Life Cycle Cost Management

Optimise lifecycle costs with Liebherr innovations.

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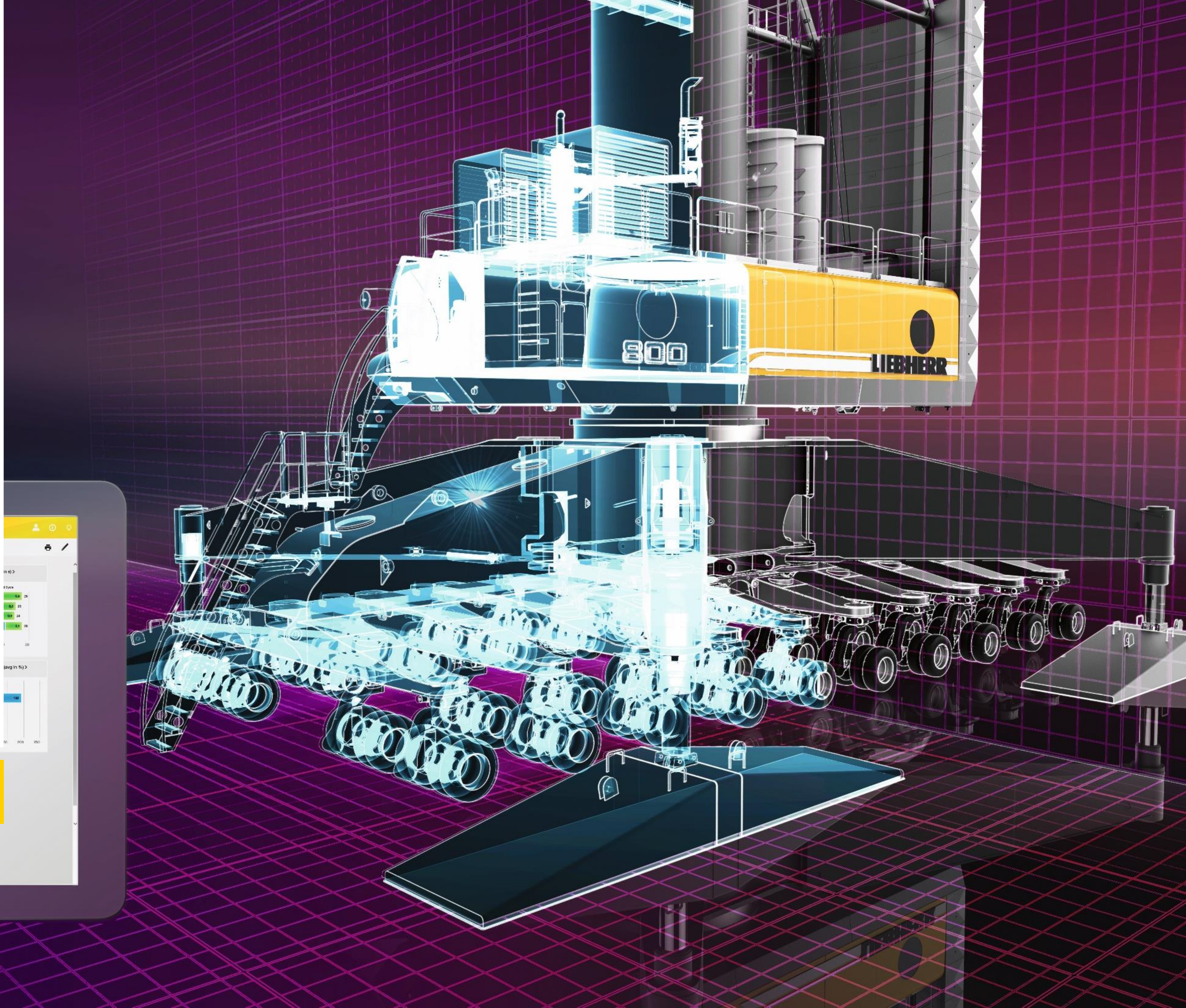
Maritime Cranes



