Capital Market Day 2017

Technology, Innovation & Sustainability

Rottweil, December 8th, 2017
Dr. Reinhold Achatz

engineering.tomorrow.together.

thyssenkrupp

thyssenkrupp Strategic Way Forward – Strategy concept for Group transformation

Diversified Industrial

More & Better, Sustainability

Change management	People success	Performance orientation	Customers & markets	Financial stability	Strategic push
Mission statement	HR Global 2020	Active portfolio management	Brand thyssenkrupp	Balanced portfolio	Organic growth: Expand market positions
Leadership	People excellence	Capital efficiency	Market intelligence	Strong cash flow position	Strengthen technology & innovation
Network organization	Employee survey	Continuous benchmarking	Sector strategies	Gearing <100%	Inorganic growth
Governance	Safety & health	Operational excellence	Customer relationships	Equity >15%	
Compliance	Diversity & inclusion	Functional excellence	Sales excellence	Investment grade	
Systems & processes	HR transformation	Profitable growth			

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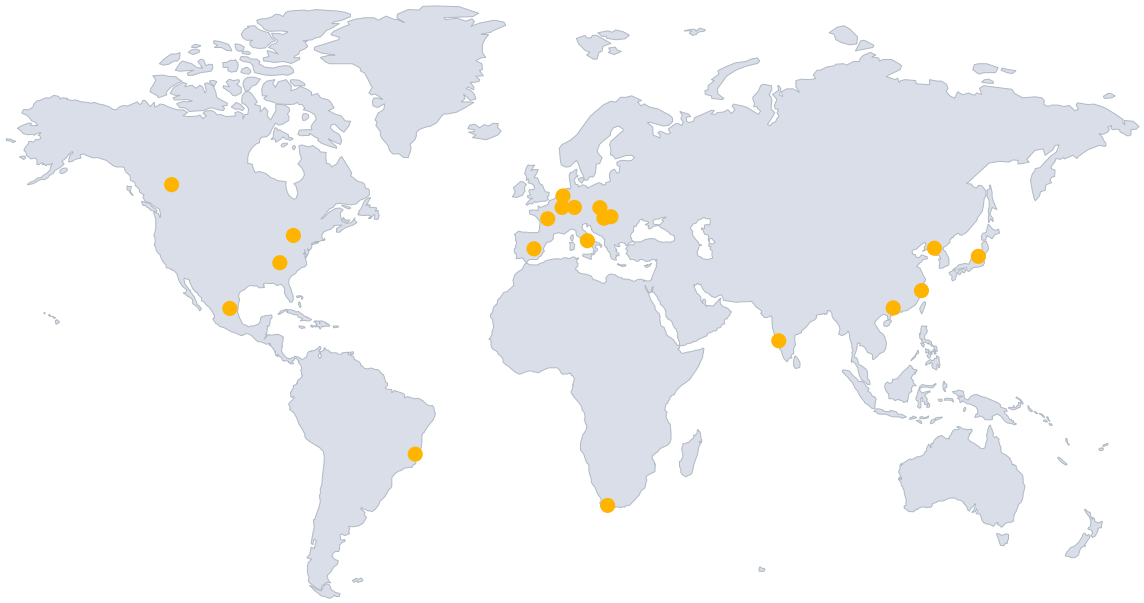
Decentralized R&D approach with strong coordination by Corporate

Our approach to Innovation

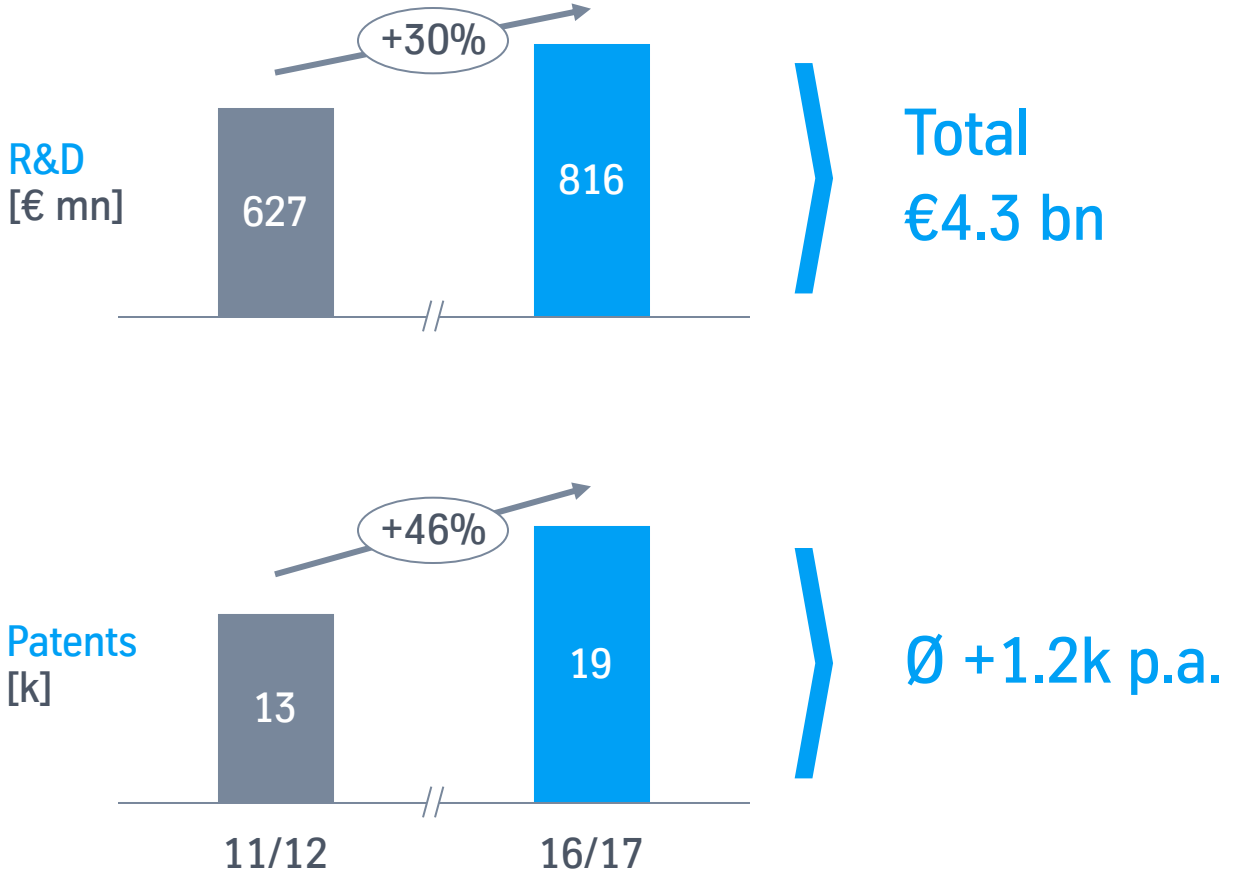
- Create value for the customer, understand customer needs
- Drive business success: Faster growth,
  customer sell-in,
  margin strength
- Be close to the customer and end markets
- A results-orientated organization
- Distributed approach supports customer proximity
- Central coordination to leverage synergies

Close to customers
90 R&D centers in 20 countries



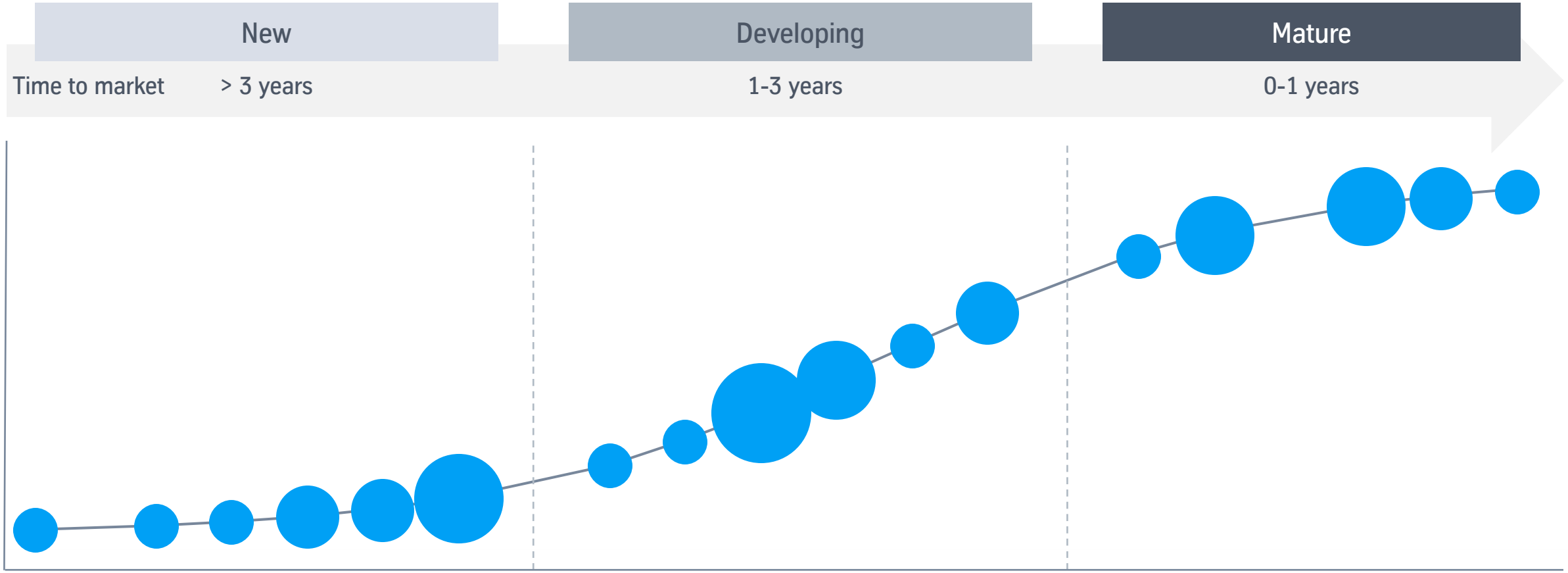
4,500 R&D experts dedicated to push innovation forward

Constantly feeding the value pipeline



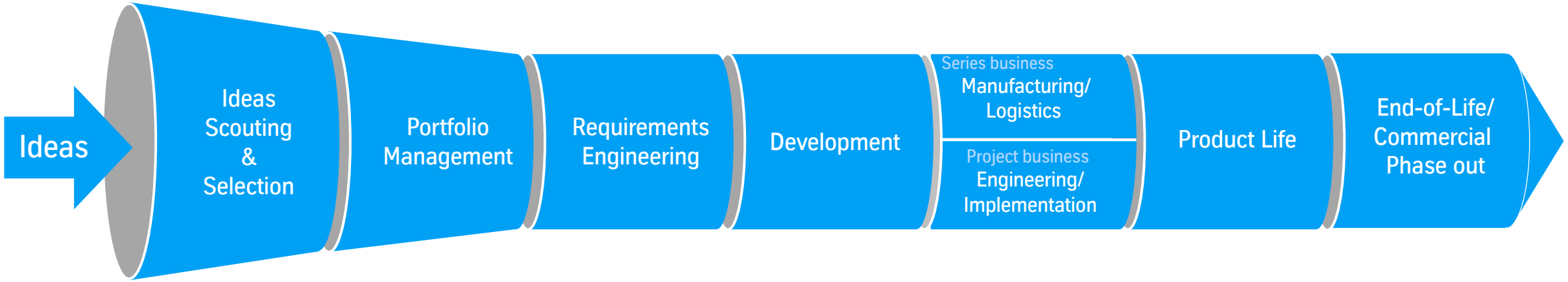
We actively manage our innovation pipeline from new to mature products

R&D spend distribution: Fill the pipeline, develop with customer focus, optimize cost and feature



Selected project examples across all BAs

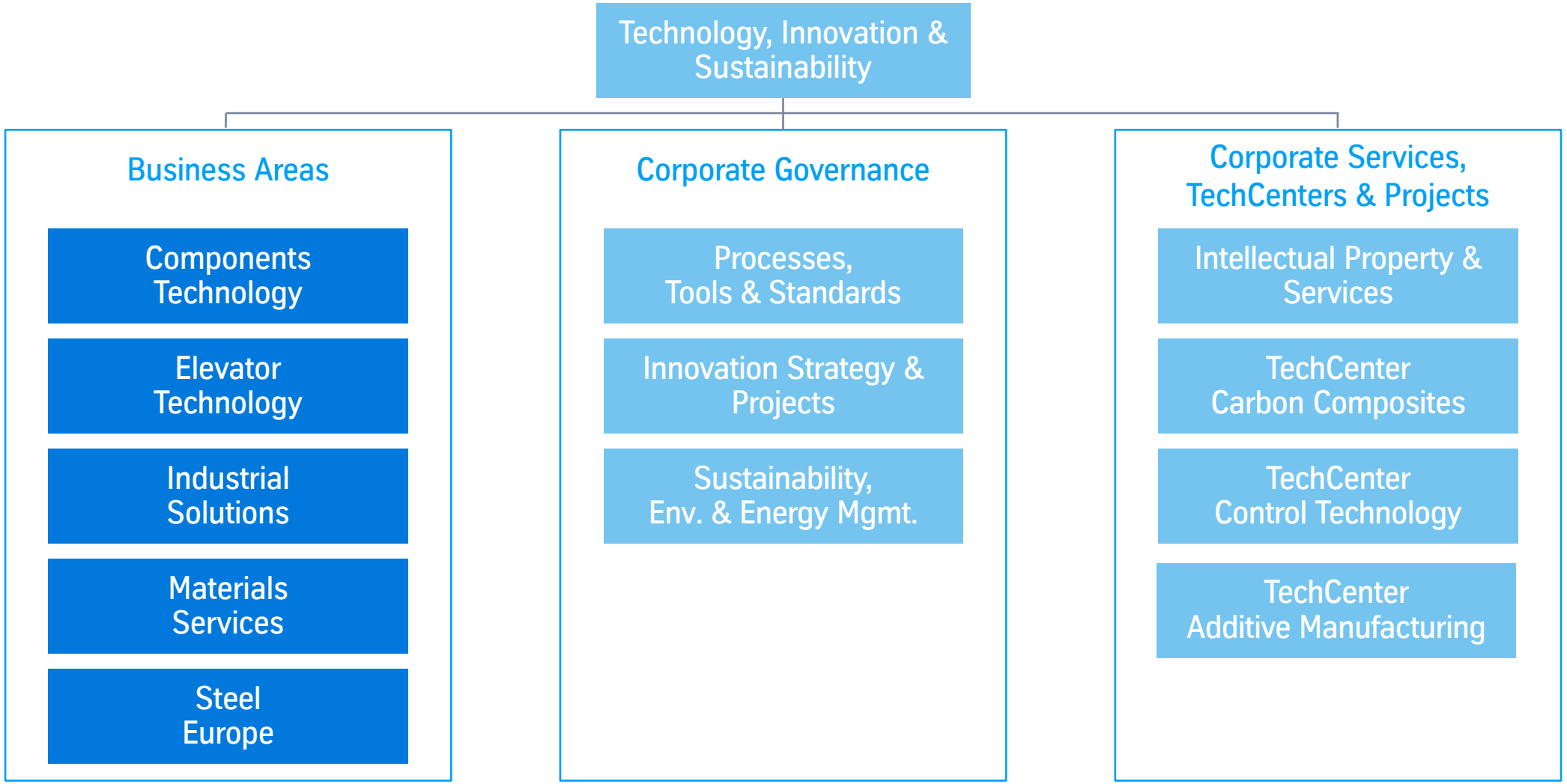
thyssenkrupp's standardized innovation process supports continuous innovation



- Active management of technology and innovation investments
- Outcome-focused approach: Value maximization
- Application across the organization: More D than R
- Strong budget and spending control

Distributed R&D organization centrally coordinated

Organization structure TIS



Innovation focus of the businesses to create customer value

Technology, Innovation & Sustainability

Business Areas

Components Technology	Elevator Technology	Industrial Solutions	Materials Services	Steel Europe
• Electro-mobility • Autonomous driving	• Mobility in densely populated areas • Aging population	• Smart technologies - enable our customers to be competitive in the changing energy system	• Optimize our customers' supply chain	• Provide best steel grades • Efficient and environmentally-aware production

Technology, Innovation & Sustainability – Create growth opportunities, strengthen competitiveness

Pillars

- Leading edge technology
  - Products
  - Processes
- Resource efficiency
  - Raw Materials
  - Energy
  - CO_2
- Sustainability
  - Products
  - Processes
- System optimum vs. local optima

Levers

- Digital Transformation
- Renewable Energy strategy
- Greenhouse Gas neutrality
- Materials/Product innovation
- Agile processes and innovation

Results

- Advanced automotive/ e-mobility solutions
- State-of-the-art elevators and escalators, strong service focus
- Smart and efficient systems
- Customer orientated material distribution and value added services
- World class flat steel products

New higher margin products & services

Additional upside in EBIT and BCF

Sustainability – Value lever for all stakeholders

Improve our customers‘ sustainability…

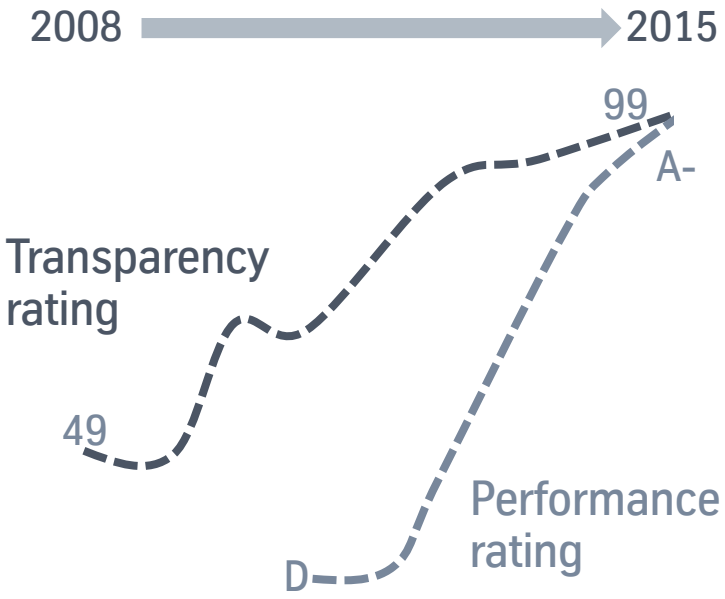
- Resource & energy efficient products, e.g. chlorine production
- Key components for renewable energy, e.g. slewing bearings
- Reduce Greenhouse Gas emissions in CO_2-intensive industries, e.g. steel, cement, …
- Solutions for e-mobility, automated driving and urban mobility

