



Global megatrends and digital transformation in metals and mining industries

11th Iranian Steel & Iron Ore Market Conference & Expo

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AGENDA

- 1 Slowing steel demand
- 2 Global trade & increasing protectionism
- 3 Increasing CO2 regulation and taxation
- 4 Digital and technology disruption



RCG – International management consulting company specialized in the metals & mining industry



Consulting services to the companies with activities in different segments of metals & mining industry (including non-ferrous metals, iron ore, limestone, etc.)



Specialization in the areas of Strategy, Organization & Transformation, Markets, Customers & Sales as well as efficiency improvement in operations



Worldwide presence with offices in Pfäffikon (CH), Düsseldorf (DE), Kiev (UA), Mumbai (IN), Saõ Paulo (BR) and Singapore



More than 200 projects with the leading companies of the metals & mining industry



RCG creates value for its customers in 3 practice areas, consulting our clients in various consulting fields

Strategy, Organization and Transformation



Markets, Customers and Sales



Operations, Technology and Industry 4.0



We help our clients to:

- develop a sustainable, successful corporate or business unit strategy and assist them during the implementation into all areas of the company
- identify winning strategies supporting profitable growth of the leading industry players
- structure, analyze and evaluate investment projects until the transaction is completed while paying attention to the alignment with their entrepreneurial goals

- better understand their markets, customers and competitive position at a detailed level
- develop strategies to increase margin generation through the optimization of product mix-vs. volume-vs price tradeoffs
- identify potential customer value chain disruptions (e.g., material substitution, shift to circular consumption, dis-intermediation) and develop effective responses
- optimize their commercial operating model and business processes, identifying opportunities to deploy advanced technologies where justified

- optimize operational performance while reducing costs focusing on machine reliability, throughput & quality as well as the organization
- make the right capital investment decisions
- leverage Industry 4.0 technologies, approaches and insights

The practice encompasses all production stages and all major support processes including maintenance, procurement, S&OP and supply chain.

Through our methodical approaches and the RCG toolbox, we enable you to align your company optimally for the future



RCG's recent project offers prove excellent knowledge of Iranian steel industry and digitization topics



Business model transformation

Analysis of business model incl. recommendations

What we did:

- Internal Assessment of sales and performance, SWOT-Analysis
- Market and external Assessment
- Transformation approach and implementation



Feasibility and Market Study

Strategic support in investment planning and decision-making

What we did:

- Risk management and financial analysis of investments
- Market and competitor overview
- Strategic positioning and scenario analysis



Development strategy for various companies

Feasibility Study for greenfield high speed rail manufacturing

What we did:

- Technical study and definition of improvement actions
- Market access and pricing strategy
- Investment decision and development of measures for execution



Digitalization strategy

Smart Factory project roadmap

What we did:

- Development of a five-year plan for the implementation of digitization projects
- Identification of interdependencies between projects
- Determination of a communication roadmap



Project management

Green field installations

What we did:

- Strategic investment planning
- Feasibility study and investment decisions
- Project management, KPI reporting and top management involvement

