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“The Second Revolution in the Aluminium Die Casting Industry”

Barbara Colloquium

Aalen - December 5, 2019

Introduction

“The Second Revolution in the Aluminium Die Casting Industry”

“ Now are the good times,
after which we will long for in ten years.”

Peter Ustinov



Notes to the lecture

“The Second Revolution in the Aluminium Die Casting Industry”

The worldwide aluminum die casting industry has been in permanent growth since the 1980s. This success story was largely supported by the substitution of many parts of the powertrain with die-cast parts. The industry has since established itself as a perceived supplier and major development partner to the automotive industry. The proportion of aluminum die-cast products in the vehicle has risen steadily since that time.

The successes have changed the industry since the eighties serious. The foundries have early come into the focus of financial and strategic investors. The originally predominantly medium-sized and local companies have often become international corporations. New market entrants have joined and new foundry regions (China, India, Mexico) have emerged. It is not yet clear where this development will lead the industry in the next few years.

In the context of this unfinished development, there are currently additional challenges for the foundry industry.

After years of continuous growth, we have been seeing a decline in the global economy since the beginning of the year. Especially the automotive industry as the most important customer of the foundry industry is affected. In addition to the current political, economic and industrial challenges (trade conflicts, Brexit, environmental discussions, ...), the automotive industry is also facing revolutionary technological changes (megatrends: mobility, digitization, autonomous driving, electrification).

A precise statement, where the development goes, is also difficult here. Even crucial questions, such as what is the powertrain of the future, still find no uniform and final answer. A variety of topics in this very complex environment are on the move. The outcome is still open in many cases.

Notes to the lecture

In exactly this turbulent environment is the German aluminum foundry industry. The change is in full swing, the crisis or the downturn is here and the megatrends in the automotive industry present the foundries with major, epochal challenges.

What makes the situation even more difficult and has influenced the development of recent years significantly, is the persistent poor earnings situation of German die casting foundries.

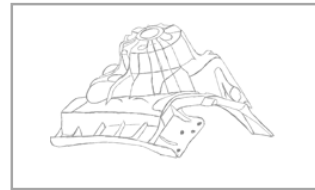
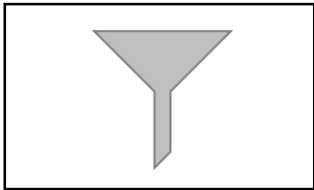
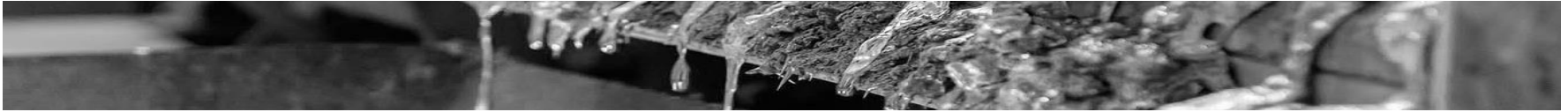
In the context of this multi-dimensional strain field, the German foundries are now at a forward-looking point. Only if it is possible to find the right answers will the individual companies and the entire German foundry industry have international significance in the future, which companies and the entire industry always had.

The objective of the lecture

“The Second Revolution in the Aluminium Die Casting Industry”

The objective of the lecture:

- Presentation of the current and very complex overall situation of die casting foundries in Germany in the context of the global transformation of this industry.
 - Die-casting industry in transition (1980 → 2040)
 - The current political, economic and industrial environment
 - The 4 Challenges in Aluminium Die Casting
- Recommend short-term, sustainable and strategic action.
- Point out opportunities and risks.



A

Management Summary

B

HPDC until 1980

C

HPDC until 2020

D

Status 2019/2020

Current environment

- Politically u. economically
- Industrial environment
- 4 Challenges in the HPDC
- Effects and To do's

E

HPDC 2040

Findings

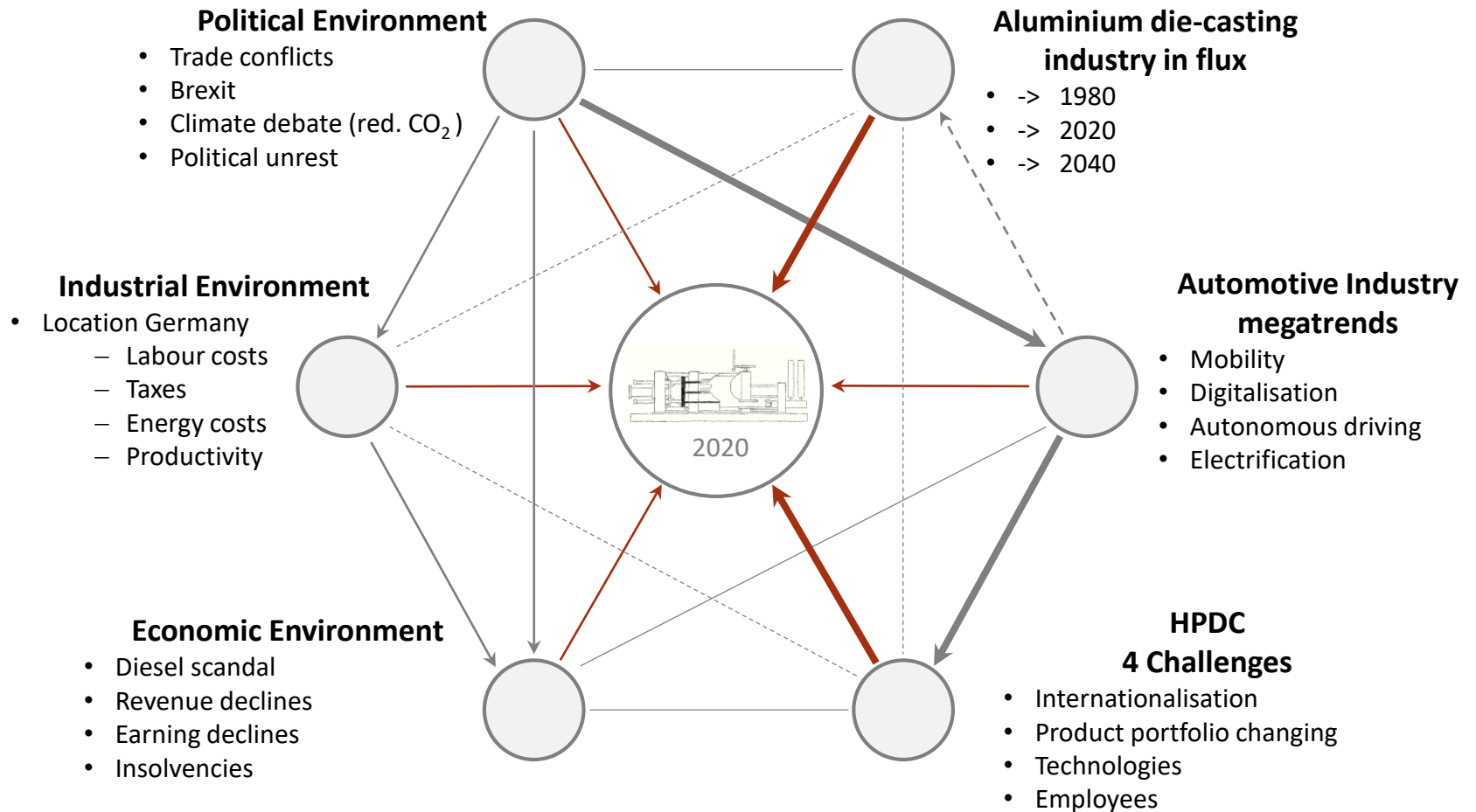
- Reflected
- Rated

Opportunities

- Recognize
- Seize
- Flanking

Management Summary 1/2

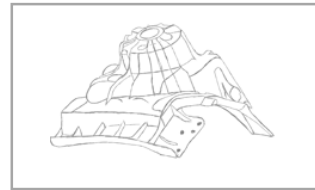
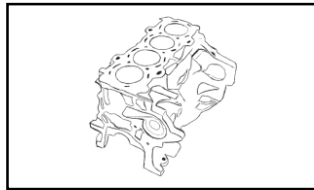
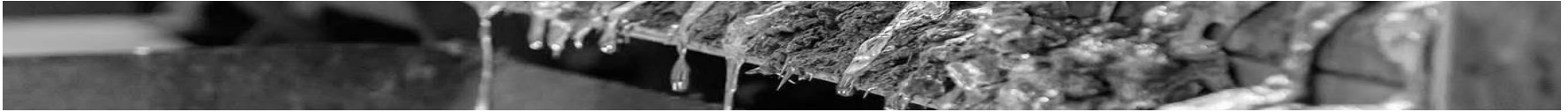
Aluminium die-casting in Germany is **currently** in a complex **multidimensional field of tension**



Management Summary 2/2

- After years of continuous growth, we currently see a decline in the global economy. Especially the automotive industry is affected. Worldwide, the industry recorded a decline in production of - 5% (1st half of 2018 vs. 1st half of 2019).
- The significant downturn (crisis?) hits Germany particularly hard. The high dependence on exports and the automotive industry is one reason for this. In addition, location disadvantages, which have not been solved for years due to a paralyzed industrial policy, increase the overall problem.
- Strongly emotional, political and social discussions such as the diesel scandal and climate change characterize the political landscape. The results and consequences of these discussions are often incomprehensible and seem unaware to some stakeholders. For companies, the long-term effects are difficult to assess.
- The mega-trends (mobility, digitalisation, autonomous driving, electrification) will change the automotive industry to an unprecedented extent. Affected by this is also the foundry industry. In addition, and partly as a consequence, the foundry industry is still faced with the four challenges of technology, internationalization, product portfolio and employees.
- This complex area of tension is currently affecting a foundry industry that has been undergoing "turbulent" change for many years in terms of market participants and markets. This change is not yet completed, the outcome is still open.

Where the journey goes is not foreseeable for most die-casting foundries. The multidimensional field of tension has the potential for **“The Second Revolution in the Aluminium Die Casting Industry”**. Foundries that master the short-term risks and use the long-term opportunities will be the winners.



