

**Report
Energy Management
on year 2023**

Legal entity name: Metharat University

Name of controlled building: Metharat University

TSIC - ID : 85302-1010

Certificate of preparation of energy management report

1. Chairman of the Energy Management Task Force

I, in my capacity as the Chairman of the Energy Management Task Force for the Control Building, hereby certify that energy management has been carried out in accordance with all regulations set forth by the Ministry.

Signature: [Your Signature]

Date: March 11, 2023

2. Person Responsible for Energy Management

I, in my capacity as the person responsible for energy management for the Control Building, hereby certify that energy management has been conducted in accordance with all regulations set forth by the Ministry.

[Your Name]

[Your Name]

3. Owner of the Control Building

I, in my capacity as the owner of the Control Building/authorized representative, hereby certify that energy management has been conducted in accordance with all regulations set forth by the Ministry.

[Your Name]

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Basic Information

General Information

1. Legal Entity Name: Metharat University

Control Building Name: Metharat University

TSIC- ID: 85302-1010

2. Specify the Control Building Groups as follows:

- Group 1 (Small size): Control buildings that use electricity meters or have installed transformers with a combined capacity of less than three thousand kilowatts or three hundred fifty-three kilo-volt-amps, or control buildings that use electricity, heat energy from steam, or other forms of wasted energy with an energy equivalent quantity of less than sixty million megajoules per year.

- Group 2 (Large size): Control buildings that use electricity meters or have installed transformers with a combined capacity of three thousand kilowatts or three hundred fifty-three kilo-volt-amps or more, or control buildings that use electricity, heat energy from steam, or other forms of wasted energy with an energy equivalent quantity of sixty million megajoules per year or more.

3. Building Address

Number: 99, Moo 10

District: Samkhok

Telephone: 02-5990000

Street:-

Province: Pathum Thani

Fax: 02-5993350

Sub-district: Bang Toey

Postal Code: 12160

Email:

4. Building Types

Office

Educational Institution

Hotel

Other (Specify): _____

Hospital

Shopping mall

5. Building Operational Start Year: 2002

Number of Employees: 150

Number of Departments/Divisions: 7

6. Total Number of Buildings: 2 (Building details are provided in Appendix A.)

7. For Hotel Buildings Total Number of Guest Rooms:- (Room details available in Appendix A.)

8. For Hospital Buildings Total Number of Hospital Beds:- (Bed details available in Appendix A.)

9. Person responsible for energy

No.	Name – Surname	Qualifications***	Registration number
1	Mr. Tripop Sairat	Person responsible for general energy Senior person responsible for energy	พชอ.16641
2			
3			

***Qualifications of those responsible for energy

Person responsible for general energy

- (a) Holds a professional high-level certification and has at least three years of work experience in buildings with achievements in energy conservation as certified by the factory or building owner.
- (b) Holds a degree in engineering or science with achievements in energy conservation as certified by the building owner.
- (c) Has completed training in energy conservation or similar training approved by the Director-General.
- (d) Has completed the Energy Manager training course approved by the Director-General.
- (e) Has passed the criteria set by the Energy Manager examination organized by the Department of Alternative Energy Development and Efficiency.

Senior person responsible for energy

- (a) Has successfully completed the Senior Energy Manager training course approved by the Director-General.
- (b) Has passed the examination according to the criteria set by the examination for Energy Managers conducted by the Department of Alternative Energy Development and Efficiency.

Energy Management Information

Step 1: Energy Management Team

1.1 Structure of the Energy Management Team (Year 2023)

Energy Management Team Structure

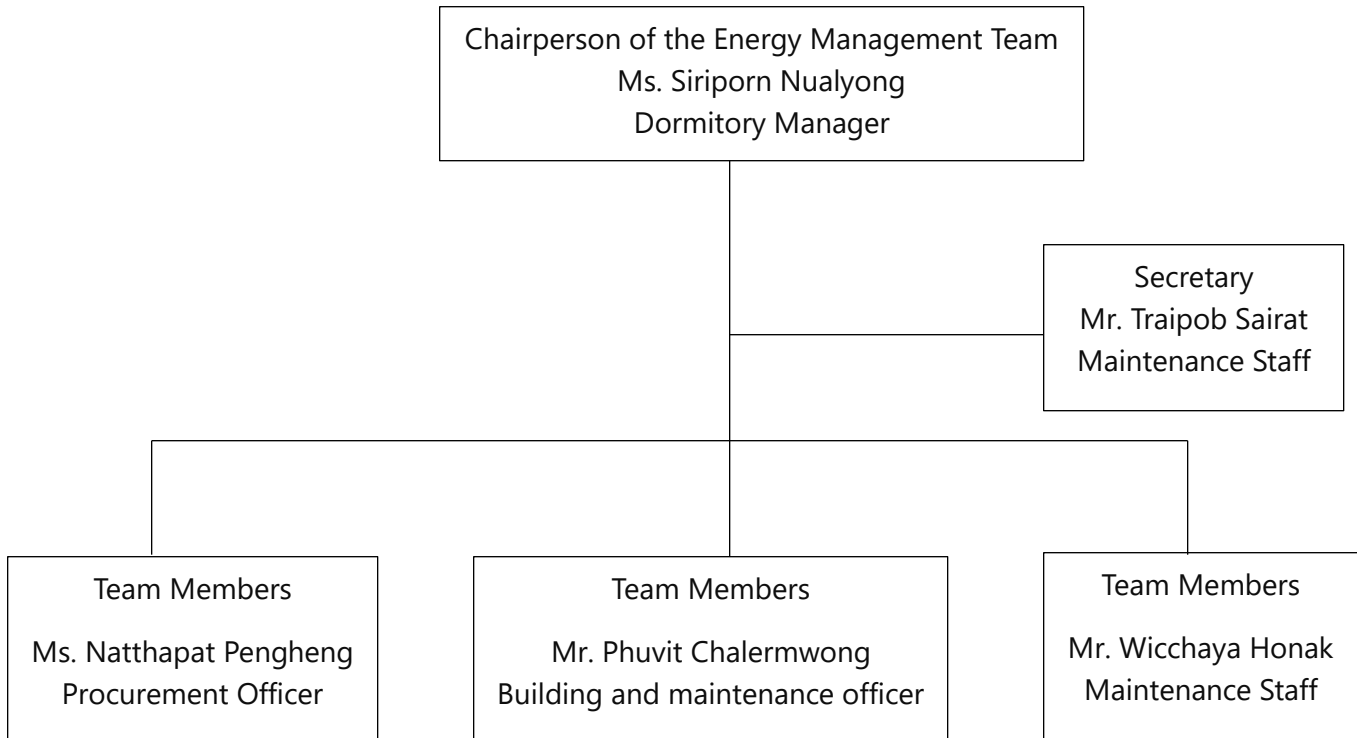


Figure 1-1: Organizational Chart of the Energy Management Team (Year 2023)

1.1 Structure of the Energy Management Team (Year 2024)

Energy Management Team Structure

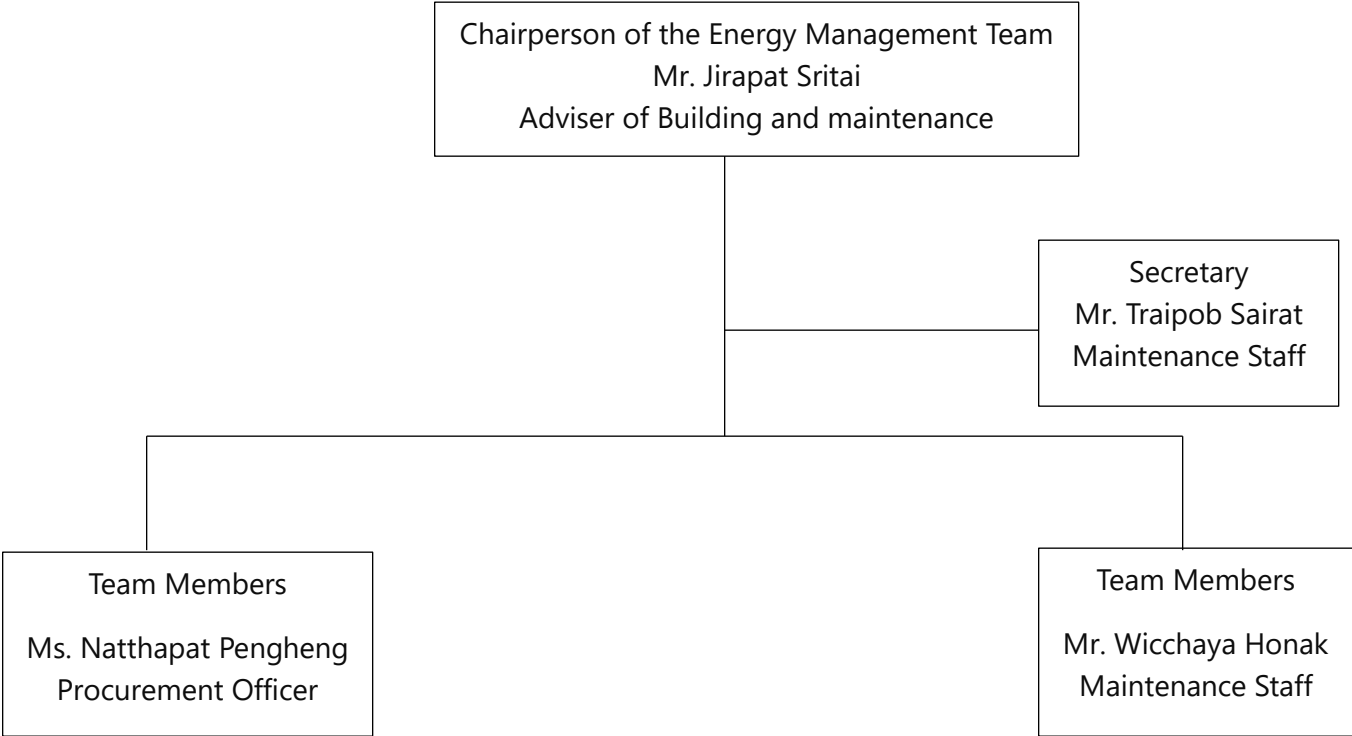


Figure 1-1: Organizational Chart of the Energy Management Team (Year 2024)

1.2 Appointment of the Energy Management Team and Duties (Year 2022)

University Order

Appointment of the Energy Conservation Committee

In order to ensure the continuous and effective operation of energy management at Metharath University, a committee has been appointed, comprised of representatives from various departments. Their role is to coordinate energy conservation efforts to achieve success in line with policies and objectives. The appointed members are as follows:

1. Ms. Siriporn Nawalong, Chairperson - Manager of Dormitories
2. Mr. Tira-pot Sairat, Secretary - Maintenance Officer
3. Ms. Nataprapa Pengheng, Member - Procurement Officer
4. Mr. Phuwit Chalermwong, Member - Building Officer
5. Mr. Wicchaiya Honak, Member - IT Officer

Roles and Responsibilities of the Energy Management Committee:

1. Ensure energy management aligns with the established conservation policies of the controlled buildings.
2. Coordinate with all relevant departments to solicit cooperation in adhering to energy conservation policies and management practices. This includes organizing training or activities tailored to the needs of each department.
3. Oversee the effective implementation of energy management practices in controlled buildings, ensuring the following actions are taken:
 - Collecting historical energy usage data from various departments.
 - Assessing the current energy usage status of relevant departments.
 - Reviewing the outcomes of energy management efforts and practices of each department based on the progress reports prepared by respective units.
4. Reporting progress to the control building owners for acknowledgment.
5. Regularly reviewing energy conservation policies and management practices, along with collecting feedback and suggestions regarding policies and energy management methods for acknowledgment by control building owners or senior management.
6. Supporting control building owners in compliance with these ministry regulations.

These provisions are effective from April 5, 2565.

Announced on April 5, 2021.

(Mr. Jirawat Srihathai)

Building and Maintenance Advisor

1.2 Appointment of the Energy Management Team and Duties (Year 2023)

University Order

Appointment of the Energy Conservation Committee

In order to ensure the continuous and effective operation of energy management at Metharath University, a committee has been appointed, comprised of representatives from various departments. Their role is to coordinate energy conservation efforts to achieve success in line with policies and objectives. The appointed members are as follows:

1. Mr. Jirawat Srihathai, Chairperson - Building and Maintenance Advisor
2. Mr. Tripot Sairat, Secretary - Maintenance Officer
3. Ms. Nataprapa Pengheng, Member - Procurement Officer
4. Mr. Wicchaiya Honak, Member - IT Officer

Roles and Responsibilities of the Energy Management Committee:

1. Ensure energy management aligns with the established conservation policies of the controlled buildings.
2. Coordinate with all relevant departments to solicit cooperation in adhering to energy conservation policies and management practices. This includes organizing training or activities tailored to the needs of each department.
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6. Supporting control building owners in compliance with these ministry regulations.

These provisions are effective from April 5, 2565.

Announced on April 5, 2021.

