

North America

Market Drivers, Supply and Demand for PVC

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ihc.com

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HOUSING TRENDS IN THE US

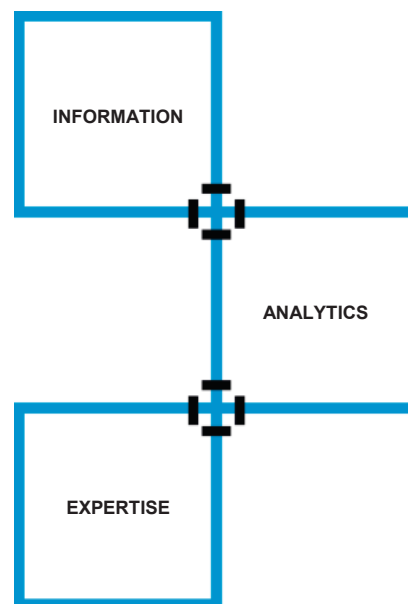
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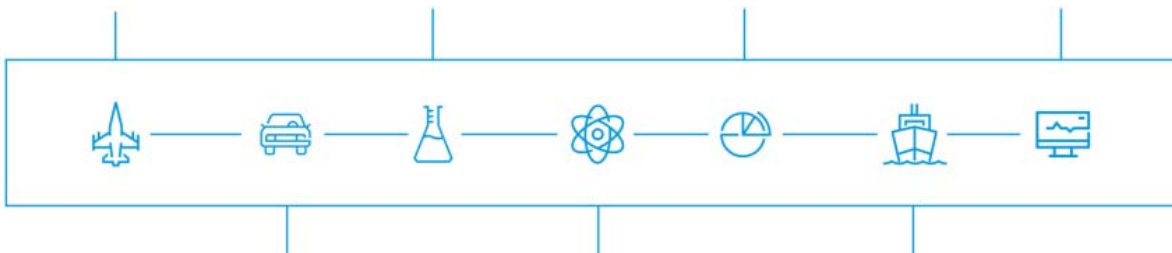
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Economy and Energy

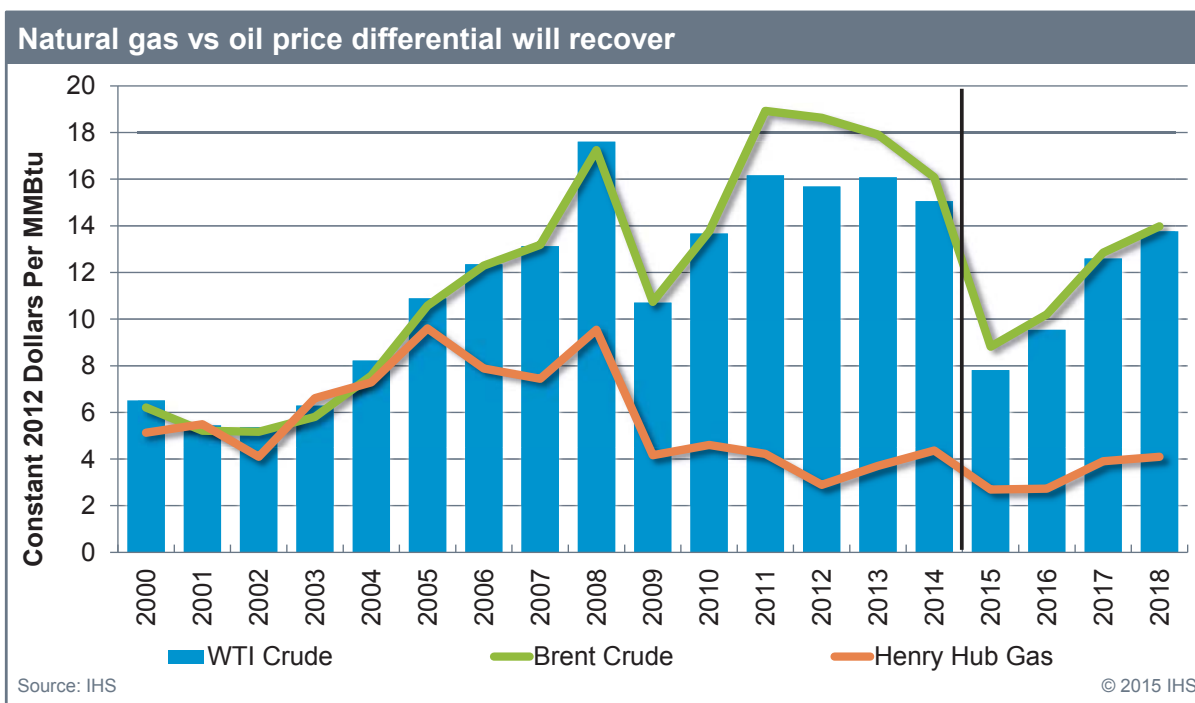
The US economic expansion will continue

- Accelerations in consumer spending and homebuilding, along with continued robust capital spending, will support growth.
- As the largest net importer of crude oil, the United States is a beneficiary of lower oil prices, but oil industry investment will be cut in 2015.
- Consumers will boost spending in response to declining gasoline prices and gains in employment, real disposable income, and net worth.
- The recovery in homebuilding will gain momentum as labor markets improve and credit standards ease.
- Interest rates will rise significantly over the next three years as monetary accommodation is withdrawn. The petrochemical industry is exposed to a global market.

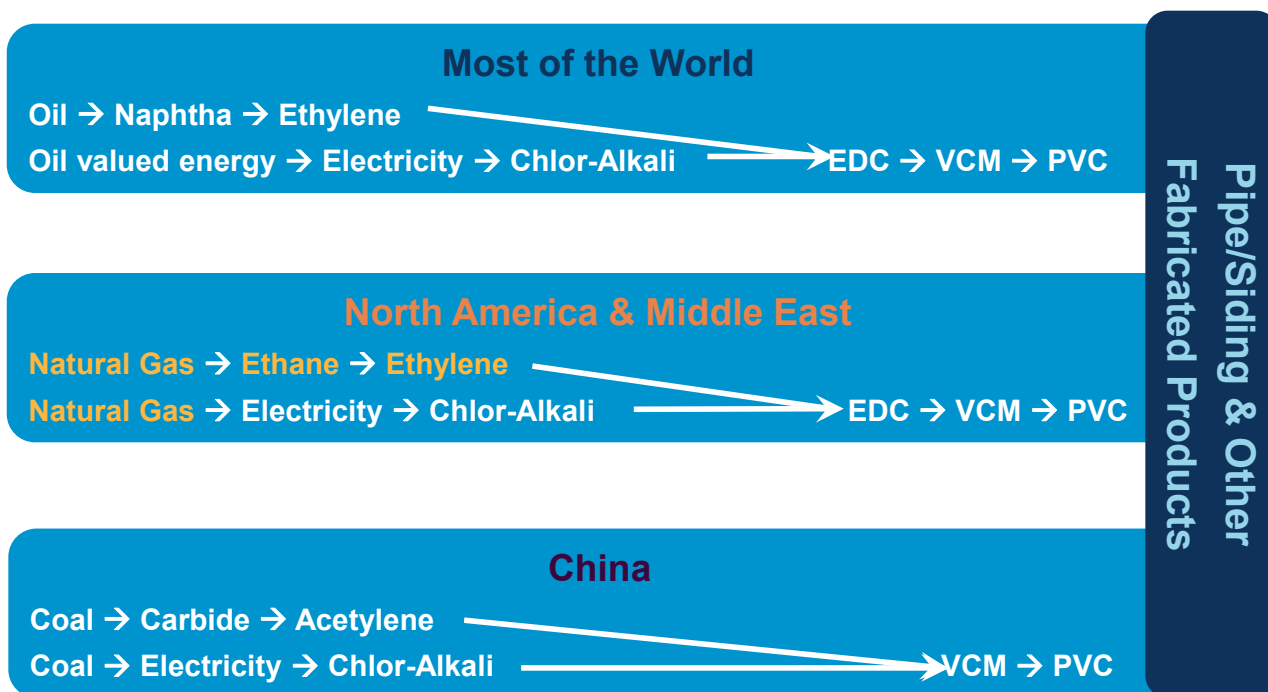
US economic growth by sector

Real GDP and its components			
Percent change	2014	2015	2016
Real GDP	2.4	3.1	2.7
Consumption	2.5	3.4	3.0
Residential investment	1.6	11.1	11.3
Business fixed investment	6.3	4.8	5.4
Federal government	-2.0	-0.3	-0.4
State & local government	0.9	1.2	0.9
Exports	3.2	3.9	3.3
Imports	3.8	5.3	5.6

