementation, monitoring, and auditing.
- Strictly comply with work manuals and emergency plans, administer training and plan testing, equipment and warning systems.
- Implement Environment Management System (ISO 14001:2015) in the following 10 power plants: Khanom, GPG, BLCP, GCC, NKCC, SCC, GYG, Theppana Wind Farm, Nam Thuen 2 and SEG. This will help to continuously develop environmental management systems.
- Implement Occupational Health and Safety Assessment Series (OHSAS 18001:2015) in five power plants, specifically Khanom, BLCP, NED, Nam Thuen 2

Kulhanok L.

and SEG. This will be done to decrease and control health and safety risks associated with employees and stakeholders and to improve company reputations.

- Implement Environmental Standards of UA (EMSCOP) to the Quezon power plant in the Philippines.

Through the constant administration of such measures, such risks are properly managed.

3.2.5. Risks from Accidents, Resistance, Sabotage, and Natural Disasters

In conducting its business, EGCO Group may cope with natural disaster risks and accidents which occur from human error or low machine efficiency. Possibly, the community resistance may occur when the production negatively affects the community. Furthermore, there is a sabotage risk which will cause severe loss to power plants.

Management has put forth the following measures to investigate and reduce the likelihood of these risks listed here:

- Communicate with personnel to avoid carelessness.
- Regularly maintain all equipment.
- Strengthen relationships with the surrounding communities.
- Collaborate with government agencies as well as local authorities.
- Deploy a security plan that includes regular drills and security equipment such as closed-circuit TV and various monitoring devices that should always be in use.
- Prepare yearly fire drills and fire evacuations to respond to an emergency in the company's power plants and its head office building.
- Arrange and practice business continuity planning (BCP) for crisis management with EGCO Group headquarters to ensure that the business operation is continuously operating with sustainability. Additionally, EGCO Group has sufficient insurance to cover all risks, property damage, machinery breakdowns, business interruptions, third party liabilities, and political violence. For example, enough insurance for the effects of loss from terrorism, sabotage, riots, political conflicts, revolution, and *coup d'état* and for disaster events such as floods, storms, earthquakes, and landslides. This will assure that loss from damages in unexpected cases would be properly and adequately protected, covering majority-owned power plants and EGCO Group headquarters.

4. Financial Risks

EGCO Group's investments are capital-intensive. Since the partial-funding sources are loans from domestic and international financial institutions, fluctuations in foreign exchange rates and interest rates are significant risks. Therefore, the mitigation measures regarding these investments are listed below.

4.1 Foreign Exchange Rate Fluctuations

EGCO Group has a policy to lessen currency mismatches for each invested project to prudent levels by matching currencies from the funding sources and revenue structures. During the

Kulhanok L.

construction phase, EGCO Group applies an appropriated financial instrument and cross currency swap in order to manage the loan currency that matches with the development and construction costs.

4.2 Interest Rate Fluctuations

EGCO Group has an interest rate fluctuation management policy which sets the guidelines of interest rate exposure reduction by swapping floating interest rates to fixed interest rates at appropriate levels when the swap market is favorable.

4.3 Cash Management from Overseas Investments

Most of our revenues are in US dollars which are a result from the excess cash from offshore accounts—which may affect the US cash management. Nevertheless, EGCO Group will attempt to expand many of its overseas projects to maximize the firm value from US currency. Moreover, our cash flow status is regularly forecasted on a monthly basis in order to monitor the balance of cash inflow and outflow as well as to maintain cash in overseas accounts for any new potential investment.

5. Corporate Tax Legislation Risk

EGCO Group prioritizes its compliance with corporate tax legislation and tax planning to ensure that its tax management has due regard for relevant regulations. Currently, EGCO Group invests in both domestic and international businesses, and each country has different tax criteria, legislation, regulation, tax tariffs, etc. Accordingly, without well-prepared risk analysis and intensive study, we may have to endure risk and extensive damage to our reputation and operations. Therefore, it is vital for EGCO Group to thoroughly plan its tax strategies and provide accurate tax payments in compliance with corporate tax legislation. For any new investment, EGCO Group must carry out an equivalent analysis and carefully calculate the potential tax liability for that investment before proceeding.

EGCO Group has also presented its tax policy and practices on its website. This is meant to inform its stakeholders and to serve as a guideline for its tax management system.

6. Compliance Risk

With both domestic and overseas business operations, EGCO Group is regulated under related local laws and regulations as well as international laws. Because a legal dispute can affect our operation and its corporate image, we have been strictly complying with all relevant laws and regulations as well as environmental laws and the safety, health and environmental (SHE) regulations. Moreover, the organization will closely monitor any new governing laws and regulations.

In 2019, EGCO Group had no record of failures to comply with related laws and regulations that involved its business. Additionally, EGCO Group followed up with the new related laws and regulations to be disclosed to all concerned units in order to comply with newly issued conditions and to monitor through the legal database for their further compliance.



7. Human Resources Risk

EGCO Group believes that its employees are its most valuable asset and the success factor of the company. Losing valuable employees will lead to impairment, inefficient business continuity, and additional costs for recruiting and training new ones. Employee knowledge and expertise in the power business is crucial, and so losing competent employees is one of EGCO Group's major concerns. In order to alleviate such a risk, EGCO Group has accomplished these following risk-reducing measures.

- The creation of the effective Succession Plan Program for leadership and management development for the key-position successor's preparation along with deploying the individual development plan and job rotation program.
- Implement knowledge sharing by keeping the lecture document, presentation and video in the Knowledge Center to publish through the internal-use EGCO GroupNet. Examples of items to be accessed are various power plant typical characteristics, insurance, innovation success, financial model and investment project valuation, and the application of the principles of ERM for integrated risk management with strategic plans.
- Granting of the appropriate remuneration in return for employees' industrious dedication from their participation in the success of the organization. The employees' remuneration will be received in the form of a monthly salary in accordance with the company's salary structure which has employees' compensation and benefits at a competitive level with the labor market of the same type of business.
- Support company activities between the management and employees to build strong relationships which then leads to a happy workplace.

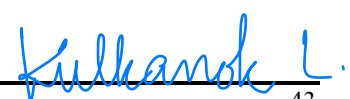
These risk mitigations ensure that the company's employees are competent and have the required knowledge and abilities which will enable it to be a sustainable growth organization.

