

The Energy Landscape

CEMENT MANUFACTURING

Using Data Insights and Predictive
Forecasting to support cement
Plant Energy Management

Reducing Electrical Costs in Cement Manufacturing

**Case study based on 1200 ktonne per year cement plant
with 15 MW load**

Reducing electricity costs in cement manufacturing is pivotal due to its direct influence on profitability, given that electricity can form a major chunk of operational expenses.

Additionally, by implementing energy-efficient technologies and optimizing production processes, manufacturers can significantly reduce their electricity consumption, leading to cost savings and improved profitability. As the industry faces increasing pressure to reduce its carbon footprint and comply with stringent environmental regulations lowering electricity usage contributes to more sustainable operations. Therefore, focusing on reducing electricity costs not only makes economic sense but also aligns with global sustainability goals, enhancing the long-term viability of cement manufacturing enterprises.

1 Site Infrastructure

PEAK LOAD: 2 MW

20%
PEAK LOAD
REDUCTION

Strategies:

- Manual or automated scheduling of interruptible processes
- Improve compressed air management

PWRStream helps cement plants cut electricity costs through peak shaving, load shifting, power quality enhancement, renewable integration, demand response, operational efficiency, and backup support.



Raw Material Mill

PEAK LOAD: 3.5 MW

Up to 3 hours

100%
PEAK LOAD
REDUCTION

Strategies:

- Manual or automated scheduling of interruptible processes
- Utilize equipment with variable speed drive
- Improve compressed air management

Reducing electricity costs in a raw material mill involves adopting efficient grinding methods, optimizing mill operations, and use process controls and waste heat recovery.

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Kiln & Clinker Production

PEAK LOAD: 3.3 MW

10%
PEAK LOAD
REDUCTION

Strategies:

- Utilize equipment with variable speed drive
- Improve compressed air management



Cement Mill

**PEAK LOAD REDUCTION:
6.2 MW**

Up to 3 hours

100%
PEAK LOAD
REDUCTION



Strategies:

- Manual or automated scheduling of interruptible processes
- Utilize equipment with variable speed drive
- Improve compressed air management

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Predictive Analytics & Demand Response

Predictive Analytics:

Leveraging algorithms and ML:

- Predictive analytics in cement manufacturing leverages data-driven algorithms and machine learning to discern patterns and forecast future electricity consumption outcomes. This approach aids in forecasting energy demand, optimizing equipment performance, pinpointing inefficiencies, and integrating renewable energy sources effectively.

Energy Storage Solutions:

- By integrating PWRStream's advanced energy storage solutions, cement manufacturers can effectively respond to predictive insights by storing energy during off-peak times and using it during high-demand periods.

Demand Response Integration:

Responding to time-based Demands:

Demand Response Integration enables cement manufacturing plants to adjust or reduce their electricity consumption during peak demand times in response to time-based rates or financial incentives. This strategy aids in decreasing charges during peak times, capitalizing on negotiated rates from utilities, and provides operational flexibility.

By scheduling energy-intensive tasks during off-peak times and integrating with energy storage systems, cement plants can ensure uninterrupted operations while participating in DR programs.

Key Financial Responses:

Additionally, these efforts contribute to the stability and reliability of the electric grid, offer access to lower electricity rates, and promote environmental sustainability by reducing the need for high-emission “peaker” power plants.



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