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## SCIENTIFIC & RESEARCH PROJECTS

**Project No.: 03**      **Year: 2010**

**Project Field: Exergy Analysis**

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### Project Title:

**Improving Energy Efficiency in Natural Gas Refineries, Using Exergy Analysis**

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### Abstract:

Energy conservation is becoming increasingly important in energy intensive industries, including oil and gas refining and petrochemical plants. Economic pressures and rising fuel costs encourage more efficient use of energy within these industries so that operating costs can be reduced. Regulatory pressures are also forcing these plants to become more energy efficient so that CO<sub>2</sub> emissions can be reduced. Nowadays, various methods are applied to natural gas refineries in order to evaluate and reduce energy consumption and GHG emissions, and subsequently bring the operating cost down. Exergy Analysis is considered to be one of conceptual methods in Process Integration and widely used for evaluation and improvement of energy systems. In this paper, a real life case study (South Pars Natural Gas Plant Phase 2 & 3) have been analyzed using exergy concept, then exergy loss as well as exergetic efficiency have been calculated for the major unit operations. Also, some modifications have been proposed in order to reduce energy consumption. Finally, the project economics have been studied and found to be cost effective.