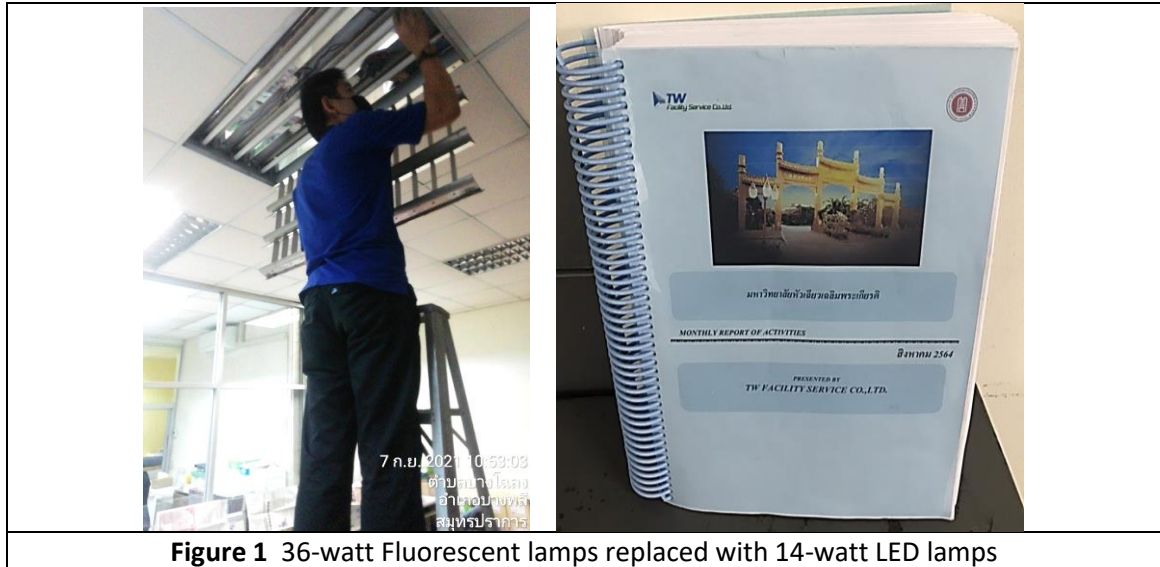


## Energy and Climate Change (EC)

### Energy Efficient Appliances Usage

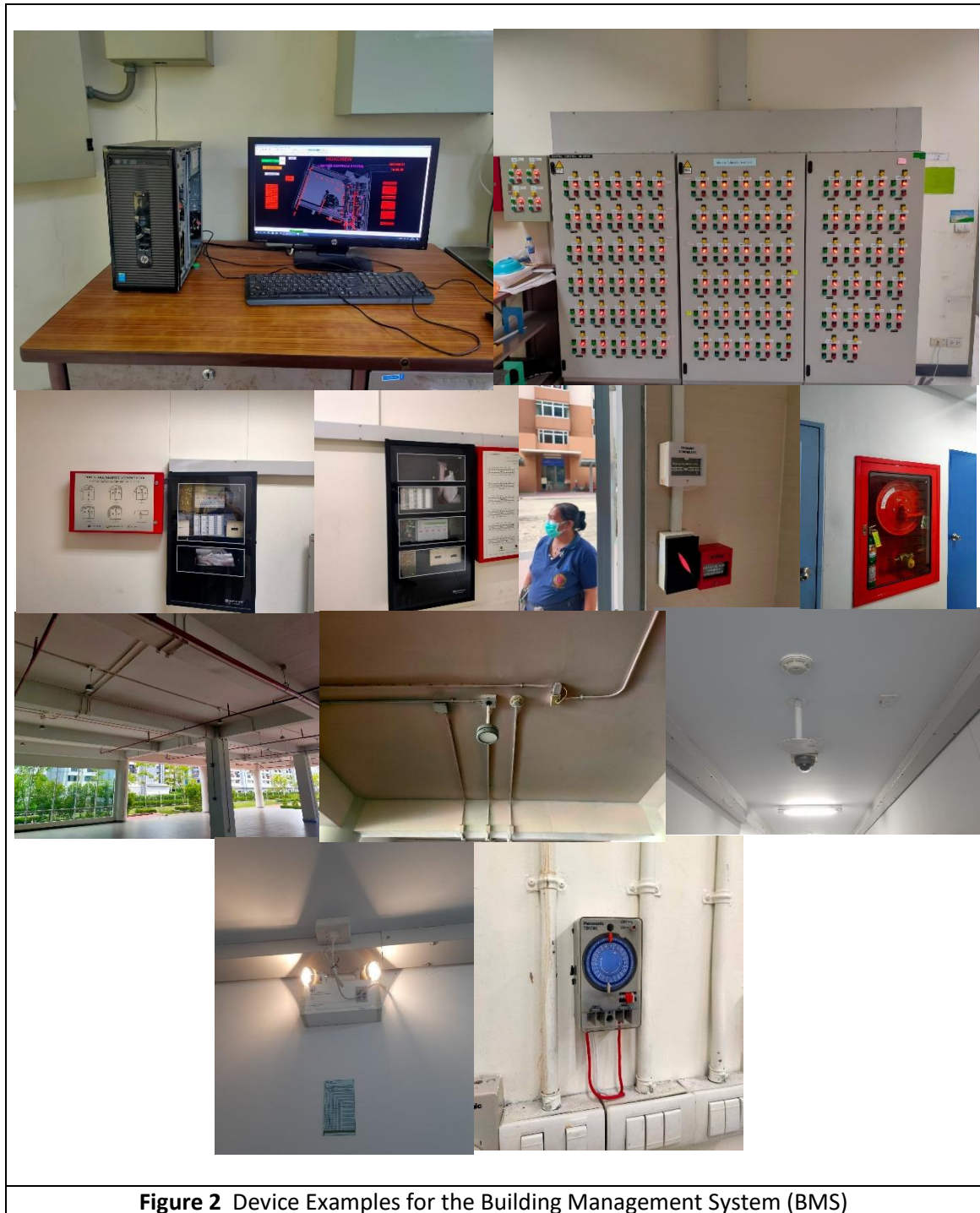
Huachiew Chalermprakiet University strives to realize the use of additional energy saving appliances by paying close attention to efficient energy management in all parts of the organization. The contract with TW Facility Service Co., Ltd. provides care and maintenance of the electrical systems, air conditioning systems, etc., to achieve potential and efficient energy saving system with the use of devices such as LED lamps and fans as replacement of the existing ones.



