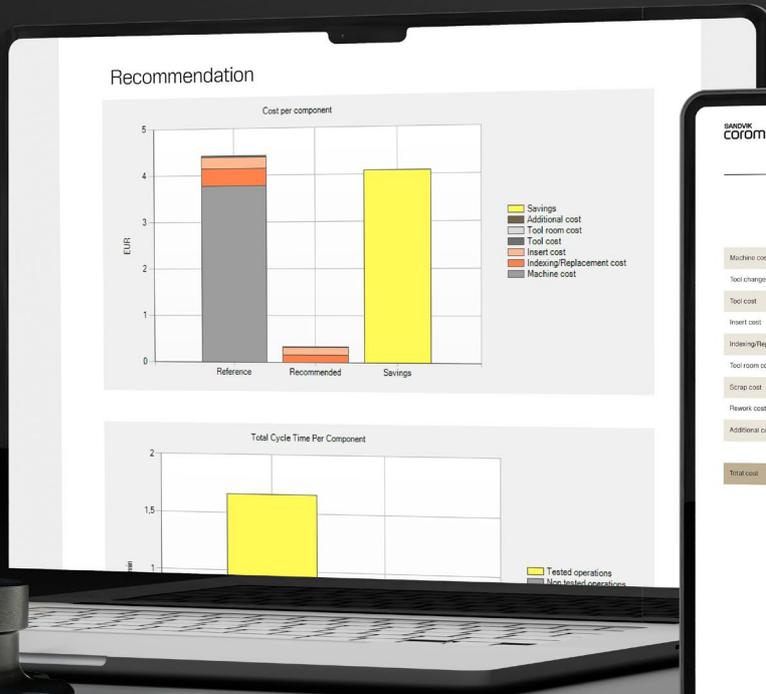


Sustainability Analyzer

Minimizing manufacturing's environmental impact with data-driven insights



Analysis per year

	Reference	Recommended
Machine cost	€3 750,00	€0,00
Tool change cost	€0,00	€0,00
Tool cost	€25,00	€4,20
Insert cost	€250,00	€156,70
Indexing/Replacement cost	€375,00	€156,70
Tool room cost	€0,00	€0,00
Scrap cost	€0,00	€0,00
Rework cost	€0,00	€0,00
Additional cost	€0,00	€0,00
Total cost	€4 410,00	€337,50

Productivity report

Wotan Industries Ltd.

YPS936-2330414033
Alpha Värkorpåss
301602233

92%
cost reduction



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Introduction

Manufacturing is at a pivotal moment. Global pressures — from regulatory demands to stakeholder expectations — are rapidly transforming how industrial operations are measured, managed and optimized. Amid this shift, sustainability has emerged not as a trend but as a strategic imperative and central to this is the need to reduce energy consumption.

Energy costs make up a significant share of operational expenses in manufacturing, particularly in high-volume, high-precision processes such as metal cutting. Reducing energy usage directly lowers emissions and operating costs, while also enhancing competitiveness and resilience. For manufacturers, this translates to improved productivity, extended equipment life and alignment with increasingly stringent climate targets such as the Science-Based Targets initiative (SBTi).

Companies such as Sandvik Coromant are leading the way by embedding energy and CO₂ metrics directly into tools like the Productivity Analyzer and the Sustainability Analyzer. These solutions offer actionable insights — quantifying energy savings per component, identifying CO₂ reductions and supporting investment decisions that favour long-term efficiency.

This whitepaper explores the current landscape and demonstrates how smart, data-driven approaches are enabling manufacturers to transition from ambition to action in sustainability.



SANDVIK
COROMANT

Sustainability is no longer just desirable



Sustainability is a constant thought for manufacturers. According to Fictiv's 2025 State of Manufacturing report¹, 91% of firms now have sustainability initiatives and governance in place to help drive sustainability goals.

It's no longer just a desirable — sustainability is a priority for manufacturers navigating the challenges of 2025. In fact, Fictiv also reports that 95% of manufacturing leaders say it's important their company implements sustainable practices.

In 2025, multiple converging forces are making sustainability a core business requirement. Rollout of the EU's Carbon Border Adjustment Mechanism (CBAM) remains underway across the continent, meaning exporters to Europe must account for embedded carbon emissions — penalizing manufacturers without low-carbon processes. Meanwhile, governments in markets such as Canada, South Korea and the UK have introduced tax incentives and green industrial policies that reward sustainable innovation while putting pressure on companies that fail to keep up.

To meet sustainability goals effectively, manufacturers must have a clear, data-driven understanding of their carbon emissions and the environmental footprint of what their plants produce.