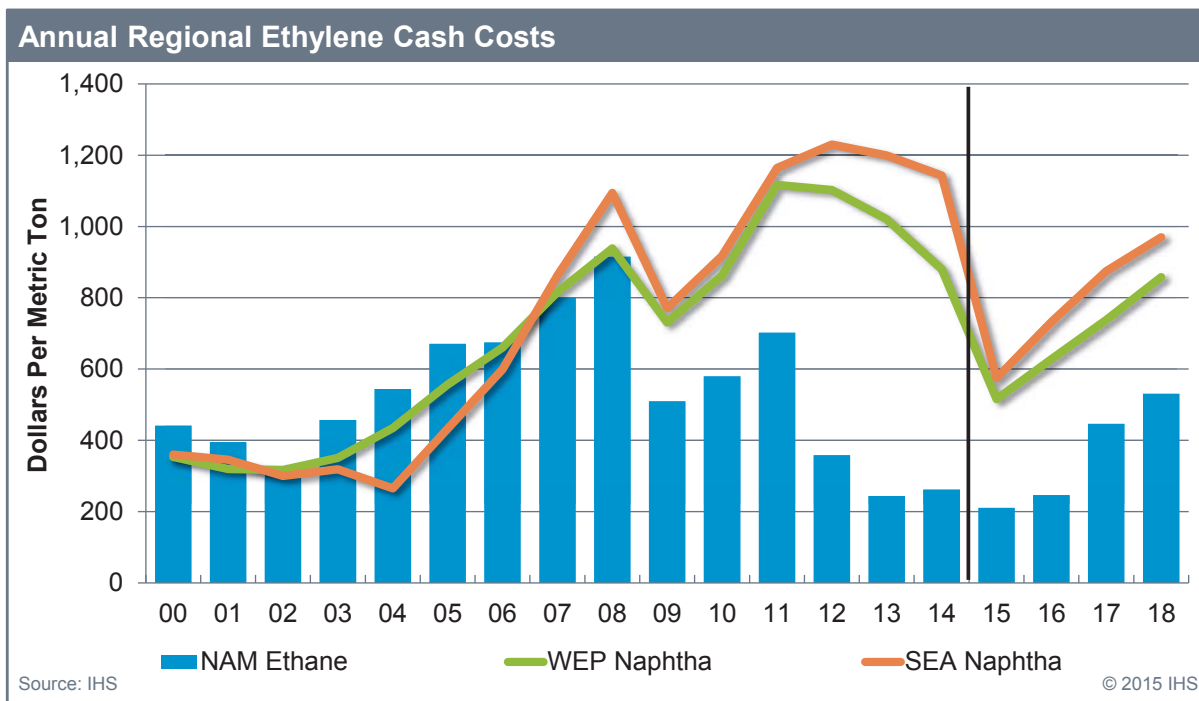
Energy: Global Crude / North American NG



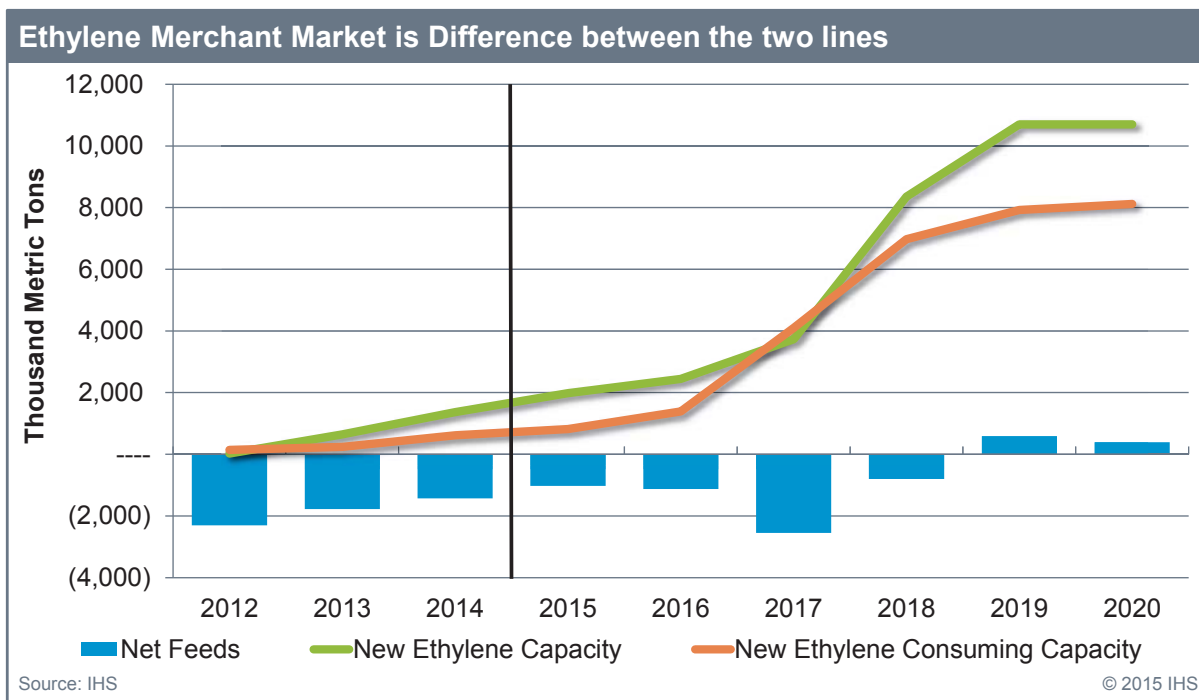
Regional Energy Chain Flows



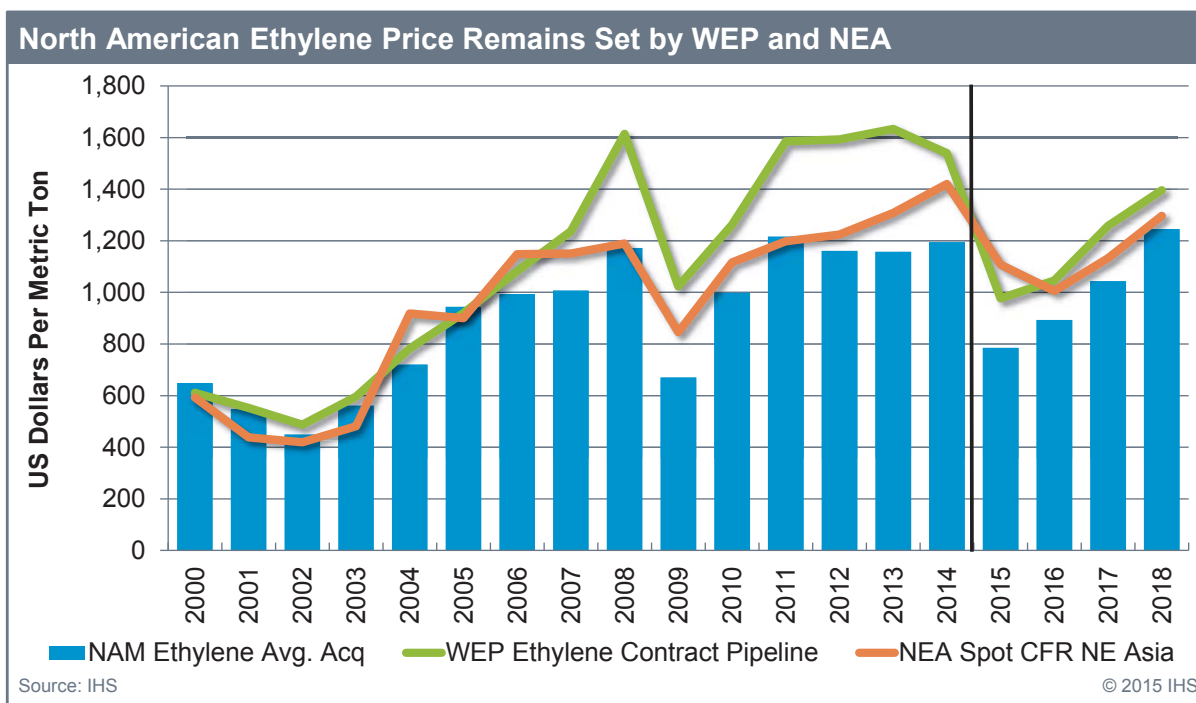
The Great Deflation Drives Naphtha Costs Down



US – Ethylene Capacity Integration



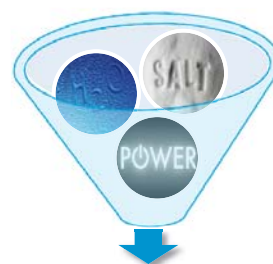
Global Ethylene Prices On Course With Energy



