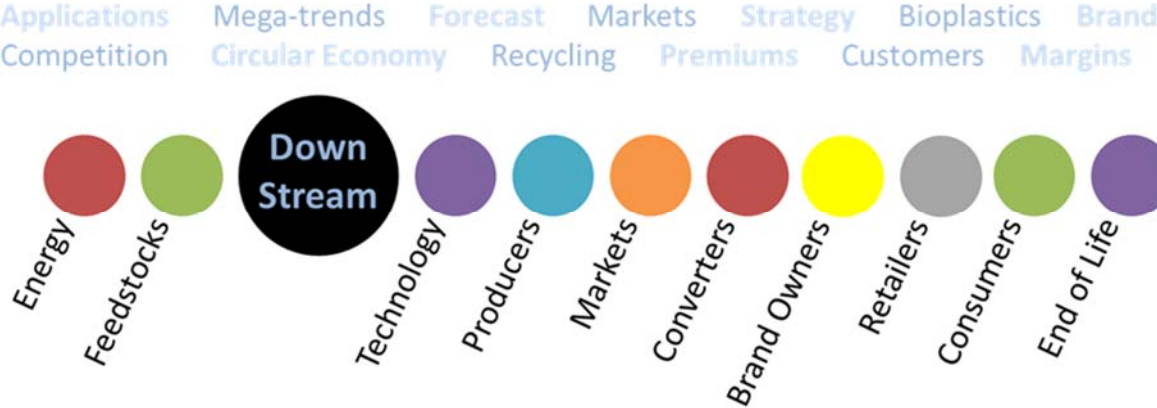


# Feedstock Dynamics - NA Shale Impact

North America’s wave of investment in PE production assets and its effect on spreads globally... it’s a little more than mere capacity additions

January 2018



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## North America's wave of investment in PE production assets and its effect on spreads globally... it's a little more than mere capacity additions

January 19, 2018

Roberto Ribeiro, Marcelo M. Do Valle, Hyejin Kim

The shale gas revolution in the US has given rise to numerous investments in new PE plants in North America in recent years. Beginning in 2017 and continuing through 2019, approximately 6.7 million tonnes of additional PE capacity is expected to come on stream in North America. This is leading to expectations that the rise in supply will be higher than consumption growth, which should bring down resin prices, thereby causing spreads to contract.

In reality however, the equation is not so simple. Plastic market experts at Townsend Solutions (Townsend), Houston based consulting firm have done a thorough analysis - considering not only future prospects, but also historical data to help answer questions about this scenario.

In Townsend's view, there are many other factors that may affect PE prices and their spreads in the future that go beyond the so called "greatest" PE capacity increase of all time in North America. Oil and gas prices and inventories, changes in consumption habits, substitution of other materials, GDP growth, and logistics and transportation costs are just a few among many other variables that contribute to the balance between supply and demand. PE spreads may decline in coming years, but capacity growth will not be the only driver.

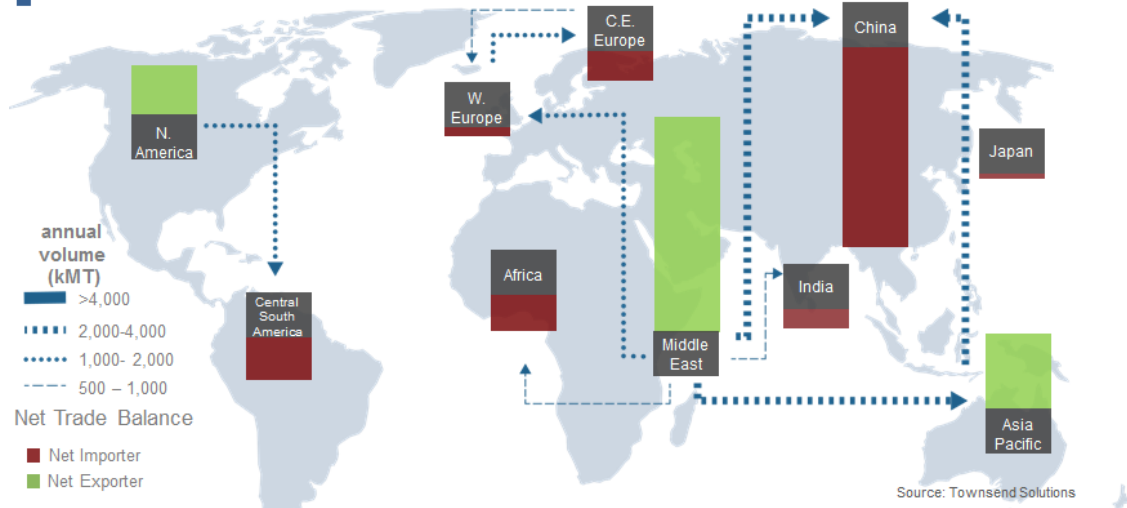
The expansion of capacity predicted over these three years (2017-2019) should add the largest volume of PE in the history of North America when compared to any other time period. However, both the US and global population has also increase, with PE consumption following along. Demand grows substantially every year.