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- Effects and To do's

Notes to the lecture

HPDC 1980 → 2020 → 2040

In order to properly understand the current, multidimensional field of tension of die casting foundries in Germany, it is imperative that the topics:

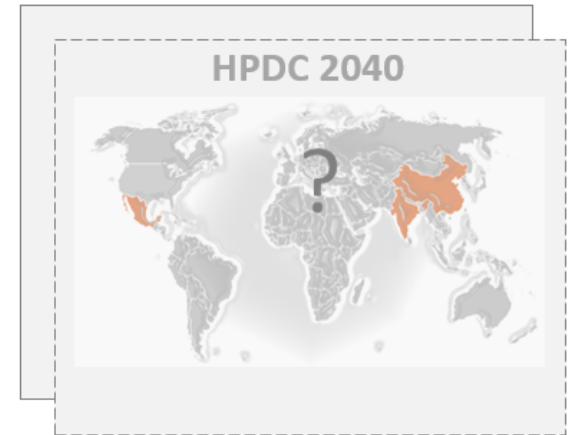
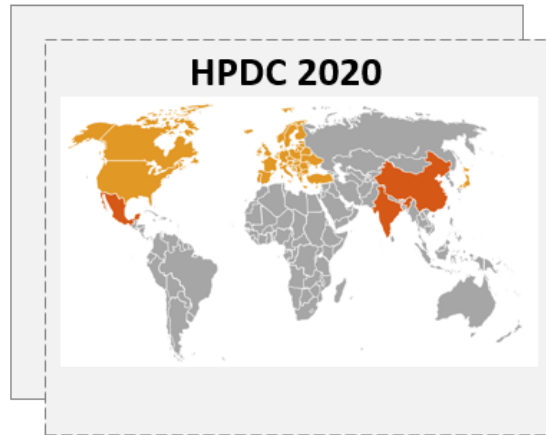
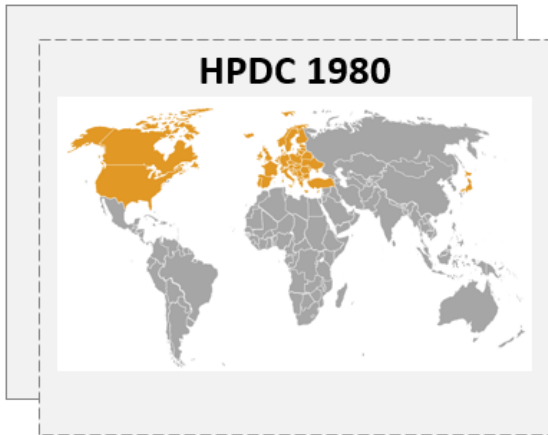
- Die-casting industry through the years (1980 → 2040)
- The current, political, economic and industrial environment
- The 4 challenges in Aluminium Die Casting

to look holistically and in context.

Only this holistic view makes it possible to come to the "right" short term (to do's) and long term measures (roadmap 2040) .

HPDC 1980 → 2020 → 2040 → Introduction

A **review**, the current status (**today**) and a strategic look into the **future**.



- **Europe / Germany** as HPDC centre followed by Japan and America / Canada
- **Start of the success story:** Aluminium Die Casting















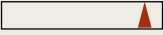

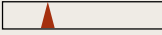

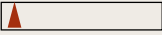

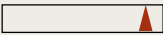

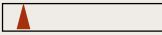

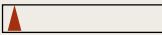
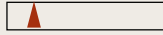
- Change in the aluminum foundry industry (**Mexico, India and China** as "new" HPDC regions)

Current environment (Focus Germany)

- Political and economic environment
- Industrial environment
- 4 Challenges in the HPDC
- Effects & To do`s

- New HPDC World Order (G3)?
- „**Mega**“ - Corporations ?
- The role of **Europe/Germany**
- Opportunities and risks

HPDC until 1980 → HPDC-world market

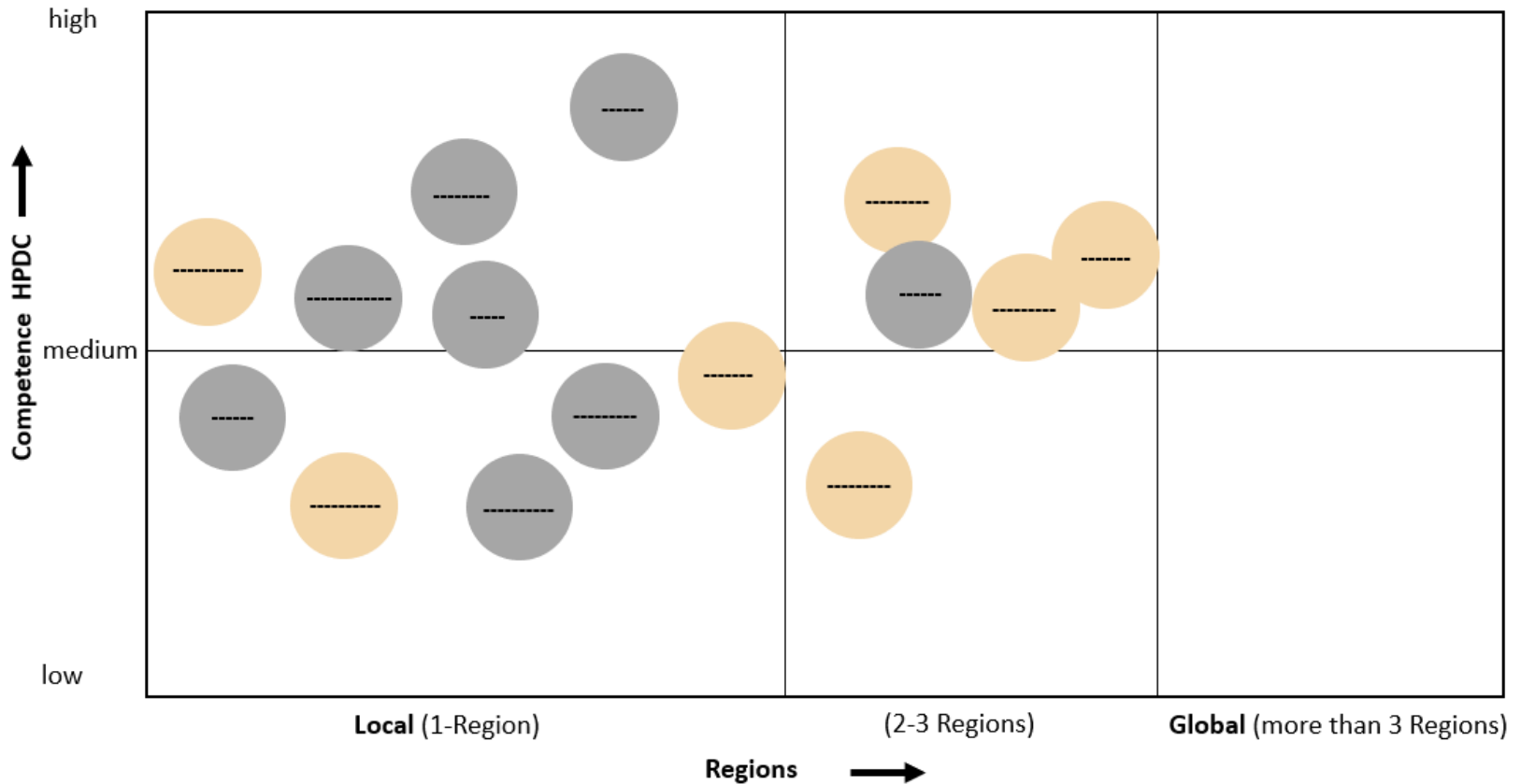
	Germany/ Europe  	USA/ Canada  	Mexico 	Japan 	China 	India 
... major market - participants	Honsel, Alumetall, KS, GF, KSM, Teksid OEM Foundries (VW, Daimler, BMW, PSA)	JL French, Walker, Meridian, Amcan, Dynacast, Gibbs OEM Foundries (Ford, Chrysler)		Ryobi, Ahresty Corporation, Hiroshima Aluminium OEM Foundries (Toyota, Honda, Nissan)		
Development in HPDC	Automatic u. Truck gearbox in HPDC, engine blocks in HPDC			Standardization, mold cooling		
Technological relevance						
Sophisticated products						
Market volume	large	large	low	medium	low	low
World HPDC Index*						

 high
 low
 high
 low

* **World HPDC-Index** = (Growth (investments), market shares, number of key market participants, know-how)

HPDC until 1980 → HPDC-world market

.... major Die Casting Foundries (until 1980)

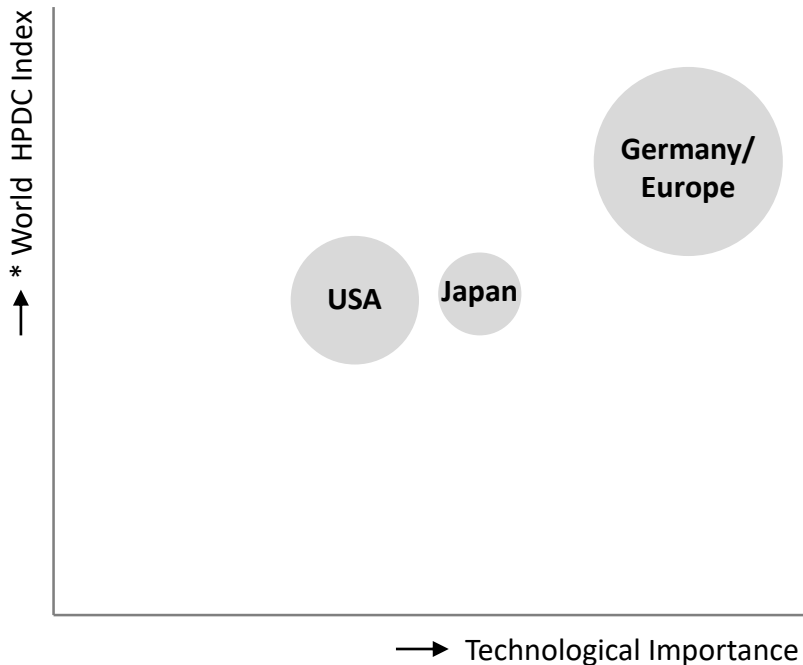


Legend: Casting processes: only HPDC (orange circle) various processes (grey circle)
 Competence (HPDC) : Quality, Technology
 Regions: Europe, USA / Canada, Japan, India, Mexico, China

Company Size : (small circle) < 500 Mio.€ (large circle) > 500 Mio.€

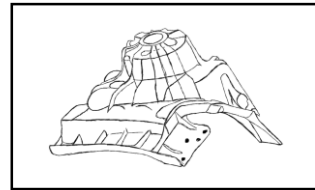
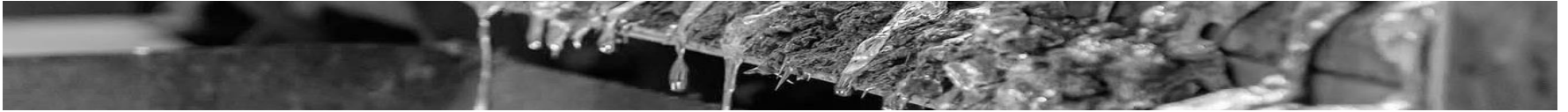
HPDC until 1980 → Summary

The eighties are of outstanding importance for the **success story of aluminum die casting**. With the substitution of many parts of the powertrain "**The first revolution in the aluminum die casting industry**" succeed.