… improve thyssenkrupp‘s sustainability

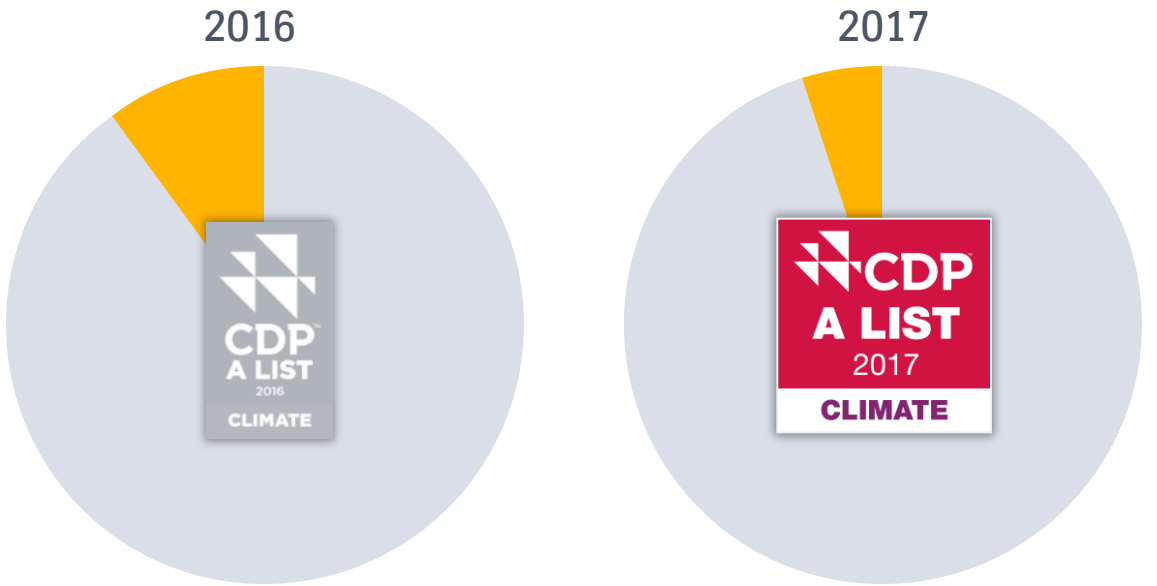
- 330 GWh energy efficiency gains in FY 2016/17 contributing to “impact”
- -50% accident frequency rate within last 5 years

CDP – thyssenkrupp is recognized as a world leader in climate protection for the 2nd time in a row

Catching up with leadership



Leadership confirmed



tk in **TOP 10 %**
as one of 9 German companies

tk in **TOP 5 %**
as one of 7 German companies

The CDP rates more than 2,400 companies on behalf of >800 institutional investors

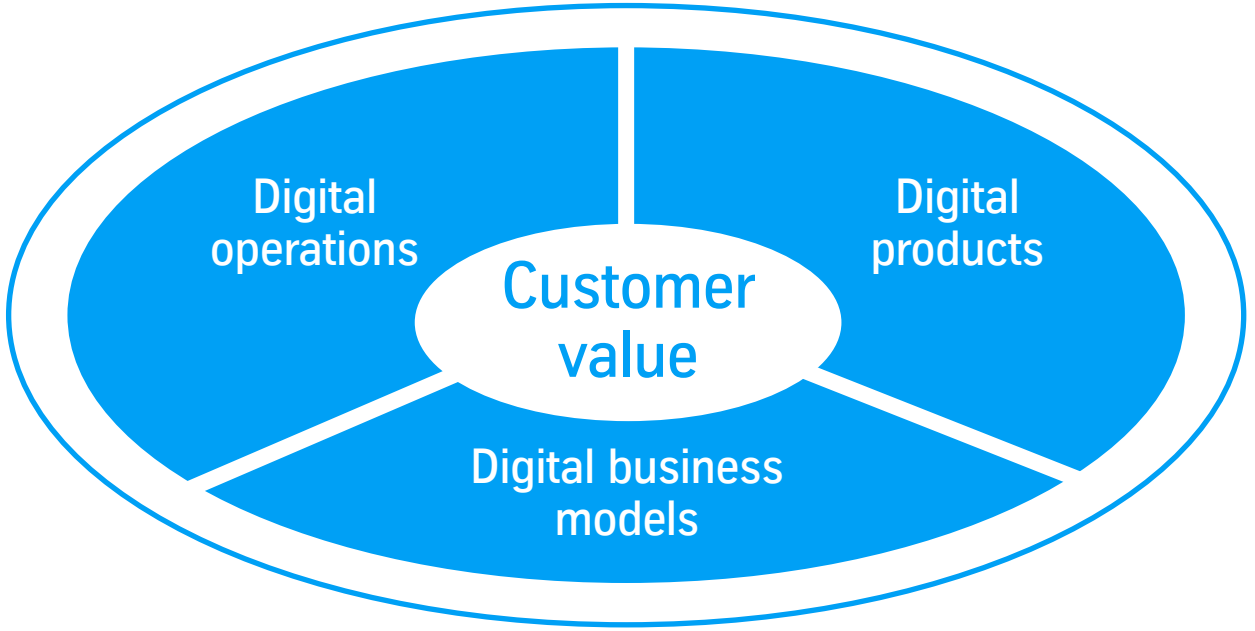
Combining Engineering Expertise with Digital Transformation to drive our competitiveness

ING.

INGENIEURKUNST

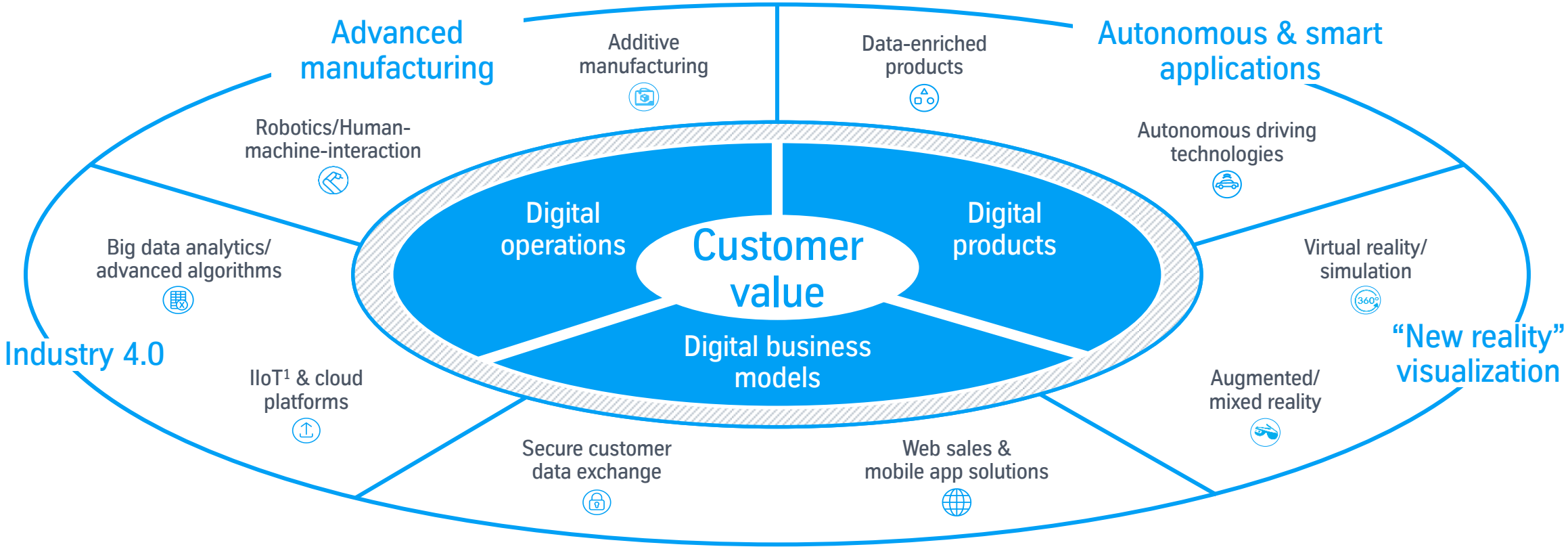
ENGINEERING OR THE ABILITY TO CONNECT COMPETENCES

+



Past: Industry focused on productivity
Future: Digital connection of value chains will be decisive

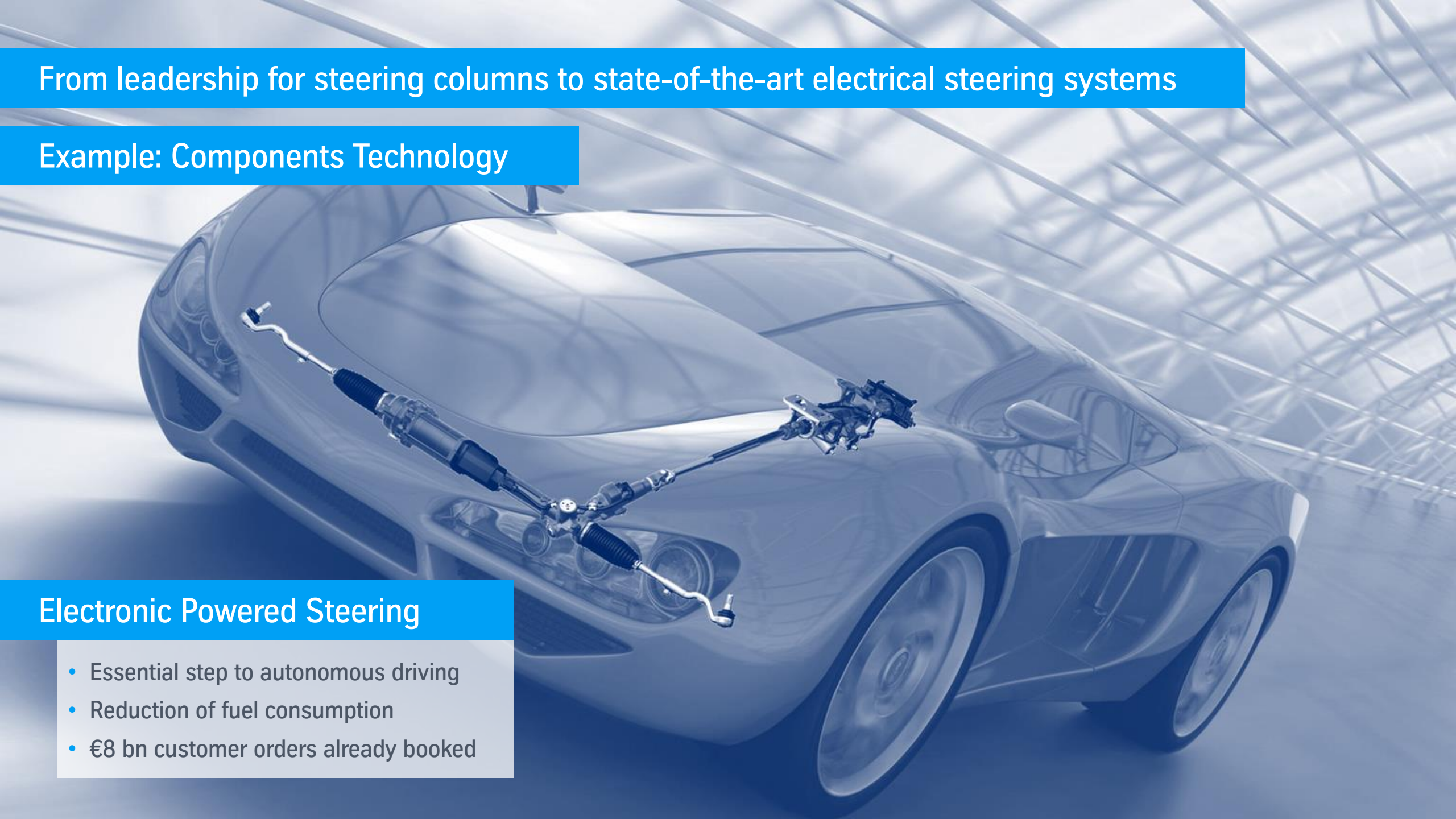
Digital Transformation creates greater internal efficiencies, new smarter products and new business opportunities



1. Industrial Internet of Things

From leadership for steering columns to state-of-the-art electrical steering systems

Example: Components Technology



Electronic Powered Steering

- Essential step to autonomous driving
- Reduction of fuel consumption
- €8 bn customer orders already booked

Next generation digitalized steering technology already under development

Example: Components Technology

Drive-by-wire

Digitalized chassis technology

- 400+ software engineers in Hungary
- Enables highly automated driving and totally new car architectures / interior concepts
- Reduces hardware variants and complexity, e.g. left/right hand drive
- Superior motion control

Autonomous driving

MULTI

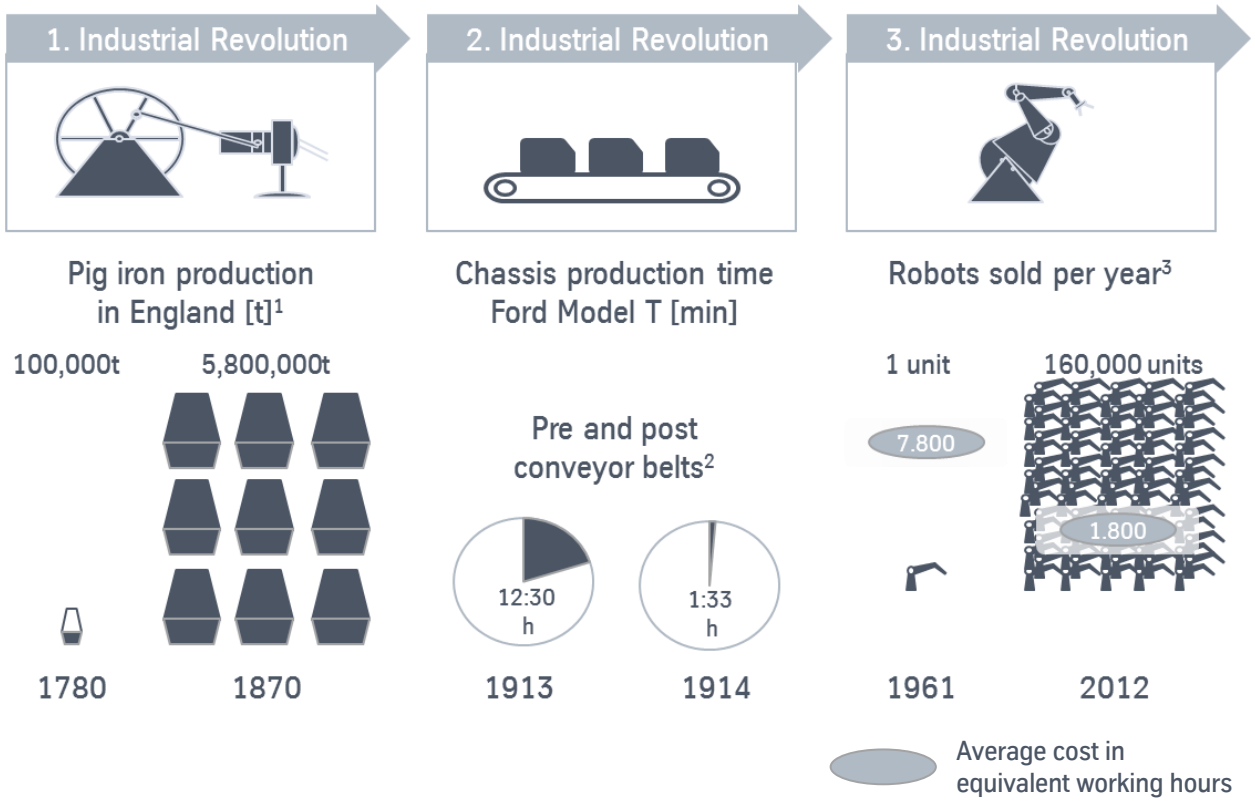
ACCEL

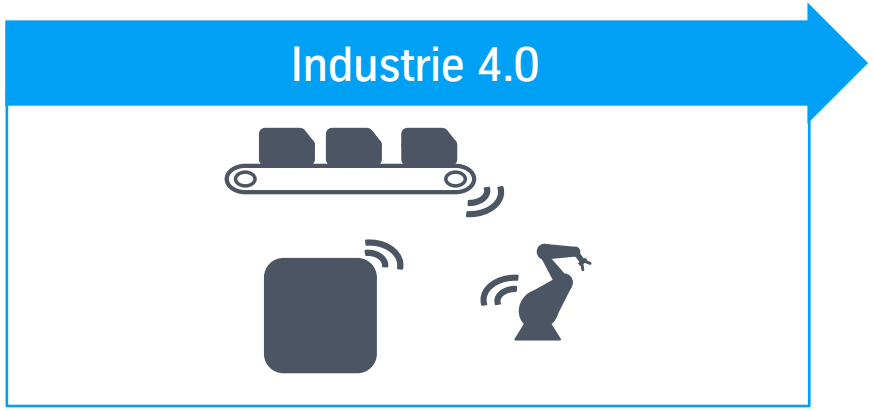
Elevator Technology

ModLens

HoloLinc

Industrie 4.0 – Next level value opportunity for thyssenkrupp and our customers





Seamless communication and process integration

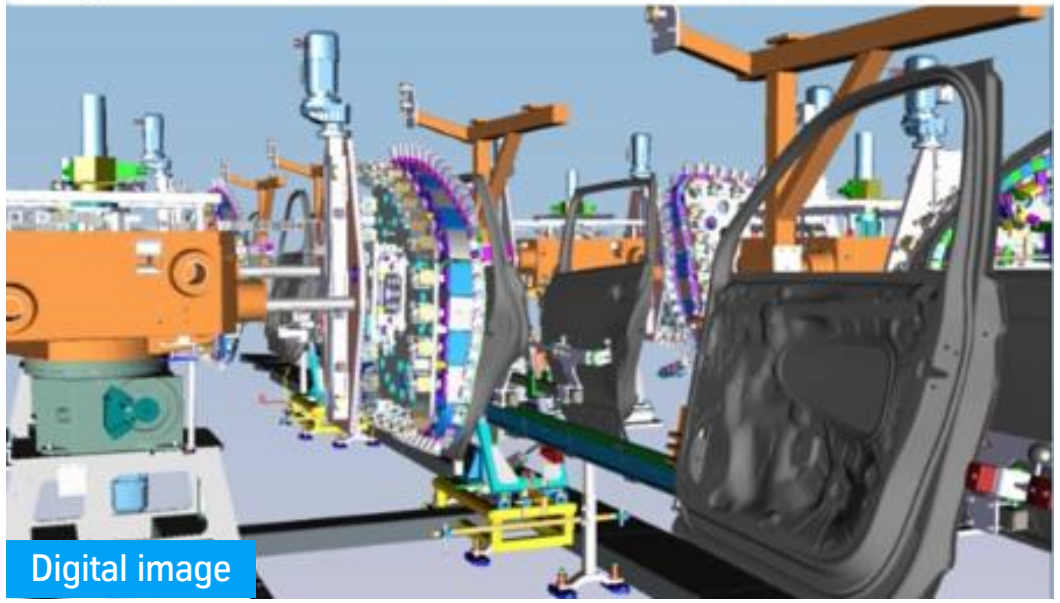
- Greater flexibility for customer
- Higher quality at lower cost
- Higher throughput
- Better environmental footprint

