

Technical Brief on Sustainable Energy

INDUSTRIAL ENERGY MANAGEMENT



switchasia



Funded by
the European Union

SWITCH
GARMENT

PROMOTION OF SUSTAINABLE ENERGY
PRACTICES IN THE GARMENT SECTOR
IN CAMBODIA



AFD
AGENCE FRANÇAISE
DE DÉVELOPPEMENT



ACTING FOR
CLIMATE
SOLIDARITY

TAFTAC

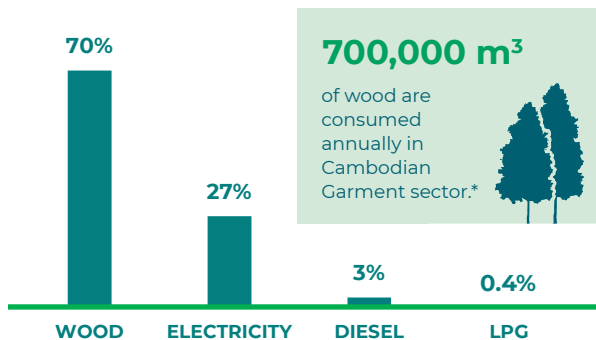
Trade - Apparel - Footwear Goods Association in Cambodia

ENERGY USE IN THE INDUSTRY

The industrial sector is a major energy consumer, utilizing substantial energy for machinery operation, heat generation, or facility lighting. Garment Industry plays a significant role in Cambodia's economic growth and is one of the largest energy consumers. Therefore, strategic planning, diversification, sustainability, and technological advancements are essential for its future.

Energy Consumption Share in Cambodian Garment Sector

Garment factories in Cambodia are mainly using **electricity and wood**, with wood being the highest, accounting for about **70%**.



Source: Total energy consumption (toe) of the 50 factories audited during Switch Garment project

*Source: Study on alternative Fuel sources for Garment factories In Cambodia, 2023

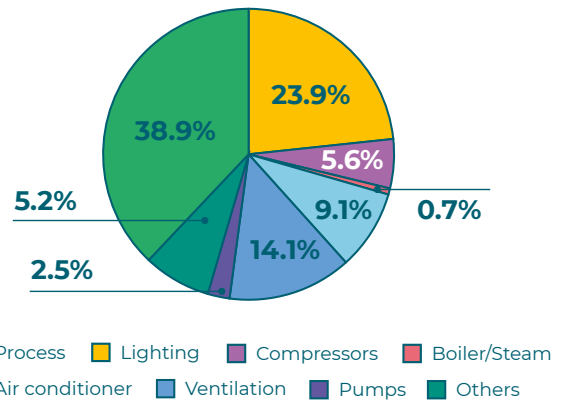


10%

AVERAGE CONTRIBUTION OF THIS SECTOR TO CAMBODIA'S GROSS DOMESTIC PRODUCT

Electricity Consumption Share in Cambodian Garment Industry

Process equipment, lighting and cooling systems are the primary consumers of electricity:



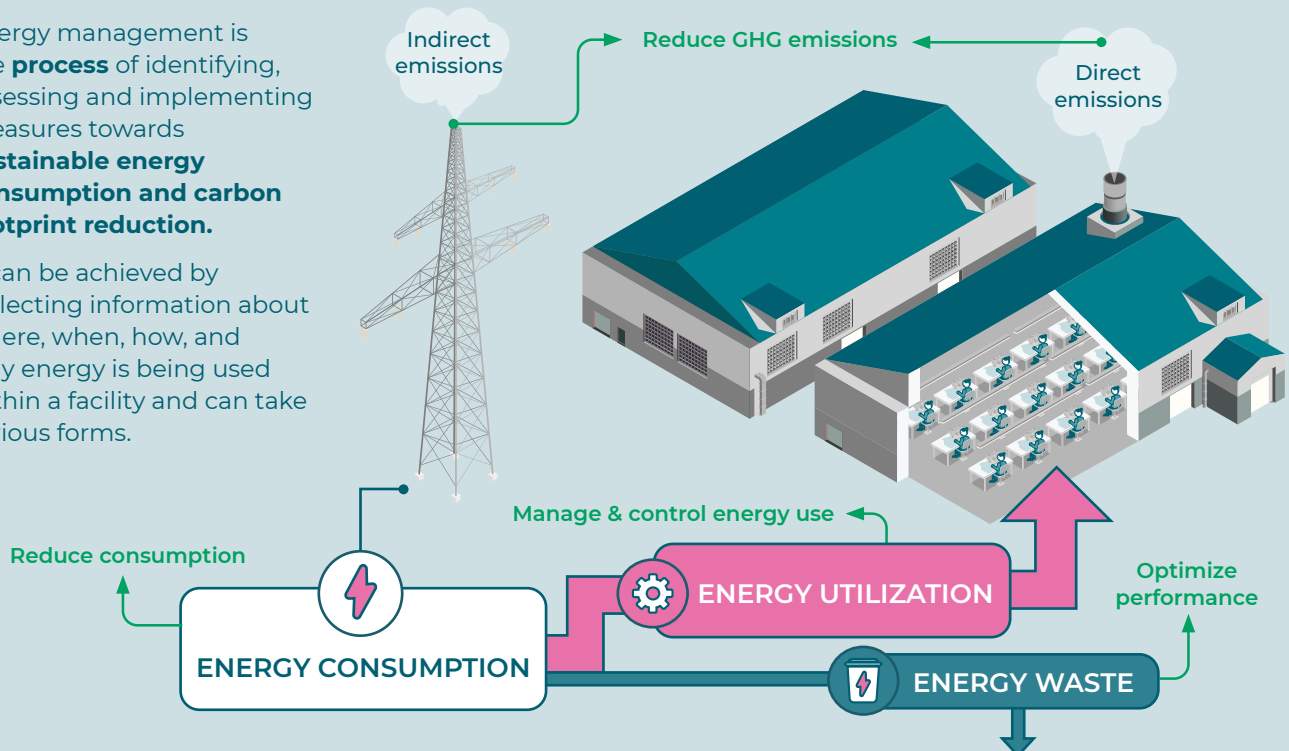
Source: Energy efficiency NAMA in the garment industry in Cambodia.

What is Energy Management?

1

Energy management is the **process** of identifying, assessing and implementing measures towards **sustainable energy consumption and carbon footprint reduction**.

It can be achieved by collecting information about where, when, how, and why energy is being used within a facility and can take various forms.



Signs you need an Energy Management Program

2



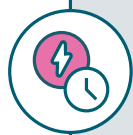
You frequently encounter surprise or disappointment regarding your monthly energy bills.



You lack the necessary data for compliance and sustainability programs.



Your top management believes the company lacks the financial resources to evaluate energy usage.



You suspect excessive energy usage during non/operational hours.



You are uncertain about who monitors energy usage within your company.



You cannot recall the last time you reviewed your organization's energy policy.

Opportunities & Barriers of Energy Management

3

Opportunities



Improving Environmental Performance:

Reducing energy consumption in factories lowers greenhouse gas emissions and minimizes environmental footprint.



Increasing Productivity:

Better matching the equipment to the needs leads to reduced wear and tear, operation and maintenance expenses, and ultimately, improved productivity.



Increasing Safety and Security:

Energy efficiency improves the reliability of equipment, increases security of supply by reducing dependence on imported fuels and improves safety at the workplace.



Boosting Attractiveness to International Brands:

Implementing energy management in factories can enhance the company's reputation as an environmentally responsible organization (Green), thereby attracting more potential buyers.



Enhancing Industrial Competitiveness:

The cost of electricity in Cambodia is among the highest in Southeast Asia. Energy management leads to lower energy costs and improves the competitiveness of Cambodian factories.

Barriers



Financial constraints:

A financing scheme may be necessary for factories to cover the investment costs of energy efficiency measures, despite the fact that these costs can be paid back through operational cost savings.



Lack of commitment from management team:

For a successful Energy Management implementation, time and dedication are crucial, particularly from management.



Lack of knowledge:

