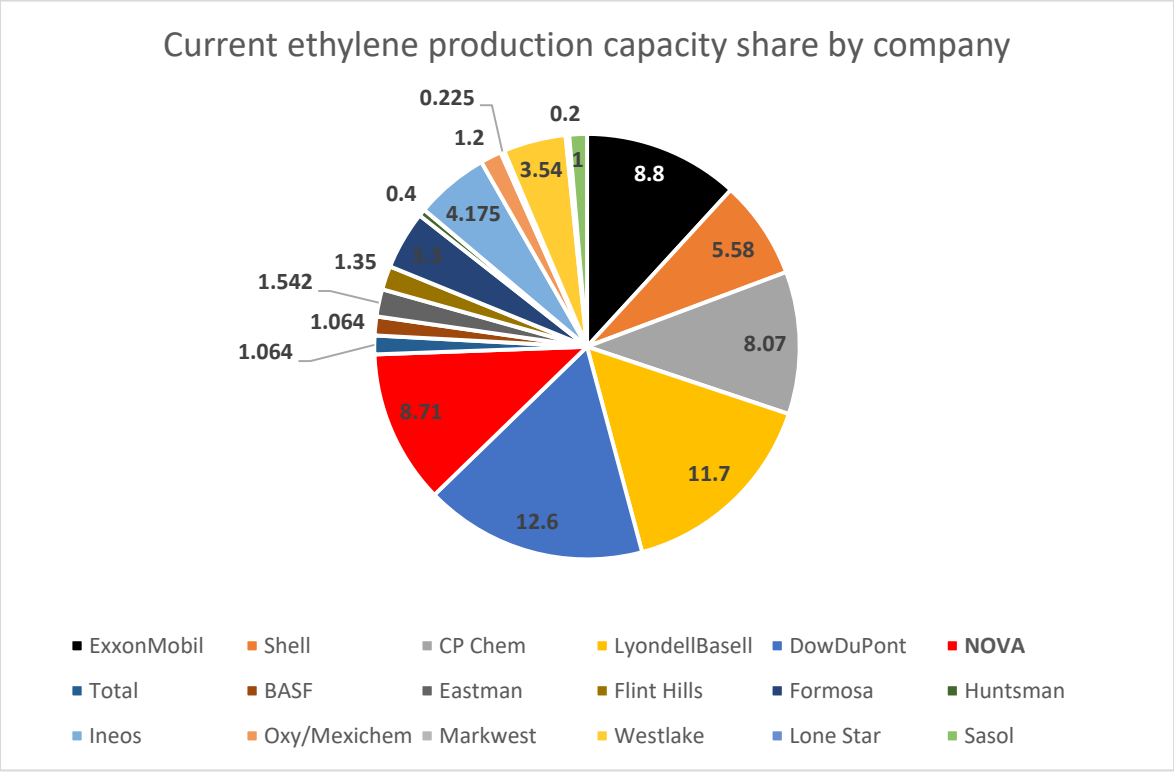
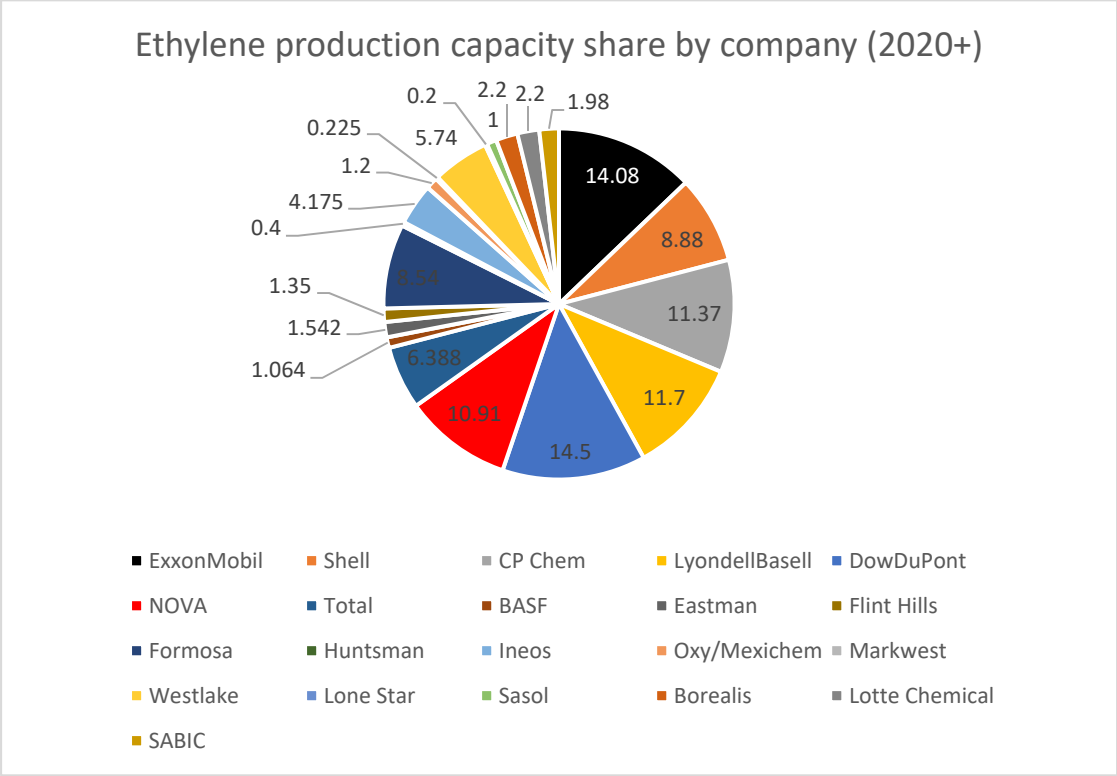
PETROCHEM WIRE FEATURE: Williams Olefins acquisition propels NOVA to 4th largest North American ethylene producer; becomes largest North American ethane consumer