**Figure 1** 36-watt Fluorescent lamps replaced with 14-watt LED lamps

## Smart Building Implementation

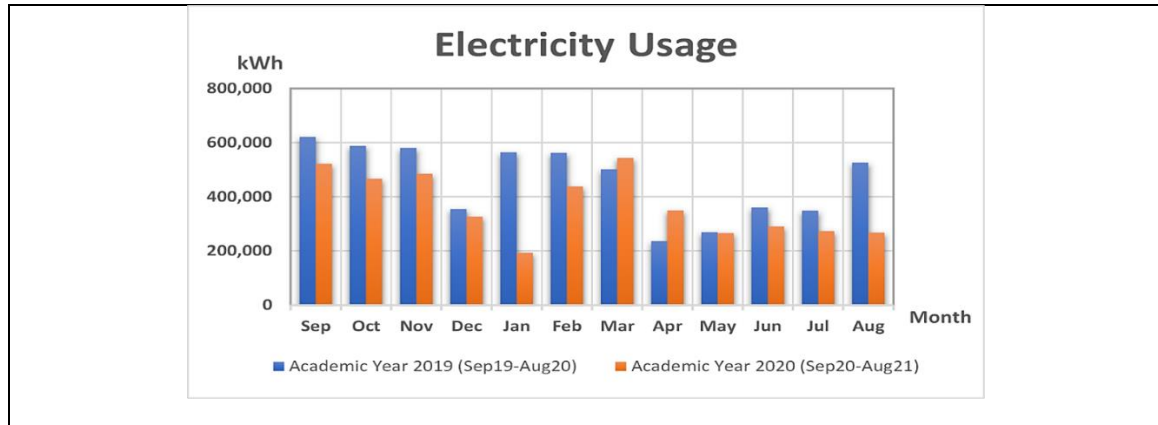
Huachiew Chalermprakiet University uses the Building Management System (BMS) that entails using the Lighting Access Control system, which can control the lighting system outside the building from the control room, the auto light power on-off system, the surveillance with CCTV, and a BAS system for controlling Chiller etc. All these systems are controlled by a computer operating system.



