Presentation of Potential of artificial intelligence in reducing energy and carbon emissions of commercial buildings at scale

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Introduction

Presented by: Ray Marange

Climate change is accelerating, and buildings are a major contributor, responsible for 39% of U.S. primary energy use. With urbanization surging and building stock/demand expected to double by 2060, improving building efficiency is no longer optional but urgent. While AI has transformed industries such as healthcare and finance, its potential in building energy efficiency remains underexplored. AI demonstrates significant potential to reduce costs, enhance benefits, and improve safety across the building lifecycle. The study investigates how AI can reduce energy consumption and carbon emissions in medium-sized office buildings, offering a scalable framework that could be applied globally. We will explore four key areas: **Results**, **Discussion**, **Methods**, and **Takeaways & Reflections**. The study focuses on medium-sized offices, and the results can be extrapolated to offices of any size.

Results part 1

Presented by: Dwayne Mark Acosta

Results part 2

Presented by: David Franz

Discussions

Presented by: Mohamed Amine Benaziza

Method and Scope

- Uses engineering + energy-simulation rather than one specific AI technology to estimate how AI can boost building-energy efficiency and cut carbon.
- The paper focuses on a medium-office as an example, yet methodology is transferable to other commercial buildings with adjustments.

Discussions

Presented by: Mohamed Amine Benaziza

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Why AI helps

- Data-driven modeling can tailor solutions and lower costs, accelerating adoption of high-efficiency / net-zero-energy buildings (HEEBs & NZEBs).

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Why AI helps

- Data-driven modeling can tailor solutions and lower costs, accelerating adoption of high-efficiency / net-zero-energy buildings (HEEBs & NZEBs).
- Advanced control models (deep learning, reinforcement learning) could refine accuracy in future work.

Methods

Presented by: James Thompson