Legend: Circle size = number of significant market participants
* World HPDC Index = (Growth (Investments), market shares, number of key market participants, know how)

- Europe / Germany, form the center of the worldwide aluminum die casting industry.
- The market participants are mostly medium-sized and locally established traditional companies.
- Technologically, Germany / Europe followed by Japan has the greatest importance.
- Development and transfer of essential parts of the powertrain in die casting (substitution of previous cast steel and cast iron applications).
- Die casting foundries are becoming perceived suppliers and major development partners to the automotive industry.



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HPDC 2040

Findings

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- Rated

Opportunities

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Notes to the lecture

HPDC → 2020

The development of the die casting industry in the last 40 years (1980 → 2020) was marked by a variety of significant events and tendencies.

- *Internationalization*
- *New Die Casting Foundries arise mainly in low-cost countries*
- *The industry gets into the focus of private equity companies and strategic investors (... since 1990 "sale of German foundries")*
- *Traditional companies disappear from the market. New market entrants arise.*
- *Earning problems and reduction of investments in the high-wage regions of Germany, Japan and the USA*
- *New AI foundry regions India, Mexico and China emerge*

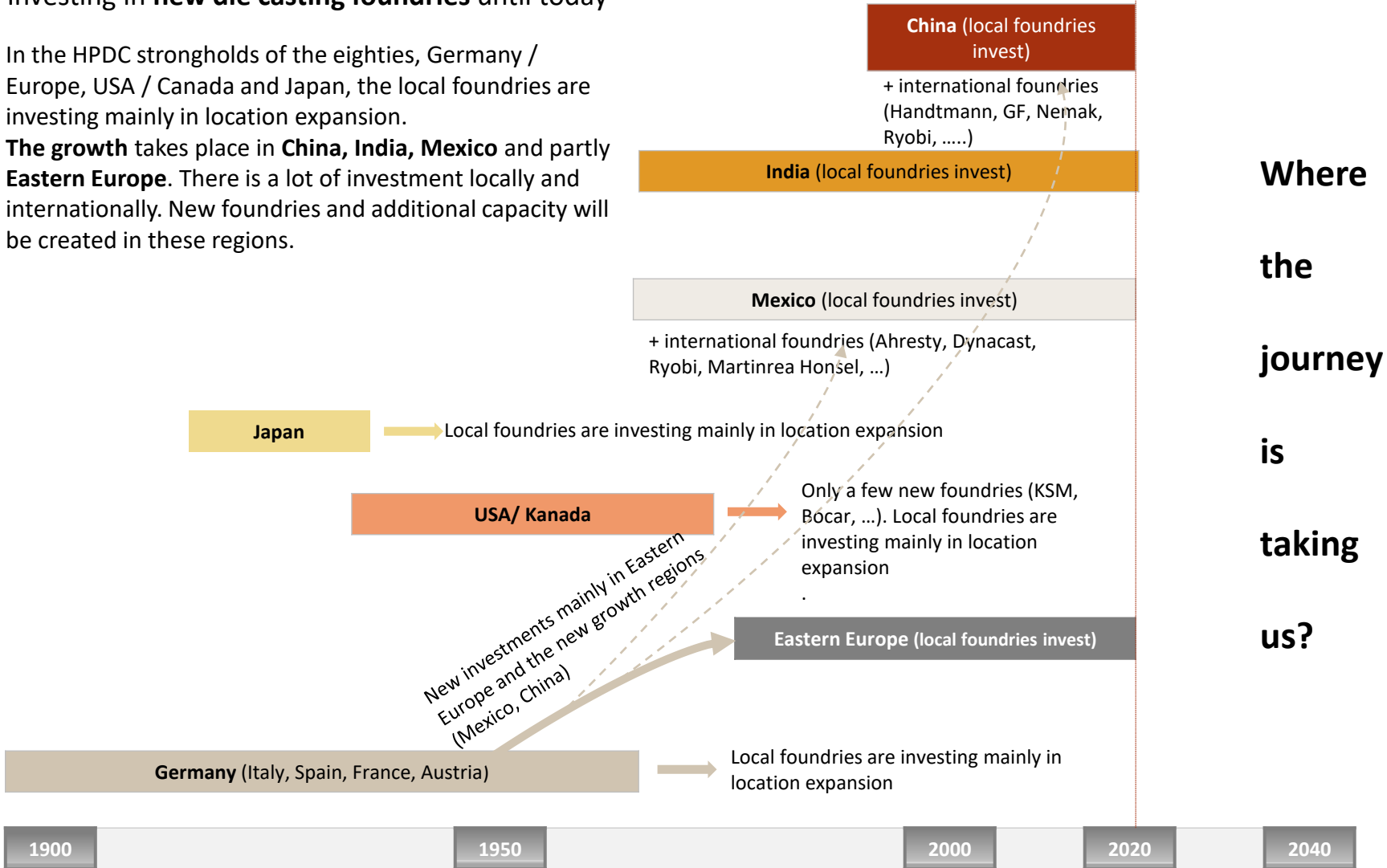
These points have contributed significantly to the massive change in the global aluminium die casting industry (companies, regions) over the last 40 years.

HPDC until 2020 → Development of the HPDC world market

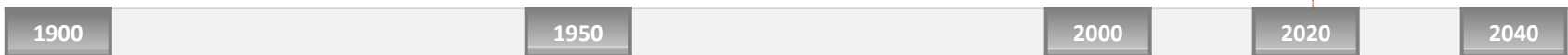
Investing in **new die casting foundries** until today

In the HPDC strongholds of the eighties, Germany / Europe, USA / Canada and Japan, the local foundries are investing mainly in location expansion.

The growth takes place in **China, India, Mexico** and partly **Eastern Europe**. There is a lot of investment locally and internationally. New foundries and additional capacity will be created in these regions.



Where
 the
 journey
 is
 taking
 us?



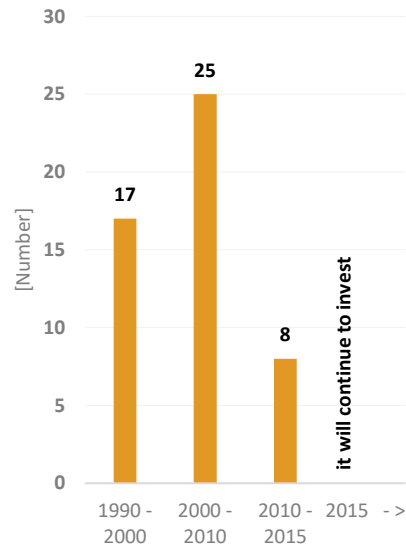
HPDC until 2020 → Development of the HPDC world market

Example: Investment in Die Casting in **Germany** and **China** (1990 - today)

From 1990 to today, the country's 50 largest die-casting foundries have been newly created in China. In the same period no new foundry has been built in Germany. It was only invested in location expansion. In addition, this low willingness to invest has continued to decline "dramatically" in Germany since 2005.

China

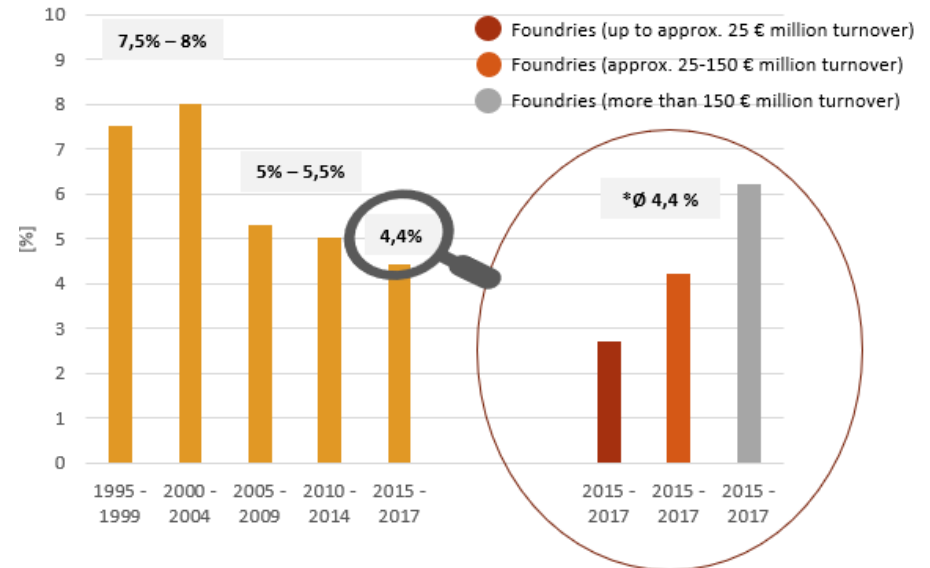
Founding of the 50 largest foundries in China 1990 - today



Source: JMC

Germany













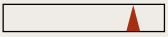


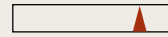
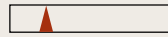







Average investments of light metal foundries in Germany in % of turnover



Source: Data source until 2017 Federal Association of the German Foundry Industry
 Data Source (Detail) 2015 - 2017 JMC (* 31 Die Casting Foundries)

Since 1990, **China** has created a large number of **new die casting foundries and undefined capacities**. In **Germany**, there has been little investment for some years and some companies have **invested below depreciation**.

