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**Title: Understanding Current and Employing Future Practices for Monitoring Building Energy Systems**

**Abstract:** Residential building energy consumption and thermal performance is an irregular phenomenon which benefits from systematic monitoring and feedback. This study demonstrates the ability for property managers of affordable housing units to monitor the performance of their building energy systems across their building stock using smart devices and cloud computing. This project presents a case study of an affordable housing development in Virginia, which was designed to be energy efficient capitalizing on incentives of the Low Income Housing Tax Credit program. Real-time building energy usage at the circuit-level, resident perceptions, property manager perceptions, and building specifications are all combined to provide a detailed understanding of current and future practices for monitoring building energy systems. Preliminary data analysis has shown great potential for updating previous processes to calibrate inaccurate perceptions of behavior-driven energy use; leverage cloud computing for data analytics and visualization to improve data accessibility; and the inclusion of socio-political impacts into decision-making tools. We have also found a critical need to better incorporate the variability of system performance due to the high potential for installation errors and user errors. The methodology of this study also provides guidance for better academic-industry-citizen engagement for the real-world testing and design of engineered infrastructure systems.