Maritime production network

Facts & figures

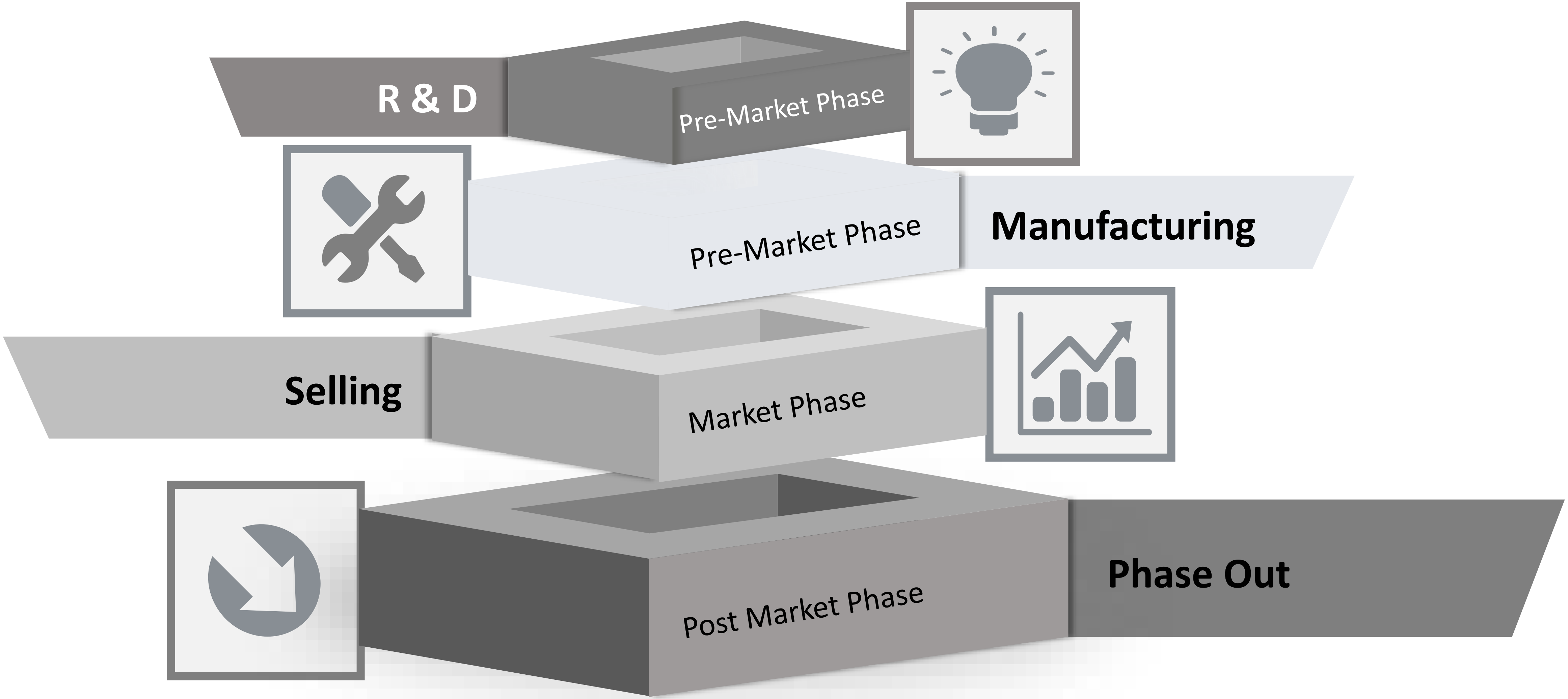
1.21 B €
Turnover (2020)

5,010
Employees (Jan 2020)