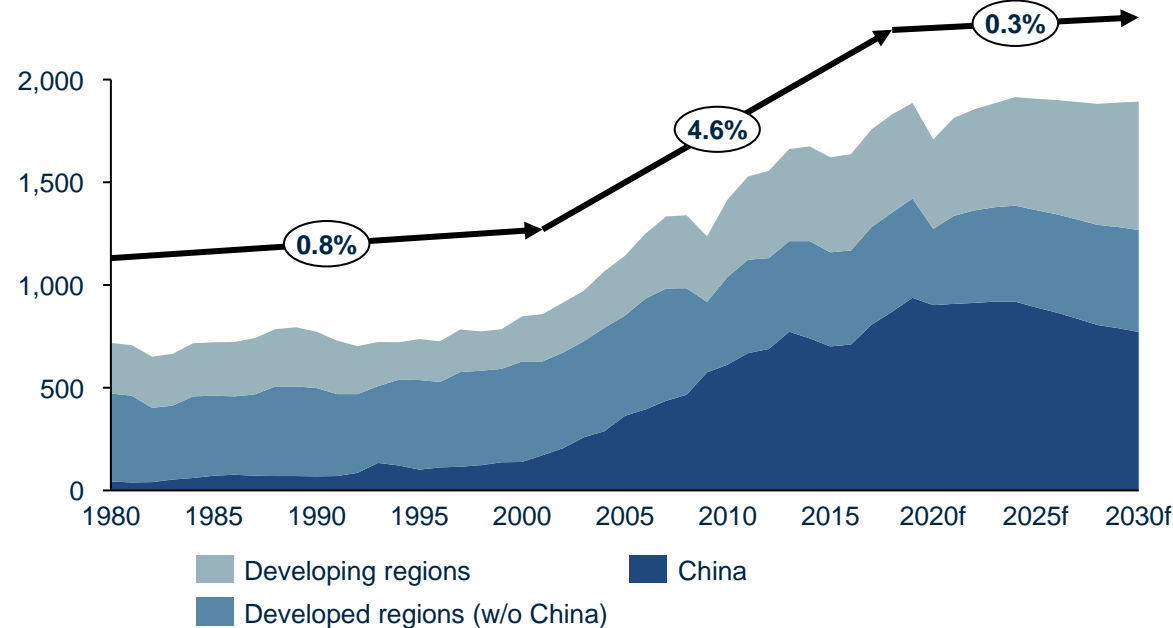


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Growth of 0.3% per annum in steel demand represents a significant deceleration compared to trend

Crude steel demand by economies, 1980 – 2030 [MT]



Crude steel demand growth (CAGR) by economies, 1980 – 2030 [%]

	1980 – 2000	2000 – 2018	2018 – 2030
Developing regions	-0.6%	4.4%	2.2%
Developed regions (w/o China)	0.7%	-0.1%	0.3%
China	6.0%	10.8%	-1.0%

Observations

- China over the past 20 years has been the driver for global growth in steel demand
- Steel demand in China is not expected to grow at its rate of recent years
 - Demand will flatten as fixed asset investment becomes smaller portion of economic activity
 - Growth in trade of steel containing goods will moderate as developed countries will enact protectionism and risk reducing shortening of supply chains – markets in SEA, MENA and Africa will offset declines in trade N.America and EU-27
- India will not be able to repeat the same pattern as China due to less autocratic environment and property rights

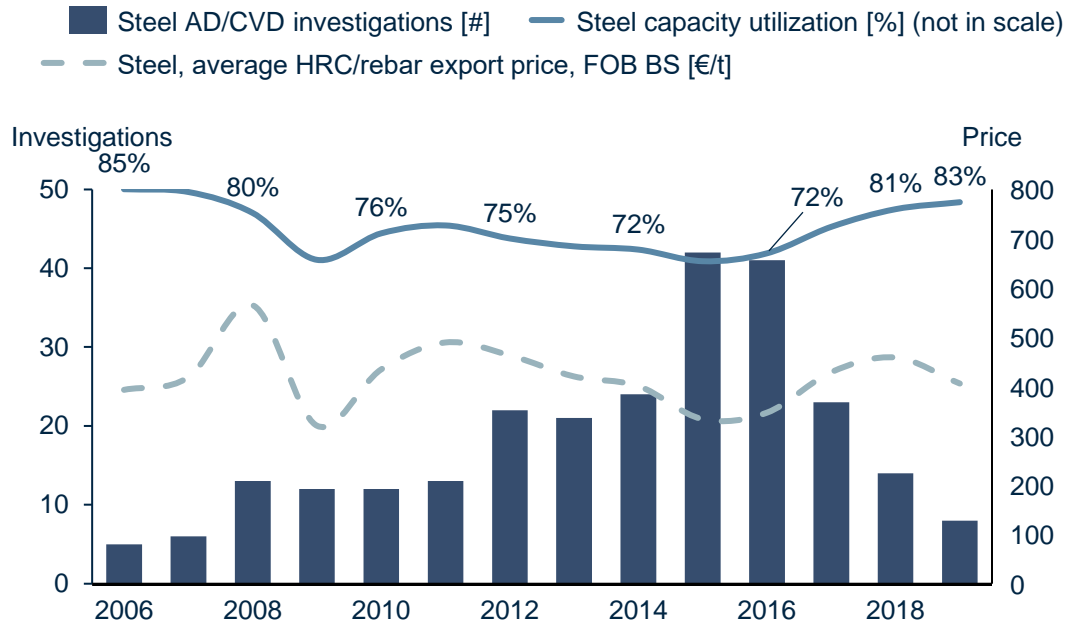


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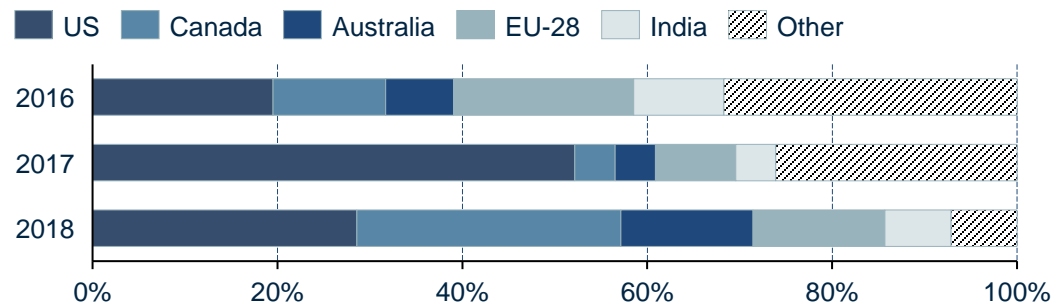
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Protectionism increases when in response to low capacity utilization and prices; Section 232 tariffs eliminated the use of AD/CVD cases by the US

