

Life Is On

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Energy Performance for Cement Manufacturers

Technical description



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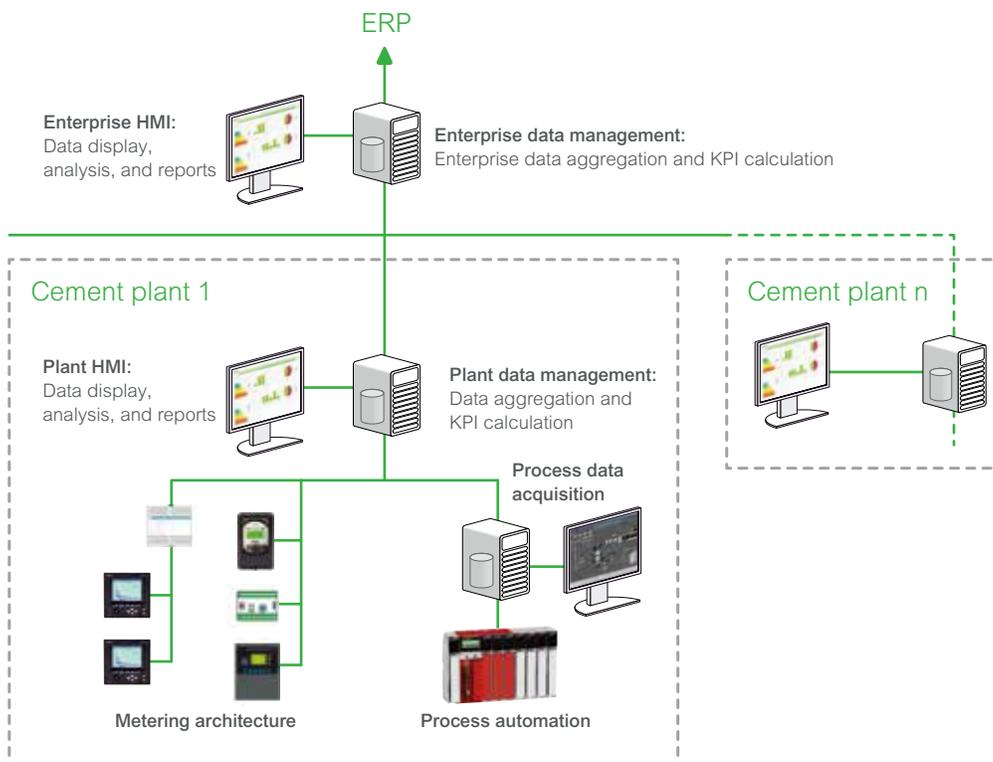
Energy Performance™ for Cement Manufacturers is a solution that helps you efficiently manage your energy consumption, energy costs, and CO₂ emissions, all in a production context that helps optimize efficiency and profitability.

The solution provides a complete Web-based, thin-client, multiuser energy information system. It delivers comprehensive dashboard and reporting features that aggregate energy (electricity and thermal), production (raw meal, clinker, cement), and environmental (carbon footprinting and emissions) data into meaningful cement key performance indicators (KPIs) to help improve performance at every level.

Virtually every stakeholder in the plant can benefit: energy managers, energy efficiency managers, financial managers, plant managers, process/production supervisors, operators, and maintenance staff. In addition, it can be used to better explain the energy efficiency challenge to internal users, government agencies, customers, and other visitors to demonstrate how the company is delivering on its sustainability objectives.

Supporting open communication standards and third-party data import and export (e.g., ERP systems), it's an engineered, affordable solution that is simple to implement and operate and evolves with your needs. Energy Performance for Cement Manufacturers is available in six languages, as well as multiple units of measure (t/h, kWh/t, MJ/t, etc.) and currencies (€/MWh, \$, RMB/t cement for power, etc.).

Overview of an energy optimization system, from single site to the entire enterprise.



