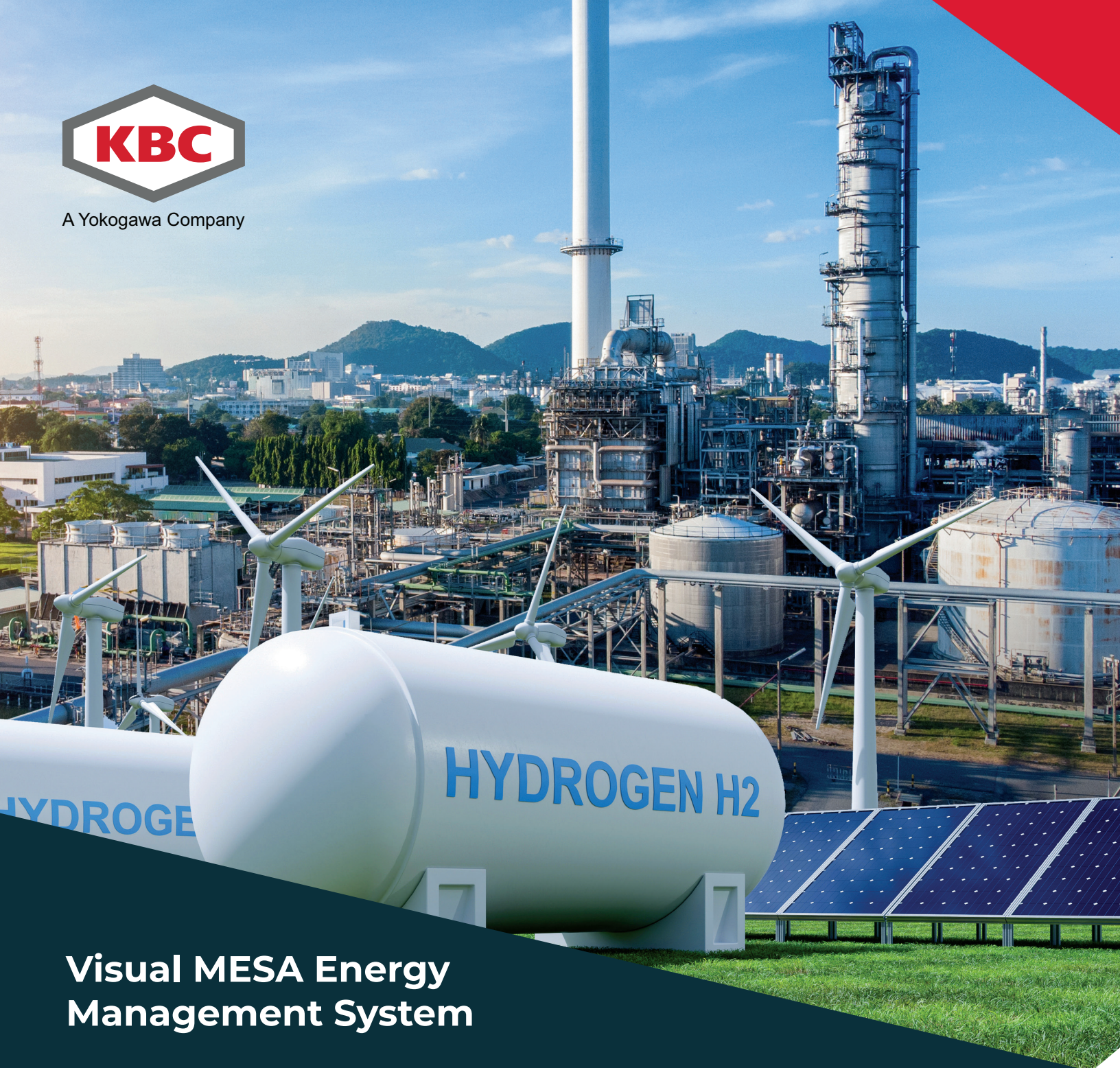




A Yokogawa Company



Visual MESA Energy Management System

To stay competitive in today's evolving landscape, operators must optimize the design and operation of their industrial assets. Speed and precision in managing energy systems are critical to maintaining an edge. Success lies in supporting energy activities by assessing past, present, and future operations to meet greenhouse gas (GHG) reduction goals at the lowest economic cost.

KBC's Visual MESA® Energy Management System (VM-EMS) enables real-time optimization of emissions, efficiency, and profitability through a digital twin model. Its Visual MESA Greenhouse Gas Emissions Management (GEM) module, TÜV Rheinland certified as ISO 14068:2023 compliant, ensures accurate Corporate Carbon Footprint calculations and helps achieve emissions neutrality.