(Mr. Jirawat Srihathai)

Building and Maintenance Advisor

1.3 Dissemination Method of the Energy Management Team

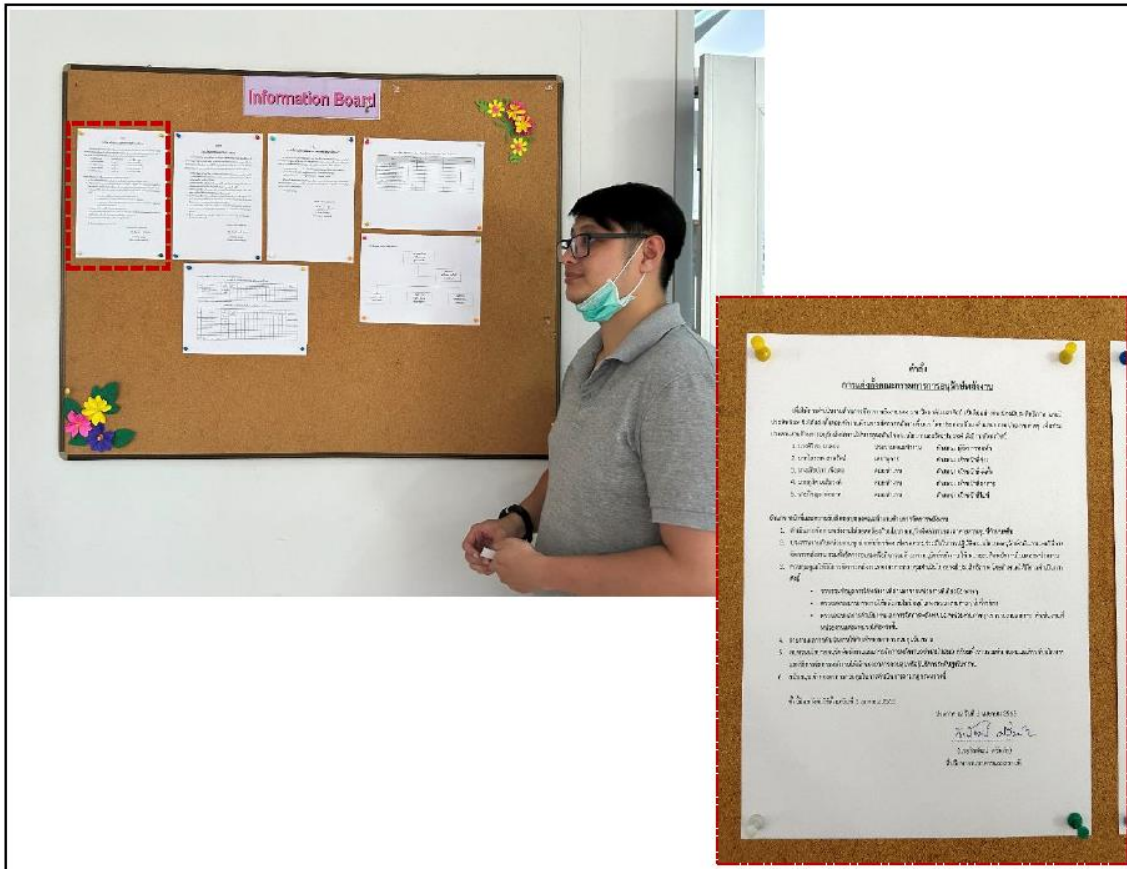
To ensure that all employees are informed, the order appointing the Energy Management Team shall be disseminated by the building through the following actions



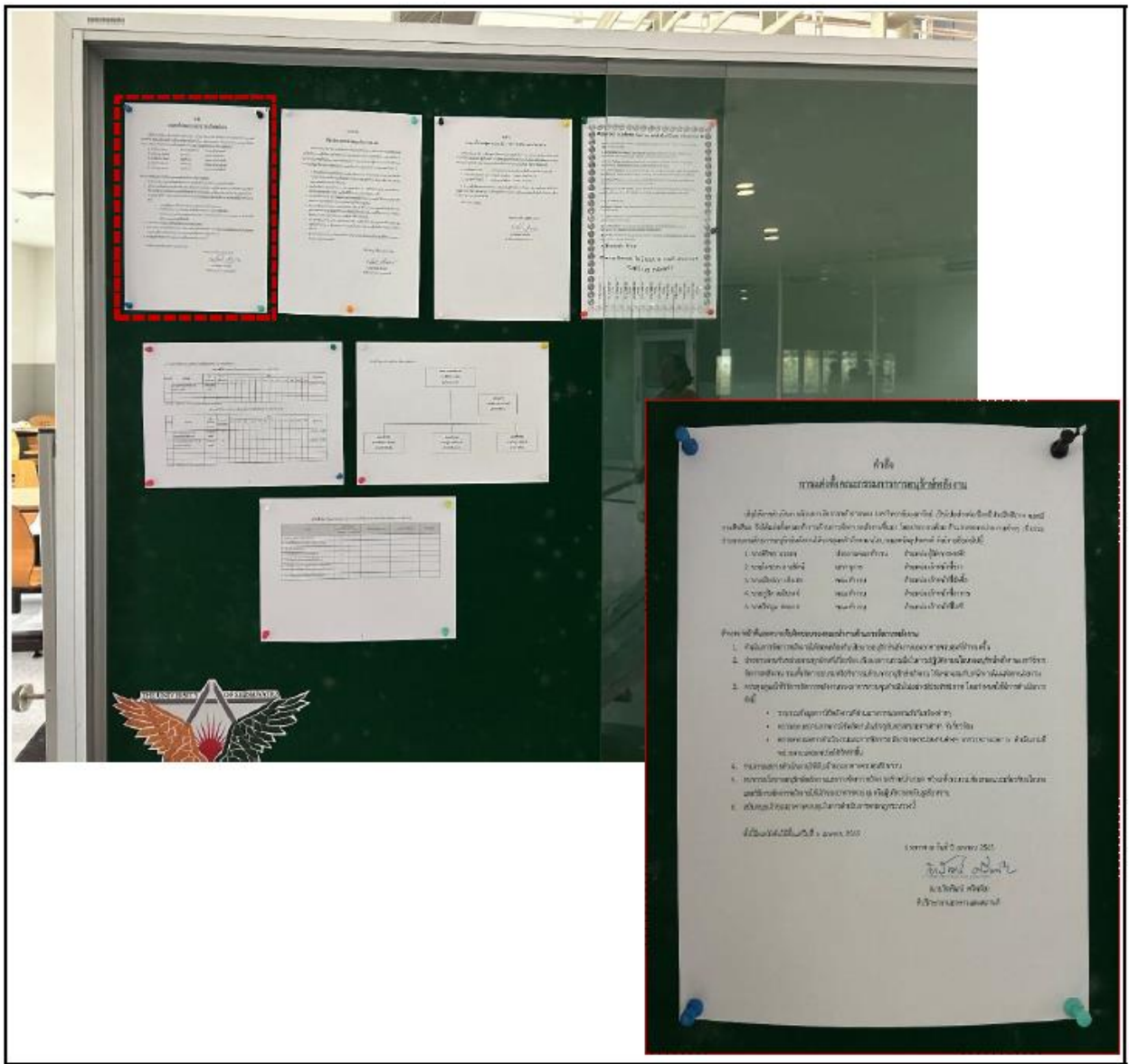
Posting
Number of posters ...2.... pieces
Published Documents
Brochures/Magazines ... copies
Emails
Number of recipients: ... people
Level of recipients: ...
Others (Specify): ...

- Posters
Number of posters: ... locations
- Audio Broadcast
... times per week, period ..
- Staff Meetings
... times per week

Document or evidence showing the dissemination of the Energy Management Committee's work.



(a) ... posted on the bulletin board in front of the elevator on the 1st floor ...



(a) ... posted on the bulletin board in the classroom building, 3rd floor ...

Figure 1-3: Image of disseminating the Energy Management Team Note: In case there are more than 2 methods of dissemination, the building can add more displays of additional documents and images to ensure completeness.

Step 2: Preliminary Energy Management Assessment

Preliminary Energy Management Assessment Results
 Evaluation Year: 2563 B.E. (2020 A.D.)

Table 2.1: Organization's Energy Management Assessment

Level	Points	Energy Conservation Policy	Organizational Management	Incentives and Motivation	Information System	Investment
4	There is an energy management policy established by the management and considered as an integral part of the company's overall policy.	The organization is structured and delineated within the management department, with clear roles and responsibilities assigned.	There is constant coordination between energy management stakeholders and teams at all levels.	Goals are set to encompass monitoring, error detection, performance evaluation, and budget control.	Promoting the value of energy conservation and communicating the outcomes of energy management initiatives is part of the company's public relations efforts.	Budget allocation is detailed, considering the importance of each project.
3	There is a policy in place with occasional support from management. 3.33	The energy manager directly reports to the Energy Management Committee, which comprises heads of various departments. 3.48	The Energy Conservation Committee serves as the main channel for implementing initiatives.	Energy usage data from sub-meters are communicated to respective departments but without highlighting energy-saving outcomes.	Employees are informed about energy conservation projects, and regular public relations efforts are made. 2.40	Time and cost-effectiveness are key considerations for investment decisions. 2020
2	There is no clearly defined policy by management or those responsible for energy.	The energy manager reports to a special committee, but lines of authority are unclear. 2.32 2.17	The special committee takes on operational roles. 2.40 2.17	Progress is tracked and evaluated based on meter readings, with involvement from the special committee in budget allocation. 2.17 2.25	Periodic training is provided to staff. 2.40 2.58	Investments are made based on measures with fast payback periods. 2.48 2.25
1	There is no established standard practice guidelines.	The energy manager has limited scope of responsibility.	Informal communication exists between engineers and energy users (staff).	Reports on energy usage expenses are summarized for internal engineering department use.	Informal notifications are given to staff to promote efficient energy usage.	Investments are considered only as measures with immediate returns. 2017
0	Lack of clear energy policy.	Absence of designated energy manager.	No communication with energy users.	Absence of energy data collection and accounting systems.	No support for energy conservation efforts.	No investments made to improve energy efficiency.

Note:

1. The preliminary assessment of energy management status is evaluated from 7 departments out of a total of 7 departments, or personnel from a total of 25 individuals out of a total of 150 individuals, which accounts for approximately 16.67%.
2. In the case where the controlled building develops its energy management system in the second phase, at this stage, the controlled building may or may not proceed with the evaluation. However, conducting evaluations of energy management status within the organization consistently every year will lead to a better understanding of the changing energy management status.
3. The overall assessment of energy management status in controlled buildings, if there are more suitable methods available, the controlled building can use them instead of the table above.

The calculation of the average score of the preliminary energy management assessment.

Score	Energy Management Policy		Organizational Arrangement		Incentive and Motivation		Information System		Public Relations		Investment	
	People	Score	People	Score	People	Score	People	Score	People	Score	People	Score
4	17	68	3	12	3	12	2	8	2	8	1	4
3	5	15	11	33	9	27	12	36	11	33	17	51
2	2	4	6	12	9	18	2	4	8	16	1	2
1	0	0	1	1	3	3	5	5	3	3	5	5
0	1	0	4	0	1	0	4	0	1	0	1	0
Total	25	87	25	58	25	60	25	53	25	60	25	62
Average Score		3.48		2.32		2.40		2.12		2.40		2.48

Step 3: Energy Conservation Policy

3.1 Organization's Energy Conservation Policy

To demonstrate commitment and dedication to energy conservation efforts, the control building has established an energy conservation policy aligned with the objectives and goals of energy conservation. This policy is in line with the energy usage status and is suitable for the control building, as follows:

Announcement

Subject: Energy Management Policy

Announcement

Subject: Energy Management Policy Implementation

Metharath University recognizes the importance of efficiently utilizing energy resources. Therefore, the university is committed to implementing energy conservation practices among its internal staff, fostering collective participation in energy conservation efforts within the organization, and aligning actions towards the common goal of reducing expenses and conserving energy in line with governmental policies. The details are as follows:

1. The university will develop and implement a suitable management system, integrating energy conservation as part of its operational framework, in compliance with relevant laws and regulations.
2. Continuous and appropriate improvement of resource usage efficiency will be pursued, considering the business, technology, and best practices in operations.
3. Annual energy conservation plans and targets will be established, aiming to reduce energy consumption and ensuring effective communication for understanding and adherence by all staff members.
4. Energy conservation is deemed the responsibility of university management, supervisors, and staff at all levels, who will collaborate in implementing measures, tracking progress, and reporting to the energy management team.
5. Necessary support, including human resources, budget allocation, work time, training, and opportunities for contribution to energy-related initiatives, will be provided.
6. The management and energy management team will review and improve energy goals and operations annually.

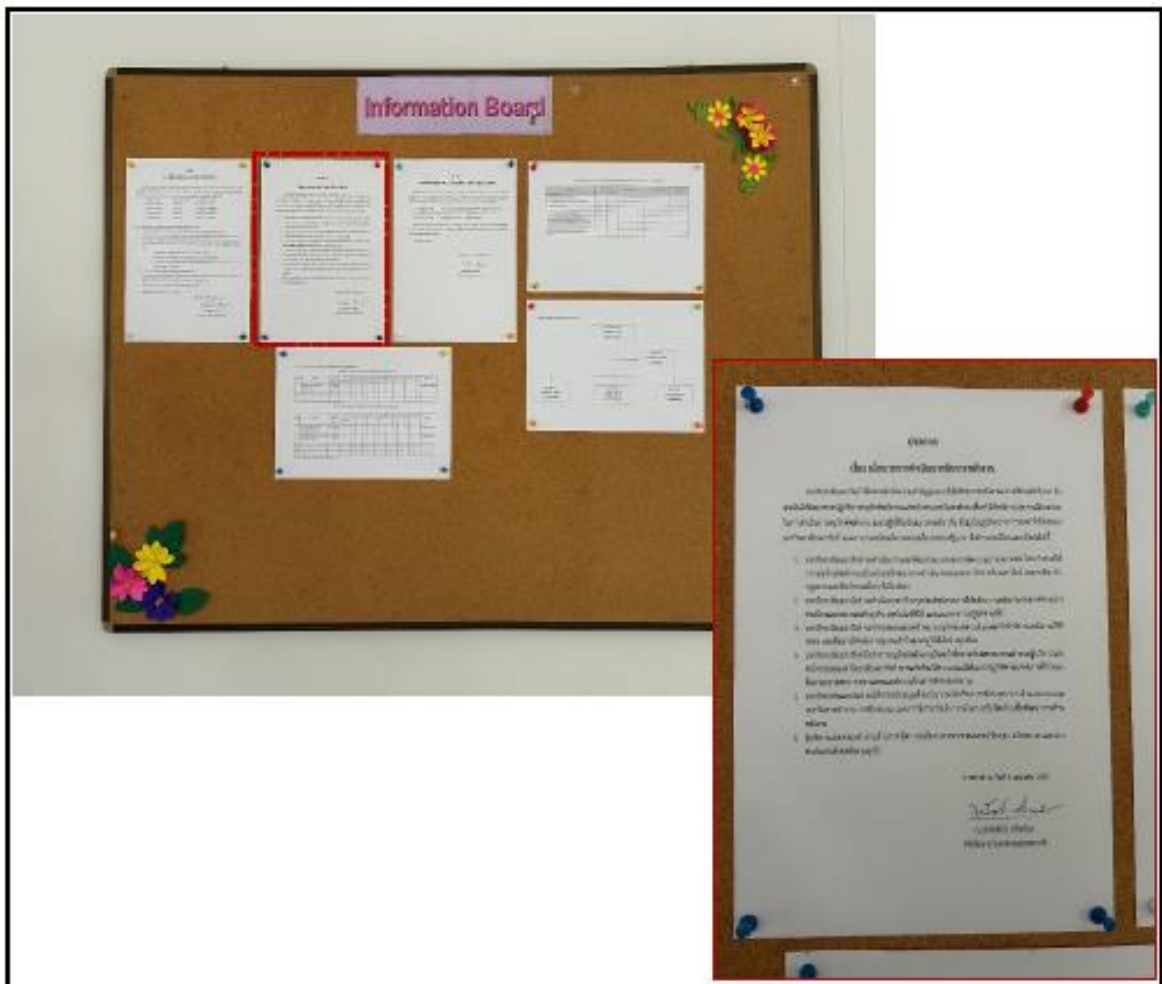
3.2 Publication of energy conservation policy

To ensure that all employees are aware of and comply with the energy conservation policy of controlled buildings. Therefore, it has been carried out.

