Johannes Messer – Consulting GmbH

„Turbulent times“

The key EBITDA levers in the HPDC-Industry

Management Summary overall project

Part 1 tool management

Hünnecke 7 | 59889 Eslohe – Wenholthausen | Tel.: + 49 2973 6021 | Mobil: + 49 151 11519779 | eMail: jm@johannes-messer-consulting.de

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Overall Project Management Summary (1/3)

- The strong growth of the German economy in recent years will most likely not be achieved in 2019, as it was in 2018. Leading economic research institutes repeatedly revised their forecasts downwards in the fourth quarter of 2018 **(2.2% → 1.8% → 1.6%).**

- The major causes from the point of view of the global economy as a whole were mainly
  - current **world trade conflicts** (USA / China) and
  - **upcoming Brexit**.

- The automotive industry, the key industry in the foundry industry, faces **major challenges** alongside the slowdown in sales. Autonomous driving, digitization in road traffic, car sharing and electrification as a result of the stricter CO2 requirements determine the current development challenges.

- Deriving from the "revolutionary" changes in the environment, the foundry industry faces **4 major challenges**
  - Internationalization
  - Changed product portfolio
  - New technologies
  - Employee recruiting

- As a consequence, the foundries now have to adapt their **business model to the new situation**
  - Revision of the strategy
  - Focus the technology roadmap
  - Enter partnerships
  - Adaptation of the corporate culture
  - Improvement of the management quality
  - .... and with the **highest priority to improve the earnings situation**

Overall Project Management Summary (2/3)

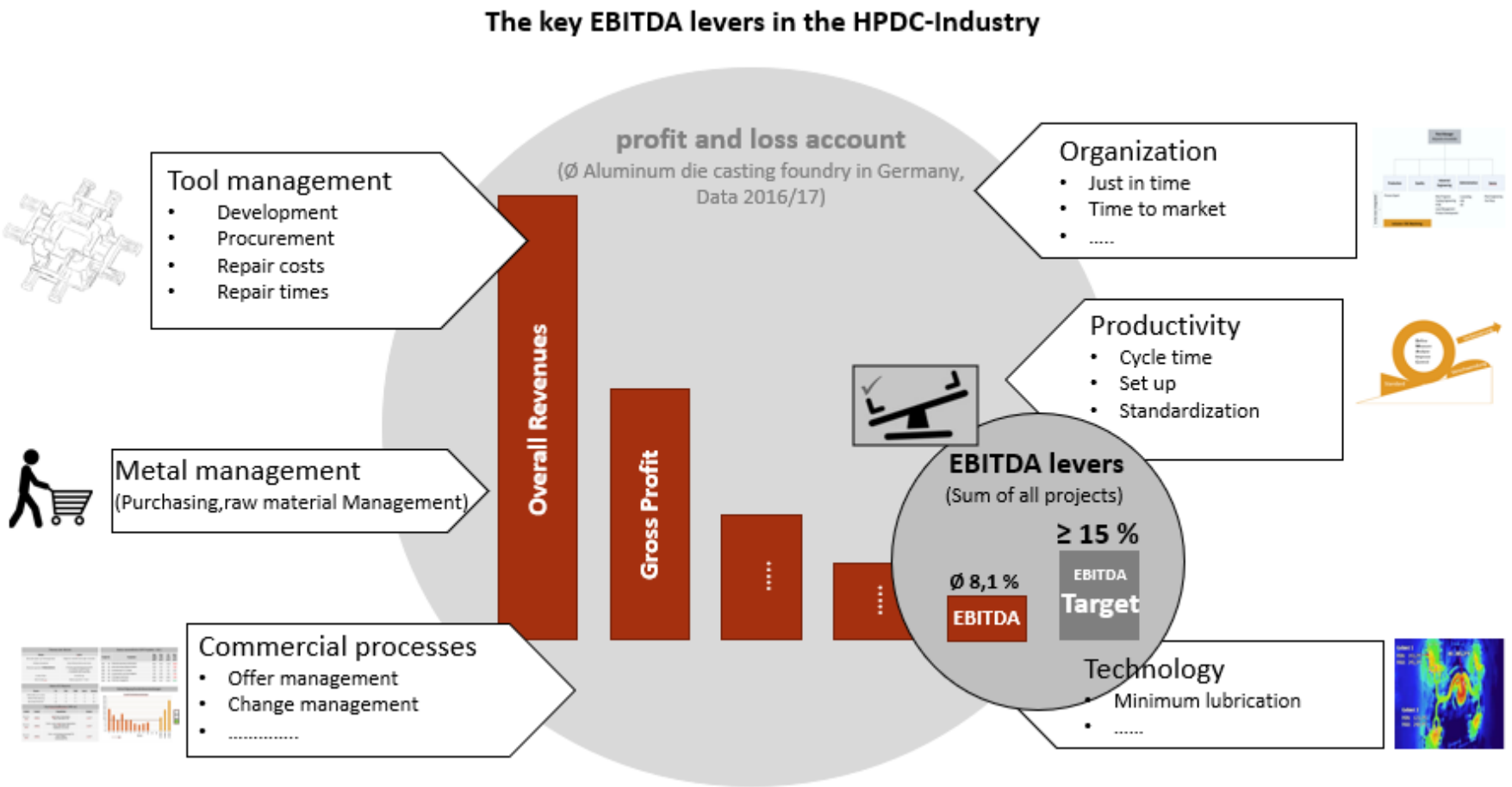
- Under the mentioned conditions, a further **deterioration** in the already low **EBITDA margins** of the German aluminum foundries is expected for 2019 (Ø EBITDA 2016 - 2017 ≈ 8.1%).

  Improving earnings quality has top priority from now on. First insolvencies of important market participants from the 4th quarter of 2018 emphasize this requirement. In addition, the "restlessness" is already perceptible elsewhere. In many companies in the foundry industry, significant management changes took place in the second half of 2018 right up to the top management levels.

