

# **SAUDI PETROCHEMICAL INDUSTRY**

# **CHALLENGES**

**November 2012**

# **CHALLENGES TO SAUDI PETROCHEMICAL INDUSTRY**

- 1) Shale gas in the USA and other countries leading to an increase in supply of Ethane, Propane, etc. in huge volumes
- 2) Subsequent impact on world prices
- 3) Already USGC propane prices are now lower than Saudi feedstock prices
- 4) Potential export of US propane of around 400,000 BPD or around 11 million tons/year
- 5) All the above will soon lead to a further decrease in propane prices and potentially rendering the current propane to naphtha formula unattractive.

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- 6) Impact of new USA ethane cost/prices will also effect Saudi ethane users, especially if the \$ 0.75 price changes upward
- 7) EU GSP (Generalized System of Preferences) under WTO will expire by end 2013. Impact is an increase of custom duties on Saudi Petrochemical from 3% to 6.5% in Europe, which will further render Saudi propane based industry less competitive.
- 8) Exports of USA derivatives of ethane and propane will impact prices of the Saudi downstream products i.e. squeezing Saudi Petrochemicals margins. Therefore any increase in the local feedstock prices will hurt the Saudi petrochemical industry.

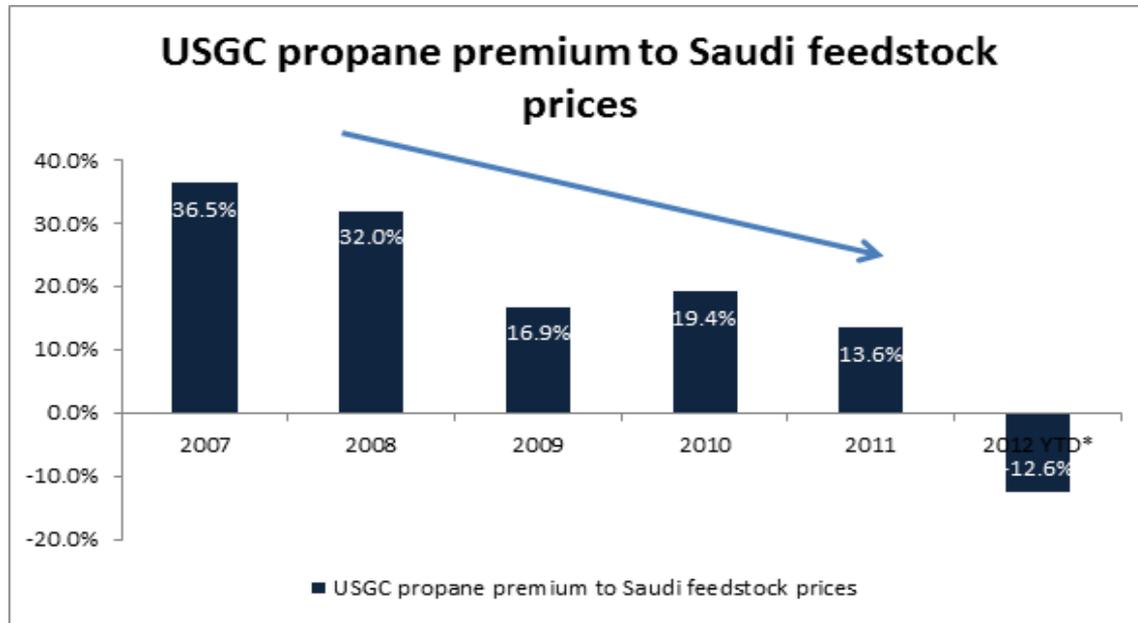
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- 9) Due to the huge Ethylene production in the USA (Shale Gas), Ethylene prices will be lower making it more economical for PP converters to switch to PE and this will make the Saudi propane based industry less competitive**
- 10) Shale Gas is vastly being developed in the USA currently, very soon China and LA will follow and Europe probably will follow at a later stage, leading to a severe threat to the Saudi Industry.**
- 11) Petrochemical upstream investments is and will be attracted to the USA depriving Saudi Arabia from growth in this industry and ultimately lower employment.**