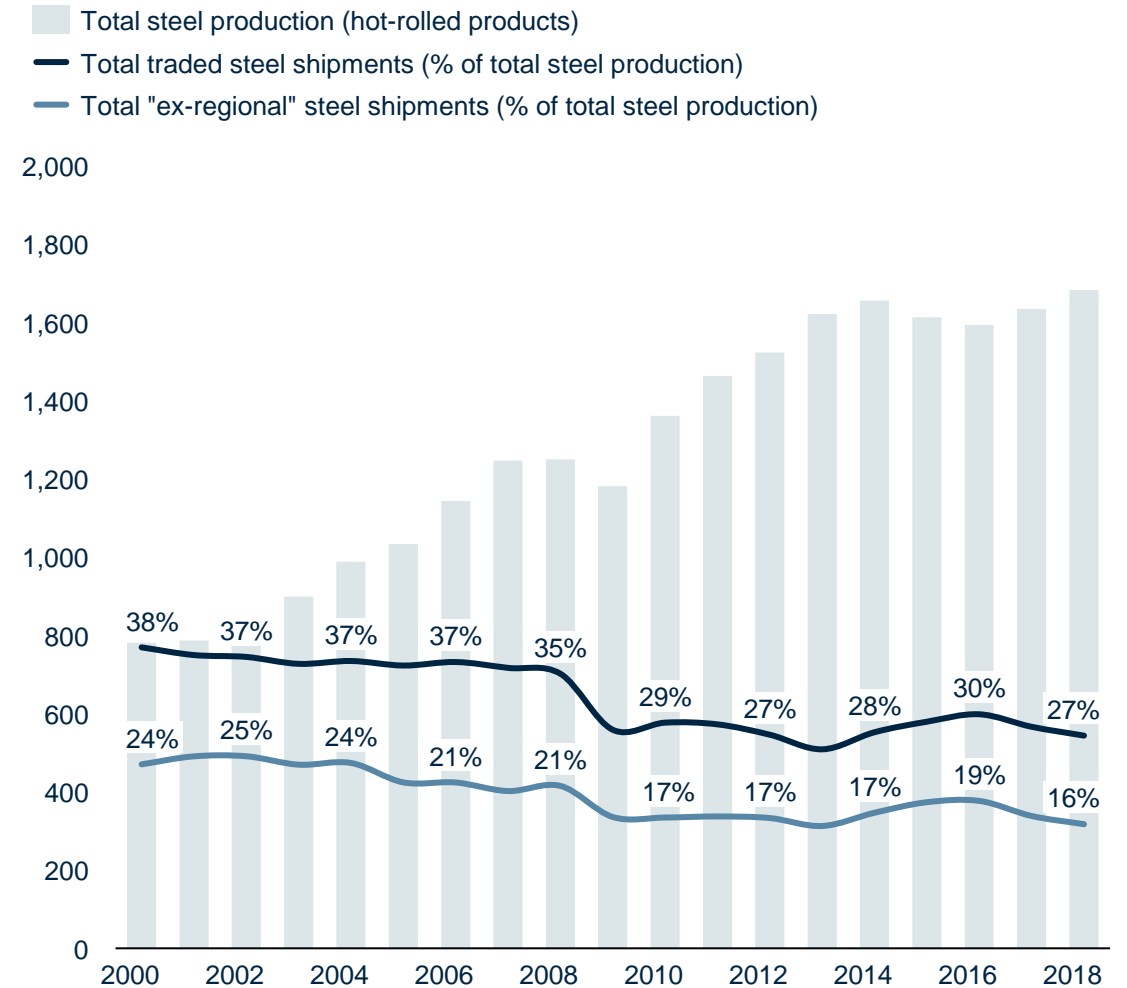
New steel AD/CVD investigations, complaints [#]



Steel AD/CVD initiations by complainant [%]



Global steel trade history, 2000 – 2018 [MT, %]



Cases of the same product against more than one defendant economy are counted as one petition. Investigations of alloy/stainless steel products are not considered (excl. pipes & tubes).

