CONNECTIVITY

Digitising the glass industry through SCHNEIDER ELECTRIC innovation

SCHNEIDER ELECTRIC is accelerating decarbonisation in the global glass sector by merging electrification, digital transformation and open, software-centric automation. Through integrated power and process systems, real-time data and digital twins, the company delivers efficient, flexible and sustainable solutions that redefine total cost of ownership and long-term furnace performance.

For the company, the glass industry stands at a decisive moment - one where energy transition and digital transformation converge to reshape how plants operate, consume energy and plan for the future. This shift is driven by a simple but powerful philosophy that guides the company worldwide: to empower all to make the most of energy and resources through intelligent, connected and efficient technologies. With more than 150,000 colleagues across over 100 countries, Schneider Electric channels its global expertise into decarbonising sectors that are both energy-intensive and essential to modern life. Glass manufacturing is one of them.

ELECTRIFICATION AS THE NEW FOUNDATION

The company highlights how the transition from fossil fuels to electricity is already reshaping glass melting. High-electric (80 percent) oxyfuel configurations for container production and large full-electric furnaces represent a dramatic shift in the industry's technological landscape. These next-generation systems significantly reduce reliance on combustion, enabling cleaner operation and offering a long-term path to decarbonisation. At the same time, Schneider Electric underlines the need to carefully reassess total cost of ownership, as the operating logic of electric furnaces introduces new patterns of investment, maintenance and energy management. To support this transition, the company provides a complete electrical backbone designed specifically for large-scale industrial performance. From XLPE cables under 1000 V and fully-equipped transformer rooms to Okken, SM AirSeT and Trihal MV/LV

Schneider Electric smart factories
Based on our own philosophy

Le Vaudreuil facility in France

- Recognized as "sustainability lighthouse" by the World Economic Forum

- 32% lower energy use

- 11% less maintenance costs

- 7% increase in productivity

- It is fun to work here => 43% more unsolicited applications!

Solutions with ROI < 2 years :

- Augmented Reality
- Predictive maintenance
- Robots & AGV
- MES performance & quality
- Non-intrusive sensors
- Cyber-security IT server

solutions, every element of the power chain is engineered to deliver stability, protection and efficiency. Combined with Masterpact MTZ circuit breakers and a power controller integrating smart power control software, these solutions form the essential infrastructure needed for high-electric furnace operation.

LEARNING FROM THE SMART FACTORY MODEL

Schneider Electric's own smart factories demonstrate the measurable impact of digital transformation. The company's facility in Le Vaudreuil, France -recognised as a sustainability lighthouse by the World Economic Forum- has achieved a 32 percent reduction in energy use, an 11 percent drop in maintenance costs

and a 7 percent increase in productivity. The transformation even improved staff engagement, generating 43 percent more unsolicited job applications. These results reinforce a compelling message: digitalisation does not simply optimise performance; it improves the human experience within the factory.

