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Energy Usage and Temperature Distribution in Old Mega Factories

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Abstract

Global environmental problems and the rising cost of energy puts industries under pressure to reduce energy consumption and lower their carbon footprint. Old “mega factories” use a lot of energy to maintain the production and working environment in an optimal condition when compared to newer factories. Heating cost can amount to more than 26% of the annual utility bill despite the mild climate of the United Kingdom.

Intelligent cost reduction solutions, suitable management strategies and contemporary low carbon policies can significantly reduce this energy consumption without incorporating the latest and expensive technical solutions. Extensive research was carried out at a manufacturing plant with large old buildings to investigate multifarious solutions of low cost energy saving methods. Environmental plant data was obtained and analysed to understand thermal characteristics of the factory space. Non-uniform temperature distribution, consistently high average temperatures and an unstable machine environment all contributed to unnecessary expenses. Cost effective implementations, such as secure high speed doors, management strategies and employee awareness, consistent temperature monitoring and communication can create more uniform temperature distribution for a more stable working and manufacturing environment. The average temperature within this plant could be reduced by adequate measures and the comfort for employees and the machinery environment could be simultaneously improved to guarantee smoother operations and lower carbon footprint.