Source: OECD, ISSB, CEPR, SBB, WSA, RCG

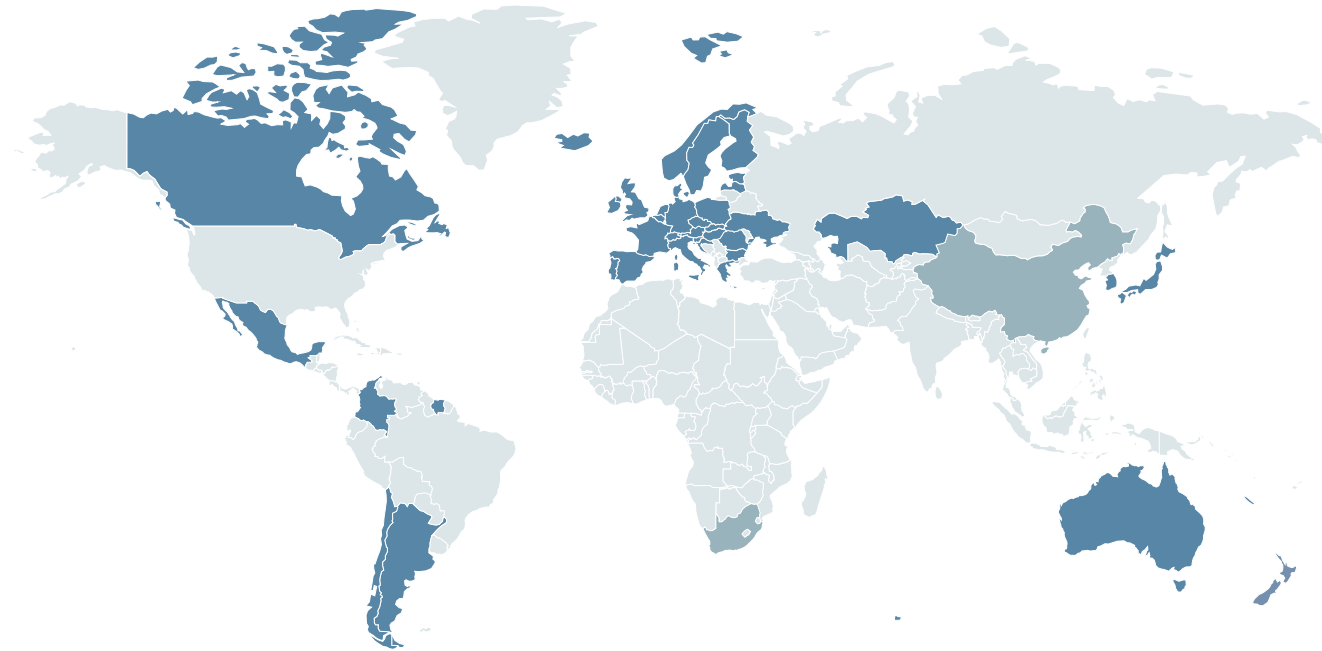


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A significant CO₂ cost impact for the steel industry is currently only expected for the EU-27

Global ETS and carbon pricing regulations



- Price on carbon
- Price in discussion
- No price

Overview of focus regions initiatives	
N.America	<ul style="list-style-type: none"> ▪ US: No financial impact to steel industry ▪ Mexico: Pilot ETS, no financial impact (start 2020) ▪ Canada: CO₂ price for above average emissions (start 2019)
China	<ul style="list-style-type: none"> ▪ Pilot ETS for coal-fired power sector (start 2017) ▪ Potential for extension to include steel industry within a few years ▪ Currently no financial impact to steel industry
Russia	<ul style="list-style-type: none"> ▪ Federal law on emission in discussion ▪ Currently no financial impact to steel industry
India	<ul style="list-style-type: none"> ▪ Discussion about ETS ▪ Currently no financial impact to steel industry
RoW	<ul style="list-style-type: none"> ▪ Japan: 25% - 27% reduction to base-year emissions, CO₂ price (start 2015) ▪ South Korea: Benchmark based auctioning of 3-10 % of all certificates, CO₂ price