1. Pfister, Uni Münster, 2008 | 2. H. Ford: Mein Leben und Werk, Leipzig 1923 | 3. Int. Federation of Robotics, History of Industrial Robots, 2012

Digital Twin - Next efficiency level for plant engineering, automation and aftermarkets business

Example: Industrial Solutions, System Engineering

Car door assembly line – Digital Twin



- Secure timely order fulfillment
- Shorter commissioning times
- Simultaneous real life test
- Higher customer retention
- Flexible adjustment of equipment to changes in car model cycles

Car door assembly line – real

Meets the customer requirement for

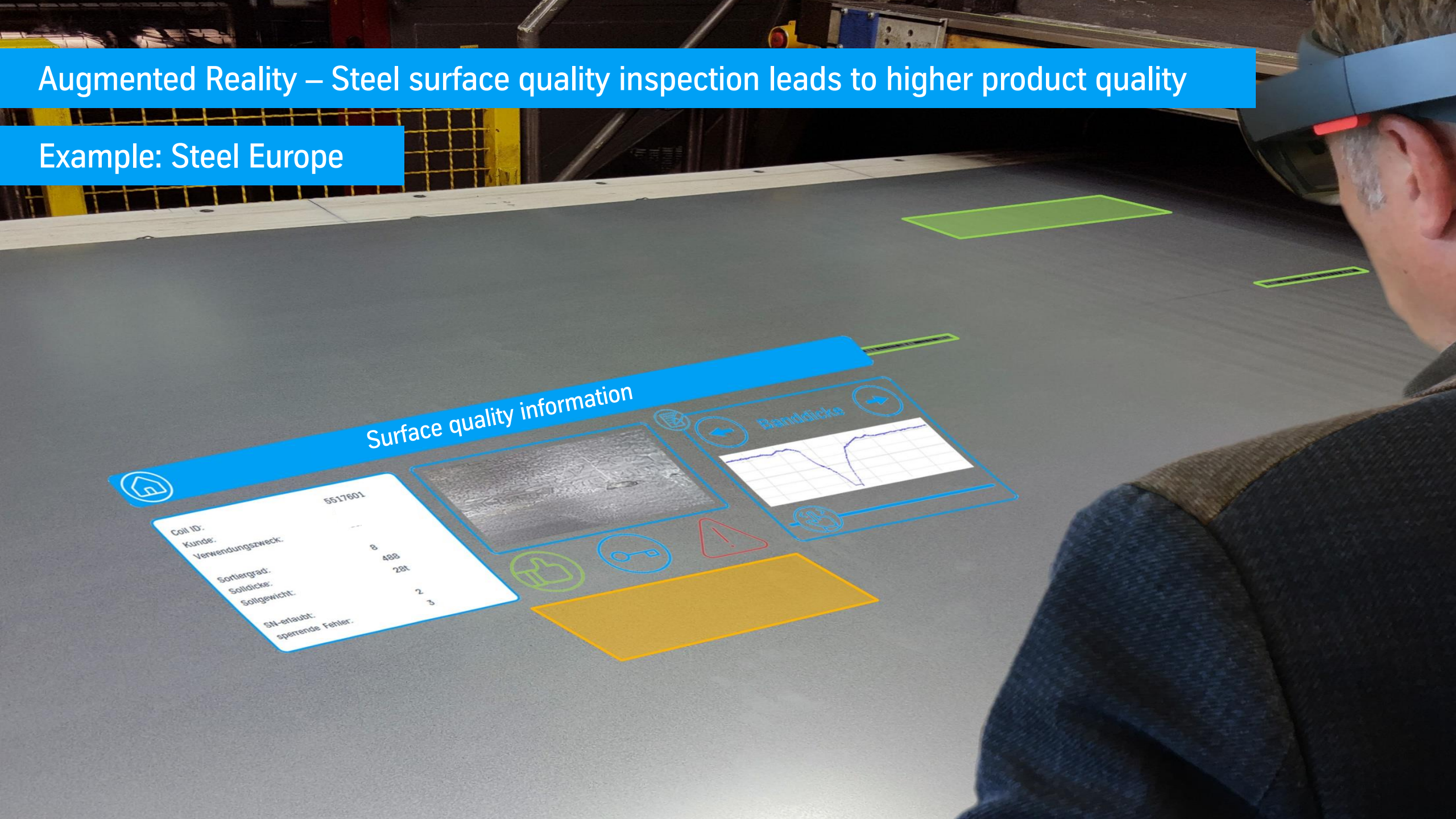
→ efficiency

→ flexibility

→ high quality

Augmented Reality – Steel surface quality inspection leads to higher product quality

Example: Steel Europe



Virtual Reality – Virtual Ship Training and Information System

Example: Industrial Solutions, Marine Systems

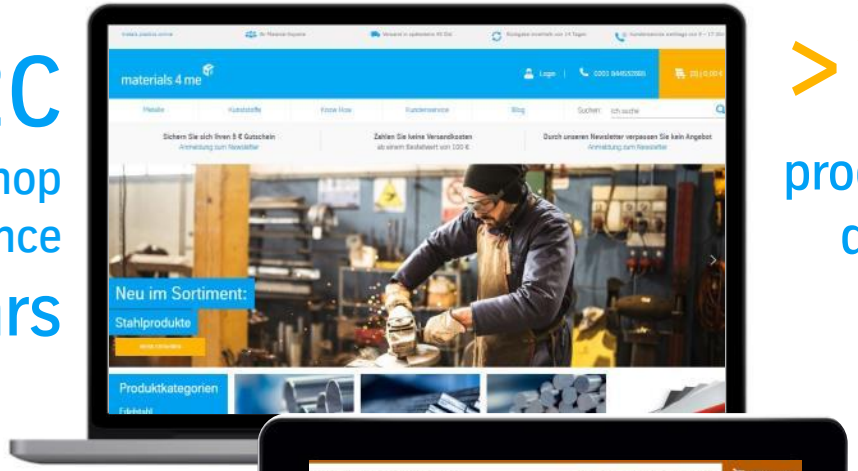
ViSTIS®

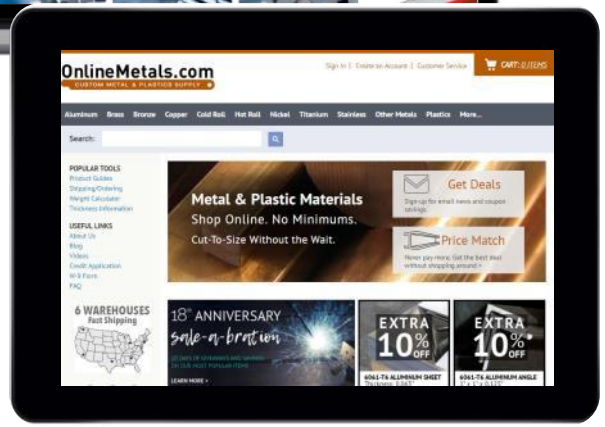
- Significant cost reduction for customers; already proven by German navy
- Crew training w/o expensive equipment even while ship still under construction
- Market roll-out in progress

Digital expansion of multichannel materials distribution and services

Example: Materials Services[1]

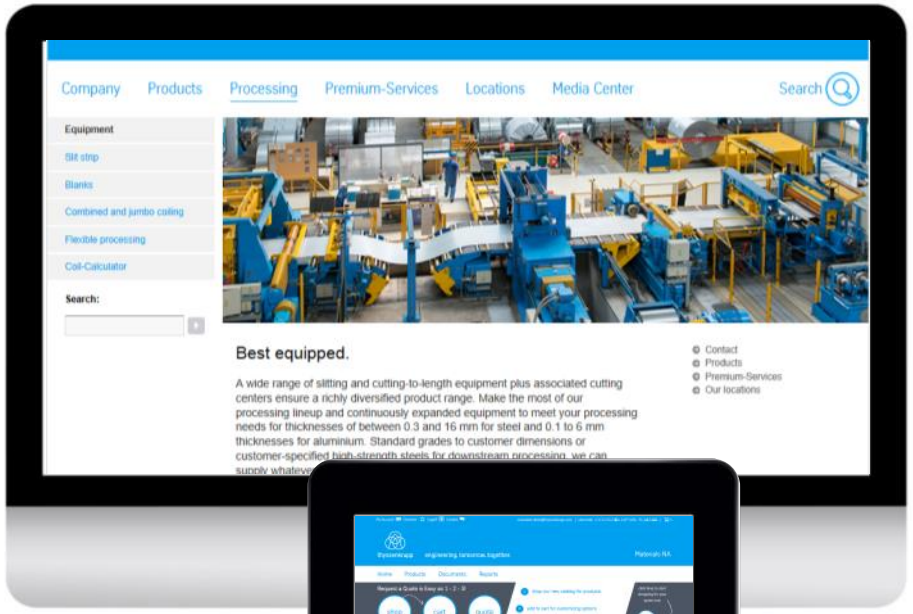
B2C
Shop experience
>10 years

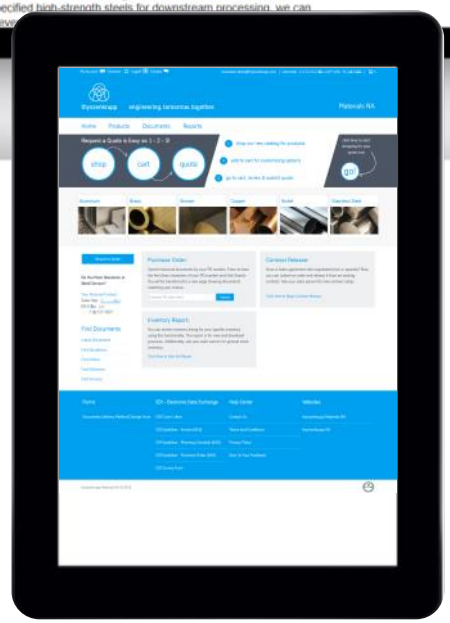




B2C
Sales online
€31 mn

>110,000
products available on digital platforms





B2B
17% from relevant sales via digital channels
~€1.3 bn

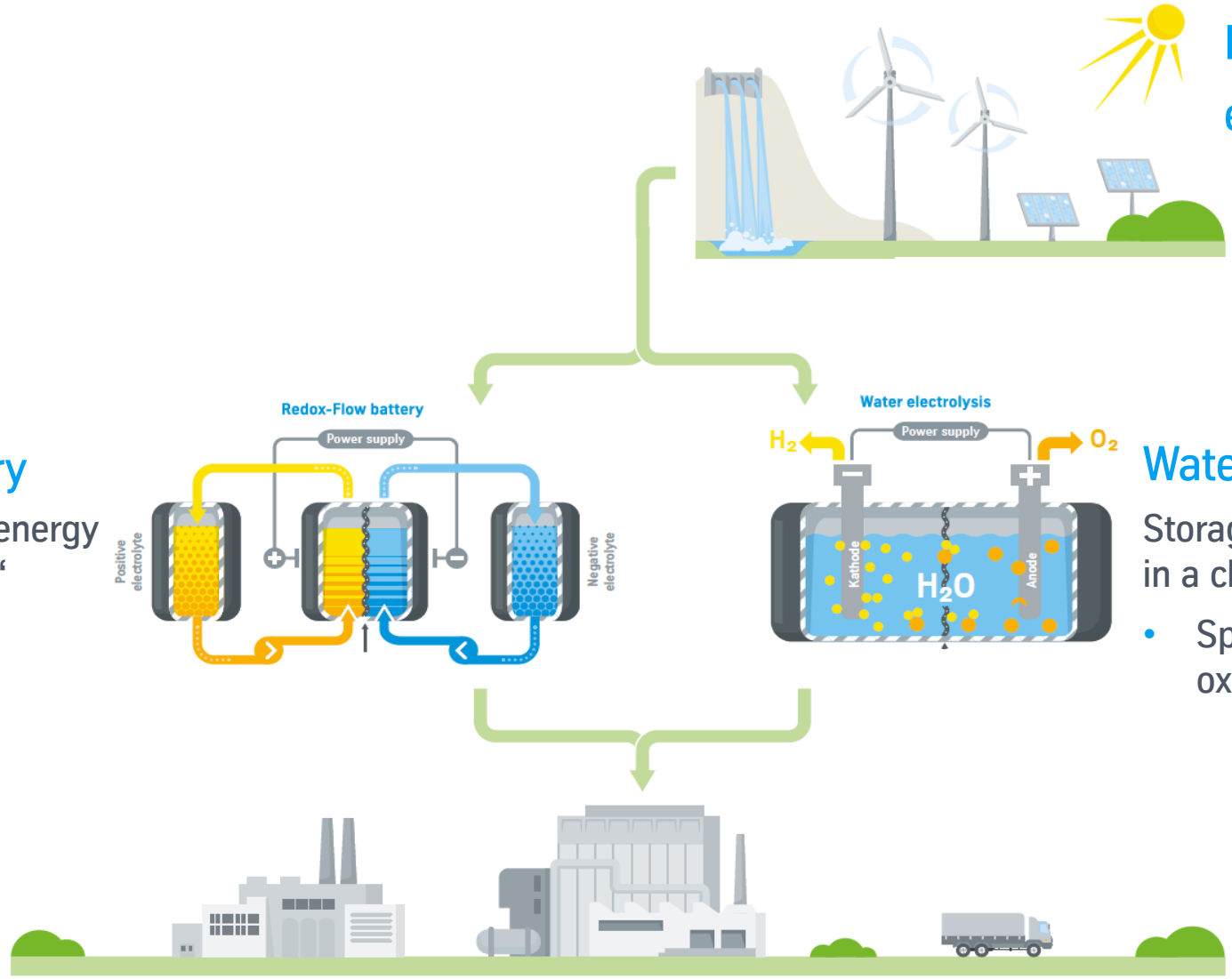
1. FY 2016/17

Development of technologies supporting Greenhouse Gas neutrality

Storage is precondition for the extensive use of power from renewable sources and grid stability

Redox-Flow battery

Storage of renewable energy in a „chemical battery“



Water electrolysis

Storage of renewable energy in a chemical product

- Splitting water into oxygen and hydrogen

Renewable Energy Strategy – Based on leadership in Chlor-Alkali Electrolysis technology

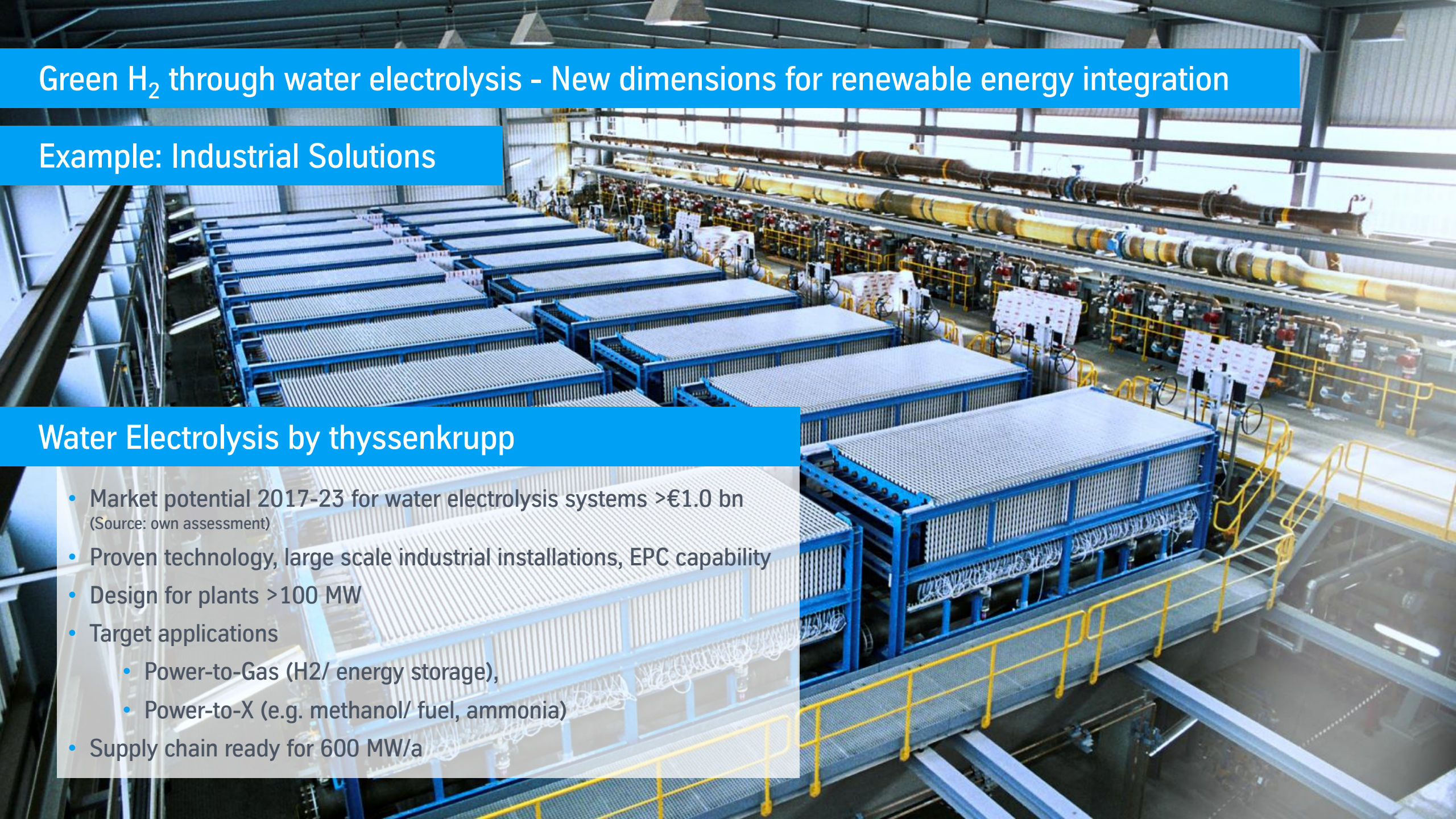
Example: Industrial Solutions

Electrolysis by thyssenkrupp

- #1 supplier for electrolytic production equipment for Chlorine, Hydrogen, Caustic Soda
- 600 electrolysis plants built
- Experience from more than 200,000 electrolysis cells engineered
- thyssenkrupp equipment with up to 20% less electrical power consumption

Green H_2 through water electrolysis - New dimensions for renewable energy integration

