

# ESTEP 2025 Annual Event

28-30 October 2025  
Udine (ITALY)

How decarbonisation, digitisation  
and circular solutions forge the  
sustainable European steel future?

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# INTELLIGENT WATER MANAGEMENT IN STEELMAKING AUTOMATION FOR PROCESS EFFICIENCY AND SUSTAINABILITY



**DIGIMET**



**DANIELI AUTOMATION**



**UNIVERSITÀ  
DEGLI STUDI  
DI UDINE**  
HIC SUNT FUTURA

## **Energy Management for Smart Production**

**01**

## **Water Management in Steel Plants**

**02**

## **WTP for Hot Strip Mill: Efficiency & Energy Saving**

**03**

## **WTP for Slab Caster: Efficiency & Energy Saving**

**04**

## **Conclusions**

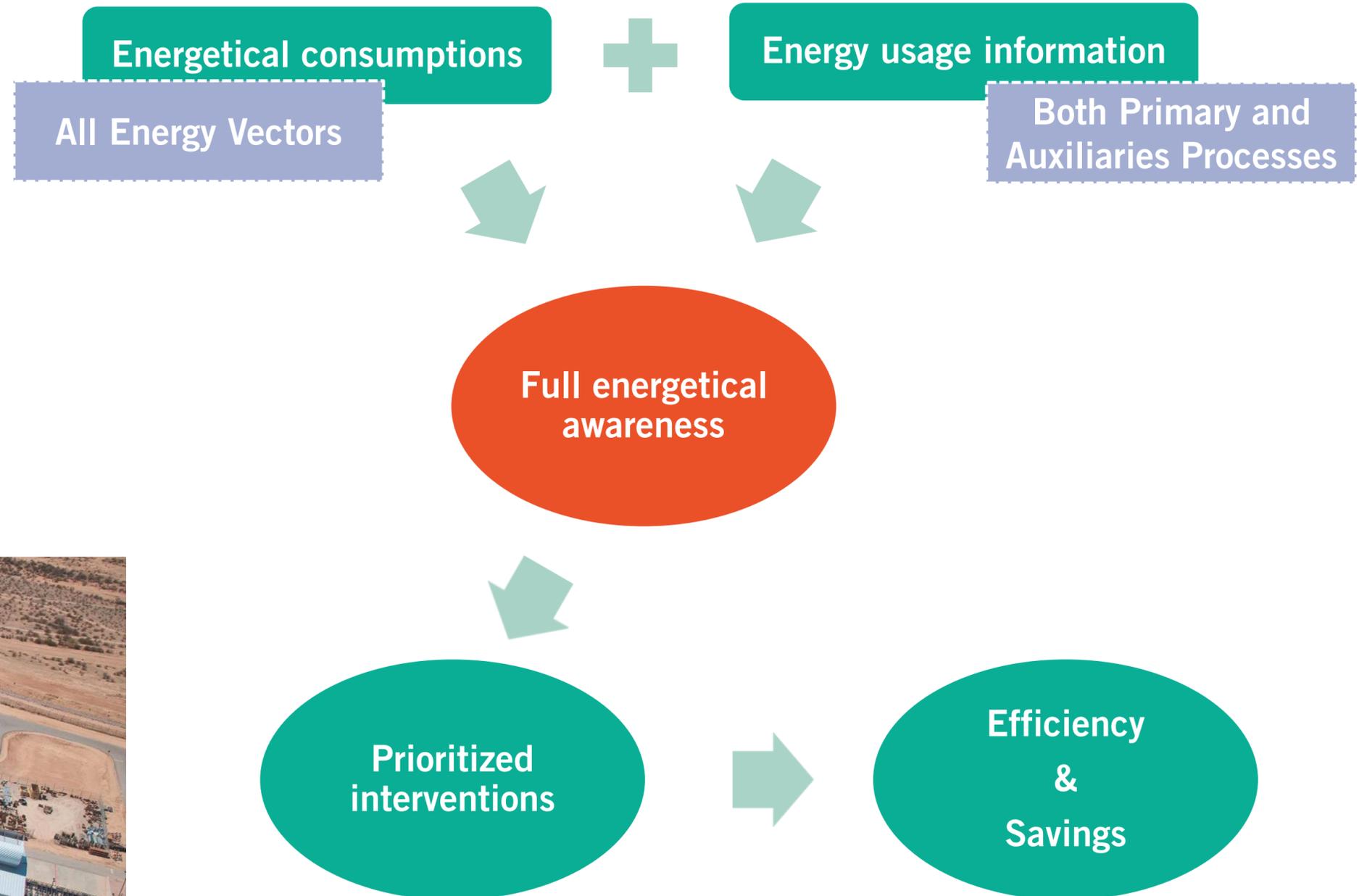
**05**

**INTELLIGENT WATER MANAGEMENT IN STEELMAKING**  
**AUTOMATION FOR PROCESS EFFICIENCY AND SUSTAINABILITY**

**ENERGY MANAGEMENT**  
**FOR SMART PRODUCTION**

**ENERGY MANAGEMENT CHALLENGES**

- > Increase energy efficiency
  - > Decrease specific consumptions
- ↓
- > Reduce the ecological footprint



# INTELLIGENT WATER MANAGEMENT IN STEELMAKING AUTOMATION FOR PROCESS EFFICIENCY AND SUSTAINABILITY

## ENERGY MANAGEMENT FOR SMART PRODUCTION

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### ENERGY MANAGEMENT IN WTP

- Cooling Water Management
- Algorithms providing precise flowrates at right pressure
- Synchronizing pumps regime with required flowrates and pressure



- Energy Saving of WTP



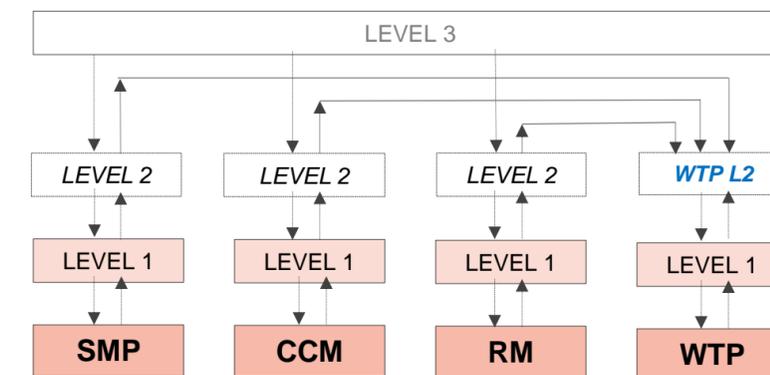
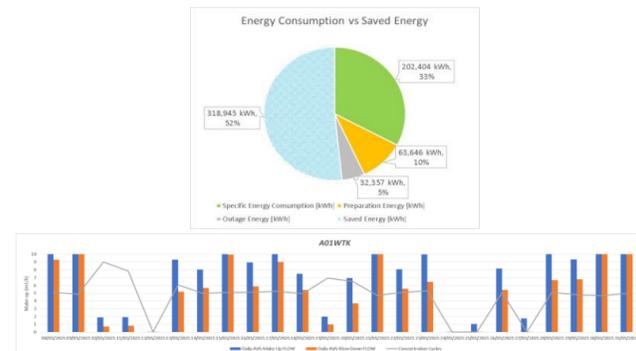
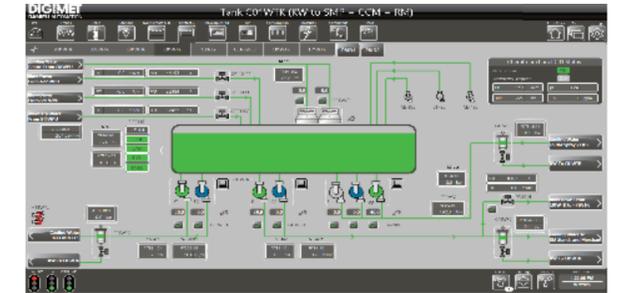
VFD  
FOR PUMP UNITS  
-  
DIGITAL  
INSTRUMENTATION

REAL-TIME  
OPERATIONS

WTP SMART  
AUTOMATION

ENERGY  
MANAGEMENT  
SYSTEM

INNOVATIVE "L2"  
FOR WTP  
-  
KPI & MONITORING



## KEY BENEFITS

- Automatic matching of required flow and pressure with pump unit speed, thanks to advanced algorithms
- Real time monitoring of WTP performances, both for energy and water consumptions
- Reference baselines of WTP consumption for specific production and non-production scenarios

**INTELLIGENT WATER MANAGEMENT IN STEELMAKING**  
**AUTOMATION FOR PROCESS EFFICIENCY AND SUSTAINABILITY**

**WATER MANAGEMENT IN STEEL PLANTS**

## WATER MANAGEMENT IN STEEL PLANTS

Pump Units for Water Cooling Circuits:

- Contact (KW)
- Non-Contact (CW, QW)
- ↑ ↓
- Productivity Rate
- Production Schedule



# INTELLIGENT WATER MANAGEMENT IN STEELMAKING AUTOMATION FOR PROCESS EFFICIENCY AND SUSTAINABILITY

## WATER MANAGEMENT IN STEEL PLANTS

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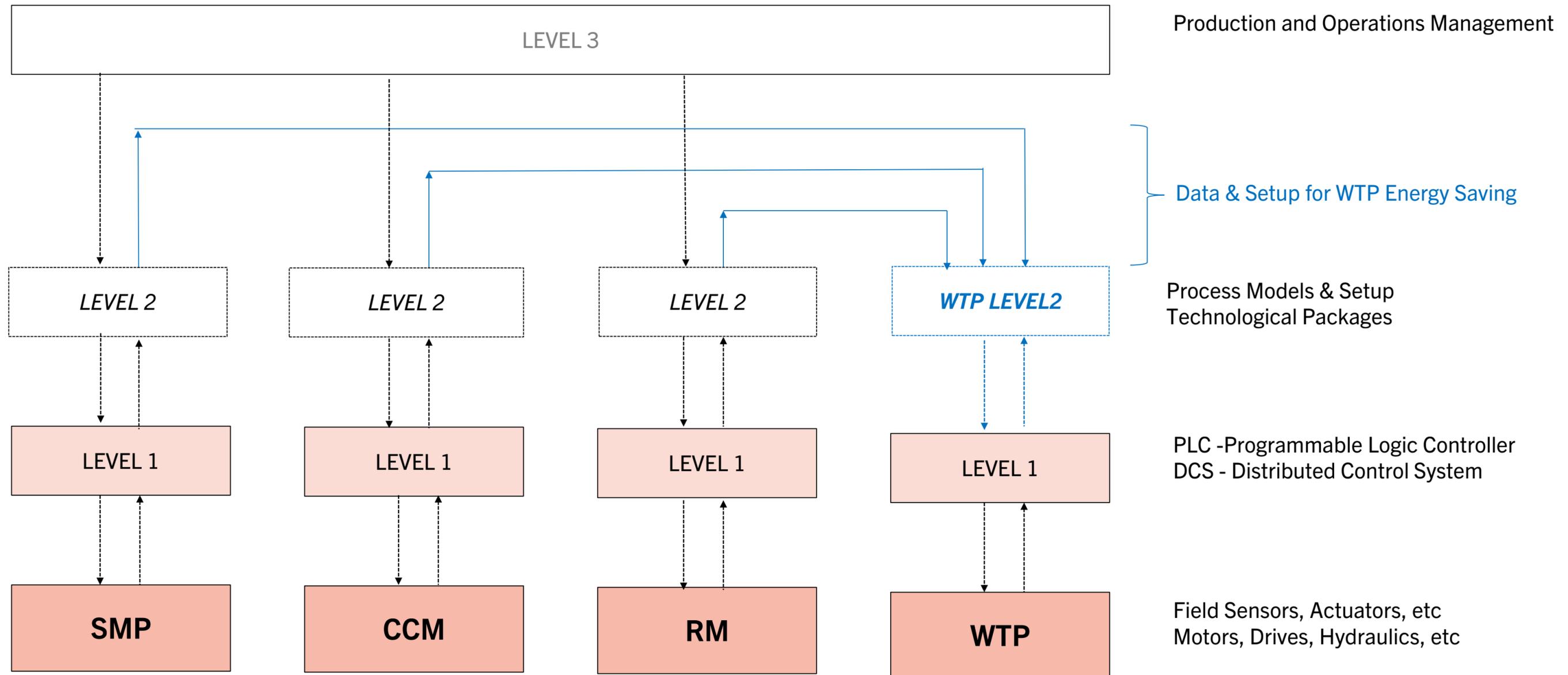
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### PUMP UNITS – VFD CONTROL

- The pump motor with VFD
- ↓
- Flexibly in adapting water flow & pressure to the real-time production conditions
- Energy Saving



**ADVANCED CONTROL SYSTEMS AND DYNAMIC CONTROL FOR AUXILIARY PLANT**



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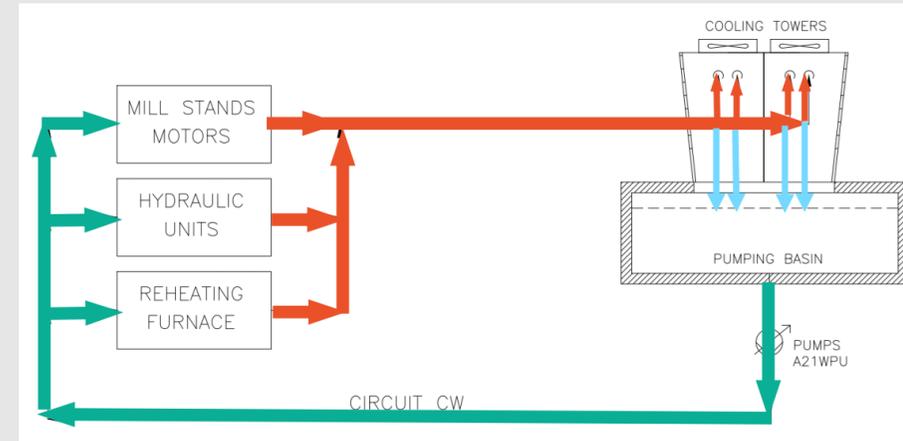
**WTP FOR HOT STRIP MILL:**  
**EFFICIENCY AND ENERGY SAVING**

# INTELLIGENT WATER MANAGEMENT IN STEELMAKING

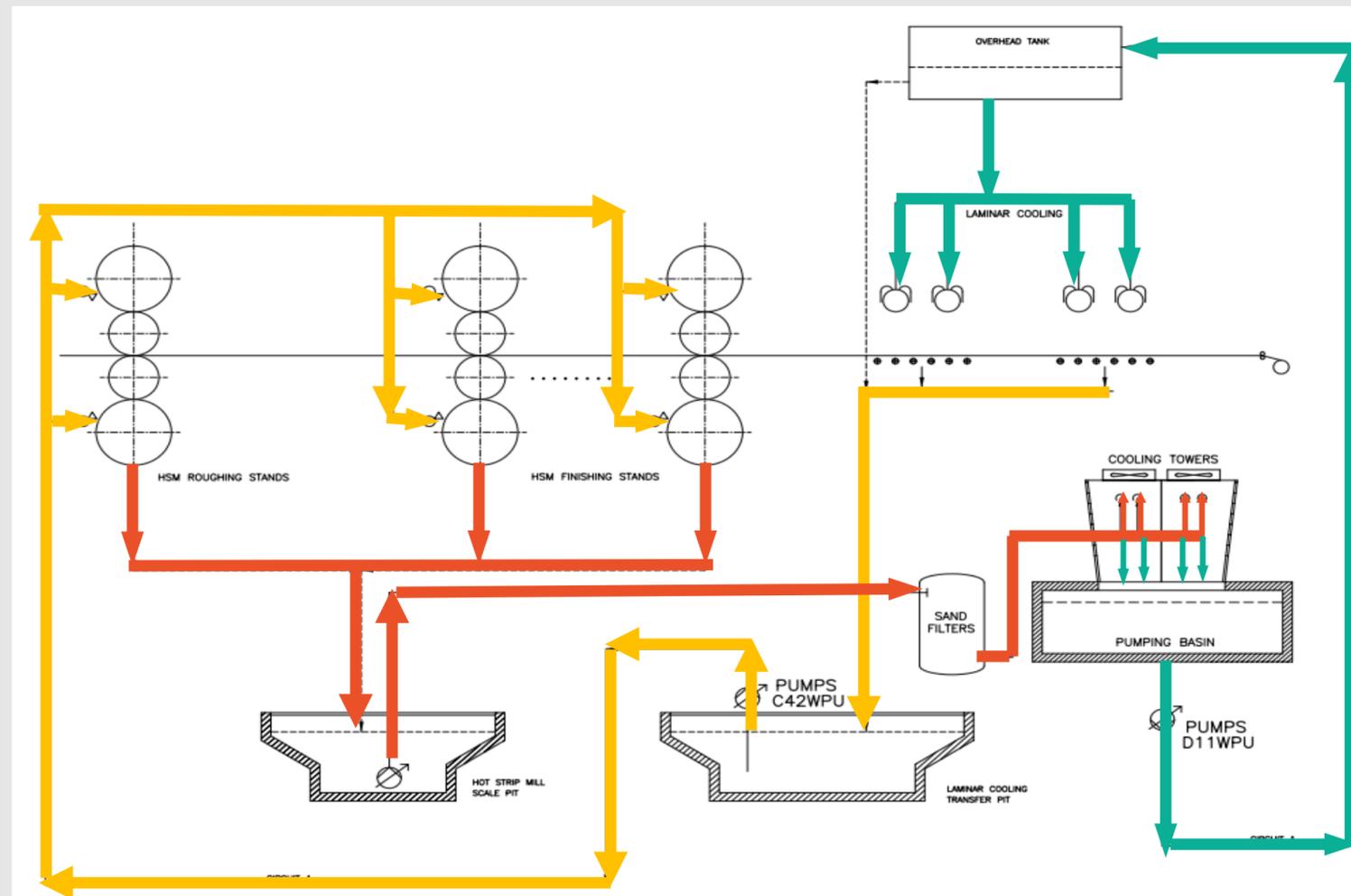
## AUTOMATION FOR PROCESS EFFICIENCY AND SUSTAINABILITY

