

PERFORMANCE

Continuous improvement energy strategies
for world-class cement innovator

World leader in building materials reduces CO₂
and achieves ROI in two years.

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Following a comprehensive energy assessment, Lafarge implemented powerful site-wide energy management tool to optimize efficiencies and investment

Founded in 1833, Lafarge boasts a proud history as a world leader in building materials, with top-ranking positions in the cement, aggregates and concrete sectors. Headquartered in Paris and reporting sales of 15.8 billion Euros in 2012, the group has a presence in 64 countries with over 65,000 employees around the world.

In 1994, Lafarge commenced operations in China, building its presence with site expansions and numerous joint ventures. One such venture is Lafarge-ShuiOn, established in 2005 between Lafarge and the Hong Kong based ShuiOn Building Material Group. With a production capacity of 30 million tonnes (2011), 20 cement plants and over 8,000 employees, the group is a leader within the cement sector of the southwest region of China. Its Dujiangyan cement plant is a model plant for Lafarge, housing three cement lines with a production capacity of over 5 million metric tons per annum.

Customer objectives

With rising energy costs, accounting for approximately 70% of production expenditure, Lafarge's primary objective included realizing reductions in energy consumption levels and costs. In addition, they were faced with increased government regulations, reporting mandates and environmental pressures and concerns.

Operationally, the Dujiangyan plant struggled with limited process measurement tools, proving it challenging to identify energy saving opportunities and continuous improvement strategies. With idle equipment, such as large air compressors and numerous conveyor belts left running, power supply costs were rising.

Economic constraints limited CAPEX availability to make significant improvements, which drove them to look at their operational processes to achieve efficiency and financial gains.

Customer benefits

Vital to the success of Dujiangyan project's deployment was the step-wise approach undertaken, the close collaboration with the customer throughout all stages of the process, as well as the in-depth training delivered by Schneider Electric to Lafarge stakeholders.

Goal

Struggling with limited process measurement tools, making it difficult to identify energy saving opportunities and continuous improvement strategies, Lafarge needed an overall energy optimization plan

Story

With rising energy costs, accounting for approximately 70% of production expenditure, plus increased government regulations at their Dujiangyan, China plant, Lafarge's primary objective was to find solutions to reducing energy consumption levels and costs

Solution

Schneider Electric's Energy Optimization solution

Results

Overall, Schneider Electric's Energy Optimization for Cement Production solution provided a host of benefits for Lafarge including:

- Reductions in energy costs directly reducing CAPEX
- Increased process visibility and reporting metrics
- Secure, scalable and flexible operation improvements
- Reduced power consumption by 0.8kWh/t.cement
- Reduced production cost and CO₂ emissions

Additionally, project key success factors included:

- Detailed and comprehensive site audit and energy assessment audit carried out
- Complete energy management solution, integrating process, and energy information for use from the operator level to the enterprise level
- A solution that both reduces energy consumption as well as energy costs
- Energy assessment tools vital in the provision of regulatory data and ongoing cost effectiveness
- Customizable system functions — such as kiln coach report
- In-depth segment (cement) process and application knowledge
- Specific process improvements — i.e., air compressor optimization
- Remote access for ease of technical support and energy analysis
- Onsite service and support carried out by Schneider Electric energy consultant
- Collaboration and shared objectives between Lafarge and Schneider Electric project team

Powerful site-wide energy management tool optimizes efficiencies and investment

A number of specific energy conservation measures were selected for the project including:

- Kiln operation optimization
- Monitoring clinker over-burning and over-cooling
- Improvements in the cement finish grinding operation
- Maximizing efficiencies in the operating hours within cement mills
- Air compressor optimization, with a centralized control system avoiding idle running of air compressors
- Enhancements in crew performance with “Kiln Coach Report” which evaluates operator KPIs (production, quality, SPC/SHC) as well as the introduction of the “best operator of the month” program

In addition to a timely return on investment, with a project payback period of two years, Lafarge also realized valuable energy improvements by reducing power consumption by 0.8kWh/t.cement. As a result, production cost and CO₂ emissions have been reduced.