8. Products and Services Procurement Procedure Risk

Because EGCO Group is determined to create sustainable operations, the providing procedures will be directed toward "suppliers" risk management to cover these three aspects: Environmental, Social and Governance (ESG). The associated measures are as follows:

EGCO Group has developed the Supplier Code of Conduct in line with the Ten Principles of the UN Global Compact and other internal standards, including the industry material topics such as a guidance applying to all of our suppliers. As is our expectation, EGCO Group's suppliers shall operate their businesses with integrity and align with the ESG objectives as per the statement in this code.

EGCO Group intends to regularly hold a "Supplier Day," not only to promote our relationship with our suppliers, but also to provide sustainability-related information to them. Moreover, we have asked for the cooperation from our suppliers to create their own supplier self-assessment questionnaire which includes ESG objectives. The results show that, overall, the governance part received the "best performance" score, while the environmental management section was given the "least performance" score. According to the environmental management part



of the questionnaire, the analysis also indicated the lowest performance, where it showed that most of the suppliers did not keep track of their energy and water usage as well as their greenhouse gas (GHG) emissions. Therefore, EGCO Group may take these results into its consideration for further development of any initiatives or collaborations with suppliers.

EGCO Group has developed a Supplier Audit—the ESG risk assessment program to evaluate all suppliers. The results of the risk assessment show that 234 out of 1,123 suppliers are high ESG risk suppliers. Therefore, EGCO Group has considered selecting 30 targeted suppliers for onsite visits that will include site observations, interviews, and the review of relevant documents and records. The results of the ESG performance of suppliers will be used for their risk improvement.

Emerging Risk

1. Global Economic Growth Slowdown Risk

Decreasing regional economic growth forecasts in the US, China, and Europe as well as emerging markets such as Thailand and countries that EGCO Group has invested in and is planning to invest in are mainly caused by the US-China trade war, volatility in exchange rate, oil and natural gas prices. Notably, EGCO Group is concerned about these situations and has prepared the following measures:

- The assignment of the authorized operators to EGCO Group’s invested countries such as the Philippines and Indonesia to closely monitor, report, and assess the situation in order to prepare risk mitigation actions and to alert the related parties to respond to all of the possible risks.
- Diversify its investment portfolio throughout many countries.
- Invest in different types of power plants and seek new business opportunities.

2. Government Policy, Legislative Change and Compliance Risk Due to Climate Change

Due to the ongoing extreme global weather conditions, the 23rd United Nations Framework Convention on Climate Change, which was held from November 6 through November 17 in 2018, approved a new resolution aimed to fight climate change by reducing GHG emissions. Thailand not only participated and signed the agreement, which aimed to reduce GHG emissions from 20% to 25% by 2030—compared to the based year 2015—in this conference, but also committed to review and participate in climate change solutions every five years. Because of this regular five-year revision, Thailand’s government can consider additional relevant laws and regulations that are related to GHG emissions within three to five years. Also, the Thailand Power Development Plan (PDP) could be revised so it can be aligned with the agreement. To mitigate such a risk, EGCO Group not only closely monitors and analyzes the impacts, but also aims to increase its renewable energy portfolio to achieve 30% by 2026 from both domestic and overseas operations. In 2019, our renewable energy portfolio was 18.86% of our total electricity generating capacity which could reduce approximately 537,000 tons of carbon dioxide equivalent to the per-year emission rate (14 EGCO subsidiaries) in alignment with the government’s policy. Furthermore, EGCO Group will invest in environment-friendly technology for future investments,



promote energy conservation within our organization, and reduce GHG emissions indirectly by conducting business with eco-friendly partners.

3. Emerging / Disruptive Technology Risk

In accordance with the rapid technological advancements from micro grid systems, renewable energy systems, energy storage systems, and big data systems, the government aims to develop and launch its Commercial Smart Grid by 2021. Regarding the Thailand Smart Grid Development Master Plan 2016–2021, the Ministry of Energy has been assigned to take primary accountability through these three pillars: (1) Demand Response and Energy Management System, (2) Renewable Energy Forecast, and (3) Micro Grid and Energy Storage System. This Government policy will gradually change user behaviors from consumer to “prosumer” and peer to peer. Furthermore, the smart grid could reasonably be expected to influence the industries due to its production cost and energy trading scheme that may impact not only government authorities that includes the Electricity Generating Authority of Thailand, Metropolitan Electricity Authority, and Provincial Electricity Authority, but also the independent power plants. On the other hand, this transformation may provide an opportunity to create value to the organization. To alleviate such a risk, EGCO Group closely monitors technological changes while developing new businesses by running the “Innovation Team Challenge” contest. This event aims to improve teamwork, employee creativity, and employee competency which will then provide sustainable business growth to the organization.

4. Cybersecurity and Data Privacy Protection Risk

Information technology (IT) systems are the crucial fundamental infrastructure that increases a business operation’s efficiency, its efficient control of electricity generation, and its operating cost management. IT allows for a business to successfully compete in both domestic and overseas markets where EGCO Group invests and plans to invest; IT plays its role more importantly in business operations respectively.

In 2019, the *Royal Thai Government Gazette* announced the Cyber Security Act B.E. 2562 (2019), which came into effect on May 28, 2019, and the Personal Data Protection Act B.E. 2562 (2019), which is going to take effect on May 28, 2020.

According to the Cyber Security Act B.E. 2562 (2019), a system administrator that provides computer-related services must build confidence and strengthen computer cyber security, computer data, computer systems, or other information related to computer systems in order to prevent, confront, and reduce the risk of cyber threats in a timely manner. EGCO Group has to establish an IT security policy, which includes a policy for creating an IT emergency plan as well as an IT risk management policy.

According to the Personal Data Protection Act B.E. 2562 (2019), which stipulates that in regard to the control of personal and business partner information, to collect, use or disclose any data has to comply with such law. EGCO Group must establish a policy and measures to prevent the leakage of confidential information along with the development of information security and sta-



bility systems and the protection of personal information by collecting, storing, using, or disseminating the personal data of employees, partners, or contacts in the form of electronic data in order to prevent the violation of personal data.