# WTP FOR HOT STRIP MILL: EFFICIENCY AND ENERGY SAVING

## HOT STRIP MILL WTP NON-CONTACT COOLING CIRCUITS



## HOT STRIP MILL CONTACT (DIRECT) COOLING CIRCUITS (with CASCADE solution)



# INTELLIGENT WATER MANAGEMENT IN STEELMAKING

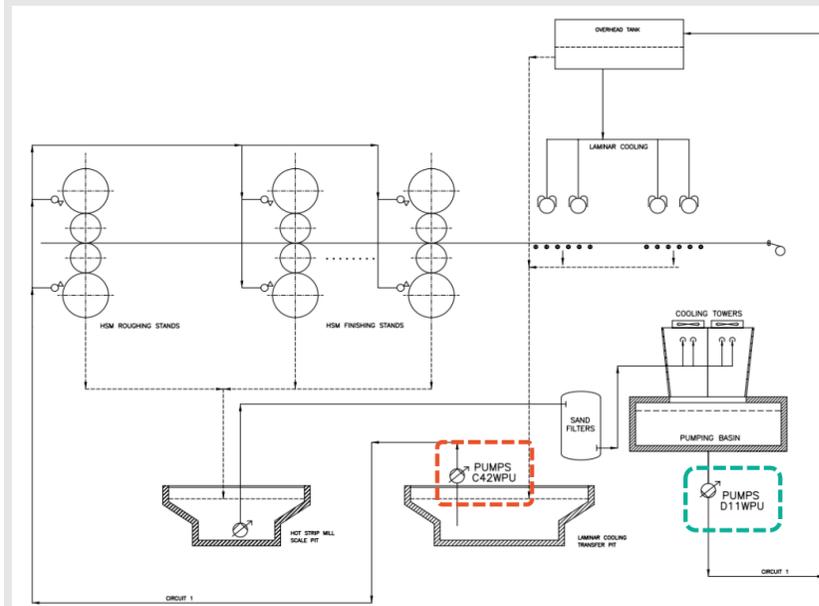
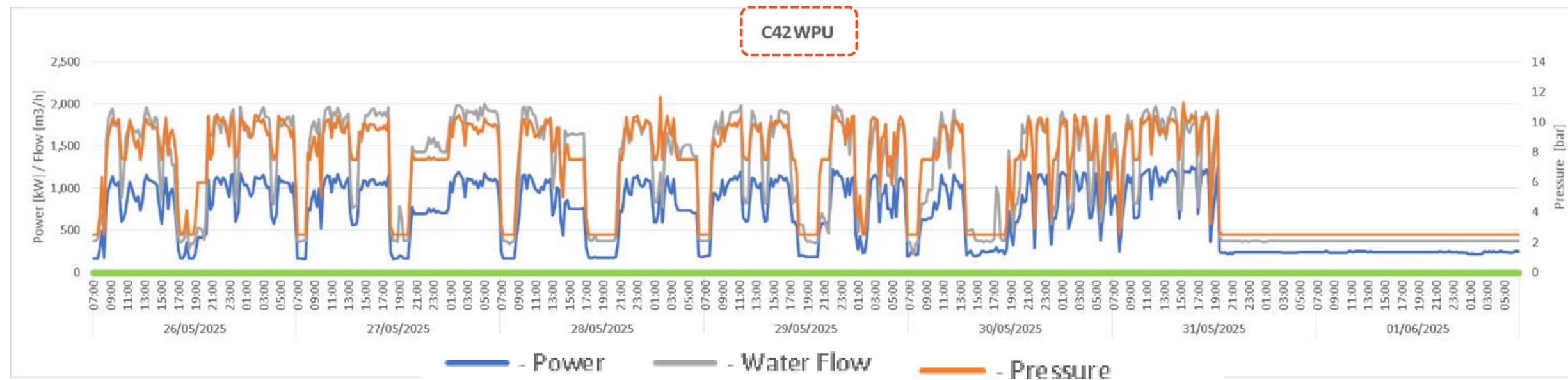
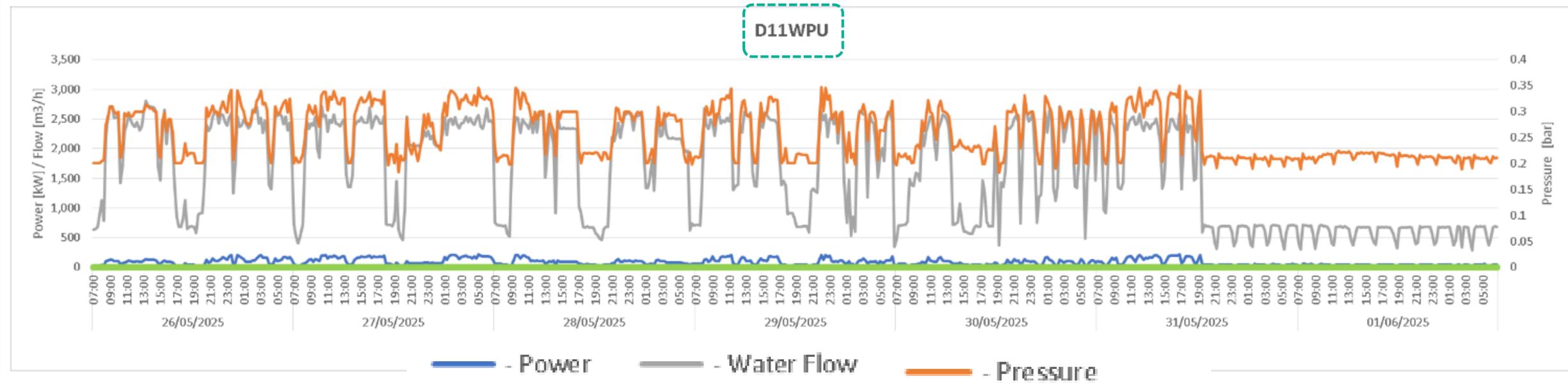
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## CONTACT (DIRECT) COOLING CIRCUIT