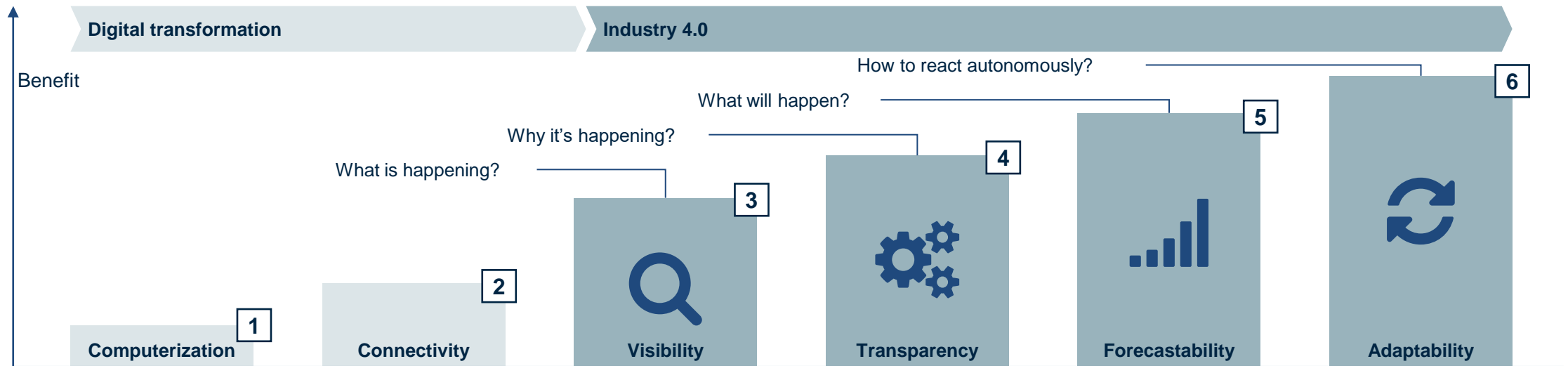
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The path to Industry 4.0 typically follows is well-defined

Typical steps of the Industry 4.0 development path







Definition of steps

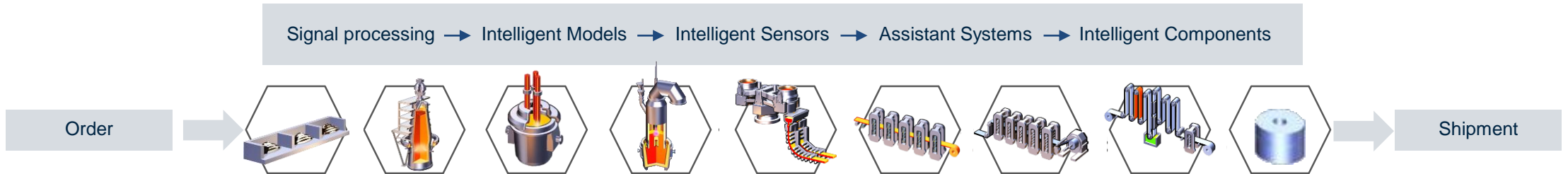
Step	Definition	Step	Definition
1 Computerization	Isolated application of IT for efficiency advantage in repetitive operations	4 Transparency	Derivation of root-causes from digital picture based on context driven data analysis (e.g. big data, smart data analytics)
2 Connectivity	IT-systems are connected with each other and represent core business processes	5 Forecastability	Creation of future scenarios with likelihoods based on real-time process data (digital twin)
3 Visibility	Sensor-based real time tracking of a variety of data points which are representing a digital picture of the company at any time	6 Adaptability	Autonomous machine decision-making, and self-optimization based on continuous adaption of a company (AI)



RCG helped leading metal and mining companies to increase EBITDA by 6-8% p.a. by digital transformation

 Smart Maintenance	 Smart Quality Management	 Smart Planning	 Smart energy management
<ul style="list-style-type: none"> ▪ 10-25% lower maintenance cost ▪ 15-25% lower downtime ▪ Gain real-time insights into plant condition ▪ Predict machine failures and process insufficiencies ▪ Proactively schedule production 	<ul style="list-style-type: none"> ▪ 6-8% lower cost of quality ▪ Production without downgrading/scrap ▪ Maximum prime quality rating ▪ No customer claims ▪ React to process deviations in real-time ▪ Certify product quality along the entire process chain and automatic coil release ▪ Reduce human impact 	<ul style="list-style-type: none"> ▪ 1-2% increased EBIT ▪ 10% improved OTIF (on time in full) ▪ 15% less transition ▪ 1,5% Energy cost reduction ▪ Reduced transportation cost ▪ Mobile Access ▪ KPI Analysis ▪ Trend Analysis ▪ Process overview ▪ Intelligent production scheduling 	<ul style="list-style-type: none"> ▪ Up to 7% reduction of energy & utilities costs ▪ Tracking and optimizing energy flows along the entire plant and energy matrix ▪ Advanced machine learning function considers steel grade, scrap blending, heat sequence, fluxes and alloys