US PE capacity will grow by 21.3%, of which 11.8% will be in HDPE, 20.1% in LDPE, 22.6% in LLDPE and 42.5% in swing plants, providing US swing PE producers with significant operational flexibility according to respond to the changes in demand for both HDPE and LLDPE.

HDPE and LLDPE will be exported in the largest volumes from the US to other countries. American producers will likely seek to maintain healthy margins in the North American market by reducing the volumes available in the region through exporting a portion of these products to South America and other markets. Even with the most competitive prices, foreign companies can still gain market share in Brazil and neighboring countries.

This leads us believe that PE prices in the South American market could be subjected to major downward pressure from US exports and possibly have to adjust to the new market conditions, as indicated in the trade flow map below that depicts material flows forecast for 2021.

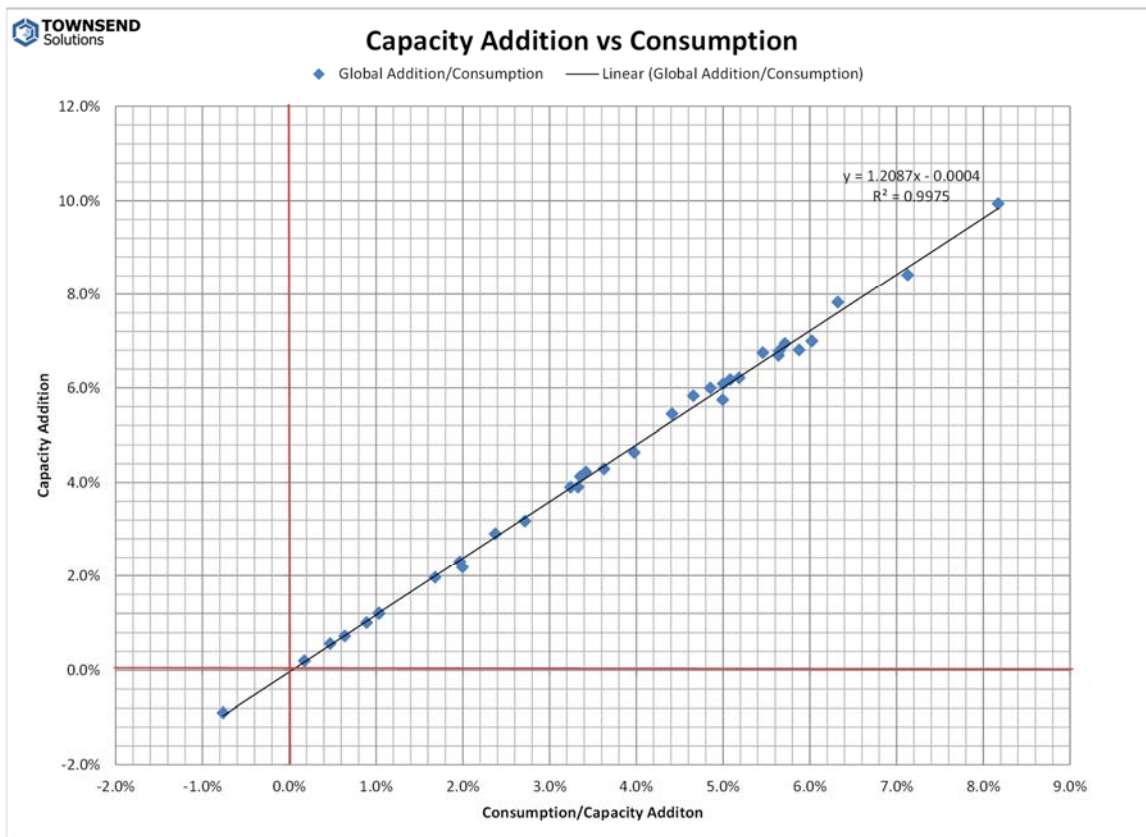
## Major Global PE Trade Flows



The table below shows the capacity additions over the years in relation to total capacity and the capacity additions in relation to total consumption in the world. Keep in mind that there is product trade across all continents.

