

Green prescriptions: how a pharmaceutical company in the Italian Alps is tackling decarbonisation

The pharmaceutical sector, one of Europe's most energy-intensive industries, is under increasing pressure due to rising energy costs and the need for decarbonisation. A pilot project in the Italian Alps now promises innovative solutions to cut the industry's environmental footprint by integrating renewable energy and advanced technologies.



Europe's energy-intensive industries—like steel, cement, chemicals, or paper—are at a crossroads. These sectors once drove Europe's post-war recovery and industrial growth, cementing the region's position as a global economic powerhouse. But today, **soaring energy costs threaten their competitiveness**, squeezing profit margins and compelling companies to rethink their production strategies in a bid to **preserve their place in the global marketplace**.

Meanwhile, the **European Green Deal's goal of [net zero by 2050](#)** is pressing member states to implement steep cuts in their industrial emissions, something made more urgent by [sudden](#)



[geopolitical shifts](#) which have exposed **Europe's vulnerability to energy price shocks**. "You have the high energy prices and, prospectively, the costs that come with the Emissions Trading System certificate prices. [...] Then you have the high costs of decarbonising industries," explains Philipp Jäger, policy fellow at the [Jacques Delors Center](#). "It's kind of a double challenge."

While energy prices are manageable for most companies, as they typically amount to [2-5%](#) of expenses, they can represent **40-50% of costs for several energy-intensive industries**. This, in turn, inevitably incentivises offshoring to regions with cheaper energy, stoking the well-known spectre of ["deindustrialisation"](#) that haunts Europe's policymakers, especially as countries like China and India impose far fewer emission constraints. For the most part, **Europe's response has been uneven**. Although the EU's early measures in 2022 cushioned the impact of the energy crisis on households and industry, **a long-term strategy is still lacking**.

The term 'energy-intensive' applied to industries is not official, but they are typically identified by comparing energy use to economic value-added, from chemical products to essential metals. As they require massive amounts of energy, it should come as no surprise that they are responsible for up to [14% of Europe's greenhouse gas emissions](#). On paper, these industries collectively represent only around 2% of the EU's GDP output and total employment. However, this is only part of the whole picture, as their indirect impact on Europe's broader manufacturing sector is, in fact, far more significant. **These industries provide crucial raw materials**—such as steel, chemicals, and cement—to key downstream sectors like automotive, construction, and consumer goods. Manufacturing, in turn, accounts for [approximately 15% of the EU's GDP](#). Therefore, **any disruption—whether due to rising costs or offshoring—poses a risk** of destabilising entire supply chains and diminishing Europe's industrial competitiveness. Although cautious, Jäger is not concerned that this may prompt a radical rethinking of the European Green Deal. At least not for now. "Sure, there might be some tweaks now that the European Parliament and the European Commission have a more conservative makeup," he says. "Especially since they may be less eager to foot the bill for decarbonisation. But the Green Deal is already in place, and there's not enough political momentum to tear it down—unless we're talking about specific measures, like the 2035 phase-out of combustion engines. That could end up delayed or watered down. [...] But overall, I'd say **the Green Deal is definitely still alive and kicking**." The question, he speculates, is what will be done to help the European economy achieve those decarbonisation goals, which he still considers an open question.

Several EU-wide initiatives address these challenges through various strategies, often approaching industries not usually known for their high resource demand. And among these, **pharmaceutical manufacturing is probably the most deceptively energy-intensive**. Due to the complex processes involved, such as air handling, temperature control, and chemical synthesis, it requires a lot of resources. **It is also a critical contributor to the European Union's economy**. [In 2022 alone](#), this industry added approximately €311 billion to the EU's economic output, accounting for **6.8% of the total manufacturing**. However, addressing spiralling energy costs puts unprecedented pressure on this sector, and companies are actively exploring ways to redefine sustainable production. A few initiatives have already proven to be quite inventive. Rovereto, a small town in the Italian Alps, is now home to **a pilot project to reduce a local pharmaceutical factory's environmental footprint**. This initiative reflects a broader reality: Italy is one of Europe's leading pharmaceutical manufacturers, with a production value of over [€52 billion](#). The sector is the country's [third-largest export](#) and provides employment to [around 70,000](#) highly skilled and educated workers.



The project in question involves [SUANFARMA Italia S.p.A.](#), a pharmaceutical manufacturing firm based in **Rovereto**, and the [Bruno Kessler Foundation](#) (FBK), a local research centre in Trento. Both entities are involved in the EU-funded consortium **Flexindustries**, which aims to advance efficient and sustainable industrial manufacturing practices. "The goal is to create a flexible, renewable-ready energy system," says Francesco Ghionda, a researcher at FBK's **Sustainable Energy Centre**. The initiative combines renewable energy systems with advanced technologies to demonstrate the feasibility of large-scale decarbonisation.

Central to the project is a **500-kilowatt photovoltaic installation** that offsets a portion of the plant's electricity demand. Additionally, a **megawatt-scale heat pump system**, capable of simultaneously providing heating and cooling, and a **robust battery storage system** that adds flexibility by storing renewable energy—redistributing it as needed to address the intermittency of solar power. "**These solutions are not mere prototypes**. They are designed to operate at a scale that proves their viability for wider adoption," explains Ghionda. "But hardware alone is not enough." **A critical project component is an optimisation algorithm** developed by FBK that evaluates and simulates different energy configurations. In short, these tools model the performance of 13 energy-efficient technologies, assessing their economic and environmental impacts.

"Our software helps us figure out **the best mix of technologies to meet energy needs while keeping costs and carbon emissions in check**," says Ghionda. "We can run scenarios for 2030 and 2050, laying out a practical plan that aligns with Europe's climate goals." **Decarbonisation costs are declining as renewable technologies mature**, but they remain significant. "Decarbonisation today is more expensive than business as usual," Ghionda concedes, "but with falling technology costs, the balance is shifting." For now, the lessons from these projects and initiatives suggest that the future is neither purely solar-powered nor reliant solely on wind turbines. Instead, it may be built on **a complex net of integrated solutions**, including sector coupling and storage, each tailored to the specific demands of its environment. At the end of the day, **flexibility in energy systems is simply the ability to adapt to real-time fluctuations in energy supply and demand**, ensuring stability and efficiency. And as grids integrate higher levels of variable renewable energy sources, solutions like the one in Rovereto become more relevant.

[A recent study](#) by the **Spanish technology centre CIRCE** explored the flexibility mechanisms in seven key industrial sectors. It found that, despite the apparent potential, technical constraints and inconsistent European policies limit the adoption of flexibility measures. The study highlighted the **need for collaborative efforts between policymakers, grid operators, and industrial stakeholders** to unlock the full potential of flexibility. It's not an overstatement to say that Europe's ambitious decarbonisation goals are now hanging by a thread. On paper, the plan detailed in the Green New Deal to reduce as much as 55% of current emissions by 2030, not to mention achieving climate neutrality by 2050, seemed at hand in 2019. Today, not so much. However, if the EU's policymakers and industries can maintain this balance, they might succeed in **turning sustainability from a challenge into a competitive advantage**.

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