22ND

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

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

Certificate
OF RECOGNITION

This certificate is awarded to

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Noel R. Estoperez, Napoleon Enteria
Rovick Terife
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 11th day of October 2024, at the MSU-Iligan Institute of Technology, Iligan City, Philippines.

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POSTER PAPER

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ENERGY AND GREENHOUSE GAS AUDITING OF MSU-IIT BUILDINGS

Hernando P. Bacosa, Melgie A. Alas, Noel R. Estoperez, Peter D. Suson, Napoleon A. Enteria, Rovick P. Tarife & Mark June Aporador

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

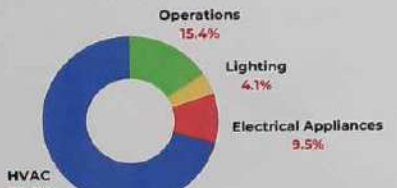
- There are two main approaches in this study:
  a. Inventory of ALL items that consumes electricity classified into four (4) types
     - Operations (computer units, laptops, printers, etc.)
     - Lighting
     - Electrical Appliances
     - HVAC (Heating, Ventilation and Air Conditioning)
  b. Survey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

Approaches	Output	Outcome
Inventory	Amount of energy consumed (kWh)	Recommended replacement of energy consuming items
	Amount of greenhouse gas emitted (kg CO_2)	Atmospheric contribution of greenhouse gas emitted in MSU-IIT
Survey	Behavioral energy utilization practices	Recommended energy utilization policy

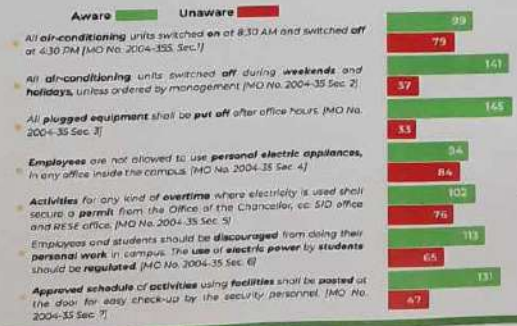
- **First phase** of this research project focuses on **15 buildings**:
  - Admin
  - Office of the Chancellor
  - Office of Communications
  - OVCSI/Registrar/IDS Library/HRM Laboratory
  - OVCIA/Legal Office/HRMD
  - Main Library
  - MCR/SID
  - KTTO
  - CSM Main & Annex
  - CASS (Old & New)
  - COE (Old and New)

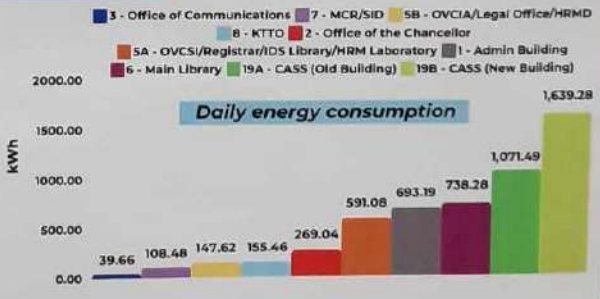
Results & Discussion

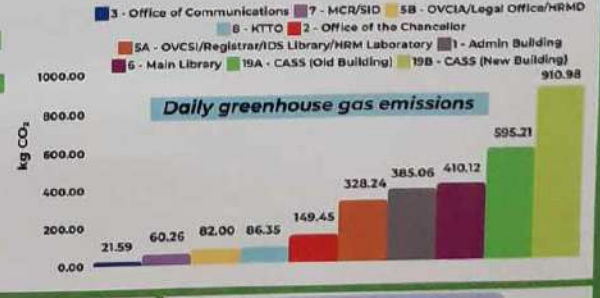
Energy Consumption on 4 Classes of Electrical Items