  As a way out of misery, the following study was prepared: **The key EBITDA levers in a HPDC foundry.**

Overall Project Management Summary (3/3)

As part of a six-part series, **the key EBITDA levers** in a HPDC foundry will be examined in more detail and approaches for short-term and sustainable improvement will be demonstrated. The beginning is the topic of **tool management**.



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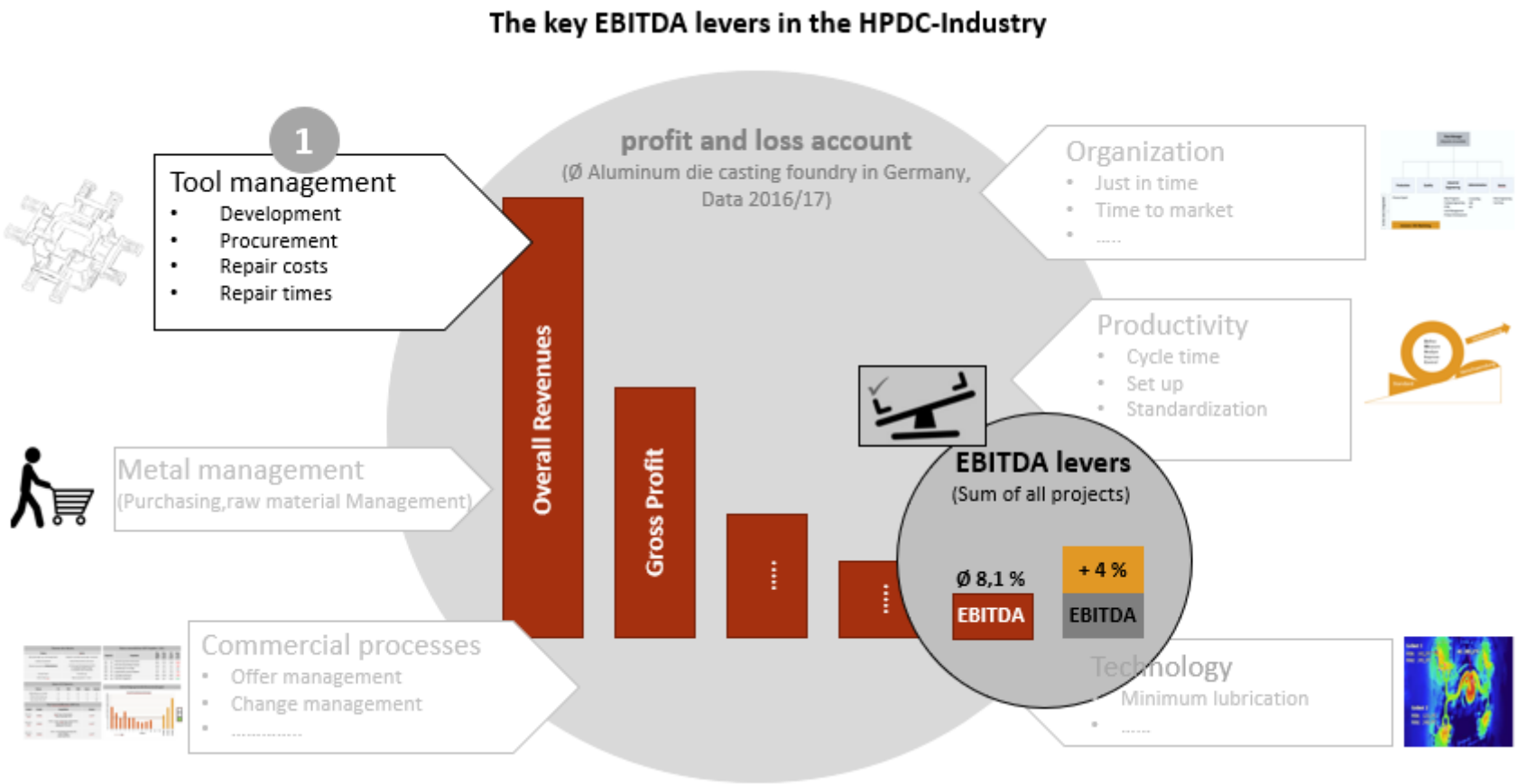
Part 1 Tool management Introduction

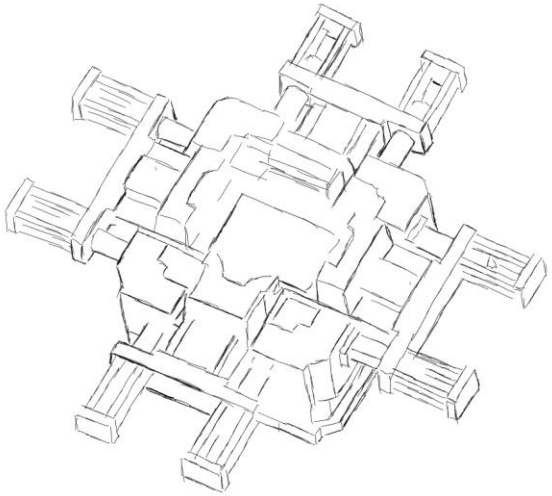
As part of a six-part series, the **first part** deals with the subject of **tool management**. Due to increased customer requirements, an extension of the depth of added value, flexibility and internationalization the requirement profile for the foundries has changed significantly. New opportunities but also risks have arisen. The subject of tool management as one of the most **important influence levers** on the **company result** has also gained importance in this context.



Procurement, repair and OEE losses

This work focuses on the areas of tool procurement costs, tool repair costs and OEE losses in the foundry (tool repair times). The existing **"EBITDA levers"** are of **existential importance** for every HPDC foundry.

