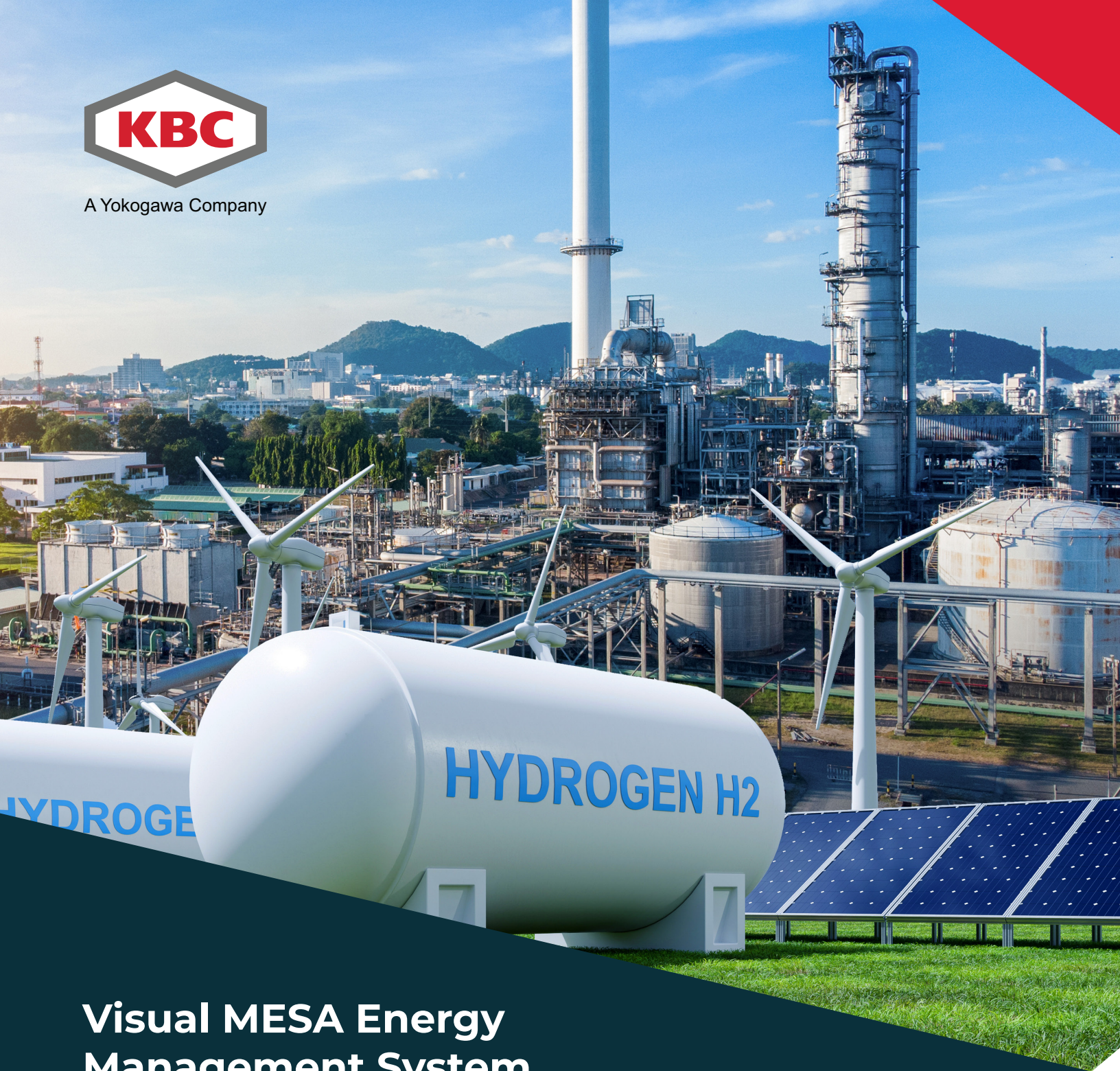




A Yokogawa Company



## Visual MESA Energy Management System

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 being able to support energy system activities, by considering the past, present, and future, to always operate while achieving greenhouse gas (GHG) emissions reduction goals at the lowest economic cost.

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

**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

Energy transition is accelerating. Fuelled 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 GHG emissions, government 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.