HPDC until 2020 → Current Status HPDC World Market

	Germany/ Europe 	USA/ Canada 	Mexico 	Japan 	China 	India 
... major market - participants	Martinrea/Honsel, KS/Huayu, GF, KSM/Citic, Handtmann, Gnutti Carlo Group OEM Foundries (VW, Daimler, BMW, PSA)	Pace Industries, Dynacast, Magna, Shilo Industries OEM Fundries (Chrysler)	Nemak, Bocar	Ryobi, Ahresty Corporation, Hiroshima Aluminium OEM Foundries (Toyota, Honda, Nissan)	Dajiang Millison Die Casting, Guangdong Hongtu Technology, Guangdong Minglida Precision M.	Endurance, Sunderan Clayton
Private Equity and Tier 1 companies are entering the foundry market (ZF, Martinrea, Magna,						
Development in HPDC	Chassis - and structural parts					
Technological developments: reho-casting, MMS, vacuum, ... are not clearly attributed to individual countries / companies						
Technological relevance						
Sophisticated products						
Market volume	large	medium	large	medium	large	medium
World HPDC Index*						

 high
 low
 high
 low

* **World HPDC-Index** = (Growth (investments), market shares, number of key market participants, know-how)

HPDC until 2020 → Current Status HPDC World Market

Endurance since 1985

●	●				●
HPDC	PMC	SC	Other		
Size:	1) 600				
Competence HPDC:					

Georg Fischer since

●	●	●			●
HPDC	PMC	SC	Other		
Size:	2) 2.700				
Competence HPDC:					

Gnutti Carlo Group since 1922

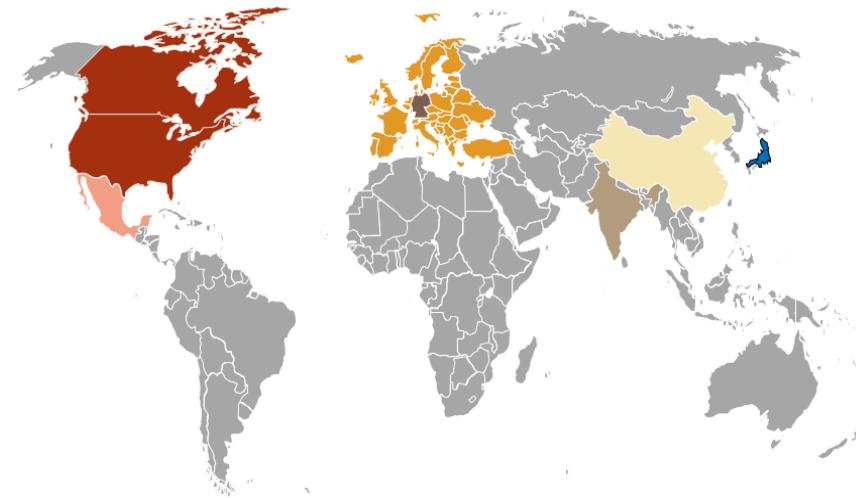
	●	●			●	●
HPDC	PMC	SC	Other			
Size:	1) 800 2) 4.000					
Competence HPDC:						

Guangdong Hongtu Techn. since 2000

					●
HPDC	PMC	SC	Other		
Size:	2) 4.200				
Competence HPDC:					

Dynacast since 1940

●	●	●	●		●	●
HPDC	PMC	SC	Other			
Size:	2) 3.000					
Competence HPDC:						



Guangdong Minglida Prec.M. since 2004

					●
HPDC	PMC	SC	Other		
Size:					
Competence HPDC:					

Dajiang Millison Die Casting since 2001

					●
HPDC	PMC	SC	Other		
Size:	2) 2.000 3) 60.000				
Competence HPDC:					

Bocar Group since 1958

		●	●		
HPDC	PMC	SC	Other		
Size:	2) 6.000				
Competence HPDC:					

Ahresty Corporation since 1938

	●	●	●	●	●
HPDC	PMC	SC	Other		
Size:	1) 1.200 2) 7.400				
Competence HPDC:					

Legend:

Size:
 (Non Fe – casting processes, partly estimated)

1) Turnover: Mio.€
 2) Employees Number
 3) Tonnage: to

Locations:

Germany	Europe	USA/ Canada	Mexico	Japan	China	India	Rest World
●	●	●	●	●	●	●	●

Competence HPDC

0	5	10
low	medium	high

Handtmann since 1873

●	●				●
HPDC	PMC	SC	Other		
Size:	1) 630 2) 2.300				
Competence HPDC:					

HPDC until 2020 → Current Status HPDC World Market

Magna (COSMA) since 1957

●	●	●	●	●	●	●
HPDC	PMC	SC	Other			
Size:						
Competence HPDC:						

Martinrea Honsel since 1908

●	●	●	●	●	●	●
HPDC	PMC	SC	Other			
Size:	2) 3.500					
Competence HPDC:						

Nemak since 1979

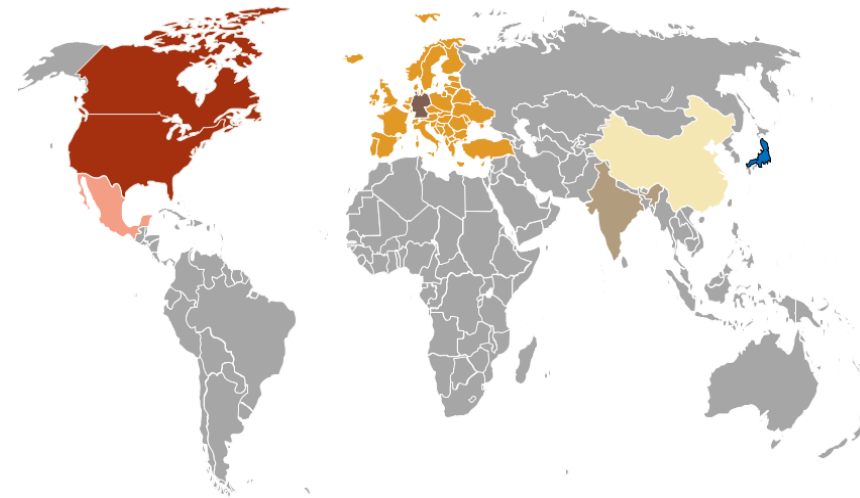
●	●	●	●	●	●	●
HPDC	PMC	SC	Other			
Size:	1) 4.000 2) 22.000					
Competence HPDC:						

Pace Industries since 1970

●	●	●	●	●	●	●
HPDC	PMC	SC	Other			
Size:	2) 2.800					
Competence HPDC:						

KSM (CITIC DICASTAL) since 1947

●	●	●	●	●	●	●
HPDC	PMC	SC	Other			
Size:	2) 3.500					
Competence HPDC:						



Ryobi since 1943

●	●	●	●	●	●	●
HPDC	PMC	SC	Other			
Size:	1) 1.800 2) 7.800					
Competence HPDC:						

KS Huaya Alu Tech since

●	●	●	●	●	●	●
HPDC	PMC	SC	Other			
Size:						
Competence HPDC:						

Shiloh Industries since 1950

●	●	●	●	●	●	●
HPDC	PMC	SC	Other			
Size:	1) 910 2) 4.200					
Competence HPDC:						

Hiroshima Aluminium since 1921

●	●	●	●	●	●	●
HPDC	PMC	SC	Other			
Size:	2) 2.300					
Competence HPDC:						

Legend:

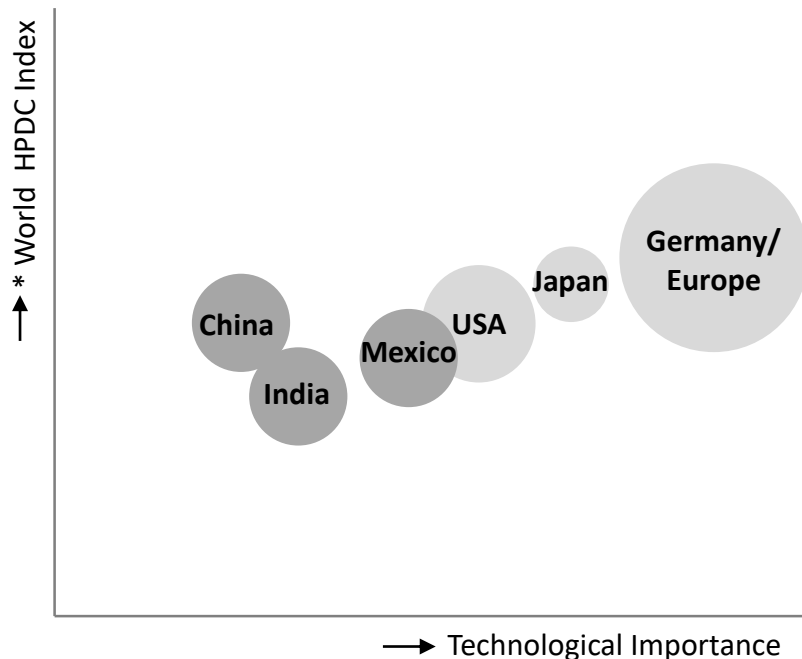
Size: (Non Fe – casting processes, partly estimated)	Locations:	Competence HPDC
1) Turnover: Mio.€	Germany	0
2) Employees Number	Europe	5
3) Tonnage: to	USA/ Canada	10
	Mexico	low
	Japan	medium
	China	high
	India	
	Rest World	

Sunderam Clayton since 1962

●	●	●	●	●	●	●
HPDC	PMC	SC	Other			
Size:	1) 260 3) 74.000					
Competence HPDC:						

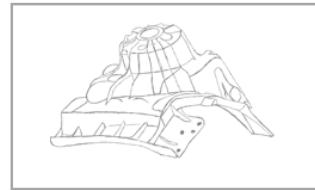
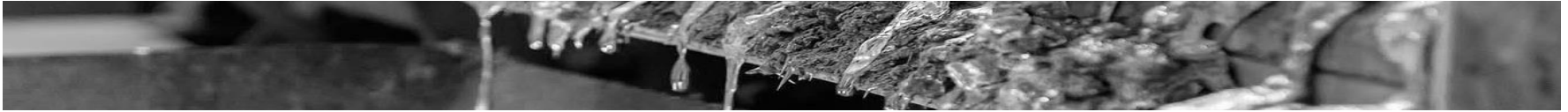
HPDC until 2020 → Summary

Some of the leading regions and companies of the 1980s are losing considerable importance and are experiencing strong **competition** from **Mexico, India, China** and, in some cases, Eastern Europe.



Legend: Circle size = number of significant market participants
* World HPDC Index = (Growth (Investments), market shares, number of key market participants, know how)

- **Internationalization** continues to progress.
- Foundries are moving into the focus of financial and strategic investors (→ until 2018).
- **Technologically**, the leading regions and companies of the 1980s are losing some of their importance.
- **Mexico, India** and **China** have created three new growth regions. There is currently a lot of investment here.
- In China, **new die-cast capacities** are being created "undefined". In Germany, investments are predominantly made only in location expansion.
- **Chassis and structural parts** are the growth market of the future. Parts of the powertrain are being replaced by new parts of e-mobility.