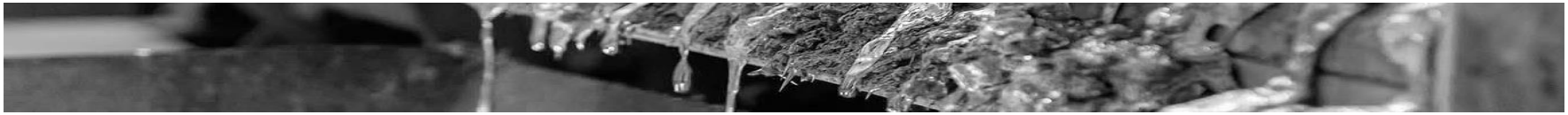
This becomes clear when we look at the key cost items of these levers and their impact on the profit and loss account.



The following document was created to highlight the importance of tool management for **EBITDA** and to present approaches for **short-term, sustainable and significant** earnings improvement.

„Turbulent times“ The key EBITDA levers in the HPDC-Industry

Contend tool management



A

Tool-procurement-costs

B

Tool-repair-costs

C

Production-costs
(OEE losses → Tool repair time)

Result

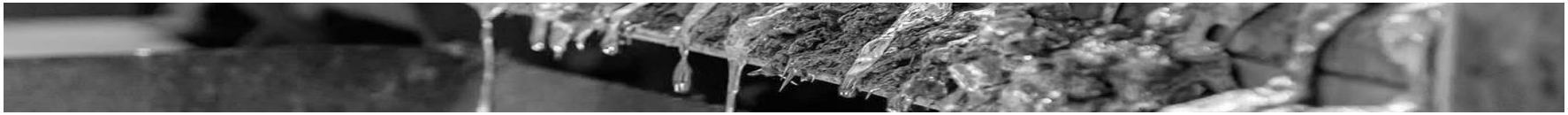
Result
- Any influence of profit and loss account
- To do´s

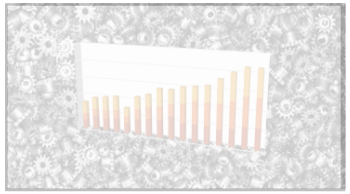
CIP

Cost-reduction
- Example CIP Project: Reduction of tool repair times

Annex

Contend tool management





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Tool procurement costs

The procurement costs of a die-casting tool are severely influenced at the earliest stage of product development. This is one of the reasons why participation in product development (simultaneous engineering) is very important for the foundries. Through a joint development (customer / caster) one is able to develop products and tools that are designed both under casting-technical aspects as well as economically optimal.

Unfortunately, joint development is still a major weakness. On the one hand, it is the customers who still lack the **know-how that many founders require** in their development. On the other hand, not all foundries are able to contribute the necessary development know-how (tool making, casting technology and production technology).

We see the effects of insufficient development (simultaneous engineering) in many areas (production, set-up, repair) and, unfortunately also in tool procurement costs.

The analysis of the profit and loss account of a foundry shows that the average **tool turnover** (predominantly forms) between **8-14% of the total turnover** (see attachment: assumptions about the Ø die casting foundry). As a result, tool procurement costs, as the most important cost items for tool sales, are a major lever in the profit and loss account of a die casting foundry.

The relatively wide range (8-14%) compared various HPDC foundries is essentially founded on:

- the respective product - customer requirements (product portfolio)
- the complexity of tools (product design → tool design)
- the price quality in tool purchasing (... even own production)
- Foundry production philosophy (e.g. promised lifetime)

„Turbulent times“ The key EBITDA levers in the HPDC-Industry

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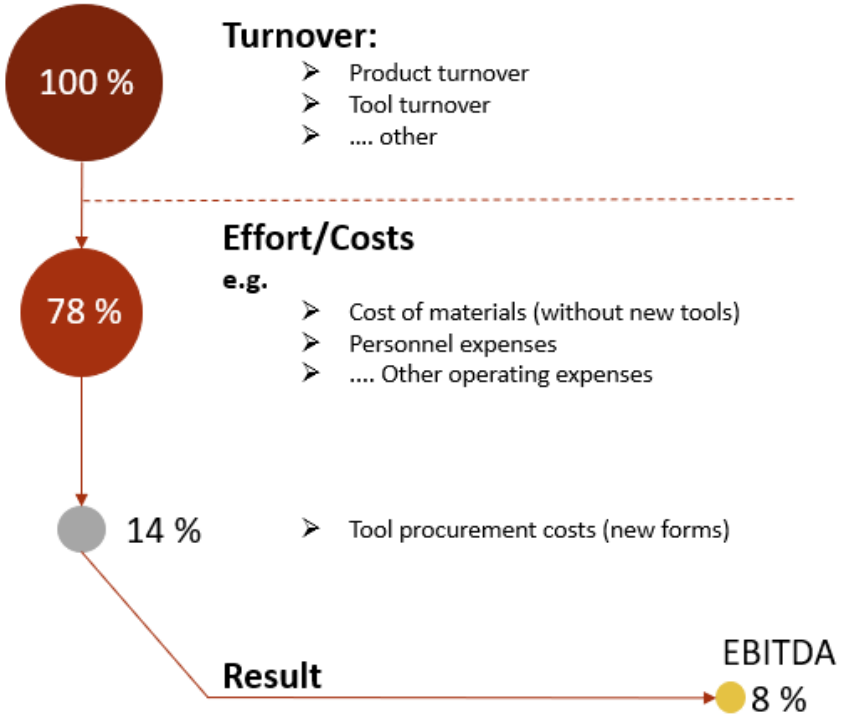
Tool procurement costs

Looking at the impact of **tool procurement costs** on the profit and loss account, we see the **significant importance** and the **large EBITDA leverage** as an approach to CIP projects.