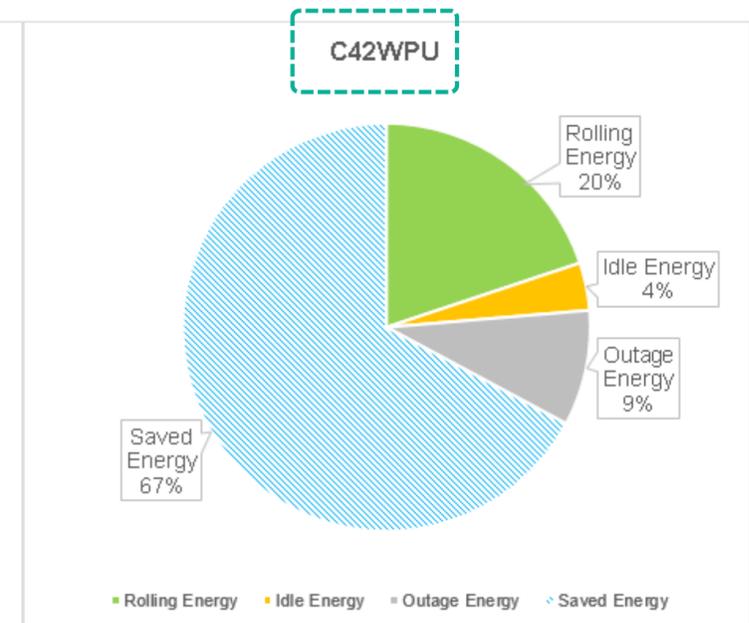
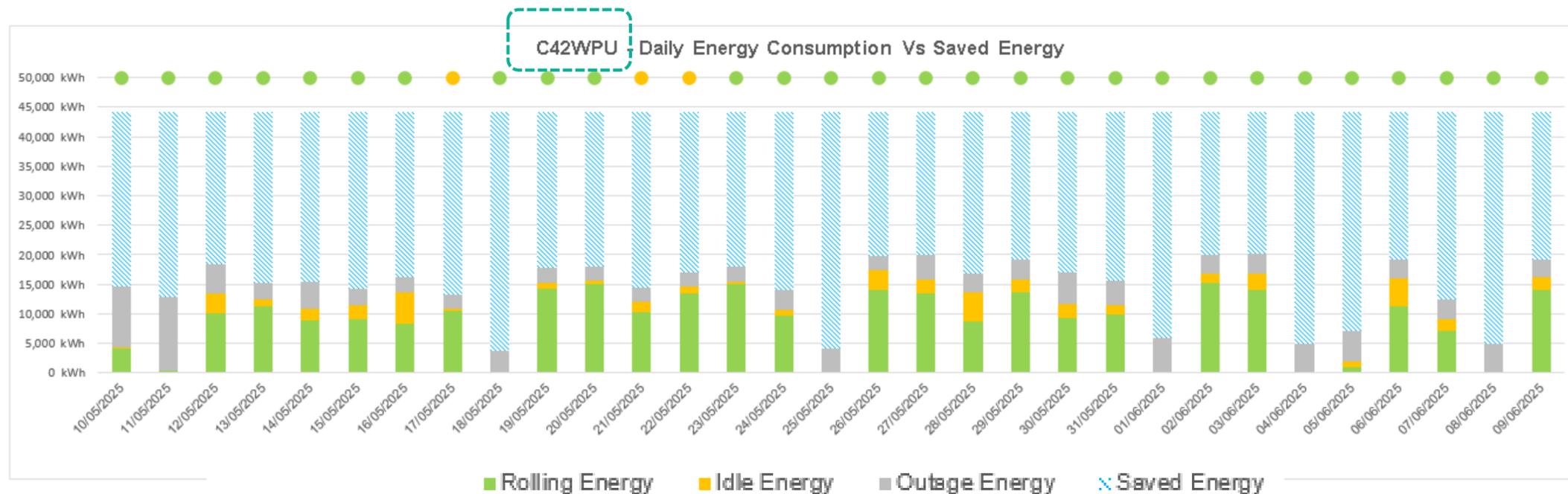
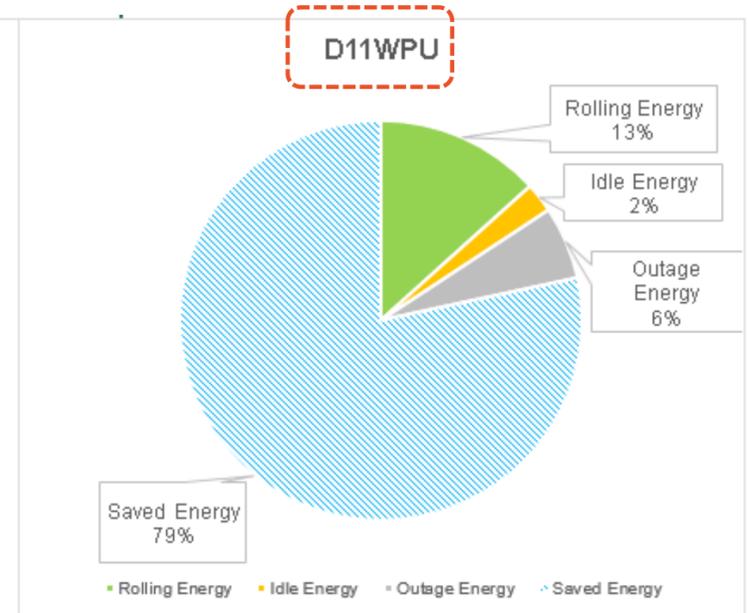
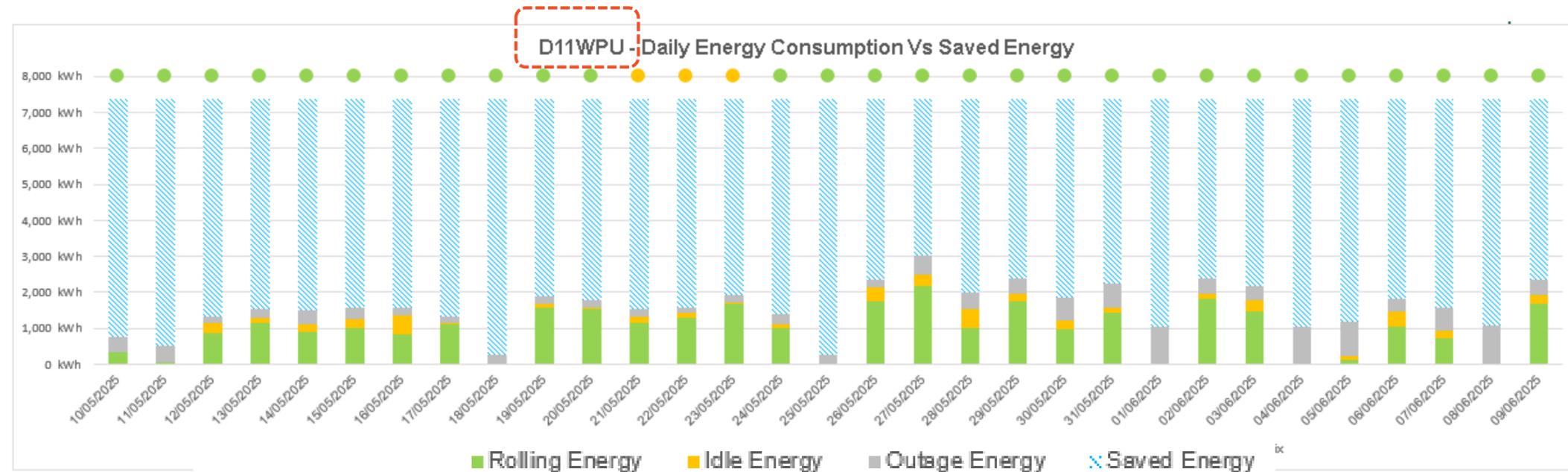
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# WTP FOR HOT STRIP MILL: EFFICIENCY AND ENERGY SAVING

