



**MSU-ILIGAN INSTITUTE OF TECHNOLOGY**  
Office of the Vice Chancellor for Research and Enterprise  
OFFICE OF RESEARCH MANAGEMENT



ND

MSU-IIT Annual  
In-house Review  
of Research  
and Development  
Projects

# *Certificate* OF RECOGNITION

This certificate is awarded to

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Mark June Aporador**

for presenting their research article entitled:

**Energy and Greenhouse Gas (GHG)  
Auditing of Mindanao State University -  
Iligan Institute of Technology Buildings**

during the **22nd MSU-IIT Annual In-house Review  
of Research and Development Projects**  
on October 11, 2024, at the MSU-Iligan Institute of Technology.

Given this 11<sup>th</sup> day of October 2024, at the MSU-Iligan Institute  
of Technology, Iligan City, Philippines.

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# ENERGY AND GREENHOUSE GAS AUDITING OF MSU-IIT BUILDINGS

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## Rationale

- As of 2024, the university's average monthly energy consumption was **314,149 kWh**



- MSU-IIT **pays** a monthly average of Php 3.6 million amounting to Php 41.4 million per year (Php 11.50/kWh)
- MSU-IIT is **required** to submit an annual energy consumption report and an energy management system policy since its energy consumption is beyond 100,000 kWh/year based on the Energy Efficiency and Conservation Act of RA 11285
- This project **aims** to conduct an energy and greenhouse gas audit as a **basis** in strategizing on how to:
  - reduce energy bill (SDG 7 & 12)
  - reduce energy consumption (SDG 12)
  - reduce greenhouse gas emission (SDG 7 & 13)

## Materials & Methods

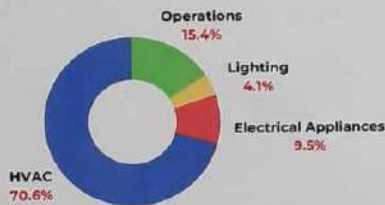
- There are two main approaches in this study:
  - Inventory of ALL items that consumes electricity classified into four (4) types
    - Operations (computer units, laptops, printers, etc.)
    - Lighting
    - Electrical Appliances
    - HVAC (Heating, Ventilation and Air Conditioning)
  - Survey Questionnaire

Approaches	Output	Outcome
Inventory	Amount of energy consumed (kWh)	Recommended replacement of energy consuming items
	Amount of greenhouse gas emitted (kg CO <sub>2</sub> )	Atmospheric contribution of greenhouse gas emitted in MSU-IIT
Survey	Behavioral energy utilization practices	Recommended energy utilization policy

- First phase** of this research project focuses on 15 buildings:

- Admin
- Office of the Chancellor
- Office of Communications
- OVCSI/Registrar/DS Library/HRM Laboratory
- OVCL/Legal Office/HRMD
- Main Library
- MCR/SID
- KTTO
- CSM Main & Annex
- CASS (Old & New)
- COE (Old and New)

## Energy Consumption on 4 Classes of Electrical Items



## Awareness of Institute Energy Conservation Policies (partial)

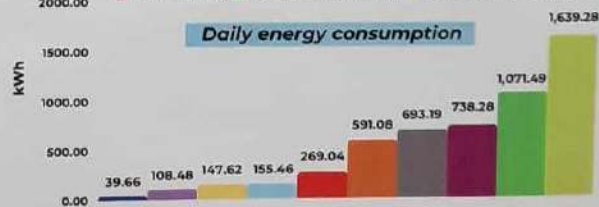
- Aware** ■ **Unaware** ■
- All air-conditioning units switched on at 8:30 AM and switched off at 4:30 PM (MO No. 2004-35, Sec. 1)
  - All air-conditioning units switched off during weekends and holidays, unless ordered by management (MO No. 2004-35 Sec. 2)
  - All plugged equipment shall be put off after office hours (MO No. 2004-35 Sec. 3)
  - Employees are not allowed to use personal electric appliances, in any office inside the campus (MO No. 2004-35 Sec. 4)
  - Activities for any kind of overtime where electricity is used shall secure a permit from the Office of the Chancellor, cc: SID office and IRE office (MO No. 2004-35 Sec. 5)
  - Employees and students should be discouraged from doing their personal work in campus. The use of electric power by students should be regulated (MO No. 2004-35 Sec. 6)
  - Approved schedule of activities using facilities shall be posted at the door for easy check-up by the security personnel (MO No. 2004-35 Sec. 7)



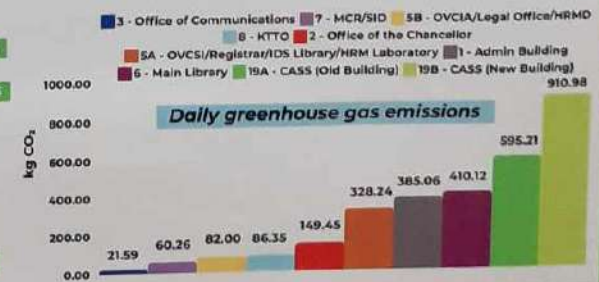
## Results & Discussion

- 3 - Office of Communications
- 7 - MCR/SID
- 5B - OVCL/Legal Office/HRMD
- 6 - KTTO
- 2 - Office of the Chancellor
- 5A - OVCSI/Registrar/DS Library/HRM Laboratory
- 1 - Admin Building
- 6 - Main Library
- 19A - CASS (Old Building)
- 19B - CASS (New Building)

## Daily energy consumption



## Daily greenhouse gas emissions



## Conclusion

- Air-conditioning units (HVAC) yields the highest energy consumption
- From the partial results, **academic buildings** (CASS Old & New buildings) generated the most amount of energy consumption (kWh) and greenhouse gas emissions (kg CO<sub>2</sub>)
- From the survey's partial results, a **considerable number** (34%) of MSU-IIT constituents are not aware of the Institute's energy conservation policies. This highlights the importance of dissemination of information in order to **influence** energy consumption behavior

## Acknowledgement

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