Awareness of Institute Energy Conservation Policies *(partial)*





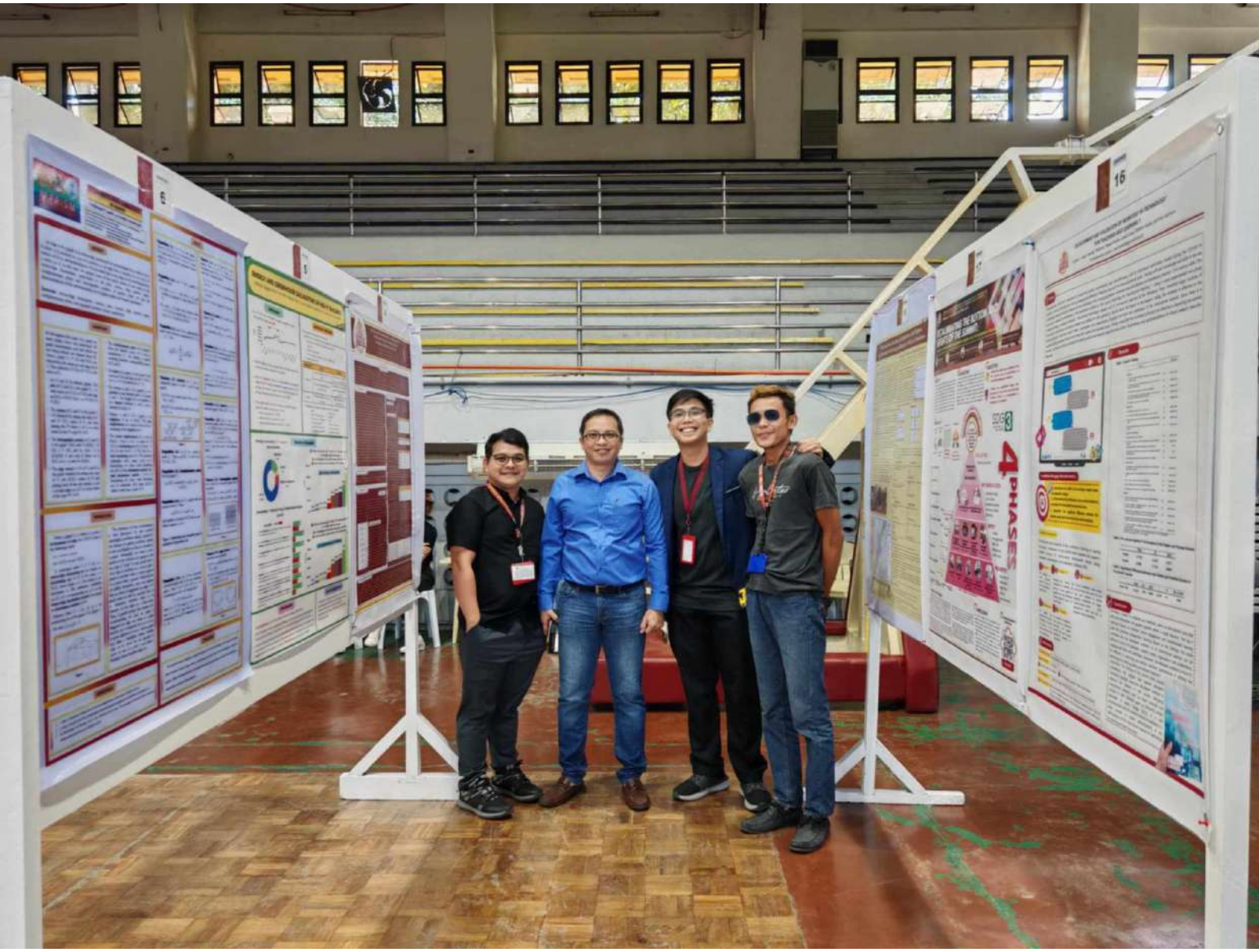


Conclusion

- **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_2)
- 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

We extend our heartfelt gratitude to OVCRE for their generous support and funding of this research project. We also wish to thank the various offices and departments that provided crucial support in obtaining the necessary data.


4 PHASES