Project Title

Saving Energy with Technology

Project Lead and Members

Project lead: Lim Tow Peng

Project members: Ryan Ye, Andrew Tang, Yee Kit Sun

Organisation(s) Involved

Ng Teng Fong General Hospital

Aims

To save energy and cost through the use of technology and improve work efficiency via automation

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Lessons Learnt

One great way to conserve energy use is to make use of external natural lighting for indoor lighting. Advances in technology has enabled us to constantly monitor and control the lights which enhance productivity and save costs. Every single kW of electricity and kg of CO2 saved counts

Conclusion

See poster appended/ below

Project Category

Automation, IT & Robotics Innovation

Keywords

Ng Teng Fong General Hospital, Automation, IT & Robotics Innovation, New Equipment, Lighting Sensor

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SAVING ENERGY WITH TECHNOLOGY

- ☐ SAFETY
- ☑ PRODUCTIVITY
- ☐ PATIENT EXPERIENCE
- ☐ QUALITY
- ☑ VALUE

MEMBERS: LIM TOW PENG, RYAN YE, ANDREW TANG, YEE KIT SUN

Define Problem/Set Aim

Opportunity for Improvement

One Reporting number Centre (ORC) has no direct visibility of the outdoor conditions resulting in lightings not switch on/off appropriately and timely according to the weather.

Background

Everyday, staff and public are using the Level 2 link bridges and common walkway areas to move between Towers A, B and C. The scheduled timing for the lighting control of these areas are programmed into our Building Management System (BMS). The lighting is turned off during daytime at 7am and turned on in late evening at 7pm.

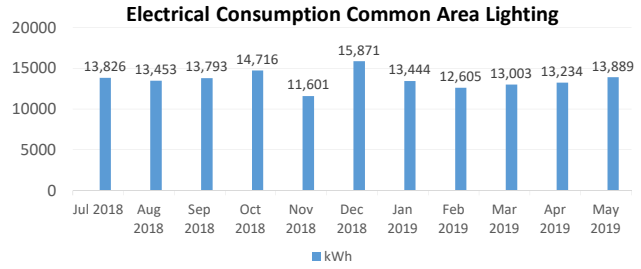
When the weather pattern changes from cloudy to sunny day, the BMS is unable automatically switch off the lighting. ORC is dependant on feedback received to remotely turn on the lighting in these areas during bad weather and to turn them off when the bad weather passes.

Aim

The team aimed to save energy and cost through the use of technology and improve work efficiency via automation.

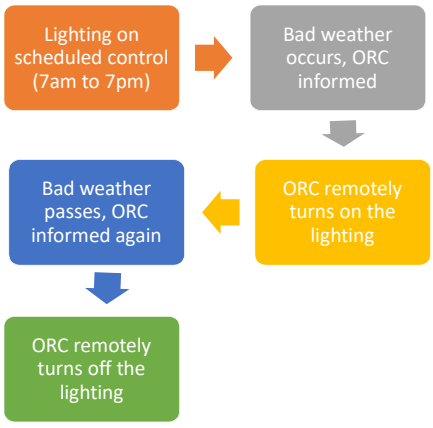
Establish Measures

Current performance



Analyse Problem

Current Process



Probable Root Cause

Currently, BMS is using a time schedule program to control the lighting. This method does not take into consideration the outdoor lighting level.

Select Changes

Probable solutions

1. Hourly updates of the weather conditions by ORC personnel
2. Use of technology to monitor and control the lighting

Option 2 was chosen as this was less costly and would not require additional manpower.

Test & Implement Changes

Implementation

1. **Installation of Photo control sensors**

These sensors are able to detect how much light there is in an area. One is mounted at the rooftop and the other sensor indoors. These sensors are then connected to our BMS through cabling.

2. **Verification & testing of the sensors**

The sensors were then tested on the site both indoors and outdoors by using equipment which are able to measure lighting levels. This was compared to the readings obtained by our BMS.

3. **Programming of the logic and scheduling control**

Our BMS is then programmed to recognize the difference in light between the areas where the sensors are mounted. It will then send a signal to turn on or off the lighting.

Results after implementation

Electricity used in areas with these lighting	kWh	* $	** CO_2
Before implementing (May)	13,889	$3,364	1,410
After implementing (June)	13,059	$3,163	1,326
Savings	830	$201	84

* Electricity Tariff Rate = 24.22 cents / kWh

** Operating Margin = 0.4192 kgCO_2 / kWh

Spread Change/Learning Points

Key learnings

Making good use of external natural lights for indoor lighting use is one great way to conserve energy usage. Advance in technology had enable us to constantly monitor and control the lights which enhance productivity and save cost. Every single kW of electricity and kg of CO2 saved counts.

Ng Teng Fong General Hospital
Jurong Community Hospital
Jurong Medical Centre
Members of the NUHS