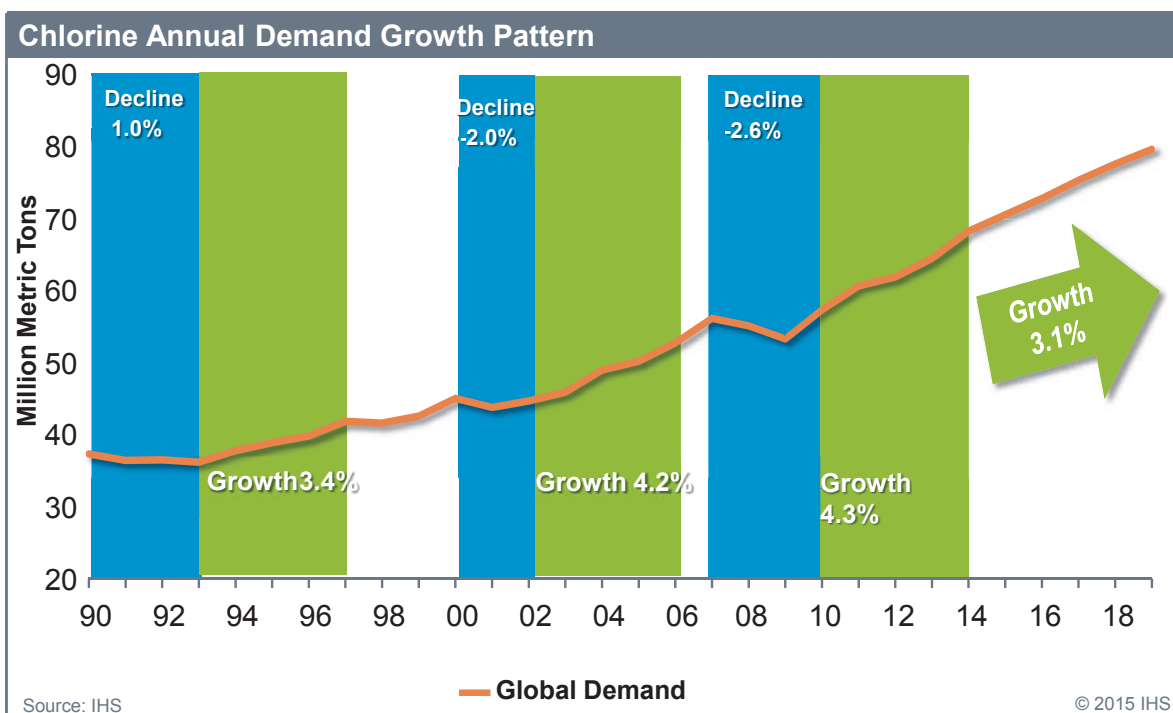
Chlorine

The Chlorine Chemistry

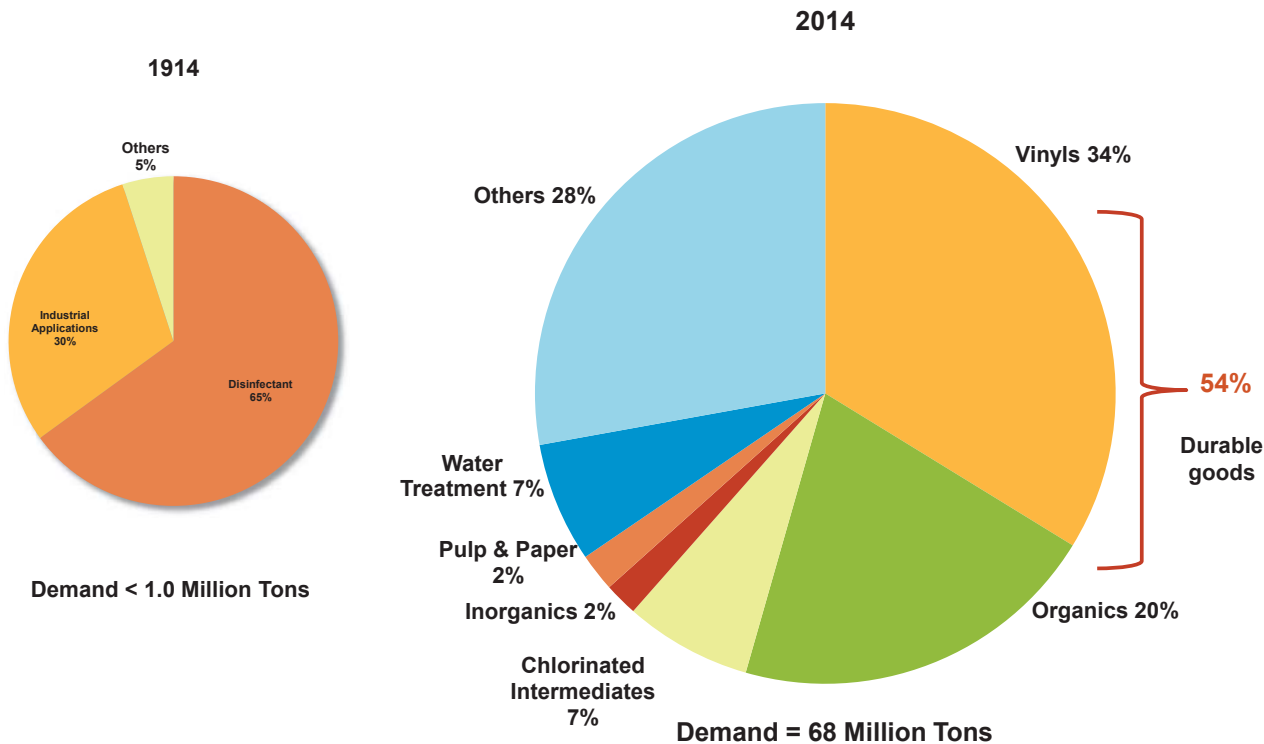
- Discovered in 1774 by Carl W. Scheele
- Is an element on the periodic table.
- Named after the Greek word 'chloros', meaning green-yellow.
- Produced by electrolysis of brine solution with large amount of electricity.
- Major end uses: as an element or intermediate for producing organic molecules such as PVC.



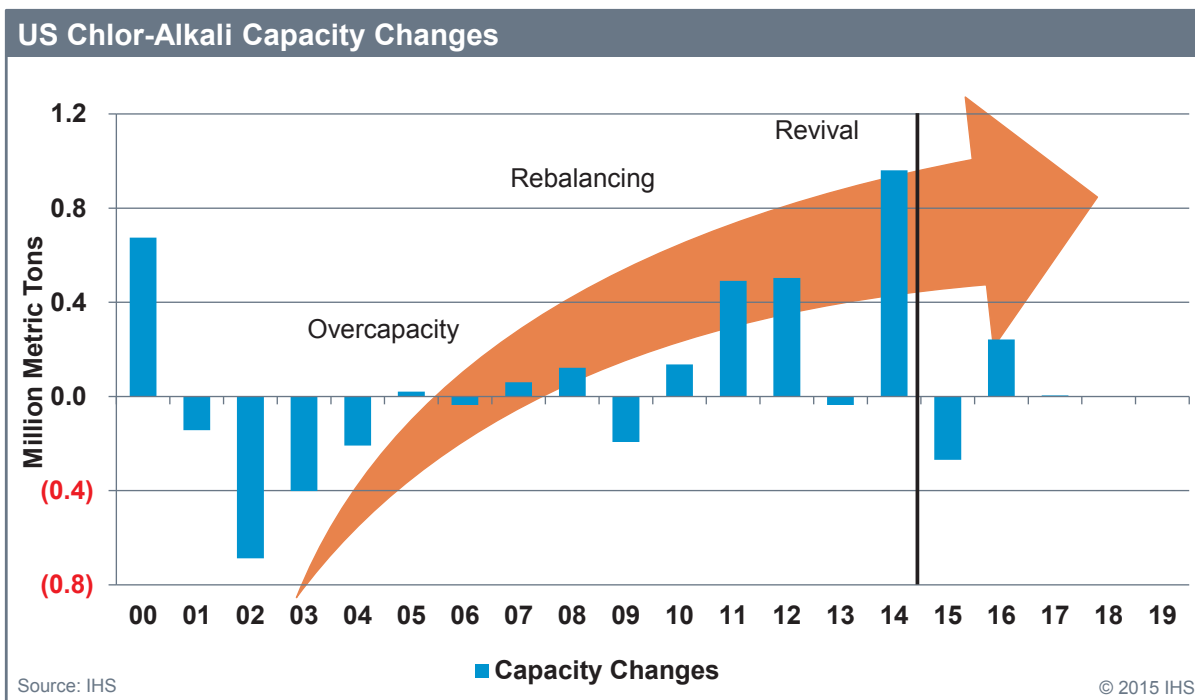
The Boom and Bust Of The Chlorine Cycle



How Has World Demand Changed ?

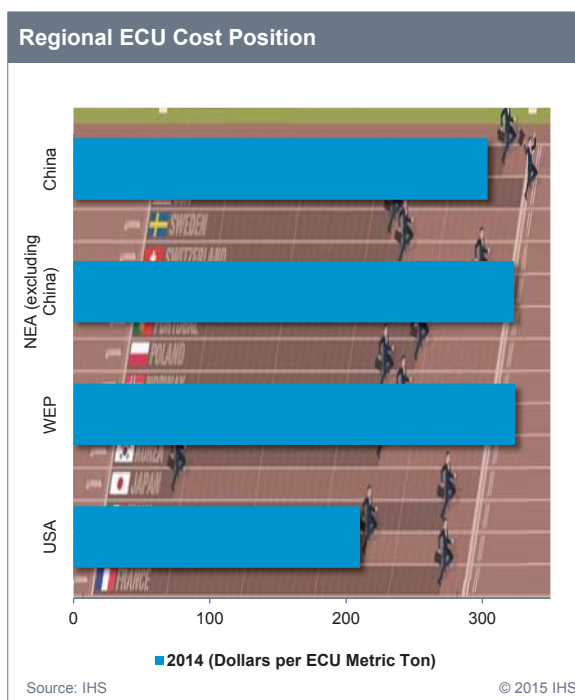


US Revival Supported By Energy Advantage



Bringing It All Together

- North America still stands out as low cost producing region.
- On average, Northeast Asia and West Europe have cash cost above North American producers.
- China position in the middle, marginally lower than average for Northeast Asia.