In this regard, EGCO Group will organize staff training to raise awareness and spread knowledge and understanding to employees regarding the Cyber Security Act B.E. 2562 (2019) and the Personal Data Protection Act B.E. 2562 (2019). The Information Technology Department will establish a data security certification system according to the international standard of ISO 27001 for data center rooms. Previously, the company has had no incidents and negative impacts from cyber threats and misuse of personal information.

Kulhanok L.

4. Operational Assets

4.1 Fixed Assets

The fixed assets of the company and subsidiaries as at December 31, 2019 comprise the following items.

Items	Value ¹ (Million Baht)
1. Land and Building	7,885.09
Less Accumulated Depreciation	(2,461.81)
Impairment	<u>(84.36)</u>
Total	5,338.92
2. Power Plant and Transmission System	72,615.14
Less Accumulated Depreciation	(22,970.72)
Impairment	<u>(2,356.71)</u>
Total	47,287.71
3. Office Equipment and Cars	631.09
Less Accumulated Depreciation	<u>(510.24)</u>
Total	120.85
4. Work under construction	34.17

Remark : ¹ The number was shown in EGCO Group's consolidated financial statement . EGCO Group has recorded interest in equity method from joint ventures in the financial statement. Therefore, the values of land, buildings and pledged of joint ventures were not shown in the financial statement.

4.2 Subsidiaries' Assets used as loan collateral

Khanom Electricity Generating Co., Ltd. has mortgaged land, buildings, and pledged power plant equipment to secure its loan from financial institutions worth 311 million USD and 11,616 million Baht.

SPP 2 Co., Ltd. has mortgaged land, buildings, and pledged power plant equipment to secure its long-term loan worth 868 million Baht.

SPP 3 Co., Ltd. has mortgaged land, buildings, and pledged power plant equipment to secure its long-term loan worth 904 million Baht.

SPP 4 Co., Ltd. has mortgaged land, buildings, and pledged power plant equipment to secure its long-term loan worth 684 million Baht.

Kulhanok L.

SPP 5 Co., Ltd. has mortgaged land, buildings, and pledged power plant equipment to secure its long-term loan worth 830 million Baht.

Banpong Utilities Co., Ltd. (BPU) has mortgaged buildings, and pledged power plant equipment to secure its long-term loan worth 103 million USD and 6,646 million Baht.

Klongluang Utilities Co., Ltd. (KLU) has mortgaged buildings, and pledged power plant equipment to secure its long-term loan worth 5,324 million Baht.

Theppana Wind Farm Co., Ltd. (TWF) has mortgaged buildings, and pledged power plant equipment to secure its long-term loan worth 4 million USD and 275 million Baht.

Chaiyaphum Wind Farm Co., Ltd. (CWF) has mortgaged buildings, and pledged power plant equipment to secure its long-term loan worth 30 million USD and 4,010 million Baht.

Solarco Co., Ltd. (SLC) has mortgaged buildings, and pledged power plant equipment to secure its long-term loan worth 35 million USD and 3,960 million Baht.

Quezon Power (Philippines) Limited Co. has mortgaged company's assets to secure its long-term loans worth 365 million USD.

Boco Rock Wind Farm Pty Limited has mortgaged company's assets to secure its long-term loan worth 210 million AUD.

4.3 Intangible Assets

Right in long-term power purchase agreements, right to use transmission facilities and licenses for operating power plants from the acquisitions of subsidiaries, associate and joint ventures at the date of acquisition which EGCO Group expected to receive benefits and bonus in return. Hence, right in long-term power purchase agreements, right to use transmission facilities and licenses for operating power plants are amortized using the straight-line method over its estimated useful life. Management determines the estimated useful life within 15-25 years.

The net value of right in long-term power purchase agreements, right to use transmission facilities and licenses for operating power plants arising from the acquisitions of subsidiaries are presented in EGCO's consolidated statement of financial position as at 31 December 2019 in the amount of 3,604 million Baht. The amounts arising from the acquisitions of joint ventures and associate are included in investments in joint ventures and associate in the consolidated statement of financial position.

Kulhanok L.

4.4 Land rental

As at 31 December 2019, EGCO's subsidiaries have operating leases for operational assets as follows:

Lessee	Lessor	Types of Lease	Period	Beginning Date	Ending Date
BPU	Siam Craft Co., Ltd	Land Rental for Power Plant	28 Years 8 Months	1 Feb 2016	15 Oct 2044
KLU	EGCO	Land Rental for Power Plant	29 Years	25 May 2015	24 May 2044
SLC	Yanhee Power Holding Co., Ltd	Land Rental for Power Plant	25 Years	18 Nov 2013	17 Nov 2038
TWF	Agricultural Land Reform Office	Land Rental	27 Years	18 Oct 2010	17 Oct 2037
	Individual	Land Rental for placing electrical wire and gateway of Power Plant	27 Years	22 Jun 2011	21 Jun 2038
		Land Rental for Wind Turbine and corridor between Wind Turbine and Agricultural Land Reform Office	27 Years	1 Jun 2010	31 May 2037
CWF	Agricultural Land Reform Office	Land Rental for operating Power Plant	27 Years	18 Jan 2012	17 Jan 2039
		Land Rental for operating Power Plant Land Rental for operating Power Plant	26 Years	29 Aug 2016	28 Aug 2042
	Individual	Land Rental for operating Power Plant	27 Years	18 Jan 2012	17 Jan 2039
		Land Rental for Storage	5 Years	1 Jan 2018	31 Dec 2023

4.5 Investment and Management Policy in Subsidiaries, Associate and Joint Ventures

EGCO aims to grow sustainably. New projects consideration is based on return on investment, EGCO's experience and expertise to create value added, optimizing financing cost and being within acceptable project risks. Also, EGCO manages and monitors its operating assets to gain benefit as planned, following EGCO's new vision: "To be a major sustainable Thai energy company with full

commitment to environment protection and social development support”. EGCO sets investment directions to expand the investment from the existing core business in power generation to fuel supply business and smart energy solution business in order to increase investment opportunities, to generate long-term income and to secure continuous growth to EGCO. We aim to enhance financial competitiveness by securing competitive funding sources with financial exposure optimization, which is the one of our key success factors. Moreover, we place a great emphasis on effective asset management to ensure maximum efficiency of existing power plants in order to achieve its highest performance and manage projects under construction to be completed as scheduled and within the planned budget. In order to secure the future success and enhance corporate competencies, strengthening in human resource foundation has been placed as priority to ensure the effective organization structure and people management. Furthermore, EGCO has a strong intention to enhance corporate sustainability practice and elevate corporate governance to be in line with international standard. In overall, the corporate strategies would be implemented to ultimately deliver sustainable long-term value towards stakeholders.

