

## ABSTRACT

For decades now, the planet's biosphere sustainability is at stake due to human, social, economic and environmental factors that have negatively impacted the earth we live in. With global warming and greenhouse gas emissions on the rise, there is every need to be concerned. Climate change today has a significant impact on almost every aspect of our environment, economies, societies and the planet's biosphere that is under immense threat of extinction. The building sector is a key contributor of carbon dioxide emissions in the world today. To reduce the building sector production of greenhouse gasses and other negative impacts to safer levels is a big challenge today and it must be met quickly and decisively. Luckily, there are many Information and Communications Technology (ICT) technologies to mitigate carbon dioxide emissions and adverse climatic change effects that already exist. This thesis reviews the nexus of Internet of Things innovations to deliver Net Zero energy buildings (NZEBS) that can mitigate global warming for a sustainable biosphere. This will help achieve favourable energy efficiency for a sustainable world from the adverse climatic upheavals due to increased global warming. The main objective of this research is to develop an Internet of Things Framework for Energy Efficient Building. The specific objectives of the research are: i) To examine the gravity of emissions from non-energy efficient buildings and the extent to which they contribute to global warming; ii) To explore the components and capabilities of IoT technology and infrastructure that influences the design of internet of things; iii) To develop a framework for IoT driven energy efficient buildings; and iv) To validate the proposed framework for internet of things driven energy efficient building. The study adopted quantitative research design. The target population consisted of 350 respondents from National Construction Authority (NCA). The study validated framework was developed from the proposed framework as indicated in the literature review. The Framework for IoT Driven Energy Efficient Buildings has five layers comprising of application or inputs/IT applications, Services, Capabilities/IT applications, Core networks and Access network. Besides, the framework has three columns. The individual items from literature review constructs were fitted to the layers, thereafter, the layers were fitted to have a final overall Framework for IoT Driven Energy Efficient Buildings. This was achieved using Structural Equation Modelling with help of SPSS AMOS 23 and Stata 15 software. The final framework was developed from SEM Model. The study yielded a framework for Internet of Things Driven Energy Efficient Building. The research fronts a future of world-wide energy efficiency for a sustainable biosphere to be realized by mass implementation of Internet of Things, M2M energy efficient buildings technology while integrating machine learning (ML) and artificial intelligence (AI) technology to reconstruct past climate events and improve future prediction.