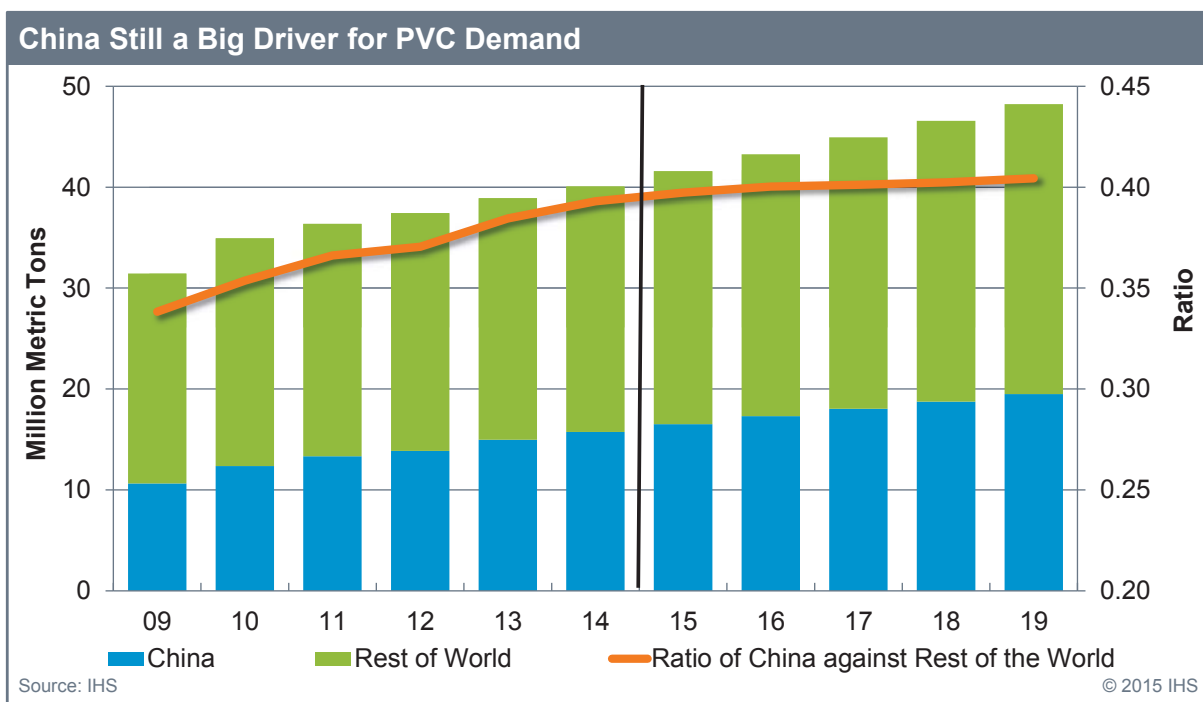
Chlorine Take-Aways

- Chlorine demand growth at trend level amid slowing expansion.
- Rebalancing working its way: North America is still in good position, West Europe should look better in due course, Asia still struggle to get into position
- Beginning of margins recovery for all regions.

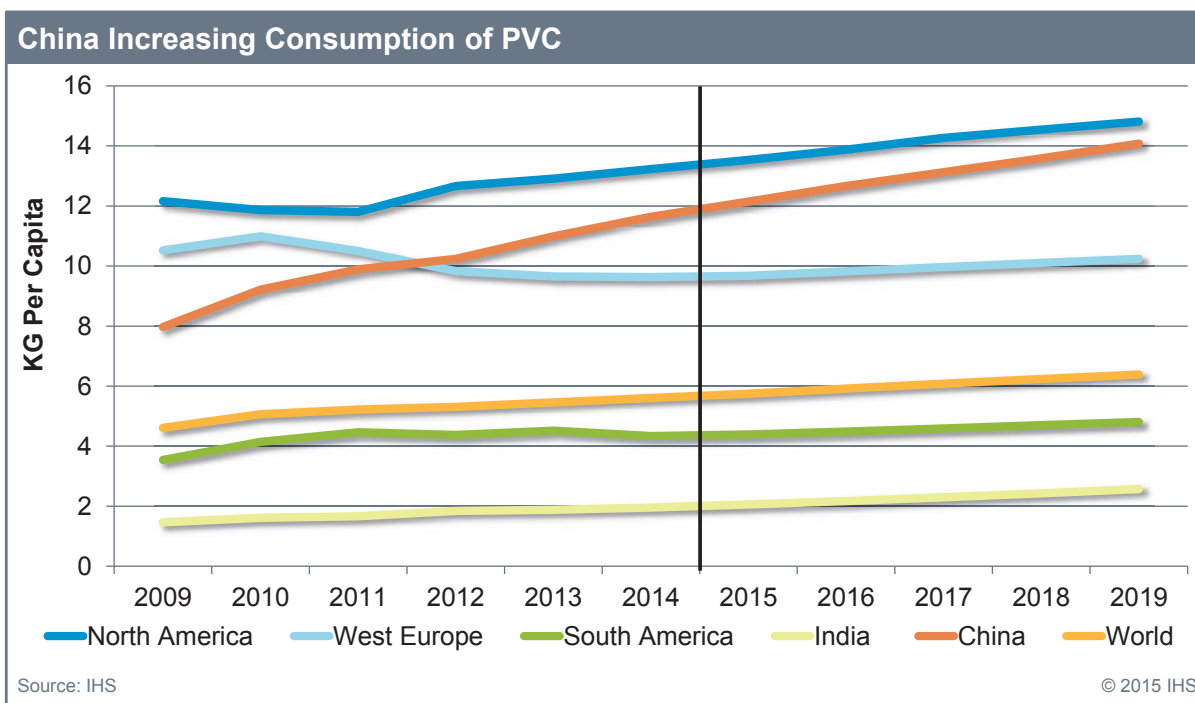


Polyvinyl Chloride

Global PVC Demand Trend



Regional PVC Consumption Per Capita



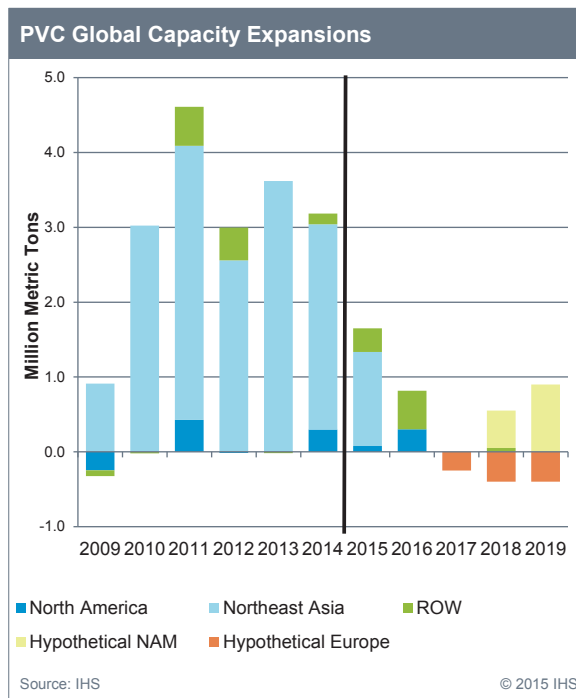
Global PVC: Planned Capacity Additions

Capacity Expansions

Producer	Timing	Capacity (-000- MT)
Many in China	2015	1257
RusVinyl	2015	256
Shintech	2016	300
Trust Chem Ind.	2016	200

Source: IHS

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Main Regional PVC Issues – Short Term

• West Europe

- Tight PVC supply due to operational constraints.
- Underlying demand is better.
- Export netbacks are attractive as a result of lower ethylene.
- Annual demand growth rate of ~1%.

• Asia

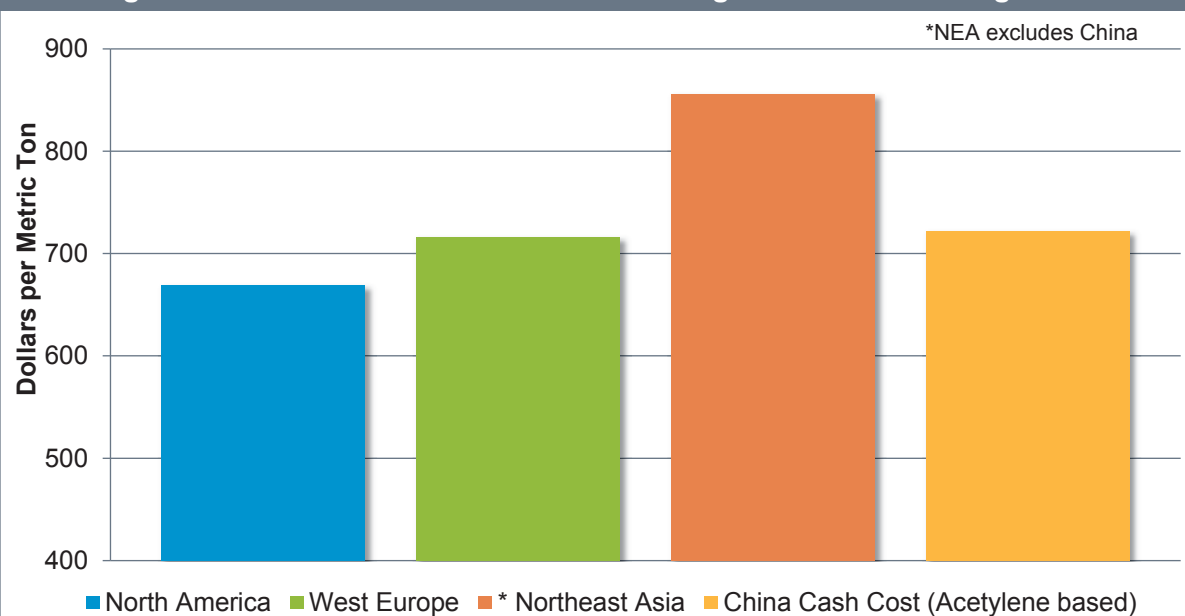
- Strong demand recovery in India.
- Sluggish demand in the rest of Asia.
- Market on an upward trend but losing momentum.
- Chinese carbide-based PVC exports will re-emerge when price recovers.

• North America

- Announced price increases for Q1 and Q2.
- Producers reducing exports to supply their domestic customers.
- Domestic demand looks positive for the next several years.
- Adequate ethylene supply restored.