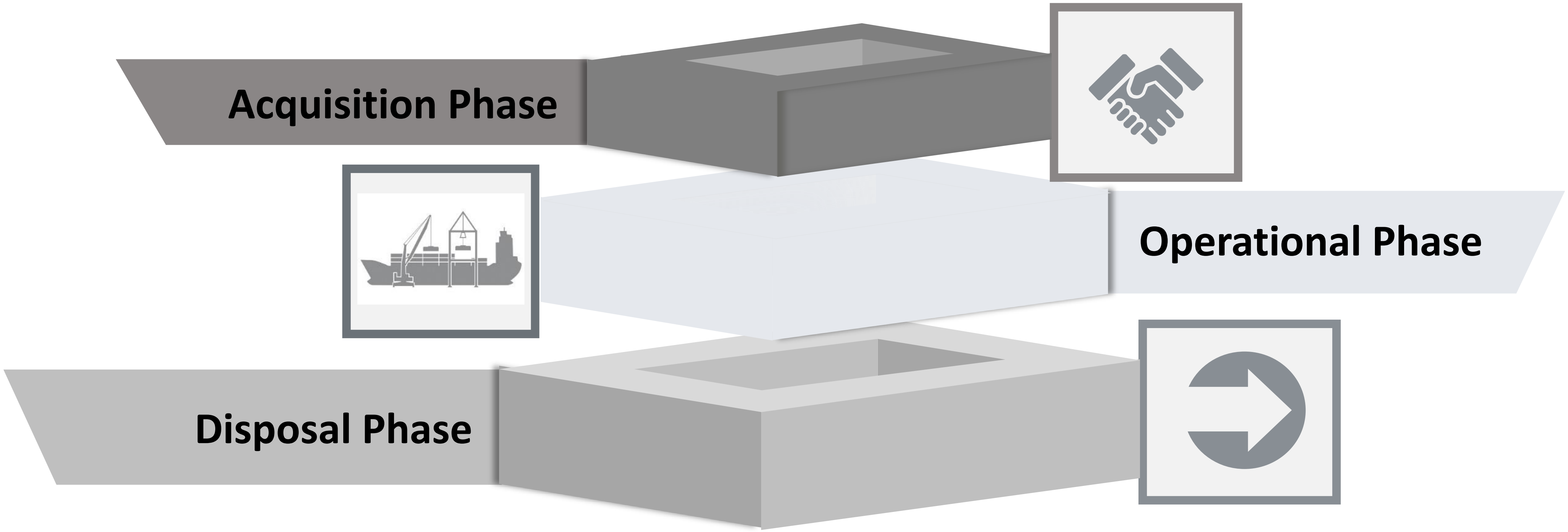
2,110.000
Production hours (2020)

42
Companies worldwide

Manufacturer perspective



Customer perspective



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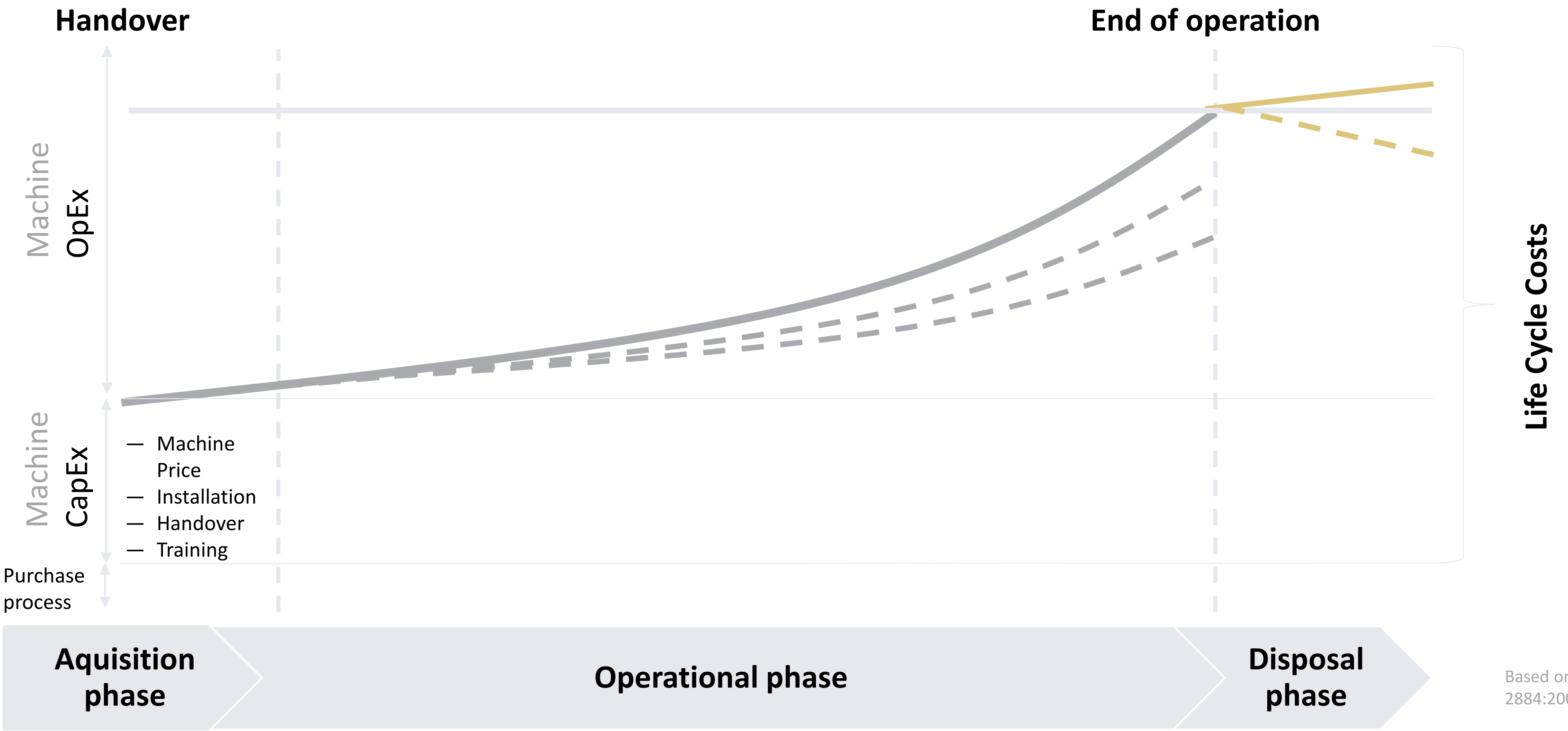
Customer perspective