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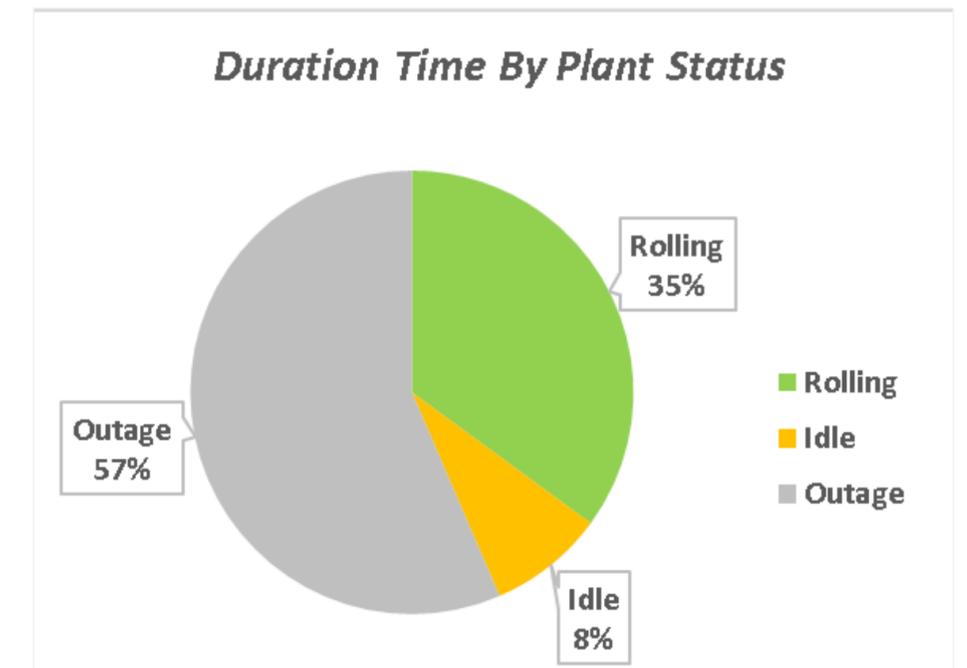
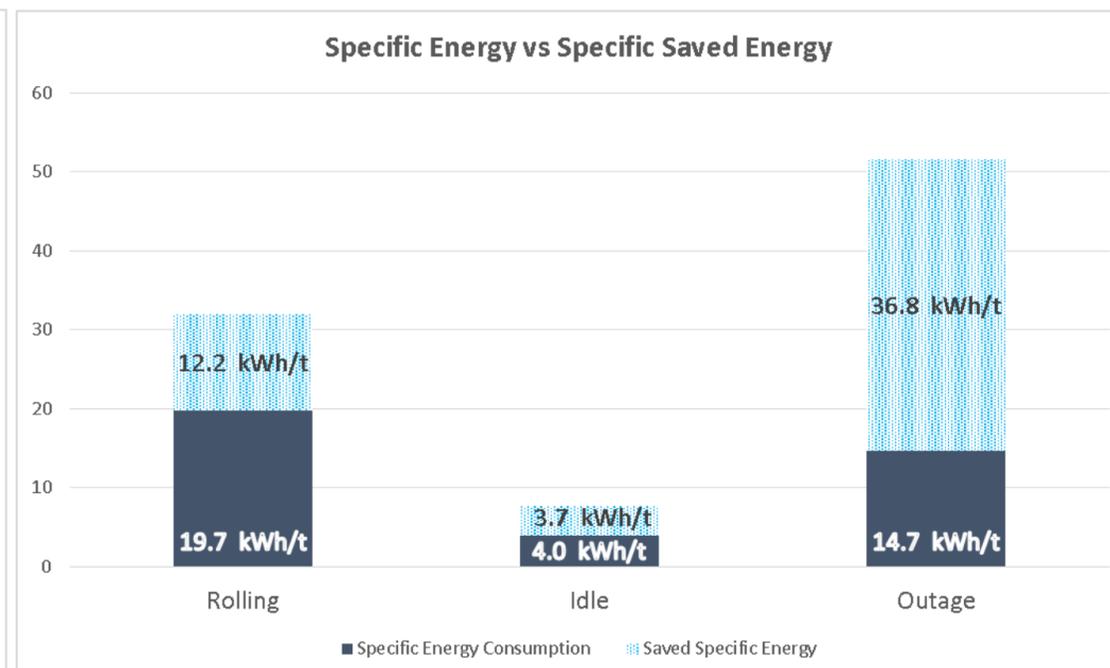
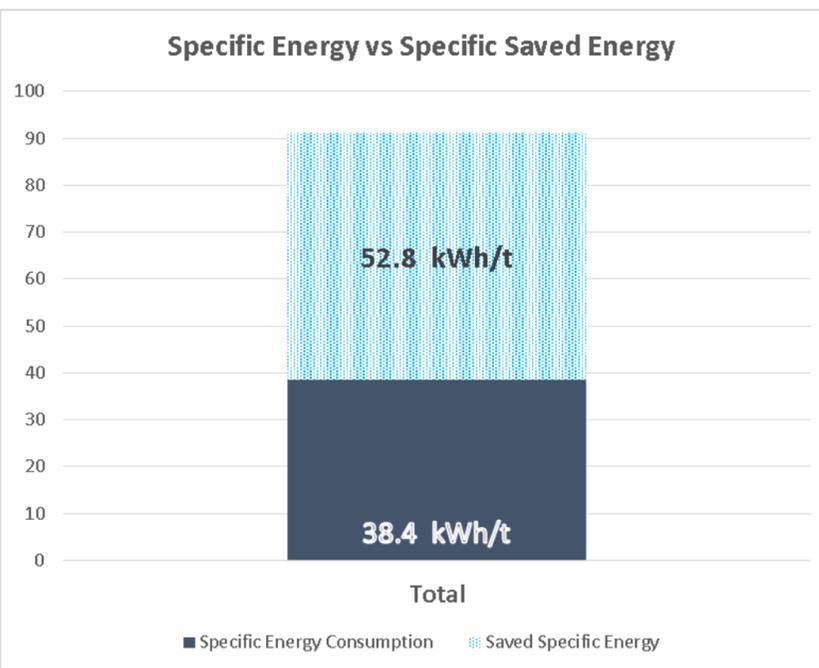
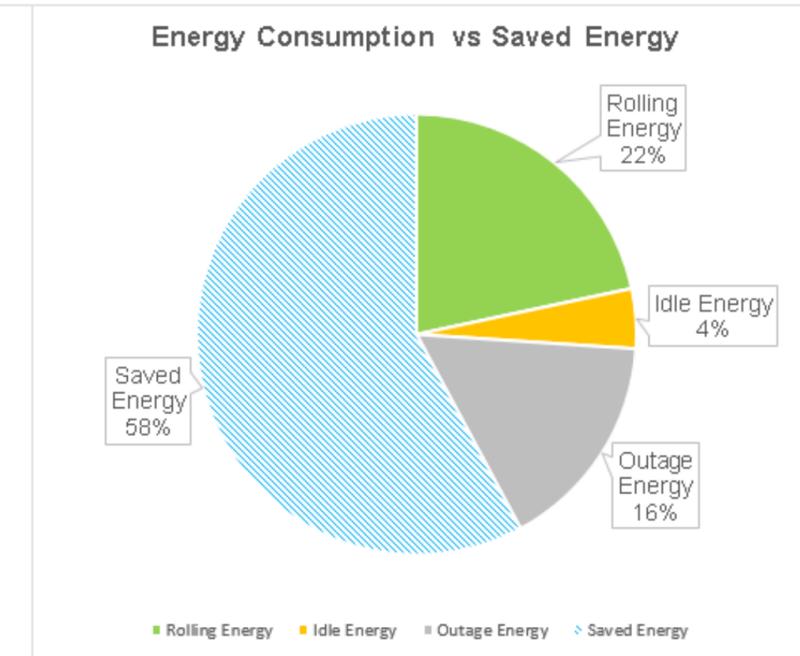
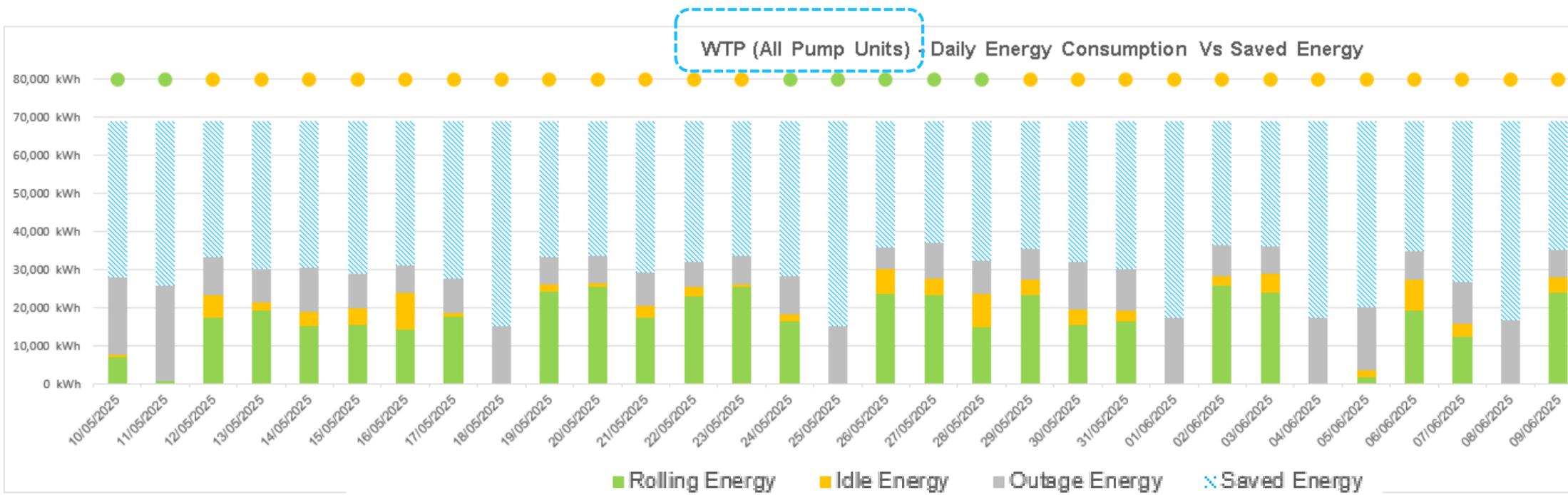


- Energy consumption is counted based on the plant unit status
- Saved energy is the difference between rated and consumed energy

