

# Kelayakan teknis dan ekonomi pemanfaatan variable speed drive dan thermal energi storage (studi kasus perusahaan farmasi) = Technical feasibility and economic of utilize variable speed drive and thermal energy storage (case study pharmaceutical company) / Fr Galuh Arum Prabandari

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## Abstrak

[Tata kelola udara atau sering disebut Heating, Ventilation and Air Conditioning (HVAC) pada perusahaan farmasi mengkonsumsi energi listrik sekitar 30% dari konsumsi listrik keseluruhan. Modifikasi teknologi pendingin dengan alternatif teknologi Variable Speed Drive (VSD), Thermal Energy Storage (TES) dan penggabungan keduanya menurunkan konsumsi energi listrik masing – masing sebesar 10%, 30% dan 36%. Penggabungan dua teknologi VSD dan TES menunjukkan nilai penurunan konsumsi energi listrik paling besar. Dan hasil analisis keekonomian menunjukan hal yang sama bahwa penggabungan alternatif VSD dan TES layak untuk dipilih. Hasil analisis aliran kas dan incremental investment analysis menunjukan penggabungan teknologi VSD dan TES lebih unggul dibanding alternatif yang lain dengan nilai NPV sebesar \$79.185,00 dan IRR sebesar 80.1%, pada jangka umur pakai 14 tahun. Tingkat kemungkinan mendapatkan NPV > 0 sebesar 98,5% dan IRR > MARR sebesar 99.5%.:HVAC (Heating, Ventilation and Air Conditioning) on pharmaceutical companies to consume electric energy about 30% of overall electricity consumption. Modification of cooling technology with alternative technologies VSD (Variable Speed Drive), (Thermal Energy Storage) and the incorporation of both lowering the electrical energy consumption of each 10%, 30% and 36%. Merging two VSD technology and TES showed a decrease in the value of electric energy consumption at most. And the results of the economic analysis indicates that the same thing that the incorporation of VSD and TES alternate eligible to be selected. Results of the analysis of cash flow and incremental investment analysis showed the incorporation of VSD and TES technology is superior to other alternatives to the NPV of \$ 79,185.00 and an IRR of 80.1%, in the period of useful life of 14 years. The rate is likely to get NPV> 0 by 98.5% and IRR> MARR of 99.5%., HVAC (Heating, Ventilation and Air Conditioning) on pharmaceutical companies to consume electric energy about 30% of overall electricity consumption. Modification of cooling technology with alternative technologies VSD (Variable Speed Drive), (Thermal Energy Storage) and the incorporation of both lowering the electrical energy consumption of each 10%, 30% and 36%. Merging two VSD technology and TES showed a decrease in the value of electric energy consumption at most. And the results of the economic analysis indicates

that the same thing that the incorporation of VSD and TES alternate eligible to be selected. Results of the analysis of cash flow and incremental investment analysis showed the incorporation of VSD and TES technology is superior to other alternatives to the NPV of \$ 79,185.00 and an IRR of 80.1%, in the period of useful life of 14 years. The rate is likely to get  $NPV > 0$  by 98.5% and  $IRR > MARR$  of 99.5%.]