Based on VDI 2884:2005-12

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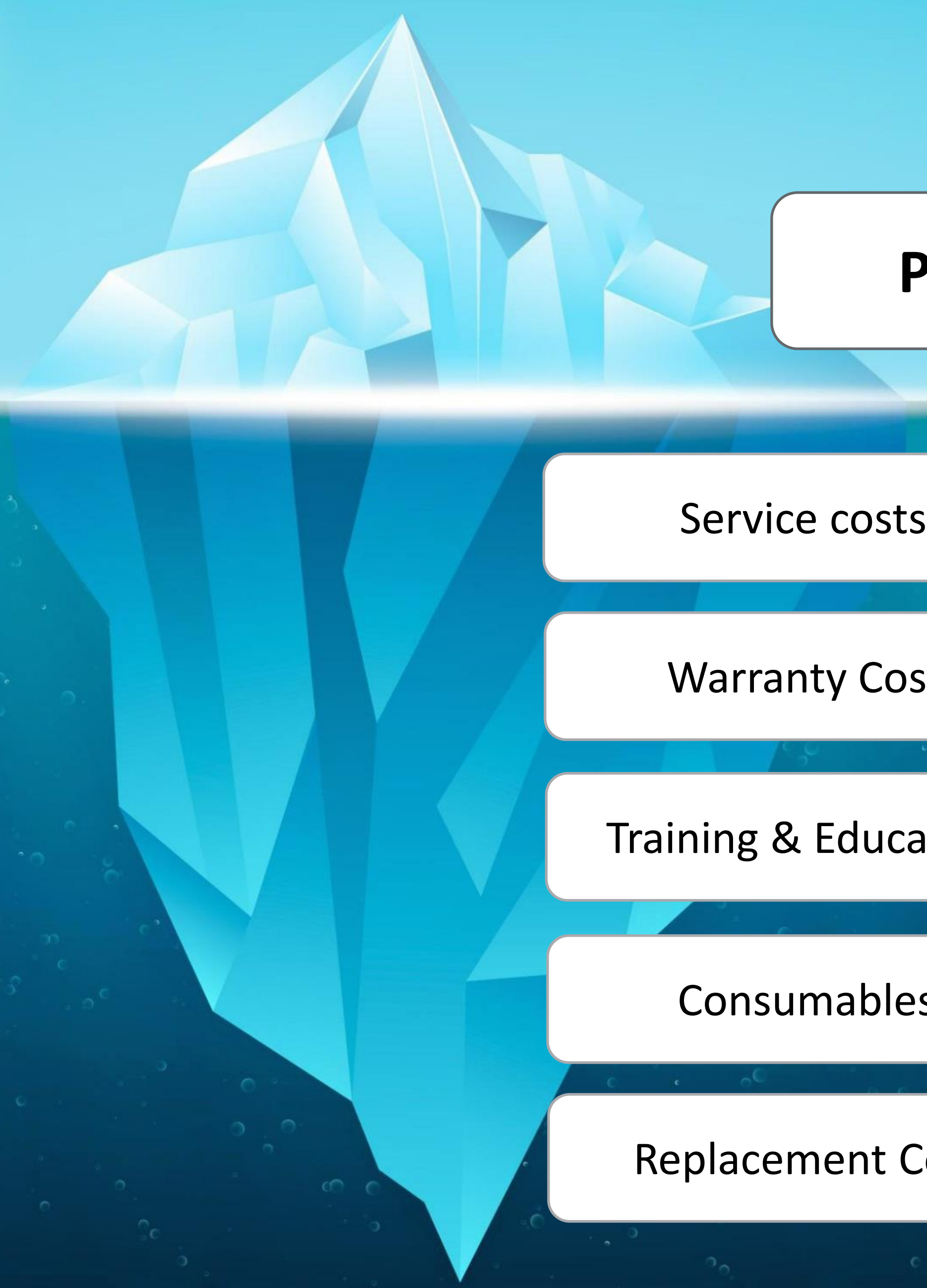
Why is life cycle management important?