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HPDC 2040

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Notes to the lecture

Status 2019/2020 – Current Environment

Amidst the serious and unfinished change, the aluminium die-casting industry faces further challenges. The field of tension is currently being expanded by:

- Political and economic environment*
- Industrial Environment (Germany)*
- Automobile Megatrends and the 4 Challenges in Aluminium Die Casting*

In cumulation, the current environment requires short-term and consistent action, taking into account long-term strategic goals.

Status 2019/2020 → Current Environment

Political Environment Headlines

- **Krise der EU**
„Europa macht es seinen Bürgern nicht leicht“
Finanzkrise, Migrationskrise, Brexit – in der EU häuften sich die Krisen
19.04.2019 Deutschlandfunk
- **Die EU in der Krise**
Was Europas Feinde freut
Der Tagesspiegel 01.07.2019
- **Handelsstreit**
Chinas Außenhandel in die USA bricht ein
Focus Online 14.10.19
- **Handelskonflikt**
US-Strafzölle auf Pommes aus der EU
Stuttgarter Zeitung 15. Okt. 2019
- **BREXIT:**
Bye-bye, EU
Zeit Online 03.11.19

Economic Environment Headlines

- **GF will Gießerei in Werdohl schließen**
18.07.19 11:20 *come-on.de*
- **CO₂-neutrale Fabrik**
Porsche-Produktionschef: „Zulieferer müssen jetzt ihren Beitrag leisten“
Automobil Industrie 29.07. 2019
- **Automobilzulieferer unter Druck.**
Experten befürchten Pleitewelle
Handelsblatt 19. Sept. 2019
- **BRANDBRIEF : Daimler-Vorstand rüttelt die Belegschaft wach**
FAZ 23 Sept. 2019
- **Branchenexperte Dudenhöffer**
„Automobilindustrie leitet die weltweite Rezession ein“
Deutschlandfunk 25.10.2019
- **Ifo-Institut: Stimmung in der Weltwirtschaft so schlecht wie seit 2009 nicht mehr**
Spiegel Online Montag 11.11.2019

Status 2019/2020 → Political and Economic Environment

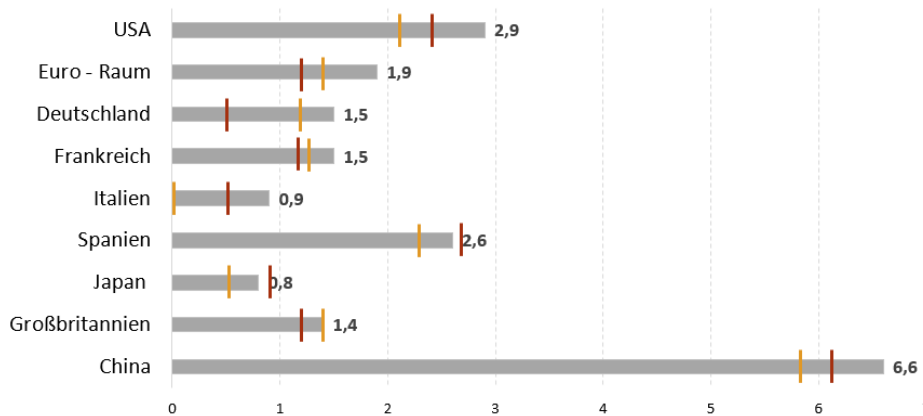
Overall Economy: World and Europe/Germany

The current political and economic environment has a serious impact on the economy. The effects are felt worldwide and especially in Germany. The great dependence on the automotive industry and export are decisive reasons for this.

World

Global Slowdown

GDP forecast (10/2019) in percent, values for **2019** and **2020** estimated

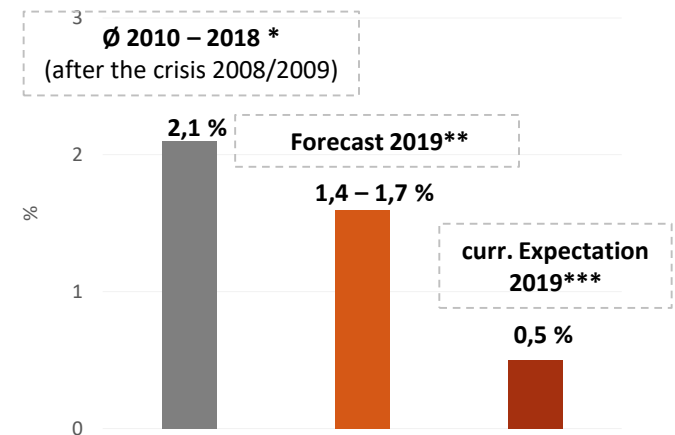


Source : IWF

- Trade Conflicts USA-China
- Punitive tariff policy of the USA
- Climate discussions
- crisis regions
-

Europe/Germany

GDP in Germany



Source: * Ist - Statistisches Bundesamt, **Forecast various economic research institute, ***Curr.Expectation – Germanys five wise man 11/19

- Brexit
- European Union
- Climate discussions ("pioneer" Germany)
- Diesel affair
-

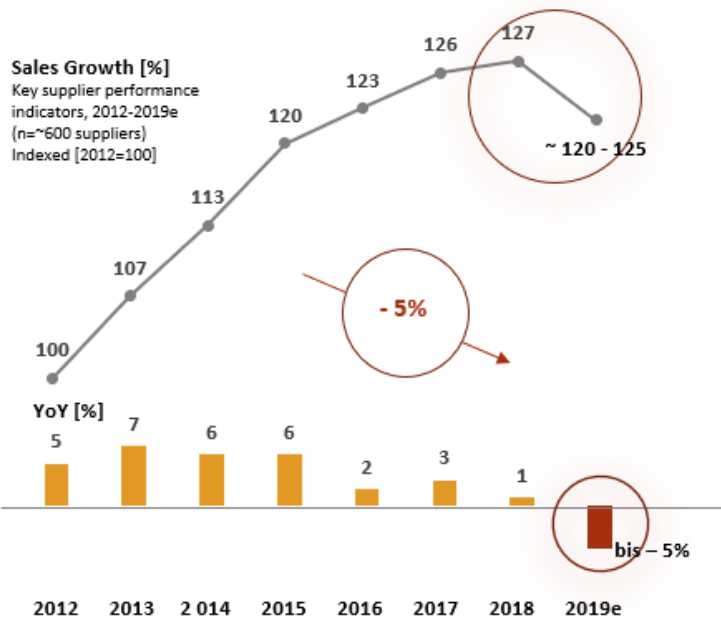
Status 2019/2020 → Political and Economic Environment

Automotive Industry

Many industry figures (automotive suppliers, M + E industry) confirm the trend. While the turnover of the companies has increased significantly since 2012 for seven consecutive years, in 2019 a decline can be observed.

World

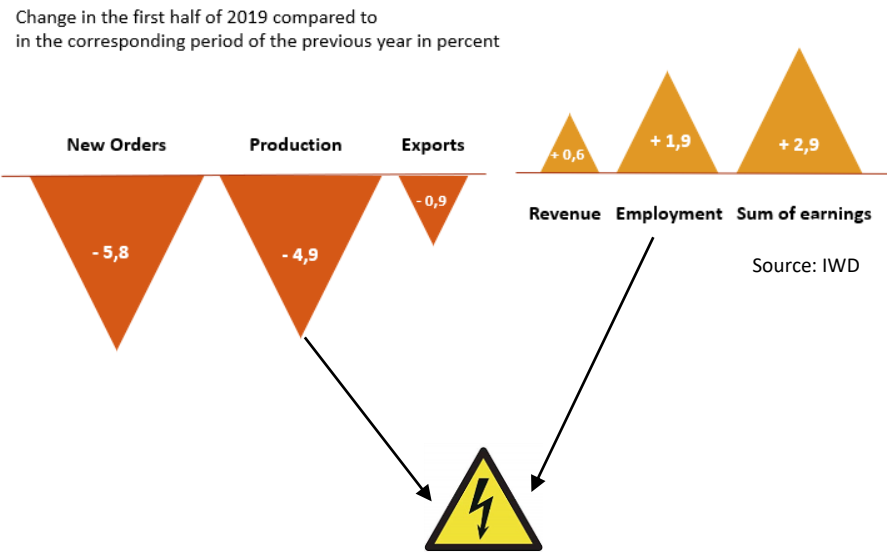
Automotive suppliers KPIs
(global industry average)



Source: Roland Berger

Germany

M+E Industry: Decline in orders



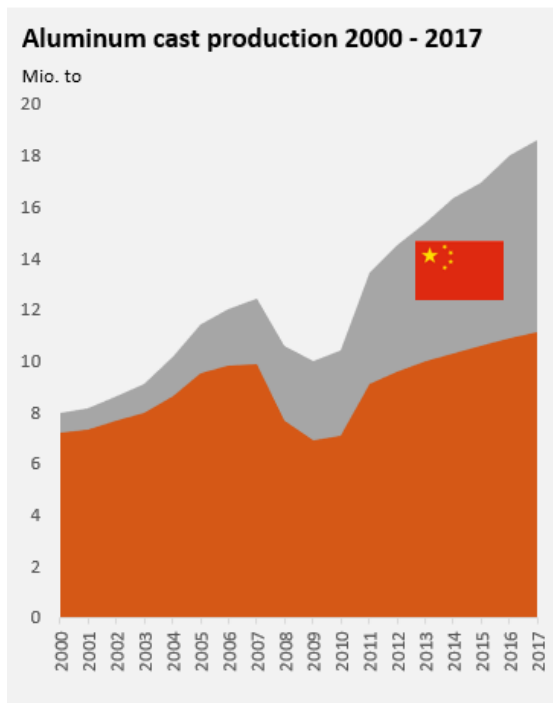
With reduced production, employment and personnel costs rise → ... EBIT is deteriorating

Status 2019/2020 → Political and Economic Environment

Foundry Industry

Even in the **foundry industry's** last years were marked (other than the crisis 2009/2009) of **permanent growth**. However, the **current development** in Germany (Jan.-Aug. 2019 to Jan.-Aug. 2018) also shows a **clear deterioration** in the economy.

Development World 2000 - 2017



Source :IKB

Development Germany Jan.-Aug. 2019 / Jan.-Aug. 2018

Light alloy foundry industry

(Jan-Aug 2019 compared to Jan-Aug 2018)

Order intake	- 8,8 %
Production	- 1,6 %
Order backlog	-22,5 % (from 4 month to 3,1 month)

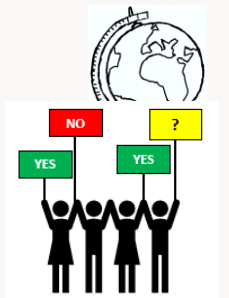
Source: BDG

As a result, it is to be expected and to some extent already visible that the already poor quality of results of the German foundries will continue to deteriorate in the short term.