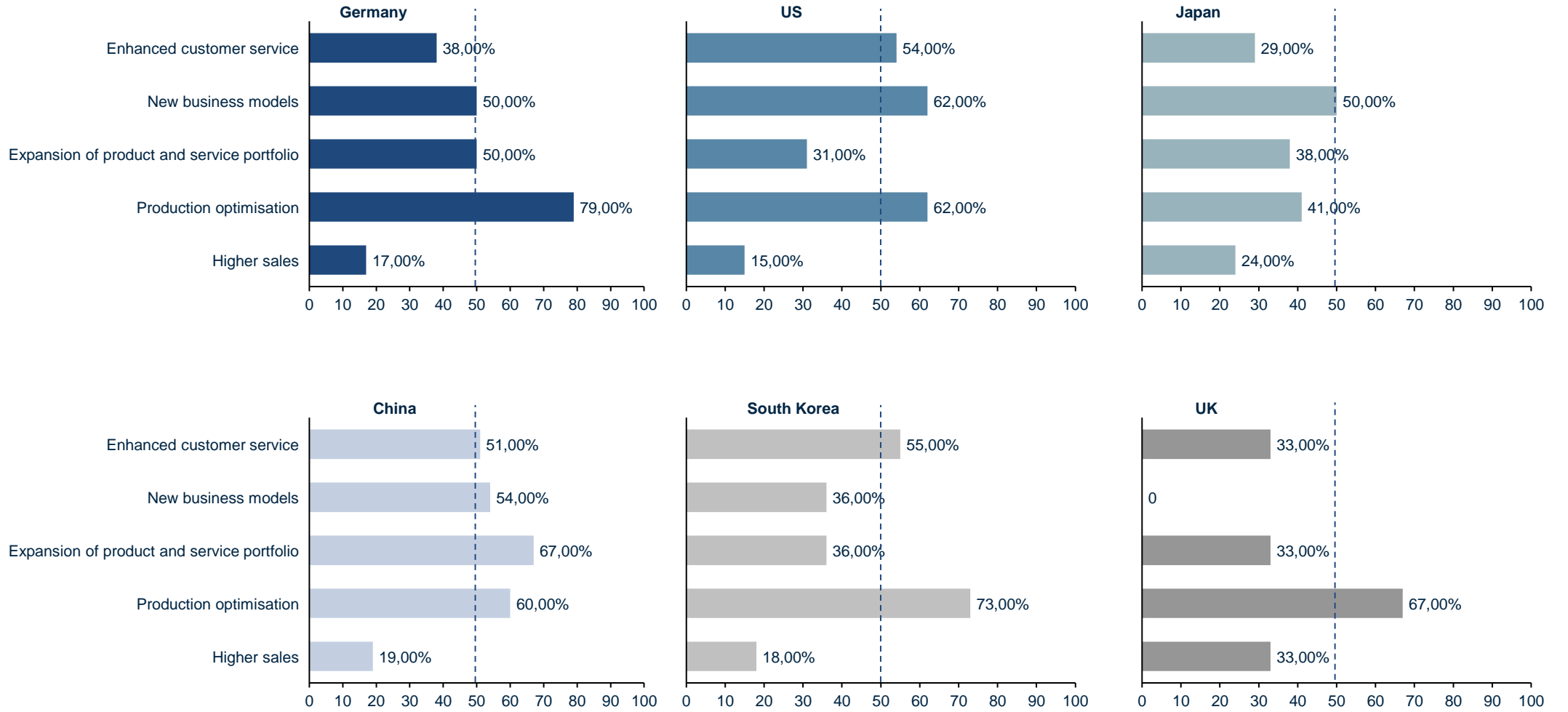
Using emerging technologies: Artificial Intelligence, Big Data Analytics, Internet of Things, Digital Twin, Mobile Devices, Autonomous Systems





