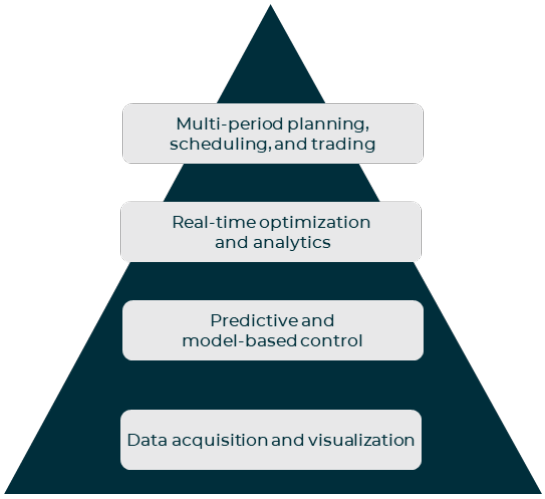
CASE STUDY



Petrochemical Complex Reduces Utility Costs

Visual MESA energy management system provides company-wide access to one version of the truth

Key Benefits

- Real-time results for timely decision making
- Decreased energy costs by 1.7% while operating in normal conditions
- Reported savings up to 7% when operating under abnormal conditions
- Reduced overall site fuel consumption 1.5%

Background

- European petrochemical complex
- Looking for energy management solution

KBC Solution and Results

- Implemented Visual MESA Energy Management System
- Company-wide access to a single utility model providing a unified version of the truth

Client Challenge

As part of a digital transformation project, a European petrochemical complex was looking to reduce energy costs, increase energy efficiency, and reduce emissions.

The facility includes a polyolefin complex, world-scale polypropylene and polyethylene plants, and petrochemical units. The polyolefin complex produces polypropylene and polyethylene while the petrochemical complex produces additives, PVC, polymers, EBD, and DIB.

Based on successful projects in similar sites, KBC offered the operator an evaluation of their complex energy system to determine potential benefits of optimizing their networks in real-time.

The Solution

KBC recommended the Visual MESA™ Energy Management (VM-EMS) System which provides process energy demand monitoring and utility cost optimization in real time. It uses sensor data for equipment and plant status validation, so the operator knows operational conditions at any given moment.

By using real-time and historical data to evaluate various case studies, the engineers can better prioritize which project opportunities to implement. This is especially helpful for early identification of projects related to the site decarbonization program. They can estimate what the real emission reduction and operations cost impact would be when implementing the projects in the current utility system.

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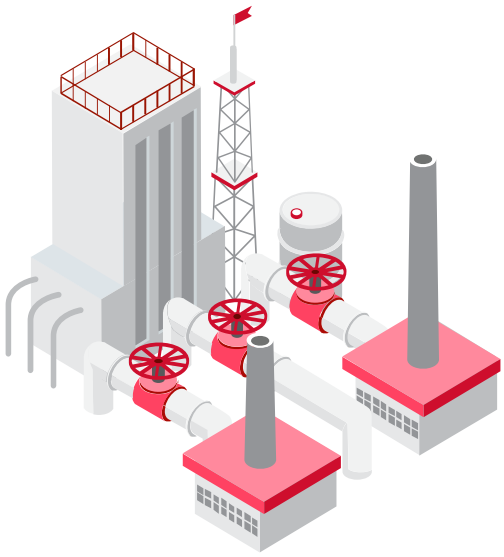

KBC held several meetings with the site engineers to ensure they considered all operating constraints and that the model accurately represented the site utility system. The team set the model to run automatically every 30 minutes. Prior to the roll out, engineers reviewed the optimization outputs and vetted the results.

Certain coordinated actions in different plants and areas were key to reduce energy costs and manage the energy usage more efficiently. The increased use of a turbogenerator and avoiding steam let downs across the site improved overall efficiency and reduced electricity purchases. Selecting the best suitable turbine and motors to run helped to reduce letdown and vents, as well as excess LP steam to the air pre-heaters. The result was a reduction in the site total steam demand.

The operator was always using low pressure steam to run the air pre-heaters to increase boiler efficiency. However, the KBC team observed that producing this steam at higher efficiency was costing more than not using the steam for air preheating at all. To reduce the site total steam demand for the site, KBC recommended that the air pre-heaters should only run when LP steam was in excess.

Results

The VM-EMS runs automatically and continuously, calculating, validating, and historizing more than 100 utilities system KPIs. Some of the monitored KPIs are boilers, steam turbines, pre-heaters, and heat exchangers performance.

The operator used a single utility model to collect all information and receive optimal actions to improve the system. This makes it possible to share information company-wide via the Intranet, so everyone had access to the same model and data.

Energy manager and site engineers can track overall efficiency performance and emissions in real time. Since, the model auto-adapts based on current operating conditions, it continuously provides energy cost savings even as demand or fuel prices vary.

By using the VM-EMS, the operator decreased energy costs by roughly 1.7% while operating in normal conditions. When operating under abnormal situations, they reported additional savings up to 7%. In addition, they reduced their overall site fuel consumption by 1.5%.

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