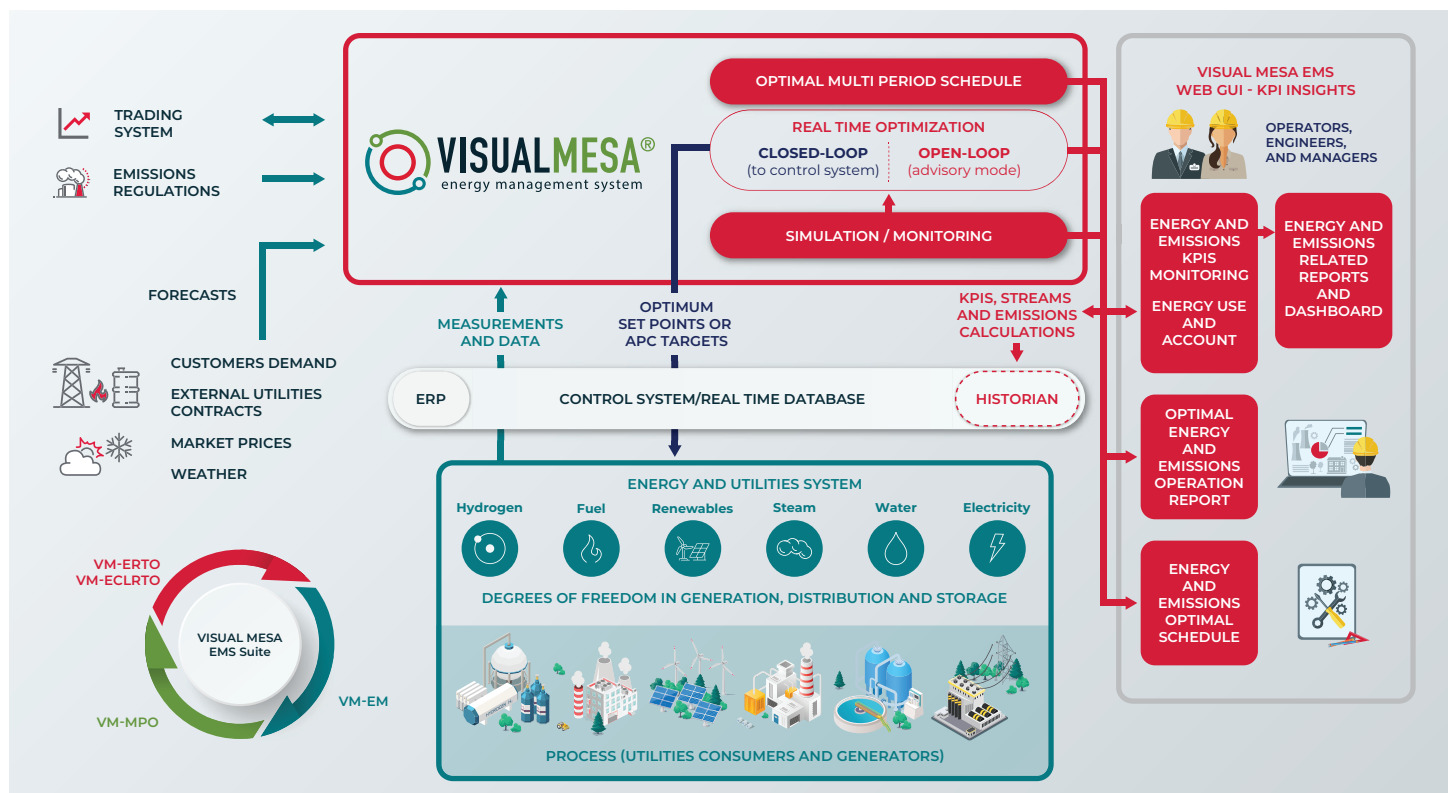
## The Solution – Visual MESA EMS

**How do you monitor and reduce emissions while improving your energy performance and manage costs?**  
**By using 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 minimal emissions and cost effective energy planning, scheduling, and 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 emissions and economic cost. All while maintaining your license to operate.



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

## Visual MESA EMS Suite of Solutions and Value Proposition

**KBC is your trusted advisor to achieve your goals on energy system costs and emissions 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"><li>• Single or multiple units.</li><li>• Plants with energy systems, across all vertical Industries.</li><li>• Geographically distributed, when operating under a virtual power plant concept.</li><li>• 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.</li></ul>	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	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	Energy system performance and balances monitoring, including KPIs calculation, tracking and alarming.	<ul style="list-style-type: none"><li>• Single or multiple units</li><li>• Where the energy use and/or GHG emissions, performance or intensity need to be calculated, tracked, closely monitored and alarmed in real time.</li></ul>	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	Optimal multi-period scheduling for energy systems.	<ul style="list-style-type: none"><li>• Single or multiple units with time related, multi-period constraints.</li><li>• Automatic update of forecasts to produce optimal schedules on a real time basis</li><li>• Schedule taking into consideration fuel(s) storage, unit(s) loads forecast, equipment availability, on-off decisions and/or other time constraints.</li></ul>	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



### 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 USD 20+ billion in benefits for our clients. For more, visit [www.kbc.global](http://www.kbc.global)



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