Status 2019/2020 → → Political and Economic Environment

Global Economy

- Trade Conflicts
- Punitive tariff policy
- crisis regions
-



Automotive Industry

- Climate discussions
- Diesel affair
- Decrease in earnings
- Job cuts
- Austerity programs
- Downturn → Crisis?
-



Foundry Industry

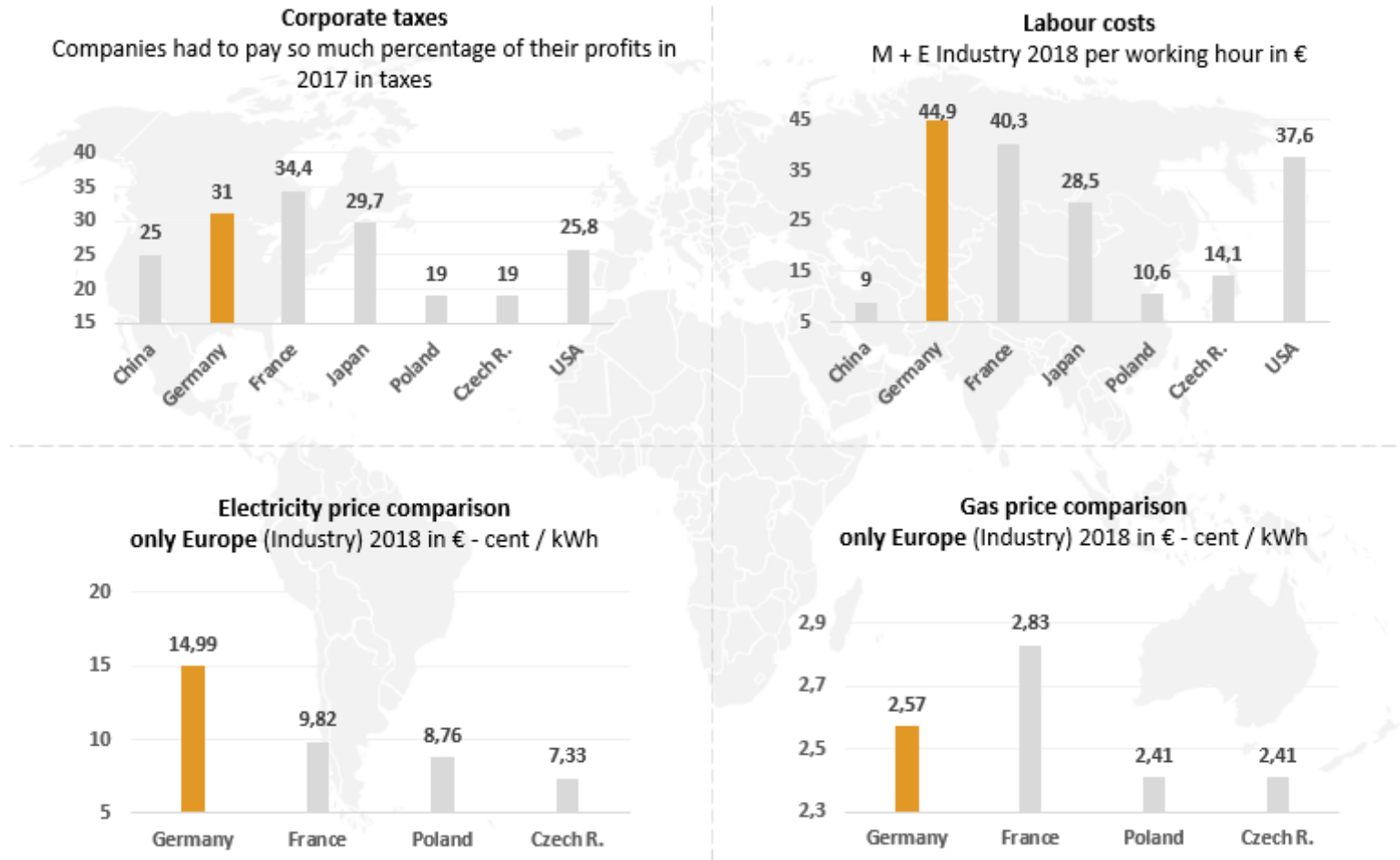
- Decline Revenue/Earnings
- Critical financial situation
- Downturn → Crisis?
- Insolvencies
-



The current **political and economic** developments are sufficient in their accumulation to trigger a crisis. Currently there is a great danger that the **downturn** will be a real **crisis**.

Status 2019/2020 → Industrial Environment (Germany)

In addition to the current clouding of the economy, German companies have been struggling for years with the world's **highest industrial costs**. On the part of politicians, these topics are partly ignored, but at least not solved.



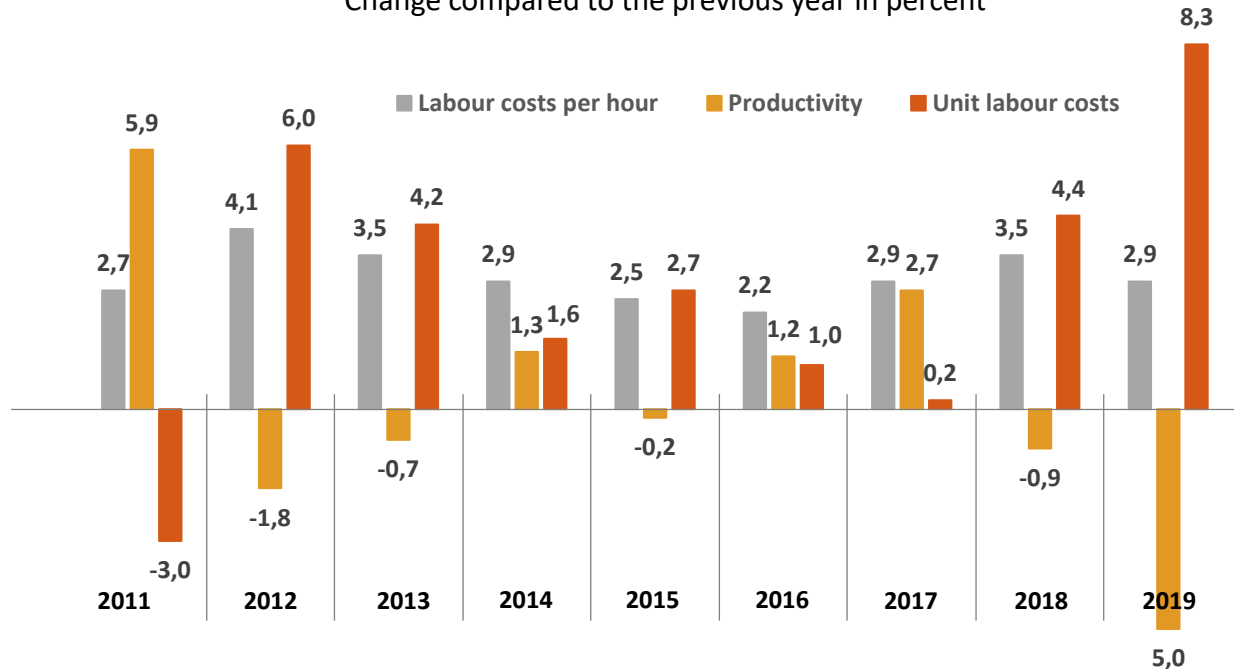
Source: Corporate taxes and Labour costs M+E Industry iwd; Electricity price and Gas price eurostat

Status 2019/2020 → Industrial Environment (Germany)

The **companies** themselves are also **involved** in the **misery**. Existing potentials around the topic of productivity have not been fully utilized for years.

M + E Industry: Unit labor costs rise substantially

Change compared to the previous year in percent



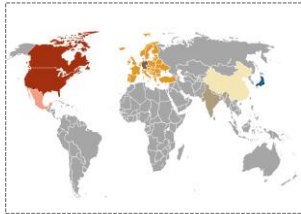
Productivity: Gross value added per working hour; Unit labour costs: Ratio between labour costs and Productivity; first half of 2019
 Source: iwd

Highest **taxes, energy and labor costs**, as well as deficits in the area of productivity currently characterize parts of the German metal and electrical industry. **Foundries**, which are also increasingly exposed to more international **price quality**, reach the limit of **financial capacity**.

The key EBITDA levers are in the study : **The key EBITDA levers in the HPDC Industry** analysed and described in detail.
 → www.johannes-messer-consulting.de; Publications

Status 2019/2020 → The 4 challenges in aluminium HPDC

In addition to the political, economic and industrial challenges, epochal changes are affecting the foundry industry. In this overall context, the handling of **the 4 challenges in aluminium die-casting** has to be reassessed by every company.



Internationalization

- The growth regions of **China, India** and **Mexico** are becoming increasingly important economically and technologically.

- "Sufficient" cash flow can only be generated in conjunction with **low-cost locations**.
- International **JV** and **partnerships** are essential. Networking gets a new priority.

Product Portfolio



- Prepare **investments** in growing clamping force ranges (product portfolio change).
- **Cost allocation** with all involved stakeholders for increasing product development and new ramp-ups.
- **Result "losses"** due to declining volumes of "bread & butter parts" (powertrain) must be compensated.

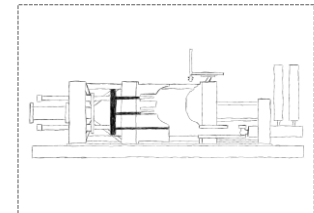


Employees

- **Strengthen** education and training (... the necessary skills now). To **promote** talents.