A UNIFIED, OPEN SOFTWARE-CENTRIC AUTOMATION APPROACH

Central to the company's vision is open, software-centric automation built on the IEC 61499 standard. Unlike rigid systems tied to proprietary hardware, this architecture allows software to operate independently of the physical device on which it runs. The result is a flexible, distributed
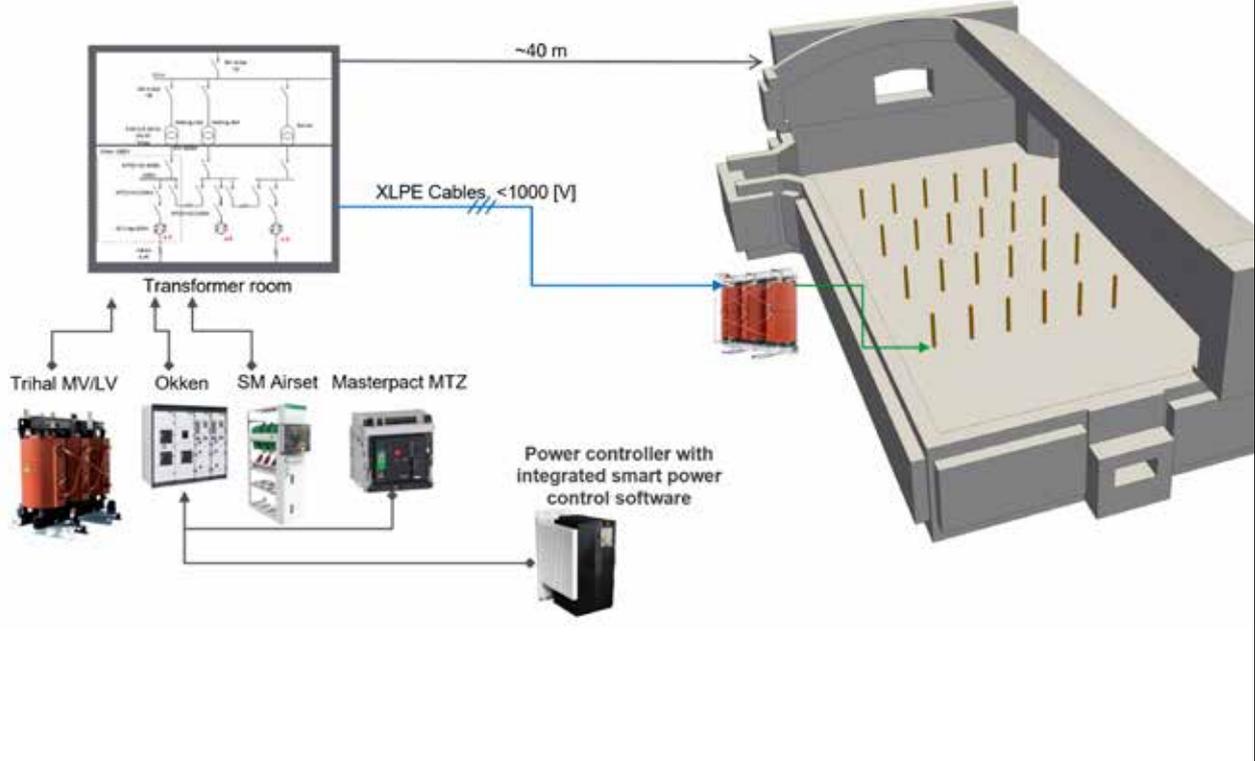
environment where orchestration becomes more powerful, integration becomes simpler and systems communicate through a common language. For glass manufacturers, whose operations depend on long furnace lifecycles and continuous process integrity, this approach provides a future-proof path. Plants gain the ability to evolve over time, integrate advanced control schemes, embed new digital services and scale without the limitations of conventional automation frameworks.

DIGITAL TRANSFORMATION: CONNECTING POWER, PROCESS AND INTELLIGENCE

Electrification is only the first step. Schneider Electric emphasises that true decar-

1. Electric Power solution

~40 m

XLPE Cables, <1000 [V]

Transformer room

Trihal MV/LV Okken SM Airset Masterpact MTZ

Power controller with integrated smart power control software

2. Digital transformation

Connect all systems, Power and Process
- Open Software Centric Automation

Use digital twins
- For Power and Process

Collect, analyze and use data (PI)
- Present information clear and easy for decision makers

bonisation requires the fusion of power and process systems into a single digital ecosystem. That means connecting every asset -from electrical equipment to production machinery- and using digital twins to simulate, predict and optimise performance. Data becomes the driving force behind operational excellence. By collecting, analysing and contextualising information through platforms such as PI, decision-makers gain a clear, accessible view of the plant's behaviour. Whether monitoring energy consumption, anticipating maintenance needs, or assessing furnace stability, digital intelligence ensures that complex information becomes actionable insight. The aim is not just transparency but clarity - empowering teams to make decisions faster and with greater confidence.

A HOLISTIC PATHWAY TO DECARBONISED GLASS MANUFACTURING

The presentation lays out a vision in which the glass factory of the future is both electrically powered and digitally orchestrated. Augmented reality, predictive maintenance, robots and AGVs, non-intrusive sensors, cybersecurity and MES performance tools all contribute to a highly connected operational model. Each innovation reinforces the others, creating a dynamic environment where energy is conserved, downtime is minimised and productivity is optimised. Schneider Electric's integrated approach ensures that sustainability does not compromise performance. Rather, electrified melting, digital twins and open automation collectively strengthen operational resilience, supporting stable production even as plants transition to greener energy sources. In doing so, the company helps manufacturers move confidently toward ambitious decarbonisation goals while laying the groundwork for long-term efficiency gains.

THE CONNECTED FURNACE ERA

At a time when the glass industry faces increasing pressure to reduce emissions, enhance efficiency and prepare for regulatory shifts, the company offers a cohesive strategy that links today's industrial realities with tomorrow's sustainability expectations. Its technologies reimagine the furnace not as an isolated asset but as the core of a fully integrated energy and data ecosystem. By combining electrification, digitalisation and open automation, Schneider Electric positions itself as a catalyst for industry transformation - one capable of guiding glass manufacturers into a more efficient, intelligent and decarbonised future. ∎