

Title: Lean thinking Applications for Energy Reduction: A case study in wood products industries

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Abstract: The energy recommendations database published by Industrial Assessment Centers at the Department of Energy was analyzed using clustering techniques. Using dynamic tables in MS Excel, the recommendations were filtered and aggregated by implementation status, specific industry sector, savings, implementation costs, and payback period. Savings and implementation costs were recalculated considering company size based on the number of employees and square footage. Specific comparisons among industry groups were conducted to single out what recommendations were implemented the most in different industry sectors. Based on this analysis, the top recommendations were classified in three categories: building and infrastructure, machinery, and management practices. Furthermore, the recommendations in the management practices were analyzed using clustering techniques to identify all recommendations related to lean principles. This final classification was used to develop a lean-based audit tool to help manufacturing companies, especially wood products industries, to easily identify the most effective energy savings recommendations. Finally, a procedure to incorporate energy consumption in a value stream map (VSM) is developed.