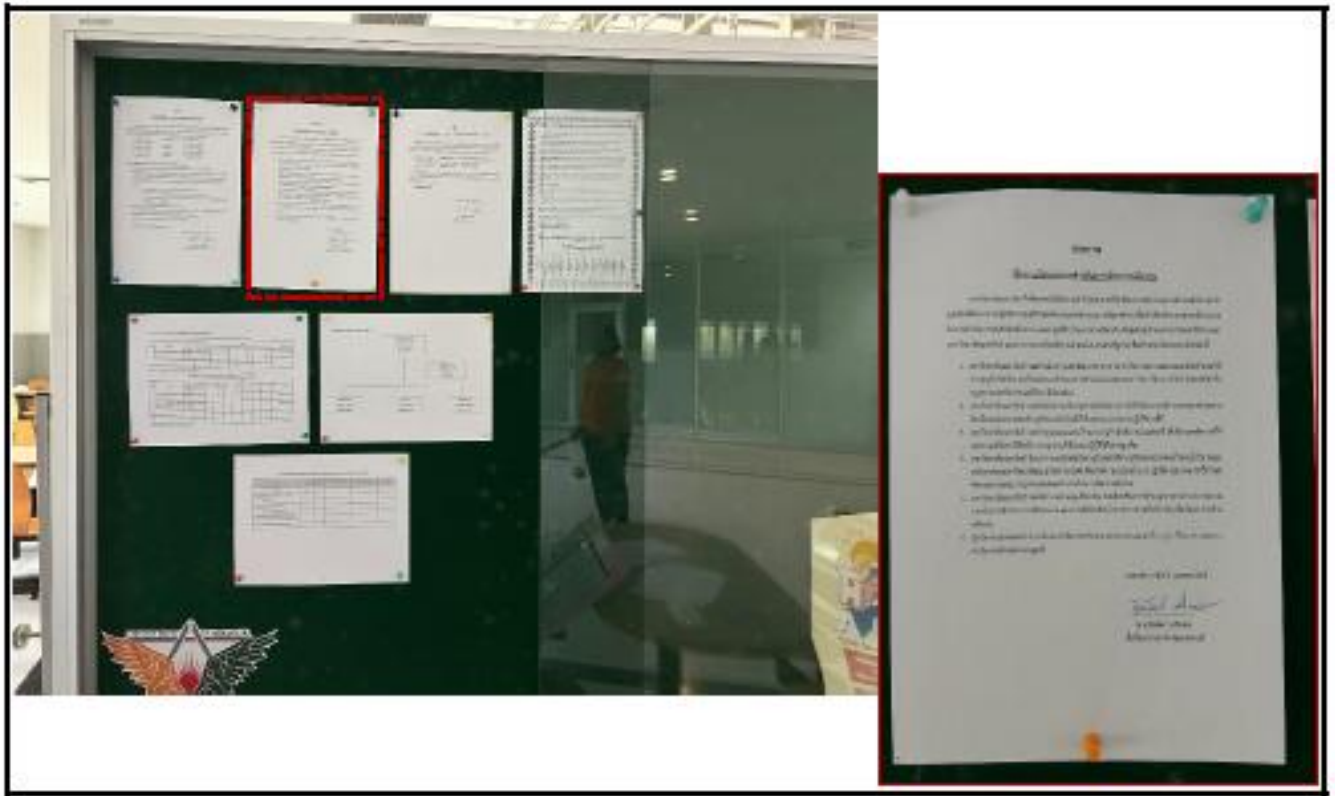
Publish and carry out the following

- | | |
|--|--|
| <input checked="" type="checkbox"/> Post an announcement | <input type="checkbox"/> Poster |
| Number of announcements ..2.. Location | Number of announcements Location |
| <input type="checkbox"/> Published documents | <input type="checkbox"/> Public Address system |
| Brochure/Journal Edition | In week.....times /Which time..... |
| <input type="checkbox"/> Electronic mail | <input type="checkbox"/> Staff meeting |
| Number of recipients..... people | In week.....times |
| Level of recipient..... | |
| <input type="checkbox"/> Other (specify) | |

Evidence or documentation that signifies the publication of findings resulting from the review, analysis, and rectification of deficiencies in energy management



(A) Located adjacent to the public relations board, in the area directly in front of the elevator on the 1st floor



attached to a public relations board Area of the classroom building, 3rd floor

Figure 3-2 Image of the dissemination of the energy conservation policy

Note: In the case of more than 2 methods of dissemination, the building can increase the number of document displays. Additional picture evidence is complete.

Step 4: Evaluating energy conservation potential

Assessing the organization's energy conservation potential can be divided into 3 levels:

- (a) Organizational assessment
- (b) Evaluation of service levels
- (c) Evaluation of machinery/equipment levels

with the following guidelines:

1) Organizational assessment

.1) Building usage information

4.1.1.1) Details of building use (for all types of buildings)

Table 4.1 Details of building usage in the year 2022

No.	Building name	Year of activation	working time		Total area of the building (square meters)				
					(1) usable area			(2) Parking space within the building	(3)=(1)+(2) ጠቅላይ
			hours/day	Day/Year	Air conditioning	Not air conditioned	Total		
1	Common school building	2002	9.00	260.00	16,681.00	0.00	16,681.00	800.00	17,481.00
2	Combined Operations Building	2002	9.00	260.00	2,698.00	0.00	2,698.00	450.00	3,148.00
3									
4									
5									
Total					19,379.00	-	19,379.00	1,250.00	20,629.00

Please note:

1. For hotels, usable areas encompass room service areas, public area front service sections, and back service sections.
2. Usable areas for hospitals include both air-conditioned and non-air-conditioned medical areas, along with all medical-related services. This excludes medical dormitories, nurse dormitories, and medical student classrooms.
3. The monthly count of available rooms for sale is determined by multiplying the total number of rooms in service by the number of days they are in service. For instance, if room number 1 is occupied for 20 days in a month, it counts as 20 rooms-days/month. Similarly, if room number 2 is occupied for 15 days, it counts as 15 rooms-days/month. The total rooms sold in a month is calculated by summing these individual room-days.
4. The monthly count of patients is calculated by multiplying the total number of inpatient beds in service by the number of days they are utilized. For example, if bed number 1 is occupied for 20 days in a month, it counts as 20 bed-days/month. Likewise, if bed number 2 is occupied for 15 days, it counts as 15 bed-days/month. The total number of inpatients using the service in a month is the sum of these individual bed-days.

4.1.1.2) Utilization of usable space actually used each month

Table 4.2 Details of the actual use of usable space each month in the year 2022

month	For all types of buildings Utilization of actual usable space			For all types of buildings hotel	For all types of buildings hospital	
	Air conditioned space (square meter)	The area is not air conditioned (square meter)	Total (square meter)	Number of rooms available for sale (room-day)	Number of outpatients (person)	Number of inpatients (bed-day)
Jan	19,379.00	-	19,379.00	-	-	-
Feb	19,379.00	-	19,379.00	-	-	-
Mar	19,379.00	-	19,379.00	-	-	-
Apr	19,379.00	-	19,379.00	-	-	-
May	19,379.00	-	19,379.00	-	-	-
Jun	19,379.00	-	19,379.00	-	-	-
Jul	19,379.00	-	19,379.00	-	-	-
Aug	19,379.00	-	19,379.00	-	-	-
Sep	19,379.00	-	19,379.00	-	-	-
Oct	19,379.00	-	19,379.00	-	-	-
Nov	19,379.00	-	19,379.00	-	-	-
Dec	19,379.00	-	19,379.00	-	-	-
Total				-	-	-

4.1.2) Electrical system information

4.1.2.1) Electrical transformer information for 2023

No.	Electricity user number	Electric meter number	Type of electricity user	Electricity usage rate	Electrical transformer		
1	GLLO98 07- 0200007 09859	23053368	4.2.2.4	<input type="checkbox"/> regular	size	800 kVA	quantity 1 piece
				<input type="checkbox"/> TOD	size	2,000 kVA	quantity 1 piece
				<input checked="" type="checkbox"/> TOU	size	1,000 kVA	quantity 1 piece
					size	250 kVA	quantity 2 piece
					size	50 kVA	quantity 2 piece
					size	1,250 kVA	quantity 1 piece
				<input type="checkbox"/> regular	size	kVA	quantity piece
				<input type="checkbox"/> TOD	size	kVA	quantity piece
				<input type="checkbox"/> TOU	size	kVA	quantity piece
				<input type="checkbox"/> regular	size	kVA	quantity piece
				<input type="checkbox"/> TOD	size	kVA	quantity piece
				<input type="checkbox"/> TOU	size	kVA	quantity piece
Total						5,650	kVA

4.1.2.2) Electricity consumption data for the year 2022

Table 4.3 Electricity usage data in 2022

Electricity usage rate 4.2.2.4 Electricity user number GLLO9807-020000709859 Electric meter number 23053368

Month	Maximum electrical power				Electrical energy		Kilovar	Total electricity bill (baht)	Load factor (percent)	Power Factor	Average electricity cost (Baht/kilowatt-hour)
	P (kilowatt)	PP/OP1 (kilowatt)	OP/OP2 (kilowatt)	Expenses (baht)	Amount (kilowatt-hour)	Expenses (บาท)					
Jan	352.00	344.00	288.00	46,791.36	108,880.00	363,638.60	128.00	441,113.52	41.58	0.94	4.05
Feb	327.20	342.40	217.60	43,494.70	110,000.00	387,085.23	137.60	442,595.26	47.81	0.93	4.02
Mar	328.00	344.00	184.00	43,601.04	128,240.00	435,284.12	136.00	514,648.54	50.11	0.93	4.01
Apr	336.00	328.00	192.00	44,664.48	109,200.00	357,392.49	144.00	432,159.19	45.14	0.92	3.96
May	328.00	328.00	160.00	43,601.04	110,720.00	371,716.22	136.00	474,068.68	45.37	0.92	4.28
Jun	320.00	360.00	280.00	42,537.60	129,840.00	434,772.65	152.00	545,468.73	50.09	0.92	4.20
Jul	328.00	336.00	336.00	43,601.04	117,280.00	378,303.96	136.00	482,856.23	46.92	0.93	4.12
Aug	336.00	368.00	160.00	44,664.48	121,920.00	417,438.16	152.00	527,097.47	44.53	0.92	4.32
Sep	336.00	352.00	168.00	44,664.48	114,160.00	394,325.88	136.00	584,179.65	45.04	0.93	5.12
Oct	296.00	336.00	272.00	39,347.28	105,360.00	352,450.92	136.00	524,886.67	42.15	0.93	4.98
Nov	360.00	368.00	264.00	47,854.80	120,080.00	416,187.00	144.00	616,902.91	45.32	0.93	5.14
Dec	304.00	304.00	160.00	40,410.72	92,240.00	312,980.90	104.00	470,675.55	40.78	0.95	5.10
Total				525,233.02	1,367,920.00	4,621,576.13	1,641.60	6,056,652.40			
average				43,769.42	113,993.33	385,131.34	136.80	504,721.03	45.40	0.93	4.44

Note: In the case of normal rates, enter the maximum electrical energy value (On Peak) in box P.
 TOD rate case: P means On Peak / PP means Partial Peak / OP means Off Peak
 TOU rate case: P means Peak / OP1 means Off Peak1 / OP2 means Off Peak2
 In the case that a building has more than one electricity meter, increase the number of tables showing electricity usage data according to the number of electricity meters
 Load factor (percentage) = $\frac{\text{Amount of electrical energy (kilowatt-hour)}}{\text{Maximum electrical power (kilowatts)} \times 24 \text{ (hours/day)}} \times 100$
 Power Factor (PF) = $\frac{\text{Maximum electrical power (kilowatts)}}{\sqrt{(kW^2) + (KVAR^2)}}$

4.1.5) Information on the proportion of electrical energy use in the year 2022

Table 4.6 Proportion of electrical energy consumption separated by system in 2022

system	Electrical energy consumption		mechanism	
	kilowatt-hour/year	percentage	estimate	Measure
Central air conditioning	820,752.00	60.00	✓	
Split air conditioning	136,792.00	10.00	✓	
light	205,188.00	15.00	✓	
other	205,188.00	15.00	✓	
Total	1,367,920.00	100.00		

4.2 Evaluation of service levels

4.2.1 Specific energy consumption values of usable areas

Table 4.8 Energy consumption per unit of usable area actually used in 2022

Month	Actual usable space (square meter)	amount of energy used		Specific Energy Consumption Value (SEC) (Megajoules/square meter)
		Electric (kilowatt-hour)	The heat (mega joules)	
Jan-65	19,379.00	108,880.00	-	20.23
Feb-65	19,379.00	110,000.00	-	20.43
Mar-65	19,379.00	128,240.00	-	23.82
Apr-65	19,379.00	109,200.00	-	20.29
May-65	19,379.00	110,720.00	-	20.57
Jun-65	19,379.00	129,840.00	-	24.12
Jul-65	19,379.00	117,280.00	-	21.79
Aug-65	19,379.00	121,920.00	-	22.65
Sep-65	19,379.00	114,160.00	-	21.21
Oct-65	19,379.00	105,360.00	-	19.57
Nov-65	19,379.00	120,080.00	-	22.31
Dec-65	19,379.00	92,240.00	-	17.14
Total	232,548.00	1,367,920.00	-	21.18
average	19,379.00	113,993.33	-	21.18

note:

Specific energy use value (SEC) = $\frac{\text{amount of electrical energy (kilowatt-hour)} \times 3.6 \text{ (megajoule/kilowatt-hour)} + \text{thermal energy amount (megajoule)}}{\text{Actual usable area (square meters)}}$

4.3 Evaluation of main machinery/equipment levels

Finding significant energy usage in major machines/equipment Controlled buildings are operated by measuring data on energy use, working hours and analyze the efficiency and energy loss of each machine/
Main equipment used in controlled buildings which has the following conclusions:

4.3.1 Evaluation of the potential of significant machinery/equipment to find measures to conserve energy

Finding significant energy usage in major machines/equipment Controlled buildings are operated by measuring data on energy use, working hours and analyze the efficiency and energy loss of each main machine/equipment used in the controlled building, which has the following conclusions:

Energy use assessment form in main machines/equipment

Department.....Maintenance..... Date23 January 2023.....

