



Digital Sustainability

Smart technologies driving the green
transition in pharma

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Pharma's Dilemma: Innovation vs. Environmental Impact

The pharmaceutical industry is finding itself in an increasingly tight corner. While its aim to develop effective medicines remains a driving force, **the industry is under growing pressure to address its significant environmental footprint.**

From energy-intensive production processes to the generation of hazardous waste, **traditional pharmaceutical manufacturing models come with major environmental costs**, and pharmaceutical companies are being urged to respond to these issues.

WHAT THE EU IS DOING AND WHY

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The pressure on firms is only being amplified by **fast-growing regulatory frameworks**, such as those in the European Community, which **require pharmaceutical companies to produce comprehensive sustainability reports**, disclosing and certifying both their energy consumption and carbon dioxide footprint.

More than just a noble aim, **transitioning to sustainable practices is now an operational necessity for pharmaceutical firms**. While a green transition may seem daunting to initiate, it's a process that offers profound opportunities for operational cost reductions.

In this white paper, we'll examine the **key production issues** in the pharmaceutical industry, **the sustainable solutions** that companies can pursue, and how **Masco Group Automation (MGA)** can provide an effective technological way forward.



ESG

ENVIRONMENT
SOCIAL
GOVERNANCE



AI



AI

AI



Profit



Understanding the environmental challenges

Manufacturing in general tends to be resource-intensive. However, the pharmaceutical industry in particular faces a number of distinct manufacturing challenges.

High energy consumption

Pharmaceutical production requires significant amounts of energy for chemical synthesis, purification, sterilization, and maintaining controlled environments. A reliance on fossil fuels in this operational environment is a recipe for substantial greenhouse gas emissions.



Water, waste, and pollution

The industry uses vast quantities of water as a solvent, reagent, and for cleaning processes. Inefficient water management leads to increased levels of waste, heightening operational expenses. Further to this, discharging untreated wastewater containing pharmaceutical substances can severely damage aquatic ecosystems and pose risks to human health.



Resource depletion and supply chain vulnerabilities

The industry's reliance on non-renewable raw materials derived from fossil fuels creates vulnerabilities in the supply chain and can expose manufacturers to dramatic price fluctuations.





The levers for sustainable pharmaceutical

The route toward a more sustainable pharmaceutical industry is a multi-faceted one that involves the **adoption of both innovative strategies and cutting-edge technologies**.

Companies today can access a wide range of digital solutions that enhance sustainability across every phase of the value chain — from engineering and design to manufacturing and servicing.

These technologies offer the in-depth process understanding necessary to identify and implement more environmentally friendly production methods, driving heightened efficiency and sustainability across the complete manufacturing lifecycle.

Browse the following pages to **discover cutting-edge solutions** designed to tackle manufacturing issues that not only have significant ecological impacts, but also lead to substantial operational costs and potential regulatory risks — all of which can undermine long-term viability and profitability for pharmaceutical companies.

Optimizing production processes

At the core of sustainable operations lies process optimization. The **use of model-based methods** is widely considered the future of pharmaceutical process optimization, garnering major support from academic, industrial, and regulatory organizations.

Through the careful analysis and refinement of existing production methods, significant reductions in energy and water consumption, as well as waste generation, can be achieved, with ongoing efforts in the field yielding tangible results.

Our AI Optimizer and DigiTwin deliver real-time data, and predictive analytics needed to identify and implement vital improvements in areas such as Statistical Process Control (SPC), Design of Experiments (DOE), and simulation and modeling.



Download the brochure →

Efficient **resource management** and circularity

The strategic **use of advanced energy and water management systems** — along with **circular practices** like the recovery and reuse of solvents and reagents — is reducing waste and maximizing resource use.

To help companies implement these circular strategies, platforms like MGA's **MascoDash** transform complex data into clear, actionable insights that help close resource loops and reduce environmental impact, while delivering major cost savings in the process.

These strategies are not just theoretical — they are already delivering **real-world results**. The **circular economy principles** at play here have been used to great effect across the industry.



Learn more on our website →

Download the brochure →

Transparency and reporting

Accurately **measuring and openly communicating environmental performance**, establishing ambitious targets for impact reduction, and **carefully monitoring** progress are key parts of the sustainability equation.

MGA's [MascoBright](#) solution offers a dynamic and comprehensive platform that moves beyond basic reporting by delivering customized insights precisely when needed. The platform transforms raw data into actionable intelligence for smarter, faster decision-making, maintaining GMP compliance, and building stakeholder trust.



[Learn more on our website](#) →

[Download the brochure](#) →

The benefits of sustainability

Beyond environmental responsibility, sustainable pharmaceutical production unlocks a multitude of compelling advantages for forward-thinking firms.



Major cost reductions

Energy efficiency, waste reduction, and lower raw material consumption translate directly into substantial long-term financial savings.



Heightened innovation and competitiveness

The drive for sustainability fuels research and development in cleaner technologies and processes, promoting innovation and sharpening a company's competitive edge.



Improved reputation and brand value

Demonstrating a strong commitment to environmental sustainability vastly improves a company's public image, builds trust with patients and stakeholders, and strengthens brand loyalty.



Attracting and retaining top talent

As more young professionals care about social and environmental issues, using green processes helps companies attract and keep top talent.



Proactive regulatory compliance

Adopting sustainable practices early ensures compliance with shifting environmental regulations, reduces the risk of penalties, and delivers smoother market access.

Open up to greener pharmaceutical production.

Contact us now!

To find out more about MGA and how our technologies can improve your pharmaceutical company's sustainability and performance, you can contact us [here](#).



MGA S.r.l.
Viale delle Industrie 14 20049
Settala (Milan) Italy

Phone: +39 02 9508061
Mail: info.mga@mgautomation.com



MGA - Masco Group Automation