

This book discusses investigation on induction motor energy saving strategy particularly applied in the small and medium scale industry. A walk-through motor energy audit is carried out in a typical type of industry in Indonesia to collect some important data. Three induction motor energy saving strategies, by which energy efficient motor, variable speed drive, and capacitor bank are considered with respect to five criteria thought to influence the decision making in selecting suitable energy saving strategy for motor. Besides, motor energy saving is assessed using technical approach considering annual energy saving obtained from energy efficient motor, variable speed drive, and capacitor bank. In addition, assessments are carried out to find energy efficiency indicator such as specific energy consumption and energy intensity, as well as assessment on carbon dioxide emission and mitigation.



Yusak Tanoto

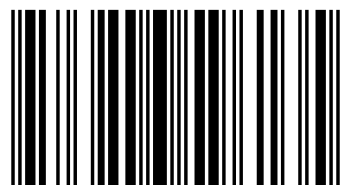


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Adaptive Electricity Energy Saving Strategy for Industrial Motors

A hybrid approach for mitigating environment impact: A case of Indonesian small and medium scale industry



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Executive Summary

This report presents investigation on induction motor energy saving strategy particularly applied in the small and medium scale industry. A walk-through motor energy audit is carried out in a typical type of industry in Indonesia to collect some important data. During the research, three induction motor energy saving strategies, by which energy efficient motor, variable speed drive, and capacitor bank are considered with respect to five criteria thought to influence the decision making in selecting suitable energy saving strategy for motor. Besides, motor energy saving is assessed using technical approach considering annual energy saving obtained from energy efficient motor, variable speed drive, and capacitor bank. In addition, assessments are carried out to find energy efficiency indicator such as specific energy consumption and energy intensity, as well as assessment on CO₂ emission and mitigation.

With the support of economic as well as technical data required for each strategy, combination of assessment method involving technical and multi criteria evaluation using analytic hierarchy process offers feasible solution corresponds to the industry's inherent characteristic. It is revealed that capacitor bank is the most suitable saving strategy to the case of small and medium scale industry in this research and thus suggested to be provisioned at the first priority, followed by variable speed drive and energy efficient motor, consecutively. It is revealed that the combination on selected motor saving strategy may lead to reduce electricity energy by around 10%, equal to around 38% CO₂ emission mitigation, or threefold. Hence applying motor energy saving should not be only seen as a chance to get cost saving, but also as an opportunity to mitigate environmental emission significantly.