Example: Industrial Solutions



Water Electrolysis by thyssenkrupp

- Market potential 2017-23 for water electrolysis systems >€1.0 bn
  (Source: own assessment)
- Proven technology, large scale industrial installations, EPC capability
- Design for plants >100 MW
- Target applications
  - Power-to-Gas (H2/ energy storage),
  - Power-to-X (e.g. methanol/ fuel, ammonia)
- Supply chain ready for 600 MW/a

Leverage electrochemical expertise for technologies supporting Greenhouse Gas neutrality

Example: Industrial Solutions

Advanced Redox Flow Batteries by thyssenkrupp

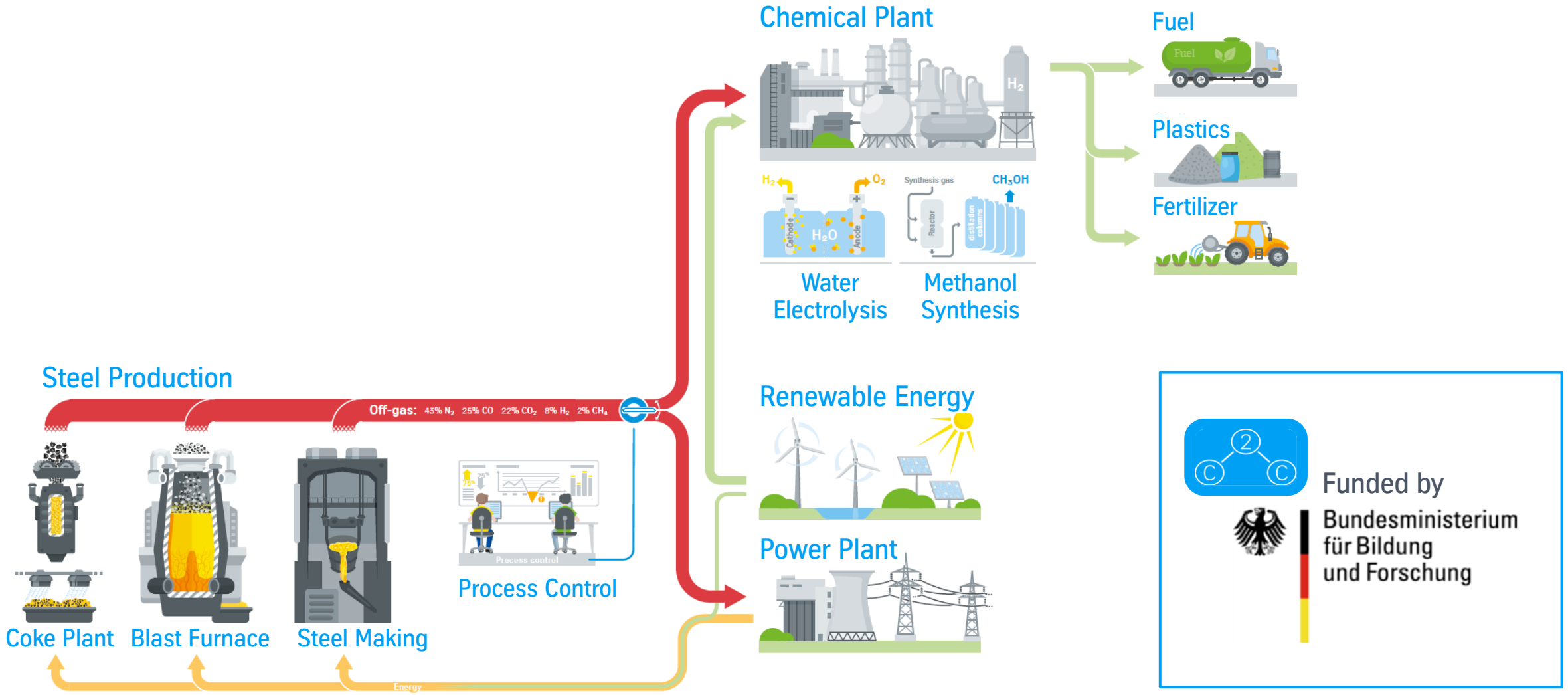
- Largest scale RF-Battery, scale economies
- Modular, highly scalable in 1 MW steps
- Better flexibility, lifetime and TCO[1] than Li-Ion-Battery systems; non-toxic, non-flammable
- Long lifetime >20 years at stable capacity
- Typical customer requirement:
  24/7 grid stability and power supply of >100 MW, 4-10 h

- Market potential 2017-22 for energy storage systems >€2.5 bn
  (Source: own assessment)
- Target applications include
  - On-grid energy storage
  - Off-grid energy storage / island solutions; distributed energy storage
- Ready for market demonstration
- RF-Battery industrial manufacturing in development

1. TCO - Total cost of ownership

Carbon2Chem – Recycling of top gases from steel production through cross-industry collaboration

Replacement of fossil fuels (oil and gas) for the production of artificial fuels, plastics and fertilizer

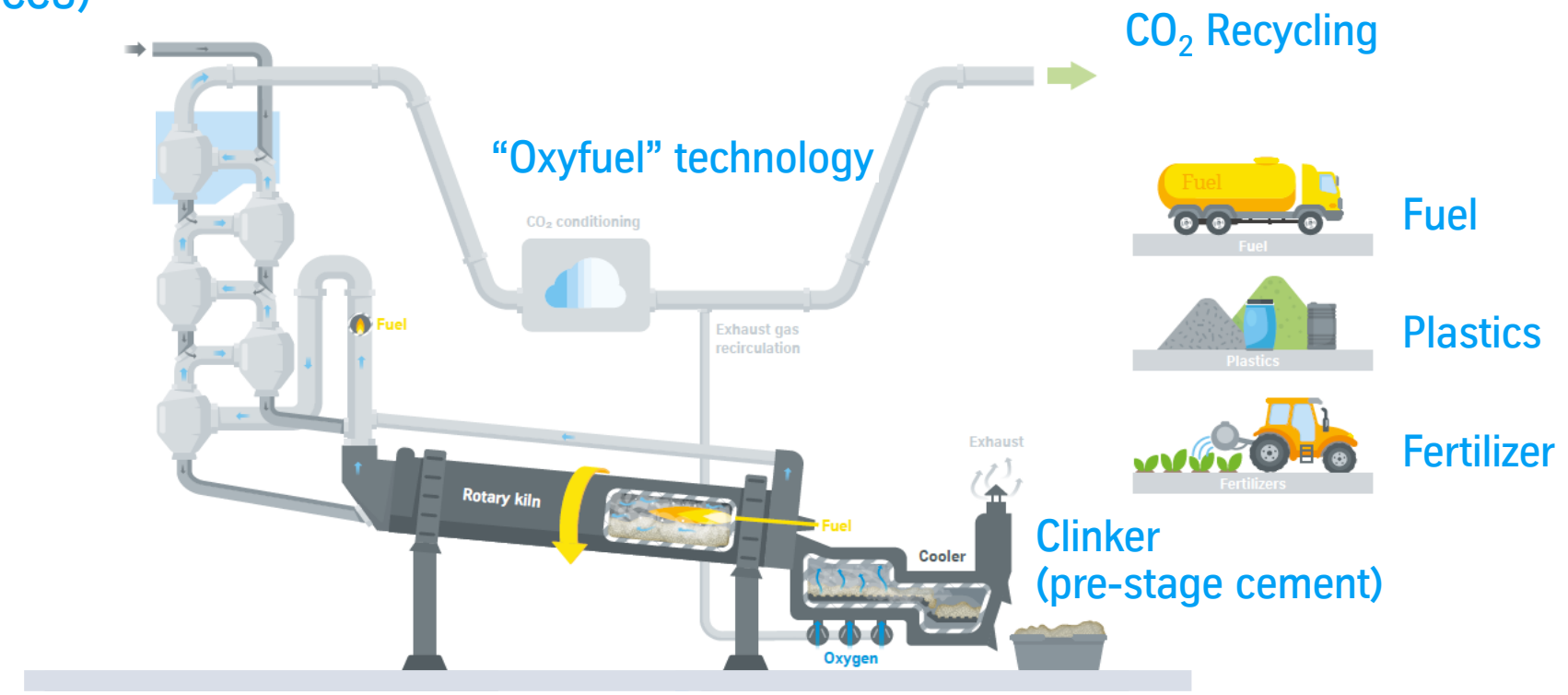


Funded by
Bundesministerium für Bildung und Forschung

Carbon2Chem - Technology modules can be offered for other CO_2 intense industries as well

Replacement of fossil fuels (oil and gas) for the production of artificial fuels, plastics and fertilizer
Example: Industrial Solutions

Carbon capture and use (CCU) for cement production



- Oxyfuel technology can be combined with any kind of modern cement production technology
- thyssenkrupp's outstanding position in cement production technology is a key lever for Oxyfuel technology roll-out

Leverage today's leadership in chemical processes and engineering for tomorrow's CO_2 recycling

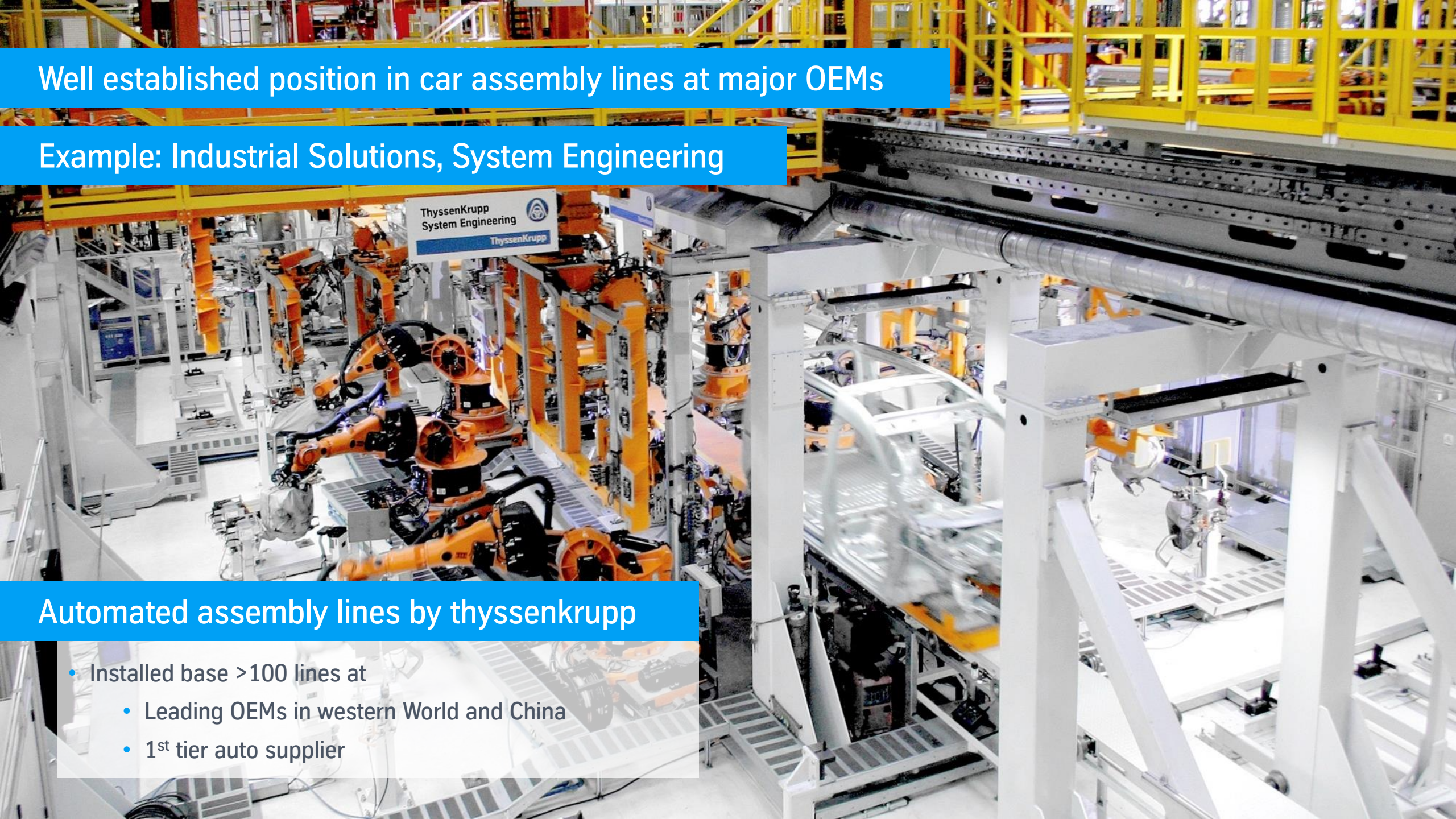
Example: Industrial Solutions

Chemical plants by thyssenkrupp

- Most efficient Ammonia and Urea plants with largest capacities
- World-leading process and plant design know-how
- We have built more than 2,500 chemical plants worldwide

Well established position in car assembly lines at major OEMs

Example: Industrial Solutions, System Engineering

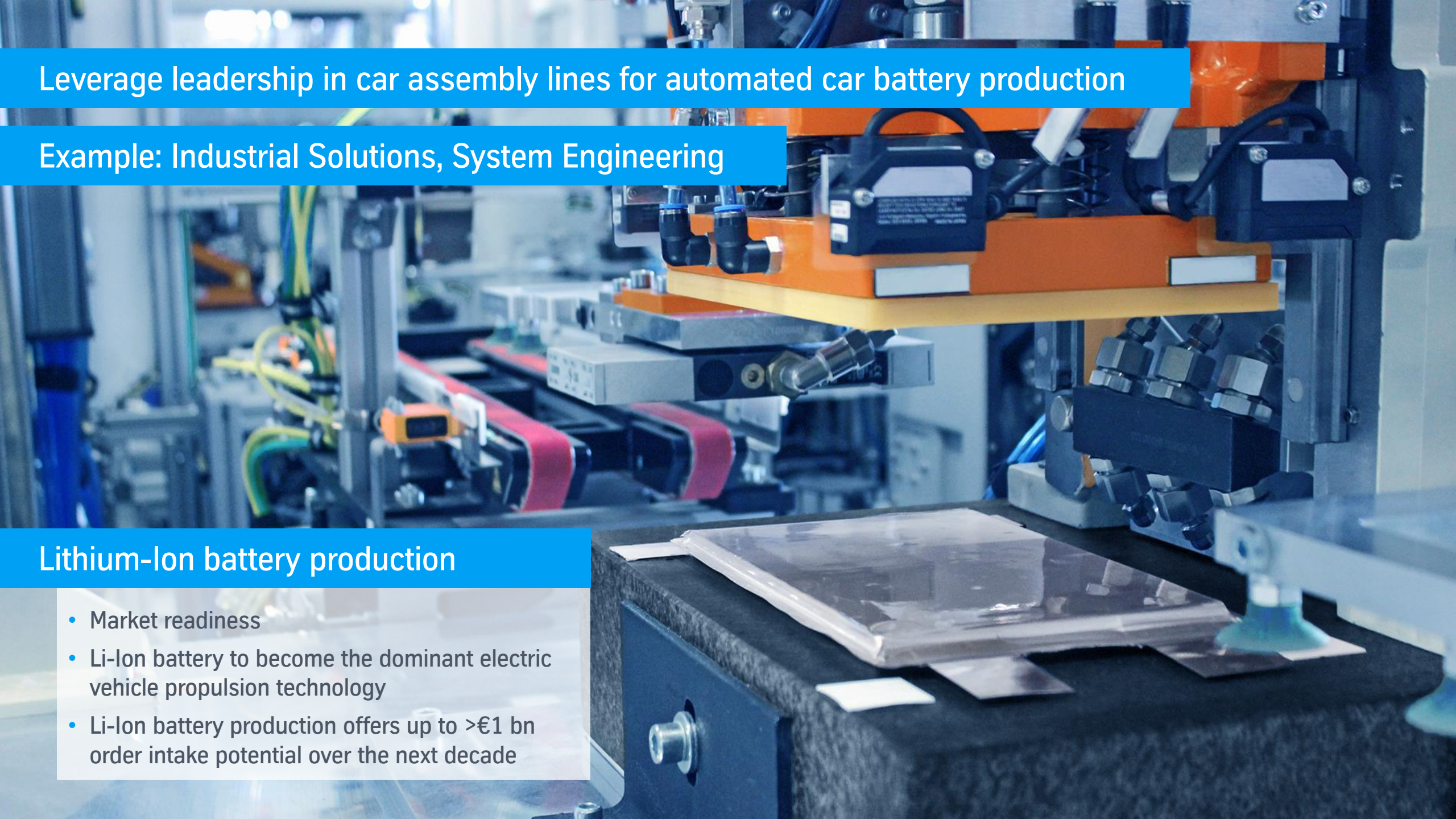


Automated assembly lines by thyssenkrupp

- Installed base >100 lines at
  - Leading OEMs in western World and China
  - 1st tier auto supplier

Leverage leadership in car assembly lines for automated car battery production

Example: Industrial Solutions, System Engineering

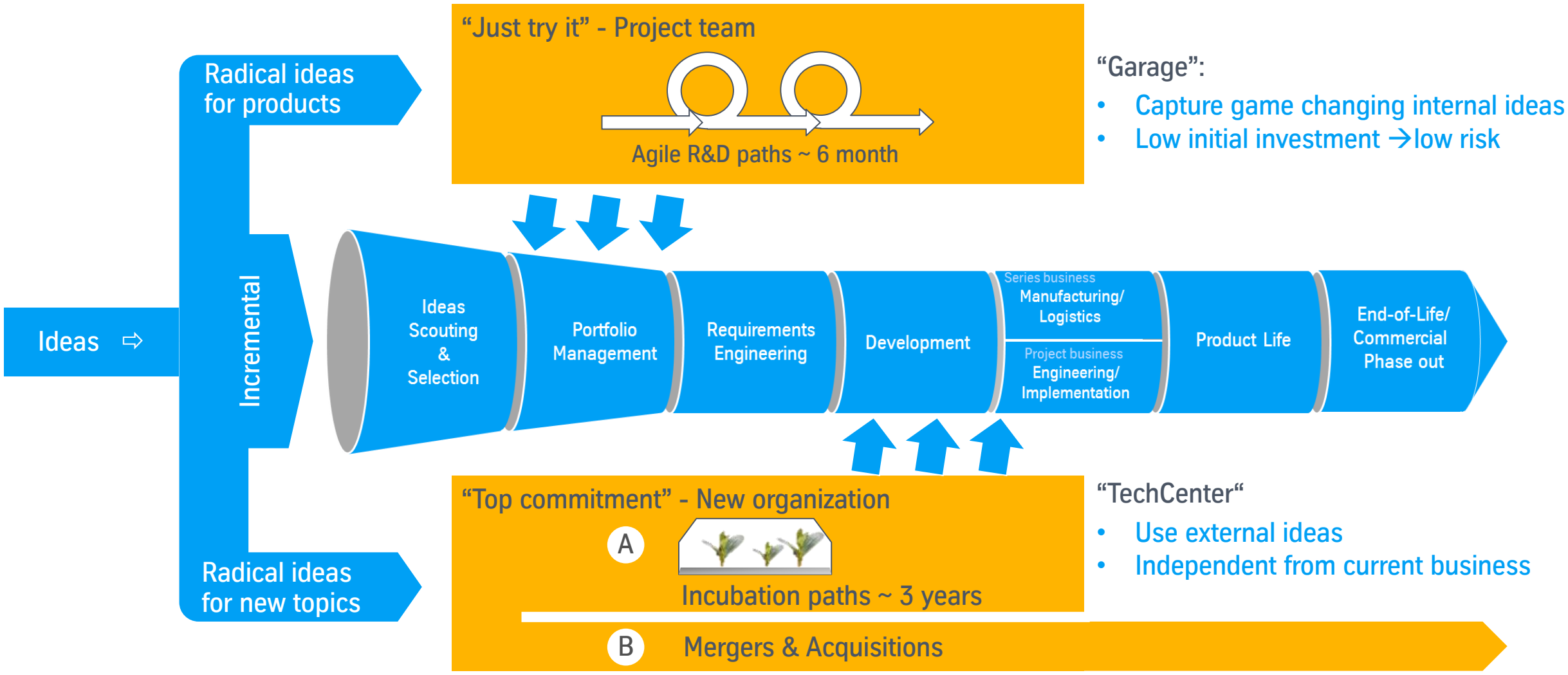


Lithium-Ion battery production

- Market readiness
- Li-Ion battery to become the dominant electric vehicle propulsion technology
- Li-Ion battery production offers up to >€1 bn order intake potential over the next decade

