

DIGITALIZATION: THE CATALYST DRIVING GREEN TRANSFORMATION IN THE STEEL INDUSTRY

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THREE PHASES TO GREEN STEEL

THE SUSTAINABLE METALS REVOLUTION

THE OPTIMIZATION PHASE

Readily available solutions for sustained impact

ACHIEVING GREEN STEEL

The new standard of production

THE TRANSITION PHASE

Redefining metals production

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The Optimization Phase: How Digitalization Solutions Can Contribute to a Reduced Environmental Impact





Example 1: AI-based Expert System for improved Blast Furnace Operation



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Typical Benefits Achieved in Previous Projects due to standardized, optimized and shift independent operation

Reduce fuel consumption Savings coke > 5 kg/tHM



Flexible raw material utilization



Avoid critical process situations







Stabilize product quality Reduce standard deviation 10%

Typical payback time in the range of a few months.



Example 2: Al-based data analysis increases plant performance



Problem:

- Input material scrap for electric arc furnaces varies greatly.
- Each operator runs the furnace differently.



Solution with Al:

- Analysis of historical (big) data
- Deriving optimal driving styles for desired steel qualities
- Turn off the "Human Factor"
- Automatic process control based on the identified operating style



Example 3: Through-process Quality Control a comprehensive quality management system





Steel Producers' Achievements By Through-Process Quality Control

30% reduction in TTM		Class 1-3 Steel grades developed within 3 years			Less Mater Waste	ʻial Ə
20%	Up to			20%	Waste	əd
reduction	30% reduction			reduction	Energ	JY
in external claims	in internal quality dispose			in number of sampling	Waste	Ə
+20%	60%	e reduction	U	p to 50%	Less C	CO ₂
Output on CGL	Cobble rat		Ad	ditional gain of yield	Emiss	sions

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Challenges of hybrid operation of existing and new processes



- Produce consistent steel quality
- Manage production schedules in hybrid operations



Gain operational expertise with new technologies



How can digitalization solutions support steel producers to overcome these challenges?





Supporting operators with Digital Assistants and Central Operation Cockpit (COC)



Consistent high Productivity and Quality

- Process related event detection
- Priorization and evaluation
- Event based guidance
- Operator Relief
- Ergonomic workplace



TRAIN YOUR TEAM AND TEST YOUR SOFTWARE BEFORE BEFORE STARTUP!



Our Solution: Virtual Plant



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Benefits Virtual Plant



Accelerate start-up

 Increase production by test & training system





Minimize shutdown duration

 Due to changes in the automation system – due to more efficient testing

Minimize unplanned shutdowns

• Through better training for critical operational situations



Online Heat Scheduling of hybrid Meltshops

- Schedules and routes heats through the melt shop facilities ensuring maximum sequence length
- Respects capacity restrictions and metallurgical constraints
- Considers downtime/ maintenance work and plant outages
- Dynamic reaction of unplanned equipment outages
- Trade-off between economical and ecological production KPIs with scenario analysis and what-if scenario simulation
- Forecasts hot metal, energy, DRI and scrap consumption

Will your heats get there in quality and on time?



OHS makes sure they will!



STEELCIRCULARITY AND GREEN STEEL

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FOCUS TODAY:

Continuously improve the gate-to-gate performance of a steel plant – from the entry of scrap to the exit of coils.



Circular Ecomomy



- EU End of Life Vehicle Directive emphasizes the need for
 - circular design,
 - recycled content and
 - improved governance.



• The circular economy concept promotes optimal resource efficiency.



- Steel offers significant advantages in a circular economy:
 - Durability
 - Ease of reuse
 - Remanufacturing
 - Recycling.



How a Circular Automotive Economy Might Look Like at Volkswagen





FOCUS IN FUTURE: What happens between outgoing coils and incoming scrap.

There Is Often a Break in the Supply Chain Because Everyone "Hides" Their Data.



One Solution Could Be "Data Circularity"



One Solution Could Be "Data Circularity"





Summary



 Digital solutions pave the way for autonomous operation



 Digital solutions pave the way for transition to hybrid operations



Digital solutions
embrace circularity

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