# INTELLIGENT WATER MANAGEMENT IN STEELMAKING

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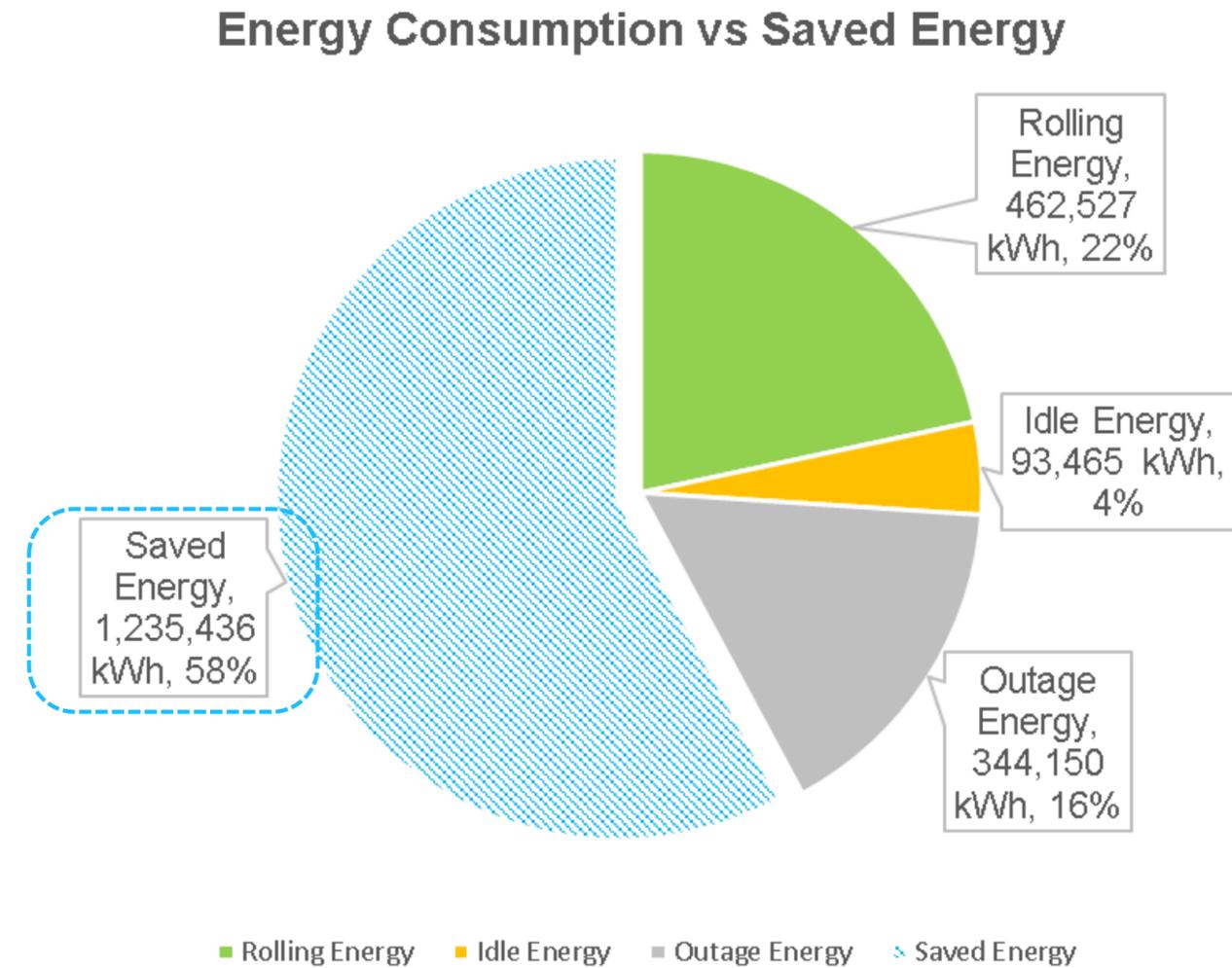
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YEARLY ** ENERGY SAVINGS – WTP FOR HOT STRIP MILL			
	ENERGY SHARE [%]	YEARLY ENERGY [MWh]	YEARLY SAVING* [€]
ROLLING energy	22%	5'318,8	
IDLE energy	4%	1'074,1	
OUTAGE energy	16%	3'956	
SAVED energy	58%	14'145	1.202.300,00 €
<b>Total</b>		<b>24'493,9</b>	



\*\*0.085 €/kWh

\*11,5 Months for Yearly Production

**INTELLIGENT WATER MANAGEMENT IN STEELMAKING**  
**AUTOMATION FOR PROCESS EFFICIENCY AND SUSTAINABILITY**

**WTP FOR SLAB CASTER:**  
**EFFICIENCY AND ENERGY SAVING**

# INTELLIGENT WATER MANAGEMENT IN STEELMAKING

## AUTOMATION FOR PROCESS EFFICIENCY AND SUSTAINABILITY

# WTP FOR SLAB CASTER:

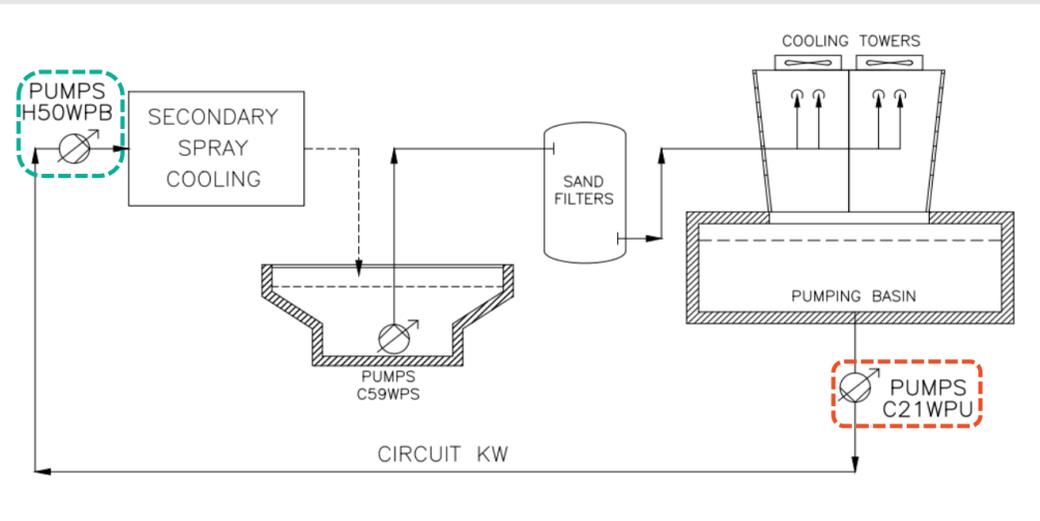
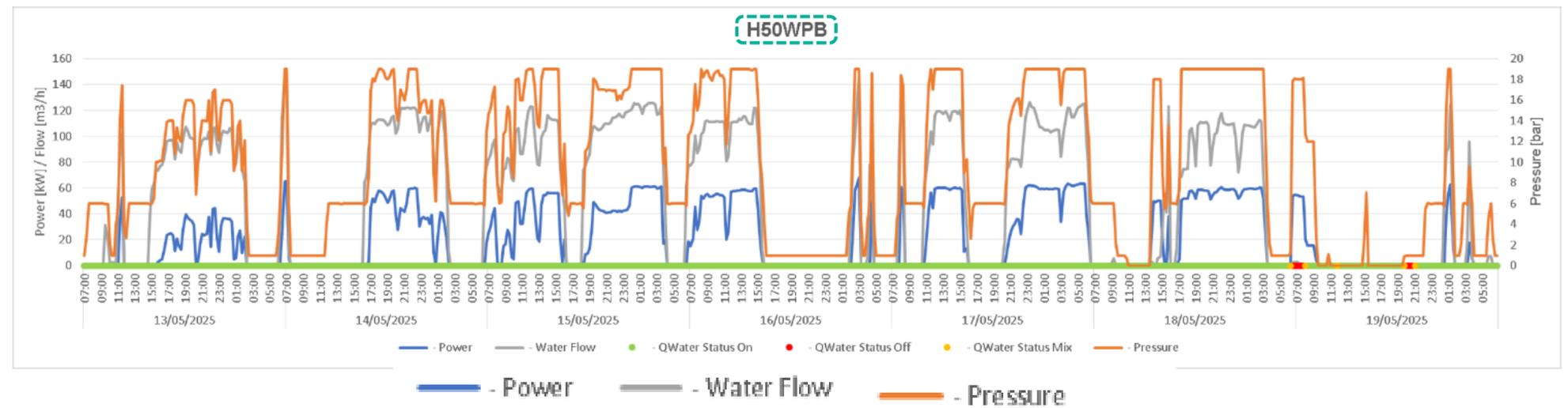
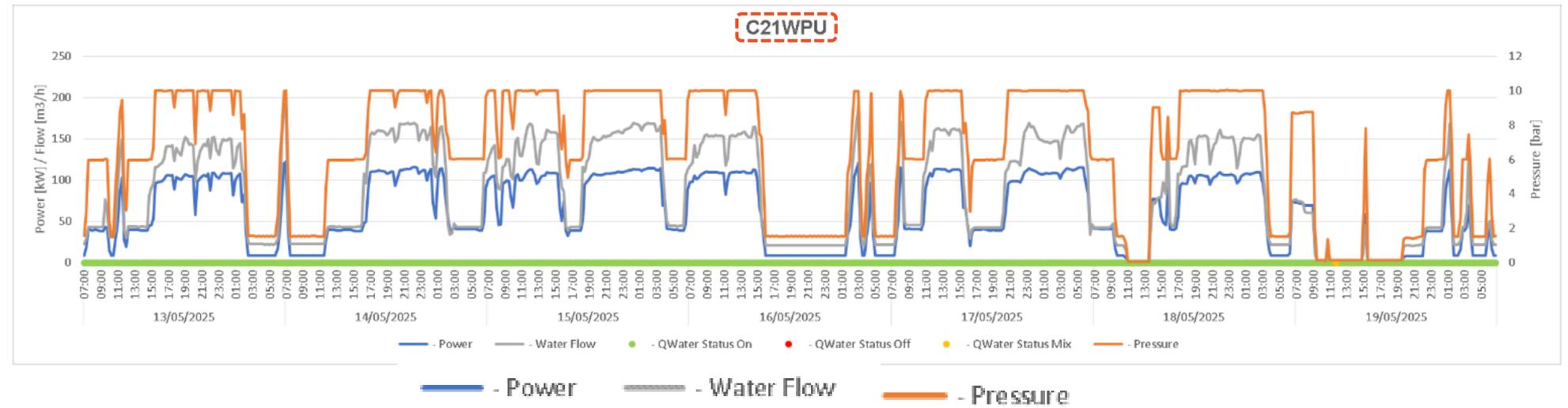
## EFFICIENCY AND ENERGY SAVING