Leverage the full power of our innovation team and from external partners

Incubation models: Garage / TechCenter



"Garage":

- Capture game changing internal ideas
- Low initial investment →low risk

"TechCenter"

- Use external ideas
- Independent from current business

thyssenkrupp Carbon Components GmbH, Dresden - established 2012

Carbon wheel

- Worldwide first serial CFRP-Wheels with braiding technology
- Market Potential up to 4.4 mn wheels p.a
- Unique lightweight ratio and damping properties
- Fully tested and approved by German OEMs
- Market entry with German sports car OEM and German motorbike OEM in progress

TechCenter Additive Manufacturing, Muelheim – established 2017

Additive Manufacturing

- Integration of function
- Reduction of weight and parts assembled
- Simpler supply chain
- Market is growing with a two digit growth rate p.a.
- Step 1: Serve internal requirements
- Step 2: Rollout of service offerings across customer base

Technology, Innovation & Sustainability –
Committed to realize the value upside from tk`s Strategic Way Forward

Pillars

- Leading edge technology
  - Products
  - Processes
- Resource efficiency
  - Raw Materials
  - Energy
  - CO_2
- Sustainability
  - Products
  - Processes
- System optimum vs. local optima

Levers

- Digital transformation
- Renewable Energy strategy
- Greenhouse-gas neutrality
- Materials/Product innovation
- Agile processes and innovation

Results

- Advanced automotive/ e-mobility solutions
- State-of-the-art elevators and escalators, strong service focus
- Smart and efficient systems
- Customer orientated material distribution and value added services
- World class flat steel products

Growth

Value

Cash

Disclaimer thyssenkrupp AG

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This presentation contains forward-looking statements that are subject to risks and uncertainties. Statements contained herein that are not statements of historical fact may be deemed to be forward-looking information. When we use words such as “plan,” “believe,” “expect,” “anticipate,” “intend,” “estimate,” “may” or similar expressions, we are making forward-looking statements. You should not rely on forward-looking statements because they are subject to a number of assumptions concerning future events, and are subject to a number of uncertainties and other factors, many of which are outside of our control, that could cause actual results to differ materially from those indicated. These factors include, but are not limited to, the following:

(i) market risks: principally economic price and volume developments,

(ii) dependence on performance of major customers and industries,

(iii) our level of debt, management of interest rate risk and hedging against commodity price risks;

(iv) costs associated with, and regulation relating to, our pension liabilities and healthcare measures,

(v) environmental protection and remediation of real estate and associated with rising standards for real estate environmental protection,

(vi) volatility of steel prices and dependence on the automotive industry,

(vii) availability of raw materials;

(viii) inflation, interest rate levels and fluctuations in exchange rates;

(ix) general economic, political and business conditions and existing and future governmental regulation; and

(x) the effects of competition.

Please note that we disclaim any intention or obligation to update or revise any forward-looking statements whether as a result of new information, future events or otherwise.”

Capital Market Day 2017

Innovation meets Elevator

Rottweil, December 8th, 2017
Andreas Schierenbeck (CEO) I Ercan Keles (CFO)

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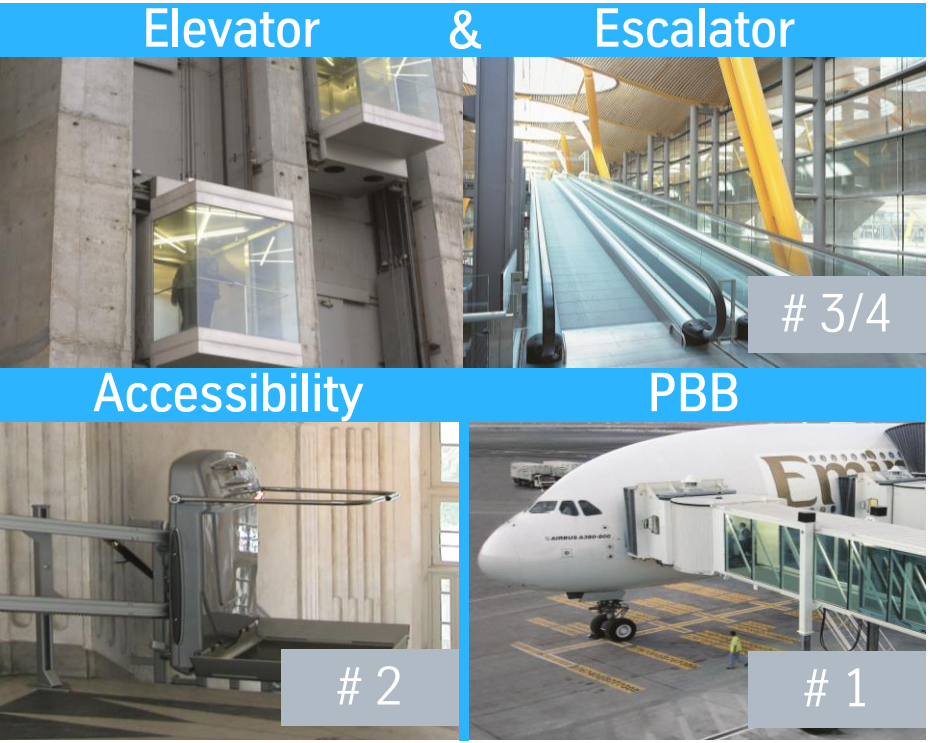
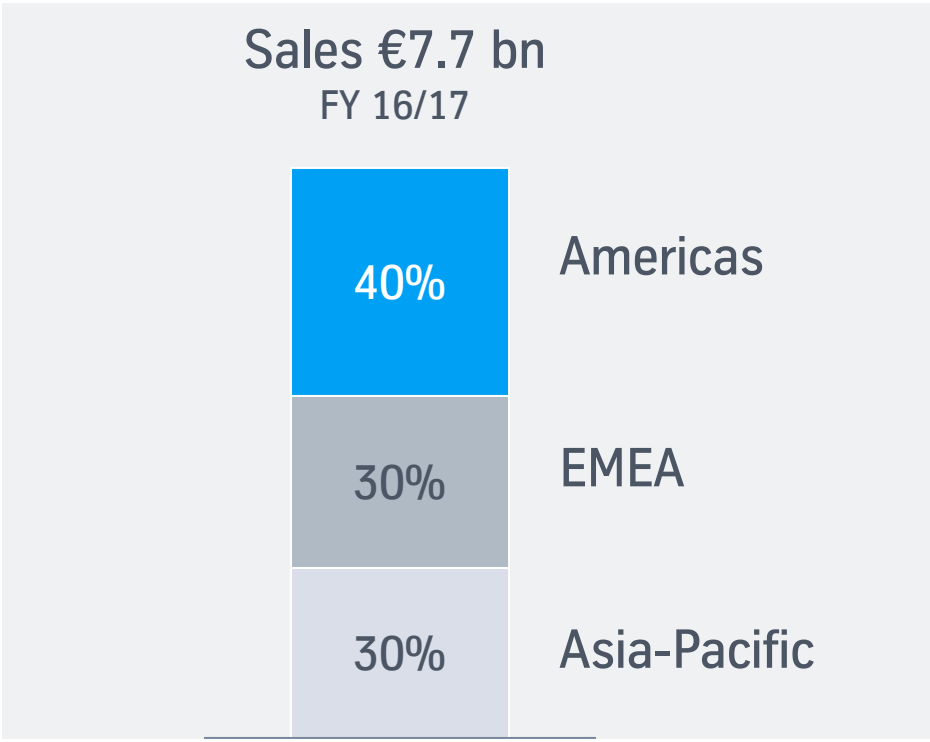
Elevator Technology: Strong market position and balanced footprint



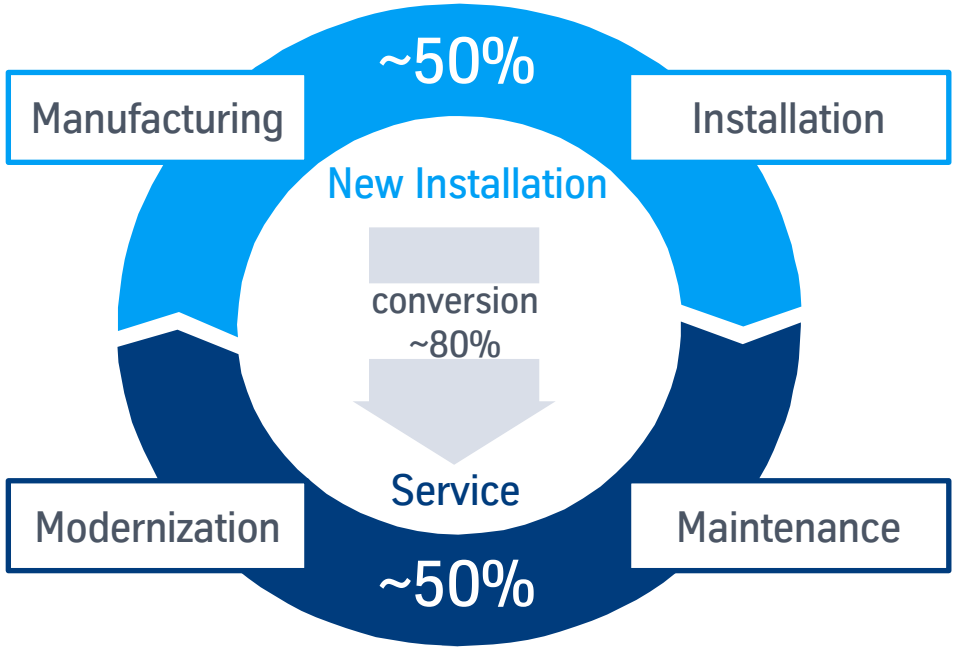


Global presence – close to the customer

>1,000 Locations | 18 Factories

Stable service oriented business

Business Model

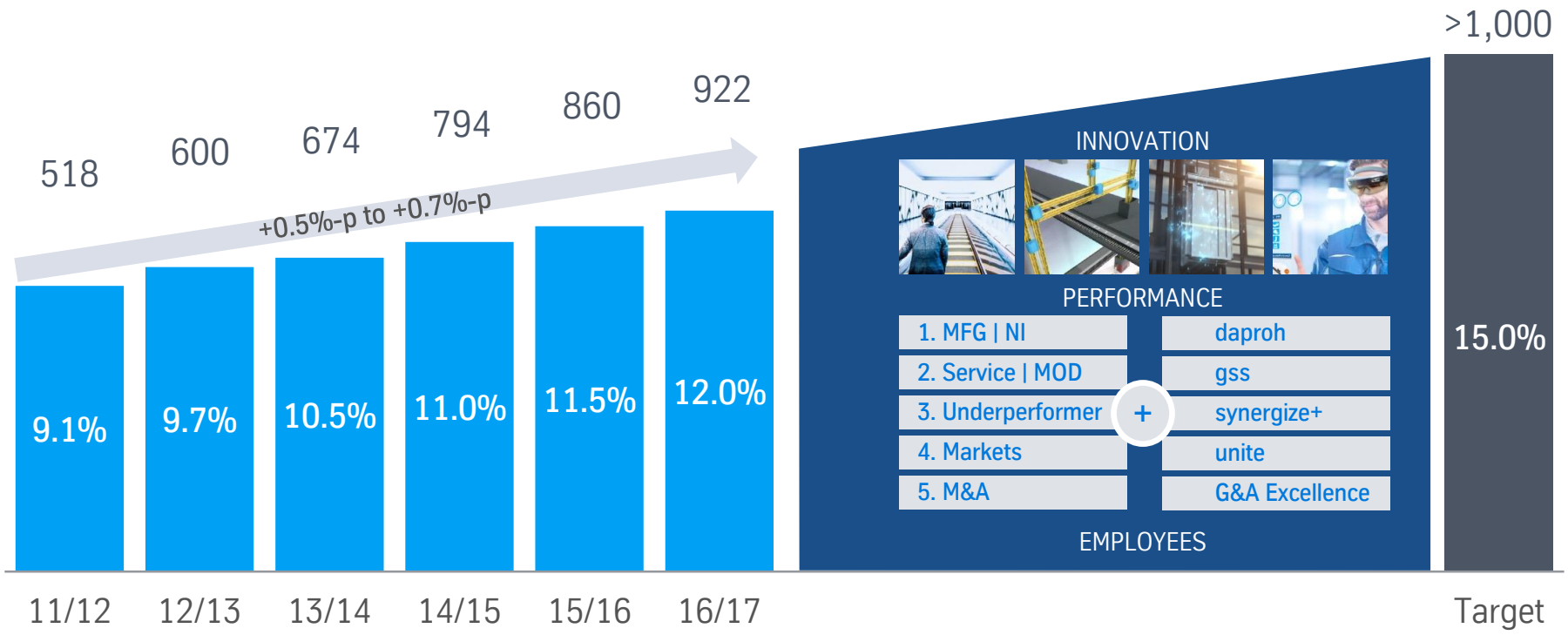


Characteristics

- 1.3m units under maintenance
- 24,000 service technicians
- Ø sales per customer <50k€
- <3% of sales by top 10 customers

Change & Performance program

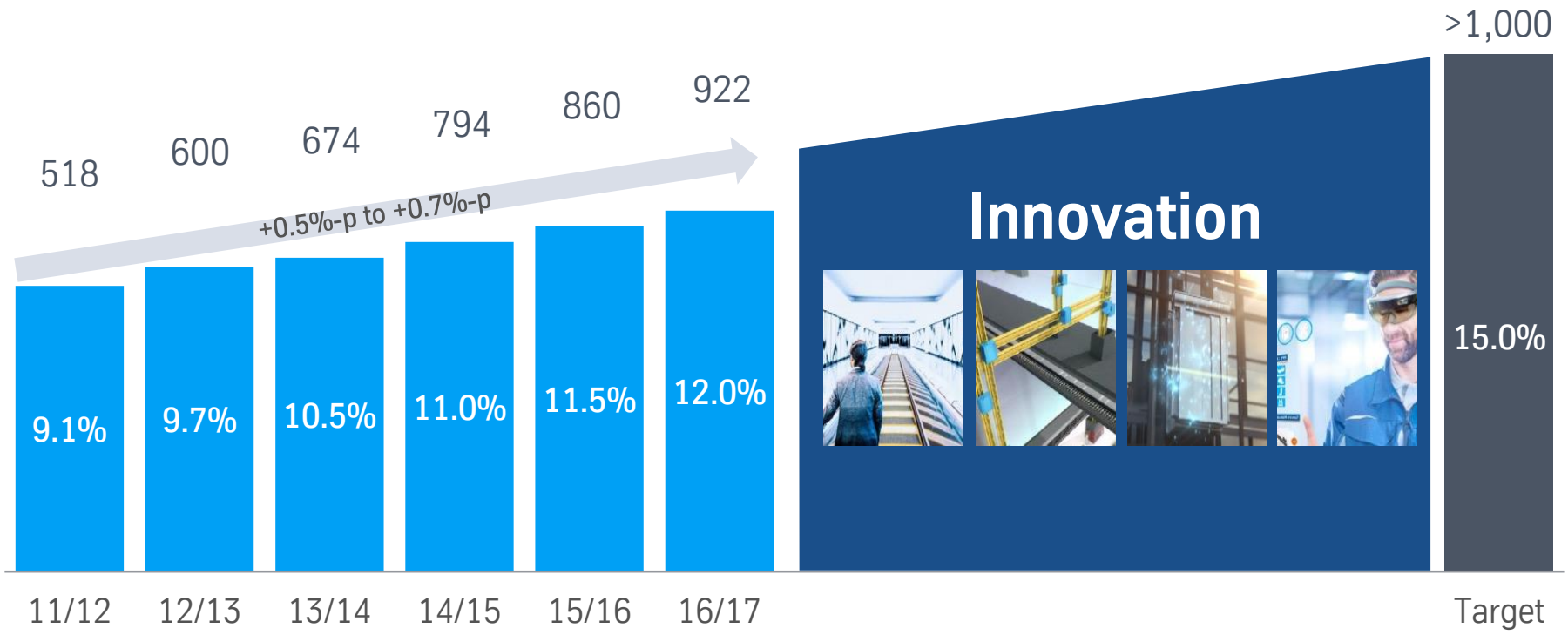
EBIT adj. [m€ | FY]