Example: Profit and loss account from a HPDC foundry (simplified)

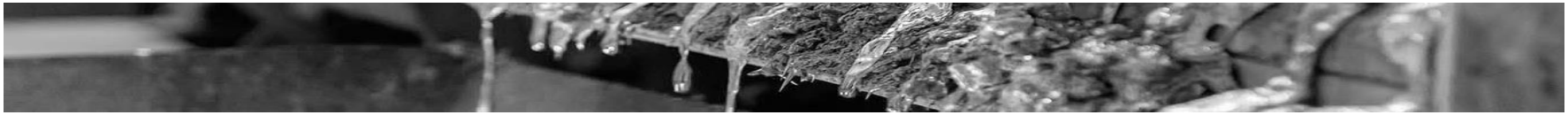


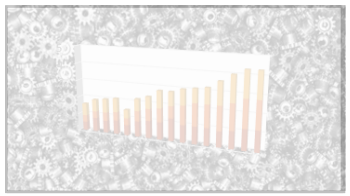
„CIP - levers (Projects)“

- Simultaneous Engineering
  (product development → tool design)
- Optimized purchasing strategy
  - Collaboration (e.g., JV) with tool makers
  - Internationalization
  - ……
- Standardized procurement processes
- Forward looking tool demand management
- …..

The **large EBITDA leverage** (14% tool sales / potential) and the relatively **uncomplicated CIP projects** make the topic "reduction of tool procurement costs" particularly attractive.

Contend tool management





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Annex

Tool repair costs

In addition to the tool procurement costs, the tool repair costs are another relevant cost block.

Based on empirical values and benchmark comparisons, the average **repair costs of a die-casting tool** can be estimated at approx. 60% of tool sales over life time. This corresponds to approx. **5-8% of the total turnover** of the foundry.

Again, the wide range (5-8% of total sales) compared to various foundries is due to reasons similar to those associated with tool procurement costs.

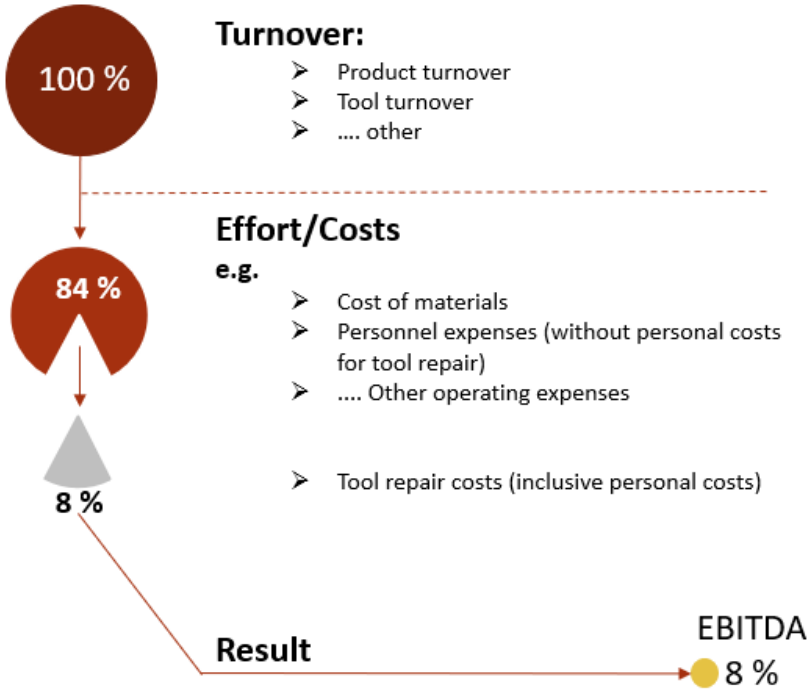
- the respective product - customer requirements (product portfolio)
- the complexity of tools (product design → tool design)
- Foundry production philosophy (e.g. promised lifetime)
- Performance / know-how of the own tool repair department

In contrast to the procurement of the tools, the tool repair is mainly carried out internally. The corresponding cost items can therefore be found in different places in the profit and loss account. Due to the fact that the tool repair is internal, there are many possibilities with CIP projects to design repair processes as needed and to improve their results.

Tool repair costs

Looking at the impact of **repair costs** on the different positions within the profit and loss account, the significant importance and the large **EBITDA leverage** as an approach for CIP projects can also be seen here.

Example: Profit and loss account from a HPDC foundry (simplified)

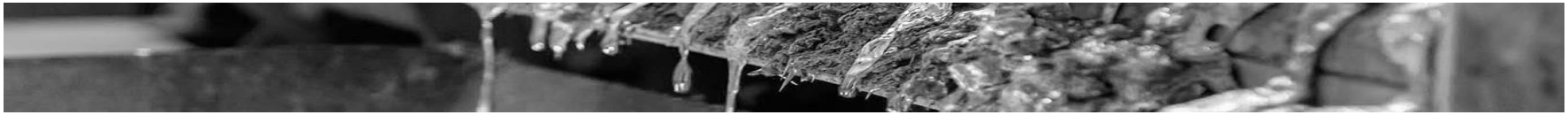


„CIP - levers (Projects)“

- Forward looking tool demand management
- Optimized processes in the tool repair
  - Time and cost specifications
  - .....
- Standardized tool repair orders
- Optimized spare parts management
  - make or buy decisions
- .....

The smaller EBITDA leverage, as well as a greater need for know-how, resources and time within the CIP projects compared to the "reduction of procurement costs", should not prevent die casting foundries to tackle the issue of reducing tool repair costs with high priority.

