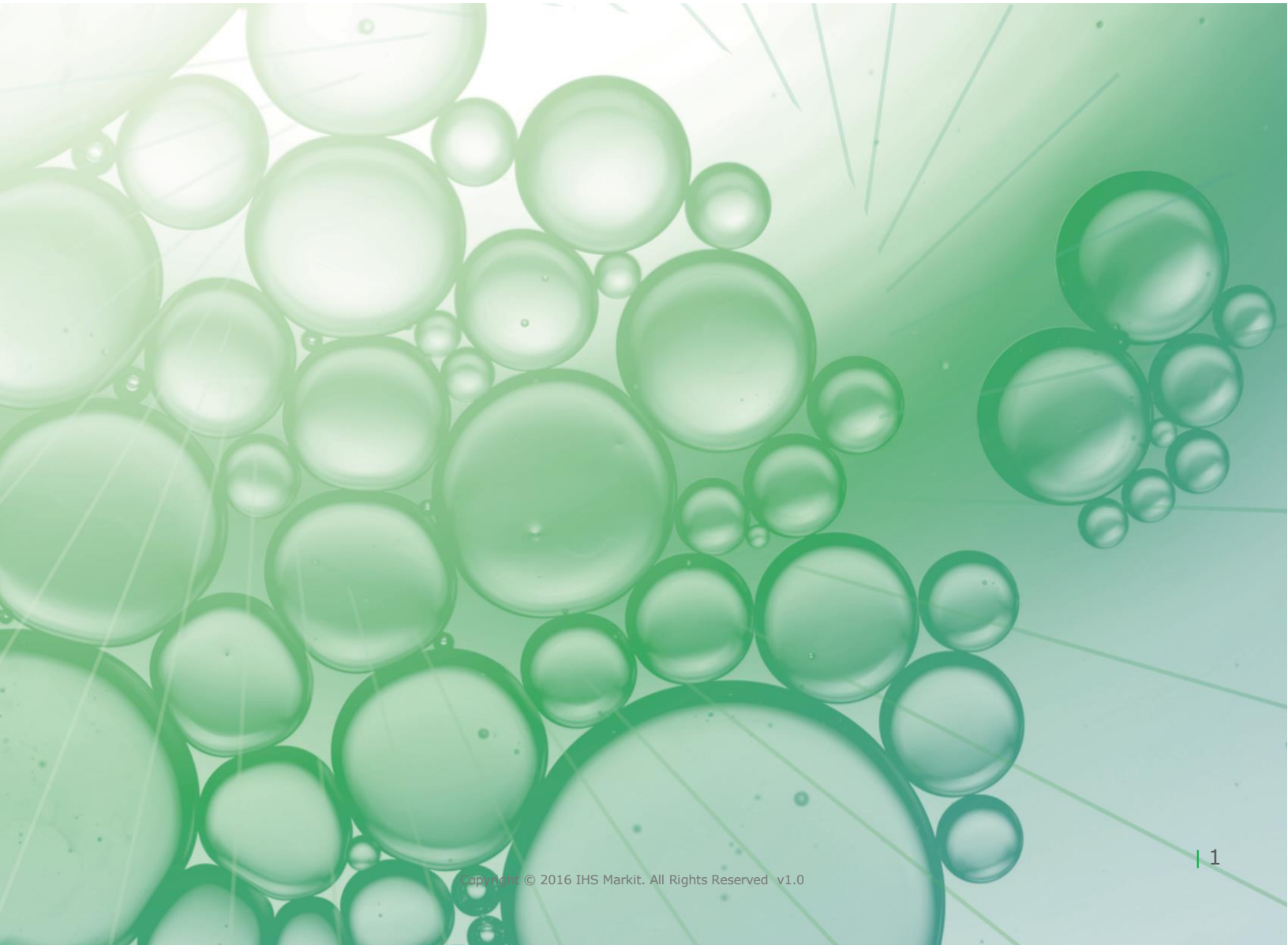
IHS Markit™

Case Study

Process Economics Program (PEP)

How PEP helps: Ethylene Manufacturing Technology



Case Study & Background

Ethylene manufacturing technology: The widespread commercialization of hydraulic fracturing (fracking) has resulted in an enormous increase in natural gas and natural gas liquids (ethane, propane, and butane) production. Although these processes have been initially commercialized in the United States and Canada, other regions of the world will soon (as of 2015) receive the same low-cost hydrocarbon economic benefits, largely through the importation of natural gas liquids from the United States. In China, regionally competitive coal-to-olefins and methanol-to-olefins technologies have been commercialized. These routes take advantage of an unconventional but locally abundant and inexpensive carbon sources.

Scenario

Over the last decade technology there has been a proliferation and commercialization of light olefins technology, all driven by energy feedstock dynamics; not only advantage regional price and volume, but also the shift of corresponding co-product manufacture, and in-turn the commercial need for on-purpose technologies for propylene and butene-1.

Issue

Planning the next wave of capacity expansion for a business is a complex decision on many levels. For the production of fundamental petrochemical feedstocks such as ethylene, the type of process technology is one of key decisions especially considering that these are multi-billion dollar investments with operating lives of 30 years of more. Specifically, technology for selection is complex when each type have unique attributes that can be to the stakeholders' long-term advantage or disadvantage depending on the Project basis e.g., feedstock, capacity, geographical location, "disruptive" or first-of-a kind technology on the horizon, etc.

Approach

Within PEP, we have a proven methodology for providing our customers a side-by-side technology and economics comparisons of the various process types by bringing all on a common basis and in a single point in time. The comparisons typically consider and highlight: recent technology advances (patent review), licensor activities, product specification and range, process design, investment and operating costs.

The iPEP modules allow customers to compare and interrogate the investment and operating costs under a variety of scenarios such as: scale, geographic location, timeframe (with actual market price data) as individual variable or multi variables..

Results

The comparative results of the chemical technologies analysis results vary; depending on the product type, but each have different drivers to advantage of disadvantage a specific technology. For example for the production of ethylene, the these key differentiators fall along the lines of feedstock type, and geography and coproduct slate, all as a strong function of time-dependent energy market dynamics.