Because the majority of costs is not transparent.



Product Price

- Service costs
- Energy costs
- Warranty Cost
- Insurance
- Training & Education
- Labor Cost
- Consumables
- Maintenance Cost
- Replacement Cost
- Spare Parts

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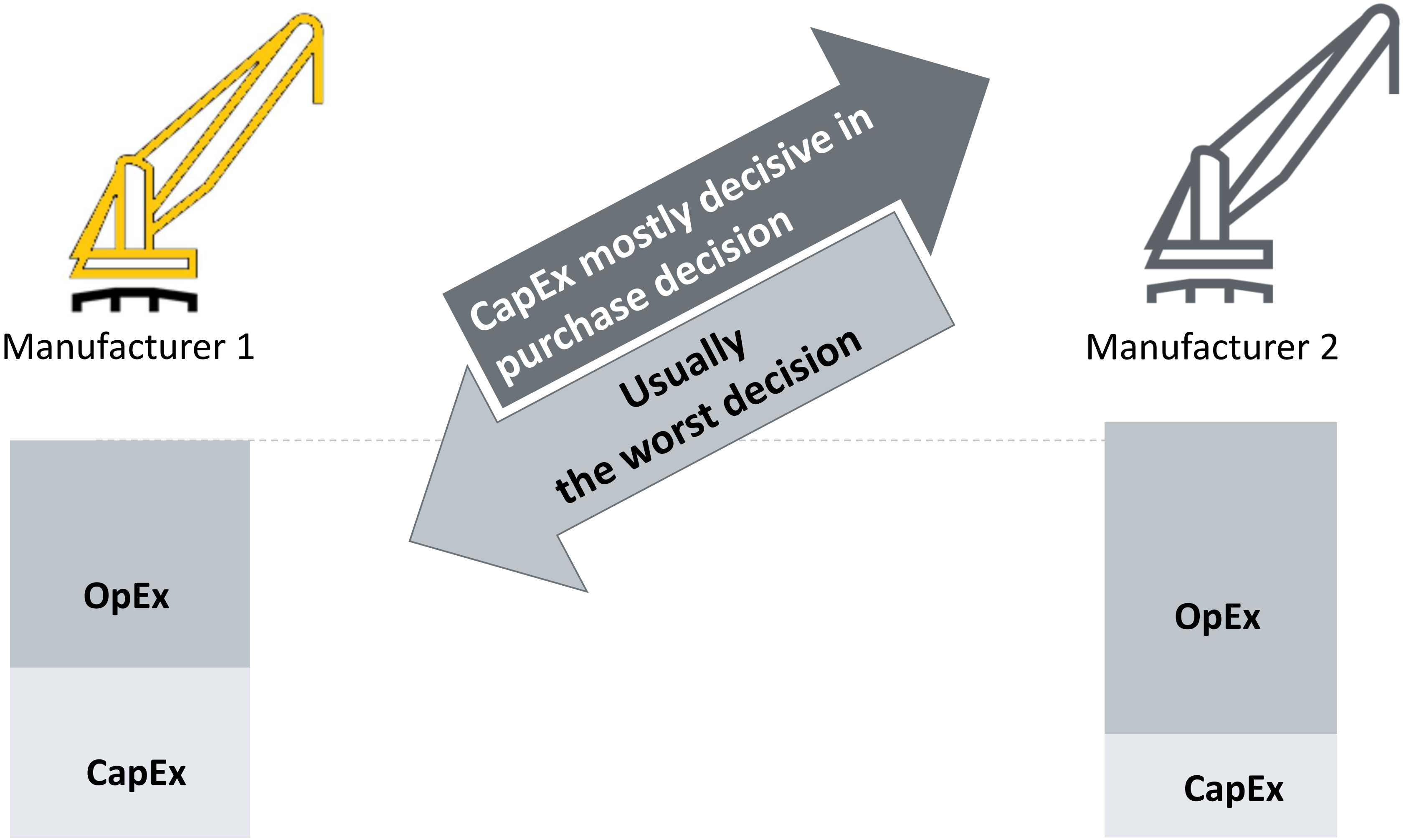
Why is life cycle management important?



