

Problem 8-15**Antifreeze plant canning unit****Goal:** Decide replacement return on capital when replacing antifreeze canning unit**Given:**

Design:	old Unit	new Unit	
Fixed Capital Investment	\$5,000	\$6,000	
reduction in Operating Costs	-	\$1,000	per year
increased annual tax & insurance		\$100	per year
new years ago	10	-	
Salvage Value	\$0	\$0	
Depreciation recovery period	10	10	
current Salvage Value	\$600	-	
remaining useful life	5	10	
ending Salvage Value	\$0		

Approach:

Incremental Investment paired comparison
 Manufacturing Costs = Labor + Maintenance + Taxes + Insurance
 let X = Labor + Maintenance costs; Y = Taxes + Insurance costs
 calculate delta Investment, include old salvage as income to reduce new investment
 Existing unit depreciation based on current salvage value & remaining life

Calculations:

old unit Depreciation cost, $d = \text{straightline } \$600 / 5 = \$120$ per year
 Manufacturing Costs = X + Y

new unit Depreciation cost, $d = \text{straightline } \$6000 / 10 = \$600$ per year
 Manufacturing costs = (X - \$1,000) + (Y + \$100)

new Savings with new unit = (X + Y) - [(X - 1,000) + (Y + \$100)]
 algebra simplification = X - X + \$1,000 + Y - Y - \$100 = \$900 per year
 delta savings including depreciation = \$900 - (\$600 new unit - \$120 old unit)
 delta savings profit = \$900 - (\$600 - \$120) = \$420 per year
 Incremental Investment = \$6,000 new - \$600 old salvage = \$5,400
 Incremental ROI = \$420 Savings/year / \$5,400 Investment = 7.78%

Answer

Recommend keep existing Canning Unit if MARR is greater than 7.8%
purchase NEW Canning Unit if MARR is less than 7.8%

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