



„Energy Efficient Production Plant“

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Energy Efficient Production Plant

■ WELSER PROFILE

- 300.000 tons of steel per annum
 - *Plate/Sheet* thickness 0,2 - 8mm?
 - *Plate/Sheet* width - 800mm
- Product development with clients
- 20.000 cross sections
- *Production sites*
 - *Austria*
 - *Germany*
- 1700 Employees
- Offices in 12 European Countries



Energy Efficient Production Plant

*The production plant
is idle!*

*Die Produktionsanlage
steht !*



*Why is the energy
demand still so high?*



Energy Efficient Production Plant

- Data Collections
 - Evaluation of the set-up and production times
 - 48% down-time and set-up time
 - 52% production time
 - Change over mode?(Rüstbetrieb)
 - Many plant sections running continuously/permanently (laufen durch)
 - Large potential savings
 - Production operation
 - Intervention in the production process
 - High risk
 - Low potential for savings

Energy Efficient Production Plant

- Optimization potential - 1
 - Motor drives
 - Performance optimisation
 - Needs based control and regulation
 - Hydraulic systems
 - Pressure and volumetric flow rate regulation with frequency converter
 - Installation of accumulator
 - Optimization of the duty cycle
 - Pump / Fan
 - Pressure and volumetric flow rate regulation with frequency converter
 - Plant sections
 - Only switch on when necessary

Energy Efficient Production Plant

- Optimization potential - 2
 - Machine Lighting
 - LED lights
 - Light control
 - Selection of appropriate operating power
 - Pneumatic
 - Hydraulic
 - Electric
 - Maintenance
 - Troubleshoot hydraulic leaks
 - Elimination of pneumatic leaks
 - Correct pressure setting

Energy Efficient Production Plant

■ Drive Engineering / Technology

■ Before optimization

- DC Motor 152kW
- Field always on
- Fan always on
 - Noise / pollution

■ After optimization

- DC Motor 152kW
- Field at standstill off
- Fan controlled by temperature
 - Less noise / pollution

■ Energy savings of 2.500 kWh / year

- Invest 800,-



Energy Efficient Production Plant

■ Hydraulic Power Unit

■ Before optimization

- Three phase AC motor 37 kW direct
- High idle times
 - Strong oil heating
 - Noise in **change-over** mode
(Rüstbetrieb)

■ After optimization

- Three phase AC motor 37 kW with FU
- Demand-dependent volume flow rate control
 - low oil warming
 - **Downtime/idle state** in **change over** mode

■ Energy savings of 9.000 kWh / year

- Invest 3.000,-



Energy Efficient Production Plant

- Profilabsaugung / Profile Vacuum?
 - Before optimization
 - Three phase AC motor 12,5 kW direct
 - Vacuum/negative pressure too high / safety valve
 - High noise development
 - High heat loss
 - After optimization
 - Three phase AC motor 12,5 kW with FU
 - Vacuum/negative pressure -250 mbar
 - Low noise
 - Low heat loss
 - Energy savings 6.000 kWh / year
 - Invest 1.000,-



Energy Efficient Production Plant

■ Power off during down-time/idle state

- Before optimization
 - All electrical drives ON
 - Hydraulics running continuously (no accumulator)

- After optimisation
 - Electrical drives off in down-time
 - Ramp up/boosting time

Hochlaufzeit - 3 sec

- Utilizing the belt loop
- Hydraulic with accumulator
- Energy savings of 15.400 kWh / year
 - Invest 8.000,-