EGCO expects all of its subsidiaries, affiliated companies and joint ventures to operate their business with the following values:

- To conduct sustainable business which correspond with EGCO Group’s vision, mission, code of conduct, the acceptable risk profiles and good governance.
- To implement core policies via EGCO Group’s representative directors and management. Meanwhile, representative directors must seek advance concurrence from EGCO’s Board of Directors upon the substantial matter of events
- To monitor the progress and performance of the subsidiaries, affiliate companies and joint ventures via the Asset Management and Group with monthly reports to the Board. Urgent matters for which the immediate action is required shall be duly reported to the Board on the first occasion.

Kulhanok L.

5. Dispute

In 2019, EGCO and its subsidiaries had no litigation based on the definition of SEC as follows:

- Legal case that has negative impact on EGCO and its subsidiaries with the size larger than 5% of the shareholders' equity as at the end of the accounting year.
- Legal case that has significant impact of which the value can not be assessed.
- Legal case which is not related to EGCO's normal business.

Kulhanok L.

6. General Information

EGCO Information

Name	: Electricity Generating Public Company Limited (EGCO)
Business	: Holding Company focusing on power business and other related business
Registration	: 0107537000866 (Previously Number Listed Co. 333)
Sector	: Energy and Utilities
Industry	: Resources
Registered Capital	: 5,300 million baht
Paid up capital	: 5,264.65 million baht
Par Value	: 10 baht
Foreign Limit	: 44.82%
% Free Float	: 50.01% as of September 9, 2019
Head Office	: EGCO Tower, 222 , Vibhavadi Rangsit Rd., Tungsonghong, Laksi, Bangkok 10210, Thailand.
Home Page	: www.egco.com
Tel.	: 0 2998 5000
Fax.	: 0 2998 5999
Board of Directors	: Email address : directors@egco.com
Audit Committee	: Email address : auditcommittee@egco.com
Corporate Secretary	: 0 2998 5020-7 Email address : cs@egco.com
Investor Relations Contact	: 0 2998 5147-8 Email address : ir@egco.com

Kulhanok L.

Reference Persons

Regulator	<p>Securities and Exchange Commission, Thailand 333/3 Vibhavadi Rangsit Road, Chomphon, Chatuchak, Bangkok 10900, Thailand Tel +66 (0) 2695 9999 Fax. +66 (0) 2695 9660 E-mail: info@sec.or.th Website: www.sec.or.th</p>
Regulator	<p>The Stock Exchange of Thailand The Stock Exchange of Thailand Building, 93 Ratchadaphisek Road, Dindaeng, Bangkok 10400, Thailand Tel +66 (0) 2009 9000 Fax. +66 (0) 2009 9991 SET Call Center +66 (0) 2009 9999 E-mail: SETCallCenter@set.or.th Website: www.set.or.th</p>
Share and Debenture registrar	<p>Thailand Securities Depository Company Limited The Stock Exchange of Thailand Building, 93 Ratchadaphisek Road, Dindaeng, Bangkok 10400, Thailand Tel +66 (0) 2009 9000 Fax. +66 (0) 2009 9991 Call Center +66 (0) 2009 9999 E-mail: TSDCallCenter@set.or.th Website: www.set.or.th/tsd</p>
Auditor	<ol style="list-style-type: none"> Ms. Amornrat Peampoonvatanasuk Certified Public Accountant (Thailand) No. 4599 Mr. Vichien Khingmontri Certified Public Accountant (Thailand) No. 3977 Mr. Boonrueng Lerdwiseswith Certified Public Accountant (Thailand) No. 6552 <p>PricewaterhouseCoopers ABAS Limited 15th Floor, Bangkok City Tower, 179/74-80 South Sathorn Road, Bangkok 10120, Thailand Tel +66 (0) 2844 1000 Fax. +66 (0) 2286 5050</p>

Kulhanok L.

General Information

Company	Business	Registered Share Capital (Million Baht)	Par Value (Baht)	Paid-up Share Capital (Million Baht)	Ownership Interest (Direct+Indirect) (%)
Electricity Generating Public Company Limited (EGCO) Registration 0107537000866 (No.BorMorJor.333) Head Office 14 th , 15 th Floor EGCO Tower, 222, Vibhavadi Rangsit Road, Tungsonghong, Laksi, Bangkok 10210, Thailand Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999	Holding Company focusing on Power business and others related to power business	5,300	10	5,264.65	-

Subsidiaries

Company	Business	Registered Share Capital (Million Baht)	Par Value (Baht)	Paid-up Share Capital (Million Baht)	Ownership Interest (Direct+Indirect) (%)
Khanom Electricity Generating Company Limited (KEGCO) Office 12 th Floor, EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2955 0931 Site Office 112 Moo 8, Tongnean, Khanom, Nakhon Sri Thammarat 80210, Thailand Tel. +66 (0) 7552 9173, +66 (0) 7552 9179 Fax. +66 (0) 7552 8358	IPP Electricity Generating and supply business using Natural gas	8,395	10	8,005.02	99.99
EGCO Engineering & Service Company Limited (ESCO) Office 13 th Floor, EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2955 0933 Site Office 35 Rayong Highway No. 3191 Huay Pong, Amphur Muang, Rayong 21150, Thailand Tel. +66 (0) 3868 2611-4 Fax. +66 (0) 3868 2823	Engineering, operation and maintenance services for power plants and manufacturers	400	10	400	99.99

Kulkanok L.