Goals and expectations of Industry 4.0 heavily vary by region

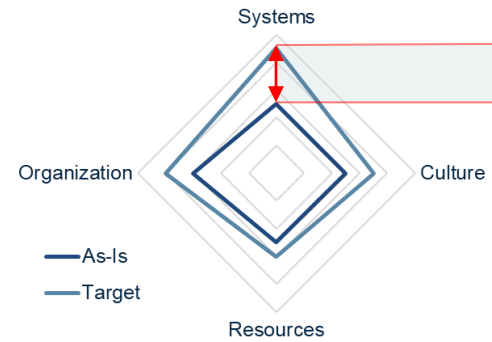
Goals and expectations by regions



*Multiple responses allowed

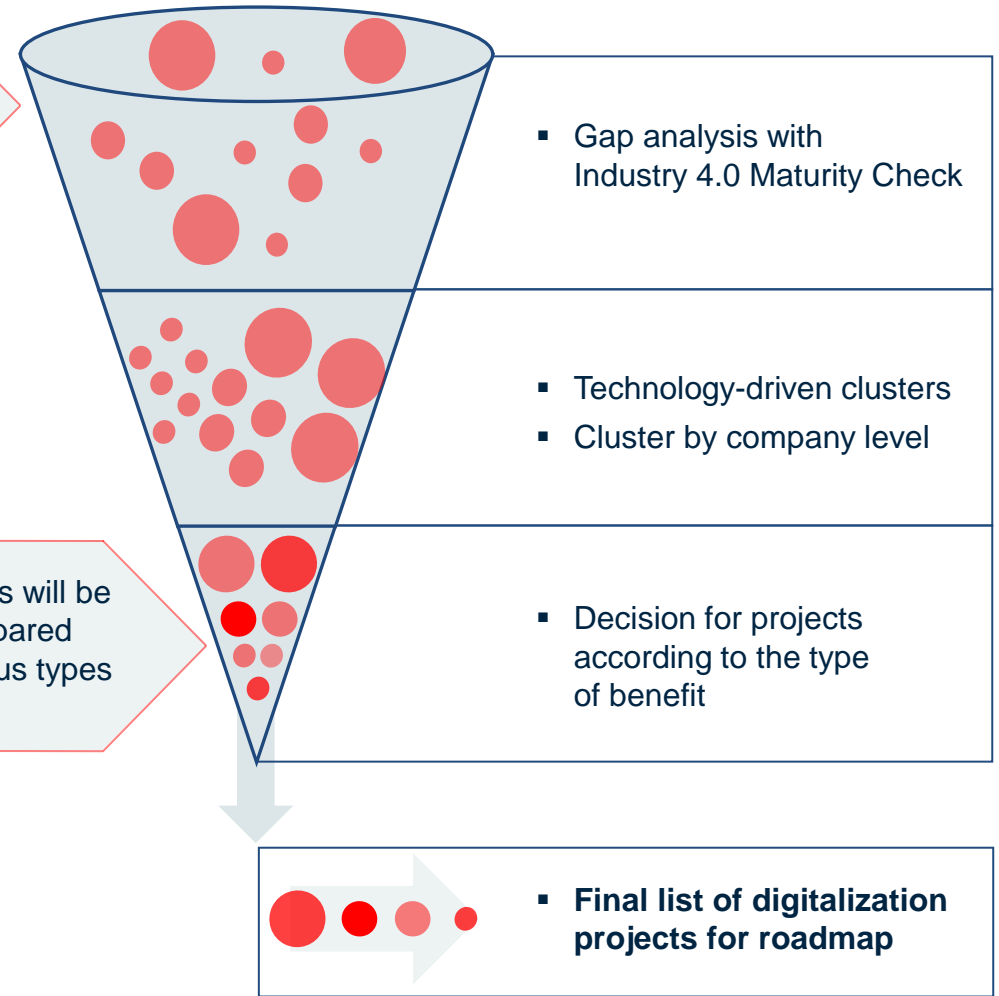
A company-specific project roadmap is essential for a successful digital transformation

Industry 4.0 Maturity Check results



The difference between the aspirational level and the current maturity level of the company will be determined for each of the areas.

Methodological procedure to funnel, filter, and organize projects



Type of benefit (company individual)

Type of Benefit	Description	Impact on business
		Negative / Positive
▪ Equipment efficiency	Degree of use of the existing machines (OEE)	Increase in OEE is positive
▪ Product quality	Occurrence of quality problems with the transferred product	Improved quality levels is positive
▪ Equipment useful life (life extension)	Time until an equipment can no longer be used	Equipment life extension is positive
▪ Reduce Equipment failure	Probability of an equipment failure, downtime	Reduce failures is positive
▪ Agility (speed improvements)	Ability to adapt to new circumstances at short notice	Increasing speed is positive
▪ Transparency	Transparency about the current status in production	Increase in transparency is positive
▪ Deliveries on time	What percentage of the deliveries arrive at the customer completely and on time (OTIF)	On time delivery is positive
▪ Increase Customer satisfaction	Satisfaction perceived by the customer	Increase customer satisfaction is positive
▪ Inventory decrease	Primary and intermediate products that have to be kept in stock	Inventory decrease is positive
▪ Forecasting	Quality of forecasts regarding sales volumes	Better forecasts are positive
▪ Reduce Energy consumption	Amount of energy consumed by the company	Reduce energy is positive
▪ Reduce Water consumption	Amount of water consumed by the company	Reducing water consumption is positive
▪ Reduce Workforce	Number of employees that are required in the company	Making more use of current workforce is positive
▪ Increase Safety	Employee safety against accidents and other injuries	Increase safety is positive
▪ Increase Employee satisfaction	How much the employees enjoy working in the company	Increase employee satisfaction is positive

Short-listed projects will be validated and compared based on the various types of benefit.



