Anläggning 2
Drift och underhåll av VA-anläggningar

LCC

Tommy Giertz

tommy.giertz@byv.kth.se

Lifetime Phases

1 Idea

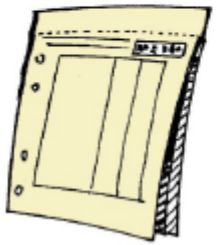
2 Specification

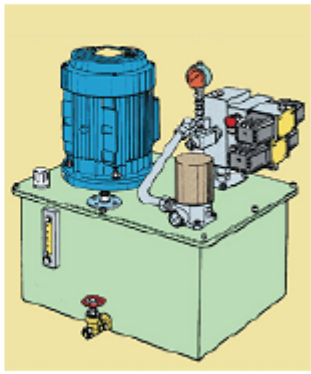
3 Design

4 Procurement/installation

5 Operation

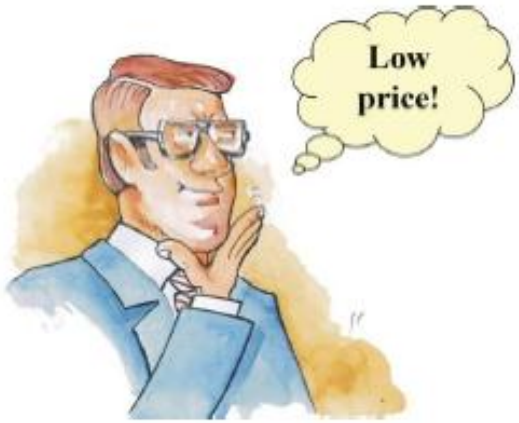
6 Winding Up



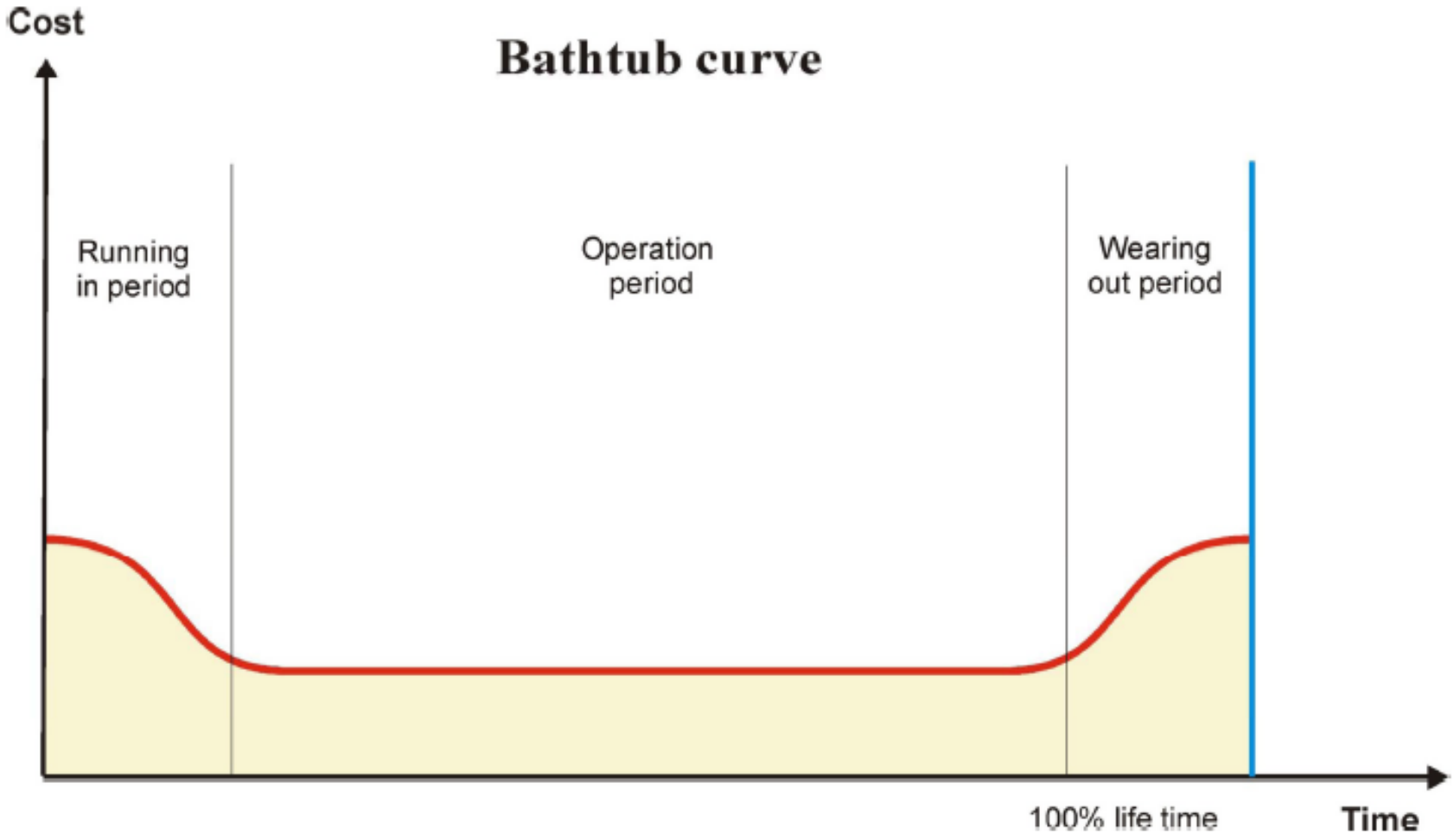


Cost

Phase	Cost
1 Idea	Free
2 Specification	1 x higher
3 Design	10 x higher
4 Procurement	100 x higher
5 Operation	1000 x higher



Bathtub curve



LCC - what does it stand for?

LCC - Life cycle cost - is commonly understood to be the customer's (buyer's, user's) total cost and other sacrifice during the actual life time of the product.

Hence LCC includes the acquisition cost as well as all future costs for operation and support of the product until it is finally discarded.

Vi vill alltså veta totalkostnaden + andra insatser

LCC means that:

Prior to the decision on acquisition of the product and source selection, the customer wants to know the total cost of ownership

i.e.

"To which future costs do I commit myself by the choice of this product today?"

Vi vill se hela kostnadsbilden innan vi beslutar om inköp

Vilka kostnader kommer i framtiden?

LCC - what does it stand for?

After the decision on acquisition of the product and source selection, the customer wants to be able to monitor and control the evolution of the owner's costs,
i.e.
"How can I assure a concept of the product which keeps the ownership costs within the budget frame ?"