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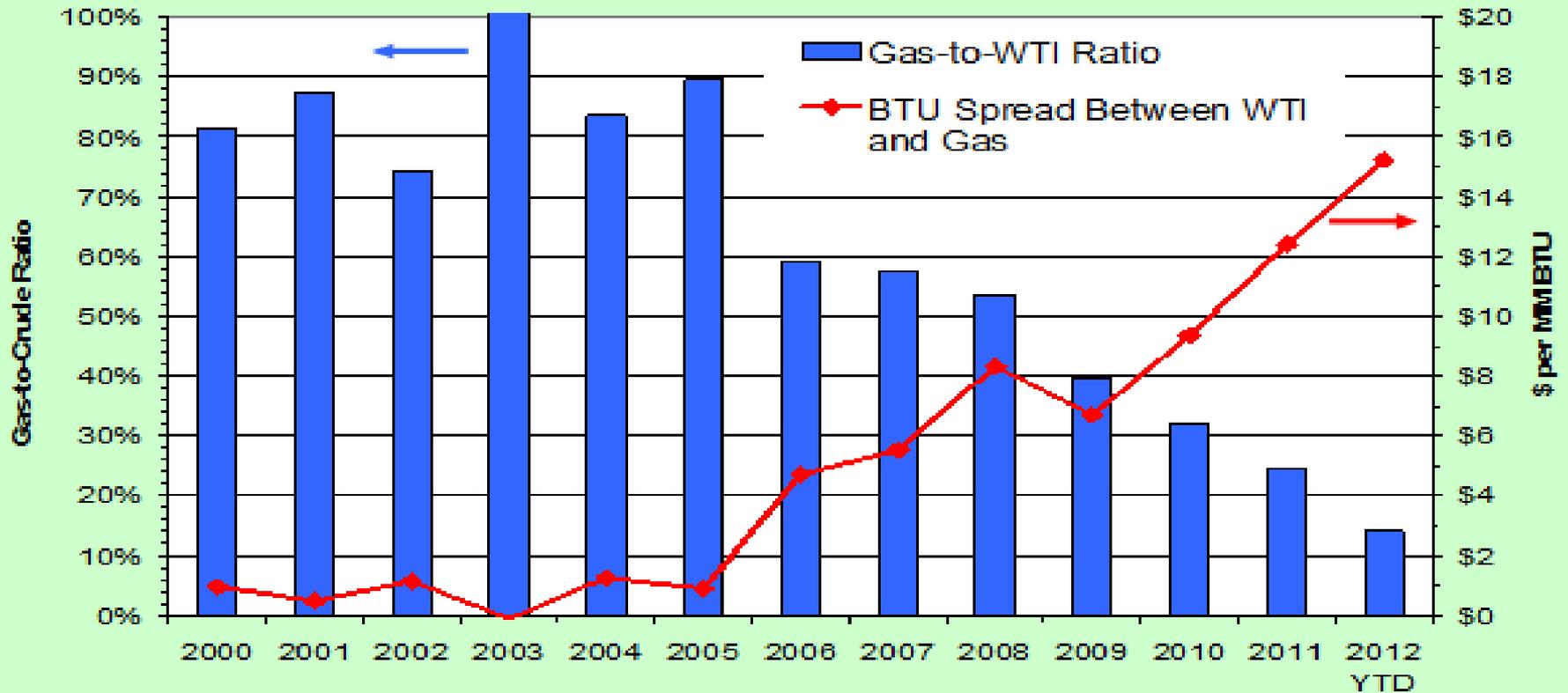
- 12) Any increase in feedstock prices will lead to an increase in products prices, ultimately hurting the government's drive to encourage the downstream industry, which will also lead to a serious reduction in employment of Saudi nationals.**
  
- 13) Ultimately Saudi stock market will be severely hit due to lack of growth in the petrochemical industry and lower profits.**

The chart below shows a clear secular deterioration of the premium US propane enjoyed over Saudi feedstock prices primarily due to shale gas production As of 2012 that premium has turned into a deficit:

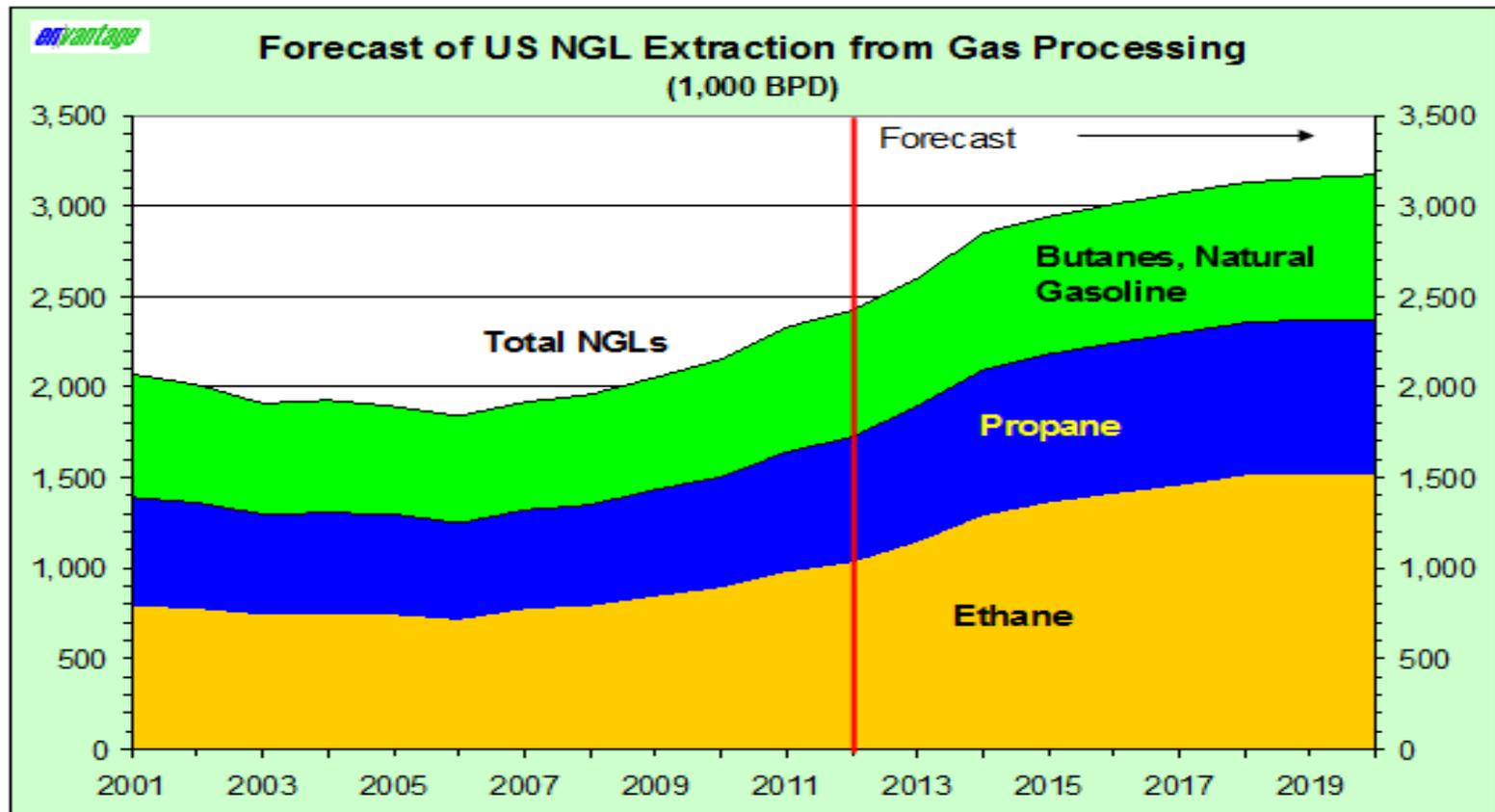


**Substantial increase in US shale gas production:** Due to the increase in price discrepancy between crude and gas (see below chart), producers have concentrated on exploiting very wet (rich in NGLs such as ethane, propane, butanes, and natural gasoline) shale plays. US propane supply from field production (not including refining operations) is expected to reach 950 kbd by 2015 up 50% from current levels

Gas-to-WTI Price Ratio (On a Thermal Basis) vs the BTU Spread between WTI and Gas