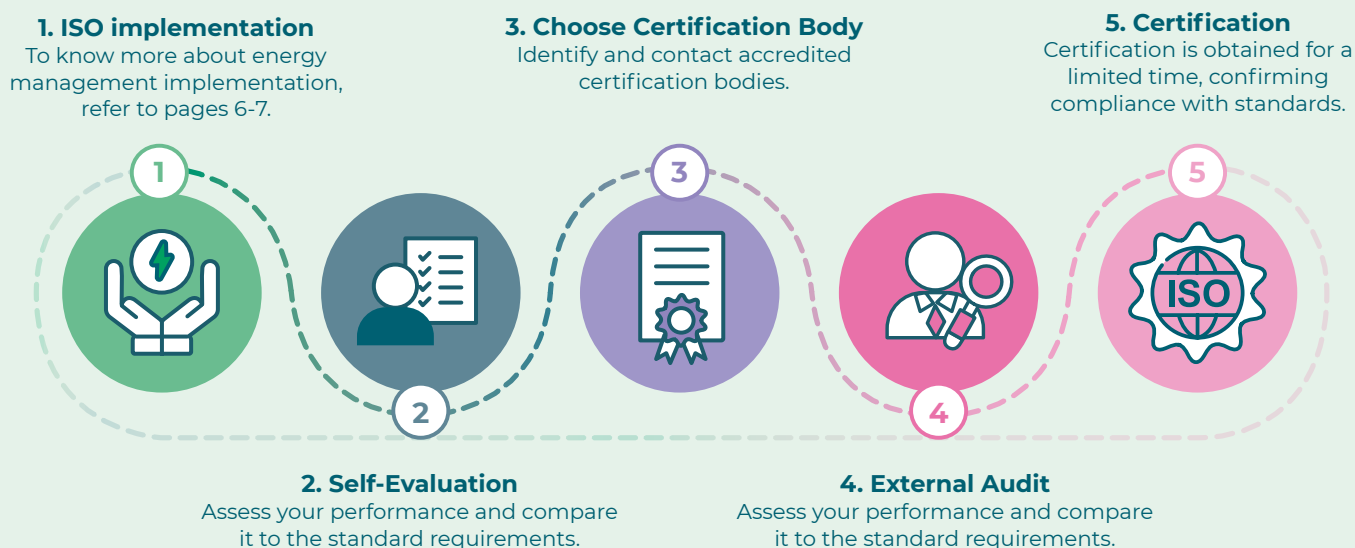
Basic knowledge of energy and processes is essential for implementing energy management. To acquire this knowledge, organizations can use various training programs.

Management standards are useful tools that provide a **framework** and **practical guidelines** to implement a management strategy. **ISO 14001** and **ISO 50001** are the two applicable standards that propose a similar process to the implementation of an Energy Management System, with different level of focus:

Aspects	ISO 14001	ISO 50001
Standard Type	Environmental Management System (EMS)	Energy Management System (EnMS)
Objective	Improve overall environmental performance.	Improve specifically energy performance and efficiency.
Topics Covered	Sustainability, resource and waste reduction (water, energy, material, etc.).	Focus on Energy consumption and efficiency.
Energy Efficiency Impact	Only the environmental impact of energy consumption is considered.	Deep analysis of energy use: <ul style="list-style-type: none"> • Energy Consumption • Equipment performance • Systems and procedures
Carbon Emissions	Considered from the broader environmental impact.	Considered from the energy-related processes.
Legal and Regulatory Compliance	Follow and comply with applicable environmental laws, regulations, and requirements.	Follow and comply with energy-related laws, regulations, and requirements.
Applicability	Businesses aim to specifically manage and control environmental performance and indicators.	Businesses aim to reduce energy consumption and improve overall efficiency.

About Certification

Certification is possible but is NOT a requirement: Implementing Energy Management standards provides immediate benefits. However, obtaining certification proves to external stakeholders that the company is committed to adhering to these standards.



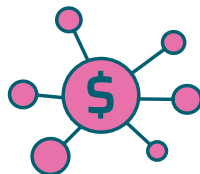
The **three dimensions of energy management** should be addressed together to have the greatest impact.

1. ORGANIZATIONAL: Organizational and Financial Commitment



Leadership and cultural change:

Start with the management. To encourage sustainable practices and energy savings, it is crucial to have leadership and cultural changes that inspire other employees to adopt these practices.



Allocation of Resources:

It is crucial to allocate specific funds to support energy management initiatives such as energy audits, trainings or monitoring activities.



Energy-saving policies and regulations:

Establish energy reduction targets, put labels and reminders, and consider financial incentives for energy-saving measures to encourage energy conservation.

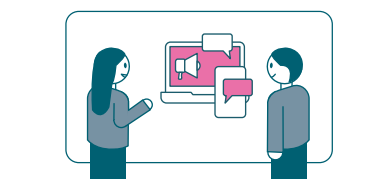


2. BEHAVIOURAL: Promoting Behavioral Change and Awareness



Employee Awareness and Training:

Training, workshops, and awareness campaigns increase engagement and empower energy-conscious decision-making.




Communication and Engagement: Use effective communication channels such as newsletters, bulletin boards, and online platforms to share energy-saving tips and success stories. Dedicated committees can also engage employees and encourage active participation and feedback.




3. TECHNICAL: Practical measures


Implementing technical measures to reduce energy consumption at different levels, from low cost to high investment rate. Some examples are:


 Upgrade to more efficient technologies

 Incorporating renewable energy technologies

 Performance analysis through benchmarking

 Regular and preventive maintenance

 Regular management assessments and reviews

 Measure, monitor and analyze

To have more information on possible opportunities, refer to the other Technical Briefs on specific equipment, please visit TAFTAC's website: <https://www.taftac-cambodia.org/publications/>

Energy Management Process

01. Commit and Appoint a Manager

Assigning a **dedicated energy** manager or **team** responsible for overseeing energy management initiatives shows a real commitment from management.

