FortTech Phi, inc (FP)

FortTech Phi, inc. is the US company owning the IP of the technology used for producing Crude Oil Breaker (COB) products for Electrically Enhanced Oil Recovery of heavy and light oil

Forttech Phi is successor of technology developer, a Swiss company White falcon Petroleum Technologies AG, having same ownership structure. Transition is made due to initial focus to U.S. market which have lowest entry barriers for such kind of the product. After initial acceptance of U.S. market, the Company plan to focus on other markets promising greater rewards, particularly MENA

In the past 12 years of COB Electric EOR technology R&D and deployment, over 10 million $ has been invested by owners

CRUDE OIL BREAKER TECHNOLOGY TECHNICAL BACKGROUND

Technology: Crude Oil Breaker (COB) Electric EOR increases production and ultimate recovery of heavy oil fields and some light oil fields by in situ liquefaction of heavy oil and simultaneous electro osmosis-driving fluid from anode towards cathode by a low voltage electric field. The equipment/technology has relevant EU certification.
Benefits: higher oil production rates, lower water cut, higher ultimate recovery, lower operation costs per produced barrel of oil, improving oil quality and API rate, lower or eliminated need for diluents.

COB EEOR technology application consists of:
COB EEOR **signal generator and control panel**
Software
Electric **cables** for 3 phase and DC current (characteristics depend from case to case)
Rubber or plastic **pipe** to be inserted at the outlet from wellhead to achieve electric insulation of the cathode and anode wells
Air conditioned container for placing and protecting EEOR control panel

Crude Oil Breaker Electric Enhanced Oil recovery technology is an electrochemical technology sui generis which utilizes Electro Chemical Oxidation (ECO) to achieve irreversible improvement of heavy oil quality ad in situ decrease of oil viscosity as well as mobilizing residual oil by strong electro osmotic effect.
The performance of this technology is based on the colloid structure of the soil particles, giving way for the colloid conductance allowing high amperages at low voltages. The colloid conductance forces the electrons on the micro-scale to cross electrochemical interfaces at which simultaneously reactions of reduction, and oxidation (redox) take place decomposing heavy crude oil to lighter constituents.
The agents for the redox reactions are generated in-situ by water electrolysis. Pre conditional is, however, that the Eh (redox potential) is in the positive range of >200 mV.
The energy supply is supported by the amplifier phenomenon of soils which need to be controlled in order to avoid exceedance of the technical performance data of the electrical ac/dc converters employed.

Electric "COB" technology is only electrically based enhanced oil recovery technology capable for liquefying heavy oil in situ, with simple application and very low cost for produced incremental barrel of oil.

Technology is also capable to mobilize residual oil by wettability alteration process and electro osmotic effect, which makes it applicable also in certain light oil and even unconventional gas applications.

The best conditions for technology applications are (ranked by effectiveness in certain conditions):

- Ultra tight unconventional reservoirs (shale oil , biogenic gas)
- Heavy and viscous oil produced from sandstone
- Heavy and viscous oil produced from limestone or dolomite
- Medium and light oil where formation pressure is depleted and unsupported by water flood or natural aquifer
- Heterogeneous medium and light oil reservoirs, like dual porosity or presence high and low permeable zones within same reservoir
- Medium and light oil with high pour point (lot of paraffin)

Why to apply our EOR (Enhanced Oil Recovery) system
Oil fields after several decades in production reach the limits of economically viable production by using conventional methods. However, there are still significant quantity of oil underground which are not recovered (not produced). Percentage of such unrecovered oil portion can vary from 60% in very favourable geologic conditions and light oil up to over 90% in unfavourable geologic conditions and heavy oil. So, even in most favourable conditions more than half geologically present oil remains under ground.
However, when certain oil field reaches it's economic limitation for further production (usually due to very high water cut in production), expensive facilities built to develop oil field are still present and in usable conditions. Those facilities include oil wells, gathering system, tanks, dewatering units, pumps and other. To drill required wells, acquire and set up other required equipment needed to put oil field on stream costs from several hundred million to several billion USD for on shore fields, while for off shore much more. Even abandonment of the field is quite expensive because all producing well should be liquidated in ecologically safe manner, all facilities removed and land restored into previous condition.
Therefore is strong economic motivation to prolong economic field life as long as possible.
For example, if from hypothetic oil field containing 1 billion barrel original oil in place (OOIP), just 10 % can be additionally economically recovered, and oil price is 80 USD per barrel, it represents gain of 8 billion USD.

