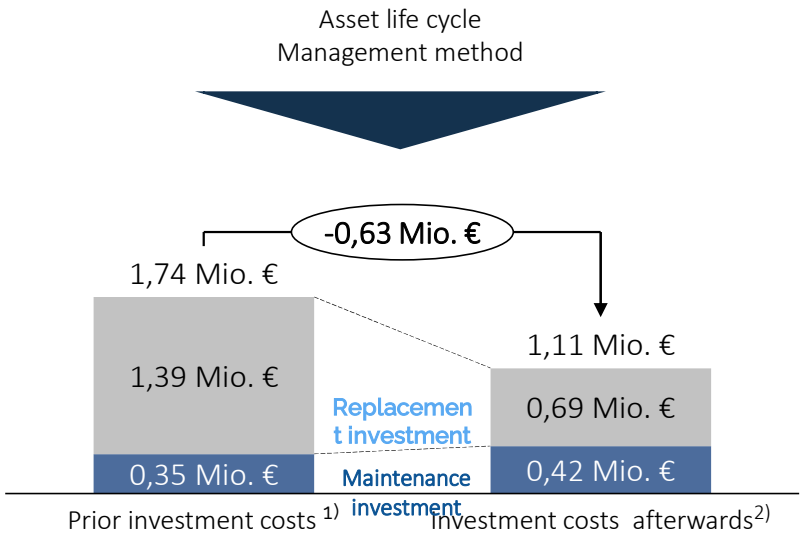
Economic leverage - investment costs are reduced by postponing/avoiding investments. The benefit-cost ratio of projects is > 5:1

Fixed assets Production facilities

Annual investment volume for the maintenance and replacement of existing systems

(1 - 2% of fixed assets)



Optimization mix of replacement and maintenance investment

Example calculation

Project implementation costs	
Expenditure	Costs
20 - 40 days ext.	Ext. costs: € 0.075 million
20 - 60 days int.	Int. costs3)0 .015 million €
	Total implementation costs: € 0.09 million

Project return	
Benefit/cost ratio (return on investment)	7: 1
Avoided investment costs	0.63 million €

1) Investment costs = interest (3%) + repayments (8.6%) for repayment in 10 years, 80% new investment, 20% maintenance

2) Maintenance investment: 40% of the costs new investment; service life of the measure 10 years

3) 80 t€ employee costs per year; 220 days per year

Strategic options for action - feasibility analysis regarding a procurement strategy for discontinued OEM spare parts

Based on the supplier evaluations, a procurement strategy for discontinued OEM spare parts is derived for each spare parts strategy

ET strategy	Build-up ET stock	Repair of spare parts	Spare part reproduction	Installation of successor component with system conversion	Retrofit strategy
Approach	/ Stock of critical ET until EoL[1)] / Replace in case of failure, replace defective parts if possible	/ Stock of critical ET (2 pieces) / Replace in case of failure, send in defective parts	/ Reproduction of critical ET (2+) / Replace in case of failure, reorder parts	/ Adapt system design / Use successor component and place in stock	/ Modernization of the control technology to the current state of the art / Replace entire critical system with current technology
Partner	/ OEM and specialized companies for widely used parts from large manufacturers (e.g. Siemens)	/ OEM and specialized companies for widely used parts from large manufacturers (e.g. Siemens)	/ Specialized companies for widely used parts from large manufacturers (e.g. Siemens)	/ Specialized companies for widely used parts from large manufacturers (e.g. Siemens)	/ OEM and specialized companies

Extrapolation of sales volume for discontinued spare parts

/ No. of crit. Spare parts without stock or inventory = 1 / Xx EUR part value / Minimum stock = 2 for reproduction & repair	/ Xx repairs / Xx repair parts / Xx EUR part value / Yy% repair costs of parts price	/ Xx replicas / Xx EUR part value / Yy% reproduction costs compared to parts price	/ Xx successor components / Xx EUR part value / Yy% rebuild costs from parts price	/ Xx retrofit projects / Yy% Project costs of new system

1) End of Life

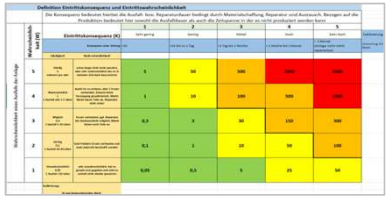
Expansion of risk-based plant status - further development of standards for the condition and risk assessment of production plants

Assessment based on the asset life cycle management methodology

Standardized, comprehensible decision-making basis for maintenance and investment decisions

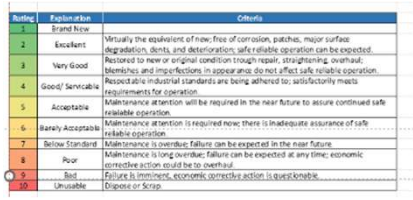
Risk assessment (risk of failure)

- Evaluation of critical spare parts in terms of availability and alternatives
- Determination of maximum tolerated risk with market (marginal risk)
- Show annualized risk costs



Condition assessment

- Evaluation of the system status from performance and maintenance data
- If a limit value is exceeded (e.g. technical faults, urgency rate), the system risk check is triggered



Rating	Evaluation	Criteria
1	Brand New	
2	Excellent	Virtually the equivalent of new; free of corrosion, patches, major surface degradation, dents, and deterioration; safe reliable operation can be expected.
3	Very Good	Restored to new or original condition trough repair, straightening, overhaul; blemishes and imperfections in appearance do not affect safe reliable operation.
4	Good/ Servicable	Respectable industrial standards are being adhered to; satisfactorily meets requirements for operation.
5	Acceptable	Maintenance attention will be required in the near future to assure continued safe reliable operation.
6	Barely Acceptable	Maintenance attention is required now; there is inadequate assurance of safe reliable operation.
7	Below Standard	Maintenance is overdue; failure can be expected in the near future.
8	Poor	Maintenance is long overdue; failure can be expected at any time; economic corrective action could be to overhaul.
9	Bad	Failure is imminent, economic corrective action is questionable.
10	Unusable	Dispose or Scrap.

Regular inspection with a focus on

- Portfolio change
- Discontinuation/failure of function-critical spare parts
- Exceeding limit values during operation

Risk-based system status

Traffic light system

Red	Apply asset life-cycle management methodology
Yellow	Early warning indicator => system optimization[2] => O.E.E. optimization
Green	No need for action

- Systematic system evaluation using a traffic light system
- Enables investment requirements to be forecast

1) e.g. once a year if the system is > 10 years old

2) ConMoto risk and reliability-oriented maintenance strategy, ConMoto value and risk-oriented maintenance planning

Five requirement areas - demand and risk analysis Asset monitoring and asset planning