90% of the world's leading oil and gas companies have used KBC as a trusted advisor and solution partner.

Bringing
DECARBONIZATION
to Life



The GHG Emissions and Energy Cost Challenge

The energy transition is accelerating. Fueled by regulatory pressure and investor expectations, process industries must cut emissions and reduce energy costs faster than ever before.

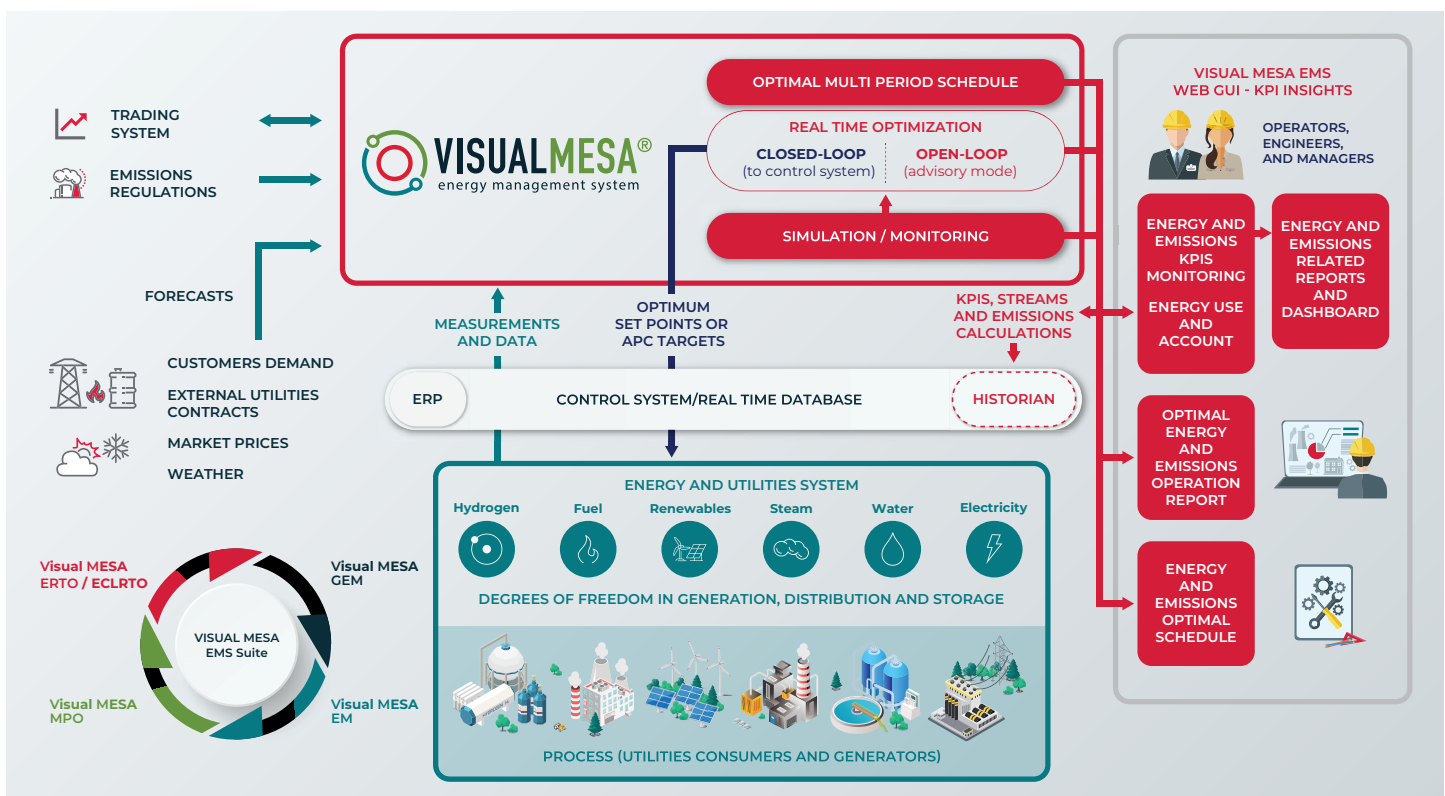
To mitigate the impact of climate change from GHG emissions, regulators, companies, and local communities are increasing awareness of the need to collaborate for environment sustainability and social economics. The need of deeper consideration of GHG emissions, renewable asset management and green hydrogen initiatives lead to complex systems that require multi-functional energy management tools.

The Solution – Visual MESA EMS

Visual MESA EMS is the world's first integrated technology for monitoring, scheduling, and real-time optimization of industrial energy systems. It delivers insights for lowering emissions and enabling cost-effective energy planning, scheduling, and trading.

