



ENVIRONMENTAL SUSTAINABILITY DIRECTORATE

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To whom it may concern

RE: Permission to use UCT Data

UCT's Environmental Sustainability Directorate (ESD) in the Office of the Vice Chancellor herewith gives permission for the students involved in the two UCT EBE undergraduate research projects below, to access and use UCT data relevant to their research, as outlined below and will be referenced in the research publications. Access to such UCT data is in line with UCT's [environmental sustainability strategy](#) that is supportive of the UCT campus being use as a living lab, where students are allowed and encouraged to undertake research on UCT's own real estate facilities. The request for this data has come via Asscoait Professor Sunetra Chowdhury in the UCT Electrical Engineering Department.

Topic SC-05

Title: DESIGN, ENERGY MANAGEMENT AND COST ANALYSIS OF SOLAR PV-BATTERY UNINTERRUPTED POWER SUPPLY (UPS)

Project Description: This project involves design, energy management and cost analysis of a solar PV-battery UPS for a selected consumer premise. The design must ensure that the consumer has uninterrupted power supply during operational hours. The energy management system (EMS) should schedule solar PV operation depending on resource availability with maximum power point tracking (MPPT), battery charging and discharging, and a diagnostic check for the overall system. Solar charging of the battery should be considered.

Topic: SC-06

Title: INTELLIGENT ENERGY MANAGEMENT SCHEME OF A HYBRID MICROGRID USING MACHINE LEARNING TECHNIQUES

Project Description: This project deals with the design of an intelligent energy management scheme for a hybrid microgrid using machine learning techniques. The microgrid must not have more than 1MW generation. The microgrid should be able to operate in both islanded and grid-tied modes. It should be able to provide uninterrupted and quality power to its own loads and must also be able to exchange power with the utility if there is excess generation. The EMS should be designed to match the generation and load demand on the microgrid under both islanded and grid-tied operation. It should also be able to control charging and discharging of the battery or to execute load shedding during a drastic generation shortfall. The aim of the scheme will be to maintain power quality at the load terminals under all operating conditions.

For these two projects, the students will need the following data for any UCT building:

"OUR MISSION is to be an outstanding teaching and research university, educating for life and addressing the challenges facing our society."

- a) Energy consumption (kWh) per month for a year except 2020
- b) Daily load profile (weekday, weekend day, summer day and winter day as available)
- c) GPS coordinate of the building
- d) Rooftop area of the building and whether flat roof or sloping roof (for design and placement of the solar PV)

The data will be shared in a digital format.

Kind Regards

A handwritten signature in blue ink, appearing to read 'M Braune', with a long horizontal stroke extending to the right.

Mr Manfred Braune (Pr Eng)

UCT Director: Environmental Sustainability in the Office of the Vice Chancellor