Houston (PCW) -- **NOVA's acquisition of Williams' olefins business makes the company the fourth largest producer of ethylene in North America,** boasting 8.6 billion lbs/yr of capacity between the plants at Geismar, Joffre and Sarnia. At 12.6 billion lbs/yr, the combined DowDuPont assets make it North America's largest ethylene producer (including Dow's interest in the Nova E-3 unit at Joffre), followed by LyondellBasell at 11.7 billion lbs/yr and ExxonMobil at 8.8 billion lbs/yr.

Upon completion of NOVA's future olefins complex with Total and Borealis in 2020, the company would be the fifth largest ethylene producer in North America with its total capacity moving to 10.91 billion lbs/yr, behind DowDuPont at 14.5 billion lbs/yr, ExxonMobil at 14.08 billion lbs/yr, LyondellBasell at 11.7 billion lbs/yr and Chevron Phillips at 11.37 billion lbs/yr. At that time, these **five companies will own 59% of North American ethylene.**



Source: PetroChem Wire Petrochemical Plants Database



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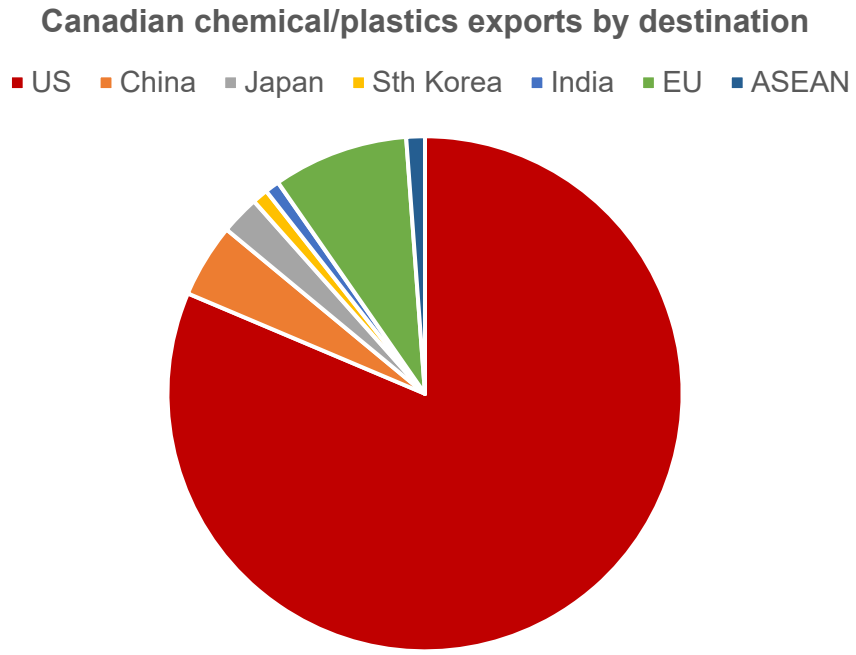
In addition to the 88.46% interest in the olefins plant at Geismar (the remainder still owned by SABIC), **NOVA now controls the operation of one of the two common carriers storage hub for ethylene on the continent.** That hub, formerly known as the Mont Belvieu Williams hub, is owned by Energy Transfer; its long-term lease was a part of the transaction. The other hub is owned by Boardwalk Louisiana Midstream and is located in Choctaw, Louisiana.

An integral part of the US Gulf Coast ethylene pipeline and storage system, the Mont Belvieu hub is only one of two storage caverns sublet not only to ethylene producers and consumers but also to trading companies that have no ethylene-related assets. That unique accessibility to ethylene storage was crucial for the launch of the ethylene futures contract by the CME/NYMEX in 2009.

The deal also includes ethylene storage space leased at the Boardwalk Louisiana Midstream Choctaw hub.