Main machinery/equipment	Power type	(1) Energy consumption					(2) Hours of use					(3) Potential for improvement				Total score (1) x (2) x (3)	Priority	
		Electrical power (kW)	Least (1 point)	Little (2 points)	Moderate (3 points)	A lot (4 points)	Most (5 points)	Least (1 point)	Little (2 points)	Moderate (3 points)	A lot (4 points)	Most (5 points)	Little (2 points)	Moderate (3 points)	A lot (4 points)			Most (5 points)
Water chiller Chiller No.2	Electric	92					5			3			1				15	1
Water chiller Chiller No.4	Electric	##					5	1							4		100	1
Cold water pump CHP(1)-02	Electric	11			3				3						4		36	3
Condenser water pump CDP-02	Electric					4			3			1					12	2
T8 fluorescent tube	Electric		1						3						4		12	4
Fluorescent bulb E27	Electric		1						3						4		12	4

Note:

1. Main machinery/equipment with a high total score It is considered important in determining energy conservation measures.
2. In the case of having many departments, add tables according to the number of departments that use energy.
3. This guideline is a recommendation only. You can use other methods to make this valuable assessment, such as measurement, actual use.

Significance assessment criteria

Scoring criteria

Issue		level				
		1	2	3	4	5
(1) Size of energy consumption	Electricity (kW)	0 - 2.0	2.1 - 5.0	5.1 - 20.0	20.1 - 50.0	>50
	Heat (MJ/hr)	0 - 100.0	100.1 - 500.0	500.1 - 1000.0	1000.1 - 2000.0	>2000
(2) Hours of use	(% of 8,760 h/y)	0% - 10.0%	10.1% - 20.0%	20.1% - 30.0%	30.1% - 40.0%	> 40.0%
(3) Potential for improvement	Service life (years)	0 - 3.0	3.1 - 6.0	6.1 - 10.0	10.1 - 15.0	> 15.0
	Unplanned Breakdown per year	0 - 2	3 - 4	5 - 6	7 - 8	>8
	The last time the measure was taken (year)	0 - 1	1 - 2	2 - 5	5 - 10	>10

Table 4.11 Form for recording data on significant electrical energy use of main machinery/equipment in 2022

energy consuming system	Name of main machine/equipment	coordinates		quantity	Service life (years)	Average hours of use/year	The amount of electrical energy used (kilowatt-hours/year)	Proportion of energy use in the system	Efficiency or performance value				loss of electrical energy (kilowatt-hours/year)	note
		size	unit						Tariff	unit	Actually use	unit		
Central air conditioning	Water chiller Chiller No.2	150.00	TR	1.00	2.00	3,458.00	334,257.48	24.44	0.61	kW/TR	0.64	kW/TR	17,592.50	
Central air conditioning	Cold water pump CHP(1)-02	5.50	kW	1.00	2.00	3,458.00	19,019.00	1.39	129.64	GPM/kW	116.67	GPM/kW	-1,901.90	
Central air conditioning	Cold water pump CHP(2)-03	18.50	kW	1.00	14.00	3,458.00	63,973.00	4.68	38.54	GPM/kW	34.69	GPM/kW	-6,397.30	
Central air conditioning	Condenser water pump CDP-02	37.00	kW	1.00	2.00	3,458.00	97,238.96	7.11	15.41	GPM/kW	13.86	GPM/kW	-9,723.90	

Step 5: Setting energy conservation goals and plans and training plans and activities to promote energy conservation.

Controlled buildings have energy conservation goals and plans. The details of the operation are as follows

5.1 Setting energy conservation goals and plans

Energy conservation goals

Targeting		Target value
<input checked="" type="checkbox"/>	Percentage reduction of the original amount of energy used	0.32
<input type="checkbox"/>	Level of energy consumption per service unit 1	
<input type="checkbox"/>	Level of energy consumption per service unit 2	
<input type="checkbox"/>	Level of energy consumption per service unit 3	

Note: In the case of choosing the energy conservation target, it is the energy consumption per service unit. And there are many services to be specified according to the services that the building operates.

Table 5.1 Measures and goals for energy conservation in the year 2023

No.	measure	Savings target							percentage saving effect	Investment (Baht)	Payback period (years)
		electricity			fuel						
		kilowatt	kilowatt-hour/year	baht/year	type	Quantity (unit/year)	fuel unit	baht/year			
<u>Electrical side</u>											
1	Changing normal bulbs to LED bulbs	3.02	4,397.12	19,533.49	-	-	-	-	0.32	16,200.00	0.83
2											
3											
4											
Total electrical aspects		3.02	4,397.12	19,533.49		-		-	0.32	16,200.00	0.83
<u>Thermal side</u>											
1											
2											
3											
4											
Total heat side		-	-	-		-		-		-	

note: 1. Percentage of savings Calculated from data on total energy use in the past year

2. Average electricity rate 4.44 Baht/kilowatt-hour (year 2022)

3. Fuel rates _____ Baht/(specify unit) (year 2022)

Table 5.2 Electrical energy conservation plan for the year 2023

No.	measure	objective	period		Investment (Baht)	responsible person
			start (month/year)	end (month/year)		
1	Changing normal bulbs to LED bulbs	Reduce energy consumption in lighting systems	Jan-66	Dec-66	16,200.00	Mr. Tripop Sairat

Note: Responsible person means the person responsible for the measure.

Details of energy conservation measures

(for electrical measures)

1) Measure No.: 1

2) Name of measure: Changing ordinary bulbs to LED bulbs

3) Person responsible for the measures: Mr. Tripop Sairat, position: Director

4) Improved equipment: T8 fluorescents, incandescent lamps

5) Number of improved equipment: 1 set

6) Renovation location: School building

7) Reason for improvement: The university has installed 24 watt E27 compact fluorescent lamps, 36 watt T8 fluorescent lamps, used together with a 10 watt steel ballast to provide light.

Inside the school building, energy consumption is quite high compared to current new technology bulbs (LED bulbs). Therefore, if improvements are made By changing from the original bulbs to LED bulbs, you can save energy.

	kilowatt	kilowatt-hour/year	baht/year
8) Energy consumption before renovation	5.08	7,396.48	32,857.65
9) Energy consumption after renovation	2.06	2,999.36	13,324.17
10) Economical results	3.02	4,397.12	19,533.49
11) Total investment		16,200.00	baht
12) Payback period		0.83	year

13) Details of the improvement operation: (Data from calculations are summarized in the table)

Replace 36 watt T8 fluorescent lamps used with a 10 watt steel ballast to LED bulbs, which will save energy. In addition, the replaced LED bulbs will provide brightness. It's similar to the original bulb, so it's worth the investment

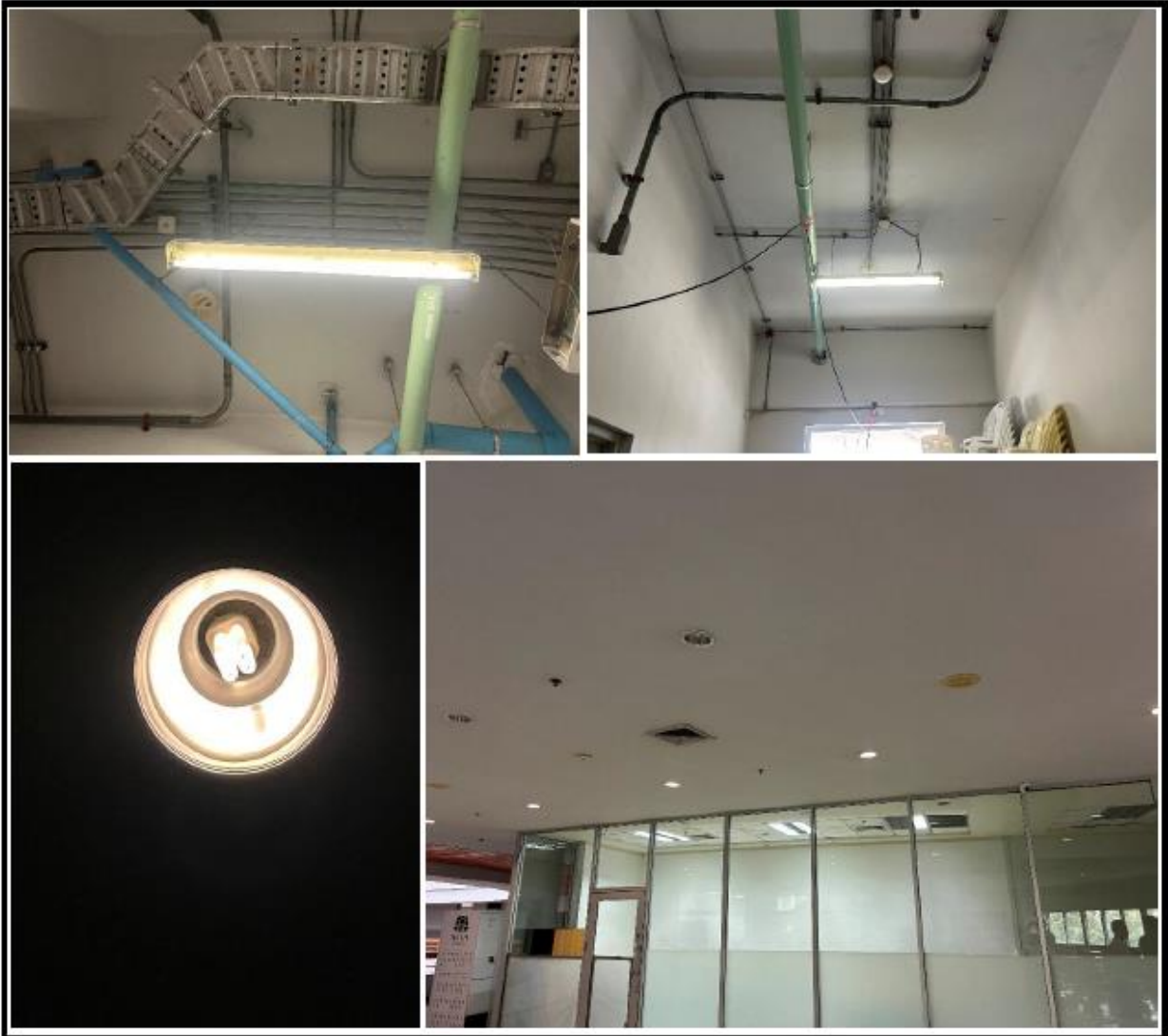
14) How to check the savings results after adjustment

Survey data on the number of light bulbs to be replaced. To calculate the electrical energy used before and after improvement from the lamp rating

Details of energy conservation measures

(For electrical measures) (continued)

15) Picture before renovation



Picture 5-1 Picture before renovation

16) Show the calculation method

list	symbol	unit	CFL _{E27}	FL T8 _{long tube}	SUM
1. Basic information					
Hours of use per day	h	h/d	8.00	8.00	12.00
Number of days per year	d	d/y	260.00	260.00	230.00
activation percentage	LF	%	70.00	70.00	70.00
Average electricity cost per unit	C _E	₺/kWh	4.44	4.44	4.44
Cost of replacing LED bulbs	C	₺	1,200.00	15,000.00	16,200.00
2. Measurement/evaluation data					
Electrical power of the tube before renov	W _L	kW/unit	0.024	0.036	0.060
Electrical power of ballast before renovati	W _B	kW/unit	0.000	0.010	0.010
Number of tubes before renovation	N	unit	20.00	100.00	120.00
Electrical power of LED bulbs after renova	W _{LED}	kW/unit	0.013	0.018	0.031
Number of LED bulbs after renovation	N _{LED}	unit	20.00	100.00	120.00
3. Technical analysis information					
Original power before renovation $P_1 = (W + WB) \times N$	P ₁	kW	0.480	4.600	5.08
Electrical power after renovation $P_2 = W_{LED} \times N_{LED}$	P ₂	kW	0.260	1.800	2.06
Original electric power before renovation $E_1 = P_1 \times h \times d \times LF$	E ₁	kWh/y	698.88	6,697.60	7,396.48
Electrical power after renovation $E_2 = P_2 \times h \times d \times LF$	E ₂	kWh/y	378.56	2,620.80	2,999.36
Electrical power decreases $P_S = P_1 - P_2$	P _S	kW	0.22	2.80	3.02
Electrical energy decreases per year $E_S = E_1 - E_2$	E _S	kWh/y	320.32	4,076.80	4,397.12
Electricity costs decrease per year $SE = E_S \times CE$	S _E	₺/y	1,422.97	18,110.52	19,533.49
4. Investment analysis					
Payback period $PB = C / SE$	PB	y	0.84	0.83	0.83

5.2 Training plan and activities to promote energy conservation

Table 5.4 Energy conservation training plan for 2023

No.	course	Training group	Number of trainees	Month												responsible person
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1	Energy management course for SMEs	Officers at all levels	25												✓	Mr. Tripop Sairat

Note: Responsible person means the person responsible for the training course

Table 5.5 Activity plan to promote energy conservation for the year 2023

No.	activity	Group of activity participants	Number of activity participants	Month												responsible person
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1	Sticker activity and energy conservation posters	Officers at all levels	30												✓	Mr. Tripop Sairat
2	Activities to turn off the air conditioner Turn off the lights during lunch time.	Officers at all levels	30												✓	Mr. Tripop Sairat

Note: Responsible person means the person responsible for the activity

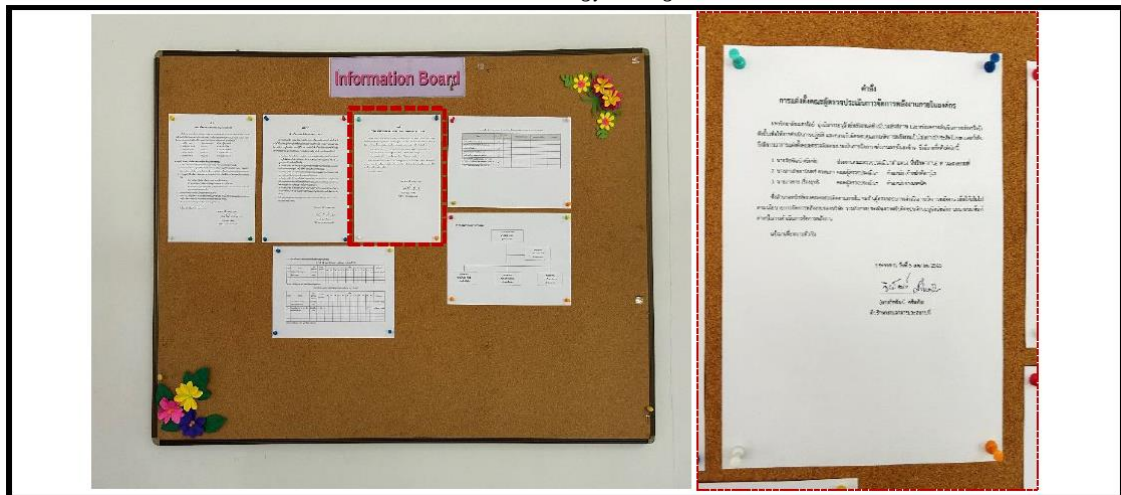
5.3 Dissemination of training plans and activities to promote energy conservation

Promote energy conservation of the organization The building has published and carried out the following operations.