Subsidiaries (Cont)

Company	Business	Registered Share Capital (Million Baht)	Par Value (Baht)	Paid-up Share Capital (Million Baht)	Ownership Interest (Direct+Indirect) (%)
Dawei Electricity Generating Company Management Pte., Ltd. (DEGCOM) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Overseas office 60 PayaLebar Road, #08-43, PayaLebar Square, Singapore, 409051	Holding company focusing on investment in electricity generating companies in Myanmar	1.80 [†] (60,000 USD)	-	1.80 [†] (60,000 USD)	100
New Growth Plus B.V. (NGP) (EGCO Plus is the company's 100% direct shareholder) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Overseas office Gustav Mahlerlaan 1212, 1081 LA, Amsterdam, The Netherlands	Holding company focusing on investment in electricity generating companies in foreign countries	46.409.05 [†] (1,543,059,337 USD)	30.08 [†] (1 USD)	46.409.05 [†] (1,543,059,337 USD)	100
New Growth B.V. (New Growth) (EGCO Plus is the company's 100% indirect shareholder) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Overseas office Gustav Mahlerlaan 1212, 1081 LA, Amsterdam, The Netherlands	Holding company focusing on investment in electricity generating companies in foreign countries	0.93 [†] (30,894 USD)	-	0.93 [†] (30,894 USD)	100
Quezon Power, Inc. (QPI) (EGCO Plus is the company's 100% indirect shareholder) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Overseas office Philippines 14 th Floor, Zuellig Building Overseas office Makati Avenue corner Paseo de Roxas Makati City 1225, Philippines Netherlands Gustav Mahlerlaan 1212, 1081 LA, Amsterdam, The Netherlands	Holding company focusing on investment in electricity generating companies in Philippines	6.02 [†] (200,000 USD)	-	6.02 [†] (200,000 USD)	100

Kulhanok L.

Subsidiaries (Cont)

Company	Business	Registered Share Capital (Million Baht)	Par Value (Baht)	Paid-up Share Capital (Million Baht)	Ownership Interest (Direct+Indirect) (%)
Quezon Power (Philippines) Limited Co. (Quezon) (EGCO Plus is the company's 100% indirect shareholder) Makati office 14 th Floor, Zuellig Building Makati Avenue corner Paseo de Roxas Makati City 1225, Philippines Overseas office Barangay, Cagsiay I, Mauban Quezon Province, 4330, Philippines	IPP Electricity Generating and supply business using Coal	6,245.03 ¹ (207,641,268 USD)	-	6,245.03 ¹ (207,641,268 USD)	100
Pearl Energy Philippines Operating, Inc. (PEPOI) (EGCO Plus is the company's 100% indirect shareholder) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Overseas office Philippines Barangay, Cagsiay I, Mauban, Quezon, 4330, Philippines Netherlands Gustav Mahlerlaan 1212, 1081 LA, Office Amsterdam, The Netherlands	Operation and Maintenance of QPL and SBPL Power Plant	6.02 ¹ (200,000 USD)	-	6.02 ¹ (200,000 USD)	100
Quezon Management Service Inc. (QMS) (EGCO Plus is the company's 100% indirect shareholder) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Overseas office Philippines 14 th Floor Zuellig Building office Makati Avenue corner Paseo de Roxas Makati City 1225, Philippines Netherlands Gustav Mahlerlaan 1212, 1081 LA, Office Amsterdam, The Netherlands	Management service for QPL and SBPL Power Plant	3.10 ³ (5,260,000 PESO)	-	3.10 ³ (5,260,000 PESO)	100
Mauban Holdings Company Inc. (Mauban) (EGCO Plus is the company's 100% indirect shareholder) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Overseas office 14 th Floor Zuellig Building Makati Avenue corner Paseo de Roxas Makati City 1225, Philippines	Holding company focusing on investment in electricity generating companies in Philippines	4,116.55 ³ (6,989,056,900 PESO)	58.90 ³ (100 PESO)	3,983.83 ³ (6,763,715,990 PESO)	100

Kulhanok L.

Subsidiaries (Cont)

Company	Business	Registered Share Capital (Million Baht)	Par Value (Baht)	Paid-up Share Capital (Million Baht)	Ownership Interest (Direct+Indirect) (%)
Evergreen Power Venture B.V. (Evergreen) (EGCO Plus is the company's 100% indirect shareholder) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Overseas Gustav Mahlerlaan 1212, 1081 LA, office Amsterdam, The Netherlands	Holding company focusing on investment in electricity generating companies in Philippines	0.00 ¹ (1 USD)	30.08 ¹ (1 USD)	0.00 ¹ (1 USD)	100
Millennium Energy B.V. (Millennium) (EGCO Plus is the company's 100% indirect shareholder) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Overseas Gustav Mahlerlaan 1212, 1081 LA, office Amsterdam, The Netherlands	Holding company focusing on investment in electricity generating companies in foreign countries	0.00 ¹ (1 USD)	30.08 ¹ (1 USD)	0.00 ¹ (1 USD)	100
South Pacific Power Pty Limited (SPPP) (EGCO Plus is the company's 100% indirect shareholder) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Overseas One International Towers, office Waterman Quay, Barangaroo, New South Wales 2000, Australia Tel. +61 2 8266 0000 Fax. +61 2 8286 3128	Holding company focusing on investment in electricity generating companies in Australia	2,296.11 ¹⁴ (110,366,987 AUD)	20.08 ¹⁴ (1 AUD)	2,296.11 ¹⁴ (110,366,987 AUD)	100
Boco Rock Wind Farm Pty Limited (BRWF) (EGCO Plus is the company's 100% indirect shareholder) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Overseas One International Towers, office Waterman Quay, Barangaroo, New South Wales 2000, Australia Tel. +61 2 8266 0000 Fax. +61 2 8286 3128	Electricity Generating and Supply Business using Wind Power	1,804.73 ¹⁴ (86,747,980 AUD)	20.08 ¹⁴ (1 AUD)	1,804.73 ¹⁴ (86,747,980 AUD)	100

Kulhanok L.