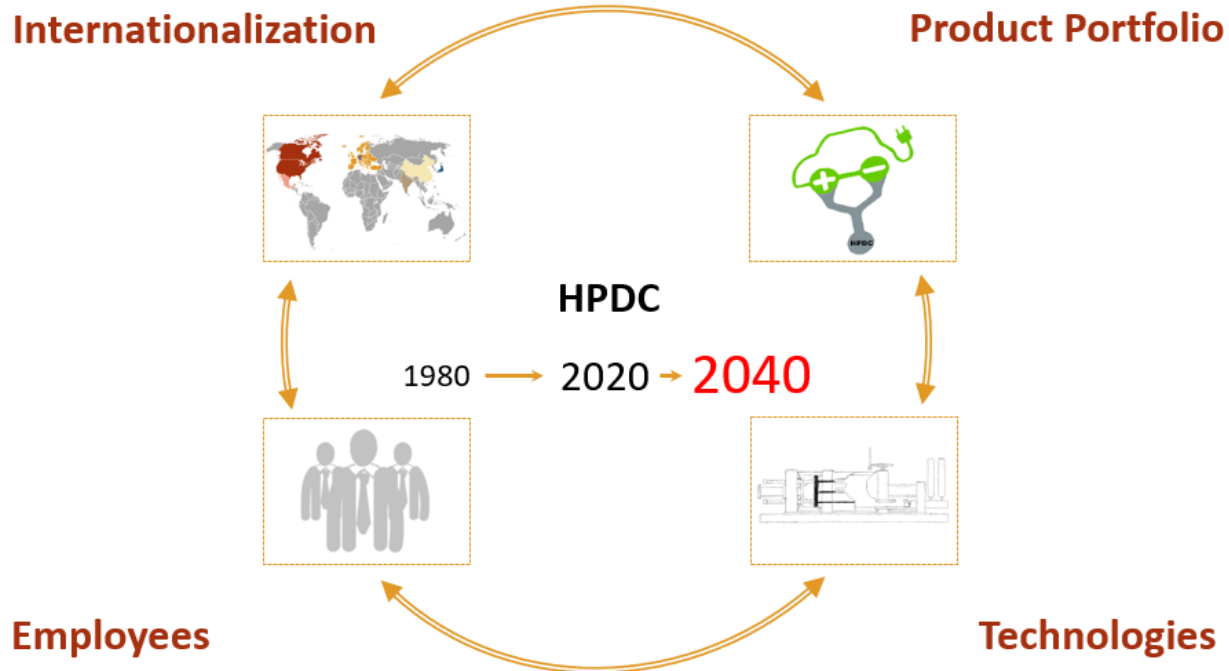
- **Improving** leadership culture, transferring responsibility, grant scope for action and decision-making.
- **Quality of the management** gets a new emphasis in the current field of tension.

Technologies



- **JV / partnerships** are required on technology topics (foundry clusters).
- The **technology roadmap** has to be prioritized and focused.
- Foundry **know-how** of the employees must be secured in the long term.
- **Profitability** has first and highest priority.

Status 2019/2020 → The 4 challenges in aluminium HPDC



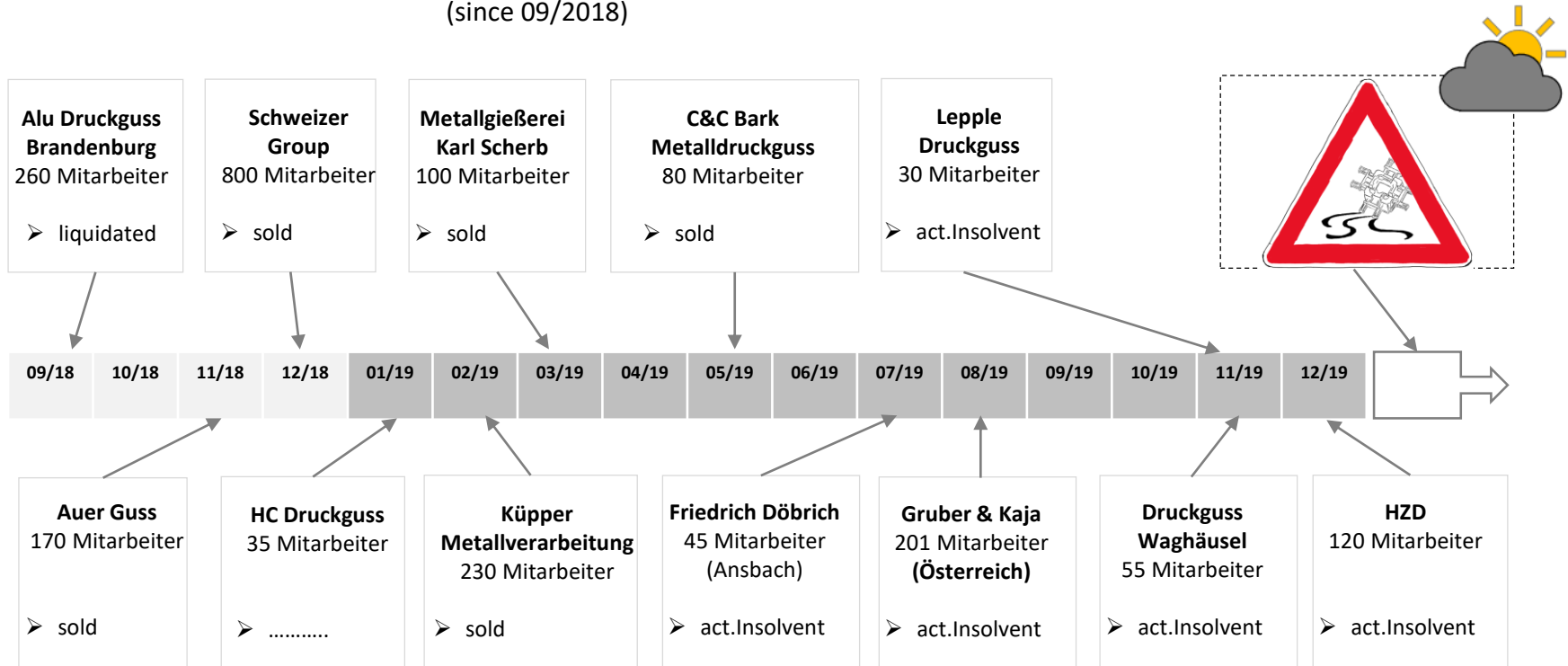
In the current field of tension, the four challenges in aluminium die casting are quickly becoming out of focus due to other priorities. In order to be successful in the long term, every company has to deal intensively with the topics. The **2040 Strategy Roadmap** needs to find the right answers to the challenges.

The 4 challenges in aluminium HPDC are in the study: „Turbulent times“ Aluminium foundry industry in flux analysed and described in detail.
→ www.johannes-messer-consulting.de; Publications

Status 2019/2020 → First effects (insolvencies)

One of the first serious effects since the beginning of the 4th quarter of 2018 has been **an increase in insolvencies** in the aluminum foundry industry. Due to the strained financial situation in many companies, there is a risk that **further bankruptcies** will follow shortly.

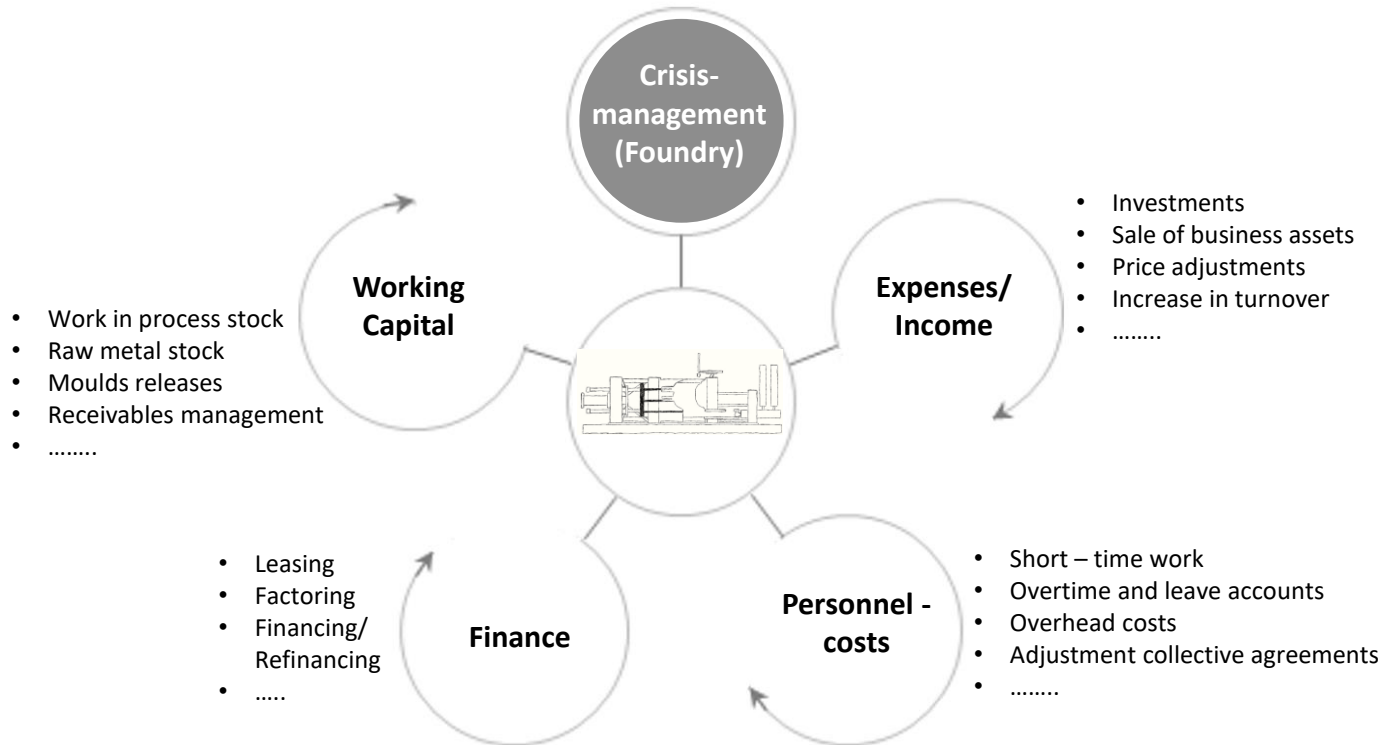
Insolvencies of German and Austrian die casting foundries
 (since 09/2018)



Quelle: JMC

Status 2019/2020 → Short term To do's

Regardless of all measures and changes necessary in the long term, the **top priority** in the short term is to **avert a damage for the company**. The goal must be to improve the quality of results in the companies at short notice and decisively.



Only foundries that succeed taking the **quality of results** to the required target range in the short term will be given the opportunity to develop the company in the long term and make it fit for the future (Strategy Roadmap 2040).

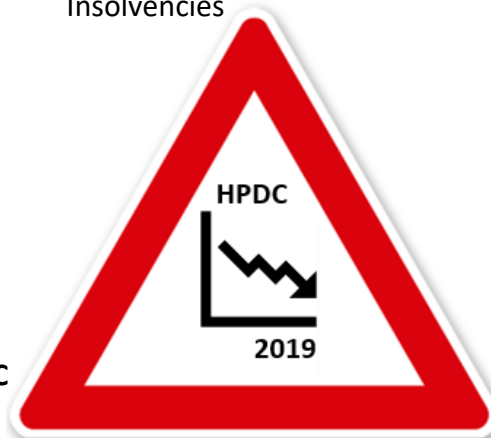
The necessary crisis management is in the study : „**Optimistic, Realistic. Stormy times in the foundry industry**“ analysed and described in detail.
 → www.johannes-messer-consulting.de; Publications

Status 2019/2020 → Summary

The complexity of the current area of tension represents the particular challenges that foundries are currently facing.

