Survive & thrive

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KBC (A Yokogawa Company)

Cutting carbon with confidence

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How is KBC thriving?

Following a record-breaking year in 2024, KBC (A Yokogawa Company) is forecasting growth in 2025 as demand increases for its decarbonisation roadmaps and digital solutions. The company's prominence was highlighted when it received the prestigious Energy Transition Solution of the Year Award from the European Refining Technology Conference (ERTC) for its collaboration with Galp on a transformative refinery decarbonisation project. This success demonstrates how KBC's data-driven approach can help deliver substantial emissions reductions while maintaining operational excellence and economic viability.

The challenge - KBC, established in 1979 and headquartered in Surrey, UK, is a technology-based consulting firm specialising in the global hydrocarbon and chemical industries. With 350 employees worldwide and a track record of more than 40 years in the sector, the company combines strategic consulting with proprietary simulation technology to optimise hydrocarbon operations while focusing on achieving operational excellence and decarbonisation goals.

Currently, the energy sector faces unprecedented challenges in balancing short-term operational demands with long-term strategic decisions, particularly in regard to decarbonisation. For European refineries such as Portugal's Galp Sines complex, the challenge was threefold – reducing Scope 1 and 2 CO_2 emissions by at least 30% by 2030, ensuring economic viability of high capital investment projects, and navigating regulatory uncertainties.

Specifically, Galp struggled with uncertainty surrounding economic impacts of decarbonisation regulations, lack of clarity on European Union subsidies, and managing immediate operational demands while making long-term strategic decisions. Additionally, remaining competitive while implementing a decarbonisation agenda and addressing shortages of qualified personnel created further complications. The transition required high capital investment, making it critical to thoroughly assess all potential projects before committing to a final roadmap.

The solution - Although Galp Sines Refinery had designed an initial decarbonisation roadmap in 2017, it approached KBC in 2022 to validate, refine and optimise its path toward achieving 30% emissions reduction by 2030. The 12-month collaboration began with an intensive two-week process to identify 100 potential energy efficiency and CO_2 reduction opportunities.

KBC's approach combined its four decades of operational expertise with advanced digital modelling capabilities. The company deployed its proprietary Integrated Process, Energy, Emissions and Economics Model (IP3EM) to create a digital twin of the refinery, which enabled comprehensive analysis of current operations and predictive assessment of proposed strategies. This advanced simulation tool allowed the team to evaluate various scenarios and prioritise efforts based on their impact on emissions, energy efficiency and economic performance.

The project then prioritised the identified opportunities, evaluating each for CAPEX requirements, expected saving and emissions reduction potential. They also assessed additional factors such as implementation probability, impact on the broader refinery operations, ease and speed of implementation, and risk levels associated with established versus innovative technologies.

Through this process, KBC helped Galp calculate a potential 26% reduction in energy consumption through the collaborative implementation of selected projects. The model allowed for evaluation of the refinery's configuration and assessment of transformative technologies, including carbon capture, electrification, and the use of green and blue hydrogen.

The analysis also revealed that achieving the 30% emissions reduction target would require capital expenditure exceeding €1bn, emphasising the importance of optimising the investment roadmap. Here, the digital twin proved invaluable by enabling scenario testing without disrupting actual operations, ensuring that decisions were based on robust data rather than assumptions.

Crucially, KBC's impact extended beyond the initial roadmap development. Although the implementation of agreed projects was initially handed back to Galp, the client subsequently requested KBC's continued support through the implementation phase, leading to a second contract in 2023 that remains ongoing.

The success of this collaboration earned industry recognition, with KBC receiving the prestigious Energy Transition Solution of the Year Award from the European Refining Technology Conference (ERTC). The award highlighted how KBC's approach successfully balanced emissions reduction with operational excellence and economic viability and demonstrated a practical pathway for energy transition in the refining sector.

This case study exemplifies KBC's broader strategy of 'Bringing Decarbonization to Life®'. Through a combination of deep industry expertise and advanced digital technology, the company is primed for sustained growth as the energy sector navigates the complex decarbonisation challenges.

KBC
A Yokogawa Company

Story type

#energy transition (main category) #collaboration, #environmental sustainability & social impact, #innovation

Benefits

- Award of Energy Transition Solution of the Year from the ERTC.
- Successful emissions reduction balanced with operational excellence and economic viability.

KBC at a glance:

Key products and services: consulting.

Main industries served:
- Oil and gas – 90%
- Carbon capture – 2%
- Hydrogen – 2%
- Others (energy) – 6%

Headquarters: Surrey, UK
Year established: 1979
Number of employees: 350