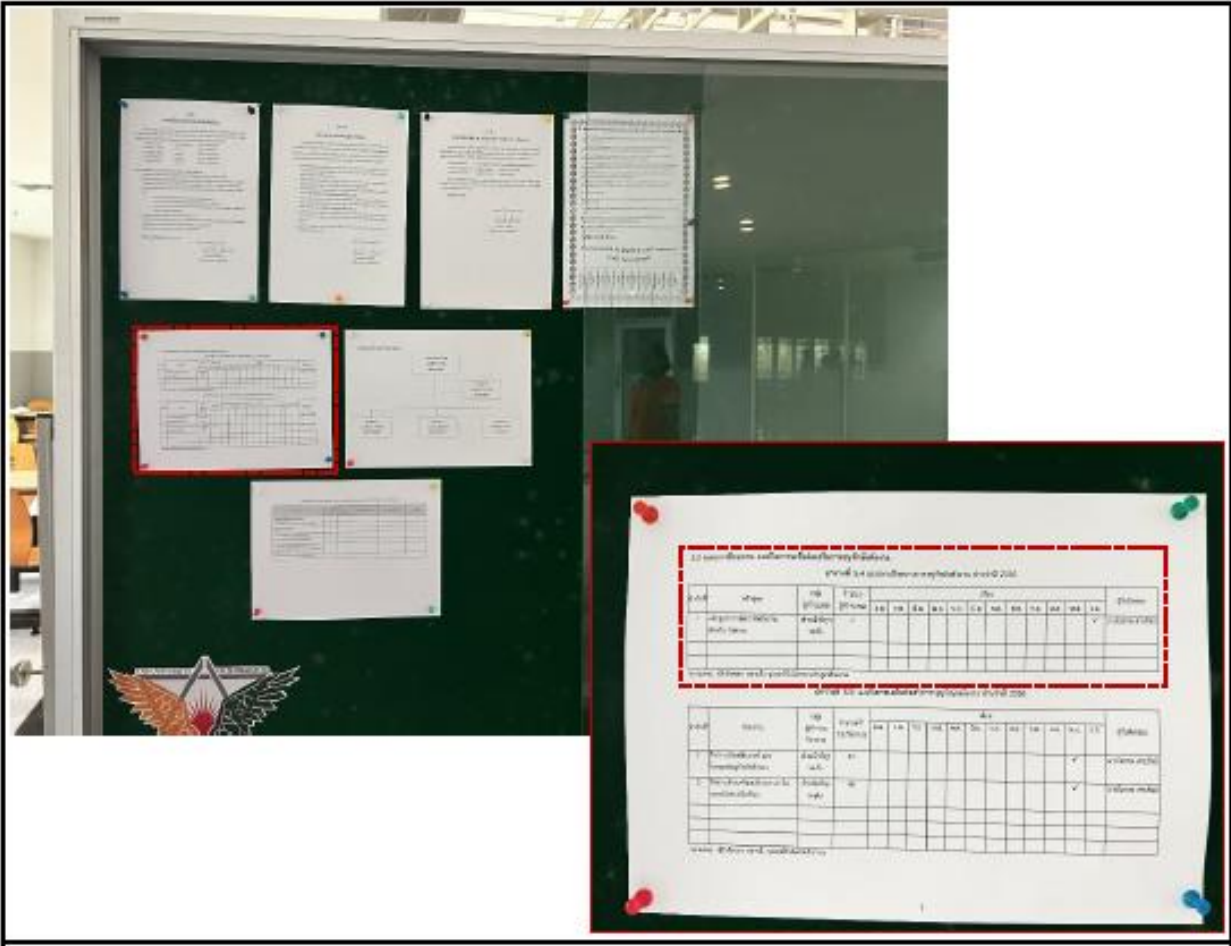
How to disseminate training plans and activities to promote energy

- Post an announcement Poster
Number of announcements ...?.. Location Number of announcements Location
- Published documents Public Address system
Brochure/Journal Edition In week.....times /Which time.....
- Electronic mail Staff meeting
Number of recipients..... people In week.....times
Level of recipient.....
- Other (specify)

Evidence or documentation that signifies the publication of findings resulting from the review, analysis, and rectification of deficiencies in energy management



(A) Located adjacent to the public relations board, in the area directly in front of the elevator on the 1st floor.

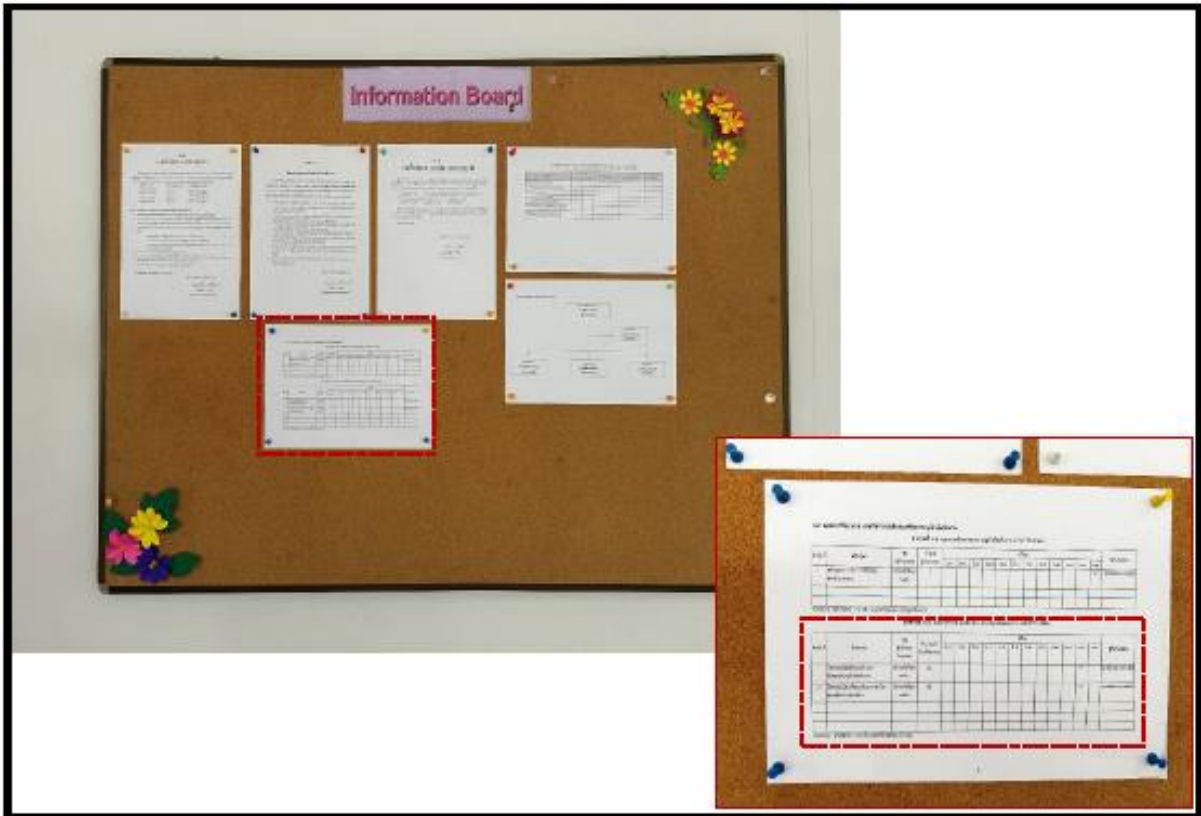


Attached to the public relations board Area of the classroom building, 3rd floor

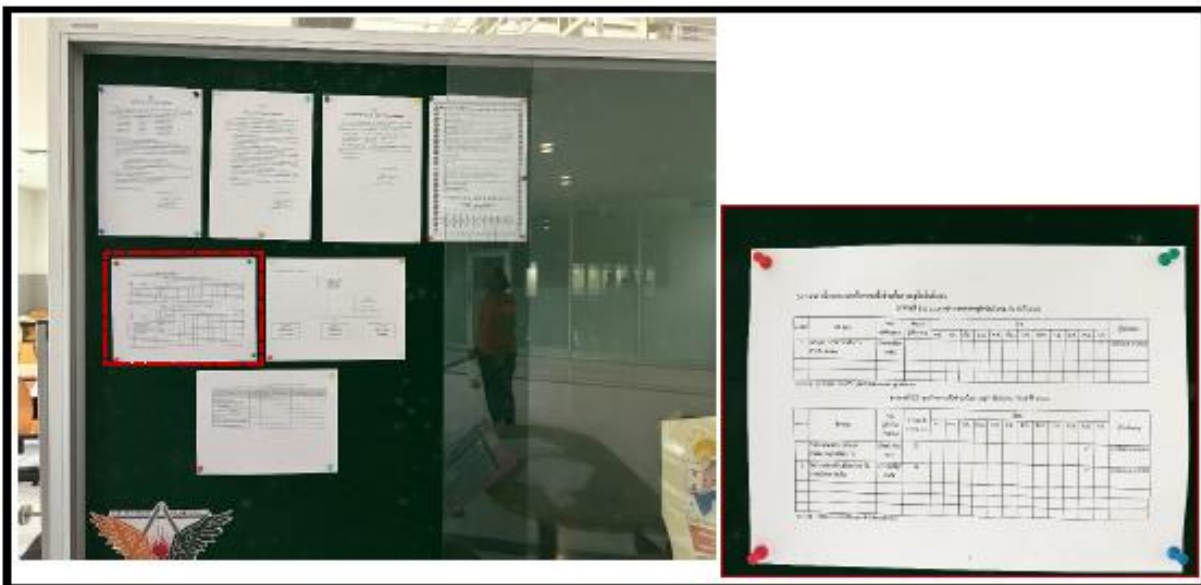
Figure 5-5 Image of training plan distribution

Note: In the case of more than 2 methods of dissemination, the building can increase the number of document displays. Additional picture evidence is complete

Evidence or documents that represents the dissemination of activity plans to promote energy conservation



Attached to the public relations board Area in front of the elevator on the 1st floor



Attached to the public relations board Area of the classroom building, 3rd floor

Figure 5-6 Pictures of the dissemination of activity plans to promote energy conservation

Note: In the case of more than 2 methods of dissemination, the building can increase the number of document displays. Additional picture evidence is complete

Step 6 Implementation of the energy conservation plan Inspection and analysis of Compliance with energy conservation goals and plans and training plans and activities to promote energy conservation

6.1 Summary of the results of monitoring the implementation of energy conservation measures.

The Energy Management Working Group has followed up on the progress of implementing the measures and plans.

Conservation of specified energy The results of operations are summarized as follows.

Table 6.1 Summary of the results of monitoring the implementation of the energy conservation plan

No.	measure	Processing status	note
1	Changing normal bulbs to LED bulbs	<input checked="" type="checkbox"/> Carry out the plan <input type="checkbox"/> Not implemented because _____ <input type="checkbox"/> Delayed due to _____	
		<input type="checkbox"/> Carry out the plan <input type="checkbox"/> Not implemented because _____ <input type="checkbox"/> Delayed due to _____	

Verifying compliance with energy conservation goals

Table 6.2 Summary of the results of the inspection of compliance with energy conservation goals

Action tracking	Energy conservation plan According to the goal	Energy conservation plan Actually happened
<input checked="" type="checkbox"/> Percentage reduction of the original amount of energy used	0.32	0.32
<input type="checkbox"/> The level of energy consumption per Service Unit 1	-	
<input type="checkbox"/> The level of energy consumption per Service Unit 2	-	
<input type="checkbox"/> The level of energy consumption per Service Unit 3	-	

Table 6.3 Results of inspection and analysis of compliance with energy conservation goals and plans for electricity measures

Measure name: Changing normal bulbs to LED bulbs

Measures in order: 1 From the total: 1 measure

Processing time		Processing status	Investment		Energy conservation results					
According to the action plan	Actually happened		According to plan (baht)	Real investment (baht)	According to the goal			Actually happened		
					Electricity			Electricity		
				kilowatt	kilowatt-hour/year	baht/year	kilowatt	kilowatt-hour/year	baht/year	
Jan.-Dec.2023	Jan.-Dec.2023	<input checked="" type="checkbox"/> Carry out the plan	16,200.00	16,200.00	3.02	4,397.12	19,533.49	3.02	4,397.12	19,533.49
		<input type="checkbox"/> Not processed								
		<input type="checkbox"/> delayed								

Note: Specify measures in order by filling out 1 sheet per 1 measure

Problems and obstacles that occur during the process: _____

Comments and suggestions: _____

Details of actual results of operations

(for electrical measures)

Name of measure:Changing ordinary bulbs to LED bulbs.....

Measure No.:1.....