Currency Appreciation Plus Energy Swings Can Change the Competitive Landscape

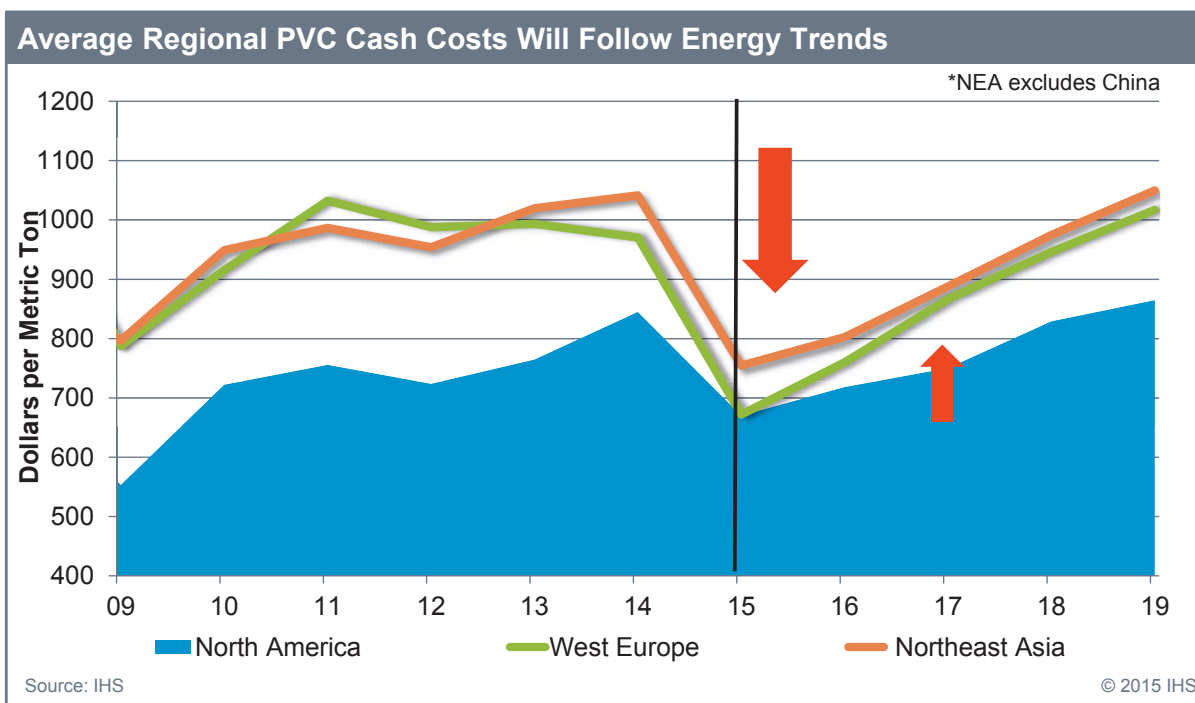
2015 Regional PVC Cash Costs – Chlor-Alkali Integrated Asset Sharing Method



Source: IHS

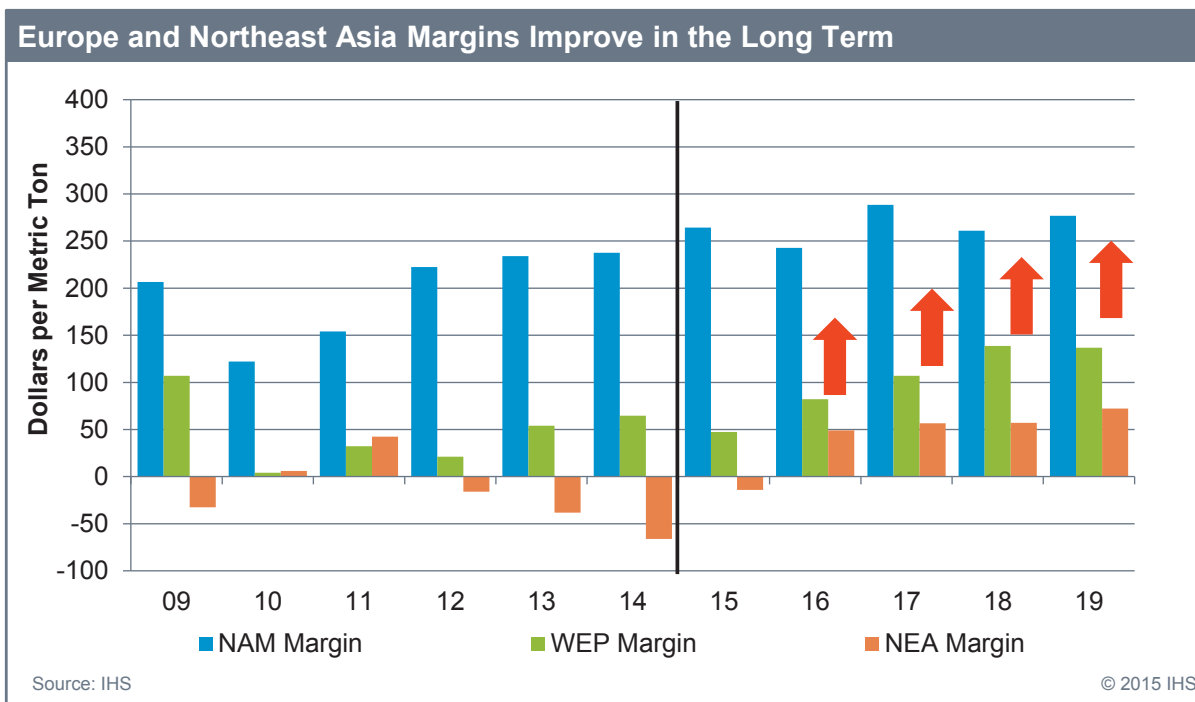
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Regional PVC Cash Costs Converge in 2015



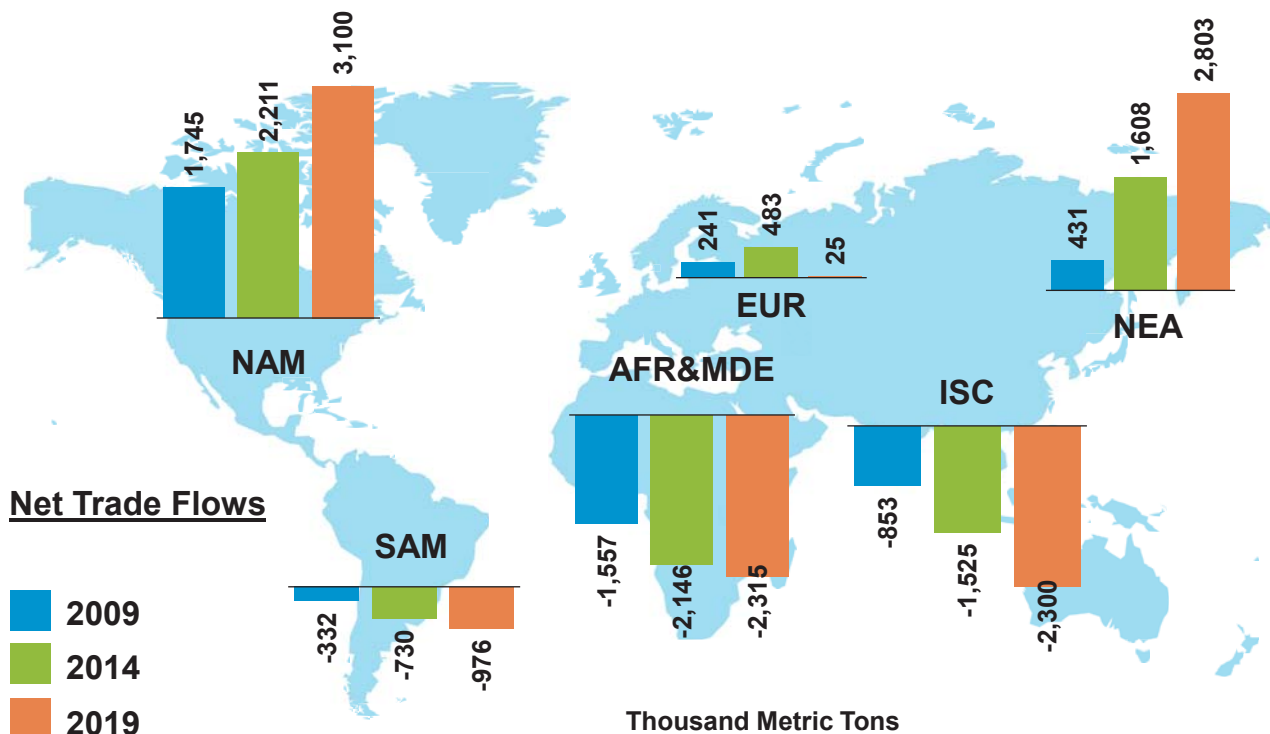
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PVC Margins Get a Boost

