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Argus White Paper: Significance of US ethane supply glut

The US shale gas revolution has produced a surge in domestic US natural gas liquids (NGL) supply — which in turn has had a major impact on US LPG exports. This year the US could export as much as 15mn t/yr of LPG — primarily propane — overtaking Qatar as the world’s largest LPG exporter.

Ethane is by far the cheapest and most abundant NGL available from US shale gas development. Its abundance has created a headache for US NGL producers. Ethane’s primary value is its global use as a petrochemical feedstock, unlike LPG which can be used in a variety of ways, such as a cooking or heating fuel. The ethane market relies on the petrochemical sector, although there has been some talk about using ethane as a power generation fuel in the Caribbean.

Global ethane production is roughly 50.8mn t/yr, around half of which comes from the US and Canada, according to Argus analysis.

Disposal issue

The main challenge facing the US ethane industry is what to do with supply when there is insufficient domestic transport, storage or processing infrastructure to utilise all of the country’s output.

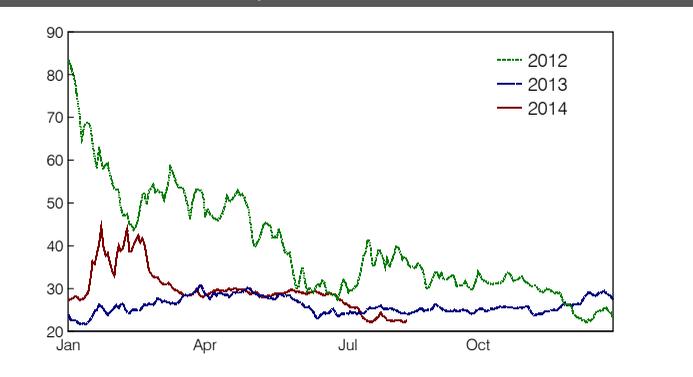
Ethane is cheap enough to entice US petrochemical firms. The US supply surge has caused domestic ethane prices to plummet. Ethane is currently trading at less than it costs to produce. US ethane costs only around 22¢/USG fob Mont Belvieu, while US propane costs over 102¢/USG fob Mont Belvieu.

But the US ethane supply glut is out of phase with a wave of US investment in petrochemical facilities configured to run on ethane. US companies are certainly scrambling to build ethane crackers, storage terminals and export capacity to cope with the glut coming from shale production. Dow Chemical, Westlake Chemical, Ineos, LyondellBasell, Chevron Phillips Chemical, ExxonMobil, and Shell have all announced new crackers or expansions to existing units to capitalise on cost-advantaged NGL feedstocks. But this infrastructure is not yet ready.

Ethane key facts

- Ethane is the second-largest component of the natural gas stream after methane, varying from between 1pc and 6pc, depending on the field from which it is extracted.
- Ethane has a higher heat value than propane and produces around 80pc less emissions than crude oil or coal.
- Ethane is primarily used as a feedstock for the petrochemical industry and processed through steam crackers to make ethylene.
- Ethane competes with naphtha, propane, butane and gasoil as a feedstock. Each product has a different yield of petrochemical products which in turn affects the economics of petrochemical plant operations. Ethane has a high ethylene yield but, unlike naphtha, a low yield of co-products propylene, pygas or C4s, for example.

Ethane Mont Belvieu prices ¢/USG



Ethane export potential

No international ethane market exists at present, but long-haul trade is on the way. US companies are looking at another alternative to domestic sales — exporting cheap ethane from the US Gulf and US east coast to petrochemical markets in India, east Asia and Europe. In theory this makes sound commercial sense for sellers and buyers — but only if three challenges are overcome:

Market reporting

Consultancy

Events

LPG/NGL

illuminating the markets

- **Investment:** The creation of viable international ethane trade depends on the construction of export and receiving infrastructure, including long-haul vessels, storage and loading facilities, and pipelines. Only a few companies have the necessary import infrastructure, notably Ineos in northwest Europe. The firm has committed to buy ethane from the US Gulf and US east coast for its cracker sites in Rafnes, Norway, and Grangemouth, Scotland.

- **Feedstock switching:** The ability of a petrochemical plant to switch feedstock slates to be able to run ethane rather than competing feedstocks, particularly naphtha.

- **Prices:** US ethane has to be cheap enough, including shipping costs, to justify the capital investment needed to import the product.

This year has seen significant progress on all fronts for international ethane trade. Exporters and importers have announced various plans to take advantage of US ethane abundance.

The chief mover on the US export side this year is Enterprise Products Partners, which has committed to build a US Gulf ethane export facility at Morgan's Point, Texas, only a year after announcing that there was no need to export US ethane because it would all be utilised by US petrochemical firms. The project will start operations

in 2016 and 85pc of its output is already tied up by term contract. Rival US NGL exporter Targa Resources Partners is also planning US Gulf ethane exports and new firm American Ethane is looking at constructing an ethane export facility at Shady Grove, Louisiana.

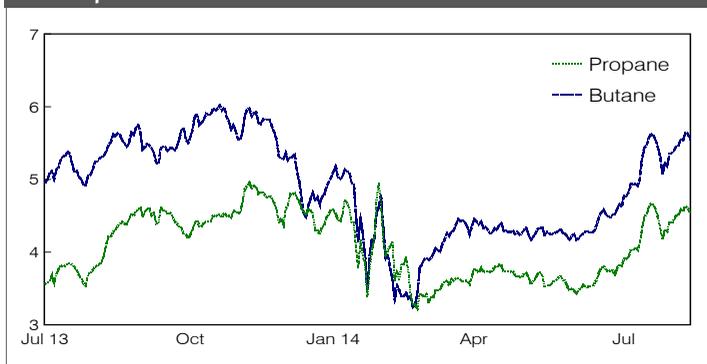
Other recent developments include South Korea's Samsung Heavy Industries' plan to build six new very large ethane carriers at a cost of around \$720mn for India's Reliance Industries to service the firm's ethane steam cracker facility at Jamnagar in India. New York-listed shipping company Navigator will build a new ethane carrier to enable Borealis to ship US to Europe. Ineos has expanded an agreement with Denmark-based gas carrier Evergas for a fleet of multi-gas vessels.

Argus is closely following the global development of ethane trade. Contact us to find out the services we can offer.

Argus LPG expertise

- Argus has an in-depth knowledge of the LPG and petrochemical industries, employing seasoned industry professionals.
- Our petrochemical consulting arm Argus DeWitt looks in detail at the ethane sector, particularly at the potential for ethane exports from the US and the likely international destinations.
- Argus provides LPG pricing, news and analysis and is widely considered the leading global price reporting agency in LPG. Argus provides daily global market LPG price benchmarks in the Argus International LPG report and informed business intelligence published through its well-known bi-monthly Argus LPG World.
- Argus Consulting Services compiles the authoritative annual global LPG statistics for the World LP Gas Association and European LPG Association.
- Argus Consulting Services has produced many studies for clients on all aspects of the global LPG industry.
- Argus also hosts regional LPG conferences which are acknowledged as key networking events for the industry.

US Propane and butane ratios to ethane



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