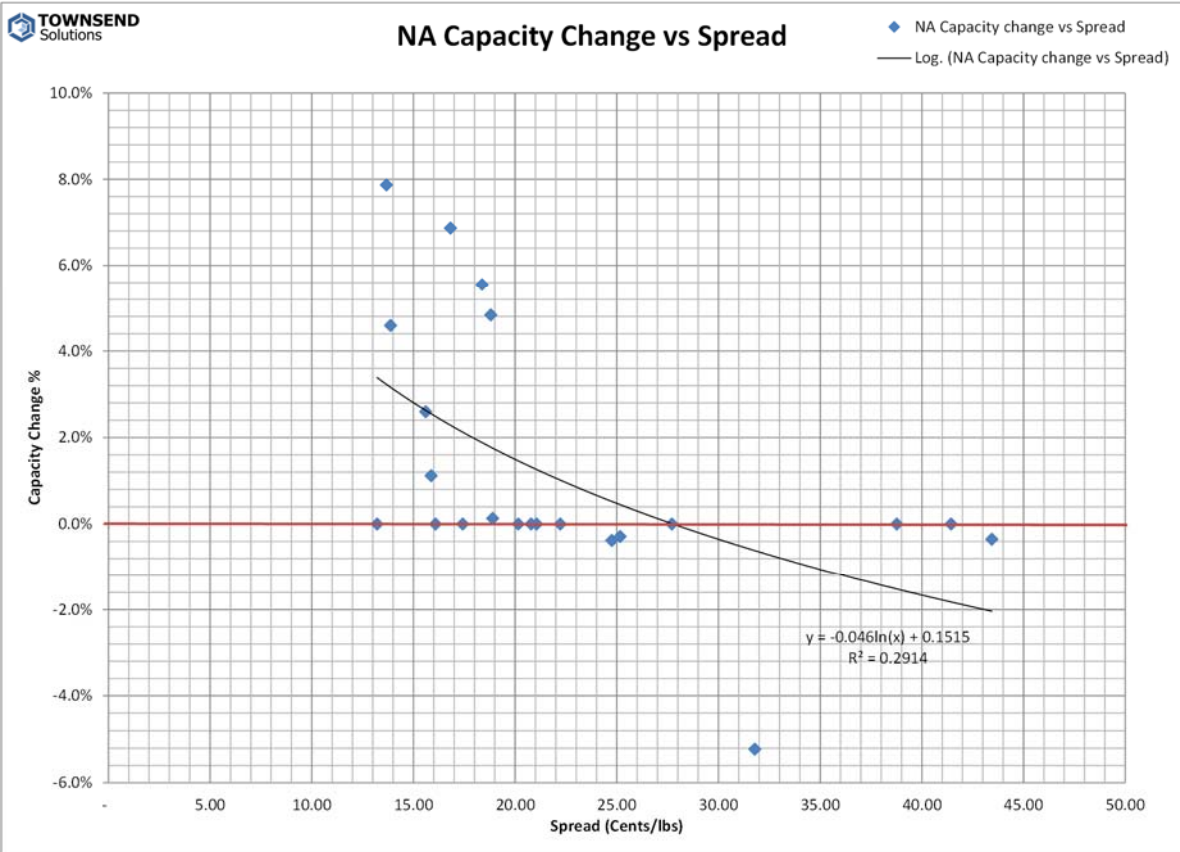
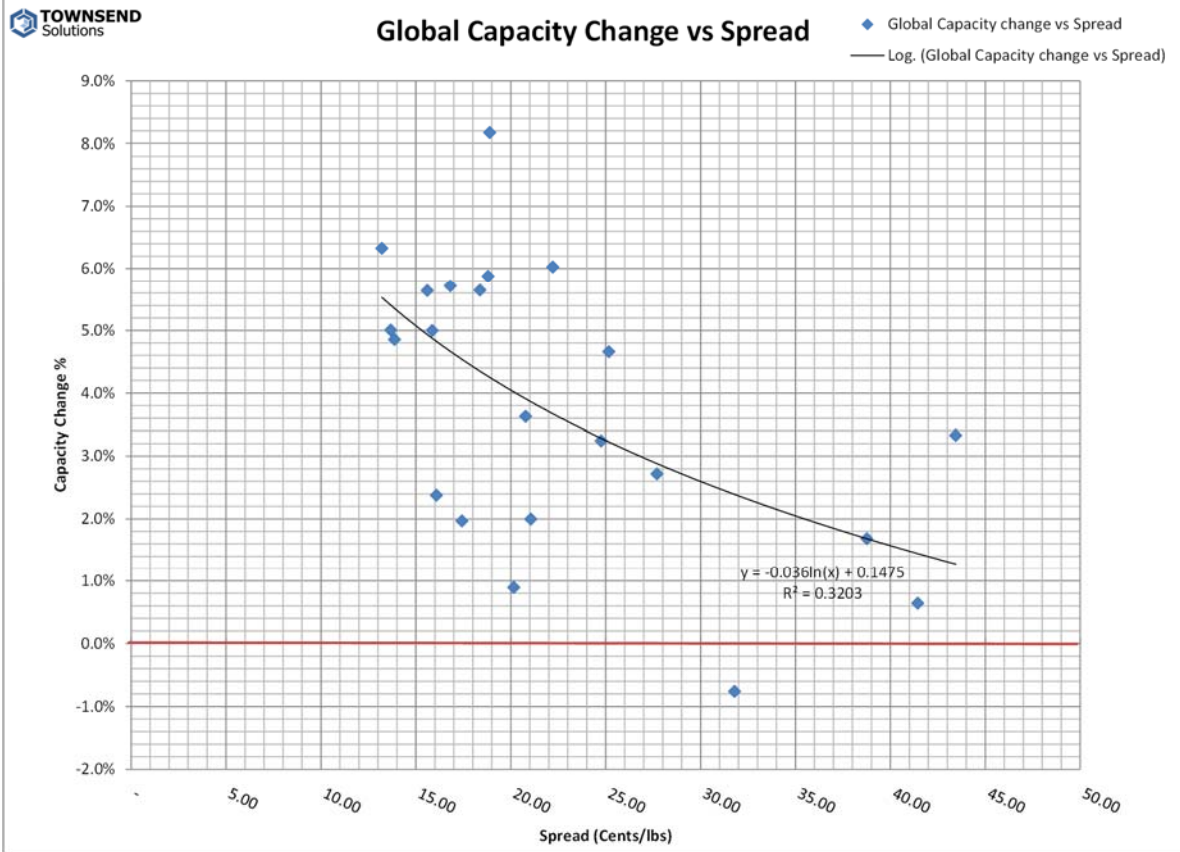
Global PE		
Year	Capacity Addition %	Cap Addition/Cons %
1995	5.6%	6.8%
1996	5.0%	5.7%
<b>1997</b>	<b>5.9%</b>	<b>6.8%</b>
<b>1998</b>	<b>5.7%</b>	<b>6.9%</b>
<b>1999</b>	<b>5.6%</b>	<b>6.7%</b>
<b>2000</b>	<b>5.0%</b>	<b>6.1%</b>
<b>2001</b>	<b>6.3%</b>	<b>7.8%</b>
2002	4.9%	6.0%
2003	2.4%	2.9%
2004	2.0%	2.3%
2005	3.6%	4.3%
2006	0.9%	1.0%
2007	2.0%	2.2%
2008	2.7%	3.2%
2009	3.2%	3.9%
<b>2010</b>	<b>6.0%</b>	<b>7.0%</b>
<b>2011</b>	<b>8.2%</b>	<b>9.9%</b>
2012	4.7%	5.8%
2013	-0.8%	-0.9%
2014	1.7%	2.0%
2015	3.3%	3.9%
2016	0.6%	0.7%
<b>2017</b>	<b>7.1%</b>	<b>8.4%</b>
<b>2018</b>	<b>5.2%</b>	<b>6.2%</b>
<b>2019</b>	<b>5.1%</b>	<b>6.2%</b>

