



# Black Oil & Unconventional Simulator



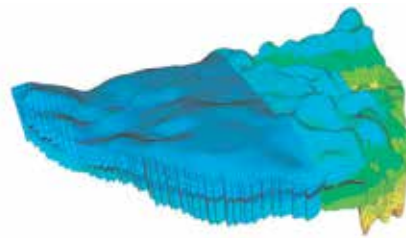
IMEX™

IMEX™, the world's fastest black oil reservoir simulator, is used to model primary, secondary, and tertiary oil recovery processes.

## Conventional Black Oil Reservoirs

IMEX™ models simple to structurally complex, heterogeneous, faulted oil and gas reservoirs, using small to very large scale multi-million grid cell models to achieve reliable production forecasts. Apply either the implicit/explicit method or the fully implicit method for faster calculations and to minimize run times without sacrificing credibility.

- Model different types of reservoir fluids, including: under-saturated and saturated oils, volatile oils, gas condensates, dry and wet gas reservoir fluid systems
- Select from multiple gridding options (Cartesian, radial, areal orthogonal and fully non-orthogonal corner point grids) to capture the best resolution
- Seamlessly interface with CMOST AI to facilitate rapid history matching and optimization of reservoir management workflows



Analyze the presence and extent of inter-well communication with an option to connect overlapping hydraulic fractures

## Unconventional Reservoirs

IMEX incorporates sophisticated tools to model naturally or hydraulically fractured reservoirs to accurately capture transient flow behaviour and to achieve better production forecasts.

- Accurately simulate fluid transfer in a naturally fractured reservoir using different fracture models, which account for: gravity, re-infiltration and transient effects
- Model longitudinal or transverse bi-wing hydraulic fractures and complex hydraulic fracture networks through a Stimulated Reservoir Volume (SRV)
- Import third-party hydraulic fracture simulation data for better propped fracture characterization, history matching and forecasting
- Model variation in permeability along the length of the fracture to more realistically capture field conditions
- Accurately model the matrix-fracture and matrix-matrix transfer in naturally fractured reservoirs
- Utilize various correlations to capture the effect of non-Darcy flow inside hydraulic fractures
- Characterize geometry, shape and size of the SRV using microseismic data
- Achieve more reliable gas-in-place and reserves estimates by modelling adsorption gas contribution to production in shale and CBM reservoirs
- Integrate the geomechanical fracture model to design and optimize well completions
- Use CMOST AI to optimize well and fracture spacing to increase production, NPV and EUR
- Model naturally fractured reservoirs and gravity segregation processes using the multiple dual continuum options

## Benefits

- Quickly screen various recovery mechanisms before moving to more complex simulations
- Model complex hydraulic fracture networks, and all associated effects, to accurately history match field results
- Troubleshoot bottlenecks with coupled surface network modelling in CoFlow-X
- Fast and easy transition to EOR process modelling in GEM™ and STARS™
- Seamless integration with CMOST AI for rapid history matching and optimization of reservoir management workflows

## Features

- Fully customize natural fracture orientation for more accurate and flexible geomodelling using discrete fracture networks
- Apply new PVT-based wellbore correlation for sandface to surface calculations for multiphase producers
- Utilize new features for more flexible hydraulic fracture modelling including overlapping fractures, height specification, and selective history matching of fractured well.
- Track a fluid's movement by applying a Passive Tracer to an existing aqueous or hydrocarbon phase

## Secondary & Tertiary Oil Recovery

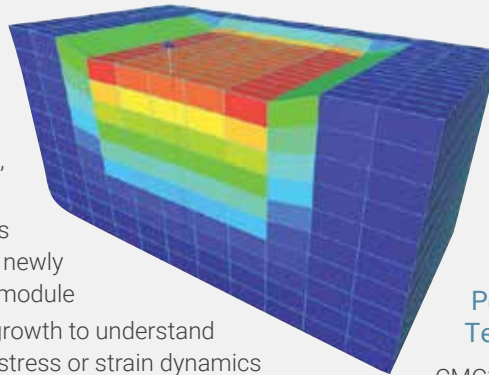
Evaluate and optimize field development plans and predict recovery for primary and secondary recovery methods in complex and heterogeneous reservoirs.

- Predict and compare reservoir performance by applying: water injection, polymer injection, pseudo-miscible gas injection, in continuous and WAG mode
- Implement polymer related processes by modelling adsorption, polymer degradation, shear thinning and non-linear viscosity mixing

## Geomechanics

IMEX includes a powerful rigorous, iteratively-coupled 3D geomechanics module to accurately model subsidence, compaction and dilation behaviour.

- Accurately model pore volume changes due to pore pressure changes with the newly implemented geomechanics coupling module
- Properly model fracture initiation and growth to understand fracturing mechanisms and impact of stress or strain dynamics
- Estimate fracture block permeability using normal fracture stress with the Barton-Bandis model
- Visualize hydraulic fracture initiation and propagation using discrete finite element
- Model and predict “fracture hits” incorporating flow and geomechanical models



Capture important geomechanical effects, such as surface subsidence (above), using the implicitly coupled geomechanics module

## Performance Enhancement Technologies (PET)

CMG's focus on all aspects of simulator performance maximizes hardware potential and provides software that runs large, complex simulation jobs in the shortest amount of time.

- CMG Cloud (Public & Private) meets on-demand needs, improves project delivery, improves hardware efficiency and uses the latest CMG software releases
- Achieve reduced run-time and solver iterations with CMG's combinative solver
- Quickly achieve accurate, stable answers and an average 3x speed-up with Autotune
- Maximize productivity by quickly loading results of large models using the standardized and compressed SR3 files
- Apply Dynamic Grid (DynaGrid) amalgamation to significantly speed up simulation models, while maintaining accuracy in important regions of the reservoir

## Coupled Surface Network Modelling

CoFlow-X bridges the gap between reservoir simulation models and the surface network. By explicitly coupling IMEX reservoir models to the surface facility model in CoFlow, companies will achieve faster and more efficient network optimization.

- Couple any number of IMEX reservoir models to the surface network, without any model conversion
- Troubleshoot bottlenecks in the entire reservoir and surface network system with coupled system modelling
- Leverage CMOST AI to apply iterative decision-based workflows to the integrated modelling workflow



### Contact

For more information please contact [marketing@cmgl.ca](mailto:marketing@cmgl.ca)



### R&D Investment

CMG reinvests 20% annual revenue back into R&D, to further innovation and drive technology forward



### Superior Software

CMG delivers easy to use software that provides the most accurate results



### Dedicated Support

Experienced technical sales & support personnel, deliver highquality, timely and personalized customer support



### Relevant Training

CMG's industry renowned reservoir software training provides the skills to improve productivity and efficiency