

## Optimizing Energy Efficiency: Leveraging Big Data Analytics and AWS Services for Buildings and Industries

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**Abstract :** In an era marked by increasing concerns about energy sustainability, this research endeavors to address the pressing challenge of energy consumption in buildings and industries. This study delves into the transformative potential of AWS services in optimizing energy efficiency. The research is founded on the recognition that effective management of energy consumption is imperative for both environmental conservation and economic viability. Buildings and industries account for a substantial portion of global energy use, making it crucial to develop advanced techniques for analysis and reduction. This study sets out to explore the integration of AWS services with big data analytics to provide innovative solutions for energy consumption analysis. Leveraging AWS's cloud computing capabilities, scalable infrastructure, and data analytics tools, the research aims to develop efficient methods for collecting, processing, and analyzing energy data from diverse sources. The core focus is on creating predictive models and real-time monitoring systems that enable proactive energy management. By harnessing AWS's machine learning and data analytics capabilities, the research seeks to identify patterns, anomalies, and optimization opportunities within energy consumption data. Furthermore, this study aims to propose actionable recommendations for reducing energy consumption in buildings and industries. By combining AWS services with metrics-driven insights, the research strives to facilitate the implementation of energy-efficient practices, ultimately leading to reduced carbon emissions and cost savings. The integration of AWS services not only enhances the analytical capabilities but also offers scalable solutions that can be customized for different building and industrial contexts. The research also recognizes the potential for AWS-powered solutions to promote sustainable practices and support environmental stewardship.

**Keywords :** energy consumption analysis, big data analytics, AWS services, energy efficiency

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