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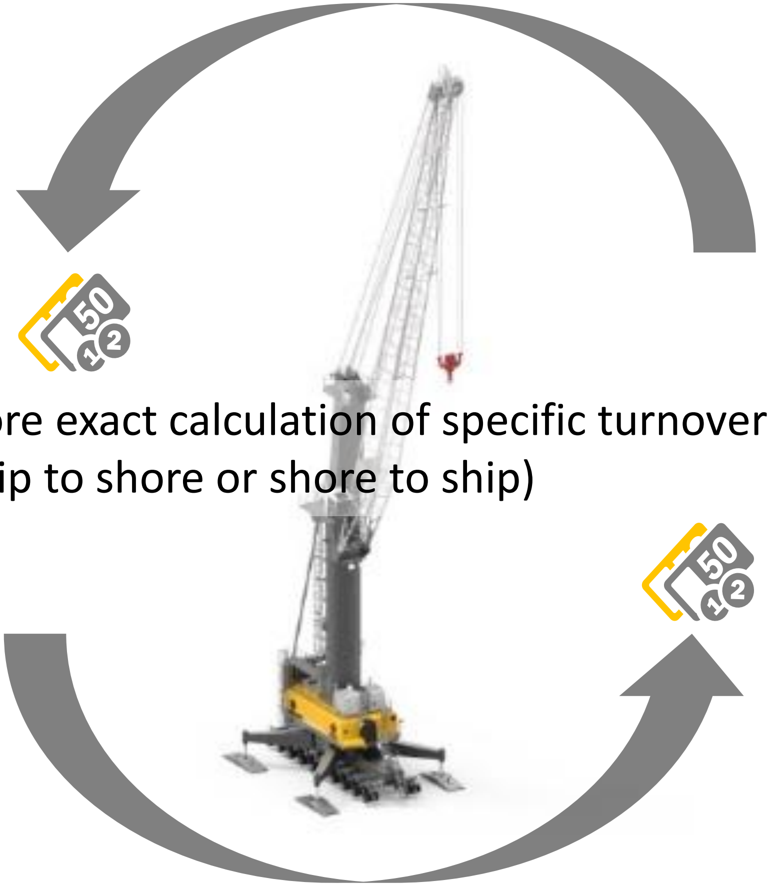

— More exact calculation of specific turnover costs (ship to shore or shore to ship)