**Figure 2** Device Examples for the Building Management System (BMS)

### Electricity Usage Per Year

The total electricity consumption of Huachiew Chalermprakiet University in the past 12 months (in academic year 2020, from September 2020 to August 2021) equal to 4,420,812 kWh was used for lighting, cooling, heating, laboratory equipment and etc.



**Figure 3** Electricity usage in academic year 2019 - 2020

### Renewable Energy Sources in Campus






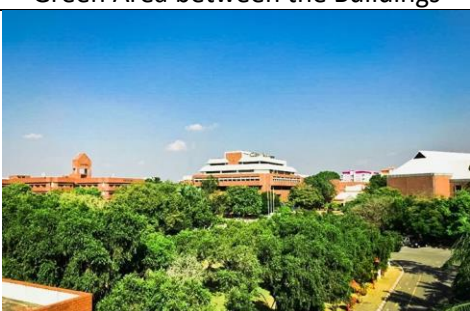


Huachiew Chalermprakiet University has implemented the HCU Solar Rooftop project by installing solar panels on the roof of the Lecture Building, Canteen 1 and Gymnasium (Power Purchase Agreement with Solar Energy Society Co., Ltd. on July 2, 2020). The solar power capacity is 829.44 kW. In 12 months, the solar power generation is 3,583,180.80 kWh.



**Figure 4** HCU Solar Rooftop Project

**Elements of Green Building Implementation as Reflected in All Construction and Renovation Policies**

Huachiew Chalermprakiet University has a building design that focuses on ventilation and natural light. The area between the buildings is green areas for relaxation. In the construction and renovation works of the building, paints are used which are environmentally friendly paints. There is green library implementation. In addition, the university has appointed various committees that are involved at both the university and faculty levels.

Green Area in the Middle of Lecture Building	Green Area together with Bicycle Lane
	
Health Park	Health Park
	
Green Library Implementation	Green Area between the Buildings
	
Student Dormitory Building	Srivaree Pavilion Hotel Operation Center Building
	
<p><b>Figure 5</b> Examples of buildings and green areas in Huachiew Chalermprakiet University</p>	

### **Greenhouse Gas Emission Reduction Program**

Huachiew Chalermprakiet University's programs aimed to reduce all three scopes emissions (Scope 1, 2 and 3) as following activities:

1. With a collaboration of Thailand Greenhouse Gas Organization (Public Organization) or TGO, HCU Library has participated in individual carbon offsets through the Green Library Network by calculating various energy consumption of staff in the library to be aware of social responsibility and compensation according to actual power consumption since the university cooperated in 2019. Receiving a certificate from Mr. Jatuporn Burusphat, a permanent secretary for Ministry of Natural Resources and Environment on September 16, 2020 at the Mayfair Grand Ballroom, the Berkeley Hotel Pratunam, Bangkok, Thailand from "Roi Duang Jai, Join the Heart to Reduce Global Warming" event organized by Greenhouse Gas Management Organization. (Public Organization) in 2020.

2. We had developed routine to research (R2R) for reducing the use of black HPDE plastic bags (garbage bag) in garden service and gasoline (as fuel) for leaf waste trucks. It was found that the use of black bags and gasoline was clearly reduced and the estimated of the amount of greenhouse gases was decreased (unit in kgCO<sub>2</sub>). As a result, it can help to reduce global warming.