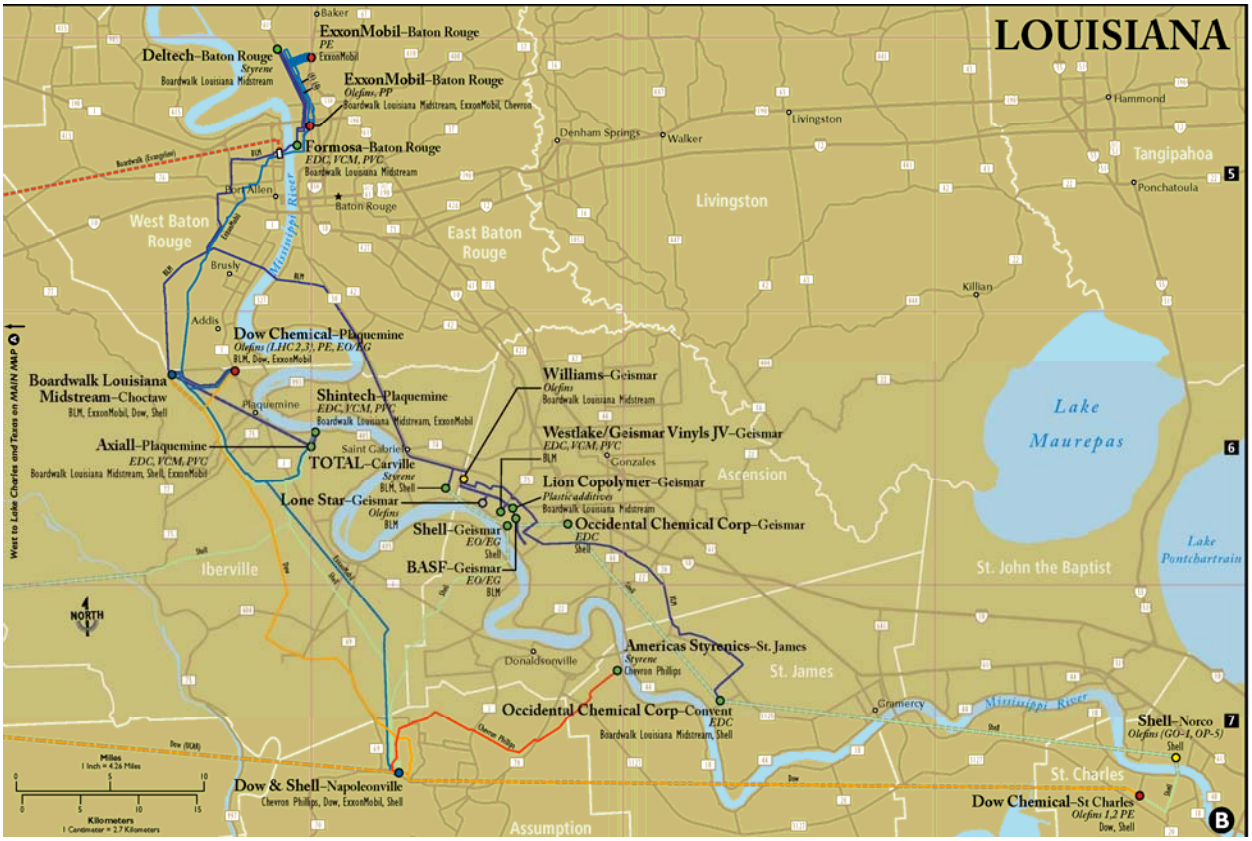
Until this transaction, NOVA's ethylene has been almost exclusively captive to its own polyethylene production, with the exception of supplying an ExxonMobil PE unit at Sarnia and Dow's PE plants units at Alberta (from its JV cracker with Dow). The inclusion of a 523.5 acre tract of land adjacent to the Geismar cracker (with access to the Mississippi River) as part of this transaction has given rise to speculation that NOVA will build a PE plant on the site.



Coming to the Gulf enhances NOVA's ability to export to Asia and Latin America. **Chemicals and plastics currently make up only 10% of overall Canadian exports, of which 81% heads to the US and 10% goes to Asia.**

The US Gulf Coast certainly offers increased optionality to markets to both East and West, while still maintaining attractive netbacks. With crackers