A special-purpose 30-horsepower electric motor has an efficiency of 90%. Its replacement price (including installation) is $2,200. A second 30-horsepower high-efficiency motor is being considered as an alternative and it can be purchased (including installation) for $3,200 and its efficiency is 93%. The motor will be operated 4,000 hours per year at full load and electricity costs $0.10 per kilowatt-hour (kwh). MARR = 15% per year, and neither motor will have a market value at the end of the eight-year study period.

What is the operational cost for the current motor and the replacement?
What is the potential annual savings and simple payback period?
Considering the time value of money and the life of the project, is the higher efficiency motor economically justifiable?