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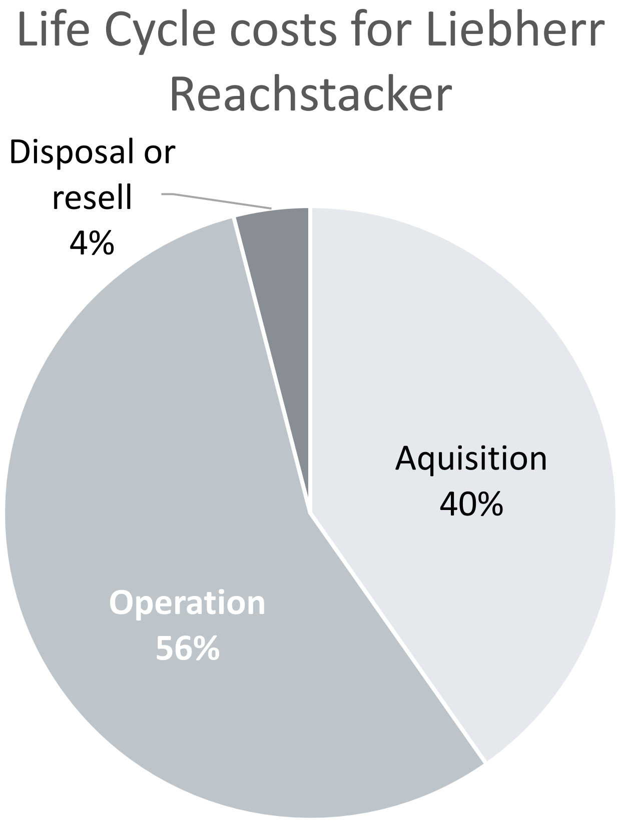
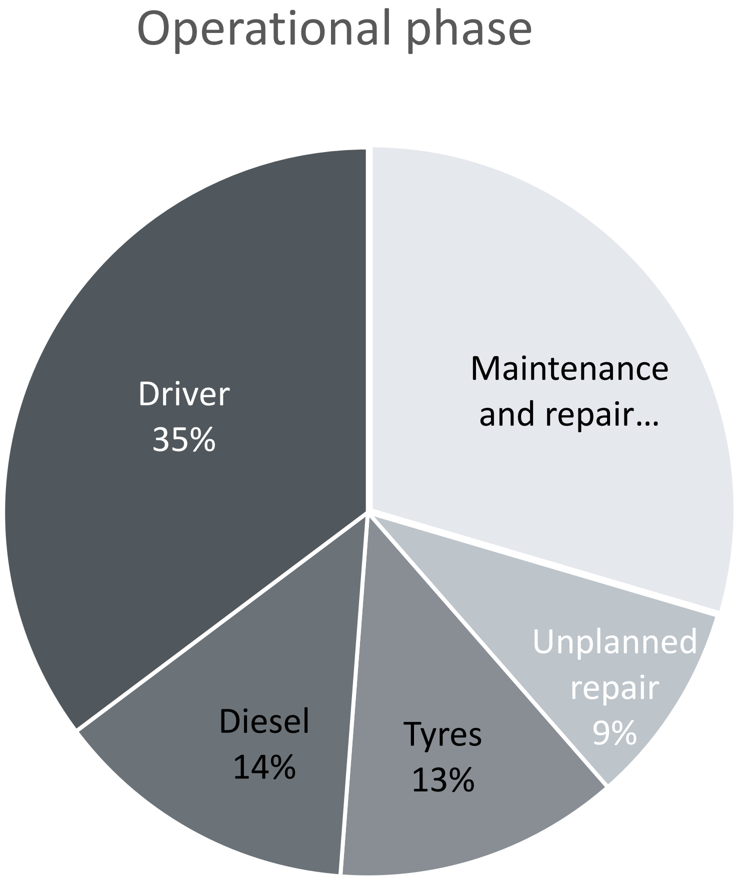
Why is life cycle management important?





How life cycle costs are calculated

Projektdaten		
Betrachtungszeitraum:	5	[Jahre]
Betriebsstunden pro Jahr:	2000	[Stunden/Jahr]
Stückzahl pro Jahr:	39000	[Einheiten/Jahr]
Anzahl der Maschinen:	1	