Subsidiaries (Cont)

Company	Business	Registered Share Capital (Million Baht)	Par Value (Baht)	Paid-up Share Capital (Million Baht)	Ownership Interest (Direct+Indirect) (%)
Gen Plus B.V. (Gen Plus) (EGCO Plus is the company's 100% indirect shareholder) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Overseas Gustav Mahlerlaan 1212, 1081 LA, office Amsterdam, The Netherlands	Holding company focusing on investment in electricity generating companies in foreign countries	0.00 ¹ (1 USD)	30.08 ¹ (1 USD)	0.00 ¹ (1 USD)	100
Phoenix Power B.V. (PP) (EGCO Plus is the company's 100% indirect shareholder) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Overseas Gustav Mahlerlaan 1212, 1081 LA, office Amsterdam, The Netherlands	Holding company focusing on investment in electricity generating companies in foreign countries	0.00 ¹ (100 USD)	30.08 ¹ (1 USD)	0.00 ¹ (100 USD)	100
Greenwing Energy B.V. (Greenwing) (EGCO Plus is the company's 100% indirect shareholder) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Overseas Gustav Mahlerlaan 1212, 1081 LA, office Amsterdam, The Netherlands	Holding company focusing on investment in electricity generating companies in foreign countries	0.00 ¹ (100 USD)	30.08 ¹ (1 USD)	0.00 ¹ (100 USD)	100
EGCO Cogeneration Company Limited (EGCO Cogen) Office 13 th Floor, EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Site Office 222 Moo 8, Mabkha, NikhomPhattana, Rayong 21180, Thailand Tel. +66 (0) 3863 7051-57 Fax. +66 (0) 3863 7063	SPP Electricity and steam generating and supply business using Natural gas	1,060	10	1,060	80

Kulkanok L.

Subsidiaries (Cont)

Company	Business	Registered Share Capital (Million Baht)	Par Value (Baht)	Paid-up Share Capital (Million Baht)	Ownership Interest (Direct+Indirect) (%)
EGCO Green Energy Company Limited (EGCO Green) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999	Holding company focusing on power business	175	10	175	74
Roi-Et Green Company Limited (RG) (EGCO Green is the company's 95% shareholder) Office 13 th Floor, EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Site Office 222 Moo 10, Nua-Muang, Amphur Muang, Roi-Et 45000, Thailand Tel. +66 (0) 4351 9825-6 Fax. +66 (0) 4351 9827	SPP Electricity Generating and Supply Business using Biomass as primary fuel	180	10	180	70.30
SPP Two Company Limited (SPP 2) Office 10 th Floor, EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Site Office 160 Moo 5, Salaeng Phan, Wang Muang, Saraburi 18220, Thailand	VSPP Electricity Generating and Supply Business using Solar Power	196.7	10	196.7	99.99
SPP Three Company Limited (SPP 3) Office 10 th Floor, EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Site Office 85 Moo 3, Thakhlo, Benchalak, Srisaket 33110, Thailand	VSPP Electricity Generating and Supply Business using Solar Power	197.5	10	197.5	99.99
SPP Four Company Limited (SPP 4) Office 10 th Floor, EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Site Office 86 Moo 3, Thakhlo, Benchalak, Srisaket 33110, Thailand	VSPP Electricity Generating and Supply Business using Solar Power	148.7	10	148.7	99.99

Kulhanok L.

Subsidiaries (Cont)

Company	Business	Registered Share Capital (Million Baht)	Par Value (Baht)	Paid-up Share Capital (Million Baht)	Ownership Interest (Direct+Indirect) (%)
SPP Five Company Limited (SPP 5) Office 10 th Floor, EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Site Office 128 Moo 2, Khu Mueang, Muang Suang, Roi-Et 45220, Thailand	VSPP Electricity Generating and Supply Business using Solar Power	198.4	10	198.4	99.99
Theppana Wind Farm Company Limited (TWF) Office 10 th Floor, EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Site Office 555 Moo1, Watabaek, Thepsathit, Chaiyaphum 36230, Thailand	VSPP Electricity Generating and Supply Business using Wind Power	157.32	100	145.23	90
Yanhee EGCO Holding Company Limited (Yanhee EGCO) Office 10 th Floor, EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999	Holding Company investing in electricity generating from Solar Power	10.01	100	10.01	49
Solarco Company Limited (Solarco) (Yanhee EGCO is the company's 100% shareholder) Office 10 th Floor, EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Site Office - Branch 1 317, 318 Moo 1, Bang Ta Then, Song Pee Nong, Suphanburi 72110 - Branch 2 155, 156 Moo 17, Bang Luang, Bang Lane, Nakhonpathom 73190 - Branch 3 157, 158 Moo 17, Bang Luang, Bang Lane, Nakhonpathom 73190 - Branch 4 94, 95 Moo 1, HinMool, Bang Lane, Nakhonpathom 73190 - Branch 5 96, 97 Moo 1, HinMool, Bang Lane, Nakhonpathom 73190 - Branch 6 98, 99 Moo 1, HinMool, Bang Lane, Nakhonpathom 73190	VSPP Electricity Generating and Supply Business using Solar Power	1,650	100	1,650	49

Kulhanok L.

Subsidiaries (Cont)

Company	Business	Registered Share Capital (Million Baht)	Par Value (Baht)	Paid-up Share Capital (Million Baht)	Ownership Interest (Direct+Indirect) (%)
Chaiyaphum Wind Farm Company Limited (CWF) Office 10 th Floor, EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Site Office 190 Moo 9, Subyai, Subyai, Chaiyaphum 36130, Thailand	SPP Electricity Generating and Supply Business using Wind Power	1,514	100	1,514	90
Klongluang Utilities Company Limited (KLU) Office 11 th Floor, EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Site Office 1/9 Moo 3, Klongnueng, Klongluang, Pathumthani 12120, Thailand	SPP Electricity and steam generating and supply business using Natural gas	1,000	10	1,000	99.99
Banpong Utilities Company Limited (BPU) Office 11 th Floor, EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Site Office 19/300 Moo19 Tha Pha, Banpong, Ratchaburi 70110, Thailand	SPP Electricity and steam generating and supply business using Natural gas	2,000	10	2,000	99.99
EGCO Plus Company Limited (EGCO Plus) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999	Holding company focusing on investment in electricity generating companies in foreign countries	510	10	510	100
EGCO Pearl Co., Ltd. (EGCO Pearl) (EGCO Plus is the company's 100% direct shareholder) Office EGCO Tower Tel. +66 (0) 998 5000 Fax. +66 (0) 998 5999 Overseas Office 4F No.200, Sec.1, Keelung Rd., Xinyi Dist., Taipei City110, Taiwan	Holding company focusing on investment in electricity generating companies in Taiwan	0.15 ⁵ (150,000 TWD)	10.02 ⁵ (10 TWD)	0.15 ⁵ (150,000 TWD)	100

Kulhanok L.