Uppföljning av kostnader

Vi vill försäkra oss om att hålla budgeten

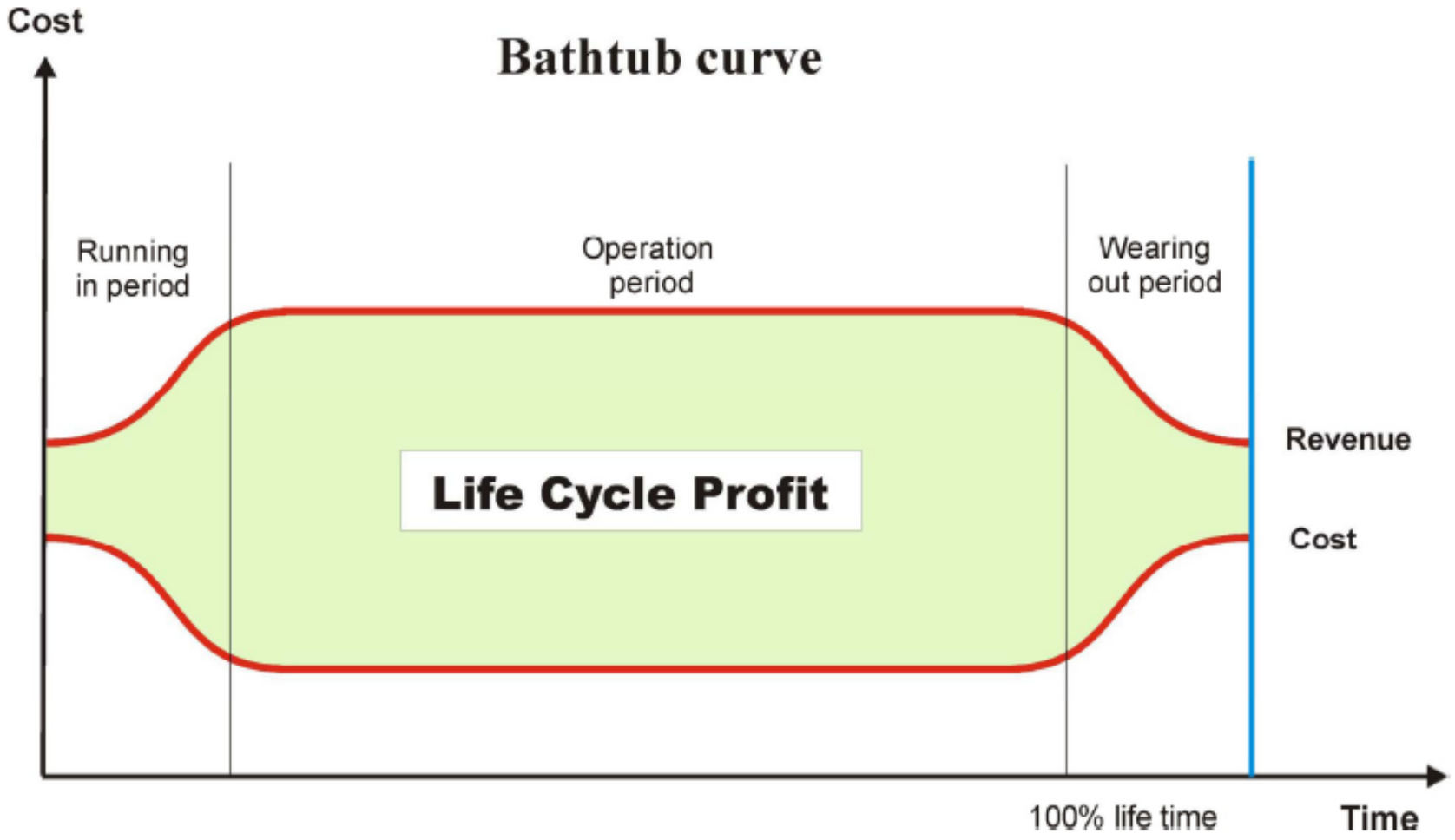
LCC INCLUDE:

- Maintenance Costs
- Down Time Costs
- Costs for Modification
- Energy Costs
- Operation Costs
- Deduction avdrag
- Interest Costs
- Quality Costs
- Spare Part Carrying Cost

