Nexant SPECIAL REPORTS

The following subjects are addressed in the report:

- *An assessment of the main alternative on-purpose technologies comprising a review of the technologies, licensors, and commercial experience*
- *Technology, economic and commercial evaluation*
- *Economics of alternate routes and feedstocks to propylene along with a comparison to conventional routes*
- *Discussion on the current North American propylene shortage focusing on causation and consequences*
- *Global propylene supply/demand outlook*

Evolving Propylene Sources – Solution to Supply Shortages?

U.S. propylene supply tightened considerably in 2010 and 2011 due to the increase in ethane cracking and decrease in heavy liquids steam cracking, while propylene demand increased as the economy continued to recover from the effects of the 2008/2009 recession. Consequently, the propylene to ethylene price ratio increased to above 1.5 in 2011, indicating skyrocketing propylene prices. This supply/demand imbalance and its effects on price will only be exacerbated with continued exploitation of shale gas deposits and the resulting increased use of lighter feedstocks in crackers. While the shale gas reserves do not directly affect Europe, LPG cracking in Europe makes propylene shortages a real possibility there.

To address issues of propylene availability, Nexant has prepared a new multi-client report which examines and compares the process technologies and economics of conventional as well as newer on-purpose commercial technologies, such as propylene via biomass. Additionally, the report includes an exploration of the causes and effects of the current propylene shortage in North America and ways in which these new sources of propylene may supplant conventional sources.

The report investigated and evaluated the following technologies:

- **Conventional Technologies:**
  - Conventional steam cracking
  - Off gases from Fluid Catalytic Cracking units in refineries
  - Catalytic Cracking: Selective Olefin Cracking, Catalytic Pyrolysis, Deep Catalytic Cracking
  - Enhanced (High Severity) FCC
- **On Purpose Technologies:**
  - Propane Dehydrogenation
  - Metathesis
  - Selective Olefin Cracking
  - Methanol to Olefins/Methanol to Propylene
- **Bio-Propylene:**
  - Corn or Sugar Fermentation (Ethanol Based)
  - Biomass Gasification
  - Switchgrass based

The evaluation of the above technologies included existing technology developers as well as those new to specific technologies. Alternate feedstock technologies using natural gas, coal, corn, sugar, switchgrass and biomass were analyzed using only information that is in the public domain or was developed by Nexant from non-confidential information.

Nexant also provided an analysis on the current propylene situation in North America, including an in-depth discussion of the various factors that have led to the current propylene shortage and possible solutions based on alternative supply sources.

Evolving Propylene Sources - Solution to Supply Shortages?

The ***"Evolving Propylene Sources - Solution to Supply Shortages?"*** report was published in January 2012 and is available immediately for US$22,000.

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