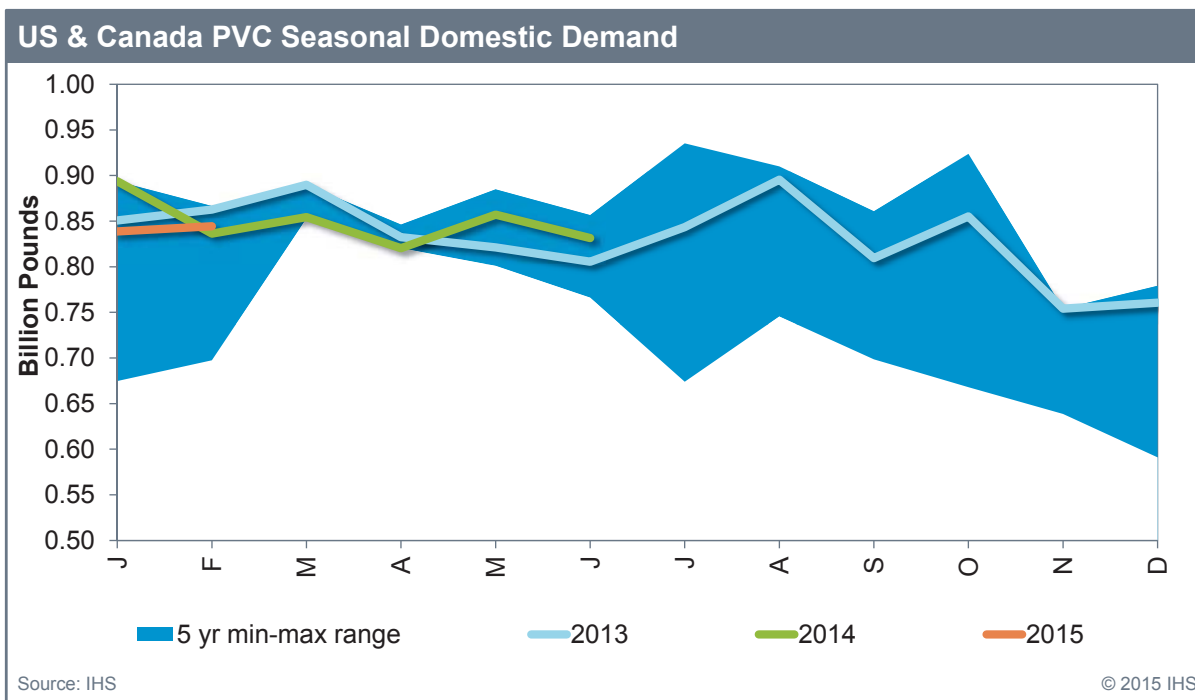


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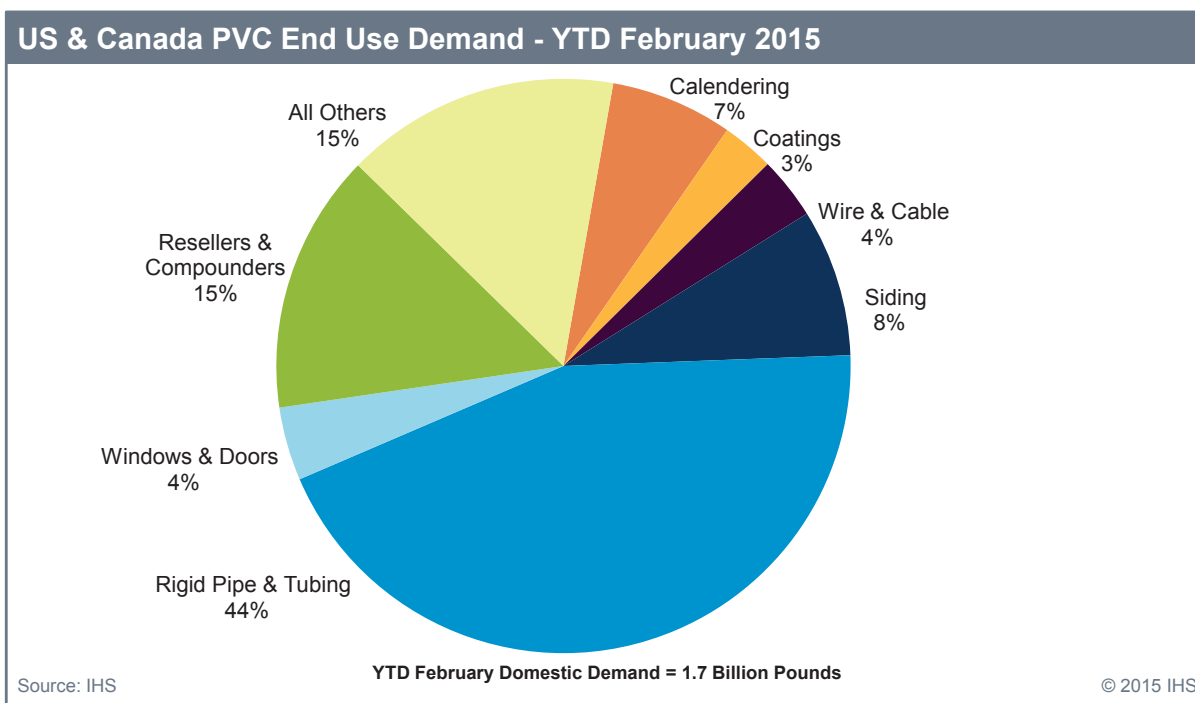
Global PVC Net Trade



There is Domestic Demand Growth Potential in North America For PVC



PVC Demand by Conversion Process



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North America PVC By The Numbers

US & Canada PVC Scoreboard

2013-2015

(Million Pounds)

Market Factor	2013	2014	Forecast	% Change	
			2015	13-14	14-15
Capacity	17,730	17,831	17,979	0.6	0.8
Supply*	15,560	15,214	15,653	(2.2)	2.9
Domestic Demand	10,248	10,516	10,823	2.6	2.9
Export Sales	5,275	4,739	4,830	(10.2)	1.9
Total Sales	15,523	15,254	15,653	(1.7)	2.6
Operating Rate, %	86.7	84.3	86.1		

* Includes Imports

Source: IHS

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North America: US Housing Market In Recovery

US Housing Market Scoreboard

	Feb-15	Jan-15	Feb-14	% Change	
				M/M	Y/Y
Thousand Units, SAAR					
Housing Starts	897	1,081	928	(17.0)	(3.3)
Building Permits	1,092	1,060	1,014	3.0	7.7
Housing Completions	850	986	866	(13.8)	(1.8)
Million US\$, SAAR					
Total Construction Spending	967,170	967,930	947,088	(0.1)	2.1
Private Residential Construction	349,852	350,469	357,267	(0.2)	(2.1)

Source: US Census Bureau

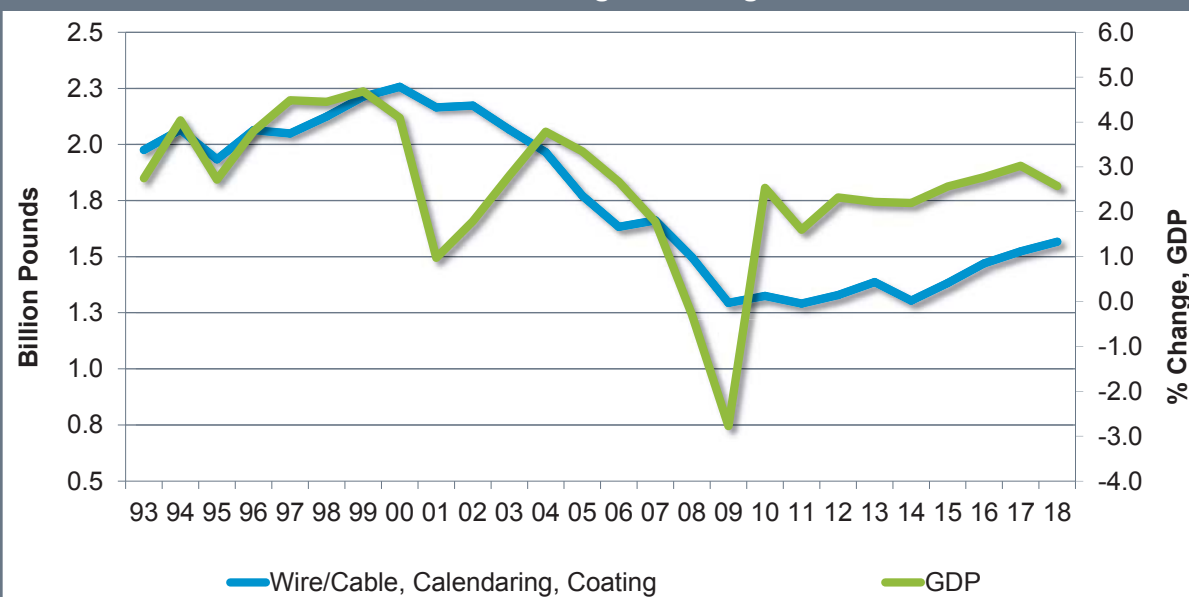
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The Traditional Demand Pattern Strengthens

