

### Information on Energy Management

SUTHA oversees resource utilization to optimize efficiency and mitigate the risk of depleting finite natural resources. The primary resources include limestone, electricity, fuel, energy, and water, the majority of which are derived from natural sources. Management practices are implemented in accordance with the established policy framework as outlined below.

1. Integrating Effective Management of energy and resources, along with energy conservation into the operational workflow.
2. Tracking the consumption of key resources involves gathering data on energy usage by each unit, followed by analysis to identify opportunities for reduction.
3. Committed to adhering to regulations concerning energy conservation and the management of energy and resources.
4. Dedicated to the ongoing enhancement of energy and resource efficiency, aligning with best practices.

#### Energy management plan

SUTHA establishes objectives and oversees the utilization of critical resources throughout its operations. A management framework is in place to ensure the efficient use of these resources. Key activities are implemented to manage essential resources, allowing for the monitoring of progress and the assessment of tangible outcomes. This framework encompasses various important resources and energy types, including:

- Electricity consumption
- Overall energy consumption
- Utilization of renewable or clean energy
- Fuel consumption (including diesel, gasoline, NGV, all coal types, and all biomass energy types)
- Water usage, waste volume management, and efforts to minimize waste and pollution arising from business processes.

The company's energy management plan : implemented

#### Coal and diesel fuel management goals

In the primary production process, specifically lime production, which constitutes the company's core offering, fuel management is critical for optimizing costs and enhancing operational efficiency. The objective is to manage the cost structure effectively in alignment with prevailing economic conditions and fuel usage guidelines, ensuring that fuel costs are monitored and controlled at all times. The principal fuel utilized for the heating process in the company's lime kiln is Solid Fuel, which includes various types such as Petcock, Bituminous, Sub-Bituminous, and Steam Coal in various heat grades.

The FLEX\_FUEL development project facilitates the use of diverse Solid Fuels in the production process. This investment initiative aims to enhance machinery and processes, including systems for fuel grinding, transportation, storage, and injection. By supporting the utilization of various Solid Fuels, the project enables efficient procurement, whether through domestic purchases or imports, thereby improving cost management, working capital, and inventory control. This approach significantly mitigates procurement risks and ensures a steady supply of fuel for production.

The company employs a range of fuels to support its production, marketing, and logistics operations. Diesel oil is primarily used for company vehicles involved in transporting goods and raw materials, including trucks, loaders, and forklifts, as well as vehicles designated for customer deliveries. Fuel management encompasses both the dispensing of oil from authorized petrol stations located within the factory and purchases from external service stations. Additionally, natural gas is utilized for various support vehicles, including those for executives and personnel in sales and marketing departments, among others.

Environmental operating results-Energy Management

The company is actively exploring alternative energy sources as part of its commitment to reducing reliance on fossil fuels, which are finite resources.

To achieve this objective, the company has initiated a development project focused on alternative fuel sources, specifically through the Biomass Project. This initiative includes sending personnel to investigate the lime industry's utilization of biomass as a fuel for lime production, as well as examining various types of biomass raw materials that can be consistently sourced for production processes.



Support for this project has been provided by the Carmeuse Group, an indirect major shareholder, which has offered expertise and techniques to enhance the understanding of biomass applications within the country. Currently, the project remains in the experimental and development stages. Should it prove successful, the company will be positioned to utilize biomass as a fuel source, thereby contributing to the reduction of greenhouse gas emissions in alignment with the CO2 Roadmap's targets.

The biomass project remains in the planning phase of the research process, which includes process development and the identification of appropriate biomass sources.

The allocated funds are utilized for research, development, and the installation of equipment necessary for optimizing the transportation of biomass materials, aimed at testing the process within the lime kiln at the Huai Pa Wai branch. This investment has been documented as assets for the Bio Fuel construction project at the Huai Pa Wai branch, with a total investment value detailed as follows:

**Sustainability is a core value and objective, so far, we made progress via solar, and developed biomass solution technically implementation ready**

- Fuel available and Sustainability**
  - Petroleum Coke
  - Bituminous Coal
  - Biomass focus on local availability
    - Rice husk
    - Wood dust
- Biomass Engineering ready** but there is no CO2 incentive yet present to contribute to the cages payback yet in Thailand
- Electricity sustainable**

