



LEAN TO GREEN: REDUCING ENERGY WASTE THROUGH LEAN TOOLS AT WEARTECH LTD

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INTRODUCTION

Issue at hand

- Weartech is a precision engineering company that makes high-performance metal parts with the use of energy intensive machines.
- Rising energy bills and inefficiencies have prompted a need for change within the company.
- A growing need for sustainable, low-waste manufacturing is becoming apparent globally.

OBJECTIVE

What did I try to do?

- Investigated ways to try reduce energy waste and production inefficiencies
- By incorporating two strategies
Lean Manufacturing
(Cutting operational waste)
Energy Efficient Machining
(Reducing electricity usage)

FINDINGS

What was discovered?

- Machines that were left idle consumed more than £35,000/year of electricity.
- Set up times were excessive and varied.
- Raw materials that were stockpiled consumed space and capital
- Operators had no idea or instrument to operate energy efficiently.

METHODOLOGY

How was the problem studied?

- A month long case study at the machine shop of Weartech was carried out.

Data collected:

- Machine idle time
- Delays and scrap rates
- Inventory and staff habits

EVSM, Gamba Walks, Staff interviews and Root Cause Analysis were the lean tools used.

SOLUTIONS

What were the improvements recommended?

- Machine auto-idle systems
- Reduce motion waste through 5S redesigns
- Faster changeovers through SMED
- Tools-related defects can be prevented with TPM
- Monitoring energy to identify waste
- Involvement of staff for sustainability and ownership

CONCLUSION

Why this matters?

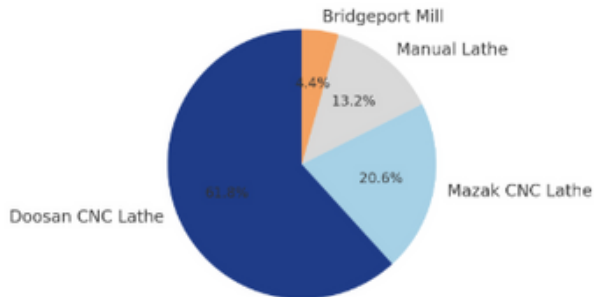
The combination of **Lean** and **Energy-Efficiency** is a powerful method to:

- Save money
- Benefit the environment
- Empower the shop-floor employees

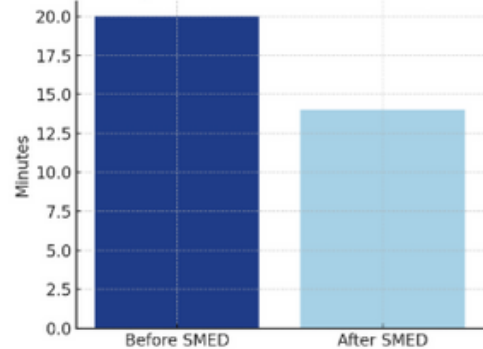
This strategy is realistic, scalable, and relevant to other SMEs.

RESOURCE PAGE

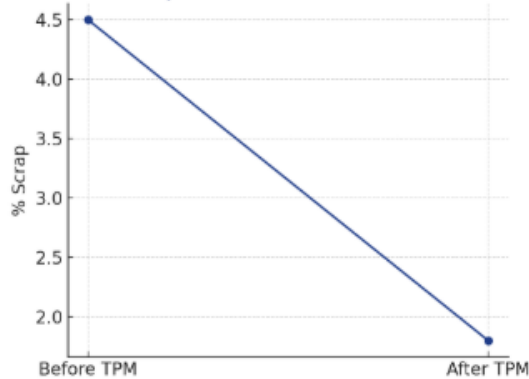
Annual Energy Use Share by Machine



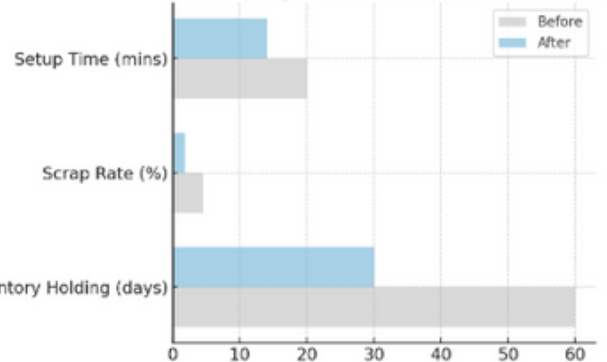
Setup Time Before and After SMED



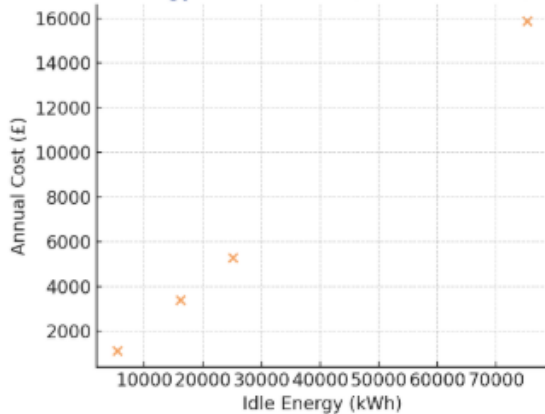
Scrap Rate Reduction via TPM



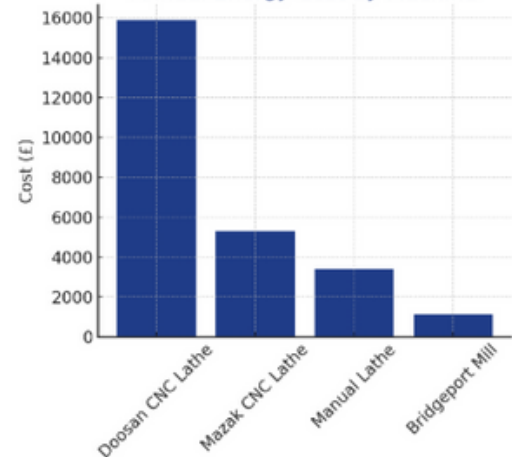
Process Improvements (Before vs After)



Energy Use vs Cost (Idle Machines)



Annual Energy Cost by Machine



REFERENCES

- Womack & Jones (1996) – Lean Thinking
- Herrera & De Las Heras-Casas (2018) – EVSM
- Liker (2004) – The Toyota Way
- Nakajima (1988) – TPM
- Gao et al. (2017) – IoT for machining