Abstract
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REFINERY RESIDUE GASIFICATION
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Following an episode of intensive interest during the late 1970s and early 1980s as a means to converting coal to transportation fuels, interest in gasification appears to be gaining new impetus. A continuation of the decades long trend of increasingly heavy crude oil feedstock supply availability is resulting in increased yields of low value refinery residues such as residual fuel oil and coke while increasingly stringent environmental regulations appears to be reducing the markets for these residues. The need to convert these residues into a more marketable product while meeting increased refinery needs for hydrogen and electric power appears to be shifting commercial interest in favor of refinery residue gasification, particularly in the context of a synergistic refinery integrated gasification utility island, as opposed to large stand alone coal gasification facilities.

Recent advances in gasification technologies are facilitating the efficient application of gasification to refinery residues, which can present unique technical challenges relative to more traditional gasification feedstocks such as coal. The low cost synthesis gas intermediate produced can be applied to the economic production of hydrogen, methanol, and other chemicals. Recent advances in gas turbine combined cycle technologies are also enabling some refiners to participate in one of the fastest growing energy markets – electric power.

The focus of this report is a comparative evaluation of the economics of merchant hydrogen, electric power, and methanol production via the gasification of high sulfur residual fuel oil. The scope of this report includes a review of the latest gasification technologies in addition to a discussion of important advances in key associated technologies such as air separation and gas turbine combined cycle power generation. We discuss refinery integration synergies in addition to key advances which have not only dramatically reduced reported capital costs for these technologies but also improved performance efficiencies. The scope of the report includes an extensive review of supply and demand trends for refinery residues, as well as that for hydrogen, electric power, and methanol.
REFINERY RESIDUE GASIFICATION

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