

Idhammar Whitepaper – Reduce your carbon footprint with Overall Equipment Effectiveness

Increasing your OEE score not only means enhanced production capacity, but greater energy efficiency too, resulting in visible benefits to the bottom-line.

A greater general awareness of environmental issues together with rising energy costs and increased Government targets has caused manufacturing energy-consumption to rise to a board-room level concern. It is no longer acceptable for companies to treat energy simply as a fixed cost of production, there is an urgent requirement to monitor and improve energy-efficiency.

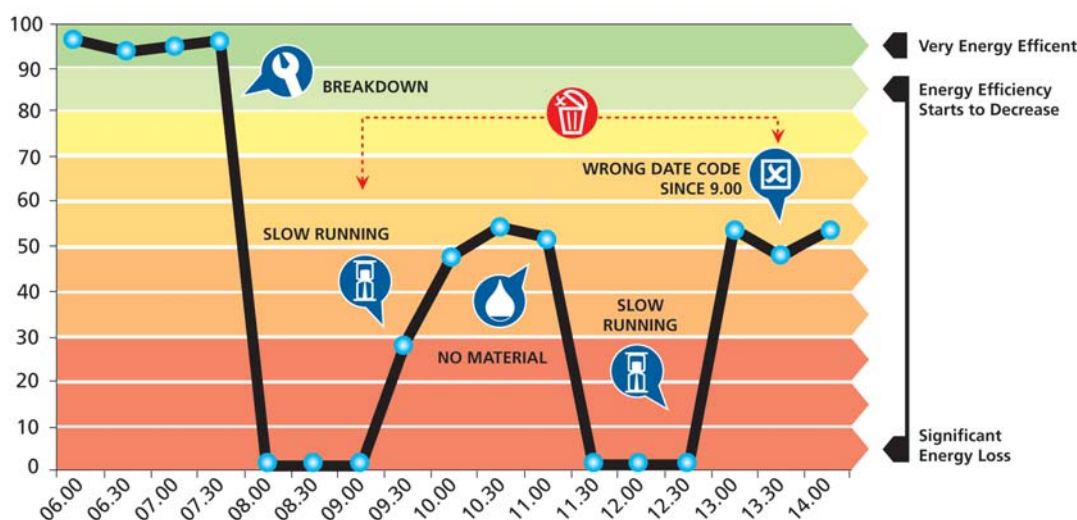
Most manufacturers have already implemented a wide-range of energy related programmes with varying degrees of success including: switch-off campaigns; intelligent production scheduling at a lower time-tariff; installing new energy-efficient equipment or enhancing maintenance to reduce leaks. All of these programmes are necessary for an ongoing improvement in energy consumption but they are not sufficient on their own. There is a bigger prize to be gained in operating the factory as effectively as possible to maximise energy-efficiency.

Major contributors to wasted energy

1. **Breakdown** – apart from the broken equipment, most of the plant; conveyors, pumps, ovens, shrink tunnels, etc. continue to cycle, wasting large amounts of energy.
2. **Start-up** – most items of plant use more energy at start-up than at normal operating speed, particularly electricity, so if the plant breaks down frequently more energy will be used.
3. **Slow running equipment** – uses the same amount of energy as equipment running at full capacity
4. **Rejects** – waste all the added-value used to produce them including labour, materials and energy
5. **Under-utilised capacity** – companies regularly invest in additional capacity, unaware that existing lines are underperforming and could provide the production increase they are looking for. It is well proven that improvements to existing plant are 10 times more effective than the installation of new capacity and this would include energy consumption.



The results of one or more of these factors on a normal production cycle could have a dramatic impact on both the productivity and the energy-efficiency of a production line, as illustrated in the following diagram. As you will see slow running, breakdowns and material shortages push energy efficiency 'into the red'. The wrong data code not only results in the scrapping of material but also the waste of energy associated with that particular production cycle.



Implementing an OEE system provides the monitoring and indicators to enhance the overall efficiency of a factory in terms of productivity, quality and energy consumption.

OEE systems provide a platform for greater efficiency

Overall Equipment Effectiveness (or OEE), is a simple concept;

- Anything that prevents normal operations is a loss of availability. 'The A'
- Anything that prevents completion of the target products is a performance loss. 'The P'
- Any product, which is 'not right first time' is a quality loss. 'The Q'

OEE is then calculated by multiplying the $A \times P \times Q$.

Although the equation is simple, the results are surprisingly powerful in highlighting the potential areas for improvement.

Based on OEE concepts, OEE systems provide rich functionality to quickly calculate, clearly report and deliver intelligent drill-down capabilities to uncover previously hidden issues as a platform for continuous improvement.

A number of forward-thinking manufacturers have already embraced OEE systems with remarkable success, achieving 15 – 25% improvement in the OEE score in less than 3 months. The score in itself is not important; however the corresponding improvement in profitability and subsequent competitive advantage provides clear motivation for these companies.

The following table is a simple illustration of the potential a 1% improvement in OEE could make to the bottom-line profitability of a company.

OEE Score	43%	44%	Plus 1% improvement
Actual units	76,500	75,750	Less waste
Hours to produce	118	115	3 hours saved
Rejects	1,500	750	Quality improvement
Labour costs	£11,769	£11,477	£292 saved less running hours
Materials cost	£76,500	£75,750	£750 saved less waste
Energy costs	£47,077	£45,909	£1,168 saved due to fewer running hours
Saved per week			£2,210
Saved per year			£114,909

With a 1% improvement in OEE we can save £750 in materials, require 3 hours less production, and reduce energy costs by £1,168.

The illustration highlights the important link between increased OEE scores and enhanced energy consumption. Energy reductions also generally lead to some of the greatest manufacturing cost savings. Taking our illustration further, improving the OEE score to around 60% or 70% would allow us to fulfil the orders in 5 days and safely reduce operations to a 2-shift pattern. This would obviously result in far greater energy savings than any of those shown here.

With OEE system users quickly gaining and holding 20% improvements, it is easy to see why OEE, as a key driver for change, generates so much interest.

Mark Rogers, Site maintenance manager at Smith & Nephew commented:

“We have seen real sustainable improvements in our assets through reducing the six losses of OEE. One particular asset was running seven days a week and still struggling to meet customer demands. Now it typically does the same volume in four-and-a-half days.”

That’s an annual reduction of 2,080 hours of energy usage, whilst achieving the same output.

Benefits of an OEE system



THE COMPANIES WHO HAVE BENEFITED FROM OEE SYSTEMS all share certain characteristics; an obsession with performance measurement, detailed failure analysis and a focus on improvement. They also share corresponding improvements in profitability.

Idhammar's OEE System provides can measure your OEE including energy monitoring to discover your loss structure, convert losses to cash, cost justify improvements and monitor them to resolution. We have the expertise to ensure your staff will take the action to make the difference.

[Call us on +44 \(0\) 117 9209400](tel:+44201179209400) to find out how OEE could reduce your carbon footprint and your energy bills!