



Capital Project Support

With a focus on the effective use of capital, KBC Capital Project Support Services utilises our proprietary in-house simulation technology, extensive process expertise, and refinery and petrochemical operations experience to add value and bring practicality to design. In addition, we optimise project life-cycle costs to maximise the Internal Rate-of-Return (IRR) and Net Present Value (NPV) of our clients' investments.

KBC Capital Project Support Services provide technical and commercial consulting throughout the complete life-cycle of an investment project – from concept to commissioning and beyond. Integrated seamlessly with a client's project team, KBC specialists provide effective support to the project as an Owner's Representative, as well as Technical Support to the existing facilities through our CapX PMC+ range of services.

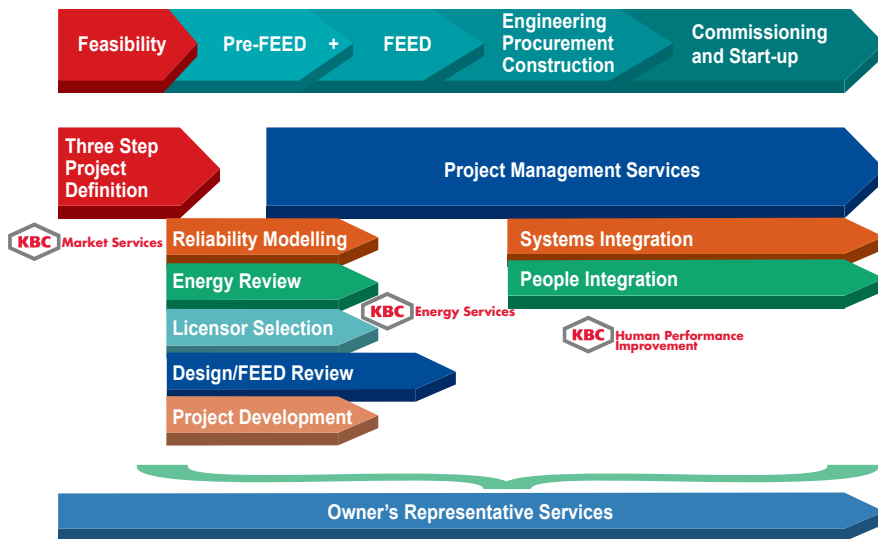
These services are modular; they can be applied as single modules or as part of a larger Owner's Representative Program. Typical Capital Project Support Services are:

- Reviewing Existing Capital Investment Masterplan to Ensure Global Consistency
- Reviewing Capital Investment Project FEED Package to Ensure Effective ROCE
- Preparing Project Basis of Design and Licensor EPC Bid Documents
- Evaluating/Selecting Independent Licensors
- Reviewing Site-wide Design Reliability
- Reviewing Site-wide Design Energy Efficiency/Emissions
- Reviewing Site-wide Design Hydrogen Requirement
- Reviewing Site-wide Water Consumption and Rationalisation
- Creating Process Design Packages/Basic Engineering Packages for Non-Licensed Units
 - Grass Roots Facilities and Revamps
 - Crude Distillation Units
 - Vacuum Distillation Units
 - Primary Fractionators
 - Gas Recovery Plants
 - Visbreakers
- Defining Requirements for Integrating New Plant into Existing Facilities
 - Utilities, Hydrogen, Amine Treatment, Sour Water, Flare System, Fuel Gas System, Power, Cooling Water, Air, Blending, Tankage, Inter-unit Transfers
- Defining Manpower Requirements, Job Specifications and Training for Safe and Profitable Operation of the New Plant



- Designing Upgraded Systems to Incorporate New Plant
 - Planning (LP, Scheduling Models)
 - Control Room Layout, Organisation
 - Inter-unit Control Logic Specification
 - Process Engineering Tools (Simulations, Unit Monitoring Applications, and more)
 - Routine Maintenance Planning Systems
 - Turnaround Planning (Frequency, In-plant Equipment Redundancy, On-stream Bypassing of Equipment, and more)
 - Definition of Critical Equipment Care Policies
 - Engineering (Inspection, Drawings, and more)
 - Health, Safety, and Environmental Reporting Systems
- Supporting Project Management
 - Technical/Commercial in Negotiations with Third Parties
 - Monitor Cost Estimates
 - Track and Validate Change Orders
 - Develop Start-Up Procedures
 - Final Inspection of Equipment
 - Guarantee Test-Run Planning, Execution, and Analysis
 - Definition of Operating Best Practices
 - Unit Monitoring Support (On-Site Applications or Remote Monitoring Service)
 - Post-Commissioning Optimisation Support
- Providing Start-up Expertise

(Continued)



- Steady Evolution of the Project Learning Curve – Seamlessly from Conceptual Phase Through FEED (Front-End Engineering Design Package)
- Consistent, Evolving Petro-SIM™ Simulation Tool-Kit Between Phases
- Available KBC Specialist Process Technical, Mechanical and Operational Expertise Throughout the Project

Our experience is that this unique integrated approach, combined with our unique Petro-SIM simulation tool-kit offers considerable time savings (15-25%) over the conventional project development approach by avoiding cycles and reliance on third-parties (such as licensors) for revised yield estimates as the project evolves.

This means that long lead delivery equipment is specified and ordered earlier, and, as such, the plant is commissioned earlier. Consequently, this positively impacts the project's financial performance, which makes third-party financing easier.

Owner's Representative Services

Our project development experience covers more than 25 years, and it encompasses both Grass Roots plant and Revamps of existing plant. KBC appreciates the importance of correctly specifying effective and flexible cutting strategies on the primary distillation equipment, in terms of the impact on downstream unit performance, final product blending and overall plant profitability, while maximising re-use of existing equipment wherever possible. With more than 50 Distillation tower Process Design Packages completed globally, many of our clients have experienced first-hand the unique benefits of a KBC design, including, in several cases, proven designs for grass roots "Deep Cut" vacuum units with cutpoints in excess of 600°C (1110°F).

Our global alliances with several major engineering contractors allow us a mechanism to continue to deliver value throughout the project development cycle, in a flexible and cost-effective manner. Close integration of KBC consultants with the contractor team provides:

- Consistency of Project Team Throughout the Various Project Phases
- Effective Capture and Transfer of Project Knowledge

™ Petro-SIM is a trademark of KBC Advanced Technologies plc, and it is registered in various territories.



Meeting Client Needs

KBC offers a comprehensive range of consulting, implementation, and training solutions to provide sustainable competitive advantage to our process industry clients worldwide.



DRIVING EXCELLENCE

OUR SERVICES INCLUDE:

CapX – Capital Excellence

- Market Analysis & Forecasting
- Business Strategy Review
- Merger, Acquisition, & Integration Studies
- Feasibility Studies
- Capital Project Support

OpX – Operational Excellence

- Operational Planning
- Process Optimisation
- Energy
- HSE
- Reliability, Availability, & Maintenance
- Human Performance Improvement
- Software Solutions

For more information, please visit www.kbcat.com,
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