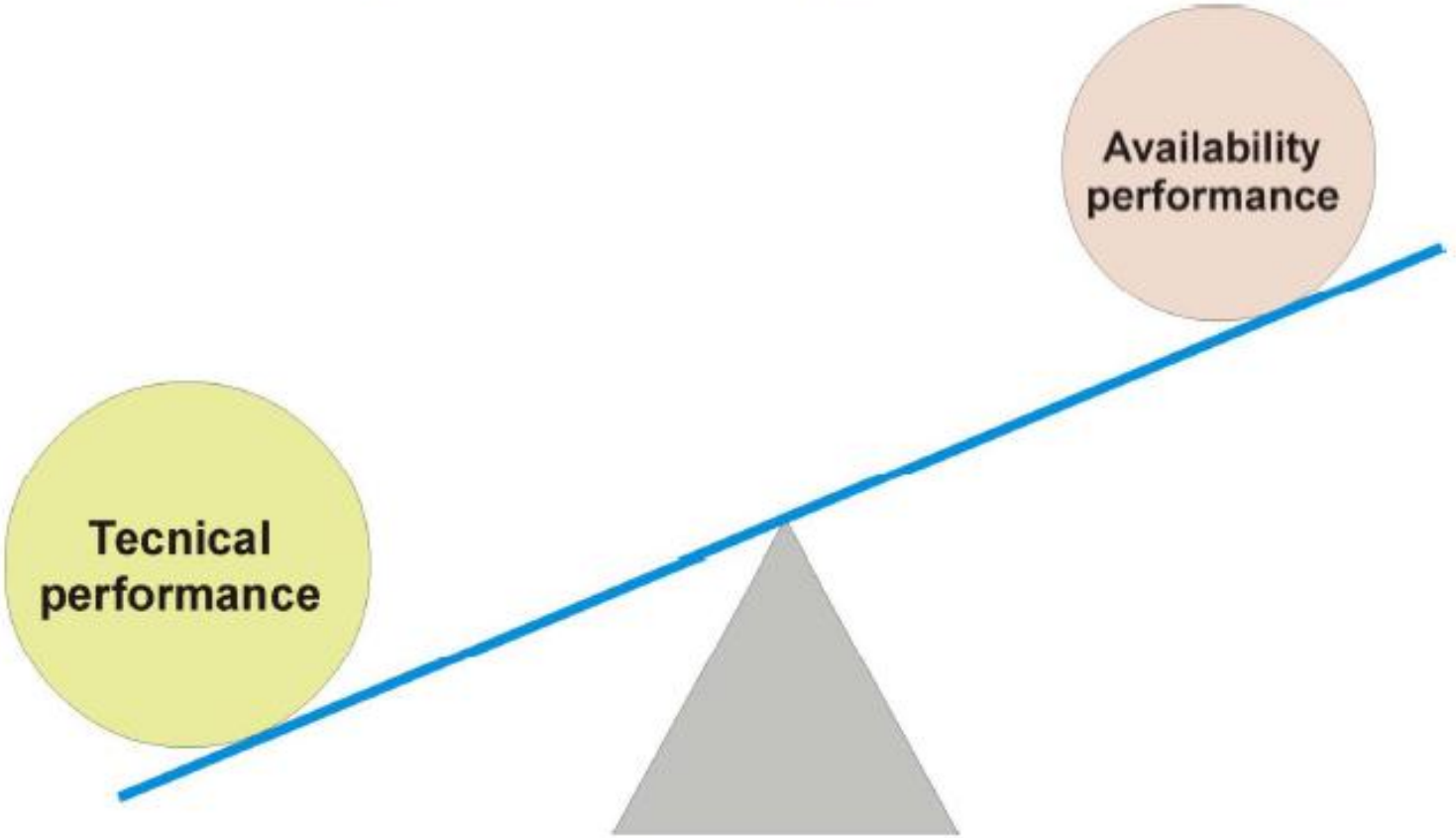
LCC IS USED FOR……

- Comparison of alternative products
- Improvements of products
- Adaptation of the maintenance and support organization