Picture after improvement



Picture 6-1 after improvement

Illustrates comprehensive methodologies for calculations

list	symbol	unit	CFL _{E27}	FL T8 _{long tube}	SUM
1. Basic information					
Hours of use per day	h	h/d	8.00	8.00	12.00
Number of days per year	d	d/y	260.00	260.00	230.00
activation percentage	LF	%	70.00	70.00	70.00
Average electricity cost per unit	C _E	₺/kWh	4.44	4.44	4.44
Cost of replacing LED bulbs	C	₺	1,200.00	15,000.00	16,200.00
2. Measurement/evaluation data					
Electrical power of the tube <u>before renovation</u>	W _L	kW/unit	0.024	0.036	0.060
Electrical power of ballast <u>before renovation</u>	W _B	kW/unit	0.000	0.010	0.010
Number of tubes <u>before renovation</u>	N	unit	20.00	100.00	120.00
Electrical power of LED bulbs <u>after renovation</u>	W _{LED}	kW/unit	0.013	0.018	0.031
Number of LED bulbs <u>after renovation</u>	N _{LED}	unit	20.00	100.00	120.00
3. Technical analysis information					
Original power before renovation $P_1 = (W + W_B) \times N$	P ₁	kW	0.480	4.600	5.08
Electrical power after renovation $P_2 = W_{LED} \times N_{LED}$	P ₂	kW	0.260	1.800	2.06
Original electric power before renovation $E_1 = P_1 \times h \times d \times LF$	E ₁	kWh/y	698.88	6,697.60	7,396.48
Electrical power after renovation $E_2 = P_2 \times h \times d \times LF$	E ₂	kWh/y	378.56	2,620.80	2,999.36
Electrical power decreases $P_S = P_1 - P_2$	P _S	kW	0.22	2.80	3.02
Electrical energy decreases per year $E_S = E_1 - E_2$	E _S	kWh/y	320.32	4,076.80	4,397.12
Electricity costs decrease per year $S_E = E_S \times C_E$	S _E	₺/y	1,422.97	18,110.52	19,533.49
4. Investment analysis					
Payback period $PB = C / S_E$	PB	y	0.84	0.83	0.83

6.2 Results of monitoring the implementation of training plans and activities to promote energy conservation

Table 6.5 summarizes the operational status according to the training curriculum

No.	Training course name	Processing status	Number of trainees	Note
1	หลักสูตรการจัดการพลังงานสำหรับ SMEs	<input checked="" type="checkbox"/> Carry out the plan <input type="checkbox"/> Not implemented because _____ <input type="checkbox"/> Delayed due to _____ 	25	

Picture/evidence of training



Figure 6-5 Training images

Table 6.6 outlines the operational status categorized by activities aimed at fostering energy conservation

No.	Name of activity to promote energy conservation	Processing status	Number of participants	Note
1	Sticker activity and energy conservation posters	<input checked="" type="checkbox"/> Carry out the plan <input type="checkbox"/> Not implemented because <input type="checkbox"/> Delayed due to	30	
2	Activities to turn off the air conditioner Turn off the lights during lunch time.	<input checked="" type="checkbox"/> Carry out the plan <input type="checkbox"/> Not implemented because <input type="checkbox"/> Delayed due to	30	

Pictures/evidence showing activities to promote energy conservation



Figure 6-6 Picture showing activities to promote energy conservation

6.3 Energy information for the year 2023

6.3.1) Building usage information for the year 2023

6.3.1.1) Details of building use (for all types of buildings)

Table 6.7 Details of building usage in the year 2023

No.	Building name	Year of activation	Office hours		Total area of the building (square meters)				
					(1) usable area			(2) Parking space in the building	(3)=(1)+(2) Total
			hours/day	Day/Year	Air conditioning	Not air conditioned	Total		
1	Common school building	2002	9.00	260.00	16,681.00	-	16,681.00	800.00	17,481.00
2	Combined Operations Building	2002	9.00	260.00	2,698.00	-	2,698.00	450.00	3,148.00
3									
4									
5									
Total					19,379.00	-	19,379.00	1,250.00	20,629.00

Note:

- (1) Usable areas for hotels encompass room service areas, public area front service sections, and back service sections.
- (2) Usable areas for hospitals comprise air-conditioned and non-air-conditioned spaces within medical areas, along with all medical-related services. Exclusions are medical dormitories, nurse dormitories, and medical student classrooms.
- (3) The monthly available room count for sale is calculated by multiplying the total number of rooms in service by the number of days in service. For instance, if room number 1 is utilized for 20 days in a month, it equals 20 room-days/month. Similarly, if room number 2 is used for 15 days in a month, it equals 15 room-days/month. The total rooms sold in a month would be the sum of such room-days.
- (4) The monthly patient count is determined by multiplying the total number of inpatient beds in service by the number of days in service. For instance, if bed number 1 is occupied by inpatients for 20 days in a month, it equals 20 bed-days/month. Similarly, if bed number 2 is occupied for 15 days in a month, it equals 15 bed-days/month. The total inpatients served in a month is the sum of such bed-days.

6.3.1.2) Utilization of usable space actually used each month.

Table 6.8 Details of the actual use of usable space each month in the year 2023

Month	For all types of buildings, effective utilization of usable space.			For building types Hotel	For building types Hospital	
	Air-conditioned area (square meters)	Non-air conditioned area (square meters)	Total (square meters)	Number of rooms available for sale (room- day)	Number of outpatients (people)	Number of inpatients (beds-day)
Jan	19,379.00	-	19,379.00	-	-	-
Feb	19,379.00	-	19,379.00	-	-	-
Mar	19,379.00	-	19,379.00	-	-	-
Apr	19,379.00	-	19,379.00	-	-	-
May	19,379.00	-	19,379.00	-	-	-
Jun	19,379.00	-	19,379.00	-	-	-
Jul	19,379.00	-	19,379.00	-	-	-
Aug	19,379.00	-	19,379.00	-	-	-
Sep	19,379.00	-	19,379.00	-	-	-
Oct	19,379.00	-	19,379.00	-	-	-
Nov	19,379.00	-	19,379.00	-	-	-
Dec	19,379.00	-	19,379.00	-	-	-
Total				-	-	-

6.3.2) Electricity consumption data for the year 2023

Table 6.9 Electricity usage data in 2023

Electricity usage rate 4.2.2.4 Electricity user number GLLO9807-020000709859 Electric meter number 23053368

Month	Maximum electrical power				Electrical energy		Kilovar	Total electricity bill (baht)	Load factor (percent)	Power Factor	Average electricity cost (Baht/kilowatt-hour)
	P (kilowatt)	PP/OP1 (kilowatt)	OP/OP2 (kilowatt)	Expenses (baht)	Amount (kilowatt-hour)	Expenses (บาท)					
Jan	336.00	360.00	176.00	44,664.48	99,520.00	342,175.53	144.00	579,221.63	37.16	0.93	5.82
Feb	360.00	360.00	192.00	47,854.80	109,680.00	377,604.67	104.00	637,386.13	45.34	0.96	5.81
Mar	368.00	360.00	224.00	48,918.24	137,040.00	470,362.62	144.00	783,096.05	50.05	0.93	5.71
Apr	392.00	368.00	216.00	52,108.56	129,440.00	426,399.04	128.00	726,902.67	45.86	0.95	5.62
May	384.00	352.00	352.00	51,045.12	135,840.00	457,726.98	128.00	677,263.82	47.55	0.95	4.99
Jun	384.00	368.00	208.00	51,045.12	132,560.00	455,760.47	152.00	671,959.24	47.95	0.93	5.07
Jul	384.00	376.00	224.00	51,045.12	134,240.00	453,434.64	152.00	671,109.84	46.99	0.93	5.00
Aug	400.00	392.00	344.00	53,172.00	156,880.00	527,678.75	152.00	774,917.39	52.72	0.93	4.94
Sep	424.00	400.00	288.00	56,362.32	163,440.00	554,998.71	168.00	690,305.98	53.54	0.93	4.22
Oct	416.00	416.00	384.00	55,298.88	170,240.00	567,647.23	160.00	704,192.15	55.00	0.93	4.14
Nov	472.00	416.00	352.00	62,742.96	199,600.00	675,063.79	152.00	833,526.86	58.73	0.95	4.18
Dec	472.00	440.00	368.00	62,742.96	182,080.00	603,026.02	200.00	752,607.18	51.85	0.92	4.13
Total				637,000.56	1,750,560.00	5,911,878.45	1,784.00	8,502,488.94			
average				53,083.38	145,880.00	492,656.54	148.67	708,540.75	49.39	0.94	4.97

Note: In the case of normal rates, enter the maximum electrical energy value (On Peak) in box P.

TOD rate case: P means On Peak / PP means Partial Peak / OP means Off Peak

TOU rate case: P means Peak / OP1 means Off Peak1 / OP2 means Off Peak2

In the case that a building has more than one electricity meter, increase the number of tables showing electricity usage data according to the number of electricity meters

Load factor (percentage) = $\frac{\text{Amount of electrical energy (kilowatt-hour)}}{\text{Maximum electrical power (kilowatts)} \times 24 \text{ (hours/day)}} \times 100$

Power Factor (PF) = $\frac{\text{Maximum electrical power (kilowatts)}}{\sqrt{(\text{kW}^2) + (\text{KVAR}^2)}}$

Chart illustrating a comparison of energy usage data

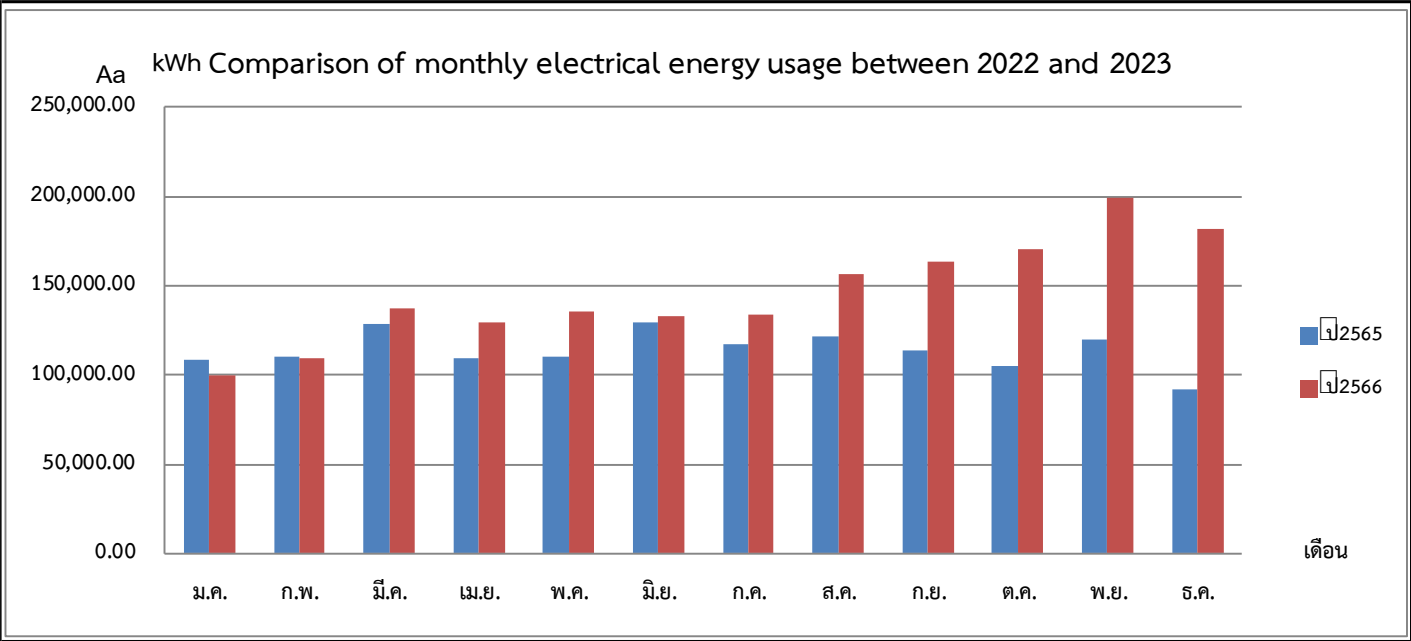
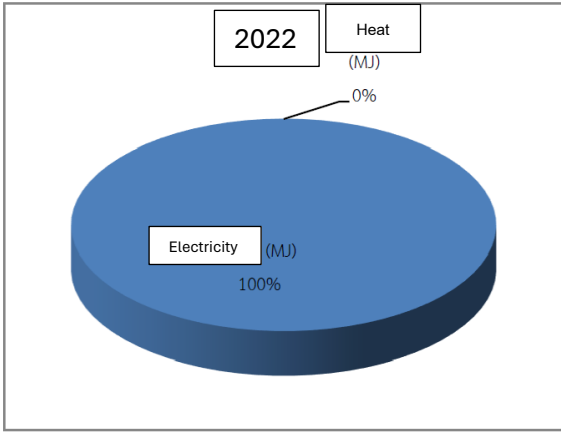


Figure 6-5: Chart depicting a comparison of monthly electrical energy usage in 2022 and 2023

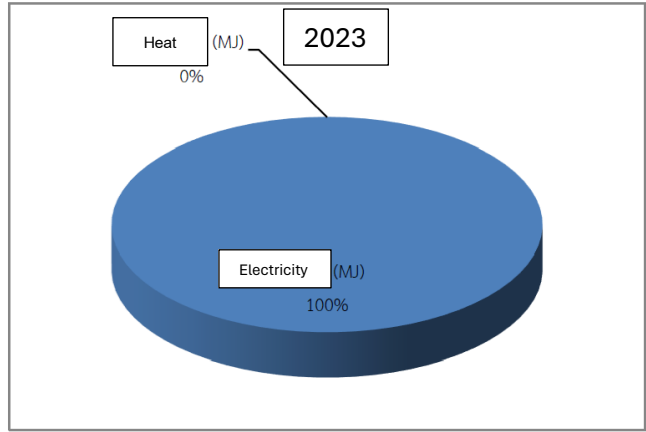
6.3.5) Information on the proportion of electrical energy use in 2023

Table 6.12 Proportion of electrical energy consumption by system in 2023

System	Electrical energy consumption		Implement	
	kilowatt-hour/year	Percentage	Estimate	Measure
Centralized air conditioning	1,050,336.00	60.00	✓	
Split air conditioning	175,056.00	10.00	✓	
Light	262,584.00	15.00	✓	
Other	262,584.00	15.00	✓	
Total	1,750,560.00	100.00		