Operators can take real-time actions in open-loop (advisory) mode or closed-loop (automatic setpoint control) mode to deliver fast, accurate decisions. By uniting data analytics, first-principles digital twins, and multi-period constraints, Visual MESA EMS enables proactive planning and efficient operations at the lowest emissions and cost.

All while maintaining your license to operate.



The figure above shows the overall VM-EMS applications working and interacting together.



Ideal For

- **Energy Managers** to reduce energy costs while achieving emissions targets.
- **Operations Leaders** to monitor KPIs, adjust in real time, and safeguard license to operate.
- **Sustainability Teams** to track Scope 1, 2, and 3 emissions with auditable reporting.
- **Digital Transformation Leaders** to scale digital twin programs with a secure, cloud-ready platform.

Future-Ready by Design

Visual MESA EMS is built to evolve with the energy transition. It delivers flexible cloud deployment with seamless Acuity Industrial Cloud integration and Docker-ready architecture. Expanded modeling libraries cover renewables, energy storage, and industrial clusters—helping operators evaluate transition scenarios with precision.

The platform also advances scheduling and forecasting through API-triggered MPO runs and an intuitive role-based interface. Enhanced historian and cybersecurity features protect critical infrastructure, while autonomous, closed-loop operation ensures resilient, real-time optimization in distributed, electricity-intensive systems.



Visual MESA EMS Suite of Solutions and Value Proposition

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

Software Suite	Functional Description	Applications Scope	Value Proposition
Visual MESA Energy Real Time Optimizer (ERTO)	Leading real-time solution for modeling and optimizing energy systems.	- Single or multiple units. - Plants with energy systems, across all vertical Industries. - Geographically distributed, when operating under a virtual power plant concept. - Especially suited for 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 emissions and operational costs.	Provides an excellent ROI between 3 to 12 months. Energy cost savings and carbon emission reductions between 2 to 15% were obtained.
			Deployable on premise or on the cloud providing seamless OT/IT integration.
			Energy system knowledge transfer across several generations of engineers and operators is easy and systematically done.
			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.
Visual MESA Energy Closed Loop Real Time Optimizer (ECLRTO)	Including optimization for continuous and discrete variables.		Offers a proven and validated software solution to industrial facilities with dynamic steam generation and usage, co-generation, conventional, renewables, heating/cooling capacity and other site-wide energy systems.
	Operate in open loop (advisory mode) or closed loop (automatically sending optimum energy system set points of continuous variables to the DCS).		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 130 sites, including some of the world's leading refining and petrochemical companies but used for many other industries.
Visual MESA Energy Monitor (EM)	Energy system performance and balances monitoring, including KPIs calculation, tracking and alarming.	- Single or multiple units. - Where the energy use and/or GHG emissions, performance or intensity need to be calculated, tracked, closely monitored and alarmed in real time.	Exceptions never go unnoticed and the site is constantly reminded of emission targets, KPIs under alarm, and if benefits are not being captured (watch dog effect).
	Optimization of continuous variables (could be enabled or disabled).		KPI insights and advanced drill-down functionalities to identify and fix root causes. Integrated Visual MESA EMS provides supply and demand side energy management to support ISO 50001.
Visual MESA Multi Period Optimizer (MPO)	Optimal multi-period scheduling for energy systems.	- Single or multiple units with time related, multi-period constraints. - Automatic update of forecasts to produce optimal 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.	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.
	Can automatically execute to refresh the schedule for the ERT0 at a given frequency or manually triggered by the operator.		Generates energy schedule based on automatically updated forecasts for energy demand and weather/fuel costs from multiple data sources.
			Supports renewable energy assets management, including green hydrogen and energy storage, price, day-ahead nominations, fuel and power trading.
Visual MESA Greenhouse Gas Emissions Management (GEM)	Near real-time tracking, alarming, reporting and auditing of Greenhouse Gas emissions at an industrial site.	- Single or multiple units. - Monitoring, tracking and analyzing equipment details contributing to emissions. - Enabling faster, informed corrective actions to keep GHG emissions on track.	TÜV Rheinland certified; compliant with ISO 14068:2023 for calculating Corporate Carbon Footprint and achieving emissions neutrality.
			Centralized tracking and recording of all energy sources (coal, NG, fuel gas, hydrogen, biomass, power, and biofuels) and its greenhouse gas emissions.
			Automated, auditable and compliant reporting helps track energy use and Scope 1, 2 and 3 emissions on a daily basis.



Certified Calculation Method
Regular Surveillance



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