Petro-SIM is the only purpose-built oil and gas facilities simulator that combines the rich DNA of process simulation in an advanced and modern platform.

Petro-SIM’s integration with Infochem’s Multiflash offers a leading compositional PVT simulator with advanced thermodynamics packages able to handle multiple fluid and solid phases such as ice and hydrates.

Adding FEESA Maximus’s thermal hydraulic network simulator provides Life-of-Field production system models from reservoir and wells through pipelines and production facilities.

Petro-SIM provides the unique capability to model life of facility scenarios to ensure that your processing facility meets the long term needs of the reservoir.
Petro-SIM provides innovative technology for the upstream and midstream hydrocarbon industries in an advanced process simulation platform.

**Petro-SIM’s Core Capabilities**
for the Upstream and Midstream Hydrocarbon Industries

**Date-Based Simulation**
Petro-SIM is the first process simulator to allow date-based modelling enabling you to run a steady state model at different points in time using different sets of time-dependent input data. You can activate alternative facilities that are required for equipment change-out or process debottlenecking, inside a single simulation. The simulator calculates a series of steady state scenarios over days, months and years in one model.

Key process variables can be plotted during the Life-of-Field model. The cumulative results over time and time-weighted averages of rate variables such as volume, mass, and economic cost, can also be calculated. Petro-SIM allows you to explore the life of asset economics.

**Life-of-Field Integrated Production Modelling using the Maximus Plugin**
Maximus provides a unique field-wide and life-of-field modelling capability that combines thermal hydraulic and compositional rigour for accurate, steady state model-based performance predictions. Maximus delivers world leading decision support with a realistic representation of all the major components of a field-wide system.

By combining rigorous Maximus production models with high-fidelity Petro-SIM process models, an Integrated Production Model (IPM) reduces the number of arbitrary boundary specification and design margins. By using Maximus in conjunction with Petro-SIM in an IPM, alternative designs enable you to reflect actual operating conditions with more realistic design margins and provide lower CAPEX designs that allow quick decision-making within your organisation.

**Maximus – Petro-SIM – Multiflash Advantage**
Using an IPM with Multiflash’s verified and accurate PVT/compositional data and applicable equation of state methods provides a consistent basis for production and processing simulation. A consistent thermodynamic basis allows all groups working on the project to collaborate effectively and efficiently. This can only be achieved using KBC’s Maximus and Petro-SIM technology along with the Multiflash common thermodynamic basis.

Investigate the impact of time-dependent variables such as changing process feed flow rate, gas quality, and seasonal ambient air temperature based on the gas turbine performance.

In this example case, the refrigeration load factor increases from 65-75% during Year 1 to 95-105% during Year 5 of operation. Cumulative and time-weighted average values of feeds, products, fuel gas consumption, and energy consumption throughout the Life-of-Field study allows for quick evaluation of alternatives to maximise production and achieve optimum NPV.
Multiflash Native Integration and Flow Assurance Analysis

Petro-SIM's native integration with the Infochem's Multiflash fluid package methods allows you to complete flow assurance studies directly inside process simulator models. Advanced hydrate prediction and hydrate inhibition modelling can be completed using the superior CPA-Infochem cubic EOS. Other natively supported Multiflash fluid package methods include GERG 2008, RKS (Advanced), and RKSA (Infochem).

Using Multiflash, the rigorous n-phase thermodynamic flash calculations allow for all fluid and solid phases to be modelled. Solid phases such as ice and hydrates can be predicted in addition to the typical vapour, liquid hydrocarbon, and aqueous water phases. All phases are correctly represented in the Petro-SIM PFD simulation environment.

Lab Analysis Graphical Interface

Petro-SIM's new Lab Analysis interface provides a single environment for the rapid assessment of hydrate risk and development of mitigation actions. Lab Analysis uses the superior CPA-Infochem cubic EOS, resulting in rapid assessment of hydrate formation risks by providing phase envelope boundaries, Hydrate I, Hydrate II, ice and water boundaries as well as the current operating point. The ability to add alcohols and glycols for hydrate inhibition to the process stream without impacting the flowsheet enables rapid testing and development of hydrate mitigation strategies.

Black Oil Characterisation and Blending

The combination of Petro-SIM blending with Multiflash thermodynamics offers best-in-class blended oil property predictions, including standard carbon number characterisation. In addition, wax deposition calculations and asphaltenes prediction can be accessed via the improved Cape Open interface.

Where there is a risk of hydrate formation, workflows can be configured to automatically check the process simulation and identify streams. Streams are highlighted on the process flow diagram and a customisable warning message is generated for the material stream status.

The rigorous n-phase flash using the CPA-Infochem cubic EOS identifies the solid phases present as well as the quantity and composition of each phase.

Individual or groups of streams can be sent to Lab Analysis for further detailed analysis. Fluid properties including phase boundaries, critical point, Hydrate I, Hydrate II, ice and water boundaries, as well as current operating point are plotted.

Inhibitor strategies can be investigated by adding alcohols and glycols to the stream without impacting the flowsheet. The fluid with inhibitor phase boundaries are plotted and the quantity of inhibitor required to prevent hydrate formation reported.
**KBC has a unique focus on:**

**Quality. Innovation. Support. Value.**

All of these areas of focus are backed up by our industry-leading consulting capabilities to help provide answers for our diverse clients. In addition, world class technical support is available to all of our customers under a maintenance agreement.

Petro-SIM is the process simulation platform that was purpose-built with industry relevant technology. Petro-SIM focuses on maximising the value of your assets by providing you with the confidence to make knowledgeable decisions to improve your facility’s performance and drive organisational excellence.

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**Gas Turbine and Compressor Technology**

A rigorous single- or twin-shaft gas turbine unit operation is part of the Petro-SIM flowsheet. Combustion reaction models are handled automatically. Isentropic efficiencies and air and fuel flow rates are calculated. Compressor unit operations provide you with the ability to enter multiple alternative performance curves and a performance map to visualise compressor performance relative to surge and stonewall limits. The combined gas turbine and compressor models allow compression system performance, power loading limits, and operating envelopes to be accurately modelled. As a result, the gas turbine fuel gas consumption can be correctly accounted for within the model therefore allowing the total material and energy balance for the overall compression process plant to be calculated.

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**Third Party Hydraulic Technology**

Petro-SIM provides integration to leading third-party technology for other hydraulic modelling vendors and software including:

- Schlumberger PIPESIM™ for steady state integrated production modelling.
- Schlumberger OLGA™ software and Billington Process Technology OLX™ link for dynamic integrated production modelling.
- Flaretot Limited Flaretot Professional™ software for a rigorous approach to modelling of flare systems in a single flare simulation environment.