Contend tool management



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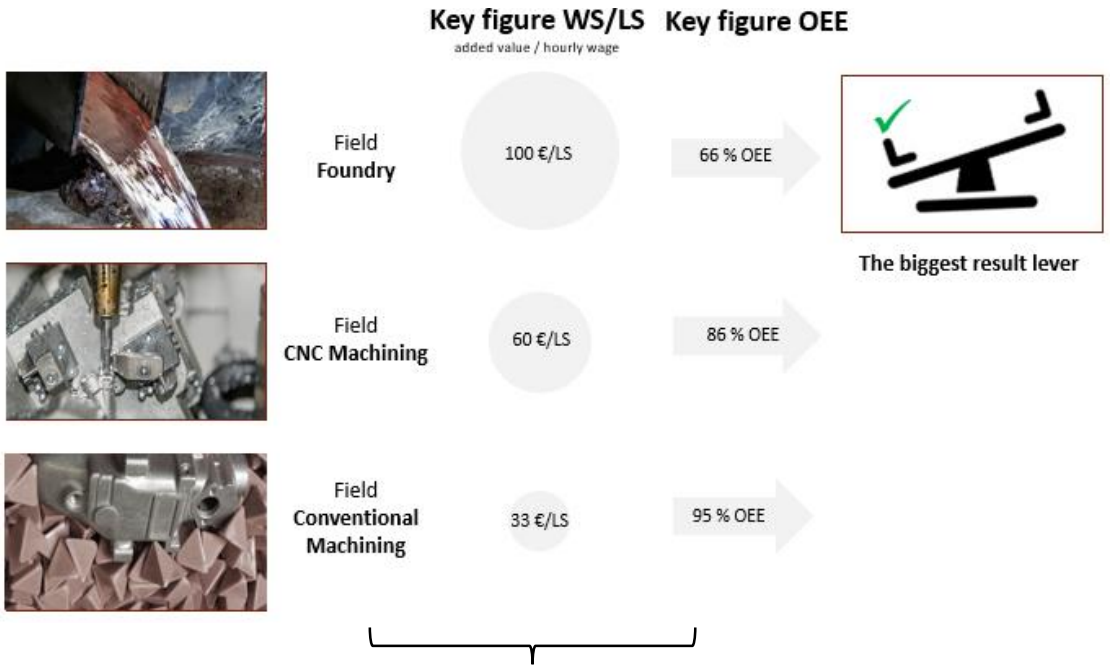
Annex

Production costs Tool availability → OEE

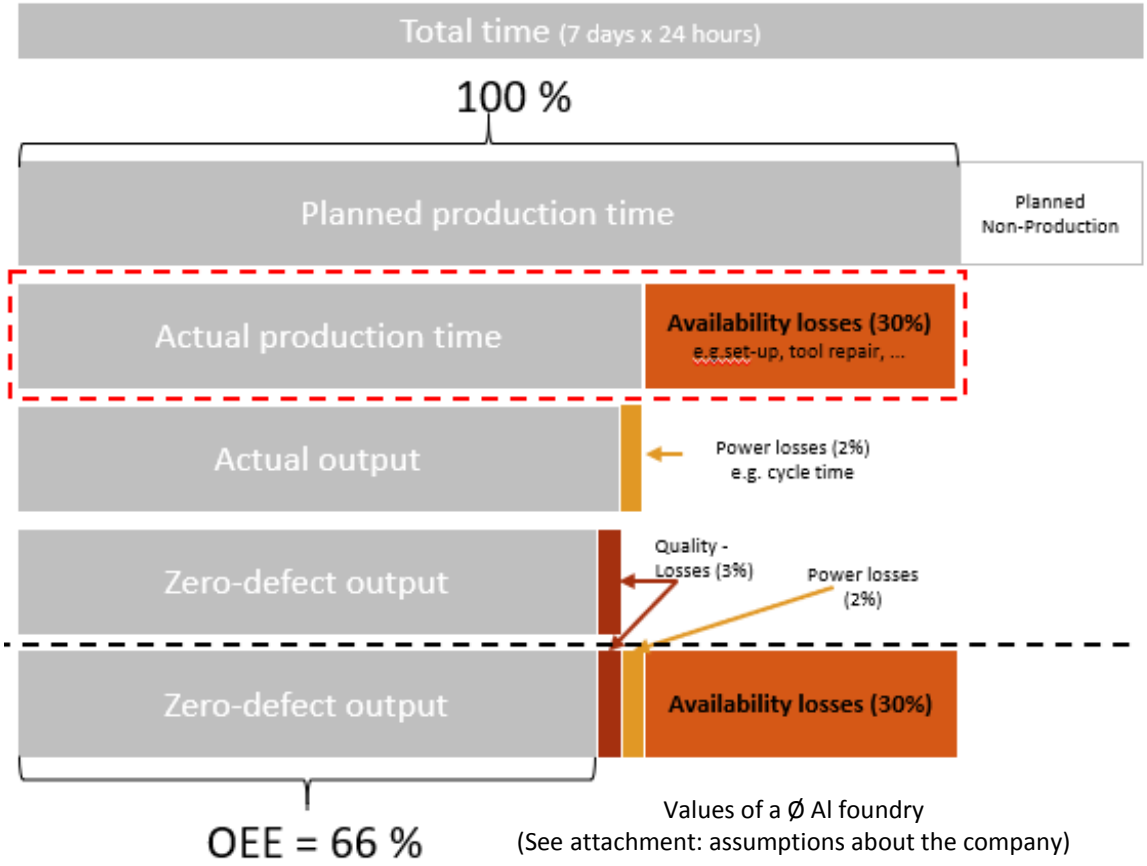
Another important result lever is the OEE (Overall Equipment Efficiency). Here it is above all the OEE within the range foundry, which possesses the largest potential.
This becomes clear, when one looks at the key figures **WS/LS** (added value / hourly wage) and **OEE** of a die casting foundry in the comparison of foundry, CNC machining and conventional machining.



The largest EBITDA lever **(potential OEE = 66% and influence WS / LS = 100 €)** is in the foundry area. On the following pages this will be further detailed and analyzed.

Production costs Analysis OEE (Overall Equipment Effectivness)

Representation of the OEE (average values) in a HPDC foundry.

