KBC

A Yokogawa Company

CASE STUDY



# Digital Energy Management Delivers Fourfold Increase in Energy Savings

Real-time energy performance and insights identify energy savings

## Benefits

- Energy savings of 12% of the site energy bill.
- Payback period of less than one year.

## Background

- South African oil refinery seeking to reduce energy costs and emissions.

## KBC Solution

- Implementation of a Digital Energy Management System (DEMS) integrated with site monitoring systems.
- DEMS established as the backbone of the site's energy management strategy to ensure that expected energy saving benefits are realized and sustained.

## Challenge

KBC conducted a Strategic Energy Review for a major South African oil refinery. One of the key recommendations was to implement a Digital Energy Management System (DEMS) to continuously monitor and manage energy performance across the site.

Preliminary analysis indicated that the refinery could potentially reduce its site energy bill by at least 3%, representing savings of several million dollars annually. However, realizing and sustaining these savings required a structured, data-driven approach to energy management.

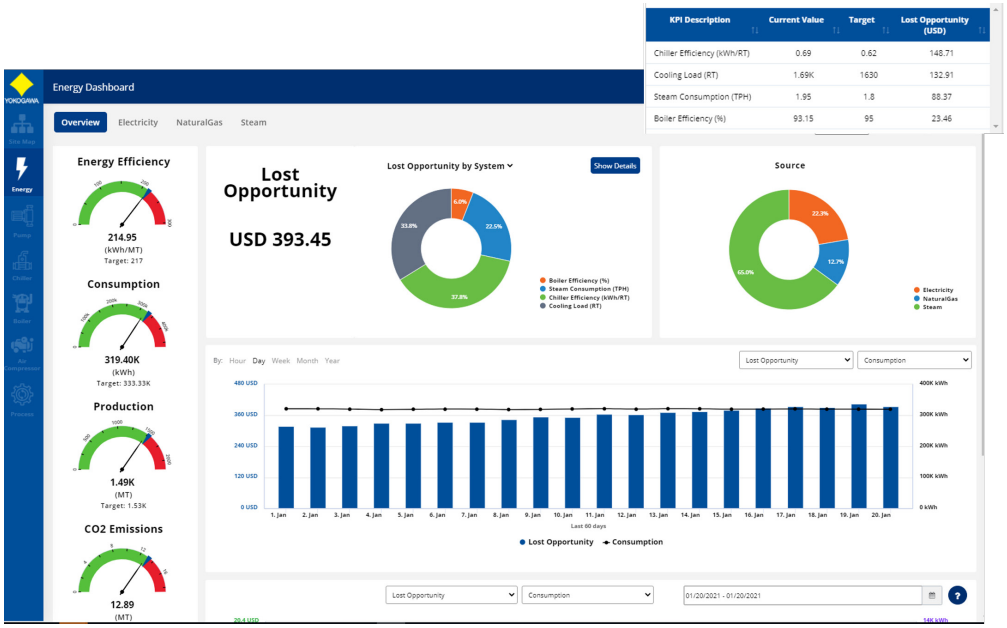
## Solution

KBC developed and implemented a comprehensive Digital Energy Management System (DEMS) tailored to the refinery's operations—covering individual process units, utility systems, and the overall site.

DEMS was tested using recent operating data. The energy metrics were reviewed collaboratively by the refinery's energy team and then integrated into the site's monitoring system.

With DEMS in place, energy performance is tracked in real time at the equipment, process unit, and site levels. When deviations or unexpected increases in consumption occur, drill-down analysis identifies the root cause.

Actionable insights are delivered through interactive dashboards, highlighting the potential energy savings by priority. Operators can then take targeted corrective actions on a shift-by-shift basis, ensuring that savings opportunities are promptly realized.




Digital Energy Management System dashboard

**Information and actions:**

- Summary and breakdown of overall energy performance.
- Total lost opportunity, specific energy consumption etc.
- Review and drive energy improvement efforts in key areas of the site.
- Identify key areas to assess and implement energy optimization opportunities.

## Results

Upon completion of the project, the refinery analysis revealed an achievable energy saving potential of 12% of the total site energy bill—four times higher than the initial estimate.

A portion of the annual cost savings is reinvested into enhancing energy metering and control systems, further improving monitoring accuracy and sustaining long-term energy efficiency gains.

DEMS now serves as the backbone of the refinery's energy management strategy, ensuring that both new and existing energy initiatives deliver measurable and lasting value.

**Using DEMS has enabled:**

- New energy-saving projects to be validated and confirm that expected benefits are fully realized.
- Continuous monitoring to sustain energy saving improvements, preventing regression to prior inefficient practices.