Life-Cycle Cost of Equipment (Present Value)

Present-value life-cycle cost of equipment from capital cost, escalating energy and maintenance costs, a mid-life replacement and salvage value over its life.

Method: Present-value life-cycle cost with growing annuities (Hydraulic Institute/Europump pump LCC approach)

Input parameters

Unit system: SI

Parameter	Value	Unit
Capital cost (installed)	2,500,000	
Energy cost in year 1	1,200,000	
Energy cost escalation	5.0000	%
Maintenance cost in year 1	100,000	
Maintenance escalation	4.0000	%
Discount rate	10.000	%
Life (whole years)	15.000	
Replacement or overhaul cost (in the year it is spent)	400,000	
Year of the replacement (0 if none)	8.0000	
Salvage value at end of life	100,000	

Calculated results

Parameter	Value	Unit
Life-cycle cost (present value)	1.5666e+07	
Present value of energy	1.2056e+07	
Energy share of the LCC	76.952	%

Notes for this case

- For pumps, fans and motors the energy usually dwarfs the purchase price: compare options on LCC.

Formula and method

$$LCC = C_0 + \sum_{k=1}^{n} \frac{E_1(1+e_E)^{k-1} + M_1(1+e_M)^{k-1}}{(1+d)^k} + \frac{R}{(1+d)^{n_R}} - \frac{S}{(1+d)^n}$$

Variables

C_0	Capital cost (installed)	-
E_1	Energy cost in year 1	-
e_E	Energy cost escalation	-
M_1	Maintenance cost in year 1	-
e_M	Maintenance escalation	-
d	Discount rate	-
n	Life (whole years)	-
R	Replacement or overhaul cost (in the year it is spent)	-
n_R	Year of the replacement (0 if none)	-
S	Salvage value at end of life	-
LCC	Life-cycle cost (present value)	-
PV_E	Present value of energy	-

x_E	Energy share of the LCC	-

Method and standards

Present value.

Assumptions and limits

- End-of-year cash flows.

References

- Present-value life-cycle cost with growing annuities (Hydraulic Institute/Europump pump LCC approach)

Report details

Report reference	FCC-NRQK-AQ1Y (the same inputs always give the same reference)
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Release checks	2 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/general/economics/life-cycle-cost

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.