

News

# **Steps to Reduce Carbon Footprint & Meet Sustainability Goals**

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According to a [2023 report by the International Energy Agency](#) (IEA), industries account for 24% of global CO<sub>2</sub> emissions, highlighting the critical role operations and maintenance teams must play in reducing environmental impact. As global concerns about climate change grow, businesses are under increasing pressure from regulators, stakeholders, and consumers to show their commitment to sustainability. By optimizing workflows, cutting down on waste, and adopting innovative strategies, businesses are finding new ways to boost efficiency while minimizing their environmental impact.

### **Start with Measurement**

The first step in reducing waste and emissions is understanding the current state. Organizations must invest in measuring their current carbon footprint and leverage data-driven insights to create an actionable sustainability strategy. These measurements should include a comprehensive review of energy consumption, emissions, waste output, and overall process inefficiencies.

Carbon footprint assessments can be performed using [Greenhouse Gas \(GHG\) Protocol standards](#), which classify emissions into three categories:

- Scope 1: Direct emissions from owned or controlled sources (e.g., factory operations).
- Scope 2: Indirect emissions from purchased electricity, steam, heating, and cooling.
- Scope 3: Emissions from the entire value chain, including suppliers and customers.

By identifying where emissions originate, businesses can set realistic reduction targets. Many organizations use [ISO 50001](#) as a framework for managing energy use. This internationally recognized standard enables certified organizations to use energy more efficiently, reduce energy costs, minimize emissions, and improve profitability.

### **Streamline Processes**

Optimizing workflows is a key strategy for reducing environmental impact. Operations and maintenance leaders can often make targeted improvements that significantly cut emissions and energy use.

In the surface finishing sector, optimizing batch processing times has proven to be highly effective. For example, MacDermid Enthone recently conducted an evaluation of batch processes, which revealed that one product family, [TRIPASS](#), took two days to produce, requiring continuous mixer operation. By identifying inefficiencies and adjusting processes, production time was cut to eight hours, reducing energy consumption for this product by over 50%.

While this example is specific to surface finishing, other industries can utilize a variety of strategies to streamline their processes, including implementing lean manufacturing principles, optimizing supply chain logistics, and using predictive analytics to prevent unnecessary energy expenditure.

### **Energy Generation & Consumption**

A fast and impactful approach to lowering a company's carbon footprint is reducing energy consumption. Investing in on-site renewable energy sources, such as solar panels, has proven successful for many organizations. For instance, MacDermid Enthone recently installed solar panels across several of our global facilities, leading to a 30% to 40% reduction in energy consumption based on location. This approach not only lessens reliance on traditional power grids but also offers long-term cost savings while enhancing environmental sustainability.

Moreover, basic energy efficiency improvements can lead to substantial cost savings. Examples include upgrading lighting to LED, enhancing building insulation, and installing energy-efficient heating and cooling systems. Our recent transition to LED lighting has led to a 10% to 15% energy savings based on location. This equates to a savings of roughly 20 tons of CO2 emissions at each of MacDermid Enthone's 21 global production locations.

### **Proactive Maintenance to Reduce Waste**

The industry has coined the term "energy wasted on reactive maintenance" to describe the excess energy used when restarting equipment or reprocessing products. Reactive maintenance can result in increased downtime, wasted energy, and elevated emissions.

As a result, organizations have shifted to preventive maintenance strategies to boost operational efficiency and cut down on unnecessary energy use. Facility managers

should look to adopt condition-based monitoring and predictive maintenance platforms to help minimize unplanned downtime and reduce energy waste.

### **Sustainability Beyond CO<sub>2</sub>**

While reducing carbon emissions is a key indicator of sustainable practices, sustainability encompasses more than just CO<sub>2</sub> reduction. Factors such as minimizing waste and water consumption also play a vital role in facility management and process optimization.

In the surface finishing sector, where water usage is high, reducing water consumption can greatly decrease environmental impact. By tracking the water used for cleaning between chemical batch productions, MacDermid Enthone found that manual cleaning processes were both water-intensive and generated a significant amount of wastewater. Introducing automatic washing systems and revising production schedules to sequence compatible chemistries reduced water use by 30%, improved reliability, and decreased energy consumption.

This example underscores the importance of industries evaluating their unique environmental impacts, whether through consumables, waste, or emissions and taking necessary steps to reduce their overall footprint.

### **Looking Ahead: The Role of AI in Sustainability**

Artificial intelligence (AI) is set to play a key role in enhancing production planning and eliminating inefficiencies in manufacturing. AI-driven production scheduling uses advanced algorithms and machine learning to analyze data and make real-time decisions to continually optimize inventory and batch size while providing the best service to customers. These systems can forecast demand, optimize resource allocation, and streamline decision-making, resulting in less waste and improved operational efficiency.

Measuring emissions, streamlining workflows, and reducing energy consumption are all ways operations and maintenance leaders can play a pivotal role in lowering their organization's carbon footprint. As sustainability becomes a business imperative in 2025, companies that proactively invest in clean technologies and process optimization will not only meet regulatory and stakeholder expectations but will gain long-term competitive advantages. To stay ahead, facility leaders must embed

sustainability into their core strategies, leveraging innovation and data-driven insights to accelerate both environmental and financial performance.

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