3. Huachiew Chalermprakiet University has Solar Rooftop project to install solar panels on the roof of the Lecture building, Canteen, and Gymnasium. The total capacity is 829.44 kW and within 12 months production capacity equals 3,583,180.80 kWh.



**Figure 6** HCU Library participating in individual carbon offsets with Thailand Greenhouse Gas Organization (Public Organization)

(Source: <http://lib.hcu.ac.th/index.php/16-news/728-16092563>)



**Figure 7** Routine to research (R2R) project for reducing CO<sub>2</sub> emission by reducing the use of black HPDE plastic bags (garbage bag) in garden service and gasoline (as fuel) for leaf waste trucks.



**Figure 8** HCU Solar Rooftop

**Total Carbon Footprint (CO<sub>2</sub> Emission)**

Total carbon footprint (CO<sub>2</sub> emission in the last 12 Months) of Huachiew Chalermprakiet University is 3,729 metric tons.

## Number Innovative Programs During Covid-19 Pandemic

The innovations that emerge during the COVID-19 pandemic involve keeping distance, reducing exposure, following the new normal, and sterilization which include the following details:

1. The development of digital transcripts by the graduation department, Registry and Processing Office.
2. The development of the Employee self-service (ESS) program by the Human Resources Division, allowing university staff to access and edit their personal information by themselves. It also simplifies the process and reduces interpersonal contact in coordinating requests for information.
3. Two UV lamps were installed at the COVID-19 testing point and at the COVID-19 waiting area for disinfection. They were switched on for 30 minutes during the period. Every evening after Huachiew Chalermprakiet Clinic is closed.
4. Faculty of Medical Technology organizes an energy conservation project for 2nd and 3rd-year students to submit a hematology laboratory test report via google form to reduce exposure from traveling to submit reports.
5. In addition, the Faculty of Medical Technology has also produced alcohol gel for students to use during the COVID-19 pandemic.

The image displays a digital interface for creating a digital transcript. At the top, there are two promotional posters. The left poster, titled 'Digital Transcript คืออะไร? มีแล้วสะดวกยังไง?' (What is Digital Transcript? How convenient is it?), features an illustration of a student and a computer. The right poster, titled 'Digital Transcript คืออะไร?' (What is Digital Transcript?), explains that digital transcripts with digital signatures help prevent tampering and allow users to check document authenticity. Below the posters is a web form for creating a digital transcript. The form includes fields for 'ชื่อ-นามสกุล' (Name and Surname), 'รหัสนักศึกษา' (Student ID), 'ชื่อ-นามสกุล ภาษาอังกฤษ' (Name and Surname in English), and 'เลือกเอกสารที่ต้องการ' (Select the document you want). The form also includes a 'เลือกประเภทของเอกสาร' (Select document type) section with options for 'เอกสารใบประกาศนียบัตร' (Certificate) and 'เอกสารใบแสดงผลการเรียน' (Transcript). The form is titled 'แบบฟอร์มการศึกษาระดับปริญญาตรี' (Bachelor's Degree Form) and is provided by the 'กรมส่งเสริมการศึกษาระดับปริญญาตรี' (Bachelor's Degree Promotion Department).