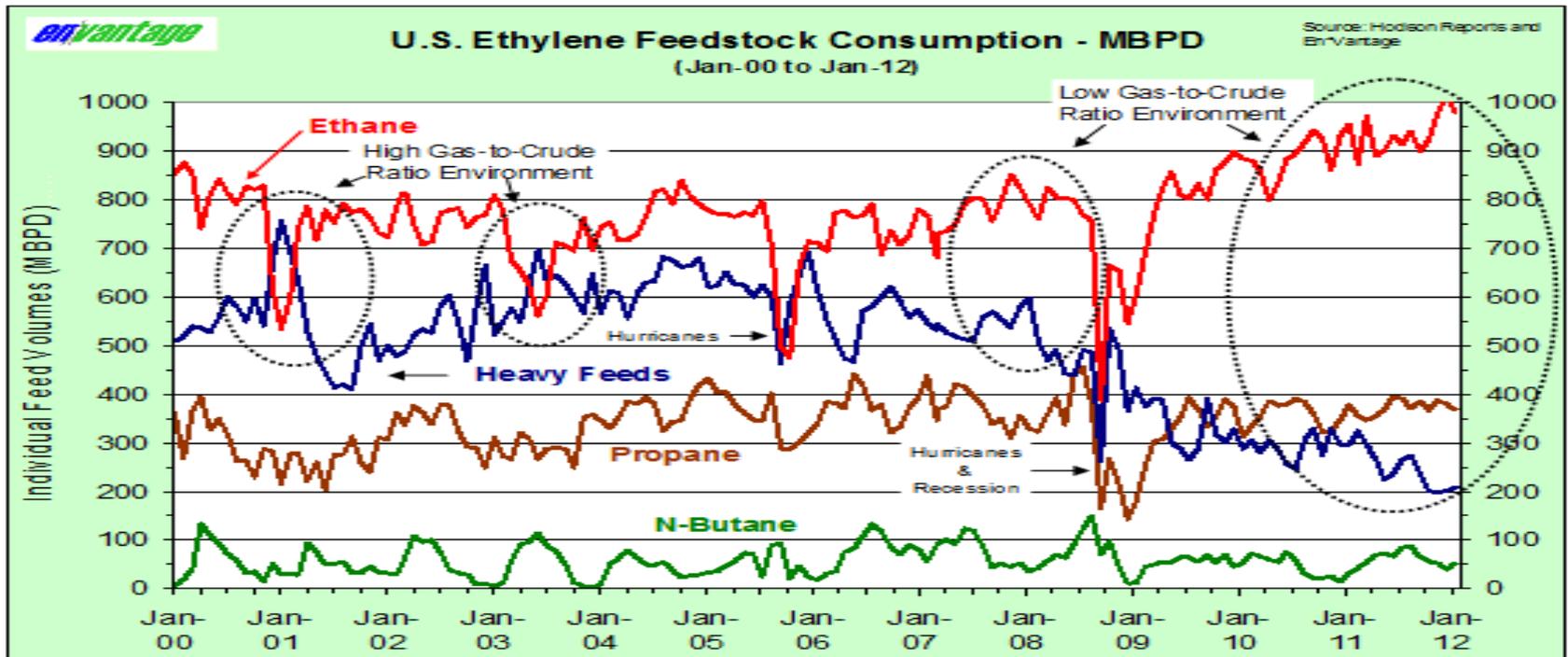


The situation on the ethane side is more established and well documented. Again due to wet shale gas production, ethane extraction capability is expected to increase from 1,000 kbd in 2011 to 1,500 kbd by 2020 as shown in the below chart:



The dynamics of ethane pricing can be simplified as follows: Low gas-to-crude ratio → lowers ethane's price floor → allows the relative market value of ethane to drop and be more competitive with alternative ethylene feedstock → gives the incentive to maximize ethane cracking as ethane extraction grows

This phenomenon is very apparent starting in 2008, which has led to ethane being the preferred petrochemical feedstock, driving its consumption to record levels (see below).



## New world-scale crackers announced or under consideration:

Company	Location	Est. Cap Bn Lb/Yr (kta)	Est. Ethane Cracking Capability (MBPD)	Est. Completion
Formosa	Pt Comfort, TX	1.763 (800)	53	2016
Dow	Freeport, TX	3.300 (1,500)	99	2017
CP Chem	Cedar Bayou, TX	3.300 (1,500)	99	2017
Shell	Western PA	2.600 (1,180)	78	2018
Sasol	Lake Charles, LA	2.646 (1,200)	79	2018
ExxonMobil	Baytown, TX	1500	Announced	2016
<b>Total</b>		<b>7,680 KTA</b>	<b>408 MBPD</b>	

## PDH Plants Gain Momentum in the U.S. \*

Company	Location	Est. Cap (kta)	Status	Est. Completion
PetroLogistics 1	Houston, Tx	550	Under Production	Since Dec 2011
PetroLogistics 2	Houston, Tx	750	Announced	TBA
Dow 1	Freeport, Tx	750	Under FEED	2015
Dow 2	NA	NA	Announced	2018
Formosa	Pt Comfort, TX	600	Announced	2016
Confidential	Texas	TBA	Not Announced	2015
<b>Total</b>		<b>+2,650</b>		

\* Info is as of June 2012.

**THANK YOU**