



A Yokogawa Company

Profit Improvement Program

In an increasingly competitive landscape refiners need to increase their margins by improving product yields, reliability and availability, and reducing operating costs, while also improving safety and emissions. The industry is seeking innovative, impactful solutions to performance improvement that focus on implementation and, more importantly, sustaining improvements worth hundreds of million dollars to the bottom line.

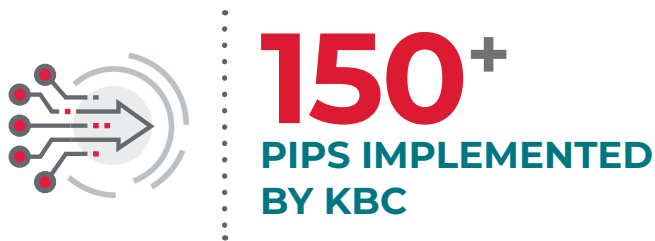
We partner with clients to achieve, repeatable, measurable improvements. Our process optimization solutions are enabled by a unique combination of subject matter expertise and best in class technology enabled by digitalization and automation to ensure assets sustain maximum return on capital employed.

Bringing
DECARBONIZATION
to Life



Working collaboratively with clients, we drive performance improvement through focusing on maximizing asset potential and investment project returns using a proven structured process. Our operational excellence best practices capture our extensive 'hands-on' industry knowledge, experience, and competence in all facets of optimization, operations, planning and project development. Couple this with our leading-edge technologies, Petro-SIM® and the Visual MESA® suite, we enable the evaluation of improvement opportunities with repeatable, measurable benefits delivered in a digital environment. To sustain improvements, we embed a culture of continuous improvement into client organizations with the necessary processes and tools to deliver sustained performance improvement.

The Profit Improvement Program® has been KBC's flagship process optimization solution with a focus on non-investment quick wins for an immediate return on investment.



The main elements of the program include:

- Yield Improvement (Inter and Intra Unit Optimization including Molecular Management)
- Energy Reduction
- Supply Chain Improvements (Crudes to final product blending and Products)
- Reliability, Availability and Maintenance
- Human Performance Improvement
- Major Investment Opportunities (Feasibility Studies)

A typical KBC Profit Improvement Program delivers:

**\$150
MILLION**
Cumulative
implemented
benefits over 5 years

**<1
YEAR**
Cash flow positive

**>100%
IRR**

**5-10
TIMES**
Profits generated
are greater than
the program costs



Profit Improvement Programme (PIP)

PIP forms the backbone of making improvements in refinery margins and performance. It starts with a technical and operational excellence benchmarking against best practices, followed by opportunity identification studies. The opportunities are evaluated using rigorous first principle kinetic models in Petro-SIM and then prioritized with a comprehensive suite of customized tools. This is followed by a comprehensive, structured, measurable implementation programme using KBC's proprietary KPI-based tracker models, which results in implemented improvements of up to 50c/bbl (\$44m per year).

Sustainable Improvement Programme

After the implementation of a PIP, it is critical to develop a sustainment programme where 80% of the benefit is derived based on KBC's proprietary Profit Tracker. This starts with an initial personnel and work realignment, followed by a competency development programme to ensure an effective and aligned workforce that can sustain the improvements. The programme then delivers a full suite of best practice work processes aligned with the best practice training, operating and maintenance procedures, tools and comprehensive checklists. This program is powered by a Continuous Improvement Program that then generates new opportunities perpetually. The sustainment programme can result in profits of up to 150mm dollars over its 5-year life cycle for a 250,000 BPD refinery.

The Essential Pillars for a Successful PIP Program

Subject Matter Experts

KBC has a multi disciplined team of experts spanning across process, operations, maintenance, utilities, automation and operational planning that are seasoned users of the supporting technologies and execution methodology.

Technology

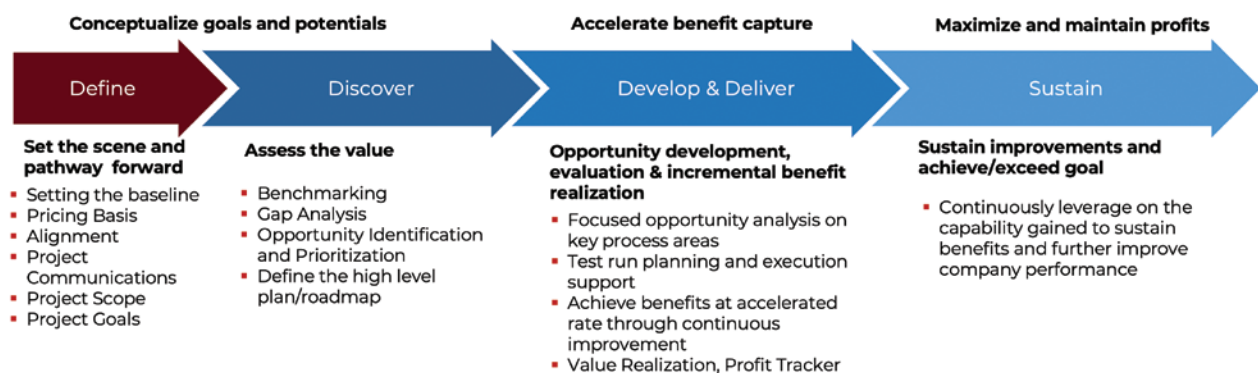
KBC's flagship simulation tools, Petro-SIM and Visual MESA, powered by our subject matter experts 'hands on' industry knowledge and experience deliver an unparalleled assessment of current performance whilst considering unit & market constraints and the non-linearities in unit operations.

Methodology

KBC uses its 4DS methodology (Define, Discover, Develop, Deliver and Sustain) for the successful execution of the program.

Sustainment and Continuous Improvement

Sustainment and continuous improvement are achieved via the KBC Profit Tracker® model, digital process models and human performance.



SUSTAINMENT AND CONTINUOUS IMPROVEMENT VIA DIGITALIZATION AND HUMAN PERFORMANCE





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