Building materials / QM-05

Advanced control of mills and raw mix

Plants worldwide use APC systems to reduce electricity consumption in cement and raw mills.

Every kWh ends up in the cost per tonne.

Advanced process control (APC) stabilises the mill and the raw mix. Such systems run on hundreds of lines worldwide, but they require accurate measurement and a data history.

Conceptual architecture. No operating results are shown.

01 Measurement	Mill meter · Scale / feeder · Laboratory
02 Linking	Shift · Product type · Stoppage
03 Baseline	kWh/t · Best shift · Gap
04 Next step	APC partner · Production cost · Report

At a glance

200+ — Cement lines using Expert Optimizer, according to ABB. [1]

Up to 3.8% — FLSmidth case study: energy reduction on the raw mill at the Çimentaş İzmir plant. [3]

Up to 5% — ABB brochure: reduction in electricity consumption (vendor claim). [2]

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01 Evidence and context

Who it is for

CEO	Electricity cost.
Chief Technologist	Fineness and quality.
Chief Power Engineer	kWh/t.
Mill Supervisor	Operating mode and stoppages.

Facts and global practice

ABB

ABB Expert Optimizer has been deployed on more than 200 cement production lines. [1]

ABB

ABB brochure: production up to 5% higher, fuel and electricity consumption up to 5% lower. [2]

FLSmidth / Pacpro

At the Çimentaş İzmir plant, FLSmidth ECS/ProcessExpert reduced raw mill energy consumption by up to 3.8%. [3]

ABB

CRH Group implemented Expert Optimizer at five plants in Western Europe, then at the Ozarow plant. [4]

Modernisation programme

An energy audit was carried out at 34 large building-materials enterprises in Uzbekistan, accounting for approximately 65% of the sector's electricity consumption. [5]

APC vendors present results based on their own customers' cases. A plant in Uzbekistan must first measure its own baseline.

02 Where the losses occur

Shared meter

Mill consumption is not metered separately.

Fineness data lags

Laboratory results arrive hours late.

Stoppages

Causes of minor stoppages are not recorded.

No baseline

There is no reference point against which to compare improvements.

How the loss is calculated

Electricity	(actual kWh/t – best-shift kWh/t) × tonnes produced in the period × tariff per kWh
Downtime	downtime hours × output per hour (t/h) × margin per tonne
Over-grinding	share of over-grinding × grinding electricity cost for the same period (kWh × tariff per kWh)
Rework	off-spec tonnes × production cost per tonne

Illustrative calculations; establish the baseline, units and rates during the site assessment. Avoid counting the same loss twice.

03 Solution architecture

Measure first, then optimise

MEENTAKA links electricity, production and laboratory data for each mill and builds a baseline. The APC system is implemented by a specialised vendor.

01 Measurement

Mill meter · Scale / feeder · Laboratory

02 Linking

Shift · Product type · Stoppage

03 Baseline

kWh/t · Best shift · Gap

04 Next step

APC partner · Production cost · Report

Modules

Electricity metering per mill	Meters (via partner)	Engineering capability
Linking by shift and product	Production accounting	Engineering capability
Baseline report	Gap versus best shift	Engineering capability
Integration with APC partner	Data transfer	In development

Each module has a readiness status. Third-party results are not a forecast for your site.

04 Implementation and measurement

01 Measurement audit

Meters and feeders.

Output: measurement map.

02 Baseline

60 days of data.

Output: kWh/t and gaps.

03 Pilot with partner

APC vendor trial.

Output: measurable result.

04 Subscription

Monthly report.

Output: consumption trend.

What is measured

Electricity consumption	kWh/t	Meter
Shift-to-shift gap	Best and average	System
Stoppages	Hours and cause	Log
Fineness	Laboratory result	Laboratory

What is needed to start

- Chief Power Engineer
- List of mills
- Laboratory log
- Production report

05 Readiness checklist and next step

01 Is consumption of each mill metered separately?	Yes / No / Unknown
02 Is kWh/t calculated for every shift?	Yes / No / Unknown
03 Is the best shift known?	Yes / No / Unknown
04 Is the turnaround time for fineness results known?	Yes / No / Unknown
05 Are stoppages recorded with their causes?	Yes / No / Unknown
06 Are feeders calibrated?	Yes / No / Unknown
07 Is there a baseline?	Yes / No / Unknown
08 Has there been a discussion with an APC vendor?	Yes / No / Unknown
09 Are electricity tariff changes visible in production cost?	Yes / No / Unknown
10 Is there a responsible person?	Yes / No / Unknown

What we do not promise

• Fixed timelines and prices without an audit

• Commodity exchange rules and government decisions

• Repair of plant equipment

• Unmeasured results or savings

• Replicating results announced by vendors

Mill audit

We establish measurement and a baseline for each mill and show readiness for APC.

• Baseline

• Pilot plan with a partner

• Implementation fee and monthly subscription

Scope, price and schedule are agreed after reviewing the site and its data.

06 Sources and scope

[1] ABB: «Advanced process control with cpmPlus Expert Optimizer» (more than 200 cement lines). library.e.abb.com.

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[2] ABB Ability Expert Optimizer for cement, brochure (ABB, 2019). Via manuals.plus.

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[3] FLSmidth / Pacpro: «Advanced Process Control Implementation at Çimentaş İzmir», case study, 2022.

[4] ABB: «Expert Optimizer for energy efficiency at CRH Ozarow cement plant». new.abb.com.

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[5] Meeting on the modernisation programme for building-materials enterprises. anhor.uz, 2026.

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