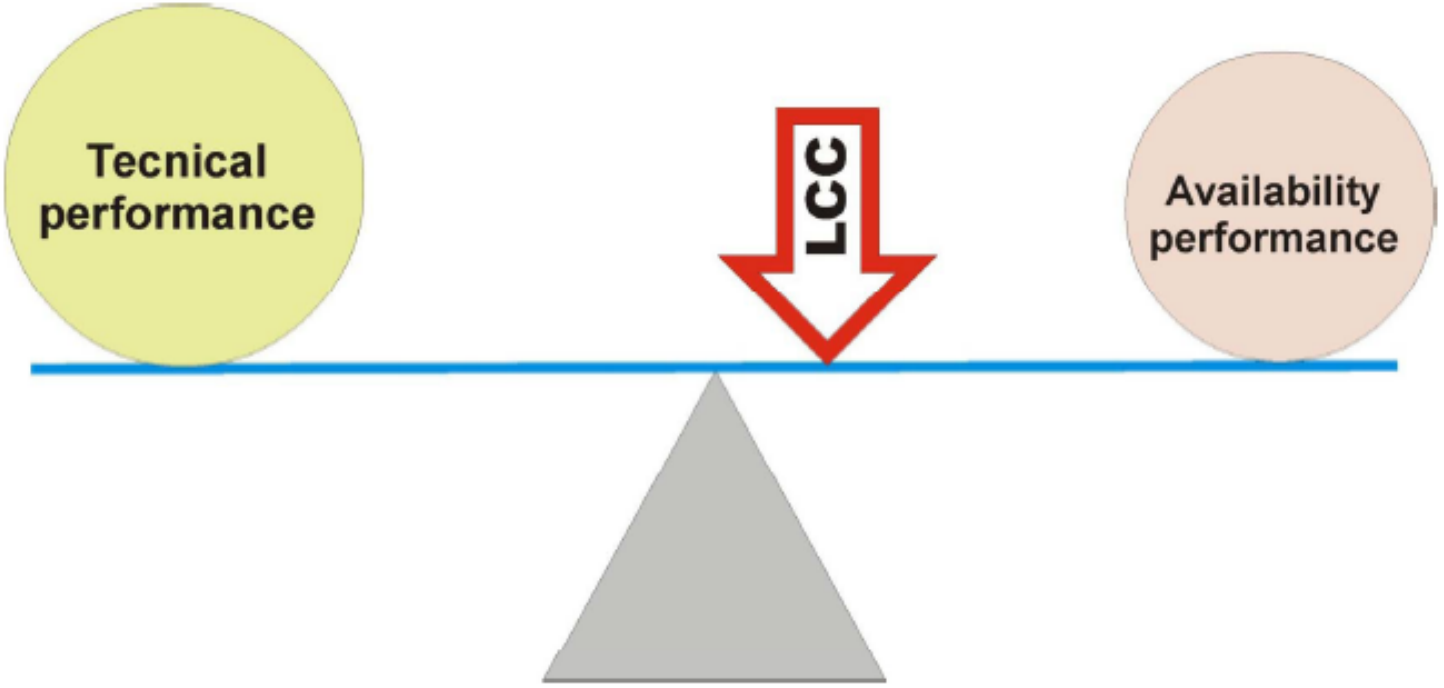
Bathtub curve

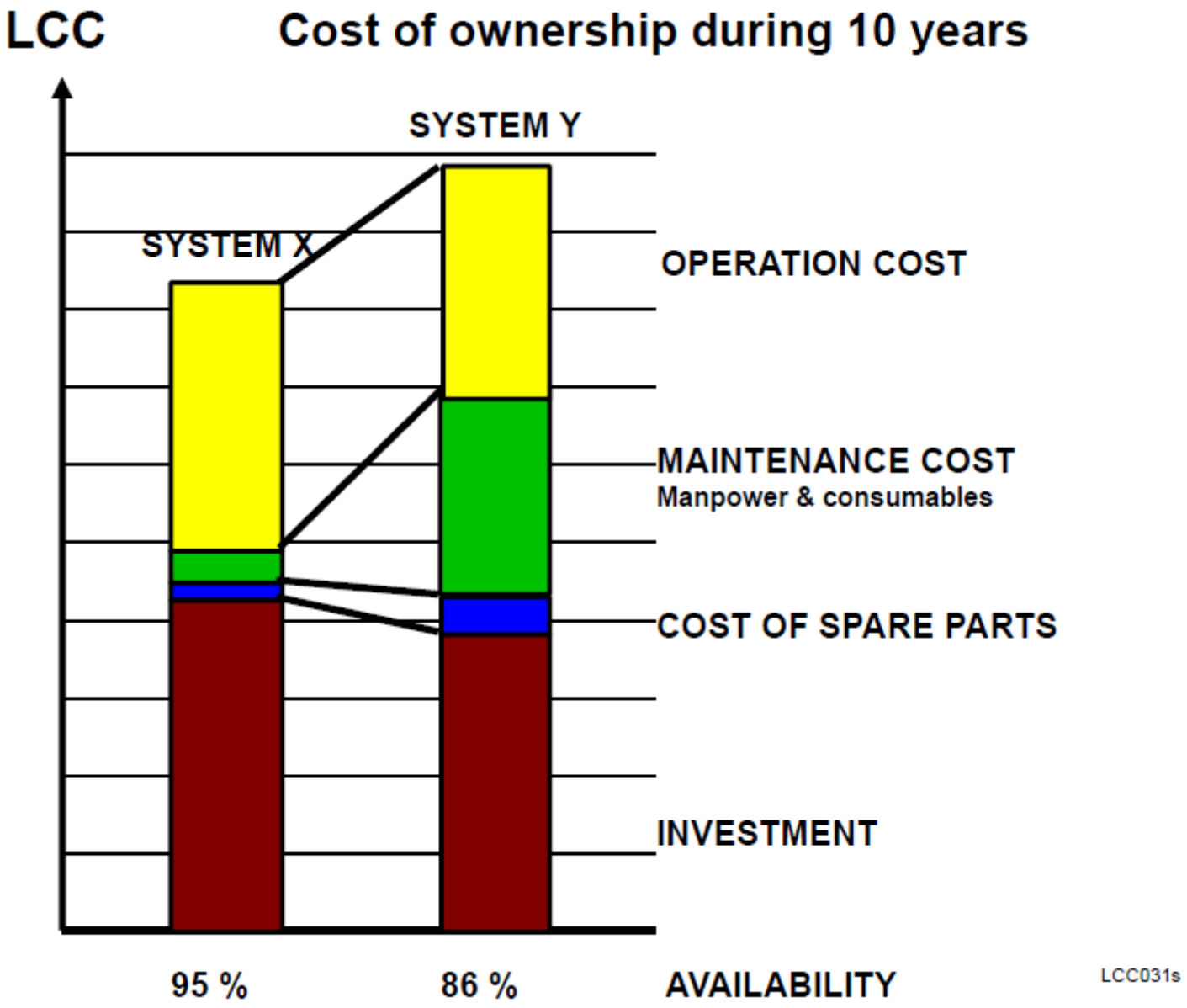


LCC when purchasing new equipment

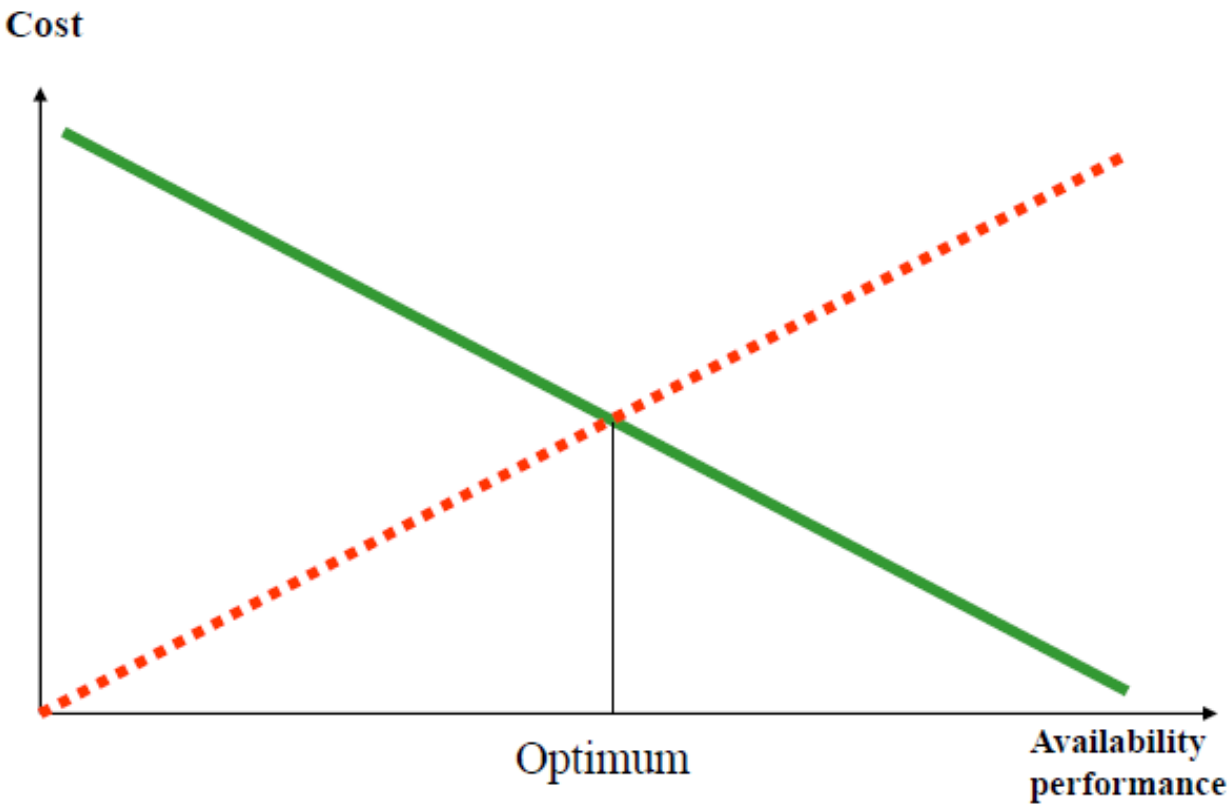


LCC when purchasing new equipment




LCC
Cost of ownership during 10 years
SYSTEM Y
SYSTEM X
OPERATION COST
MAINTENANCE COST
Manpower & consumables
COST OF SPARE PARTS
INVESTMENT
95 %
86 %
AVAILABILITY
LCC031s

LCC when purchasing new equipment



LCC = CI+NY(CO+CM+CS)

LCC = Life cycle cost (Cost for ownership)
CI = Investment cost
CO = Yearly operation cost
CM = Yearly cost for maintenance
CS = Yearly cost for down time
NY = Number of years in the calculation

- Perform prediction
- Collect information from similar systems
- Collect information from suppliers