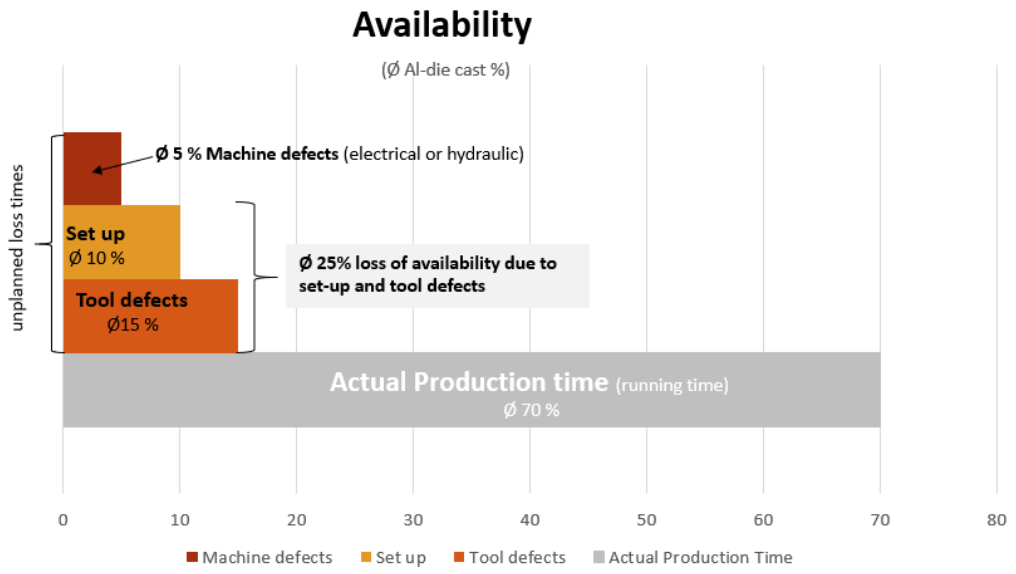


Values of a Ø Al foundry
(See attachment: assumptions about the company)

The **loss of availability** is **the most important lever** for improving the OEE in a die casting foundry.

Production costs OEE → Availability

The loss of availability in a HPDC foundry essentially consists of three areas:



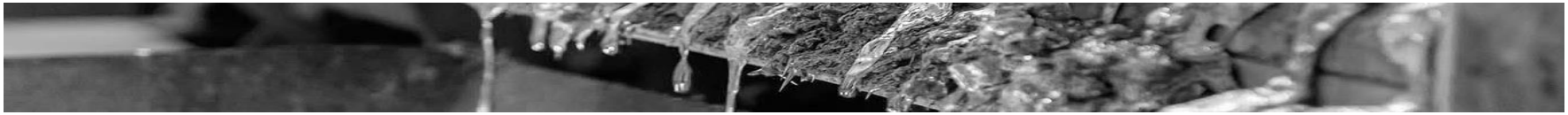
„CIP - levers (Projects)“

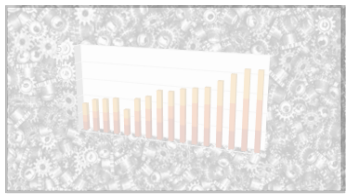
- Reduce setup time
  Increased flexibility: decision tool repair on the machine or tool change
- Reduction of tool repair times
  - Tool repair on the machine
  - …..
- Repair and setup optimized tool design (Simultaneous Engineering)
- ……

The position “tool defects" shows great potential (15%) and should be worked out in every die casting foundry as "permanent" improvement projects (**1% OEE** improvement in the foundry = approx. **0.3% EBITDA** of the company result).

„Turbulent times“ The key EBITDA levers in the HPDC-Industry

Contend tool management





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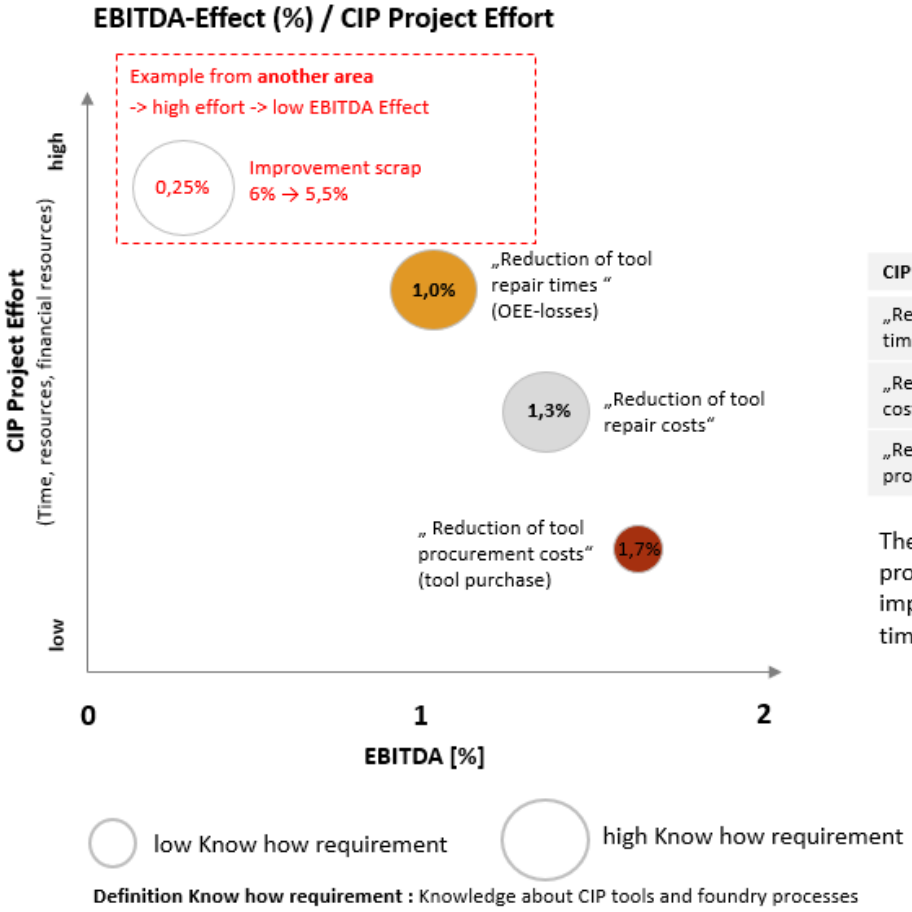
Result Evaluation of tool management CIP lever

The complex topic of tool management shows **big EBITDA levers**. Some of the projects can be implemented with manageable effort (time, resources, financial resources and CIP know-how requirements). The comparison to other CIP projects (see example: Improvement scrap rate) shows the **particular attractiveness** (large earnings effect, low effort) for all **die casting foundries**.



