

Visual MESA Energy Management System Fact Sheet

To remain competitive in the newly emerging landscape, operators must optimally design and operate their industrial assets. Speed and accuracy in how they operate energy systems underpins their competitiveness. The key to success is optimized scheduling and real-time monitoring.

KBC's Visual MESA™ Energy Management System (EMS) helps to sustain and continuously improve your energy system's efficiency and profitability in real-time, based on a digital twin model approach.

The Energy Cost And Emissions Challenge

Energy transition is accelerating. Fueled by new regulatory and investor pressures, process industries must reduce emissions and energy costs further and faster than ever before.

To mitigate the impact of climate change from CO₂ emissions, government regulators, companies, and local communities are increasing awareness of the need to collaborate for environment sustainability and social economics.

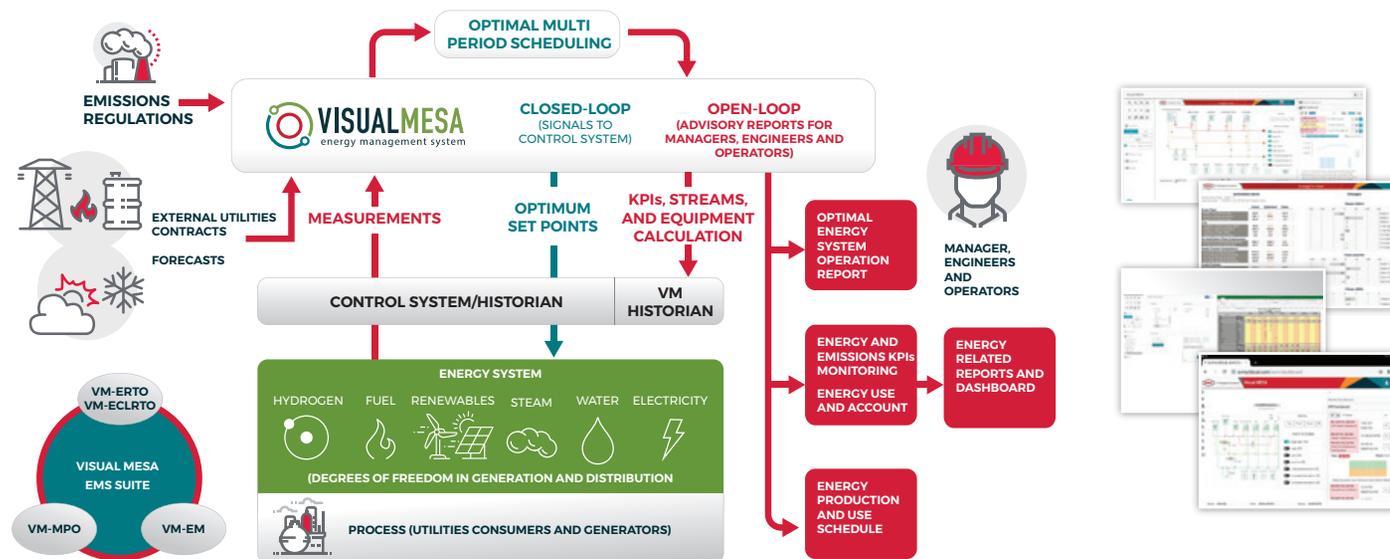
The Solution – Visual MESA EMS

How do you close the gap, monitor, and reduce emissions while improving your energy performance?

Use a combination of experience and skills that are supported by an energy management system.

Visual MESA EMS is the world's first integrated monitoring, scheduling, and real-time optimization technology for managing energy systems. It provides insights for effective planning, scheduling, and energy trading. Take real-time actions in an open loop (in advisory mode) or closed loop system (acting directly on the control system set-points) to deliver fast and accurate operational decisions.

Visual MESA EMS works the way you do. It brings together data analytics, first principle energy system digital twins, and multi-period constraints to proactively plan, schedule, and operate assets at the lowest economic cost. All while maintaining your license to operate.



The figure above shows the overall Visual MESA EMS Applications working and interacting together

90%

of the world's leading oil and gas companies have used KBC as a trusted advisor and solution partner.

Visual MESA EMS Suite of Solutions and Value Proposition

KBC is your trusted advisor to achieve your energy system cost and emission reduction goals by implementing the Visual MESA EMS applications:

| Software Suite | Functional Description | Applications Scope | Value Proposition |
|--|--|---|--|
| Visual MESA Energy Real Time Optimizer | Leading real-time solution for modeling and optimizing energy systems | <ul style="list-style-type: none"> Single or multiple units Plants with energy systems, across all vertical Industries Especially sites with multiple fuel(s), power production/import/export with frequently changing prices and energy use, where optimization decisions need to be taken in real time in order to reduce operational costs. | <p>Provides an excellent ROI between 8 to 18 months. Energy cost savings between 2 to 15% were obtained</p> <p>Energy system knowledge transfer across several generations of engineers and operators is easy and systematically done</p> <p>The information of the energy system is organized into one real time model and a single environment to which everyone has access through a web browser interface, even using mobile device</p> |
| | <p>Including optimization for continuous and discrete variables</p> <p>Able to operate in open loop (advisory mode) or closed loop (automatically sending optimum energy system set points of continuous variables to the DCS)</p> | | <p>Offers a proven and validated software solution to industrial facilities with dynamic steam generation and usage, cogeneration, heating/cooling capacity and other sitewide energy systems</p> <p>Proved sustained energy savings end emissions reduction over time as Visual MESA has a history of more than 30 years of successful application at over 100 sites, including some of the world's leading refining and petrochemical companies but used for many other industries</p> |
| Visual MESA Energy Monitor | Energy system performance and balances monitoring, including KPIs calculation, tracking and alarming | <ul style="list-style-type: none"> Single or multiple units Where the energy use and/or emissions, performance or intensity need to be calculated, tracked, closely monitored and alarmed in real time. | <p>Exceptions never go unnoticed and the site is constantly reminded of KPIs under alarm and if benefits not being captured, 'watch dog' effect</p> |
| | Optimization of continuous variables (could be enabled or disabled) | | Integrated Visual MESA EMS provides supply and demand side energy management to support ISO 50001 |
| Visual MESA Multi Period Optimizer | Optimal multi-period scheduling for energy systems | <ul style="list-style-type: none"> Single or multiple units with multiple period time constraints Optimization receives updated schedules on a real time basis Schedule taking into consideration fuel(s) storage, unit(s) loads forecast, equipment availability, on-off decisions and/or other time constraints | <p>System maintenance and sustainability is improved because the same model used for the online, real time optimization and monitoring, can also be used in stand-alone mode, populated with forecasted data, to perform optimal multi-period scheduling</p> |
| | Can automatically execute to refresh the schedule for the ERTOS at a given frequency or manually triggered by the operator | | Allows for energy schedule to be generated based on automatically updated forecasts for energy demand, weather and fuels costs acquired from many different data sources |



About KBC

KBC, a wholly owned subsidiary of Yokogawa Electric Corporation, is all about excellence in the energy and chemical industries. In the 40+ years since its founding, KBC's consultants have carried out 1000+ optimization studies, generating \$20+ billion in benefits for our clients. For more, visit www.kbc.global.