



NORSK  ENERGI



The National Cleaner Production Center - Macedonia

CLEANER AND MORE COST EFFECTIVE INDUSTRY IN MACEDONIA

www.ccei.org.mk

ROUNDTABLE DISCUSSION

FROM ANALYSIS TO REALISATION

How to realise energy efficiency projects in Macedonian industry?



Wabtec MZT
A *Wabtec* company



Information about the company

- Wabtec MZT is a company which is specialized in the manufacture of railway braking equipment

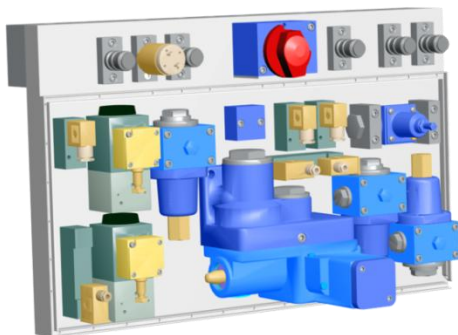
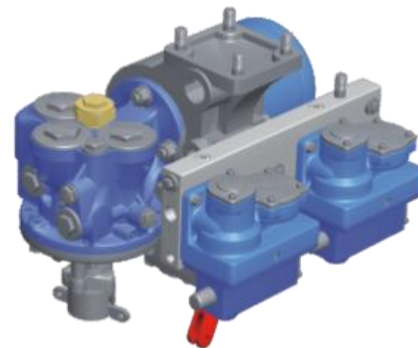
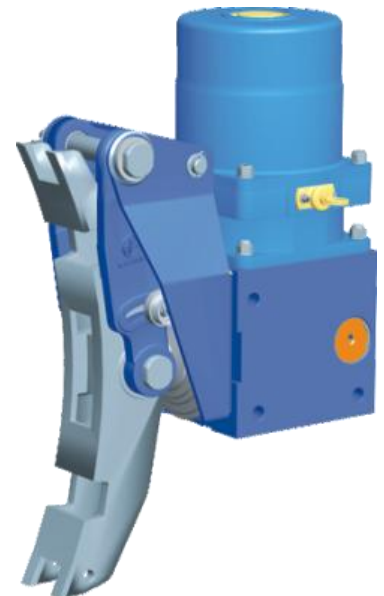


Information about the company

- Founded in 1953 as part from MZT TITO – Skopje
- Since 2003 MZT HEPOS AD become a member of Poli Group-Italy
- Since 2008 together with PolyGroup become a part of Wabtec Corporation

Production program

- Complete brake system for:
 - Freight wagons
 - Passenger wagons
 - EMU and Metros
 - Locomotives and special vehicles
 - Test benches



Main production shop floors

- Mechanical machining



Surface protection

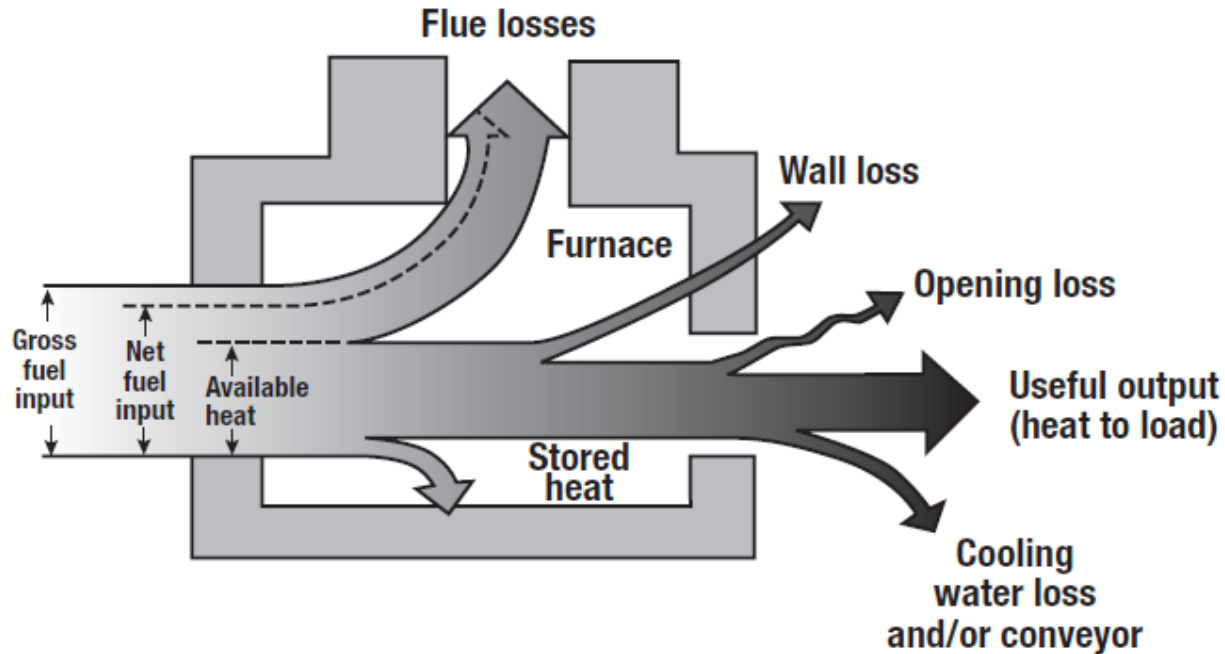


Forging and welding area



Energy consumption in the company

- Rough Sankey diagram of the chamber furnace
- Light oil consumption – 100- 140 t/ annually



Energy efficiency options identified

- Forging and welding area
 - Re-design of furnaces
 - Heat the combustion air for furnaces in a recuperative air-heater
 - Switch- over from the existing fuel, light oil, to natural gas

Energy efficiency options identified

- Surface protection
 - Signalizing unit's application for the surface process duration
 - Automation and computer follow-up of Waste water treatment station
 - Internal control of el. power consumption by regulation of Maxi graph

Energy efficiency options identified

- Mechanical machining
 - Replacing electrical heating with gas heating of premises where electrical heating exist
 - Replacing existing heating with oil by heating with natural gas
 - Monitoring of the el. power consumption and production process organization improvements

Estimated energy savings, cost savings and investment budget

Energy option	Investment	Cost savings
Forging and welding	(Eur)	(Eur) annually
Re-design of furnaces	To be estimated, depending on the scope of reconstruction	To be estimated, depending on the scope of reconstruction
Replacing existing light oil with natural gas	~ 80.000	~25.000
Surface protection		
Application of signaling units	1.000	10.000
Automation and computer control of WWTS	~20.000	~3.000
Internal control of el. power consumption	Very low cost-internal organization	15.000
Mechanical machining		
Replacing light oil with gas	~ 80.000	~30.000
Replacing el. heating with gas	~40.000	~20.000
Reducing el. consumption with changing habits	0	~5.000

Challenges for implementation

- Improvement of the overall energy efficiency
- Financial benefits through reduction of cost for fuel and el. energy
- Environmental benefit
- Technical improvement of the technology processes
- Improvement of the working conditions and development of positive motivation to the employees