Political and economic environment

- Trade conflicts, Brexit
- Climate discussions (red. CO₂)
- Political unrest
- Decline revenue, decrease in profit, Insolvencies



4 Challenges in HPDC

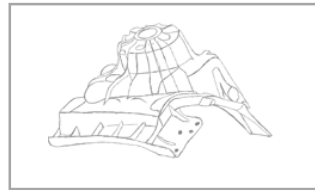
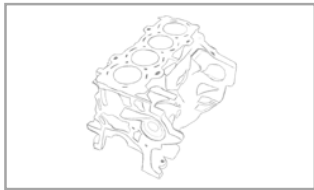
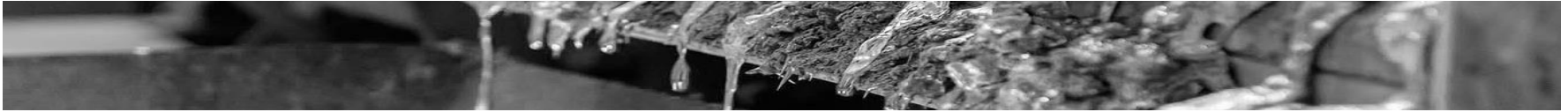
- Product Portfolio
- Technologies
- Internationalization
- Employees

Industrial environment

- Location Germany
- Taxes, energy costs
- Labour costs
- Productivity

- Slowdown of the economy. Correction of growth forecasts for **2019** (Germany: 1.6-1.8% → **0.5%**) and 0.9% for 2020.
- **Sales and earnings decline** in all parts of the automotive industry. Particularly affected the foundry industry. **Bankruptcies** are the result.
- **Location Germany lag far behind**
- Automobile megatrends and the 4 challenges in aluminum die casting require **personnel resources, capital, and management priority**.

Classical short-term crisis management (such as 1994/95 or 2008/09) is not enough to survive in the long term. Nevertheless, **short-term consistent action** is the first and most important step and has the highest **management priority**. However, the first step must be followed by the second, long-term strategic step



A

Management
Summary

B

HPDC until 1980

C

HPDC until 2020

Status 2019/2020

E

HPDC 2040

Findings

- Reflected
- Rated

Opportunities

- Recognize
- Seize
- Flanking

D

Current environment

- Politically u. economically
- Industrial environment
- 4 Challenges in the HPDC
- Effects and To do's

Notes to the lecture

HPDC 2040

The insights gained clearly show the peculiarity of the current challenge. Classic one-dimensional problem solutions will not lead to success. It is necessary to find the right answers based on a detailed analysis and with the participation of all stakeholders.

On this basis, it is important to recognize and use opportunities and flanking accompany.

If this succeeds, the German foundries are among the winners "The second revolution in the aluminum die-casting industry"

HPDC 2040 → the knowledge gained to date, **reflected**

- The HPDC world map has changed significantly in recent years. New market participants have joined. New regions have emerged.
- The high willingness to invest in the German foundry market (private equity, strategic investors and established market participants) has actual fallen sharply.
- The pressure on the foundries by the OEM's and Tier 1 has further increased. "rescue operations" as in the crises 94/95 and 08/09 are currently not visible.
- Old - and new drive technology (electric motor, fuel cell, hybrid, ...) run parallel in production and development.
- The austerity programs initiated at the OEMs and Tier 1 involve substantial reductions in material costs, with a direct impact on suppliers.
- The willingness of banks to finance in the foundry environment is declining.
- The implementation of the urgently needed improvement measures requires large human resources and know-how.
- The attractiveness of the industry for young employees is in strong competition with "new" industries.
- Necessary internationalization is becoming increasingly difficult, especially for small and medium-sized foundries (financial basis).
- The demands on the management are becoming more and more complex (... technological, economical and strategic).

HPDC 2040 → the knowledge gained to date, **rated**

Die casting location Germany

Strengthen

- Competent foundry technology environment (mold makers, machine manufacturers, universities)
- Good customer relationship and proximity to the OEM's
- Outstanding practice-related foundry know-how
- Good infrastructure throughout the entire value chain for foundry products
-

Opportunities

- Better use of cooperation / JV along the entire value chain (development → assembly)
- Cooperation with: Politicians, associations, trade unions, suppliers, banks, universities, OEMs, use more
-

Weaknesses

- Age of foundries (... often from the years before 1980)
- Difficult industrial environment in Germany
- Weak earnings and financial situation
- Low willingness to invest (... for several years)
- Slow implementation of identified CIP potentials
- Use and implementation of already developed technologies
- Partly lack of willingness to seek advice and lack of willingness to change
-

Risks

- Current downturn leads to the crisis
- Businesses are overwhelmed with the complexity of the challenges
- Everyone in the value chain tries to solve the problems alone (local optimum)
- The development of the HPDC world map (companies, regions) continues as in recent years (1980 → 2020)
-

HPDC 2040 → Opportunities recognize

We are on an epochal milestone for the German die casting industry. The described, very complex field of tension has the potential to trigger "The Second Revolution in the Aluminium Die Casting Industry". The risks are high, the opportunities are historic.

- Aluminum die casting will continue to be the dominant casting process in the future.
- The demand for aluminum casting will continue to rise in the coming years.
- Other market participants (Tesla, Uber, Waymo, ...) will establish themselves on the market and expand the existing customer portfolio.
- New products offer opportunities for the companies. Project and development expertise along the entire value chain provides significant benefits to the company.
- New trends (car sharing) change product life cycles, volumes and variants.
- The Europe / Germany region currently has the largest die-casting know-how in the foundries and along the entire value chain.
- Stakeholder continue to be interested in the foundry industry.
- The development on the world market (companies, regions) is still ongoing.

HPDC 2040 → Opportunities ... seize

The scope of the **decisions** now to be taken requires the cooperation of **all stakeholders**. Only together can the complex challenges be properly assessed and the necessary measures taken.

The **chances** (... but also the risks) for the foundries are **historical**.

- The upcoming measures will not be postponed. Necessary changes should, if possible, be consistent with the long-term strategic goals.
- The company strategy (Roadmap 2040) has to be developed or revised individually and in the context of the opportunities that arise.
- The technology roadmap must be based on the current requirements. Technology topics must be planned and coordinated along the entire value chain with all involved (partners).
- The corporate culture must be geared to the changed requirements.
- Investments must be focused on the short-term opportunities. The financing is to be secured in the long term.
- Partnerships and JV reduce costs and provide short-term access to new projects, markets and regions.
- Good strategies help the company to be successful in the long term and to make it more attractive to all stakeholders.
- Good employees are an essential lever for success. Gaining the best employees is top management task.
- The upcoming tasks to the management are complex. Technological, economic and strategic knowledge is required in management.

HPDC 2040 → Opportunities... flanking

In addition to companies, **key stakeholders** must assume **independently** their roles and responsibilities. Flanking support is obligation.

- The collective bargaining partners, **employers' associations** and **trade unions** must give special consideration to the special situation of the medium-sized foundry industry in the tension described above.
- **Associations** and **politics** must put the industrial location Germany to the test bench. The focus is on medium-sized companies. In accordance with the existing international competitive difficulties, the individual sectors are to be differentiated.
- **Politicians, associations** and **banks** must create the conditions to responsibly accompany the special significance of this epoch-making change. Supportive financing models for research, development and industrialization of new technologies are to be created.

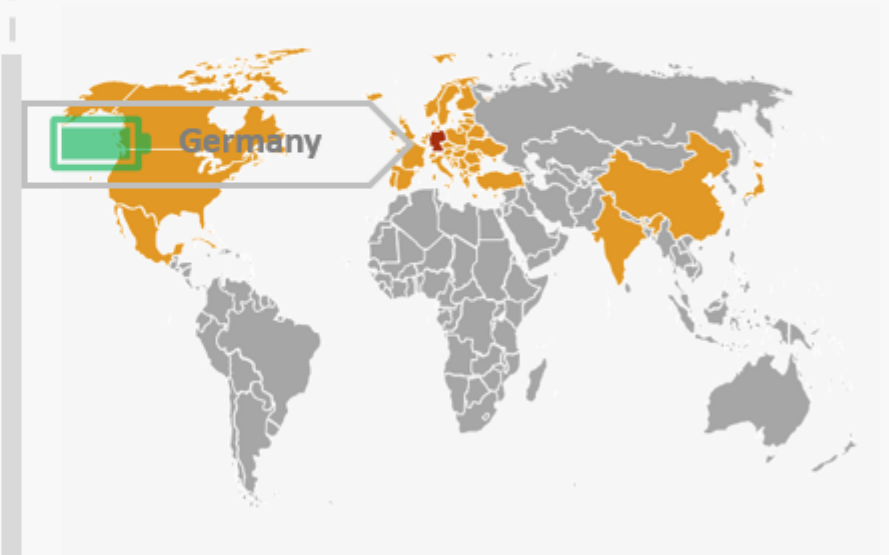
HPDC 2040 →

... .. Foundries that **recognizing** the opportunities, **using** and **flanking** will be among the winners

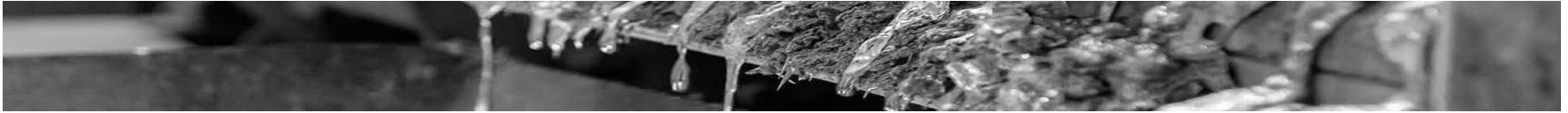
“The Second Revolution in the Aluminium Die Casting Industry”

Do nothing

Do it



HPDC 2040



... we help you with the answers, and with the implementation.



“ It's not said that it gets better when things get different.
But if it should get better, it must be different ”.

Georg Christoph Lichtenberg



STRATEGY DEVELOPMENT



MANAGEMENT CONSULTING
INTERIM MANAGEMENT



NETWORKING



COMPANY ANALYSIS