Energy efficiency and CO_2 reduction potential using real-time activity recognition in different types of buildings

Mohammed Bin Zacharia K and Dr. P Sridhar

Mohammed Bin Zacharia K

Department of Civil Engineering, NIT Warangal, mohammed.b.zac.nitw@gmail.com, NIT Warangal, India

Abstract: Industrial revolution and industrialization across the world along with rapid population growth in the past decades with the development of technology in recent years have led to a drastic increase in the use of energy resources.

The energy source for humans reconditioned from biofuels to fossil fuels through ages. Non-conventional sources of energy have become of immense importance due to the developing technology and also the unsustainable use by human beings.

The exhaustion of energy resources and the increase in energy usage affects the sustainability directly. Several environmental impacts like air pollution, ocean acidification, polluted vegetation, etc. are there due to the higher emissions. Energy efficiency focusses at reducing the energy consumption with the same level of serviceability and providing the same quality of life.

Carbon dioxide equivalent is a measure of study for assessing the impact of higher energy use. Real-time activity recognition is a tool to estimate the energy wastage in buildings. Application and benefits of real-time activity recognition technique in various types of buildings such as boarding houses, study halls, eateries, lavatory buildings, retail outlets, workrooms are studied.

CO_2 reduction potential is used to assess the benefit of real-time activity recognition technique with different sources of power. For a building with average power consumption of 100kWh per month can reduce equivalent CO_2 emission up to 34.79kg. The equivalent CO_2 emission rate can be reduced up to an average of 35.5%.

Keywords: Energy efficiency, real-time activity recognition, buildings, Carbon dioxide equivalent CO_2 reduction potential.

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