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### SLAB CASTER

### CONTACT (DIRECT) COOLING CIRCUITS



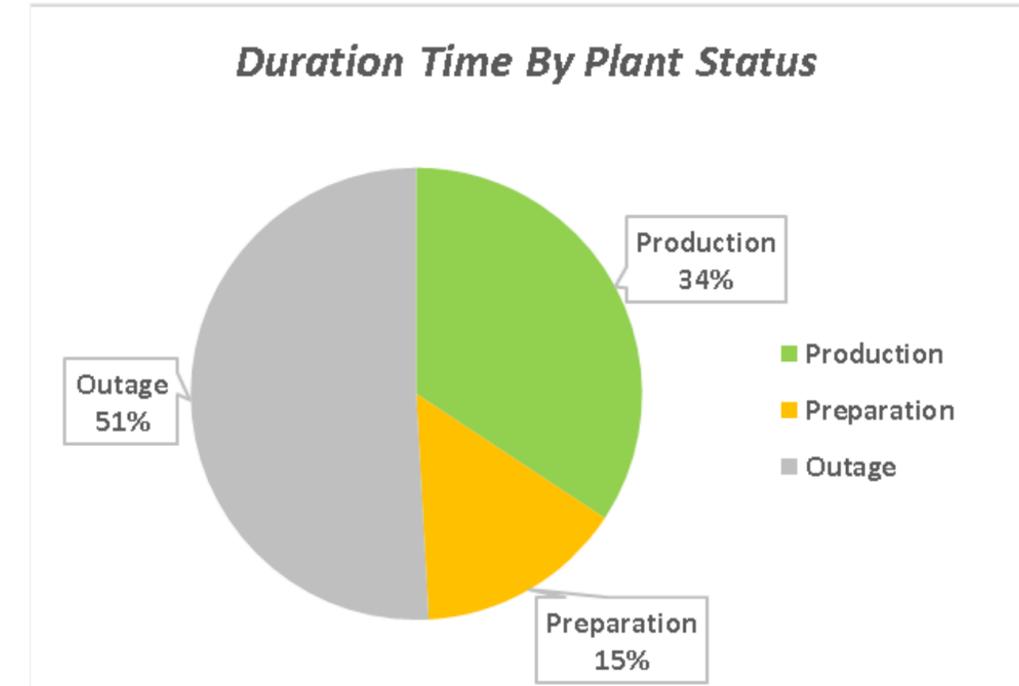
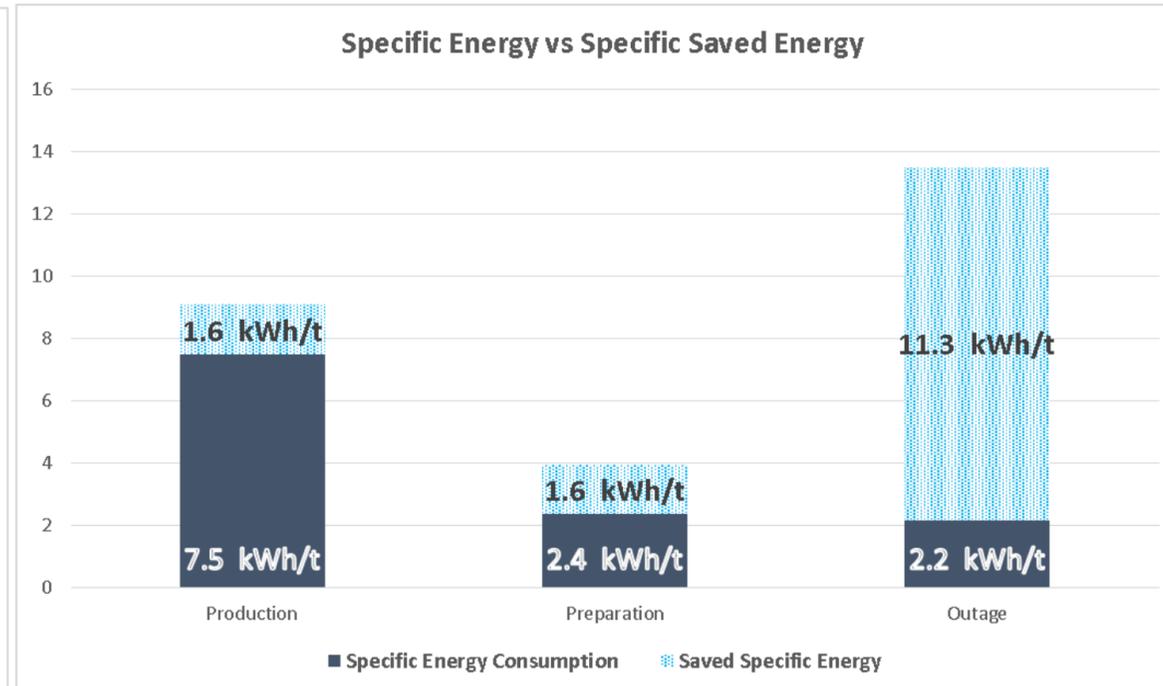
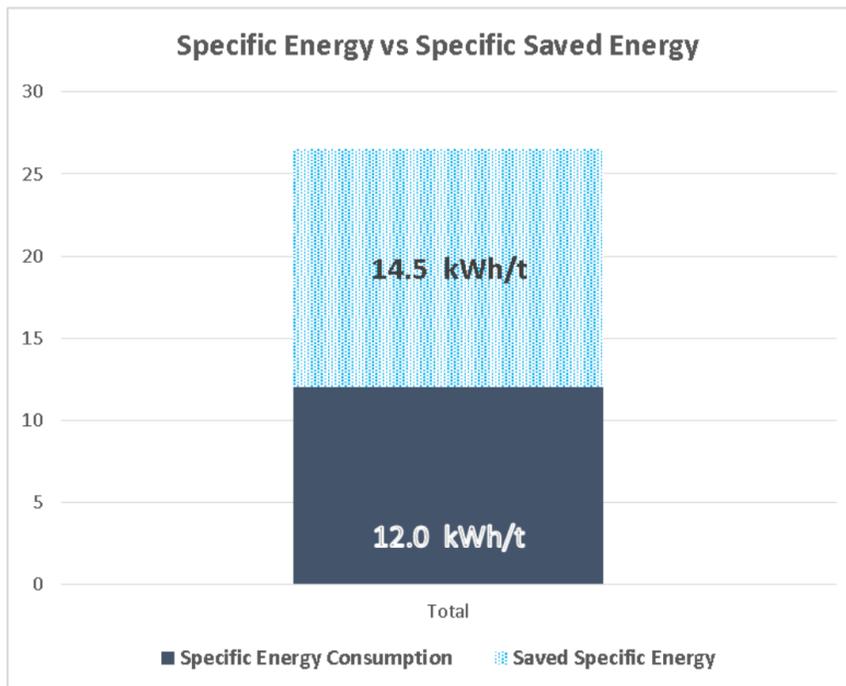
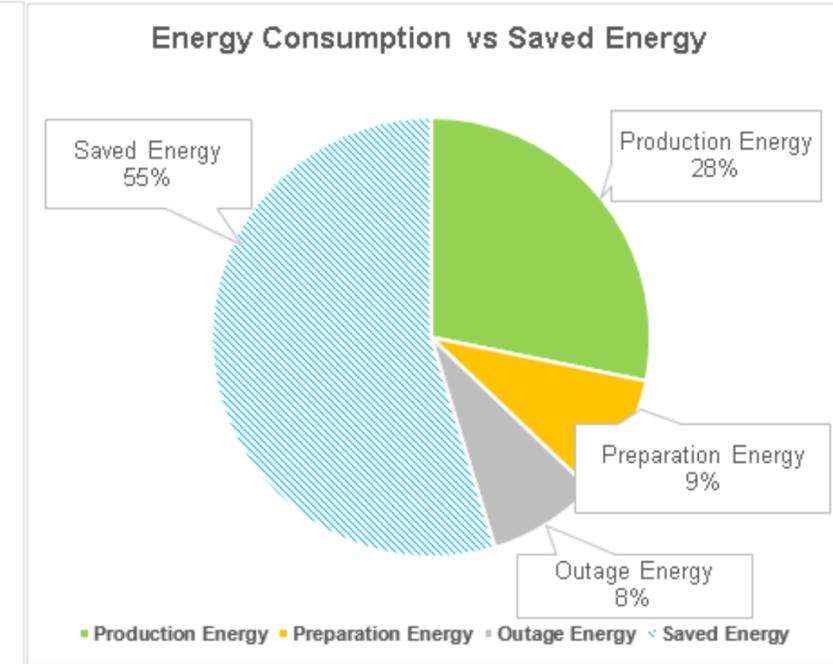
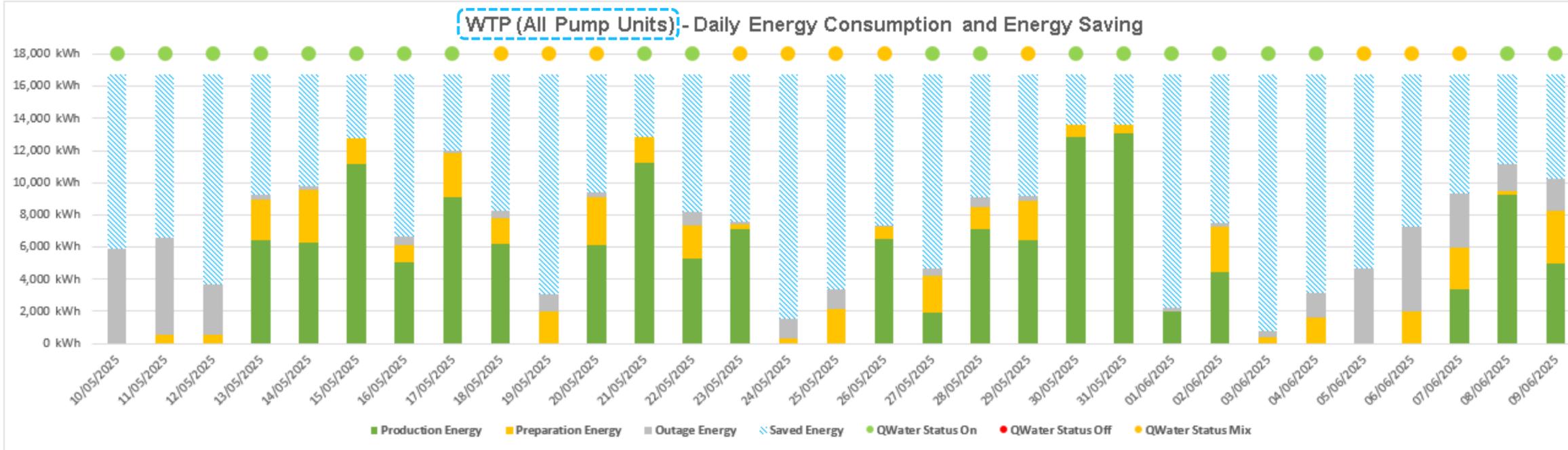
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# INTELLIGENT WATER MANAGEMENT IN STEELMAKING AUTOMATION FOR PROCESS EFFICIENCY AND SUSTAINABILITY