Joint Ventures

Company	Business	Registered Share Capital (Million Baht)	Par Value (Baht)	Paid-up Share Capital (Million Baht)	Ownership Interest (Direct+Indirect) (%)
Gulf Electric Public Company Limited (GEC) Office 8 th Floor, M. Thai Tower, All Seasons Place, 87 Wireless Road, Lumpini, Pathumwan, Bangkok 10330, Thailand Tel. +66 (0) 2654 0155 Fax. +66 (0) 2654 0156-7	Holding company focusing on IPP and SPP	14,000	10	13,784.35	50
Gulf Energy Company Limited (GEN) (GEC is the company's 100% shareholder) Office 8 th Floor, M. Thai Tower, All Seasons Place, 87 Wireless Road, Lumpini, Pathumwan, Bangkok 10330, Thailand Tel. +66 (0) 2654 0155 Fax. +66 (0) 2654 0156-7	Holding company focusing on IPP	9,782	10	9,782	50
Gulf IPP Company Limited (GIPP) (GEC is the company's 100% shareholder) Office 8 th Floor, M. Thai Tower, All Seasons Place, 87 Wireless Road, Lumpini, Pathumwan, Bangkok 10330, Thailand Tel. +66 (0) 2654 0155 Fax. +66 (0) 2654 0156-7	Holding company focusing on IPP	9,779	10	9,779	50
Gulf Power Generation Company Limited (GPG) (GEC is the company's 100% shareholder) Office 8 th Floor, M. Thai Tower, All Seasons Place, 87 Wireless Road, Lumpini, Pathumwan, Bangkok 10330, Thailand Tel. +66 (0) 2654 0155 Fax. +66 (0) 2654 0156-7 Site office 64 Moo 2 Ban Pa, Kaeng Khoi, Saraburi 18110, Thailand Tel. +66 (0) 3626 2403-9 Fax. +66 (0) 3626 2402	IPP Electricity Generating and supply business using Natural gas	9,607	10	9,607	50

Kulhanok L.

Joint Ventures (Cont)

Company	Business	Registered Share Capital (Million Baht)	Par Value (Baht)	Paid-up Share Capital (Million Baht)	Ownership Interest (Direct+Indirect) (%)
Gulf Cogeneration Company Limited (GCC) (GEC is the company's 100% shareholder) Office 8 th Floor, M. Thai Tower, All Seasons Place, 87 Wireless Road, Lumpini, Pathumwan, Bangkok 10330, Thailand Tel. +66 (0) 2654 0155 Fax. +66 (0) 2654 0156-7 Site office 79 Moo 3, Tandeow, Kaeng Khoi, Saraburi 18110, Thailand Tel. +66 (0) 3624 6203-4 Fax. +66 (0) 3624 6531	SPP Electricity and steam generating and supply business using Natural gas	850	10	850	50
Nong Khae Cogeneration Company Limited (NKCC) (GEC is the company's 100% shareholder) Office 8 th Floor, M. Thai Tower, All Seasons Place, 87 Wireless Road, Lumpini, Pathumwan, Bangkok 10330, Thailand Tel. +66 (0) 2654 0155 Fax. +66 (0) 2654 0156-7 Site office 111/11 Moo 7, Nongplamor, Nong Khae, Saraburi 18140, Thailand Tel. +66 (0) 3637 3676 Fax. +66 (0) 3637 3691	SPP Electricity and steam generating and supply business using Natural gas	1,241.72	74	1,241.72	50
Samutprakarn Cogeneration Company Limited (SCC) (GEC is the company's 100% shareholder) Office 8 th Floor, M. Thai Tower, All Seasons Place, 87 Wireless Road, Lumpini, Pathumwan, Bangkok 10330, Thailand Tel. +66 (0) 2654 0155 Fax. +66 (0) 2654 0156-7 Site office 745 Moo 2, Bang Pu Mai, Amphur Muang, Samutprakarn 10280, Thailand Tel. +66 (0) 2709 0751 Fax. +66 (0) 2709 1842	SPP Electricity and steam generating and supply business using Natural gas	981.54	76	981.54	50

Kulhanok L.

Joint Ventures (Cont)

Company	Business	Registered Share Capital (Million Baht)	Par Value (Baht)	Paid-up Share Capital (Million Baht)	Ownership Interest (Direct+Indirect) (%)
Gulf Yala Green Company Limited (GYG) (GEC is the company's 100% shareholder) Office 8 th Floor, M. Thai Tower, All Seasons Place, 87 Wireless Road, Lumpini, Pathumwan, Bangkok 10330, Thailand Tel. +66 (0) 2654 0155 Fax. +66 (0) 2654 0156-7 Site office 80 Moo 1, Pron, Amphur Muang, Yala 95160, Thailand Tel. +66 (0) 7325 2721 Fax. +66 (0) 7325 2722	SPP Electricity Generating and Supply Business using Biomass Power	460	10	460	50
BLCP Power Limited (BLCP) Office No. 9, I-8 Road, Map Ta Phut Industrial Estate, Map Ta Phut, Rayong 21150, Thailand Tel. +66 (0) 3892 5100 Fax. +66 (0) 3892 5199	IPP Electricity Generating and supply business using Coal	12,010	100	12,010	50
Nam Theun 2 Power Company Limited (NTPC) Office Unit 9, Tat Luang Road Nongbone Village, P.O. Box 5862 Vientiane, Lao PDR Tel. (856-21) 263 900 Fax. (856-21) 263 901	IPP Electricity Generating and supply business using Hydro power	13,534.20 ¹ (450,000,000 USD)	3,007.6 ¹ (100 USD)	11,233.39 ¹ (373,500,000 USD)	35

Kulhanok L.