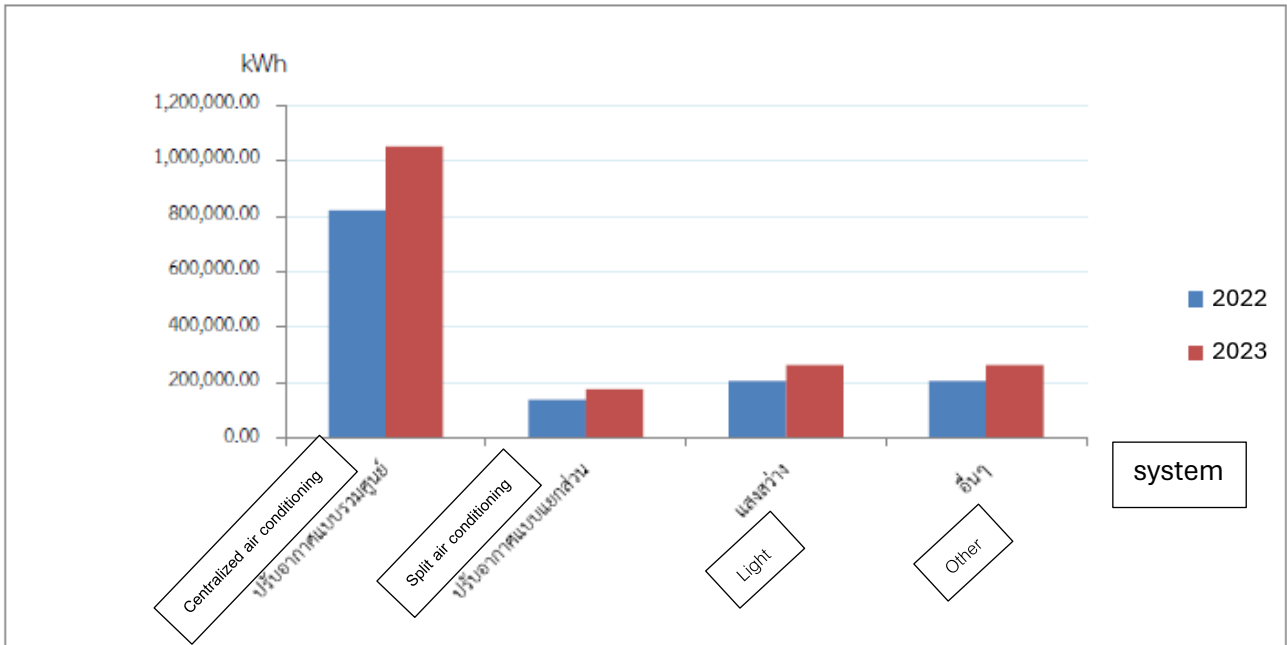


Energy usage distribution in 2022



Energy usage distribution in 2023

Graph 6-8 illustrating comparative data on the distribution of energy usage between 2022 and 2023



6.3.7) Compare specific energy consumption values (SEC)

6.3.7.1 Specific energy consumption values of usable areas (all cases)

Table 6.14 Energy consumption per unit of usable area actually used in 2022 and 2023.

Month	Actual usable space (square meter)	Amount of energy used		Specific Energy Consumption Value (SEC)	Month	Actual usable space (square meter)	Amount of energy used		Specific Energy Consumption Value (SEC)
		Electricity (kilowatt-hour)	Heat (mega joules)	(Megajoules/square meter)			Electricity (kilowatt-hour)	Heat (mega joules)	(Megajoules/square meter)
Jan-22	19,379.00	108,880.00	-	20.23	Jan-23	19,379.00	99,520.00	-	18.49
Feb-22	19,379.00	110,000.00	-	20.43	Feb-23	19,379.00	109,680.00	-	20.38
Mar-22	19,379.00	128,240.00	-	23.82	Mar-23	19,379.00	137,040.00	-	25.46
Apr-22	19,379.00	109,200.00	-	20.29	Apr-23	19,379.00	129,440.00	-	24.05
May-22	19,379.00	110,720.00	-	20.57	May-23	19,379.00	135,840.00	-	25.23
Jun-22	19,379.00	129,840.00	-	24.12	Jun-23	19,379.00	132,560.00	-	24.63
Jul-22	19,379.00	117,280.00	-	21.79	Jul-23	19,379.00	134,240.00	-	24.94
Aug-22	19,379.00	121,920.00	-	22.65	Aug-23	19,379.00	156,880.00	-	29.14
Sep-22	19,379.00	114,160.00	-	21.21	Sep-23	19,379.00	163,440.00	-	30.36
Oct-22	19,379.00	105,360.00	-	19.57	Oct-23	19,379.00	170,240.00	-	31.63
Nov-22	19,379.00	120,080.00	-	22.31	Nov-23	19,379.00	199,600.00	-	37.08
Dec-22	19,379.00	92,240.00	-	17.14	Dec-23	19,379.00	182,080.00	-	33.82
Total	232,548.00	1,367,920.00	-	21.18	Total	232,548.00	1,750,560.00	-	27.10
average	19,379.00	113,993.33	-	21.18	average	19,379.00	145,880.00	-	27.10

Note: Specific energy use value (SEC) = $\frac{\text{amount of electrical energy (kilowatt-hour)} \times 3.6 \text{ (megajoule/kilowatt-hour)} + \text{thermal energy amount (megajoule)}}{\text{Actual usable area (square meters)}}$

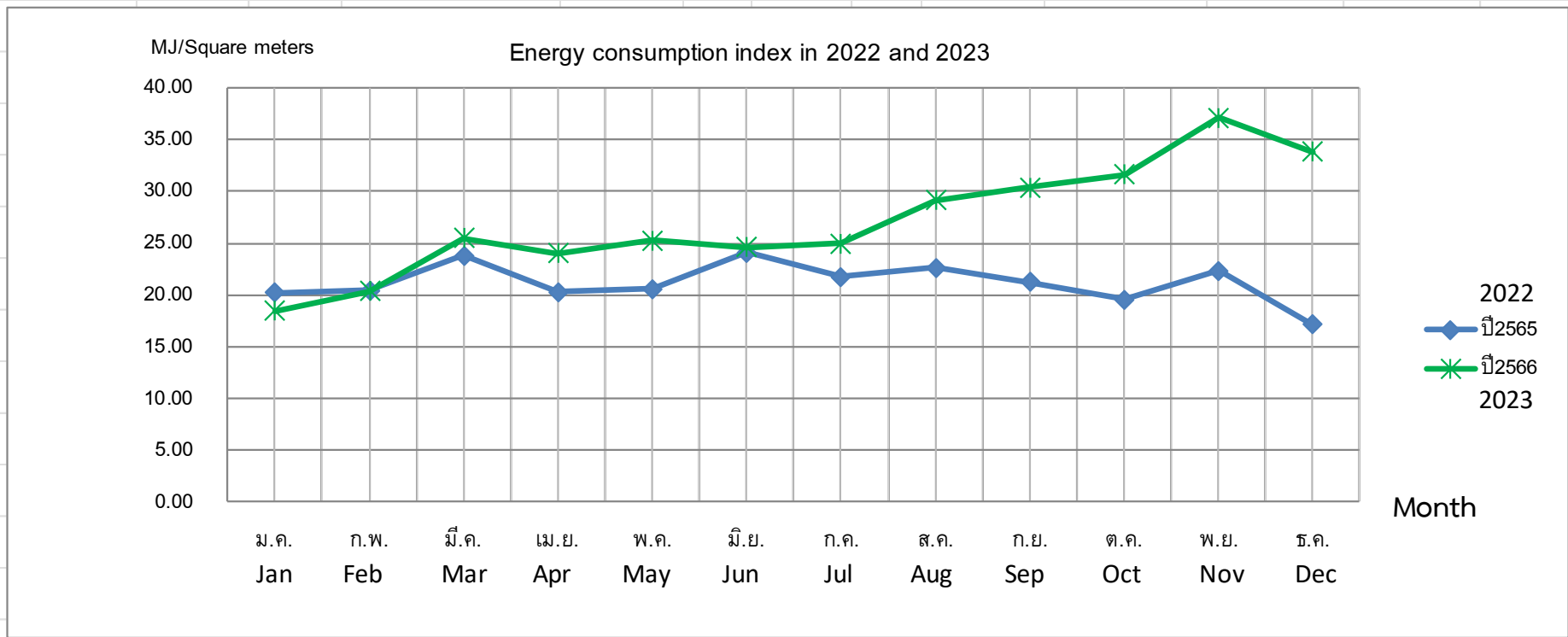


Chart 6-11: Specific energy consumption metrics for functional spaces in 2022 and 2023

Step 7: Monitoring and evaluating energy management

7.1 The committee assessing internal energy management (2023)

Appointment of a team to assess energy management within the organization

Order

Appointment of a team to assess energy management within the organization

Metharat University Committed to efficient energy conservation and seriously hope for the results of the operation Therefore, in order to carry out the practice and responsibility for ensuring efficient work management and sustainable, therefore, consider the appointment of Tanatrachattit in accordance with the evaluation of energy management within the organization which has the following list;

1. Mr. Jirapat Srihathai, chairman of the evaluation committee, position Building and location consultant
2. Ms. Phitchayanin Tuangnapa, Auditor Team, position senior officer
3. Mr. Phasakorn Rueanritchi, evaluation team, position: technician

The internal audit committee is tasked with inspecting energy management operations to align with the company's energy management policy. Additionally, they will evaluate conservation responsibilities across various operational areas.

Please disseminate this information for awareness.

Announced on April 5, 2022

Mr. Jirapat Srihathai
Building and Location Consultant

Figure 7-1: Directive for the Formation of a Team to Evaluate Organizational Energy Management (2023)

Note: Please attach a copy of the appointment order for the committee tasked with evaluating internal energy management within the organization.

7.1 The committee assessing internal energy management (2024)

Notice

The appointment of a committee to evaluate internal energy management within the organization

Metharat University is dedicated to effective energy conservation and is earnestly anticipating the outcomes of its efforts. With a commitment to ensuring responsible and sustainable energy management, the university is contemplating the establishment of a committee to oversee and assess energy management within the organization.

1. Mr. Thitikorn Thitikawin, Chairperson of the Evaluation Committee, serving in the position of Building Staff.
2. Ms. Phitchayanin Duangnapa, Member of the Audit Team, serving as a Senior Officer.
3. Mr. Phasakorn Rueanritthi, Member of the Evaluation Team, serving as a Technician.

The Internal Audit Team is hereby entrusted with the authority and responsibility to inspect energy management operations, ensuring compliance with the organization's energy management policies. Additionally, they will evaluate energy conservation efforts across various operational areas.

Please disseminate this information for everyone's awareness.

Announced on February 5, 2024

(Mr. Jirapat Srihathai)

Building and Location Consultant

Figure 7-1: Directive for the Formation of a Team to Evaluate Organizational Energy Management (2024)

Note: Please attach a copy of the appointment order for the committee tasked with evaluating internal energy management within the organization.

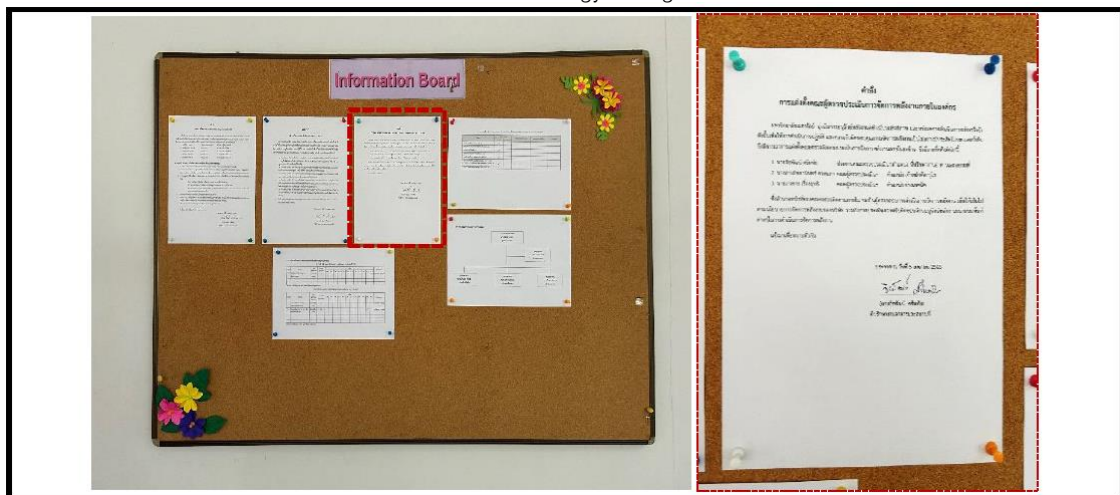
7.2 Dissemination of the Internal Energy Management Assessment Team

To ensure that all employees are informed, the appointment decree for the Internal Energy Management Assessment Team has been disseminated and executed as follows by the administration:

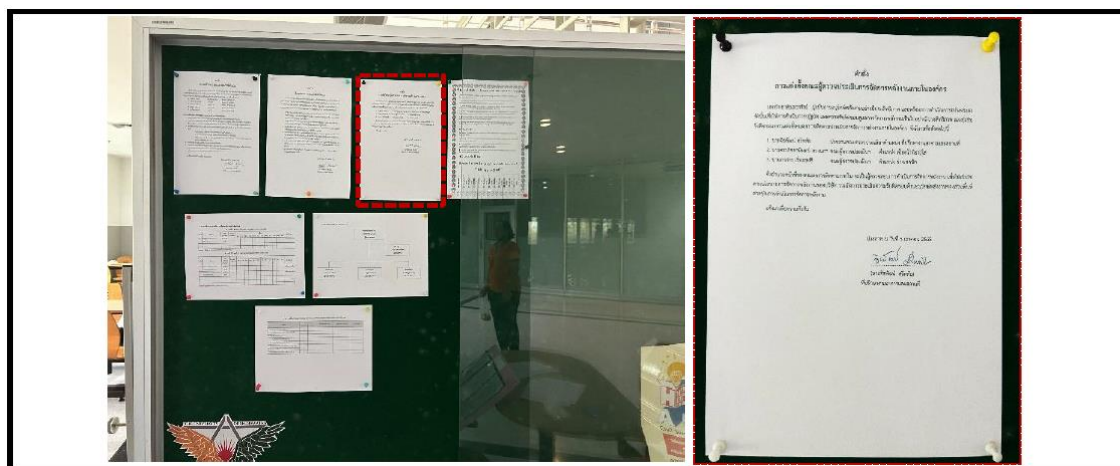
The method to disseminate the Internal Energy Management Assessment Team within the organization.

