

FACTORY AUTOMATION

Customer Reference

HOLCIM builds sustainability and slashes energy costs with regenerative drive technology

How Mitsubishi Electric's with DWI Motion energy recovery technology transformed vertical transport into a source of clean energy for concrete production

Key points

- **Energy recovery:** Saves 11kWh daily by returning power to the grid during load lowering
- **Enhanced durability:** Smooth torque control eliminates mechanical jerks and extends component life
- **Reduced footprint:** Cuts CO2 emissions by around one tonne

Holcim, a global leader in innovative and sustainable building solutions, is committed to decarbonising the entire construction lifecycle. When the company sought to improve the efficiency of its concrete production facilities, it looked to modernise the electric drive applications responsible for vertical movement. By integrating Mitsubishi Electric's FR-A800 series inverters and FR-XC regenerative modules, Holcim transformed an energy-intensive process into a highly efficient, cost-saving operation, achieving significant reductions in both energy consumption and mechanical wear.

The Challenge: Concrete production is a process where rhythm and repeatability are paramount. At Holcim's plants, raw material transport trolleys are critical components, moving loads of up to 5 tonnes cyclically along steep ramps. Before modernisation, these systems faced three primary challenges. Firstly, the "hard" start-up and braking methods caused severe mechanical jerking, leading to frequent failures of brakes and 6 mechanical components. Secondly, the braking method (using counter-current) was inefficient; the 18kW motors actually consumed full power even while lowering loads. Finally, these abrupt operations caused current surges that degraded the power supply quality for other equipment across the facility.

The Solution: To address these inefficiencies, Holcim partnered with system integrator DWI Motion to implement a solution based on Mitsubishi Electric drive technology. The heart of the upgrade involved replacing traditional starters with the FR-A800E series inverter paired with an FR-XC regenerative module.



The modernisation centres on the synergy between these two components. The FR-A800E provides the high-performance vector control required to manage heavy loads on an incline, eliminating the shocks that previously plagued the system. When the trolley moves downwards, the FR-XC module manages the regenerative energy, synchronising it with the mains supply to ensure high-quality power is returned to the grid. This "active" approach to braking not only eliminates the need for bulky brake resistors but also ensures that the drive system operates at peak efficiency throughout the entire duty cycle.

The Results: The impact of the implementation was immediate and measurable. By transitioning to controlled steering and energy recovery, Holcim achieved a saving of 11kWh per day for a single drive unit. This translates to over 3MWh of saved energy annually and a reduction of approximately one tonne of CO2 emissions. Beyond energy savings, the smoother operation has significantly extended the lifespan of mechanical elements, reducing maintenance costs and preventing production downtime. With hundreds of similar drives operating across Holcim's Polish facilities alone, the potential for scalable savings and Scope 2 emission reductions is immense.



Why it matters: Standardising on a single drive platform allowed Holcim and DWI Motion to streamline the control cabinet design. The

integration of the regenerative module reduced the thermal load within the cabinet, as energy is no longer dissipated as heat. Furthermore, the use of intelligent inverters simplified the monitoring of KPIs; plant managers can now access real-time data on energy recovery and system health via HMIs, allowing for predictive maintenance and more accurate reporting on sustainability targets.

For Holcim, these performance improvements translate directly into enhanced production competitiveness. More reliable material feeding ensures a consistent production rhythm, while the reduction in energy waste lowers the overall cost per cubic metre of concrete produced. "This type of modernisation makes great sense because it is scalable," explains Wojtek Bracha. "One drive is one saving, but when similar systems work across many facilities, the effects for energy, costs, and emissions become truly noticeable." With hundreds of similar drives operating across Holcim's Polish facilities alone, the potential for scalable savings and Scope 2 emission reductions is immense.

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