Prognose der Lebenszykluskosten nach VDMA 34160 - Durchschnittsrechnung

Code	Beschreibung	Anbieter	Kunde	Wert	Summe
E	**Entstehungsphase**		**383.000 €**		**383.000 €**
E1	Beschaffung		**383.000 €**	**383.000 €**	
E2	Infrastrukturkosten				
E3	sonst. Entstehungskosten				
B	**Betriebsphase**	**18.897 €**	**661.173 €**		**680.071 €**
IH1	Wartung und Inspektion	**15.528 €**	**144.979 €**	**160.507 €**	
IH2	Instandsetzung	**3.369 €**	**27.317 €**	**30.686 €**	
IH3	Ungeplante Instandsetzung		**56.933 €**	**56.933 €**	
RK1	Raumkosten			**- €**	
MK1	Materialkosten			**- €**	
EK1	Energiekosten			**- €**	
HB1	Hilfs- und Betriebsstoffe		**204.445 €**	**204.445 €**	
EN1	Entsorgungskosten			**- €**	
PK1	Personalkosten		**227.500 €**	**227.500 €**	
WK1	Werkzeugkosten			**- €**	
RU1	Rüstkosten			**- €**	
LK1	Lagerkosten			**- €**	
SO1	sonst. Betriebskosten			**- €**	
V	**Verwertungskosten**		**-38.300 €**		**-38.300,00 €**
V1	Rückbau				
V2	Restwert		**-38.300 €**	**-38.300 €**	
V3	sonst. Verwertungskosten				
LCC	**Prognostizierte Lebenszykluskosten**				**1.024.771 €**

- Using calculation standard VDMA 34160
- Calculation differs from customer to customer
- Invite you to calculate your case with us.

Life Cycle Costs: Further factors of influence

Crane is classified according to A – Appliance groups

Load spectrum class (Spectrum factor k_p)	Total duration of use - Class of utilisation (number of hoisting cycles)									
	---------------	-----Irregular use-----	-----------	--Reg. light use--	-R. intermitt. use-	-Irr. intensive use-	--------------	-----Intensive use-----	----------	
	U0 16.000	U1 16.000 32.000	U2 32.000 64.000	U3 63.000 125.000	U4 125.000 250.000	U5 250.000 500.000	U6 500.000 1.000.000	U7 1.000.000 2.000.000	U8 2.000.000 4.000.000	U9 >4.000.000
Q1 $k_p < 0.125$	A1	A1	A1	A2	A3	A4	A5	A6	A7	A8
Q2 $0.125 < k_p < 0.250$	A1	A1	A2	A3	A4	A5	A6	A7	A8	A8
Q3 $0.250 < k_p < 0.500$	A1	A2	A3	A4	A5	A6	A7	A8	A8	A8
Q4 $0.500 < k_p < 1.000$	A2	A3	A4	A5	A6	A7	A8	A8	A8	A8

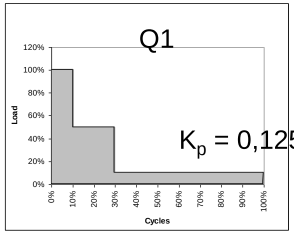
Durability of steel work and components, usually evaluated by FEM rating

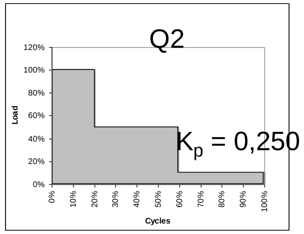
$k_p = \sum\left[(P_i/P_{max})^m * (c_i/c_T)\right]$

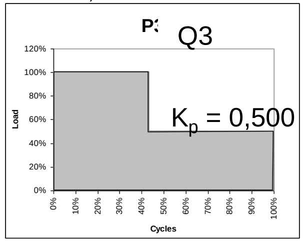
(for steel construction m≈ 3)

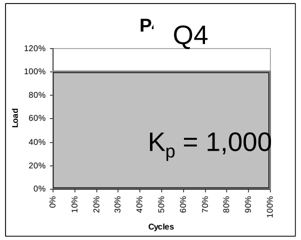
P_i=individual load magnitudes characteristic of the duty of the crane (load levels)
P_{max}=heaviest load that can may be handled by the crane (rated load)
c_i=average number of load cycles which occur at the individual load levels
c_T=total of all the individual load cycles at all load levels

Examples for standard – load spectrum classes









Life Cycle Costs: Drive technologies

Pure Electric Drive

- No Hydraulic
- Water cooled main components
- High turnover performance

Life Cycle Costs: Drive technologies

Pure Electric Drive without hydraulic

—Technology for emission free crane operation

—Increasingly important as Co2 emissions become more expensive to meet climate targets

Electro Hydraulic Drive