Transform the industry and be the partner for urban mobility

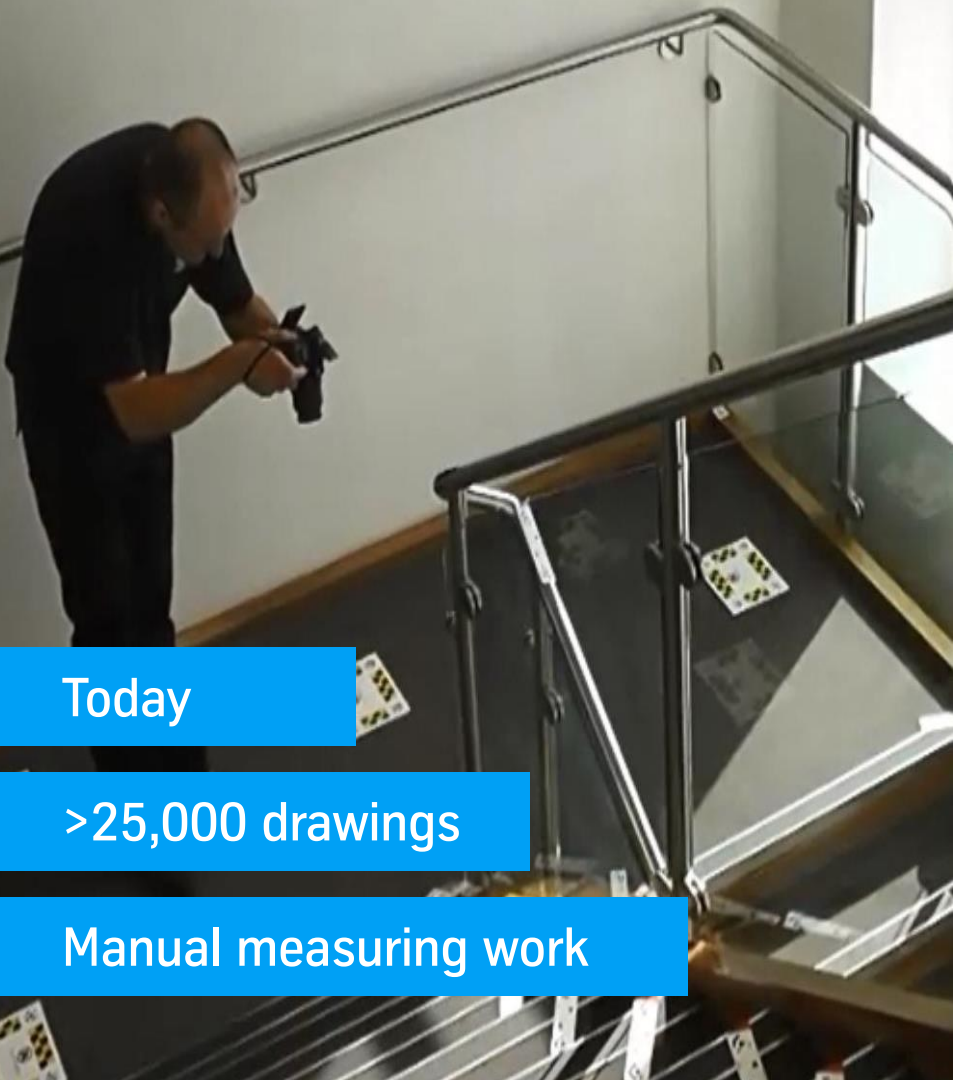
Change & Performance program

EBIT adj. [m€ | FY]



HoloLinc
MULTI
MANUFACTURING
NEW INSTALLATION
ModLens
MAX
MODERNIZATION
SERVICE

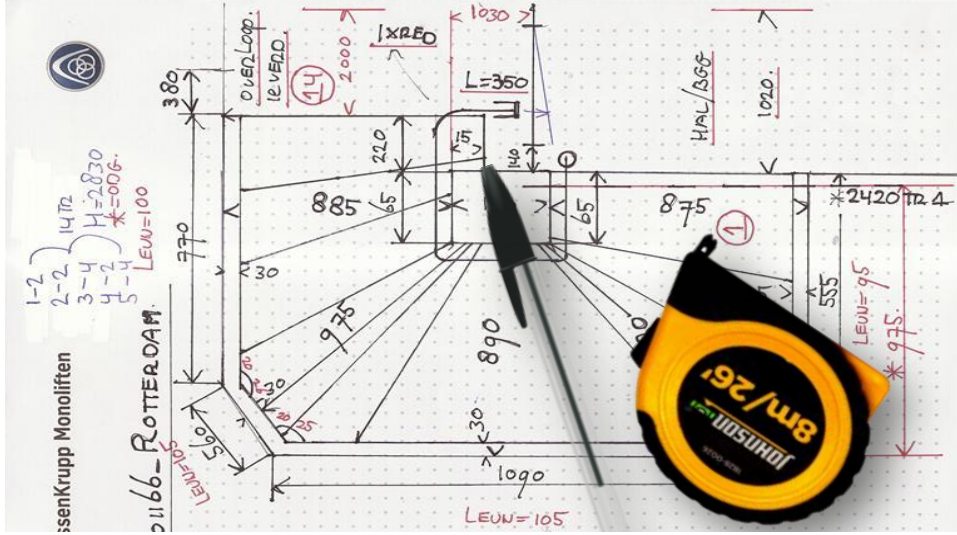
Bespoke home solutions
Enhancing quality of life



Today

>25,000 drawings

Manual measuring work



1. Measurement

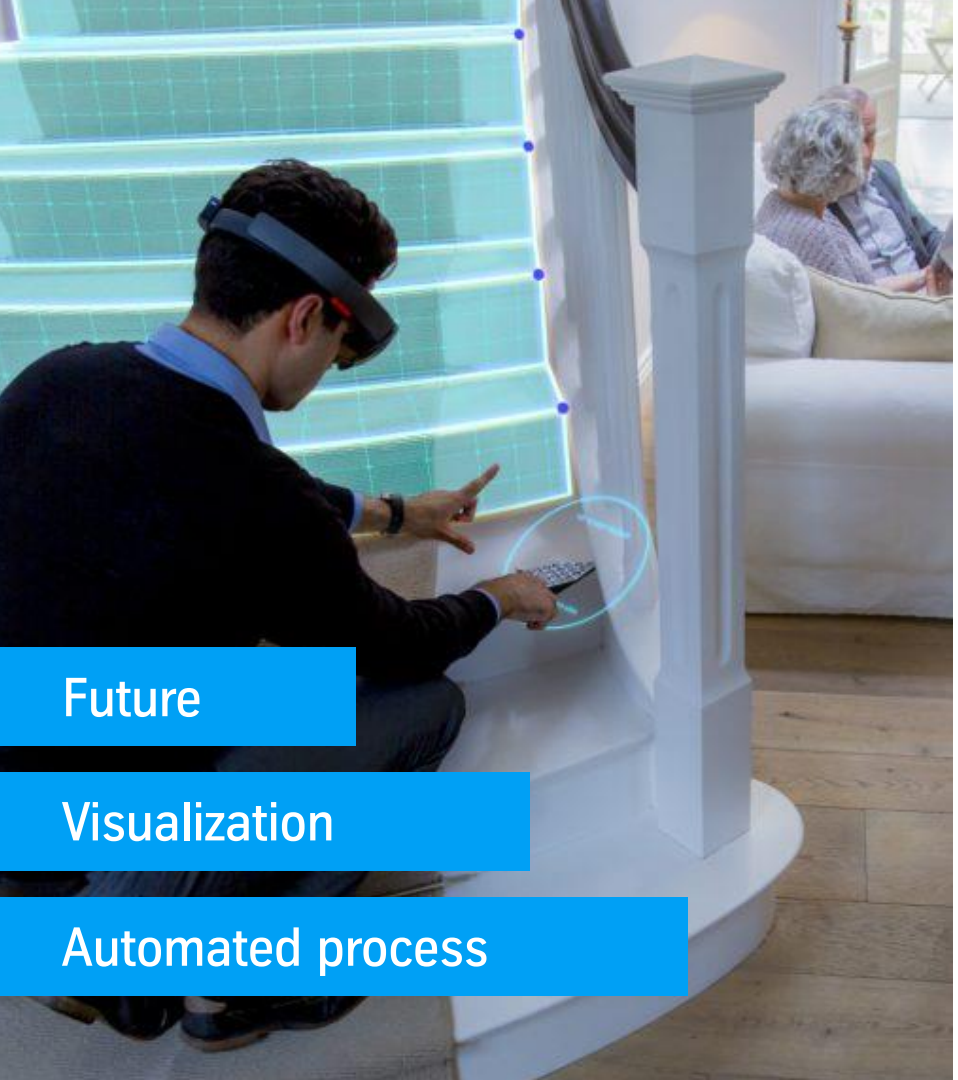
2. CPQ /Order Management

3. Tailored Production

4. Installation

Current order to delivery Process…

40 – 50 days



1. Measurement

2. CPQ /Order Management

3. Tailored Production

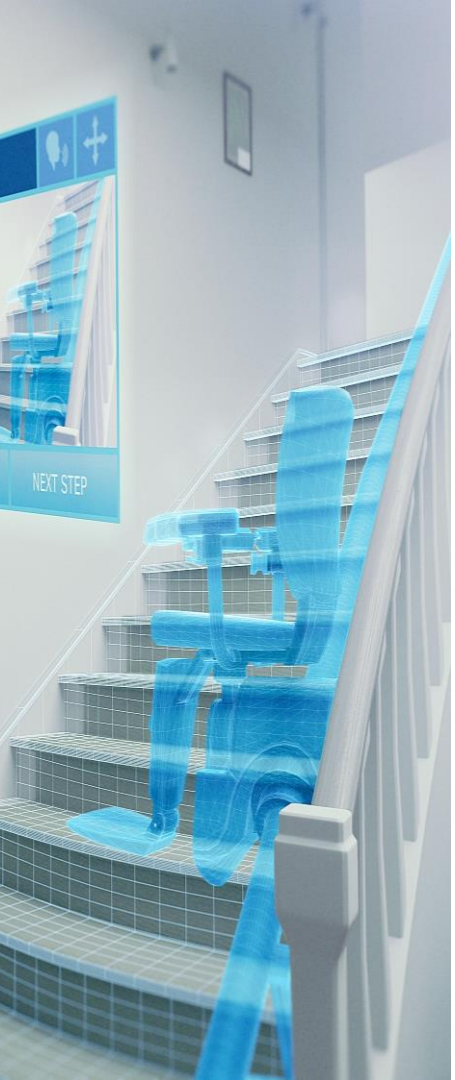
4. Installation

HoloLinc®

HoloLens + Lean Intake Connector

Automated order to delivery Process…

10 working days



Business Transformation Benefits

4x times faster delivery

>1,000 units p.a. due to higher conversion

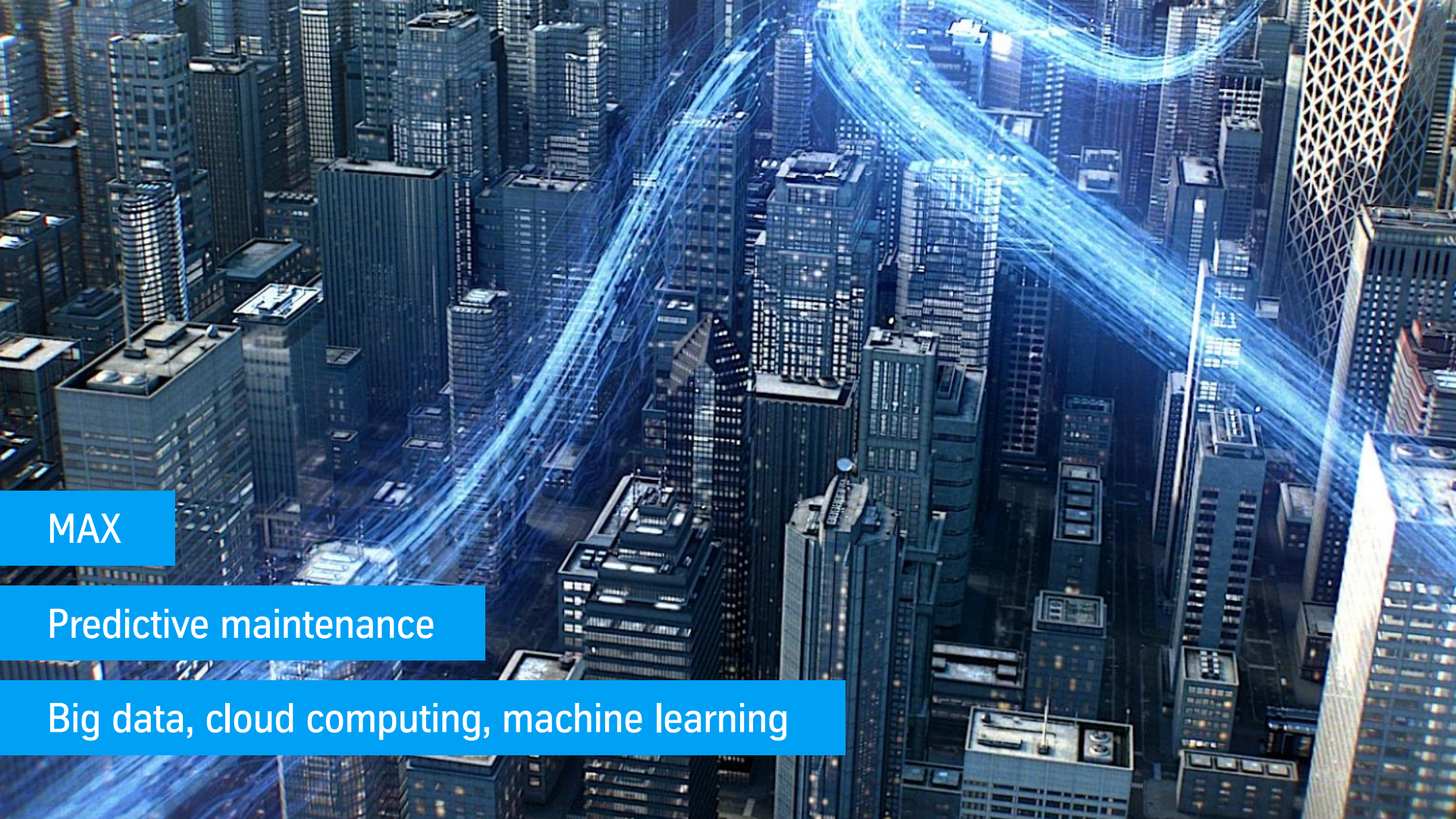
\+ Sales Time

up to **30%** more Sales due to faster processes

cloud

>30% efficiency gains in admin

+10% additional EBIT p.a.


MAX
Predictive maintenance
Big data, cloud computing, machine learning

Next Generation Service

>110k

MAX units already installed at 48,000 different sites

4 countries rollout ongoing plus 2 started

150 Million transactions per day

Collecting 100GB data daily

MAX already installed for 41,000 customers

Transforming the industry

MAX

HoloLens

SpareParts Delivery Robot

Our commitment: 50% reduction of downtime

50 Smartest Companies

1 Tesla	2	3 illumina	4 Alibaba.com	5 Counsyl	6 SunEdison	7 Tencent 騰訊	8 JUNO THERAPEUTICS	9 SolarCity	10 NETFLIX
11 OVASCIENCE	12 Google	13 amazon.com	14 AliveCor	15 GILEAD	16	17 VOXELS	18 IDE Technologies	19 AMGEN	20 AQUION ENERGY
21 Baidu 百度	22 SPACEX	23 SAKTI3	24 freescale semiconductor	25 UNIVERSAL ROBOTS	26 Bristol-Myers Squibb	27 TELADOC	28 NVIDIA	29 facebook	30 Alnylam
31 rethink robotics	32 PHILIPS	33 cellectis	34 bluebirdbio	35	36 slack	37 LINE	38 IMPROBABLE	39	40 coinbase
41 HaCon	42	43 GENERALI	44 INTREXON	45 DNAnexus	46 IBM	47	48 Microsoft	49	50

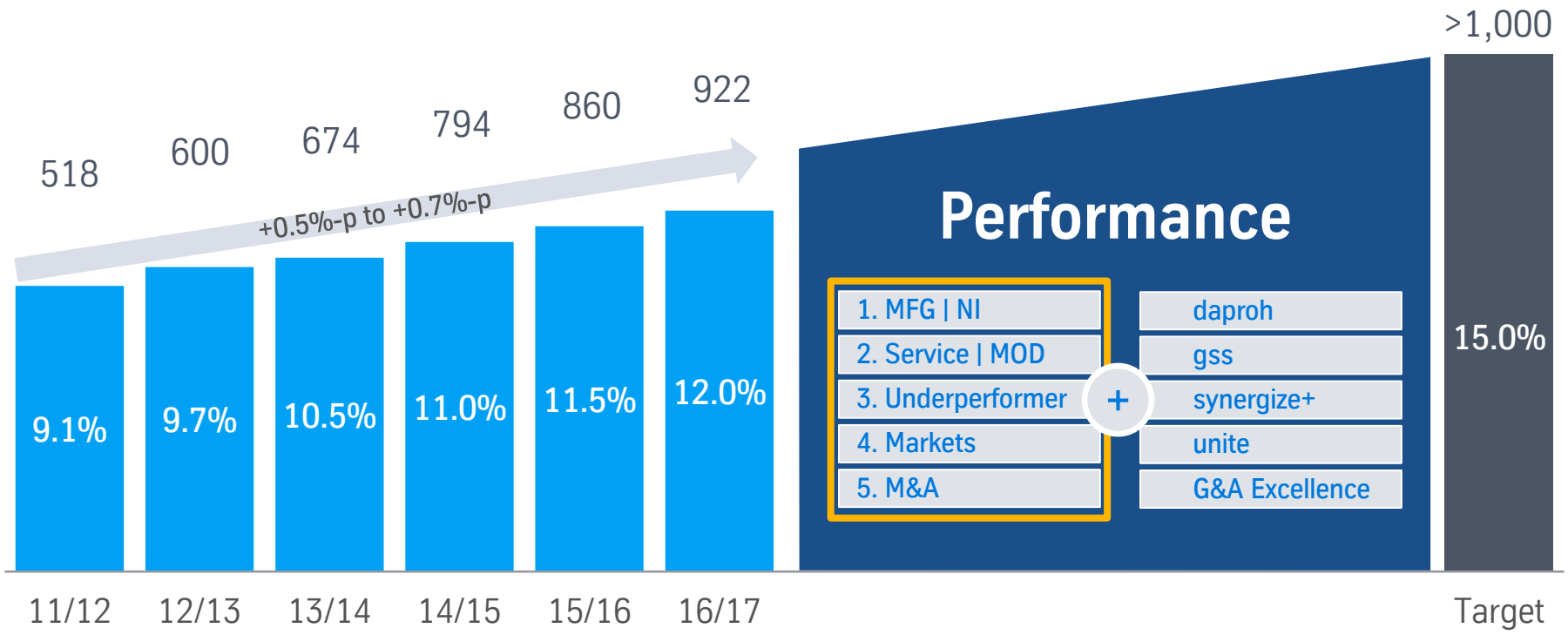
Source: Massachusetts Institute of Technology in 2015

