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The purpose of this research, Integrated Energy Management in Sugar Factory, is to analyze electrical and thermal energy used in the production system. The usage of energy of the case study factory was analyzed in order to compare with the standard value of the same industry. Then, the energy break down analysis of each process unit was conducted. The results showed that the 2 major groups of energy conservation approach could be proposed: non-investment on equipment and investment on equipment. The non-investment on equipment was firstly considered, while the priority of equipment investment was sequentially considered by the return on investment and its investment cost. The first implementation of non-investment plan was the blow down reduction of boilers while the first investment plan was installing electronic thermostats. The return on investment after non-investment plan implementation in term of payback period were 0.07 year and 0.19 year with 532.94% IRR for the investment plan. In this case study, the most sensitive factor affecting on IRR was the investment cost. Finally, the pay back period and IRR on investment risk analysis in which the installation cost of bagasse moisture reduction system increased 41.08%, the system operation expense increased 55.93% and the revenue decreased 18.18%, the pay back period and IRR were 10.76 years and 4.47%, respectively. From these figures, it can be concluded that the investment plan of energy conservation was feasible.

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