located close to well-equipped deepwater ports and pipeline access to those terminals, NOVA certainly ups its export potential to markets beyond the US.

Building a world-scale polyethylene plant to consume ethylene on-site at Geismar could significantly change the overall ethylene balance of Louisiana, where Williams was the largest merchant supplier to surrounding polyethylene, polystyrene, ethylene oxide/glycol and vinyls plants.



Source: PetroChem Wire Maps

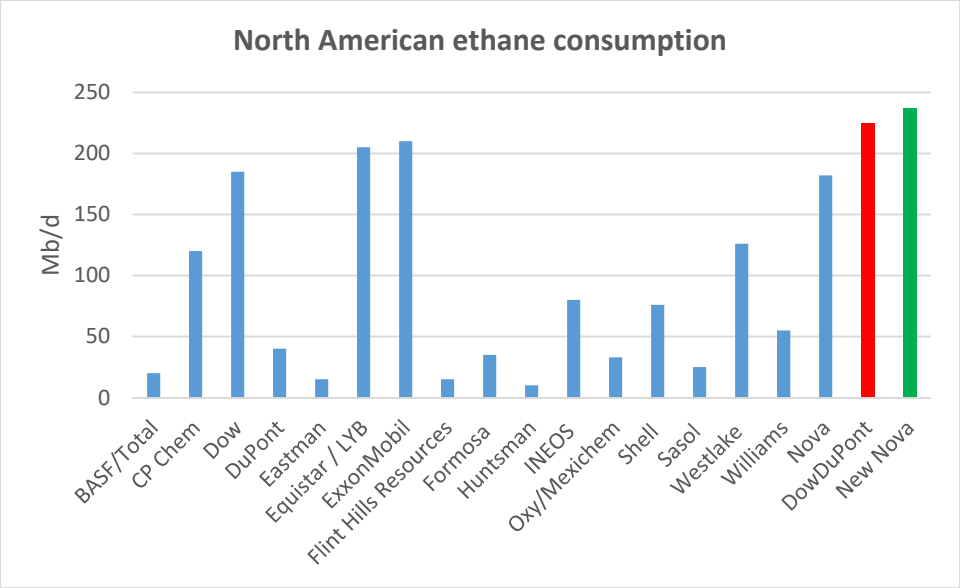
For Williams, the transaction with NOVA also includes agreements with NOVA that creates additional ongoing revenue on the NGLs side, as Williams will continue to supply the Geismar site with feedstocks. Currently, the Geismar plant can consume up to 55,000 b/d of ethane. It also has flexibility to consume propane with the ability to crack 83% ethane and 17% propane.

