



# FLEXICOKING™ technology helps refiner substantially reduce energy costs and achieve environmental benefits

Energy lives here™

## Challenge:

### Lower energy costs and emissions

The Greek energy company Hellenic Petroleum wanted to significantly lower energy costs and increase profits at its Elefsina refinery. The refinery relied primarily on imported fuel oil for its energy, which supplied 90 percent of the firing duty — a considerable expense that undermined profitability.

In 2012, Hellenic Petroleum finished the Elefsina Refinery Upgrading Project (ERUP). The goal was to annually convert 2.2 million tons of low-value, high-sulfur fuel oil into 1.4 million tons of high-value Euro-V diesel, and 0.4 million tons of naphtha and clean fuel gas.

The project comprised:

- A grassroots crude vacuum distillation unit
- A hydrocracking unit
- A resid upgrading unit

Reduced dependence on fuel oil was essential for success of the expansion project. The refiner's goal was to minimize fuel oil by substituting clean-burning gaseous fuels.

## Solution:

### FLEXICOKING™ resid conversion technology

For its energy source, the refiner shifted from purchased fuel oil to flexigas produced by the gasification step of FLEXICOKING resid conversion technology. The flexigas allowed gradual reduction of fuel oil use while maintaining system stability and reliability. Operators studied the site fuel grid configuration to determine the optimum routing of fuel and off gas streams to maximize the use of flexigas.

By switching to flexigas, the refiner increased energy integration of the complex while minimizing SO<sub>x</sub>, NO<sub>x</sub> and particulate emissions and their impact on the local environment.

As part of an expansion project in 2014, Hellenic Petroleum decided to increase the hydrocracking unit throughput at the refinery. Additionally, the company adjusted the FLEXICOKING unit operation to meet the product and fuel demands caused by the increased hydrocracker throughput.

This adjustment resulted in:

- Higher unit feed rate
- Heavier feedstock
- Higher gasification rate

# Result:

## Improved profitability and reduced pollutant emissions

The application of FLEXICOKING™ has enabled the site to reduce the fuel oil demand for firing duty from 90 percent to 9 percent in the five years since ERUP startup [Figure 1, Figure 2].

Figure 1:

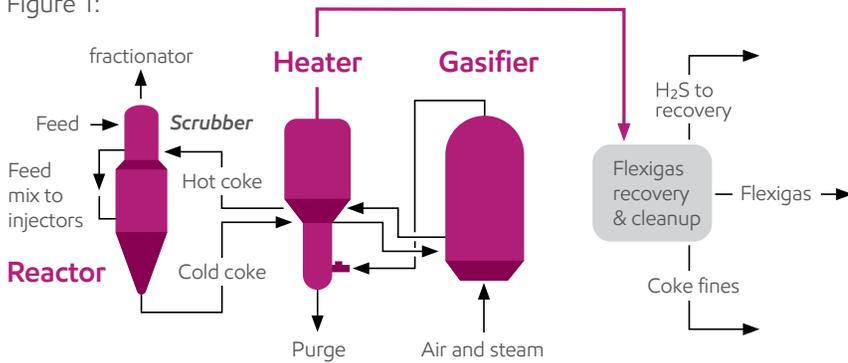
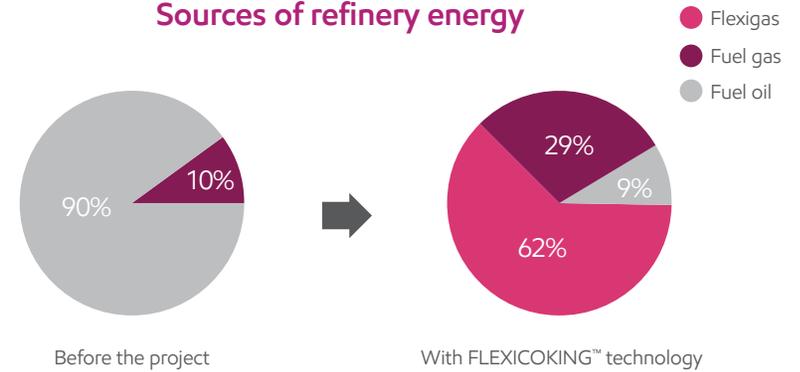


Figure 2:

### Sources of refinery energy



Emission reduction with FLEXICOKING technology vs. fuel oil firing

Particulate

97%



SOx

93%



NOx

90%



Learn more at:

[exxonmobilchemical.com/residconversion](http://exxonmobilchemical.com/residconversion).

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