¹<https://www.fictiv.com/ebooks/2025-state-of-manufacturing-report>



The power of energy

It's well understood that conserving energy is vital to reaching climate goals, for our people and for profit. But can you picture exactly what energy savings could look like?

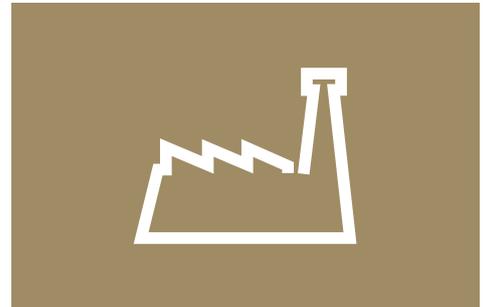
Consider 10MWh of energy. We can quantify it as:



**100 electric vehicles,
each with a 100kWh battery**



**Power for approximately 330 homes in
the US, for an entire day.**



**Enough power to run a large
manufacturing plant for several hours**

Visualizing energy in this way helps turn abstract numbers into something tangible — something that reveals the true value of energy efficiency and smart energy management. Every MWh saved can have a measurable, meaningful impact.

Why do workshops need to change?

There's increasing pressure from both market forces and environmental regulations to minimize the manufacturing industry's energy consumption, reduce carbon emissions and operate more sustainably. In metal cutting, several trends and challenges make energy consumption a priority:



1. Increased power demand in CNC machines

Modern CNC machines are more powerful, capable of operating at higher speeds and feed rates to meet productivity demands. However, this increased performance comes at a cost — greater energy consumption. A significant portion of this energy is required just to drive the spindle, which alone can account for 20-25% of a machine's total energy use. Optimizing spindle utilization and focusing on overall equipment effectiveness (OEE) becomes essential to managing this energy load effectively.

3. Pursuit of high removal rates and smart tooling

Today's operations aim to increase material removal rates and enhance chip removal efficiency. This shift requires better tool utilization and machining strategies that consume less energy per unit of production. Improvements in cutting technology and optimization of tool paths can lead to measurable reductions in energy consumption and emissions without compromising output.

2. Evolving focus on machine and process efficiency

Manufacturers using Multi-Tasking Machines (MTMs) are placing greater emphasis on:

- Machine shutdown management to eliminate unnecessary idle power draw
- Energy management systems that track usage in real time
- Efficient cooling strategies that reduce HVAC-related energy overheads

These changes are aimed not just at cost reduction, but also at aligning with broader climate goals.

4. The power of incremental gains

Even minor improvements in machining processes such as reduced cycle times, fewer tool changes or better toolpath strategies can yield significant energy savings when scaled across thousands of components and operational hours. These savings not only improve sustainability metrics but also translate into tangible cost benefits.

A gap in awareness creates opportunity

Surprisingly, many manufacturers have never measured their energy consumption at machine or component level. This presents a critical opportunity for forward-thinking suppliers and partners. By introducing tools like the Sustainability Analyzer, manufacturers gain data-driven insights into their operations, enabling smarter decisions that reduce both costs and environmental impact.



The Sustainability Analyzer: empowering manufacturers with data

The Sustainability Analyzer empowers manufacturers with the insights needed to make more environmentally conscious, better decisions. By integrating seamlessly into the Productivity Analyzer platform, the Sustainability Analyzer extends the traditional focus on machining efficiency into the realm of energy usage, carbon emissions and cost savings, enabling measurable sustainability improvements across industrial machining operations.



A smart integration of productivity and sustainability

The Sustainability Analyzer operates by embedding sustainability metrics directly into the existing Productivity Analyzer, creating a comprehensive, real-time view of both environmental and economic performance. It calculates:

- Energy consumption per component
- Annual energy usage
- CO₂ emissions per component or process
- Associated energy and emissions cost savings

These calculations are made possible by pulling from detailed production data, such as:

- Spindle energy use during cutting
- Machine idle power consumption
- Local electricity pricing (cost per kWh)
- Regional carbon intensity (CO₂ factor)

By feeding this data into the CoroPlus® Tool Guide, advanced computations are performed and returned to the Sustainability Analyzer's interface. The result is a clear, quantified picture of where gains can be achieved through smarter tooling choices, optimized machining strategies or better machine utilization.



Data inputs that power insights

To enable accurate calculations, several key data fields have been added to the platform:



Efficiency. Indicates the proportion of spindle energy effectively used for cutting, as opposed to being lost as heat or vibration.



Cost per kWh. Captures the energy price in the customer's country. This field is critical for calculating monetary energy savings and should reflect local utility rates.