1 billion

people reached
FY16/17

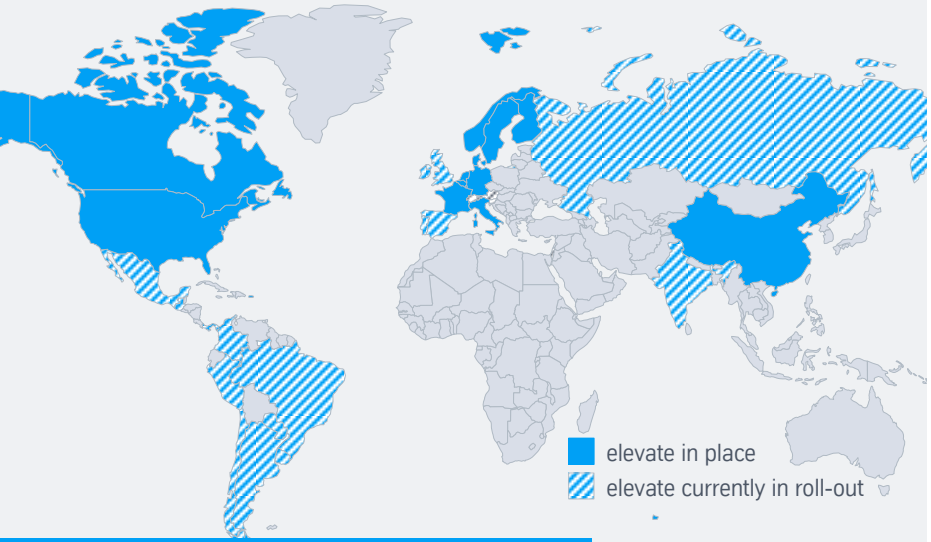
Change & Performance program

EBIT adj. [m€ | FY]



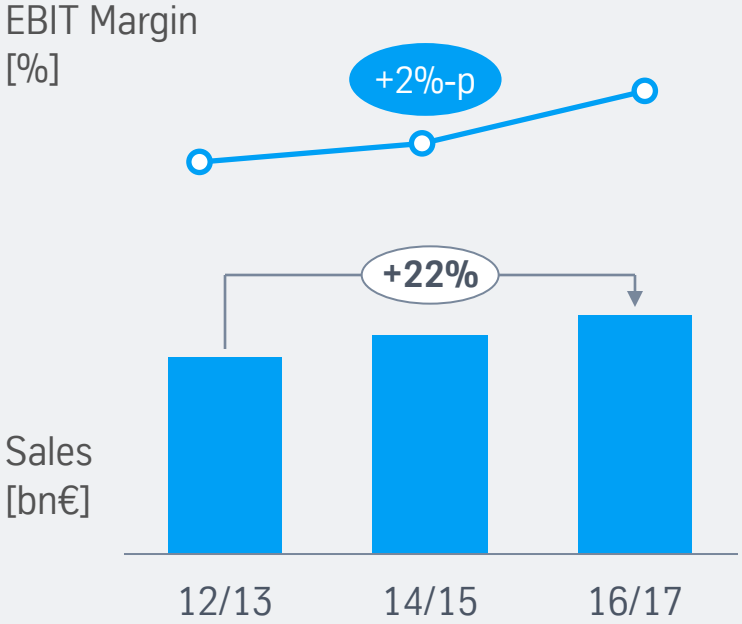
Service | Modernization: Track record

elevate Field Operations Performance Program

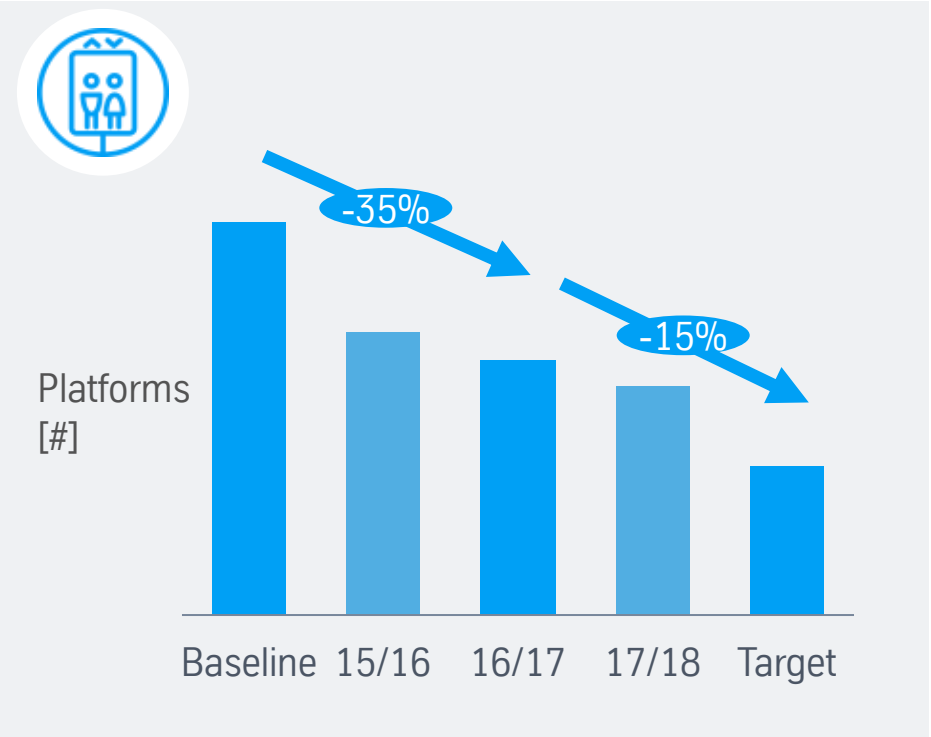


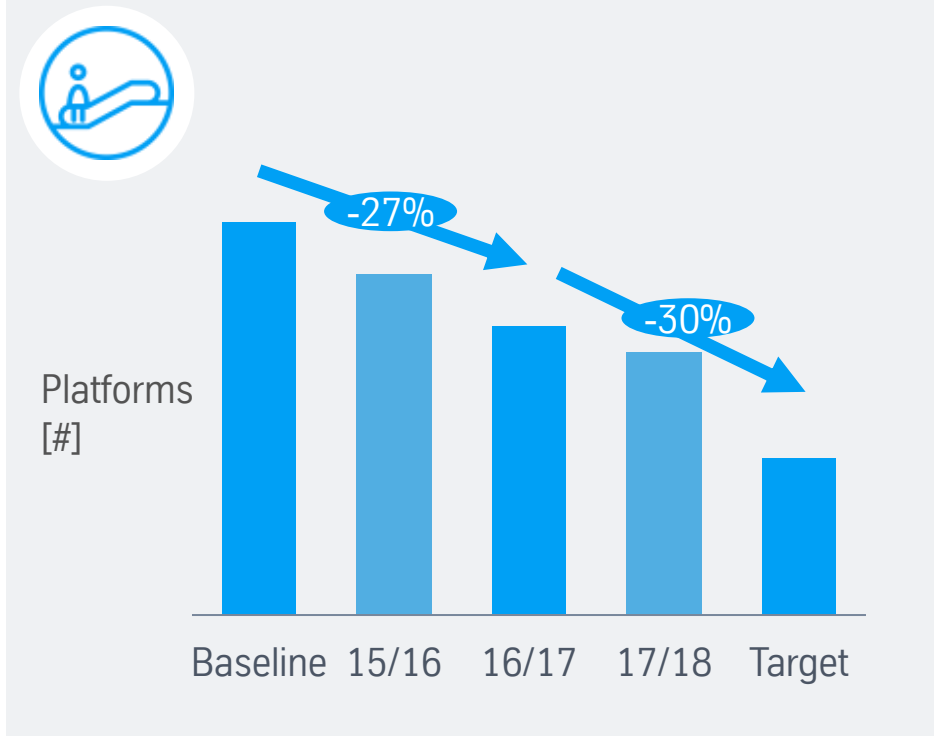
120 m€ measure volume since FY14/15

Standard Staffing | Operating Procedures



Product Portfolio: Reduction of complexity





Example on component level

Measures taken

-70%

Reduction in Variety

Make

or

Buy

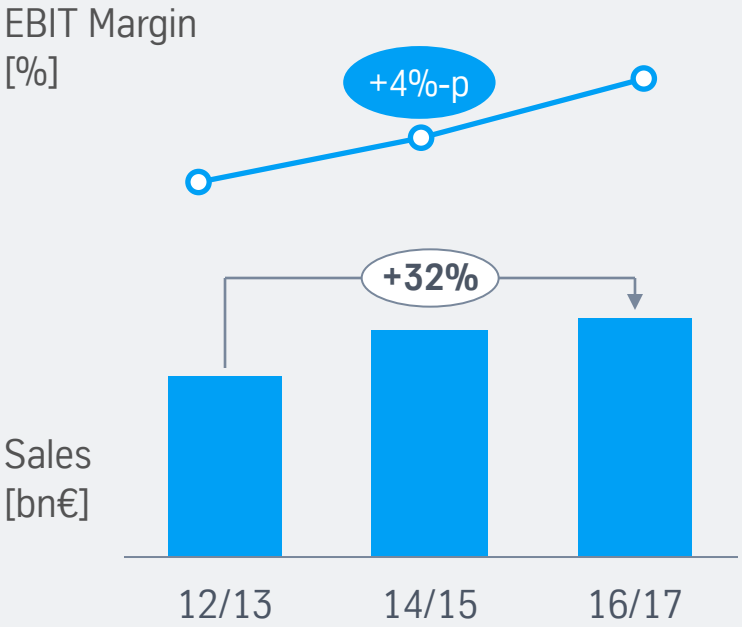
Manufacturing | New Installation: Track record

Elevator production System

Delivery times	▼
On Time	>98%
Productivity	+5.0%

Implemented since 13/14

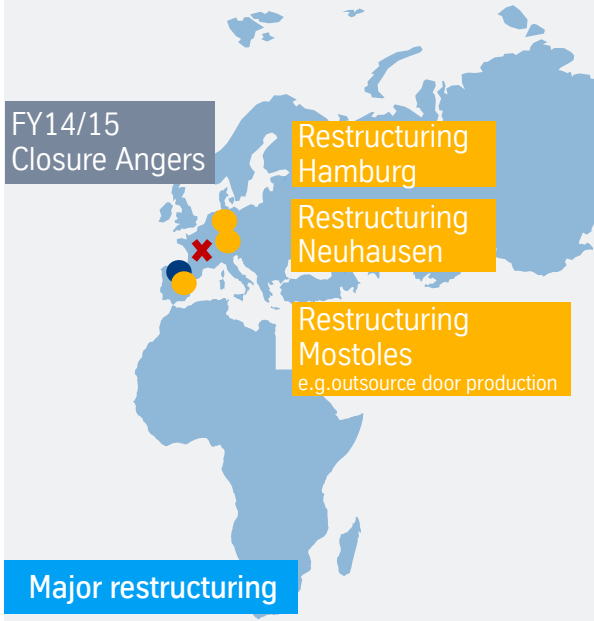
Annual Operational Excellence Scan



Manufacturing | New Installation: Optimization of Production network

>80% of Global NI Market

>150 m€ tkE Invest since FY11/12

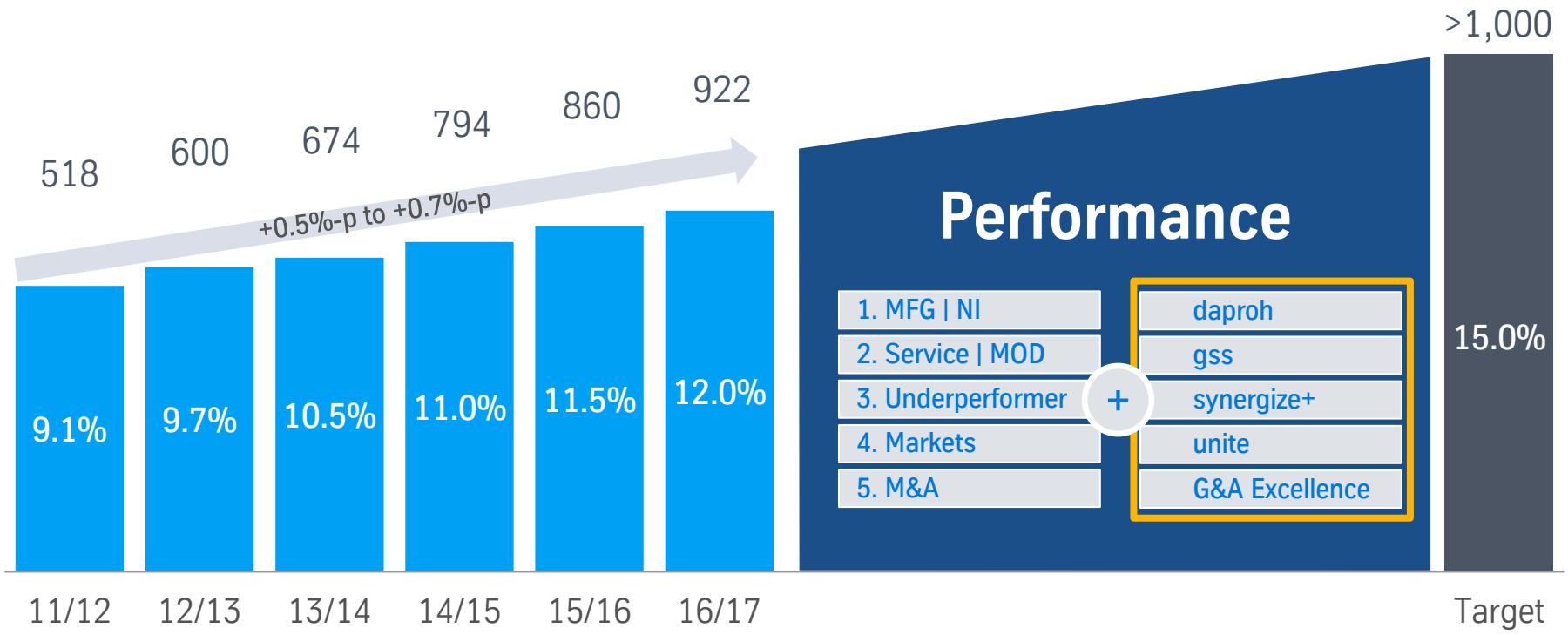


Major restructuring

Ongoing since FY16/17

Change & Performance program

EBIT adj. [m€ | FY]



G&A Excellence program

STRUCTURAL DELAYERING

- Functional concepts and organizational/process blueprints
- Bundling of Back-office processes

PROCESS OPTIMIZATION

- Optimize collaboration models across sites
- Avoid duplication of tasks

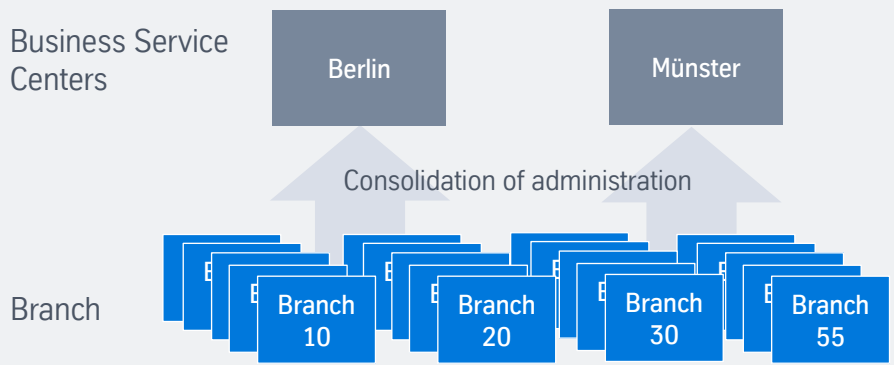
CONTENT

- Prioritization and focus on key projects
- Simplified and leaner reporting

100 m€ of savings to be achieved in next 3 years across all levels and functions

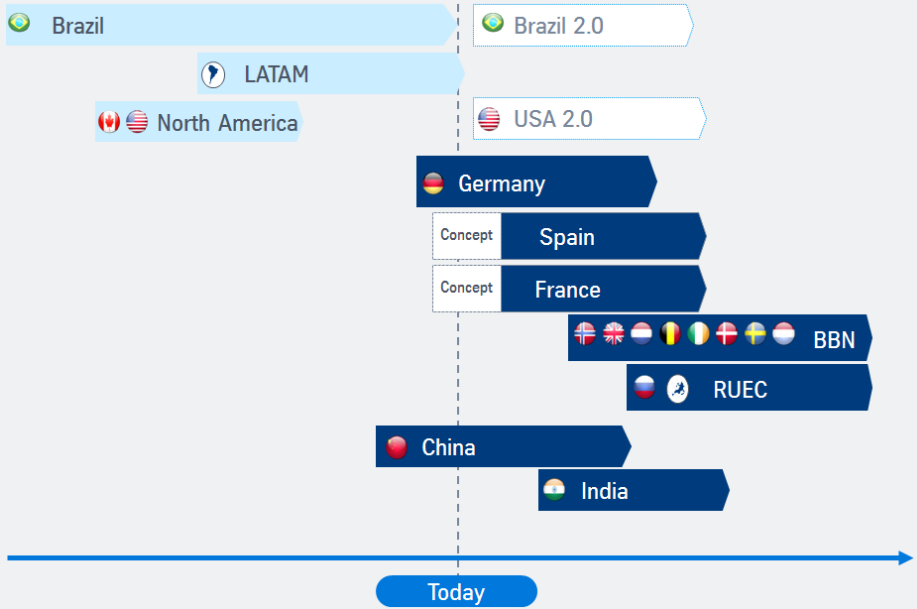
Example: Optimization of Back-Office Processes

