Cost estimating and planning

The vital element
Capital cost estimating is a critical part of any construction project, whether a major field development or a modest expansion. It is one of the major drivers governing project sanction.

At any stage in the life of a project – regardless of its level of definition – confidence in the cost estimate is essential for sound decision making. An artificially low early estimate, for example, can result in an uneconomic project being progressed further through the design process or, in the case of an overly high estimate, a profitable project could remain undeveloped.

The service
Petrofac project services team offers a complete cost estimating service that goes beyond providing simple project costing. Instead, it provides customers with an experienced cost engineer, who will contribute within a project development team at any level.

Our sophisticated cost model allows engineers to consider various scenarios, analyse sensitivities and analyse numerous options, providing a powerful project development cost analysis system.

This flexible approach to cost engineering means that cost analysis models can be applied to:

- overall project costing including multiple contracting strategies, infrastructure development and owner’s costs
- major field developments from the top of well through gathering systems, processing facilities and export systems
- minor brownfield modifications through to large scale plant expansions
- benchmarking third party estimates
- historical data analysis
- sensitivity analysis

These services extend across both onshore and offshore developments.

Proven track record
Petrofac is a unique engineering, procurement and construction specialist with a reputation for quality and safe delivery of fast-track projects, providing all the resources for successful project implementation.

Our track record includes many projects: from the Russian Arctic to the deserts of North Africa and the Middle East. During the course of these projects, Petrofac has amassed a large amount of data - including country-specific issues associated with project execution, regional costs and specific location factors - which has been stored in the in-house historical costing database.”

This bespoke historical data analysis tool is able to interrogate the information in order to produce cost curves and cost trends. These cost curves with a known basis are utilised in the overall Petrofac cost estimating methodology and final cost model.

The approach
The methodology used to estimate the capital cost of a project will largely be determined by the maturity of the commercial and technical definition of the data available.

Petrofac categorises capital cost estimates into one of four main categories:

- order of magnitude - Level 1
- conceptual/preliminary - Level 2
- Front End Engineering Design (FEED)/definitive - Level 3
- detailed/control estimate - Level 4

The accuracy of the estimate categories is determined by a combination of the level of project definition and the source of the cost data. In the early stages, items such as bulks, civils and construction costs will be based on various factors; later, verified quotes will provide an accurate estimate.

Petrofac adopts appropriate estimating tools and techniques depending on the stage of the project:

Screening studies:
Using a block estimating tool based on a preliminary definition phase for utility, process and pipeline systems with alternative options for the development phase and combined to produce the overall cost estimate.

Conceptual, FEED and detailed design:
Estimates are based on traditional estimating techniques using the same estimating model, which is further developed and more detailed with greater technical definition. By retaining the same model, costs can be reviewed in the same format throughout the estimate development.

Petrofac provides the cost estimate for customers to review and expects this to be part of the project sanction process.
Industry software and published indices such as QUE$TOR, which brings together practical modelling software with a real-time cost database, allows rapid creation of CAPEX and OPEX estimates combined with robust benchmarking and testing of different cost options.

Cost risk analysis
Using standard industry risk software, ‘@Risk’, Petrofac will perform Monte Carlo simulations for an estimate to provide P10, P50 and P90 type estimates as part of the overall project risk assessment process.

Our customers
Since the Engineering Services business was established in 2001, Petrofac has provided capital cost estimates and associated projects for many customers located in countries such as Algeria, Egypt, Iran, Kazakhstan, Kuwait, Middle East, Nigeria, Norway, Qatar, Russia, Sudan, Syria, Tunisia and the United Kingdom.

Other services
In addition to cost estimating and cost risk analysis, we also offer the following services:

- overall project risk analysis
- monte Carlo simulation
- planning, scheduling and schedule risk analysis
- operating cost analysis
- economic and financial modelling

Project control
Petrofac’s project control function is fully supported by a comprehensive suite of procedures, based upon the Petrofac project control integrity model, reinforced through project experience. The function includes key elements such as planning and scheduling, cost control, risk management, trend and change control, performance measurement and reporting, cost estimating, document control and translation services.

Quality
Petrofac provides consistent capabilities and a high-quality service based upon its project control integrity model and business management framework. Our specialist team possesses the professional expertise to address all components of the project control function within individual projects.

Experience
Petrofac’s collective project control experience ranges from:

- technological studies
- conceptual design
- FEED
- Engineering, Procurement, Construction and Commissioning (EPC) projects

The project control personnel have worldwide onshore and offshore experience and the capability to provide a high-quality service for its customers.

Systems
The very latest project control and management systems and applications are well established to execute and successfully deliver a project. Our suite of systems includes EMC Documentum for document control, Oracle Primavera, the latest project management, planning and scheduling system for engineering and construction, whilst also utilising complementary products such as Pertmaster schedule risk analysis software application.

The overall planning and scheduling system utilises proprietary software complemented by Petrofac in-house systems, to provide a comprehensive project planning and scheduling system that enables a high-quality service to Petrofac customers for all their projects.

The project control systems enable multi-centre project management on a real-time basis for project monitoring, control and reporting on an international basis. This provides world-class capability project control, supporting complex projects.

Complementary services
In addition to our extensive project control services, Petrofac can provide additional complementary services, including:

- concept study and FEED / detailed design cost estimating
- pertmaster quantitative schedule and cost risk analysis as Monte Carlo style simulations
- operating cost prediction and analysis
- overall economic and financial modelling
- translation services

Project experience
Our people within Petrofac offer an extensive and experienced skills base with the capabilities and competency to undertake projects throughout many parts of the world, from all regions of Europe, the North Sea and North Africa through to the Middle and Far East including Russia, Kazakhstan and beyond.