- Collect information from financial department
- Use own experience

REASONS WHY THE LCC DATA IS MISSING IN PROPOSALS

- We have not asked for them
- The tender doesn't have them
- The tender is reluctant to hand them over

INVESTMENT COST = CI
CI=CIM+CIB+CIE+CIR+CIV+CID+CIT

CIM = Investment in equipment, fittings, machines, electrical and control equipment

CIB = Investment in buildings and roads

CIE = Investment in electrical installations

CIR = Investment in spare parts

CIV = Investment in tools and maintenance equipment

CID = Investment in technical documentation

CIT = Investment in training

ANNUAL OPERATION COST = CO

CO=COP+COE+COC+COV+COT

COP = Labour cost for operators
COE = Cost for energy
COC = Cost for chemicals
COV = Cost for transports
COT = Cost for continuous training of operators

ANNUAL MAINTENANCE COST = CM

CM = CMP+CMM+CPP+CPM+CRP+CRM+CMT

CMP = Labour cost for corrective maintenance.
CMM = Material/Spare part cost for corrective maintenance.
CPP = Labour cost for preventive maintenance.
CPM = Cost for equipment and material, preventive maintenance.
CRP = Labour cost for reconditioning.
CRM = Material cost for reconditioning.
CMT = Cost for continuous training of maintenance personnel.

ANNUAL DOWN TIME COST = CS
CS = NT x MDT x CLP

NT = Number of times per year the unit is down for maintenance

MDT = Mean Down Time (hours)

CLP = Cost for lost operation or other losses due to maintenance ($ / hour)


KTH
VETENSKAP
OCH KONST

SLUT