Joint Ventures (Cont)

Company	Business	Registered Share Capital (Million Baht)	Par Value (Baht)	Paid-up Share Capital (Million Baht)	Ownership Interest (Direct+Indirect) (%)
G-Power Source Company Limited (GPS) Office 10 th Floor, EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Site Office - Branch 1 11/1, 111, 111/1 Moo 11, Dong Khon, Sankhaburi, Chai Nat 17140 - Branch 2 11/1, 11/11 Moo 5, Ta Khit, Banphot Phisai, Nakhon Sawan 60180 - Branch 3 11, 11/1 Moo 2, Ta Sang, Banphot Phisai, Nakhon Sawan 60180 - Branch 4 311, 311/1 Moo 2, Sap Samo Thot, Bueng Sam Phan, Phetchabun 67160	VSPP Electricity Generating and Supply Business using Solar Power	930	100	930	60
Natural Energy Development Company Limited (NED) Office 188 Moo 3, Wang Ploeng, Khok Samrong, Lopburi 15120, Thailand Site Office 188 Moo 3, Wang Ploeng, Khok Samrong, Lopburi 15120, Thailand Tel. +66 (0) 3641 8400 Fax. +66 (0) 3641 8401	SPP Electricity Generating and Supply Business using Solar Power	2,304	10	2,283	66.67
PT Manambang Maura Enim (MME) (EGCO Plus is the company's 40% indirect shareholder) Head Office Sentral Senayan 2, 16 th Floor Jl. Asia Afrika No.8, Gelora Bung Karno Senayan, Jakarta Pusat 10270 Site Office Lawang Kidul and Tanjung Enim, Muara Enim City, Sumatera Selatan (South Sumatra) Province 12920, Indonesia	COAL MINING industry, covering coal mining, coal trading and shipping	1,593.00 ² (750,000,000 Thousand Rupiah)	2,124 ² (1,000 Thousand Rupiah)	398.25 ² (187,500,000 Thousand Rupiah)	40

Kulhanok L.

Joint Ventures (Cont)

Company	Business	Registered Share Capital (Million Baht)	Par Value (Baht)	Paid-up Share Capital (Million Baht)	Ownership Interest (Direct+Indirect) (%)
Kalilayan Power Inc. (Kalilayan) (EGCO Plus is the company's 49% indirect shareholder) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Overseas office 62 H. Dela Costa Street, Barangay Daungan Mauban, Quezon Province, Philippines	Holding company focusing on investment in electricity generating companies in Philippines	5.30 ³ (9,000,000 <i>PESO</i>)	5.89 ³ (10 <i>PESO</i>)	5.30 ³ (9,000,000 <i>PESO</i>)	49
San Buenaventura Power Ltd (SBPL) (EGCO Plus is the company's 49% indirect shareholder) Office EGCO Tower Tel. +66 (0) 2998 5000 Fax. +66 (0) 2998 5999 Overseas office 62 H. Dela Costa Street, Barangay Daungan Mauban, Quezon Province, Philippines	IPP Electricity Generating and supply business using Coal	8,001.57 ³ (13,585,000,000 <i>PESO</i>)	-	8,001.57 ³ (13,585,000,000 <i>PESO</i>)	49
Nam Theun 1 Power Company Limited (NT1PC) Overseas office Unit 15, Sithong Road, Pak Thang Village, Sikhottabong District, Vientiane Capital, Lao PDR Tel. +856 (0)21 550 775 Fax. +856 (0)21 550 771	IPP Electricity Generating and supply business using Hydro power	12,045.44 ¹ (400,500,000 <i>USD</i>)	3,011.36 ¹ (100.125 <i>USD</i>)	12,045.44 ¹ (400,500,000 <i>USD</i>)	25
E&E Engineering and Service Company Limited (E&E) (ESCO is the company's 40% shareholder) Overseas office Lao-Thai Friendship Road, Thongkang Village, EDL Training Center Building, Sisattanak District, Vientiane Capital, Lao PDR Tel. +856 (0)21 316 758-59	Operation and Maintenance of NT1PC, other power plants and industries in the Lao PDR	27.19 ⁷ (8,000 <i>Bn. LAK</i>)	271.92 ⁷ (80,000 <i>LAK</i>)	27.19 ⁷ (8,000 <i>Bn. LAK</i>)	40
Paju Energy Service Company Limited (Paju) (EGCO Plus is the company's 49% indirect shareholder) Overseas office 336-234, Hyuam-ro, Paju-eup, Paju-si, Gyeonggi-do, P.O. Box: 10839 Republic of Korea	IPP Electricity Generating and supply business using Natural gas (Imported LNG)	14,300 (550 <i>Bn. KRW</i>)	130 (5,000 <i>KRW</i>)	14,300 (550 <i>Bn. KRW</i>)	49

Kulhanok L.

Company	Business	Registered Share Capital (Million Baht)	Par Value (Baht)	Paid-up Share Capital (Million Baht)	Ownership Interest (Direct+Indirect) (%)
Thai Pipeline Network Company Limited (TPN) Office 349 SJ Infinite I Business Complex 19 th Fl. Vibhavadi-Rangsit Road, Chompon, Chatuchak, Bangkok 10900, Thailand Tel. +66 (0) 2408 6230-34 Fax. +66 (0) 2408 6235	Oil transportation service business with pipeline transportation system	2,450	100	2,450	44.60
Xayaburi Power Company Limited (XPCL) Office 215 Lanexang Avenue, Ban Siang Yuen Chantaburi, Vientiane, Lao PDR Tel. (856-21) 223 215, 252 060 Fax. (856-21) 215 500	IPP Electricity Generating and supply business using Hydro power	26,861	10	26,861	12.5

Associate

Company	Business	Registered Share Capital (Million Baht)	Par Value (Baht)	Paid-up Share Capital (Million Baht)	Ownership Interest (Direct+Indirect) (%)
Star Energy Geothermal Pte Ltd (SEG) (EGCO Plus is the company's 20% indirect shareholder) Office 120 Robinson Road #08-01, Singapore 068913.	Holding company focusing on investment in geothermal power plants in Indonesia	2,840.28 ^{/1} (94,436,650 USD)	-	2,840.28 ^{/1} (94,436,650 USD)	20
Star Energy Geothermal (Salak - Darajat) B.V. (SEGSD) (EGCO Plus is the company's 20.07% indirect shareholder) Office Atrium Building, 8 th Floor, Strawinskylaan 3127, 1077 ZX, Amsterdam, The Netherlands	Holding company focusing on investment in geothermal power plants in Indonesia	0.30 ^{/1} (10,000 USD)	-	0.30 ^{/1} (10,000 USD)	20.07

Note: The Exchange rate as at December 27, 2019

^{/1} 1 USD	=	Baht	30.0760
^{/2} 1,000 Rupiah	=	Baht	2.1240
^{/3} 1 PESO	=	Baht	0.5890
^{/4} 1 AUD	=	Baht	20.8043
^{/5} 1 TWD	=	Baht	1.0021
^{/6} 1 KRW	=	Baht	0.0260
^{/7} 100 LAK	=	Baht	0.3399

Kulhanok L.