CIP Projects: tool management

CIP Project:	Duration	Target	
„Reduction of tool repair times “	3 Years	Tool repair time 15% → 11,5%	OEE
„Reduction of tool repair costs “	3 Years	8% f. Turnover→ 6,7% f. Turnover	Costs
„Reduction of tool procurement costs “	2 Years	14% f. Turnover→ 12,3% f. Turnover	Costs

The **duration** and the **target figure** of the CIP projects were chosen so that they can be implemented in the foundries with “reasonable" time, resources and know-how.

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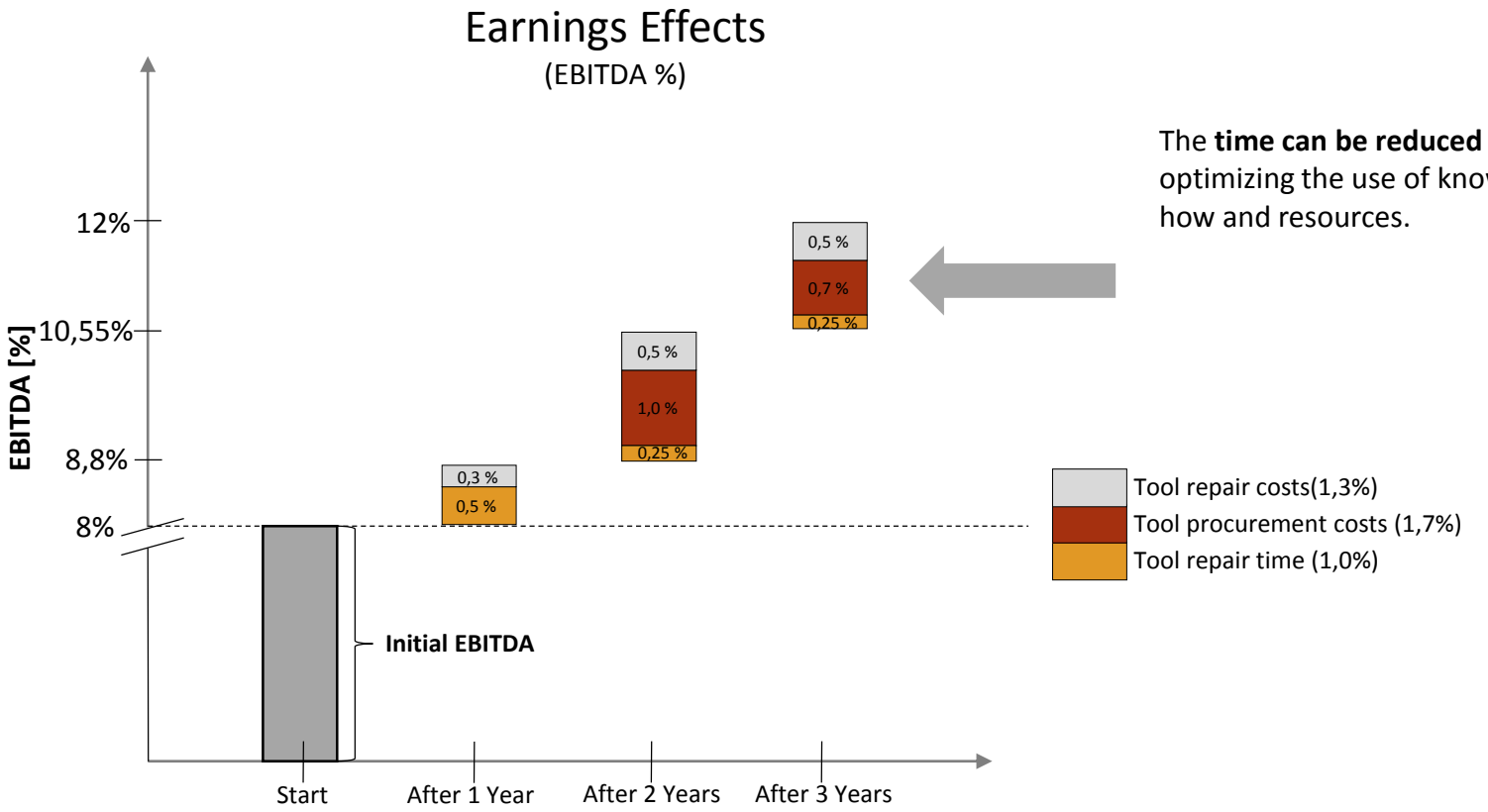
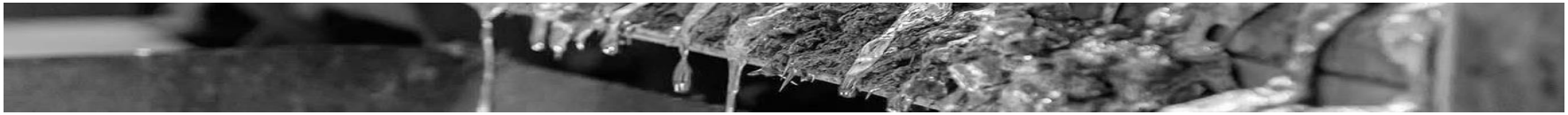
Result Any influence of profit and loss account

Comparable positive effects of other CIP projects, on the profit and loss account, are difficult to find in a die casting foundry.

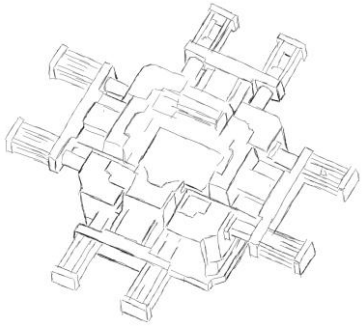


The **implementation** of the CIP potentials in the field of tool management are **existential** for all die casting foundries.

