



香港城市大學
City University of Hong Kong

Learning building decarbonization technologies incorporating daily life experiences

Project Number: 6000762

Principal Investigator: Dr. Wei WU

Grant Type: TDG

Abstract:

The building sector is responsible for more than 90% of electricity consumption in Hong Kong, imposing an urgent task on building decarbonization. There is increasing worldwide interest in low-energy or low-carbon buildings. The Hong Kong Government aims to reduce the carbon intensity by 65–70% by 2030 (from the 2005 level) and achieve net-zero carbon emission by 2050. Therefore, practical skills in building decarbonization will facilitate Hong Kong's transition to carbon neutrality. Through various opportunities when talking to employers, one core skill our students need to master is building energy efficiency, especially HVAC. Strong competency in building decarbonization technologies will make our undergraduate students more employable. However, the current building-related courses are mainly focused on theoretical knowledge or simple experimental skills, with little involvement in daily life experiences. For most of the time, many students cannot fully understand the necessity or significance of learning the technologies until they really need to use them someday. So, they show less interest and gain weak competency after learning. In this project, we aim to enable students to learn building decarbonization technologies by incorporating daily life experiences. The project will be conducted in the PI's two UG courses (SEE4112 Sustainable Engineering Systems: Modelling and Analysis; SEE4003 Energy and Environmental Engineering Laboratory). Various building decarbonization technologies (including building design, efficient HVAC, efficient appliance, smart control, efficient occupant behavior, etc.) will be investigated via modeling or experiment. The effect of our daily life activities or behaviors (your house feature, your HVAC set-point, your HVAC usage schedule, your appliance efficiency level, your living customs, etc.) on the benefits (your energy bill, your carbon footprint) will be evaluated interestingly. Students are encouraged to implement some building decarbonization technologies in their own homes and measure the generated benefits using sensors. This project takes advantage of the PI's unique research experiences in building decarbonization and the favorable background of students in SEE. The innovative incorporation of the daily-life-experience-oriented curriculum will raise students' enthusiasm in applying building decarbonization technologies to address a series of practical energy and environmental issues in their future endeavors. The success of this project will strengthen the leading position of SEE and CityU in education, research, and service in the carbon decarbonization industry in Hong Kong and the Asia Pacific region.