The table clearly demonstrates that capacity growth of similar or even larger proportion has occurred in the past compared to the 2017-2019 period. The graph of “Capacity Addition vs. Consumption” indicates that there is also a similar trend when comparing capacity increases with annual demand. In other words, there is a positive correlation between changes in capacity and consumption with a high R<sup>2</sup> coefficient of 0.99.



The following graphs show the relationship between the capacity increase and the spread globally and in North America, respectively. According to Townsend’s detailed analysis, the volume increase to the global capacity has a negative correlation (R=-0.49) with North American PE spread fluctuations.

This low negative correlation supports Townsend’s view that there are other factors to consider when predicting variations in PE spreads than merely taking into account total capacities as absolute values.



Will PE margins fall? Likely, but Townsend projects the contraction won't be as deep and long as is being projected by other analysts and market observers. Why? Because the dynamics driving a potential decline extend beyond mere capacity addition.

There is a complex combination of market drivers that impact polyethylene pricing spreads. To understand and project what may happen in polyolefins markets it's critical to understand what may occur to any influencer of this business, both up & downstream. Beyond capacity addition a reliable forecast must also consider factors like absolute demand growth, evolution of product slates in reaction to shifting consumer preferences, marketing & sales & pricing strategies, access to overseas markets, production plants in different parts of the world, netbacks and trade. While these forces may seem remotely tied to polyethylene prices, their influence is key to reliably projecting spreads – especially at the local level.

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**About Us**

Townsend Solutions has been an independent provider of market research, analysis and strategic consulting to the global petrochemical industry since 1977. Townsend Solutions is headquartered in Houston Texas, with satellite partners and affiliates worldwide.

With over 40 years of accumulated knowledge and a deep bench of industry experience, our reputation is built on providing highly detailed and specific information, keen analysis & insight. From oil price scenarios to end-use application level data, to granular details on over 60,000 plastic conversion plants, we leverage our depth and expertise to provide knowledge, context and clarity to the industry.

Our clients are oil and gas companies, midstream service providers, petrochemical companies, logistics companies, traders, distributors, equipment manufacturers, compounders, converters, brand owners, financial companies, regulators and other consultants. Our products and services include published reports, databases, grade level resin pricing, cost modeling, due diligence, strategic consulting projects, converter benchmarking, market and customer intelligence.

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- Resin Pricing
- Intelligence
- Surveys

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- Europe
- Middle East
- North America
- South America

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 Heat Stabilizers  
 Impact Modifiers & Processing Aids  
 Light Stabilizers  
 Lubricants/Mold Release Agents  
 Nucleating/Clarifying Agents  
 Organic Peroxides  
 Plasticizers  
 Slip Agents

### 2018 Global Market Studies

Polypropylene (PP)  
 Specialty PP  
 PP Compounding  
 Polyethylene (PE)  
 HDPE Bi-Modal & HMW  
 EVA  
 LLDPE C6/C8 & Metallocene  
 Ethylene Based POP/POE  
 Functionalized Ethylene Copolymers  
 Plastics Additives 9  
 Stabilizer Value Chain  
 PS  
 PVC  
 PET

### Global Supply, Demand, Trade & Forecasts: Polymers

Polypropylene (PP)  
 Specialty PP  
 HMS PP  
 Polyethylene (PE)  
 HDPE, LDPE & LLDPE  
 Bi-modal HDPE  
 HMW HDPE  
 UHMW PE  
 EVA  
 C6/C8 LLDPE  
 mLLDPE  
 POP/POE  
 Functionalized Ethylene Copolymers  
 Bioplastics  
 PS  
 PVC  
 PET

### Monthly Market Pricing & Intelligence

PP Homopolymer  
 PP Copolymer  
 HDPE Extrusion  
 HDPE Molding  
 LDPE  
 EVA  
 LLDPE  
 mLLDPE  
 PET  
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