

This doctoral research is motivated by the recognition that current approaches to energy management in facility operations are not fully realizing the potential for efficiency improvements and sustainability benefits. These benefits extend beyond direct energy cost reductions to include improved asset performance, reduced maintenance costs, enhanced occupant productivity, and increased property values. The Intergovernmental Panel on Climate Change has emphasized the critical role of building energy efficiency in limiting global warming, highlighting the need for transformative approaches that go beyond incremental improvements. Organizations that successfully implement integrated energy management strategies can achieve significant cost savings, improved operational efficiency, and enhanced competitiveness. While individual energy efficiency measures and technologies continue to advance, the lack of integrated, systems-based frameworks limits the overall impact of these efforts. The research is particularly significant given the urgent need for rapid decarbonization of the built environment to meet global climate goals.