PVC Demand into Wire/Cable, Calendering & Coating vs. GDP



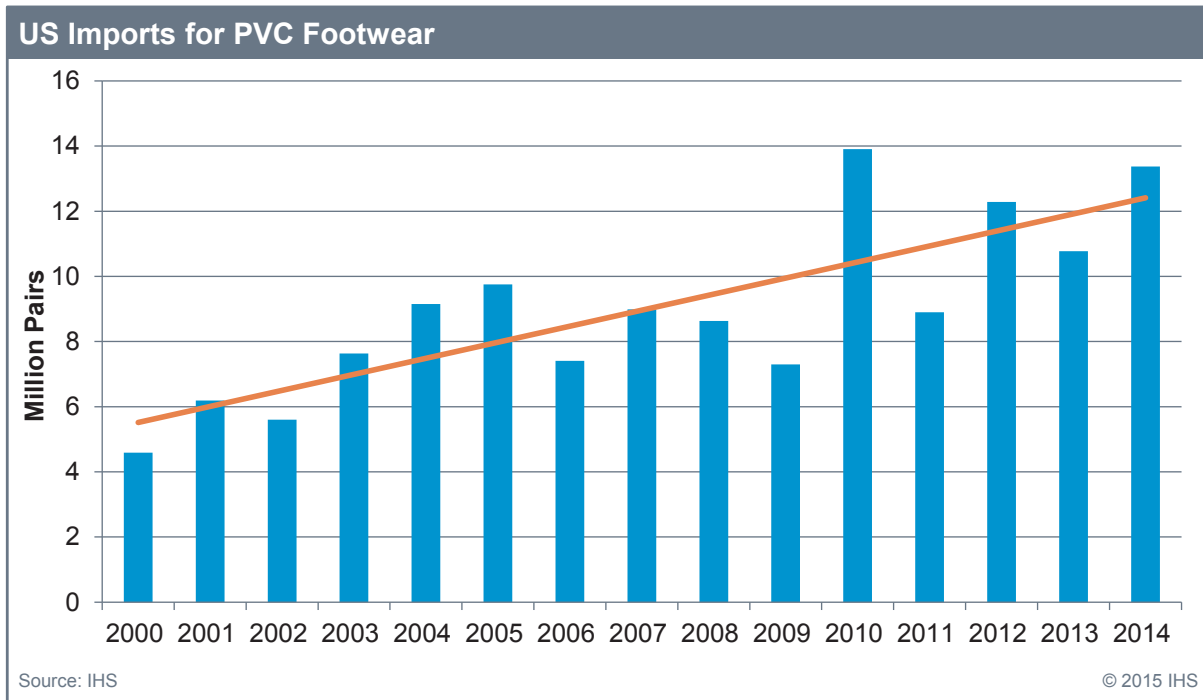
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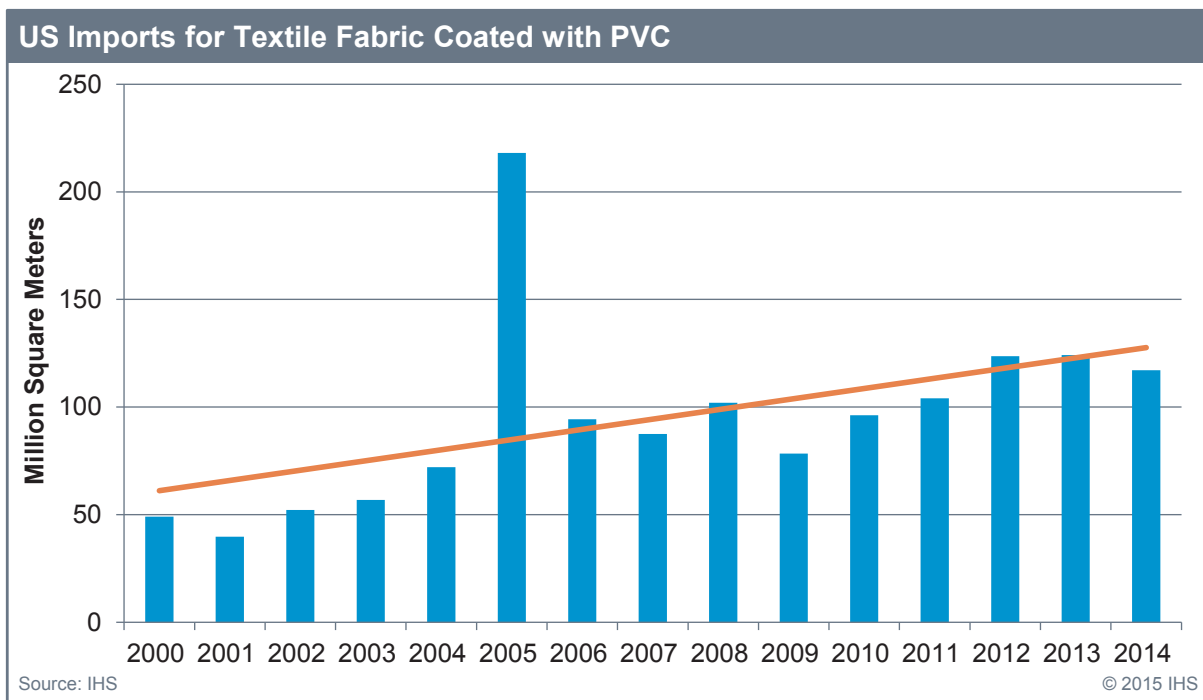
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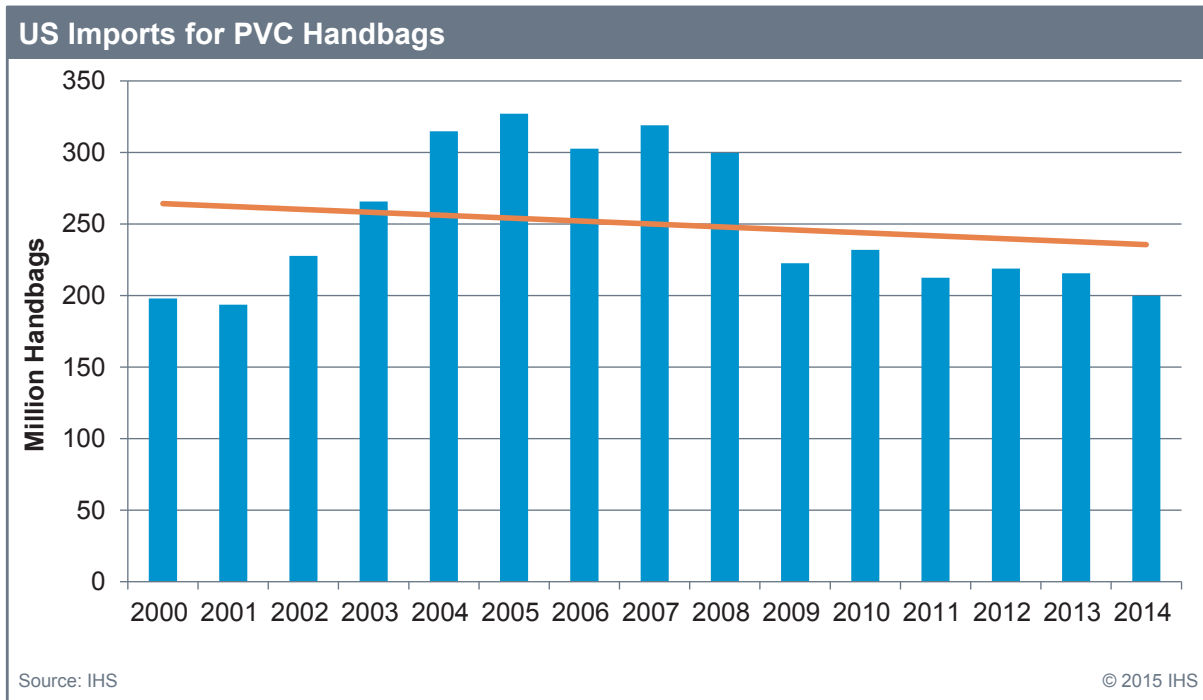
Finished Products Trade Trends



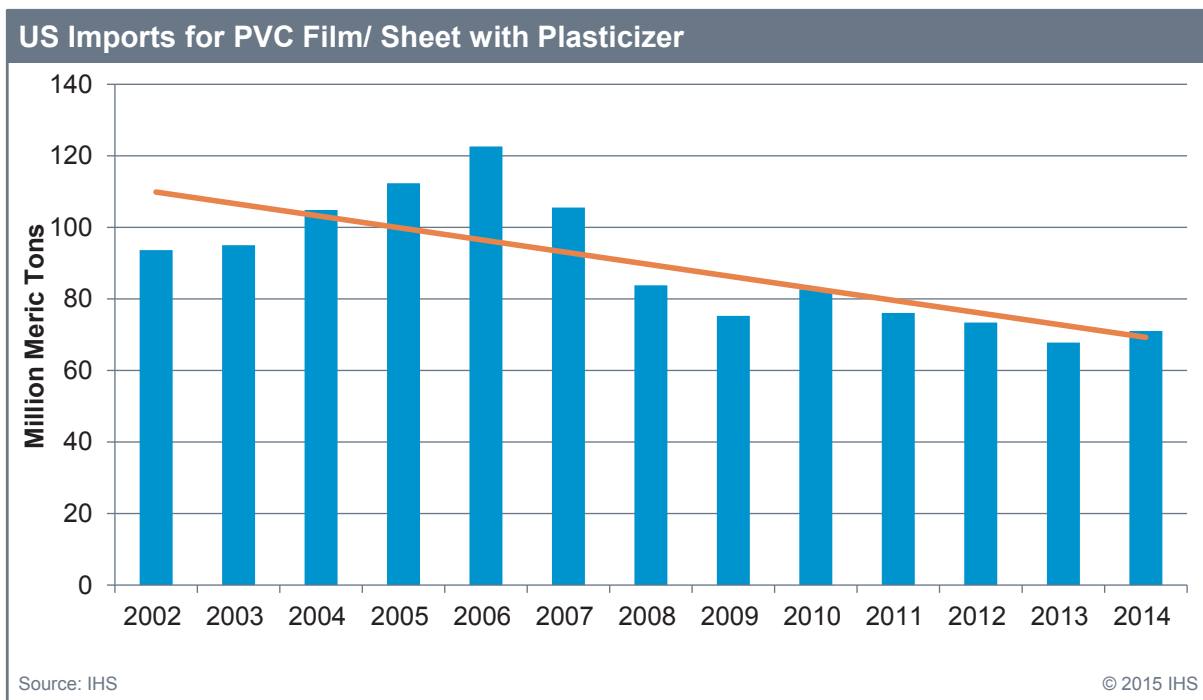
Textile Imports Compete With Domestic Product