In Thailand electricity come from

  - 60% from natural gas power plant
  - 20% from hydropower plant
  - 10% from coal
  - 5% from other

We are in the 5% !!!
- Solar**

Sutha Lime has 2.5MW Solar farm

  - 70m THB
  - BOI support
  - Another 1.5MW ongoing capex

Biomass Research and Development Project, Huai Pa Wai (Biofuel Project)	Year	2022	2023	2024	Investment amount
Installation of machines and equipment-SCAP-HW-Biofuel Ref:189500-HW-Biofuel: Asset during construction	THB	432,964	722,624	59,810	1,215,398

In terms of reducing diesel and gasoline consumption, which are essential for transportation and production support vehicles, the company has established a goal to decrease usage. Plans are underway to transition the company's fleet, including executive vehicles and those used by relevant departments, to electric vehicles, which is anticipated to significantly lower diesel fuel consumption.

To this end, SUTHA will monitor the quantitative reduction of diesel and gasoline usage, setting specific targets after the implementation of electric vehicles to facilitate a thorough analysis of the results.

### Electricity management

The organization oversees electricity consumption through an electricity management system that regulates operations by implementing measuring devices (Sensors), meters and various electrical control systems (Actuators or Controllers) to monitor and manage electricity usage. The data gathered is utilized to process and analyze outcomes, aiming to identify the most effective energy management strategies, which may include investments in renewable energy generation systems. A solar power generation system (so called Solar farm project) has been chosen as the focus for utilizing renewable energy, thereby decreasing electricity purchases and mitigating the impact of greenhouse gas emissions in Scope 2.



- Modify the operational hours of production to align with the electricity tariff structure by utilizing Time of Use (TOU) rates, scheduling machinery to operate during off-peak hours from 22:00 to 09:00, as well as on weekends, while minimizing electricity consumption during peak hours.
- Limit the operational hours of electrical appliances to the extent that is both necessary and advantageous.
- Ensure that motors operate at 80-90% of their capacity to enhance efficiency.
- Scale down the size of machinery and equipment to match the actual workload requirements.
- Replace or eliminate any motors that have experienced failure.
- Upgrade or replace machinery and equipment to achieve greater efficiency.
- Select production processes, machinery, and equipment that are designed for low energy consumption.
- Adjust the production process to incorporate renewable energy sources, specifically from solar power systems.
- Alter machinery, electrical equipment, and lighting systems to utilize solar energy in place of conventional electricity.

### Renewable / clean energy

The development project aims to invest in renewable energy sources. The objective is to identify alternatives to fossil fuels, including coal, petroleum, and natural gas, which are finite energy resources.

Currently, SUTHA focuses on key renewable energy sources as part of our strategy to stimulate economic growth while minimizing environmental impacts, particularly by lowering carbon dioxide emissions. This includes significant investment initiatives such as the Solar Farm project as follows.

- Solar Farm Phase I generation capacity 2 MW commissioned in Y2020
- Solar Farm Phase II generation capacity 0.5 MW commissioned in Y2021



- Solar Farm Phase III generation capacity 1 MW under construction

**Environmental operating results-Energy Management**

Solor Farm III is currently under review for an expansion from 1.0 MW to 1.5 MW, structured into three distinct phases for investment and development. In 2024, changes in investment promotion conditions from the BOI have led to a reduction in tax incentives, resulting in a return on investment rate that does not align with established safe investment benchmarks. Consequently, the Solar Farm Phase III project has been deferred to explore alternative investment options, aiming to effectively manage investment risks and ensure satisfactory returns. At present, land has been acquired for the project site, and the next steps involve the approval process and allocation of investments, which are currently being assessed to identify the best management strategies for optimizing investment outcomes.

**The goal for electricity management**

Estimated from the total electricity consumption in all branches in the base year 2019, with the amount of electricity purchased 26,499,722, a decrease of 3 percent or 25,704,730.34 kilowatt-hours compared to the base year.

Does the company set goals for electricity and/or fuel management? : Yes

**Electricity and/or fuel management Goal**

goal(s)	Base years (s)	Target year(s)
Reduction of electricity purchased for consumption	2019: purchased electricity for consumption 26,499,720.00 Kilowatt-hour	2024: Reduced by 3% or 25,704,730.34 Kilowatt-hour in comparison to the base year

**Energy management: Fuel consumption**

The company primarily utilizes the following fuels:

**Solid Fuels or Coal:** categorized as consumable materials as a raw material in the lime kiln process. The predominant types employed are fossil-based, including Petroleum Coke (Petcoke), Bituminous Coal, and Stem Coal.