Energy Efficient Production Plant

■ Maschine Lighting


- Before optimization
- 5x450W metal halide lamps
- 100% duty cycle

- After optimization of
- LED lights 5x132W
- Power-off by light sensor

- Energy savings of 12,000 kWh / year
- Invest 4,000, -

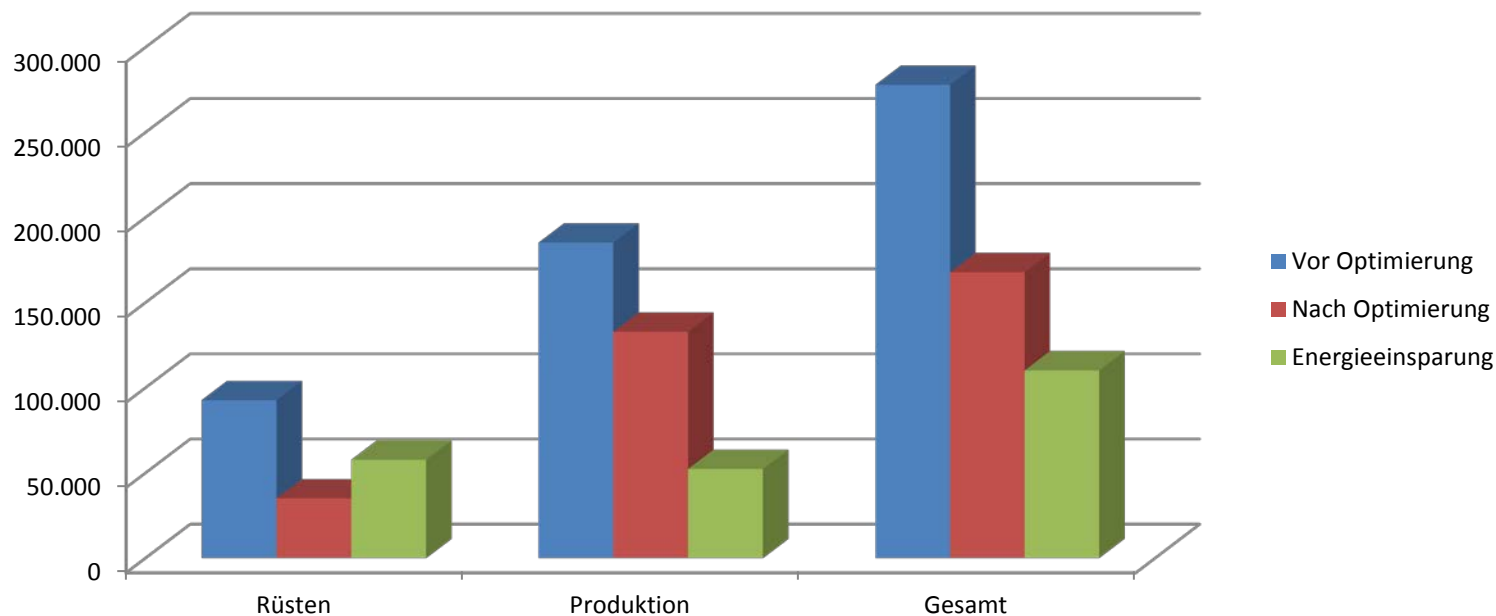


Energy Efficient Production Plant

- Benefits of drives with frequency converters
 - No mechanical translation is necessary
 - Pressures and flow rates adjusted
 - Ventilation systems
 - Adjustment of time programs enable various operating states
 - Adaptable to temperature / humidity fluctuations
 - Monitoring of filter systems
 - Monitoring of hydraulic system leakages
 - Identification of required maintenance
 - Control  Regulation

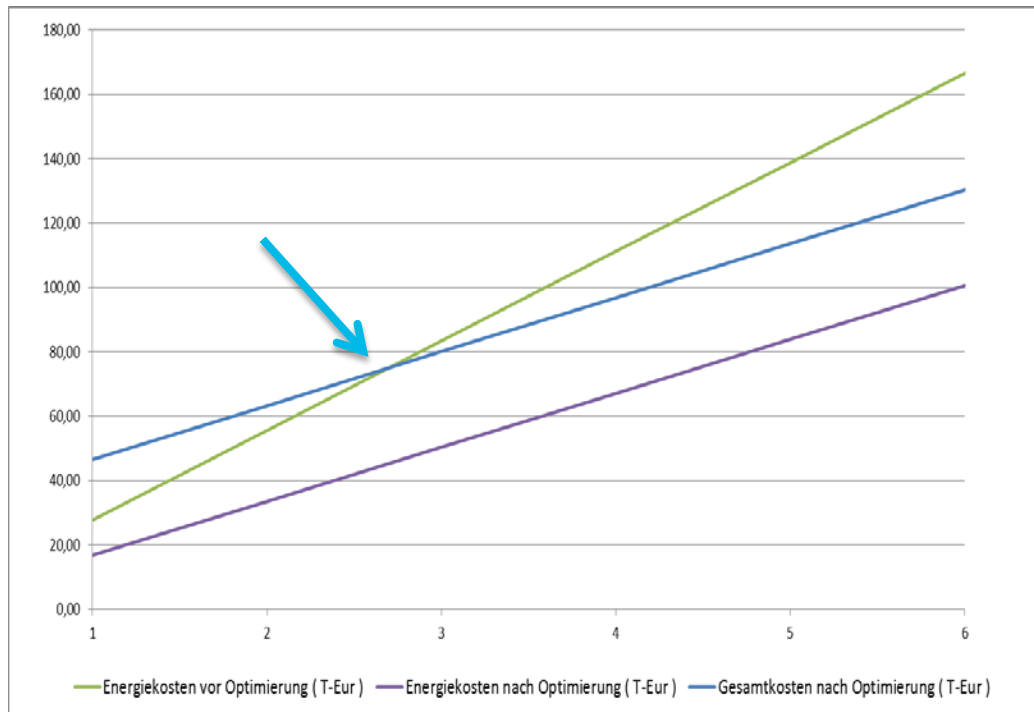
Energy Efficient Production Plant

■ Load relation before and after optimization



Energy Efficient Production Plant

Economic Efficiency



Investment
20.000,-

Personnel Expenditure
10.000,-

Energy Savings
11.000,- / Jahr

Energy Efficient Production Plant

- Implementation in the 10 comparable plants
 - Savings per year
 - > 1,1 GWh
 - approx. 110.000,-
 - approx. 400 to CO₂

Savings:

5% of the annual energy consumption!



The way to our future!