For 2. Transformation program support: PMO management support / RACI

Illustrative

PMO Responsibilities	Project leadership					Project team members					Project sub-teams				Ext. resources		
	Exec. sponsor	Project sponsor	Steering Com.	Advisory Com.	... others	Project manger	Tech. Lead	Functional Lead	Project team member	... others	Developer	Admin. Support	Business analyst	... others	Consultant	Role 2	Role 3
Initiate Phase Activities																	
- Submit Project Request	C	A				R	C	C	C								
- Develop Business Case	I	C				R	A	A	C					C			
- ...																	
Plan Phase Activities																	
- Create Project charter	C	C				R	C	C	C					C			
- ...																	
Execute Phase Activities																	
Control Phase Activities																	
Close Phase Activities																	
Communication Activities																	

RACI Matrix:

- R Direct execution of tasks
- A Full responsibility for the result, such a role can be occupied by only one person for one task
- C One staff member or group consulted on the task and whose views should be taken into account
- I Are employees who are notified of a specific task



The developed Industry 4.0 Roadmap consists of Prerequisite projects, Digital projects and Synergy projects

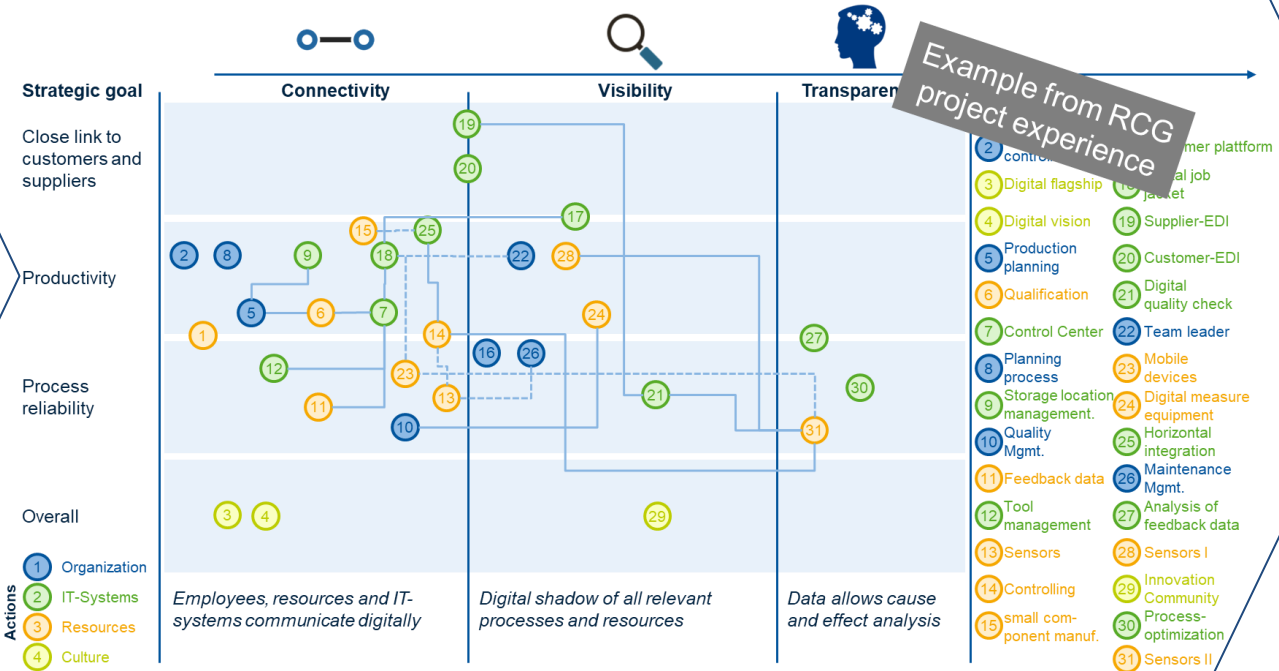
Overall Roadmap Structure

Prerequisite projects

- Projects that cover different preconditions for the main projects
- Having these prerequisites in place is the first step for a successful roadmap execution

Digital projects

- Execution of the main projects in a designated order



Synergy projects

- Different finished projects can conjointly gain synergies / additional benefits
- Gathered data can be used for additional use cases
- Additional projects are not needed – existing data gets consolidated in applications



Why RCG can support

- We have a thorough understanding of metals and mining business, organization and people (executives)
- We understand the interdependencies of individual business units
- We have a deep understanding of internal and external processes
- We can anticipate the availability, consistency and format of data

- We are rigorously independent
- We do not use our work to sell other types of services such as systems implementation or outsourcing
- We are technology agnostic
- We bring our experience and insights from our work with global leading companies

- We have been working for all big international mining & metals companies and understand the culture, values and traditions
- Our core team will consist of native Russian speakers

→ **Based on the above, we are "trusted advisors" for management and supervisory board**



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