Result To do´s

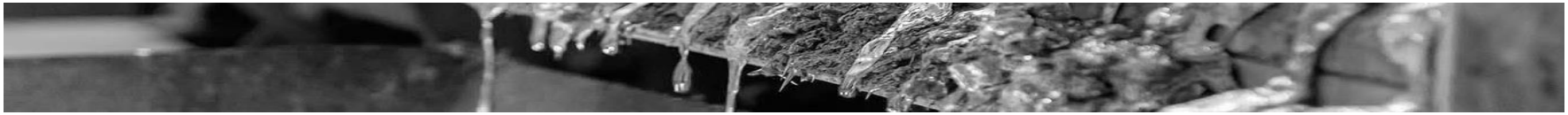


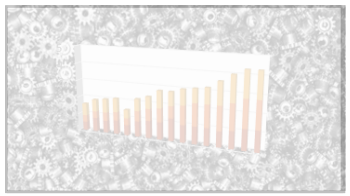
Foundries must now ... ..



- review the previous CIP strategy
- focus projects with the largest EBITDA levers
- align the corporate structure and culture to the new requirements
- initiate and lead the change process from top management (leadership)

Contend tool management





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CIP project Reduction of tool repair times

The analysis of the main cost blocks of the subject of tools or tool management has shown the **enormous potential** and the **economic importance** for every die casting foundry. **Processing or focusing** as part of the continuous improvement process is an **existential** one for all HPDC foundries.

„CIP-Lever (tool procurement costs)“

- Simultaneous Engineering
  (Product development → tool design)
- Optimized purchasing strategy
  - Collaboration (e.g., JV) with tool makers
  - Internationalization
  - ……
- Standardized procurement processes
- Forward looking tool-demand management
- …..

„ CIP-Lever (tool repair costs)“

- Forward looking tool-demand management
- Optimized processes in the tool repair
  - Time and cost specifications
  - …….
- Standardized tool repair orders
- Optimized spare parts management
  - make or buy decisions
- …..

„ CIP-Lever (production costs)“

- Reduce setup time
  Increased flexibility: decision tool repair on the machine or tool change
- **Reduction of tool repair times**
  - Tool repair on the machine
  - …..
- Repair and setup optimized tool design (Simultaneous Engineering)
- …..

Using the example of "Reduction of tool repair times", the process for the structured implementation of CIP projects presented in a simplified form.

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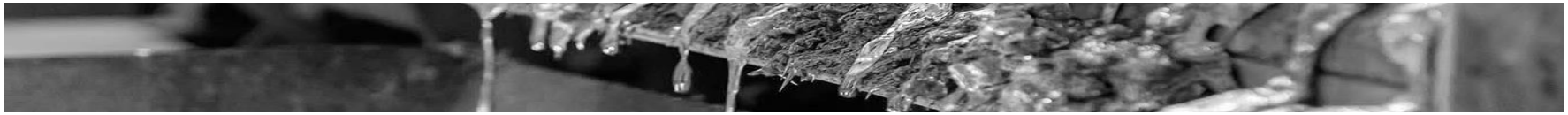
CIP DMAIC Reduction of tool repair times

Phase	Procedure (Examples)	Tools (Examples)	
D Define	**Create a project charter** • Analysis of the initial situation • Define project targets • Describe project scope • Milestone planers (project management) •	DMAIC Profile	SWOT
M Measure	**Defining measured quantities and measuring process performance** • Measure set-up times = last shot (old) → first shot (new) • Record actual process (for example, measure running paths) •	Data analysis	Record actual processes
A Analyze	**Determine the analysis of the actual situation and root causes** • Process flow organization • Pareto • 5 Why •	Ishikawa-Diagram	Pareto
I Improve	**Define, evaluate and implement improvement measures** • Cost-benefit analysis • Defining, prioritizing and implementing measures •	Cost / Benefit Analysis NUTZEN KOSTEN	Action Plan
C Control	**Project results** • Standardize processes • Set / Track Key Figures (KPIs) • Controlling •	Target Process description	Standards

Essential for the success of the project is the active **role of top management.** The projects will only be successful if the top management accompanies them with passion, enthusiasm and conviction and supports the employees in their implementation.

To do´s … the potentials are enormous. We help you to identify and implement it effective on the company result.



Everyone said:
"That will not do!"
Then someone came, he did not know that
and just did it.

-unknown-

STRATEGY DEVELOPMENT

MANAGEMENT CONSULTING
INTERIM MANAGEMENT

NETWORKING

COMPANY ANALYSIS

Annex: Assumptions about a Ø medium-sized aluminum die casting foundry in Germany

For the present analysis, a **Ø medium-sized aluminum foundry in Germany** was considered. The assumptions about the company were used as the basis for calculating potential savings (% of sales).
(All values are average figures from benchmark foundry comparisons.) In actual case of use, the values must be replaced by existing actual values of the company

Assumptions about the company: Ø Medium-sized aluminum die casting foundry in Germany

- Location: Germany
- Turnover: 50-70 Mio. €
- Clamping force from 500 to 1500 to
- Customers: 100% Automotive-Industry
- Internal tool repair costs: 5-8% of turnover
- New tools are purchased externally based on the internal design
- Comparable, high level of automation, in all production areas (foundry, CNC machining, conventional machining)
- 6% total scrap rate → 3% foundry, 1% conventional machining, 2% CNC machining
- Performance level: 98% foundry; 98% conventional machining, 98% CNC machining
- Availability: 70% foundry, 98% conventional machining, 90% CNC machining
- OEE: 66% foundry, 95% conventional machining, 86% CNC machining
- EBITDA Ø 8 %

Conversion factors (... in this example):
- **1% OEE improvement** in the foundry = **approx. 0.3% EBITDA** of the company
- **1% scrap rate improvement** in the foundry**= ca. 0,5 % EBITDA**