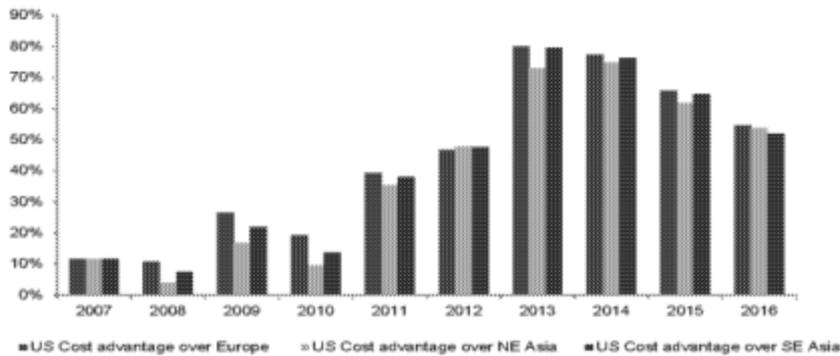




Figure 7: The cost advantage of U.S. ethane based producers vs naphtha-based producers in Europe and Asia grew markedly from 2010 thru 2014 before compressing in 2015-16



Source: IHS Chemical, Deutsche Bank

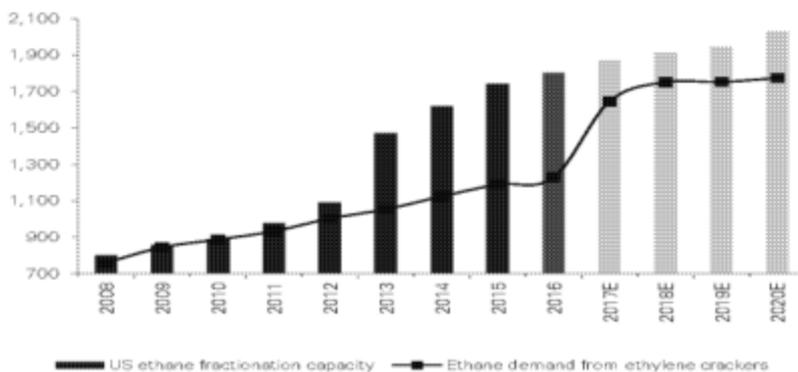
Oversupply in the U.S. ethane market has led to enhanced margins...

While U.S. ethane production is up sharply over the past five years, the ability of the U.S. chemical industry to use this additional ethane will be limited until new greenfield ethylene capacity comes on stream in '17-'18. U.S. ethane supply has increased significantly over the last few years. We estimate U.S. ethane supply has increased from 700k bpd in '08 to 1.8 MM bpd in '17, with U.S. ethane demand of 1.4 MM. The U.S. ethane market first entered an oversupplied position starting in '13 and this dynamic continued in '14-'17. The development of increased ethane production has been the primary driver of the current, highly profitable and extended U.S. ethylene cycle.

...however U.S. ethane prices are expected to increase in '18

However with 325k bpd of incremental ethane exports in '16-'19 and an additional 500k bpd of ethane demand from 6 greenfield ethylene projects scheduled to start-up in '18-'19, U.S. ethane demand should be approx. 1.9 MM bpd by year-end '18. As a result, ethane supply/demand fundamentals, which are currently loose (and the driver of near record low ethane prices), should tighten to a balanced-to-short market by year-end '18. This shift in ethane fundamentals should drive ethane prices higher by year-end '18.

Figure 8: Ethane supply/demand became very long in beginning in 2013 ('000 bbls per day)



Source: IHS Chemical, Deutsche Bank