COMPARISON WITH OTHER ENHANCED OIL RECOVERY METHODS

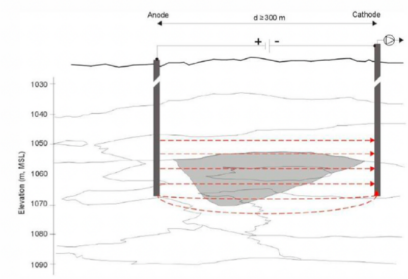
Other EOR methods are:

- Expensive
- Requiring building new dedicated facilities for chosen EOR (like boilers and piping for steam injection, compressors and pipes for CO2 flooding,)
- Long time from planning to pilot project and subsequent implementation
- Have limitations regarding depth, type of oil, type of reservoir rock

Our electric COB Electric EOR technology is:

- Non expensive for implementation
- Do not require building of new facilities
- Very short period from planning to first field results
- Have much less limitations than other EOR
- Highly versatile, applicable to heavy and light oil reservoirs

Schematic Electric EOR application



Effects:

1. forming electrochemical cell ⇒ REDOX reactions ⇒ in situ liquefaction
2. Electroosmotic effect ⇒ pressure boost ⇒ improved sweep efficiency

Details about technology and field application case can be found in:

SPE-193778-MS In Situ Heavy Oil Upgrading by Electric Enhanced Oil Recovery, Complex Carbonate Heavy Oil Field Case, Paper presented at SPE International Heavy Oil Conference and Exhibition held in Kuwait City, Kuwait, 10-12 December 2018.

CURRENT STATUS OF THE TECHNOLOGY

COB Electric EOR technology has been successfully installed in various real oilfield environments

- Technology readiness level is 9 for heavy oil and conventional light oil]
- Technology readiness level is 6for unconventional oil and gas wells

Installed in:

- Indonesia
- Albania
- Azerbaijan
- Argentina
- United States of America
- Trinidad and Tobago

installations pending in:

- Croatia
- Ecuador
- Turkey

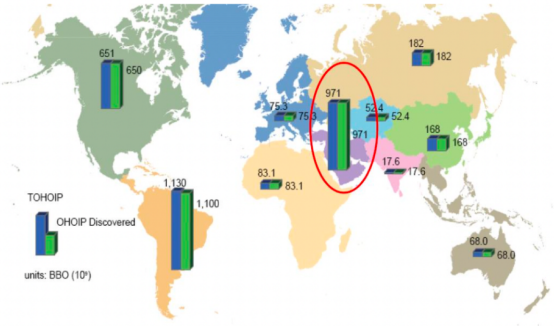
Intellectual Property Status:

Forttech Phi shareholders are investors, applicants, co-owners and registered holders of all proprietary and IP rights over EEOR and COB technology and technical documents, and the PWT technology and technical documents, specifically over the patent published under the Patent Cooperation Treaty (PCT) with the International Bureau of WIPO, as follows:

(i).- Publication number: WO2021/005383
(ii).- Publication date: 14 January 2021
(iii).- International Application number: PCT/HR2019/000018
(iv).- International Patent Classification: E21B 43/16 (2006.01); E21B 43/25 (2006.01)

SOME COB FIELD INSTALLATIONS PHOTOS

MARKET POTENTIAL MENA REGION



Meyer, R.F., Attanasi, E.D., and Freeman, P.A., 2007, Heavy oil and natural bitumen resources in geological basins of the world: U.S. Geological Survey Open-File Report 2007-1084, available online at

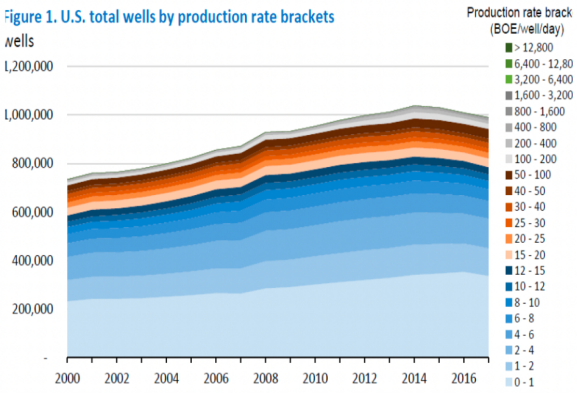
MENA region is endowed by vast heavy oil reserves; according to U.S. Geologic Survey, OOIP of heavy oil in the MENA region comprises 970 billion barrels
Such vast reserves are mostly untapped due to being hosted mostly in carbonate and dolomite reservoirs, particularly fractured carbonate reservoirs which are not good candidates for various thermal methods involving steam. All this resources can be tapped by COB technology offering in situ upgrading of oil quality.

COB technology can facilitate extraction at least 20% of those reserves, which comprises 194 billion bbl

Value of 194 billion bbl oil at 80 $ price per barrel is 15,52 trillion $

If only 1% (0,8 $ per extracted bbl) of this value will be earnings of key technology (COB) provider, it makes 155,2 billion $ over time needed for extraction

Market potential U.S.A.



Source: U.S. Energy Information Administration

In the USA there are over 1 million producing wells, out of which over 800.000 is producing 20 bbl/day or less, making tham candidate for enhanced oil recovery

If only 20% of the market will be tapped, it comprises 160.000 oil wells, or 80.000 COB units sold

80.000 units X 85.000 $ = 6.8 billion from COB devices sales

There are 500.000 oil wells producing from 1 to 6 bbl per day, average 3 bbl/d.
If only 5% of those wells will be acquired and production increased only 3 X (from 3 to 9 bbl/day average), earnings potential over 5 years is:

25.000 wells X 9 bbl day X 80$ X 365 days X 5 years = 32, 85 billion $ from oil production due to COB technology exclusive ownership