



HEAVY OIL: CHALLENGES TO DEFINE ITS VALUE

HEAVY OIL VALUE OVERVIEW.

The heavy oil price is heavily dependent on the cost associated with the quality of the crude and the desired quality of the upgraded product. Simply put, as the quality of the crude oil decreases, it takes more energy to upgrade it to the same quality product. The energy requirement is directly related to Green House Gases (GHG) emissions. Even though the industry generally discusses various steps involved in recovery and upgrading in terms of dollars, a relationship exists between energy consumption and both the energy efficiency of various steps and the economics of the process.

A barrel of heavy oil is worth the value of its salable crude oil-derived product, synthetic crude. Hence, the value of heavy oil is directly related to the world crude price and competes against the common compatible crudes in North America (e.g., West Texas Intermediate and Europe, Brent). This an unfair comparison due to the huge reserve volume worldwide of heavy oil and the amount of derivatives that it can be obtained.



NET ENERGY VALUE

The net energy value of the heavy oil takes into consideration the total energy required at every step of the process. In mathematical terms, the net energy available from the heavy oil is equal to the gross energy in the heavy oil minus the total energy required to produce it as a salable product. In brief, the following are the major energy-intensive steps:

- Generation of steam by burning natural gas and pumping steam downhole
- Pumping heavy oil - water mixture aboveground
- Water separation, cleaning, and recycling
- Production and handling of diluent to make a bitumen blend
- Derivation of syncrude (in the case of upgrading)
- Control of GHG emissions (in the case of GHG capture)