Key roles of an energy manager:

- Coordinating strategies,
- Overseeing the implementation of energy-saving measures.
- Ensuring that proper support and resources are provided.

One of the employees with the most extensive background and knowledge of energy could be nominated as the Energy Manager.



01.

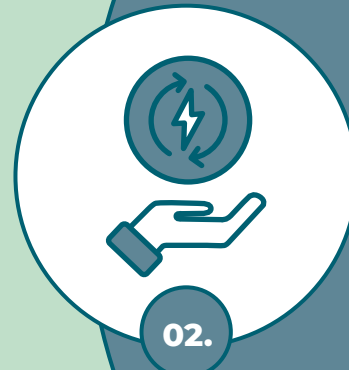
02. Understand Energy Issues

Effectively managing energy requires an understanding of **energy consumption patterns** and areas of **inefficiencies**.

This can be achieved by:

- Understanding energy needs and bill consumption
- Comparing your performance with similar facilities
- Identifying specific energy issues, such as high-energy consuming equipment.

This task can either be performed by in-house engineers or may need the assistance of an external company carrying out **energy audits**.

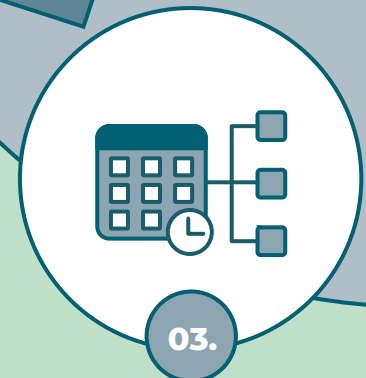


02.

03. Plan and Organize

Based on the issues identified, a comprehensive energy management plan needs to be developed by:

- Defining energy consumption **reduction targets** based on:
 - ▶ Performance, energy audit results and/or strategies.
 - ▶ National and/or international policies and standards
 - ▶ Specific requirements from buyers
- Identifying the **resources needed**.
- Setting **priorities** based on budget and resource constraints.
- Establishing concrete **milestones** and **timelines**.



03.



IMPORTANT:

Organizing the action plan ensures clear roles, responsibilities, objectives and resources to engage.

05. Control, Monitor and Report

Establish robust control and monitoring mechanisms to track energy performance, identify deviations and measure progress.

Control:

- Regularly control and enforce implementation of action plan activities.

Monitor:

- Collect and analyze energy consumption data (reading data from meters, and logging data in spreadsheets).
- Utilize energy management software to track real-time energy consumption.
- Document the changes.

Report:

- Collect information and compare it with the previous performance.
- Analyze and introduce any corrective measures if needed.

05.

04.



Regularly share energy results and goals with employees to foster feedback, engagement and continuous improvement.

04. Implement Action Plan

Following the priorities defined in the action plan, the implementation may include:

Implement technical improvement measures:

1. Contact suppliers to get quotations.
2. Compare and analyze the quotation to select the best option for quality and performance.
3. Install and inspect.

Support from dedicated energy service companies can be sought to implement specific Energy Efficiency measures.

Enhance Employees Commitment:

1. Employees should be incited to:
 - Identify **energy-saving opportunities**.
 - **Report** any issues.
 - Actively **participate** in energy conservation efforts.
2. **Encourage** and **Reward** active employees



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FABRIC Cambodia



This technical brief has been made possible thanks to the Switch Garment and VETHIC projects. They aim at providing hand-holding support to garment manufacturing units in the country to identify and adopt sustainable energy practices.

Switch Garment, a project funded by the European Union SWITCH-Asia Grants Programme and jointly implemented by Global Green Growth Institute (GGGI) Cambodia, Textile, Apparel, Footwear & Travel Goods Association in Cambodia (TAFTAC) and Geres aims at 'Promotion of sustainable energy practices in the garment sector in Cambodia' ("Switch Garment"). The objective of this project is to increase the competitiveness and decrease the environmental impact of the Cambodian garment industry through sustainable production.

The VETHIC project (2022-2024), funded by Agence française de développement (AFD), aims to improve the environmental performance of the Cambodian textile sector by leveraging energy transition. The project is jointly implemented by Geres, TAFTAC, Cambodia Women for Peace and Development (CWPD), and Live and Learn Cambodia (LLC).

This document was developed with the inputs and extensive review provided by the partners GGGI and TAFTAC.

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