Figure 9 Digital transcript development by the graduation department

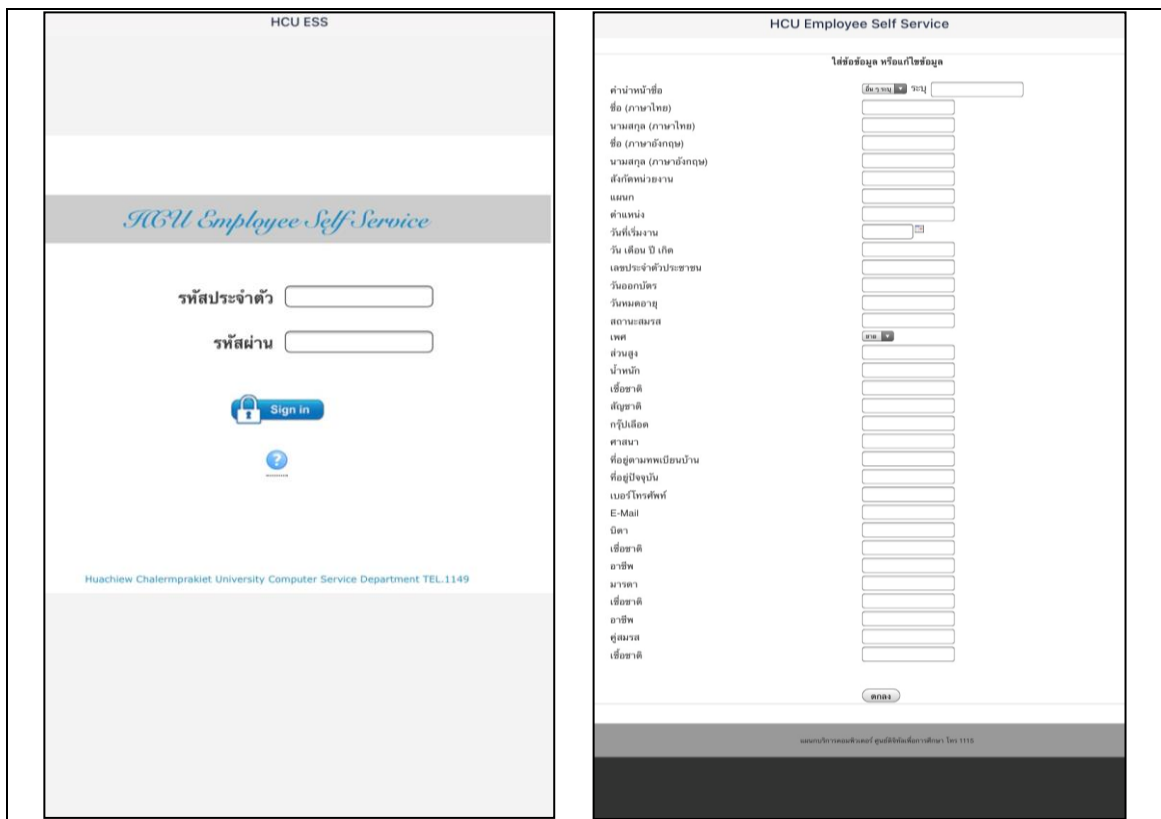


Figure 10 ESS Program Development by Human Resources Division



Installation of UV lamps at the COVID-19 testing point



Installation of UV lamps at the waiting area for COVID-19 testing

Figure 11 Installation of UV lamps at Huachiew Chalermprakiet University Clinic



ตัวอย่างหน้ารายงานผลการทดสอบทางห้องปฏิบัติการทางโลหิตวิทยาสำหรับนักศึกษาชั้นปีที่ 2 และ 3

Hematology Report Form : CBC

WBC differential count and RBC grading

WBC differential count

Figure 12 Hematology laboratory test report via google form



Figure 13 Alcohol gel Production for students during the COVID-19 pandemic

### Impactful University Programs on Climate Change

1. Huachiew Chalermprakiet University organized the 8th National and International Conference, Research Service to Society. A research paper related to climate change has been published.
2. Huachiew Chalermprakiet University joined the project with the Thai Health Promotion Foundation, which was under the cooperation of NODE Samut Prakan in the waste separation project. This project is to develop the community around the university to have a green area and provide them a sustainable development in waste management within the community. Which is part of helping to reduce greenhouse gas emissions.



**Figure 14** Articles on climate change in and the 8<sup>th</sup> national and international conference  
(Source: <https://hcuconf.hcu.ac.th/2021/>)



**Figure 15** Waste management project with Baan Eua Athon Bangna 1 community