With the purchase of the Geismar cracker, **Nova will become the largest consumer of ethane in the North American petrochemical sector**, accounting for nearly 16.6% of ethane demand for its facilities in Canada and now Louisiana. Currently, Nova's olefins units consume about 182,000 b/d of ethane and 47,000 b/d of propane at its plants in Corunna, Ontario, and Joffre, Alberta, making it the fourth largest consumer (12.71%) of ethane in the sector behind ExxonMobil, LyondellBasell/Equistar and Dow. This should change yet again by the beginning of the next decade as more crackers come online and place Nova's combined ethane consumption in third place, behind DowDuPont and LyondellBasell.

However, **unlike in most of its Canadian operations, Nova will be purchasing ethane off a pipeline that it does not operate**. In Canada, the company operates the Alberta Ethane Gathering System, the Joffre Feedstock Pipeline and Vantage Pipeline, which moves NGLs to Nova's plants, as well as other petrochemical facilities.

The Alberta line is owned by Veresen, the Joffre system is owned by AltaGas, while Pembina owns Vantage.

For Geismar, **Nova will be purchasing ethane off Williams' Bayou Ethane Pipeline**, which Williams Partners owns, but only operates the Mont Belvieu-Lake Charles leg; Boardwalk Louisiana Midstream operates the line from Lake Charles to Geismar. This situation will be similar to Nova's position as an anchor shipper on Energy Transfer's 50,000 b/d Mariner West pipeline, which moves ethane from Appalachia to Nova's Ontario facilities.



Source: PetroChem Wire Petrochemical Plants Database

Williams obtained a 41.7% stake in the Geismar plant through the equity purchase of Union Texas Petrochemicals in 1999. At the time, the plant was owned by. UTP, BASF and GE Petrochemicals Inc. In 2007, Williams purchased BASF's stake and SABIC purchased GE Petrochemicals' stake. In 2011, Williams committed to a major expansion project for the plant (SABIC did not participate in this project). When the project was completed in 2015, Williams' ownership stake in the plant increased to 88.46%.

The plant was built in 1967 and began producing ethylene in 1968. The plant was operated by Allied Chemical and was a joint venture between Allied, Wyandotte and Marbon. At the time, its ethylene output capacity was 600 million lbs/yr. In 1989, the plant underwent a major expansion, doubling its ethylene capacity. The plant had several debottlenecks during the next 12 years and by 2001 was producing 1.35 billion lbs/yr of ethylene. The 2015 expansion brought its capacity to 1.95 billion lbs/yr.

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Editorial Contacts:

Kathy Hall, Executive Editor
kathy@petrochemwire.com

Samantha Hartke, Managing Editor
samantha@petrochemwire.com

Sales Contact:

Cindy Bryan
cindy@petrochemwire.com

Media inquiries:

Jim Keener
jim@boulderpr.com

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… please e-mail cindy@petrochemwire.com