- Post an announcement Poster
 Number of announcements ..2.. Location Number of announcements Location
- Published documents Public Address system
 Brochure/Journal Edition In week.....times /Which time.....
- Electronic mail Staff meeting
 Number of recipients..... people In week.....times
- Level of recipient.....
- Other (specify)

Evidence or documentation that signifies the publication of findings resulting from the review, analysis, and rectification of deficiencies in energy management



(A) Located adjacent to the public relations board, in the area directly in front of the elevator on the 1st floor.



(A) Attached to a public relations board Area of the classroom building, 3rd floor

Figure 7-2: Dissemination of the appointment decree for the Internal Energy Management Assessment Team within the organization.

Note: If there are over 2 dissemination methods, more document displays and additional images may be provided for completeness.

7.3 Internal organizational assessment results

Table 7.1 Monitoring Energy Management Operations

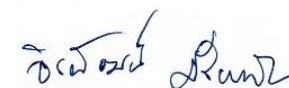
Assessment list	What documents or evidence are necessary	Inspection results		Precision and entirety in accordance with		Areas for improvement/ recommendations
		Yes	No	Complete	Not complete	
1. Energy Management Committee	1. The appointment decree for the Energy Management Committee, specifying the structure, authorities, duties, and responsibilities of the committee.	✓		✓		committee (Ms. Siriporn Nualyong) has resigned from the university. Therefore, there should be a new appointment announced so that the new Chairperson of the committee can sign the complete Energy Report for the year 2566.
	2. The document illustrating the dissemination of the appointment decree for the Energy Management Committee to personnel through various methods.	✓		✓		
	3. Other (specify)					
2. Preliminary assessment of energy management status	1. Results of energy operations evaluation utilizing the Energy Management Matrix.	✓		✓		
	2. Other (specify)					
3. Energy conservation policy	1. Energy conservation policy	✓		✓		
	2. Documents showing the dissemination of the energy conservation policy to personnel through various methods.	✓		✓		
	3. Other (specify)					

Table 7.1 Monitoring Energy Management Operations (Continued)

Assessment list	What documents or evidence are necessary	Inspection results		Precision and entirety in accordance with specifications.		Areas for improvement/recommendations
		Yes	No	Complete	Not complete	
4. Assessment of potential for energy conservation	1. Assessment of organizational energy usage	✓		✓		
	2. Evaluation of energy usage at the service level	✓		✓		
	3. Evaluation of energy usage at the machinery/equipment level	✓		✓		
	4. Other (specify)					
5. Establishing goals and plans for conservation efforts	1. Energy conservation measures and objectives	✓		✓		
	2. Electricity conservation plan	✓		✓		
	3. Heat energy conservation plan	-	-	-	-	
	4. Training plan	✓		✓		
	5. Energy conservation promotion activities plan	✓		✓		
	6. Other (specify)					
6. Implementation of energy conservation plans	1. Results of Energy Conservation Measures Implementation	✓		✓		
	2. Results of Compliance Inspection with Energy Conservation Objectives	✓				
	3. Results of assessment and analysis on adherence to electricity conservation goals and plans.	✓		✓		
	4. Results of inspection and analysis of compliance with energy conservation goals and plans for heat conservation measures.	-	-	-	-	
	5. Results of monitoring the implementation of training plan.	✓		✓		
	6. Results of monitoring the implementation of energy conservation promotion activities plan.	✓		✓		
	7. Other (specify)					

Table 7.1 Monitoring Energy Management Operations (Continued)

Assessment list	What documents or evidence are necessary	Inspection results		Precision and entirety in accordance with specifications.		Areas for improvement/recommendations
		Yes	No	Complete	Not complete	
7. Oversight and assessment of energy management	1. Directive to designate a team for evaluating internal energy management.	✓		✓		
	2. Report on assessment results	✓		✓		
	3. Other (specify)					
8. Evaluation, analysis, and rectification	1. Plan for reviewing energy management op	✓		✓		
	2. Summary report outlining review findings, analysis, and proposed solutions.	✓		✓		
	3. Other (specify)					



(Mr. Jirapat Srihathai)

Chairman of the committee that assesses energy management within the organization

Date ...21.../...December.../...2023...

Step 8: Examine, assess, and rectify any shortcomings in energy management.

Designated factories have conducted review meetings1.... times and have utilized the insights provided by the energy management assessment team within the organization. They actively engage in enhancing and rectifying operational deficiencies. (The results of the evaluation are signed) The latest review meeting took place within the organization on21 Dec. '23.., a day preceding the review meeting, with the following specifics:

8.1 Evaluation of energy management procedures

Table 8.1: Assessment of Energy Management Operations for 2023

Time	2023											
	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1												

Note : If a building is under review after December, please provide specific additional information.

Time 1 Month January A.D. 2024
 Time Month A.D. 2024
 Time Month A.D. 2024

Meeting Agenda

Subject: Review and Resolution of Energy Management Shortcomings for 2023

Date: January 16, 2023

Attendees:

1. Energy Management Working Group
2. Internal Audit Team
3. Energy Management Responsible Person

Agenda:

1. Opening Remarks by the Chairman
2. Approval of Previous Meeting Minutes
3. Presentation and Discussion of Energy Management Monitoring Results
 - a. Overview by the Energy Management Working Group
 - b. Preliminary Assessment of Energy Management Status
 - c. Energy Conservation Policy Evaluation
 - d. Assessment of Energy Conservation Potential
 - e. Establishment of Energy Conservation Goals, Plans, and Training Activities
 - f. Implementation of Energy Conservation Plan and Audit Analysis
 - g. Monitoring and Evaluation of Energy Management
4. Review of Public Relations and Training Plans
5. Any Other Business

Figure 8-1 Meeting agenda document for energy management review

Table 8.2 presents a summary of the outcomes derived from the assessment, analysis, and rectification of deficiencies in energy management for the calendar year 2023.

Procedure	Review results		Detected defects	Guidelines for improvement	Note
	Reasonable	Should improve			
1. Energy Management Task Force	✓		The chairman of the working group (Khun Siriporn Nuanyong) has resigned from the university.	During the year 2024, there should be a new appointment announcement for the chairman of the working group. Sign the complete 2023 Energy Report booklet.	
2. Initial Evaluation of Energy Management Status	✓				
3. Energy Conservation Policy	✓				
4. Assessment of the potential for energy conservation	✓				
5. Establishing objectives and strategies for energy conservation	✓				
6. Executing the energy conservation plan and conducting assessments to ensure adherence to set goals and plans.	✓				
7. Observing and assessing energy management practices.	✓				

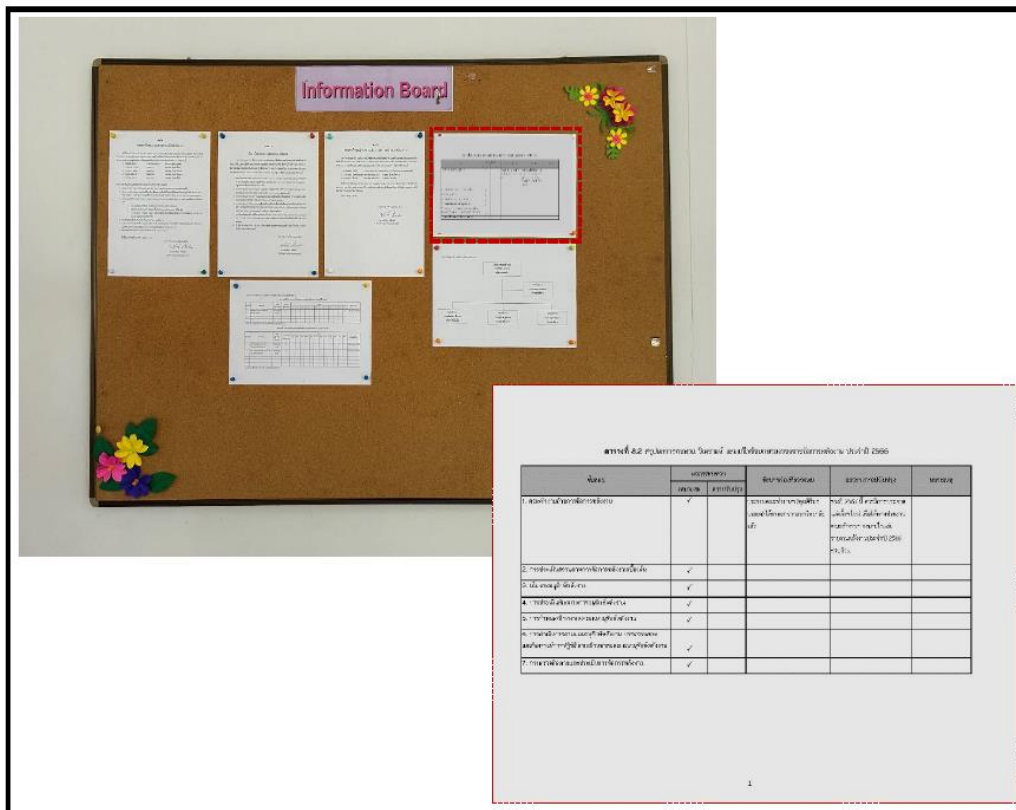
Section 8.2: Disseminating the outcomes of energy management review, analysis, and rectification of deficiencies.

To ensure all employees are well-informed and adhere to the outcomes of the review and analysis, as well as rectify any deficiencies in the arrangement, Corporate Energy Building has disseminated and implemented the subsequent measures:

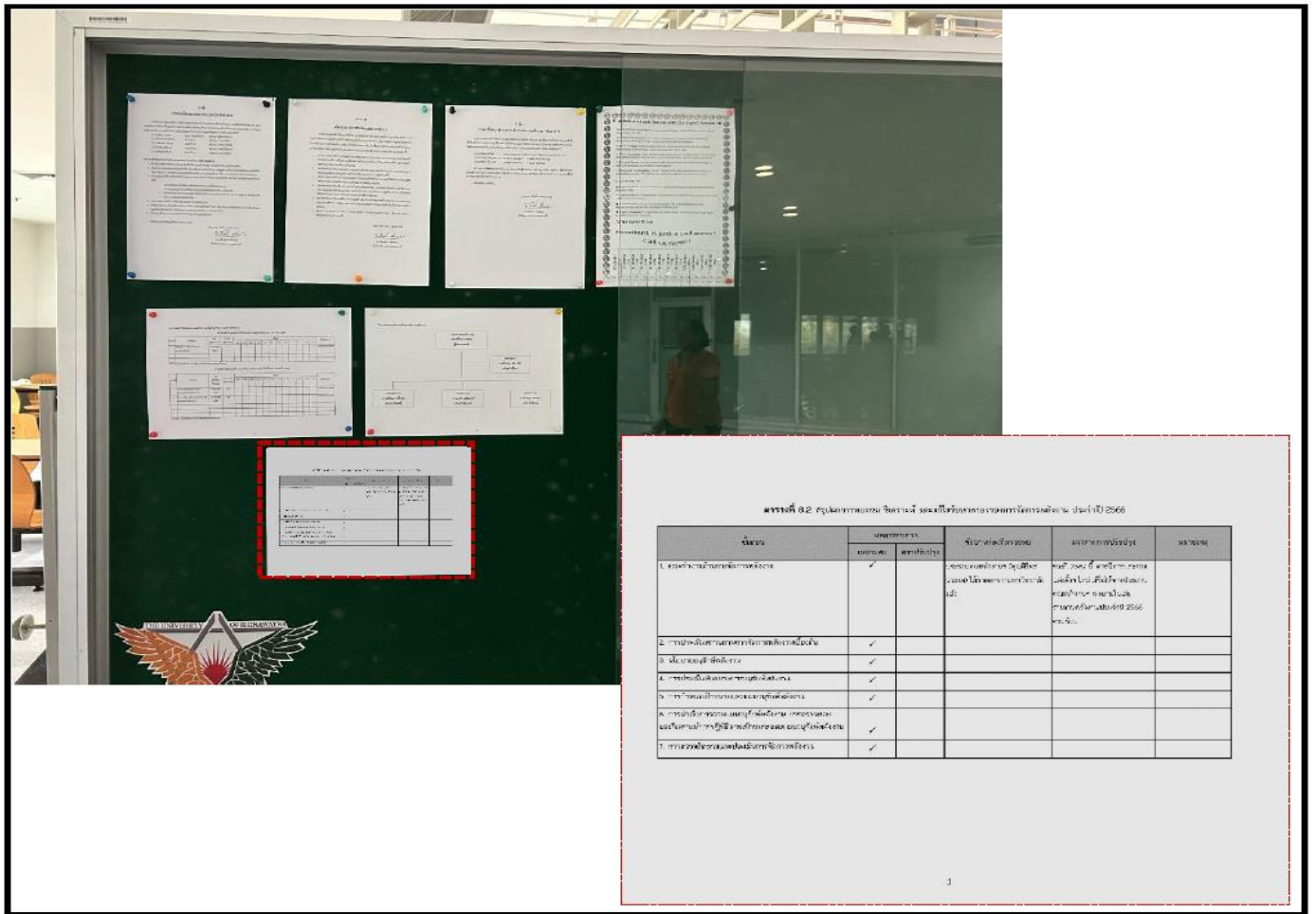
Ways to disseminate the outcomes of reviewing, analyzing, and rectifying deficiencies in energy management.

- Post an announcement Poster
- Number of announcements ...?.. Location Number of announcements Location
- Published documents Public Address system
- Brochure/Journal Edition In week.....times /Which time.....
- Electronic mail Staff meeting
- Number of recipients..... people In week.....times
- Level of recipient.....
- Other (specify)

Evidence or documentation that signifies the publication of findings resulting from the review, analysis, and rectification of deficiencies in energy management



(A) Located adjacent to the public relations board, in the area directly in front of the elevator on the 1st floor.



(A) affixed to a public relations board located on the third floor of the classroom building

Image 8-2 depicts the publication showcasing the outcomes of the review, analysis, and rectification of deficiencies in energy management.

Please note: If there are more than two dissemination methods utilized, the building can augment the number of document displays accordingly. Supplementary visual evidence has been provided.

Appendix

Appendix A. Conservation measures implementation plan Energy over the next 3 years

Appendix B. Other supporting documents (if any)

Appendix A.

Conservation measures implementation plan

Energy over the next 3 years

Appendix B.

Other supporting documents (if any)