Idle power (kWh). Represents the baseline energy consumed by the machine while not actively cutting, such as for control systems, lighting or coolant circulation. Idle power is one of the big sources of waste, as machines are consuming energy while not actively in production.



CO₂/kWh factor. Automatically retrieved from datasets in Electricity Maps², this represents the carbon intensity of electricity based on local or national energy generation sources.

²<https://portal.electricitymaps.com/datasets>

What can the Sustainability Analyzer do for your shop floor?

To explore how the Sustainability Analyzer tool could transform how a manufacturing plant tracks, monitors and adjusts its emissions, let's first examine the typical bottlenecks a plant may encounter.



Lack of visibility into energy usage

Facilities may be unable to accurately quantify the energy consumed per component, per process or per year. Without this insight, identifying inefficiencies becomes speculative.

Missed cost savings Energy costs are a significant operational expense. Without a system to track and analyze consumption trends, manufacturers are likely overspending due to:

- Suboptimal tool paths
- Inefficient machine utilization
- Frequent tool changes causing idle time

Inadequate emissions tracking

Environmental compliance and emissions reduction targets become harder to meet without real-time CO₂ data. Companies cannot confidently communicate their credentials to regulators or customers.



Limited decision support

Traditional analytics do not tie productivity to sustainability. As a result, investment decisions, such as tooling upgrades or process changes, are made without understanding their impact on relevant metrics.

Now, let's look at how this could look with the Sustainability Analyzer in place.

1 Full transparency on energy and emissions

- Energy consumption per component
- Total annual energy usage
- CO₂ emissions per test or production line

2 Quantified gains

Manufacturers can now capture:

- Energy savings per year
- Energy cost reductions
- CO₂ reductions, aiding in meeting SBTi commitments

