

Quick! analytical simulation of

- **Fractured Shales**
- **Coalbed Methane**
- **Tight Gas Sands**

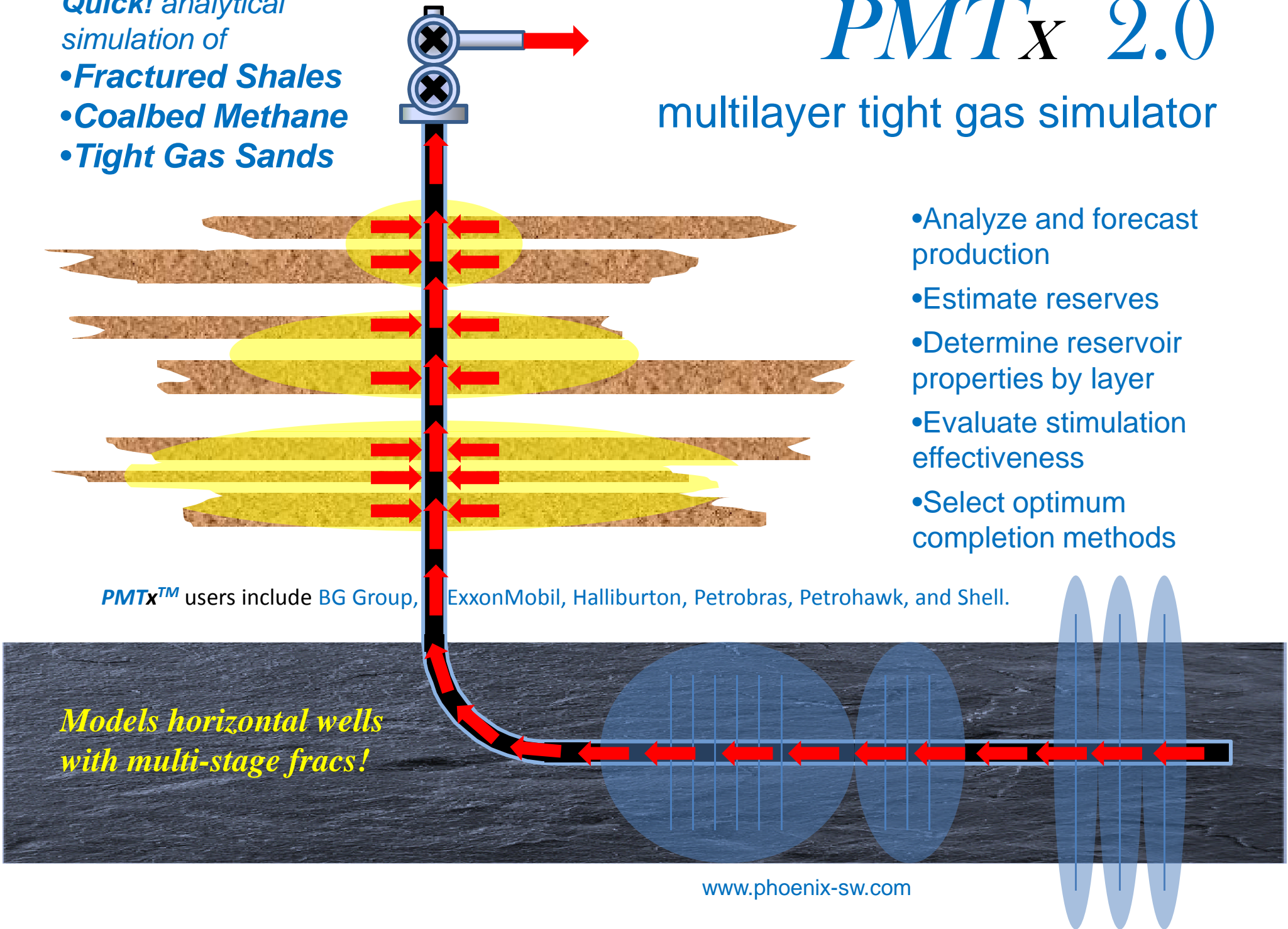
PMT_x 2.0

multilayer tight gas simulator

- Analyze and forecast production
- Estimate reserves
- Determine reservoir properties by layer
- Evaluate stimulation effectiveness
- Select optimum completion methods

PMT_xTM users include BG Group, ExxonMobil, Halliburton, Petrobras, Petrohawk, and Shell.

Models horizontal wells with multi-stage fracs!



PMT_xTM—Production History Matching for Multilayer Gas Reservoirs

• Applications

- Forecast Future Performance
 - Forecast by time or by date
 - Estimate ultimate recovery
- Evaluate Completions
 - Skin factor
 - Fracture half-length
 - Fracture conductivity
- Estimate Reservoir Properties
 - In-situ permeability to gas
 - Drainage area
 - Original gas in place
- Conduct Sensitivity Studies
 - Up to 255 different scenarios
 - Compare fracture treatment designs
 - Study effect of wellbore orientation on horizontal well productivity
 - Study effect of anisotropy on apparent fracture half-length
- Optimize Fracture Treatment Design
 - Reduce fracturing costs
 - Reduce risk
 - Increase production
- **Interface Designed For Ease of Use**
 - Minimize Pre-Processing
 - Import production data from commercial databases
 - Enter production and pressure data by date
 - Enter deviation survey data at recorded depths
 - Enter spinner survey data at recorded steps
 - Upscale by merging layers
 - Minimize Post-Processing and Formatting
 - Generate presentation-quality reports and graphs
 - Export reports in RTF or CSV format
 - Define custom graphs
 - Export graphs in metafile format

• Commingled Production Options

- Up to 255 Independent Layers
 - Different initial pressures, temperatures
 - Different reservoir models
 - Different rock properties
 - Add/plug layers at different times
- Tubing Pressure Gradient Calculation
 - Surface to top layer
 - Between adjacent layers
 - Incorporates deviation survey data
- History Matching
 - Well production data
 - Spinner survey data

• Extensive Reservoir Modeling Options

- Well and Completion Models
 - Vertical wells
 - Hydraulically fractured wells
 - Horizontal wells
 - **Horizontal wells with multiple hydraulic fractures –NEW!**
- Reservoir Models
 - Homogeneous
 - Pseudosteady state dual porosity
 - Transient dual porosity
 - Coalbed methane
 - Naturally fractured shale
 - **Pressure-dependent permeability –NEW!**
 - **Pressure-dependent porosity –NEW!**
- Permeability Anisotropy
 - Horizontal isotropy ($k_x = k_y \neq k_z$)
 - Full anisotropy ($k_x \neq k_y \neq k_z$)
- Reservoir Boundary Models
 - Infinite-acting
 - Closed circular
 - Rectangular
 - Infinite radial composite
 - Finite radial composite