

<b>Customer</b>	Oil Refiner
<b>Service</b>	Technical and Economic Feasibility Assessment



Strategic Solutions  
SSI Associates, Inc.

## Technical/Economic Feasibility Assessment – SO<sub>2</sub> Control Systems for Petroleum Refineries

Definition of technical feasibility and relative costs for SO<sub>2</sub> emissions control systems for fluid catalytic crackers and oil-fired boilers at petroleum refineries.



### Challenge

A major international oil company anticipated the global need for more cost effective and efficient SO<sub>2</sub> emissions control for refinery fluid catalytic crackers (FCCs) and oil-fired boilers, both for retrofit to existing refineries as well as for new refinery units. Current approaches typically entail once-through sodium scrubbing on FCCs that results in large discharges of sodium-laden liquors through wastewater treatment plants, combustion of low sulfur oil in boilers, which is becoming more costly, and limiting the degree of SO<sub>2</sub> control. A guidance document was needed for refinery technical managers to identify the technically feasible options and provide a basis for ranking these technologies.

### Approach

Strategic Solutions staff prepared an overview of technology and worked with the company to identify and characterize technologies most appropriate to their refinery applications.

- **Technology Primer** – The first step was a comprehensive review of all commercially available technologies and those in advanced stages of development. Over 100 processes were covered. Each technology was profiled with an outline description of the equipment configuration, a basic process flow schematic, raw material requirements, demonstrated performance, multi-pollutant control capabilities, range and types of applications and advantages and disadvantages.
- **Technology Economics** – Second, technologies were screened for technical feasibility for the two refinery applications. Six fully commercialized technologies and two at advanced stages of development were selected. For these eight technologies, economics were prepared for representative applications covering a range of inlet SO<sub>2</sub> levels and gas flows. Both SO<sub>2</sub> control alone as well as combined SO<sub>2</sub> and particulate control were evaluated. Costs were broken down by capital investment and annualized operating and maintenance costs to rank relative practicality for the anticipated range of conditions and regional variability for domestic and international applications.

### Value/Result

- Developed a combined primer and economic analysis, which the firm issued internally as a reference document to be used as the standard for conducting assessments of SO<sub>2</sub> control.
- In joint authorship with the firm, published through the AIChE an abridged version of the technology primer as a book entitled “Profiles in Flue Gas Desulfurization”.