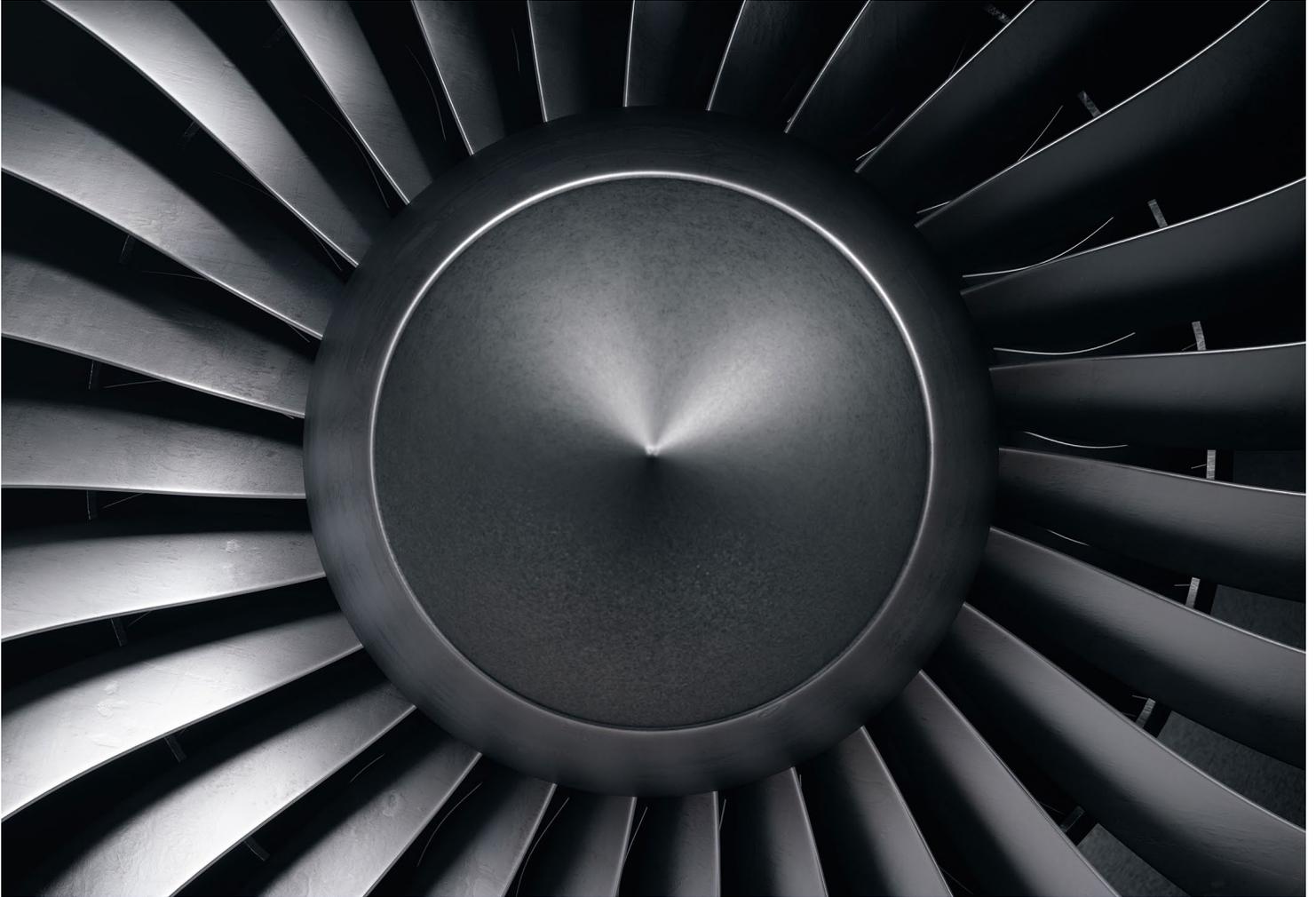
3 Value based decision making

Every tool change, path optimization or process update can be simulated and validated for both productivity gains and environmental impacts. This creates clear value propositions for:

- Tooling investments
- Avoiding unnecessary expenditure
- Aligning with internal KPIs

Value in action

The Sustainability Analyzer is most effective when its insights can help make changes to tools or machining strategies. Here are three examples that demonstrate the potential the Sustainability Analyzer possesses to reshape production processes and attitudes to waste.



Aero engine

Customer situation: A manufacturer of aircraft engine components for some of the industry's most renowned players, the customer sought to improve productivity after investing in a new site. Cutting time and energy consumption were both major considerations due to the scale of production, the number of components being produced and the sheer heat generated through production processes.

The approach: From a tooling point of view, several Sandvik Coromant solutions were implemented to deliver higher cutting speeds for HRSA components. A new grade, S205, was introduced, as well as a new turning tool and CNC

optimization software to improve stability and feed. To document productivity and sustainability gains from the new set up, the customer made the most of the Productivity Analyzer.

The result: Tool life increased by 120% and 2,200 hours of machining time per year were cut from the process due to greater efficiency. Crucially, by better measuring the carbon impact of the new site's production set up, the customer saved nine tons of CO₂ per year and 13.5MWh of energy.

Emobility

Customer situation: A producer of diesel injection systems across three production plants, the customer expanded into electromobility in 2023 and with it began producing a range of components for electric passenger vehicles. The customer was experiencing lower tool life than desired when producing these new parts and wanted to improve cycle times.

The approach: Sandvik Coromant supported the transition to an optimized machining approach that has shortened cycle times by 34%. The customer will be gradually investing in new machines over the next few years, and the Analyzer is proving fundamental in tracking the impact of this expansion.

The result: The Productivity Analyzer has helped increase productivity by 54%, while reducing costs by 26%. Tracking sustainability metrics has reduced CO2 emissions by 21% per year and 10.5 tons of CO2 have been saved annually.

Subsea and surface technologies

Customer situation: A leading subsea and surface technologies provider, the customer specializes in providing wellheads, surface trees, valves and completions systems. They sought a solution that could compete, and excel, against their current machining setup while being cost effective.

The approach: The strategy was two-fold: a rigid setup and a creative programming strategy to get through a heavily interrupted area in the component. Tests were documented via a Productivity Analyzer report that featured sustainability analysis.

The result: Productivity was increased by 238%, resulting in a 67% decrease in cost and a 68% reduction in cycle time per component. At the same time, CO2 emissions were reduced by 75% and 11.2 MWh of energy was saved per year.



Conclusion

Manufacturers today face a defining challenge: how to meet rising production demands while aligning with accelerating sustainability targets. As this whitepaper has shown, energy consumption is no longer a background concern — it is now one of the most immediate, measurable and impactful levers for operational and environmental performance.

From global regulations to growing investor scrutiny, the message is clear: what gets measured, gets managed. Yet, many workshops still lack visibility into their energy usage and emissions at the most granular level — the machine, the component, the process.

That's where tools like the Sustainability Analyzer become transformational. By embedding energy and carbon data into everyday production analysis, the Sustainability Analyzer empowers manufacturers to not only improve productivity but also make smarter decisions across their operations. It bridges the gap between ambition and action to deliver measurable outcomes in cost savings, CO₂ reduction and competitive advantage.

In short, sustainability is no longer just a responsibility — it's a capability. And with the right data, the right tools and the right mindset, manufacturers can turn that capability into long-term value.

Want to learn more about how the the Sustainability Analyzer can help you better understand your production processes? Visit the website today.

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