General features

Energy Performance for Cement Manufacturers help industry executives:

Monitor and analyze energy consumption in the production context

- Consolidate global energy performance
- Consolidate energy costs by countries, categories, and/or by plants
- Benchmark performances (plant, workshops, loads) based on energy consumption per ton
- Alarming when certain KPIs exceed the limits
- Follow electrical and power quality indicators

Improve process performance and operator skills

- Schedule production to reduce operational costs (peak/valley hour management)
- A tool to avoid idle running
- Kiln coach report to improve operator responsibility

- Operator optimization tool box to improve skill
- Three-level root cause analysis for overconsumption (kWh/t or MJ/t)

Support energy procurement

- Benchmark performances (plant, workshops, loads) based on energy consumption per ton
- Understand and check electricity bill
- Allocate energy consumptions and costs
- Compare energy consumptions with tariff schedule
- Follow power factor to minimize energy penalties

Change management

- Set performance targets
- Produce environmental reports and benchmarks

Key performance indicators

The sole aim of Energy Performance for Cement Manufacturers is to meet your real energy management needs and investment capacity — no more, no less.

Energy Performance calculates all KPIs to hourly, daily, weekly, monthly, and yearly. It aggregates all KPIs hierarchically from workshop to line, plant, business unit, and enterprise with weighted averages. It aggregates all KPIs per shift (e.g., morning, day, night) and per crew (e.g., 311, 312, 313 for line 1 kiln operators).

Plant level KPIs

- Clinker production(t/h), cement production(t/h)
- Specific power consumption (SPC) for clinker (kWh/t.clinker)
- SPC for finish grinding (kWh/t.cement)
- Specific heat consumption (SHC) for clinker (MJ/t.clinker)
- C/K ratio: Cement to clinker ratio
- Actual power use price: €/MWh
- WHR power generation per ton of clinker: kWh/t.clinker
- CO₂ emissions per ton of cement produced: t. CO₂/t.clinker; t. CO₂/t.cement

Line level KPIs

- Same as plant level KPIs but by lines

Workshop level KPIs

- Production of the workshop: t/h
- Power consumption of each workshop
- SPC for each workshop (e.g., kWh/t.coal, kWh/t.raw meal)

Key equipment KPIs (for optimization tool box)

- SPC for each key equipment (e.g., kWh/t.clinker on ID Fan, on cooler fan, on kiln main drive, on air compressors, etc.)

Crew performance KPIs (for better responsibility)

- Shift production (t/shift)
- SPC for clinker (e.g., kWh/t.clinker)
- SHC for clinker (MJ/t.clinker) f-CaO qualified rate

Energy data acquisition

The scalable architecture is designed to maximize your investment and optimize your installed metering resources so that they perform to their full potential.

Process data acquisition

Energy Performance integrates with your automation systems using one of the following automation system connectors:

- OPC-xx — The OPC-xx connectors (DA, HDA, and AE) support the acquisition of data from any OPC server that implements the mandatory feature set of these standards for the supported versions.
- StruxureWare™ SCADA Expert Vijeo™ Citect — The connector supports the acquisition of data from CitectSCADA v5.42 or later. CitectSCADA v7 added server-clustering technology to its features.
- PI — The PI connector supports the acquisition of data from OSIsoft's PI System product. The OSI PI System is a historian with visualization capabilities.
- InSQL — The InSQL connector supports the acquisition of data from a Wonderware Historian 9.0, formerly called the IndustrialSQL Server.



Energy Analyst

Energy Analyst is a feature-rich configurable tool that provides high-level summary displays with full drill-down capabilities to the raw data beneath. This facilitates root-cause analysis as well as assisting in the identification of performance improvement opportunities.



Data visualization

Energy Performance delivers Web-enabled dynamic dashboards that provide configurable profiles and secured access to the energy database, and visualizes data for at-a-glance understanding. Services can be made available throughout your intranet or mobile equipment (iPhone/iPad).

With advanced data visualization services, the dashboards are easy to use with an intuitive interface, requiring an introduction of less than an hour before users are able to create and customize their own dashboards. Users can create as many dashboards as needed by inserting energy optimization gadgets.