The fuels utilized by the company are as follows:

- **Diesel:** for the delivery operations of the company's trucks, as well as for production support vehicles such as excavators, forklifts, and water trucks, among others.
- **Gasoline:** for executive vehicles, as well as for marketing, sales, and various support tasks.
- **Natural Gas:** for the company's transport trucks that are equipped with NGV systems.

The Company aims to reduce its consumption of diesel and gasoline, aligning with its strategy to decrease greenhouse gas emissions in Scope 1. This initiative is part of the investment project development strategy under the EV Project. The project will evaluate the allocation of investment funds for the modification of trucks and production support vehicles used in quarrying and production processes, including executive cars. Replacement will be assessed based on the condition and useful life of each vehicle, considering the cost trends and the technology available in the EV Charger service system, ensuring appropriate costs, stability, and user references to achieve a satisfactory rate of return on investment.

In 2024, the Company allocated investment for the EV Charger system, the replacement of tractors and loaders, and the installation of EV Charger stations at the Chong Sarika branch. The total budget is projected at 16.43 million baht, with approximately 16 million baht earmarked for project expenditures. By October 30, 2024, one EV tractor and one EV loader started operating.

An investment 1.85 million baht is planned for two forklifts for warehouse operations, along with replacing an executive vehicle with an electric one for 1.04 million baht, to be implemented by January 2025. The goal is to reduce diesel and gasoline consumption in the initial phase.

Environmental operating results-Energy Management

[https://www.goldenlime.co.th/Energy\\_Management\\_and\\_effective](https://www.goldenlime.co.th/Energy_Management_and_effective)



Golden Lime Public Company Limited		
Project to switch the types of vehicles used for transportation and production support for lower diesel fuel consumption and greenhouse gas emissions in		
Investment plan	Execution	
Number of EV Charger station : 1 EA	Number of EV Charger station : 1 EA	
Charger capacity : 240 kW	Charger capacity : 240 kW	Year 2024
Investment plan	Investment Capex in Y2024	Amount (mTHB)
Tractor head		5.23
Excavator		6.68
charger unit - free inclusive for the purchase of 1 tractor truck and 1 loader (0.9 mTHB)		
Investment in the installation of an electrical system to provide power to charging cabinets.		4.00
<b>Overall capex 16.43 mTHB</b>	<b>Capex paid</b>	<b>16 mTHB</b>



EV charger Outdoor station for truck and wheel loader

Part	Article	Photo Number
01	3.2.2	010332_004

Golden Lime Public Company Limited

EV Project Investment

Fuel Consumption	Unit	Business activities	Y2022	Y2023	Y2024
Diesel	Liter	Production and transportation	1,125,685	1,080,172	998,268
		Sales and administration	28,989	16,500	15,265
		<b>Total</b>	<b>1,154,674</b>	<b>1,096,672</b>	<b>1,013,534</b>
Benzine Gasoline	Liter	Production and transportation	32,001	0	3,363
		Sales and administration	19,491	17,041	19,015
		<b>Total</b>	<b>51,492</b>	<b>17,041</b>	<b>22,378</b>
NGV (cubic feet)	Kg.	Production and transportation	255,589	161,260	125,752
		Sales and administration	7,645	7,805	9,373
		<b>Total</b>	<b>263,234</b>	<b>169,065</b>	<b>135,125</b>
Coals (All types)	Tons	<b>Fuel for production</b>	<b>55,755</b>	<b>47,496</b>	<b>39,554</b>
		(Excluding fuel evaporative losses, losses occurring during transport, loss during storage.)			

The Company has not collected : aviation fuel, fuel oil, crude oil, cooking gas, steam.