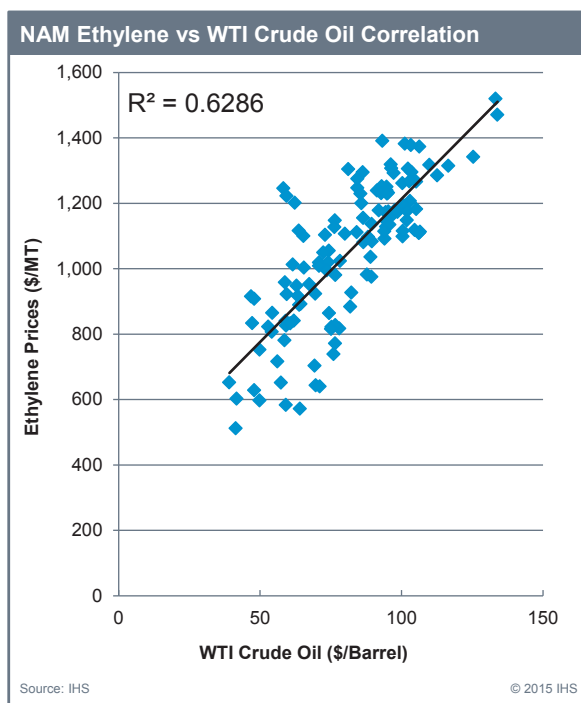
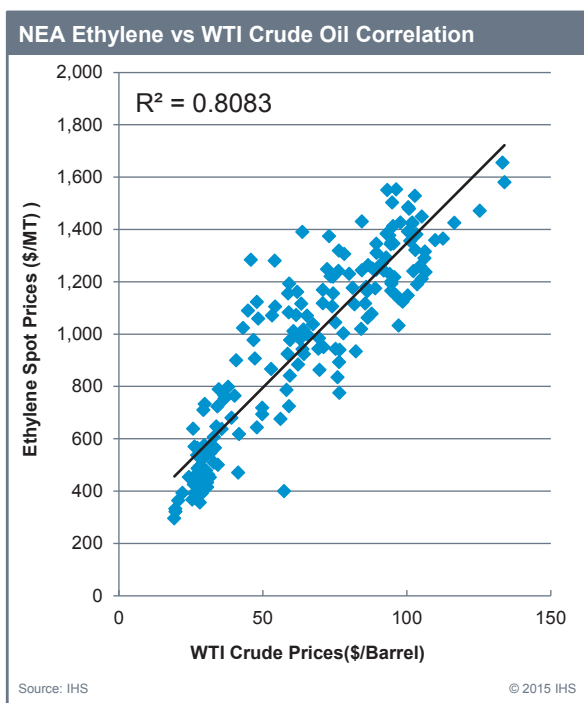
But Not In Every Buying Sector...



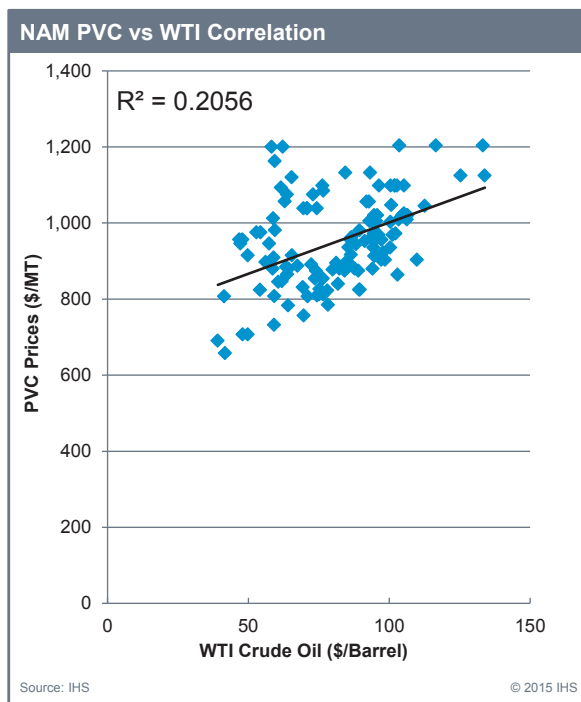
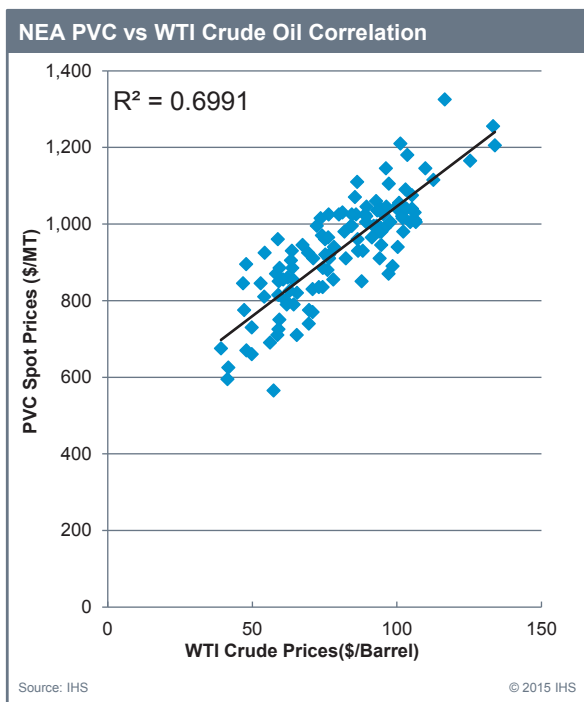
Other Finished Product Import Demand



High Correlation Between Crude Oil & Ethylene

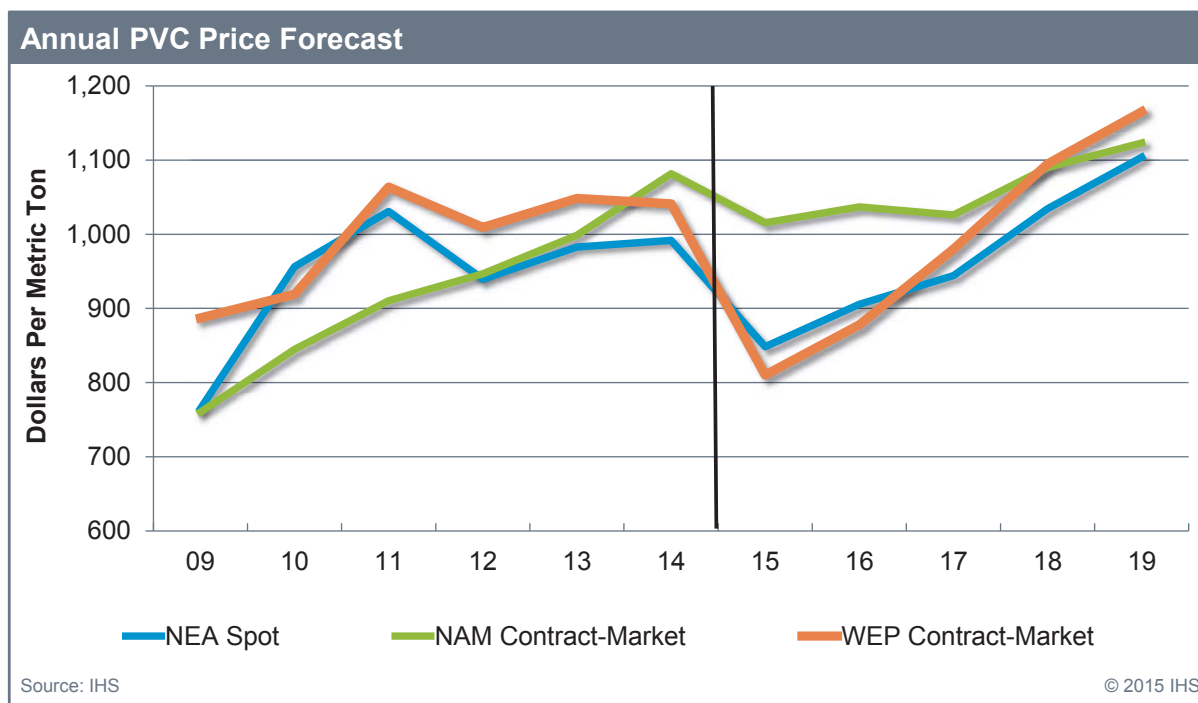


The Correlation Dilutes Downstream in PVC



What Can We Expect For The Future?

Regional Netback Comparison After Discounts and Delivery



North America PVC Resin Outlook

Rest of 2015

- Stable ethylene market ahead.
- Supply/demand fundamentals to play key role in price negotiations.
- Resin producers will try to keep PVC market balanced with exports.
- Continued strength anticipated in the housing market.

2016

- Increasing cash cost for ethylene may pressure PVC prices through the year.
- Supply/demand fundamentals to play key role in price negotiations.
- New PVC capacity coming on line.
- Continued strength anticipated in the US housing market.

Key Take Aways



- North America advantaged cash cost position continues for PVC, however currency appreciation in combination with the energy swing have changed the competitive landscape in the short term.
- Ethylene availability is key for vinyl capacity expansions in the future for non integrated producers.
- Domestic demand in North America will continue to grow hand in hand with activity mainly in the construction market.

PVC Demand in North America is Doing Better Than Before

Thank you.

Q&A

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