YEARLY** ENERGY SAVINGS – WTP FOR SLAB CASTER			
	ENERGY SHARE [%]	YEARLY ENERGY [MWh]	YEARLY SAVING* [€]
Production energy	28%	1677,9	
Preparation energy	9%	532,5	
Outage energy	8%	486,5	
Saved energy	55%	3256,8	276.828,00 €
<b>Total</b>		<b>5953,6</b>	

\*0.085 €/kWh

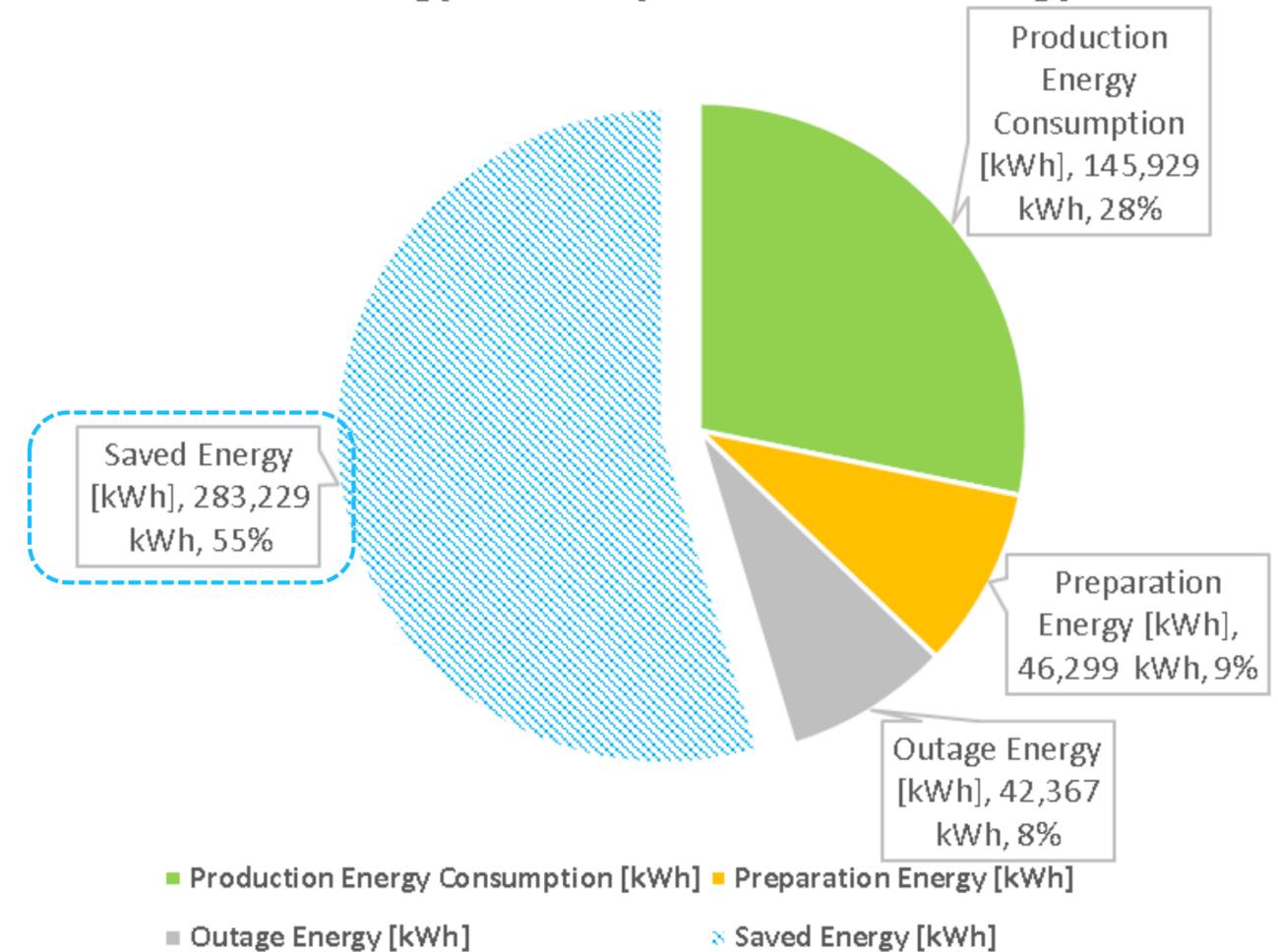
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## WTP FOR SLAB CASTER: EFFICIENCY AND ENERGY SAVING

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Energy Consumption vs Saved Energy



# **INTELLIGENT WATER MANAGEMENT IN STEELMAKING**

## **AUTOMATION FOR PROCESS EFFICIENCY AND SUSTAINABILITY**

# **CONCLUSIONS**

- Energy Management System leads to **full energetical awareness**, thanks to the **integrated monitoring of real-time consumption**, targeting to optimize for **efficiency & savings**
- Smart Automation for any WTP: a **Level 2 for Intelligent Water Management** with **VFD-pumps**
- **Advanced algorithms** ensure efficient and optimized water-cooling system, fully automated
- Saved Energy can exceed **50% of the rated power**, both for HSM WTP and for Slab Caster WTP, with significant savings on the electricity bill

**THANK YOU  
FOR YOUR KIND ATTENTION**

**QUESTIONS  
&  
ANSWERS**

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