Remote access of the system also facilitated technical support when required, as well as access for ongoing energy analysis consulting and support.

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Solution overview

With all onsite automation and electrical distribution systems provided by Schneider Electric, a collaborative improvement project was designed and implemented over a six-month period. Commencing with a detailed business and process analysis, the project included a comprehensive energy assessment, plus site audit across all installed base operations. Additionally, a Schneider Electric power monitoring system had been installed onsite in 2009 as part of the group's commitment to energy optimization and improvement.

The project implementation included:

- **Customer workshop** Collaborative onsite workshop with plant management team, with a focus on optimizing energy performance by avoiding excess power consumption and inefficiencies
- **Business and process analysis**
 - Review and understanding of customer's energy optimization goals and needs
 - Assessment of plant operations and shift management, variances
 - Comparison of cement plant energy consumption versus worldwide industry benchmarks

Operationally, the plant struggled with limited process measurement tools, proving it challenging to identify energy saving opportunities.

- **Site assessments**

- Site-wide review of operational processes in formulating potential savings assessment
- Installed base assessment in defining the energy performance system criteria

- **Energy performance system implementation and commissioning**

- **Data analysis services**

- Energy performance system data analysis
- On-site investigation of processing and management data
- Recommendations and action plan

- **Selected recommendations: implementation and measurement and verification of savings**

- Collaborative work on selected recommendations implementation
- Measurement and verification of savings
- Approbation with the signature of savings achieved

In response to the above detailed assessment and analysis findings, the project deployment involved the installation of a customized energy performance system, comprising an optimized metering and communication architecture, as well a plant-wide data management system.

Designed to maximize installations with both Schneider Electric and third-party equipment, the new architecture's open and flexible attributes allow for future expansion and additional installations, while processing and transmitting the plant's energy data at high speed.



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Innovation At Every Level

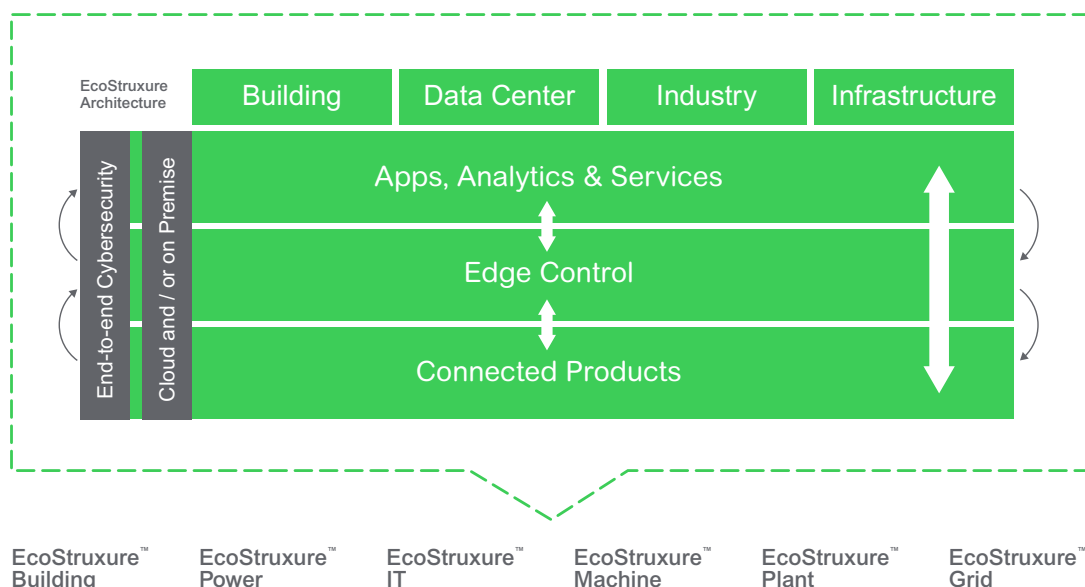
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