Example Germany



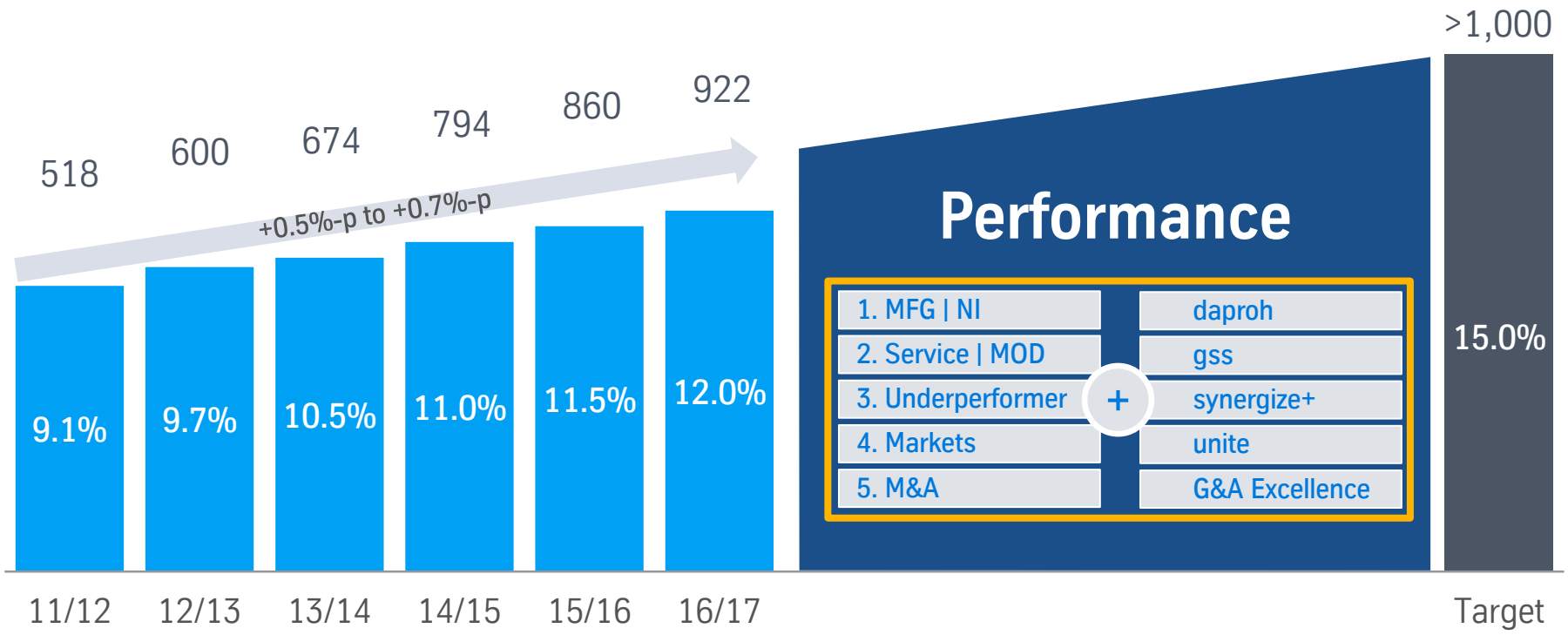
>10% reduction of admin staff

Global Rollout Plan



Change & Performance program

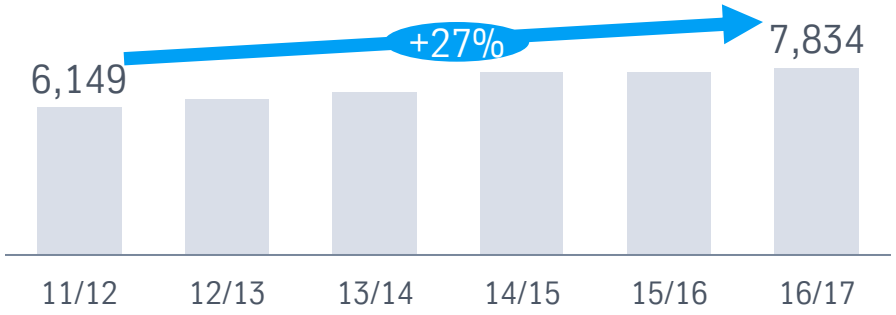
EBIT adj. [m€ | FY]



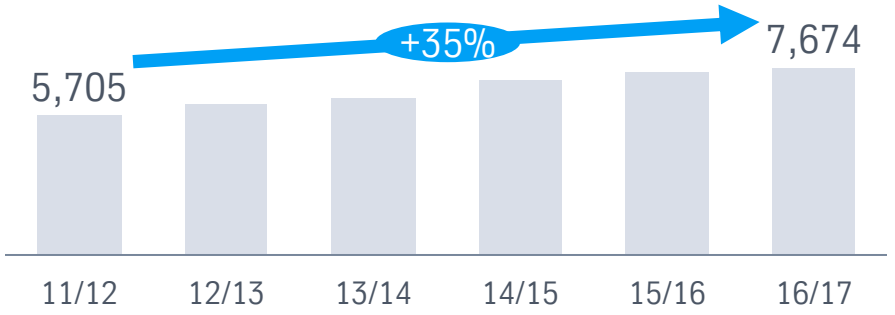
Consequent strategy execution shows results

[m€ | FY]

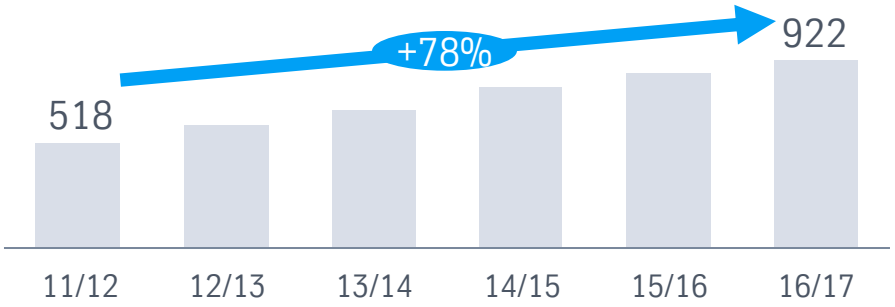
Order Intake



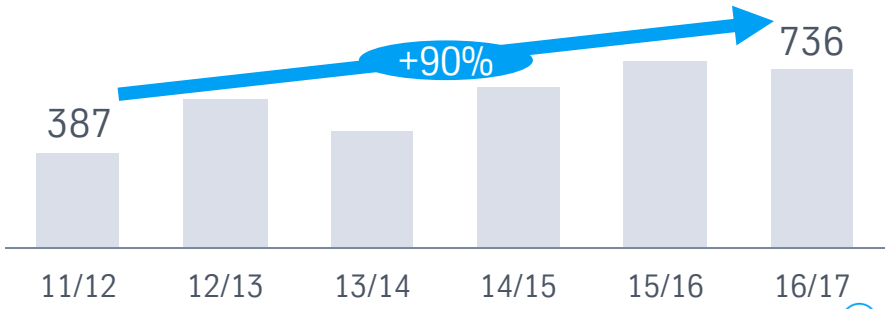
Sales



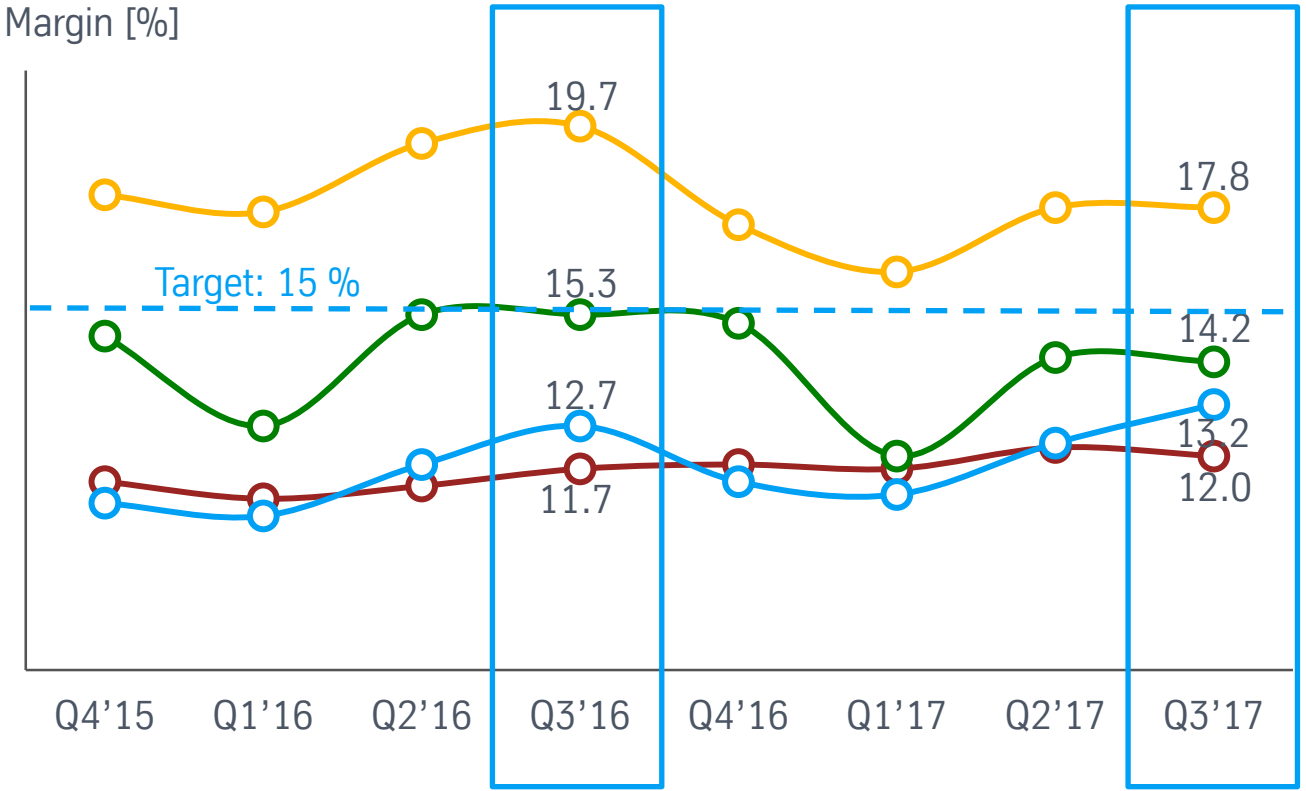
EBIT adj.



EBIT rep.



Benchmarking of Adj. EBIT-Margin with Peers

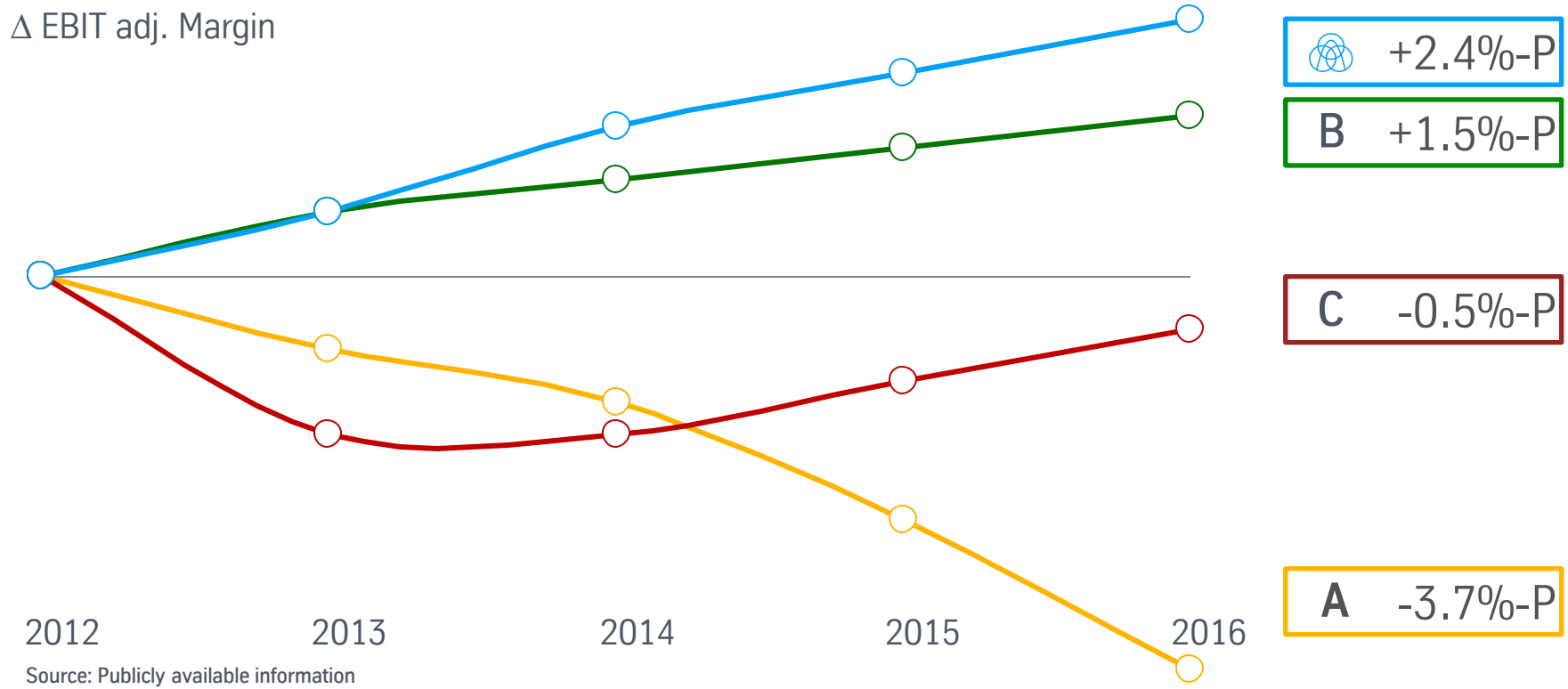


Δ YoY Q3 2017

-1.9%-P	A
-1.1%-P	B
+0.5%-P	
+0.3%-P	C

Source: Publicly available information

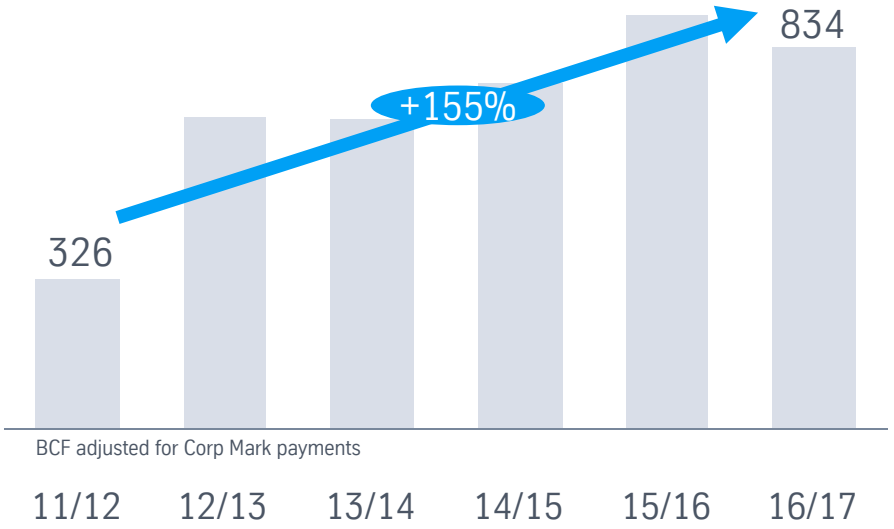
Outperformance against peers



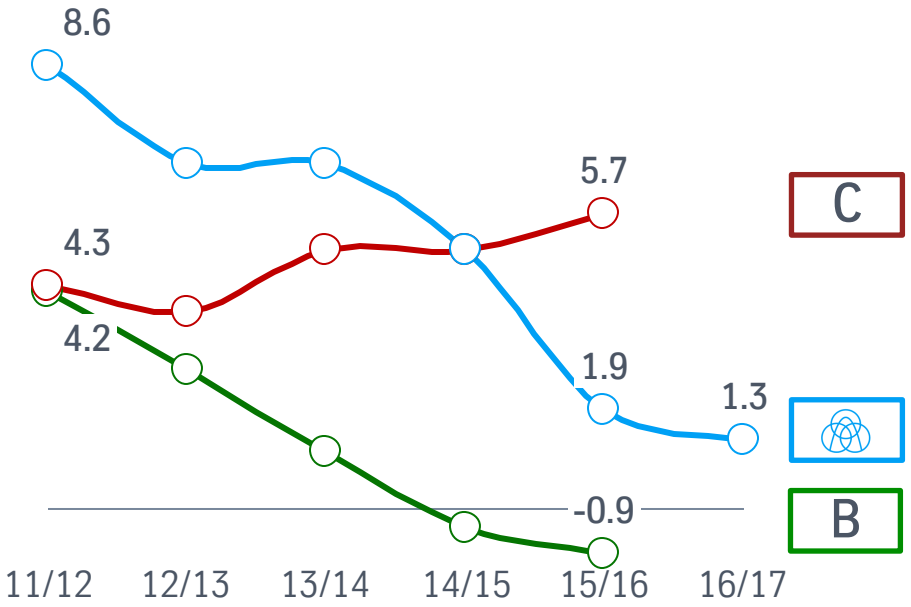
Source: Publicly available information

Business Cash Flow: Improvement driven by NWC Development

Business Cash Flow



ONWC as % of Net Sales



Management commitment to continuous growth and margin improvement

[m€]	14/15	15/16	16/17	17/18E
Order Intake	7,704	7,631	7,834	Moderate growth
Sales	7,208	7,468	7,674	Moderate growth supported by strong order backlog
EBIT adj.	794	860	922	Operational improvements
EBIT adj. margin [%]	11.0	11.5	12.0	
BCF w/o Corporate Mark	756	904	834	Investments in growth and restructuring payments

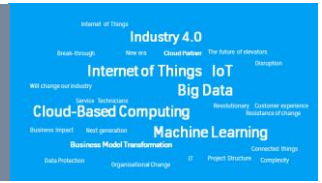
Operational improvements supported by program elevate as part of impact

Clear strategy to achieve our targets

Key Drivers and Challenges

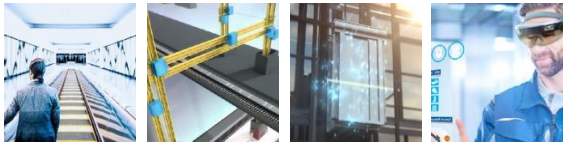
Urbanization

Digitalization



Change & Performance program

INNOVATION



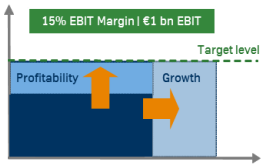
PERFORMANCE

1. MFG | NI	+	daproh
2. Service | MOD		gss
3. Underperformer		synergize+
4. Markets		unite
5. M&A		G&A Excellence

Our Targets

Transform the Industry

>1,000m€ 15% Margin



Q&A

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This presentation contains forward-looking statements that are subject to risks and uncertainties. Statements contained herein that are not statements of historical fact may be deemed to be forward-looking information. When we use words such as “plan,” “believe,” “expect,” “anticipate,” “intend,” “estimate,” “may” or similar expressions, we are making forward-looking statements. You should not rely on forward-looking statements because they are subject to a number of assumptions concerning future events, and are subject to a number of uncertainties and other factors, many of which are outside of our control, that could cause actual results to differ materially from those indicated. These factors include, but are not limited to, the following:

(i) market risks: principally economic price and volume developments,

(ii) dependence on performance of major customers and industries,

(iii) our level of debt, management of interest rate risk and hedging against commodity price risks;

(iv) costs associated with, and regulation relating to, our pension liabilities and healthcare measures,

(v) environmental protection and remediation of real estate and associated with rising standards for real estate environmental protection,

(vi) volatility of steel prices and dependence on the automotive industry,

(vii) availability of raw materials;

(viii) inflation, interest rate levels and fluctuations in exchange rates;

(ix) general economic, political and business conditions and existing and future governmental regulation; and

(x) the effects of competition.

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