

**Topic:** Energy efficiency improvement and carbon dioxide emission reduction in PVC resin industry in Thailand

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### ABSTRACT

The objective of this research is to determine the energy saving potential and carbon dioxide emission reduction of the polyvinyl chloride (PVC) resin industry in Thailand by using bottom-up energy conservation supply curves (CSC) for electricity and fuel. Measures of energy saving and their costs are obtained from annual energy reports and personal interviews. CSC was constructed by plotting costs of conserved energy against amounts of energy saved for all potential measures. The results show that the total technical potentials of electricity, steam, and natural gas for the Thai PVC resin industry in 2013 are equal to 25,335 MWh per year, 403,631 and 501,000 GJ per year, respectively. The economic potentials of electricity, steam, and natural gas, which have their costs of saving less than energy costs, are equal to 16,625 MWh per year, 369,664 GJ, and 491,857 GJ per year respectively. The Carbon dioxide emission reduction potential associated with total economic potential of electricity, steam, and natural gas are 6,986, 43,150, and 57,413 tCO<sub>2</sub>, respectively.

Furthermore, the value of energy saving potential in the Thai PVC resin industry is equal to 310 million baht per year as compared to the total cost of energy used at 2,358 million Baht per year or accounting for 13.15% of the total energy used. The cost of electricity and fuel used in Thai PVC resin industry in 2013 are equal to 1,046 and 1,312 million Baht respectively, while the values of saving potentials in electricity and fuel (thermal) equal to 66 and 254 million Baht respectively, accounting for 6.31% and 19.36% of the electricity and fuel costs respectively.

**Keywords:** PVC resin industry; energy efficiency; electricity saving potential; carbon dioxide emission