Volume of purchased electricity	Item	Unit	Scope	Before Solar Farm installation	Y2022	Y2023	Y2024
				Base year			
	Forecast electricity consumption	KWh	GL	26,499,722	25,704,730.34	25,704,730.34	25,704,730.34
	Volume of purchased electricity	KWh	All branch		23,512,253	20,444,515	19,516,280.08
	% Decreased electricity compared to the base consumption	%	All branch	100%	91%	80%	76%
	Electricity consumption against the base year	KWh	All branch		- 2,192,477	- 5,260,215	- 6,188,450

Environmental operating results-Energy Management

Actual consumption lower than 3% against the forecasted consumption				-4%	-9%	-24%	
Result: achieve /not achieve		All branch	decreased	achieve	achieve	achieve	
% Compared base year	%	All branch		89%	77%	74%	
Volume of purchased electricity against base year	KWh	All branch		- 2,987,469.00	- 6,055,207.00	- 6,983,441.92	
% Compare base year				-11%	-23%	-26%	
Cost of purchased electricity	Cost of purchased electricity	THB	All branch	87,034,613.89	86,311,518.05	88,275,124.00	72,430,843.65
	% Change from previous year	%	All branch		107%	102%	82%
	Electricity rate per unit	THB/KWh	All branch	3.284	3.671	4.318	3.711
	Cost of purchased electricity decreased compared to the base year <sup>(1)</sup>	THB	All branch		- 10,966,749.32	- 26,145,112.70	-25,917,674.26
	% Compared to base year	THB	All branch		-13%	-30%	-30%

Remark: 1) Decreased purchased electricity compared to the base year's is obtained by decreased purchased electricity multiply current unit electricity cost  
 2) In November 2018 - December 2022, electricity rates are calculated according to the time of use (TOU), classified under 4.2.2 Large business (voltage 22 - 33 kV), electricity rates in PEAK range = 4.1839 baht/unit, OFF PEAK. = 2.5849 baht/unit which it is the fixed rate but the factor varies the electricity rate per unit is the Ft as below:

FT	Y2019	Y2022	Y2023	Y2024
January – April	-0.1160	0.0139	1.5492	0.3972
May - August	-0.1160	0.2477	0.9119	0.3972
September - December	-0.1160	0.9343	0.2048	0.3972
Average	-0.1160	0.3986	0.8886	0.3972

**Environmental operating results-Energy Management**

**Management of renewable / clean energy**

**Renewable Energy Index**

Item	Unit	Scope	Base year Y2019	Y2022	Y2023	Y2024
Overall volume of purchased electricity	kWh	Golden Lime (Not including subsidiaries)	26,499,722	23,512,253	20,444,515	19,516,280
Volume of Use electricity generated from Solar Farm	kWh	Chong Sarika	18,545,960 <b>Base Year</b>	16,118,760	13,282,440	12,987,323
Reduce the amount of purchased electricity by not less than 5% compared to the base year.	kWh	GL	<b>Base Year</b>	13%	28%	30%
				<b>Achieve</b>	<b>Achieve</b>	<b>Achieve</b>
Volume of solar energy generated	kWh	Power consumption at Chong Sarika	No Power generation with solar energy	3,384,229.21	3,434,079.10	3,395,754.16
	Cost saving	Solar energy generated at Chong Sarika	No Power generation with solar energy	<b>13,045,602.38</b>	<b>14,902,348.34</b>	<b>13,714,057.39</b>

Note: The calculation scope of Renewable Energy adds the electricity consumption of the headquarter, Nonthaburi office, into the purchased electricity so it appears different from the results in Y2021 56-1 One Report.

**Energy management: Electricity consumption**

	2022	2023	2024
Total electricity consumption within the organization (Kilowatt-Hours)	26,896,482.21	23,878,594.10	22,912,034.24

Note: The total of electricity purchases + electricity usage from solar.

**Summary of total energy consumption and Total energy expenditure**

Total energy consumption represents the sum of the electricity consumption, oil and fuel all of which are converted into energy units. Total energy expenditure represents the sum of the expenses from electricity, oil and fuel.

	Data collected	Unit	Scope of collection	2022	2023	2024
Energy (kwh)	Electricity	Kilowatt-hour	All branches	23,512	20,445	19,516
	Oil	Kilowatt-hour	All branches	15,598	13,406	12,155
	Fuel	Kilowatt-hour	All branches	421,636	309,086	310,194
	Total energy	Kilowatt-hour	All branches	<b>460,746</b>	<b>342,936</b>	<b>341,866</b>
	Energy Per tons product	Kwh /Kgs product	All branches	<b>0.00130</b>	<b>0.00115</b>	<b>0.00117</b>
Energy expenditure	Total energy expenditure	THB	All branches	<b>332,608,244</b>	<b>292,028,492</b>	<b>226,659,754</b>