

### Leading the Industry

For more than six decades, GE has been applying its gasification technology expertise to help customers convert lower value feedstocks to higher value products in applications across the power generation, industrial/chemicals and refinery/polygeneration segments

GE combines industry-leading experience with technology innovation to help customers increase efficiency, performance and profitability. With our gasification technology, customers around the world use low value refinery residuals such as coke, tars, and heavy oils to produce hydrogen, power and steam.

### The Gasification Process

Gasification is a flexible and efficient process that produces mixtures of hydrogen and carbon monoxide (synthesis gas or syngas) from carbon-based feedstocks such as petroleum coke, asphaltenes, vacuum residue, visbreaker tar and other petroleum residuals.

There are three basic components to gasification: air separation, gasification, and gas clean-up. Air separation produces the oxygen that is fed into the reactor with the carbon-based feedstock. In the case of coke, the feedstock is ground, mixed with water and fed in a slurry form into the gasifier, which operates under high temperatures and pressures to produce syngas. The ash and typical contaminants in the feedstock are consolidated into a marketable, vitrified slag material. The syngas is subsequently cooled and cleaned, including highly effective sulfur removal prior to use.



### Benefits of Refinery Gasification

Gasification in refineries, can improve your operating margins by reducing or eliminating the need for natural gas to produce hydrogen, steam and power.

#### Benefits

- Uses low value refinery residuals as feedstock, minimizing disposal/blending costs
- Produces hydrogen in large quantities for refinery use
- Can be configured to suit the refinery's hydrogen, thermal energy and power needs
- Further power generation capacity can be added to enhance revenues
- Generates marketable by-products such as sulfur and slag
- Carbon dioxide can be captured and used for enhanced oil and natural gas recovery, food grade purposes, or for future emissions trading credits
- Enhances refinery capability to produce low sulfur products, using lower cost, heavier/high sulfur crudes
- Can be designed to handle fuel blends, such as petroleum coke and coal





## Commercial Feedstock Experience

### Gas

Natural Gas  
Refinery Off Gas

### Solids

Coal  
Petroleum Coke  
Coal/Coke Blends

### Liquids

Crude Oil  
Fuel Oil/Heavy Fuel Oil  
Naphtha  
Vacuum Residue  
Asphalt/Deasphalter Residue  
Visbreaker Tar  
Steam Cracked Tar

## Customized Refinery Gasification License Solutions

GE provides long-term license agreements that include the gasification process design package, process and instrumentation design review with EPC, start-up support, operator training, on-going technical support and critical equipment. We can tailor gasification and power block solutions to help customers meet the needs of challenging project requirements.

## Gasification Technology Solutions Offered

- Technical Studies
- Technology License
- Process Design Package
- Process Guarantee
- Technical Services
- Comprehensive On-site Training and Support
- Critical Equipment
- Ongoing Access to Technology Advances

GE has the largest installed base of industrial gasification facilities worldwide and as existing customers look to expand their operations, they can turn to GE for additional technology solutions to support their growth.



For more information about putting GE's gasification technology to work for your refinery, contact your GE representative or visit [www.ge-energy.com/gasification](http://www.ge-energy.com/gasification).