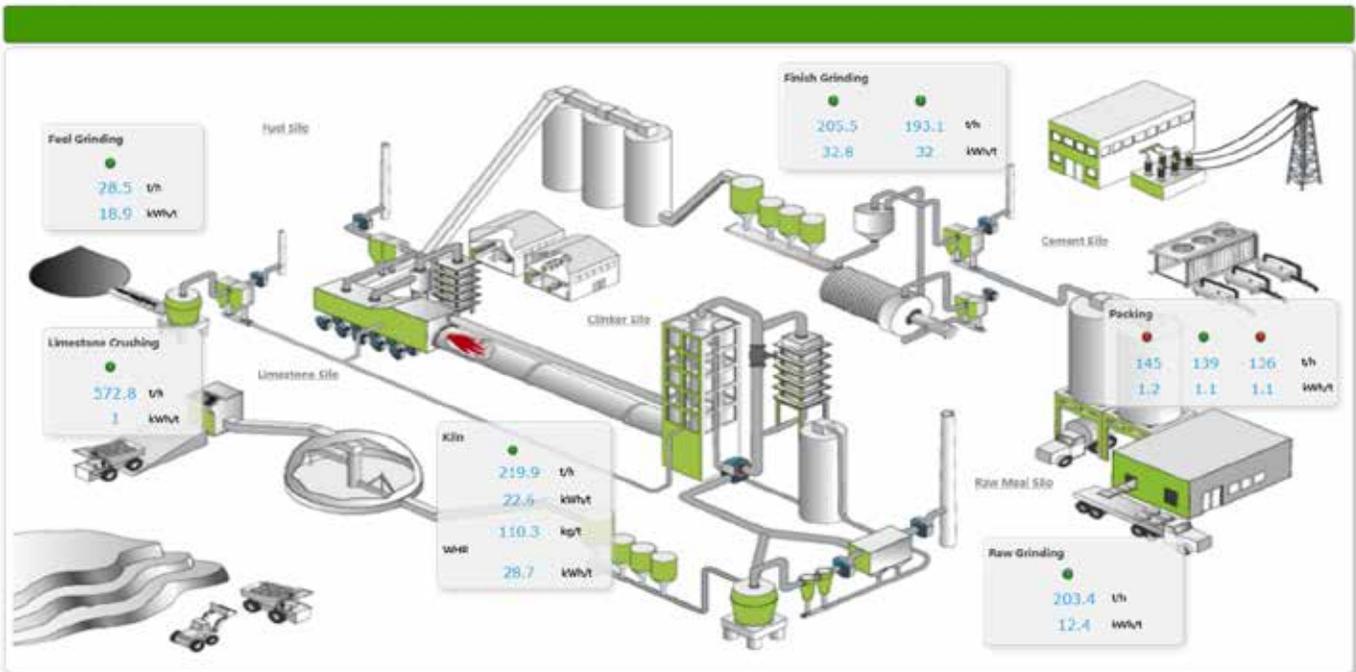


All gadgets allow:

- Selection of any calculated KPI
- Time aggregation analysis (from hourly to yearly)
- Date selection
- Min/max of each KPI

Some sample gadget usage scenarios

- **Gauge:** Measure the total plant energy cost (electricity and fuel) to produce one ton of cement hourly
- **Bar chart:** Trend of the total electrical consumption of three plants per week and compare to a static target
- **Pie chart:** Analyze the fuel consumption breakdown (fossil, biomass, alternative) monthly
- **Comparison bar chart:** Monitor the cement mill usage per hour over the last seven days
- **Export:** Export in CSV format to your desktop hard drive the energy efficiency of the four plant production lines per hour over the past week



Security

Embedded security allows administrators to specify who can gain access to the system and which operations they can perform. Security implementation within Energy Performance for Cement Manufacturers uses role-based security. The role-based security model implemented uses Windows® Integrated Security.

Reports

Energy Performance delivers data-based reports on differing sources of data (raw or KPIs). Sample reports are provided to start with, and can be extended with your own reports.

Reports can automatically be generated upon capture conditions (e.g., at the end of a shift, of a week, etc.) or triggered on request.

Scalability

Energy Performance has been designed and tested for:

- Up to 30 concurrent users on a given plant
- Up to 9 production lines per plant
- Up to 200 cement plants per company

Energy Performance can be expanded to more advanced energy and automation features, for example air compressor system optimization, load shedding, etc.

Remote access

Energy Performance provides remote access for easy and cost-efficient support (process parameters and energy KPIs).

Customer benefits

- Reduce CO₂ emissions to comply with government regulations and industry emissions guidelines, and to protect the environment
- Optimize OPEX to mitigate rising energy costs
- Control supply chain to maximize production efficiency and continuous improvement
- Monitor and improve energy consumption to reduce cost per ton
- Increase production effectiveness to improve sustainability and competitiveness
- Real-time information for decision-making and continuous improvement
- Improve your operation schedule by optimizing energy consumption and cost
- Increase your competitiveness and sustainability

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