

Carbon footprint assessment from purchased electricity consumption and campus commute in Universiti Malaysia Perlis (UniMAP): Pre- and during COVID-19 pandemic

Abstract

Most institutions and organizations nowadays have been taking responsibility in reducing their carbon footprint (CF) to curtail the global warming impact to at least 20–25% reduction by 2030. Universities and higher learning institutions are starting to invest in becoming greener and carbon-free. Current COVID19 communicable disease has swayed the routine and concurrently influenced regular trends of greenhouse gases (GHG) emissions throughout the world. This study explored the possible GHG emissions (calculated as CO₂e) from internal campus commute and purchased electricity consumption from the year 2018–2020 at Universiti Malaysia Perlis main campus to analyze the influence of COVID19 pandemic on its CO₂e emission. The average amount of CO₂e emitted during pre-COVID19 period (n = 26) was 1,518.8 tCO₂e/year while during COVID19 period, it was 1,071.5 tCO₂e/year (n = 10), marked as 29.5% reduction. Due to completeness and quality of data for contracted bus (monitoring period of years 2018, 2019 and 2020 as 12 months, 12 months, and 2 months, respectively), year 2019 was determined as the appropriate baseline year for setting the CO₂e reduction target due to COVID19 pandemic preceded year. In comparison to pre-COVID19 pandemic, almost 95%/year and 7%/year reductions of CO₂e were recorded for both Scope 1 and Scope 2, respectively. Comparing Scope 1 and 2, it was obviously observed that the purchased electricity consumption (Scope 2) was the predominant contributor to GHG emission at UniMAP campus by 78% despite of current pandemic influence and its reduction was indistinct (7%/year reduction). Thus, the reduction target in future should be venturing in energy savings and energy auditing in addition to carbon offsetting.

Keywords

Carbon footprint; CO₂ equivalent; Greenhouse gases; SDG 13