argusmedia.com

Energy and commodity price benchmarking and market insights

London, Houston, Washington, New York, Portland, Calgary, Santiago, Bogota, Rio de Janeiro, Singapore, Beijing, Tokyo, Sydney, Dubai, Moscow, Astana, Kiev, Porto and Johannesburg

illuminating the markets

Argus FMB Sulphur Outlook

Fertilizer Outlook and Technology Conference – Philadelphia, Pennsylvania

Fiona Boyd

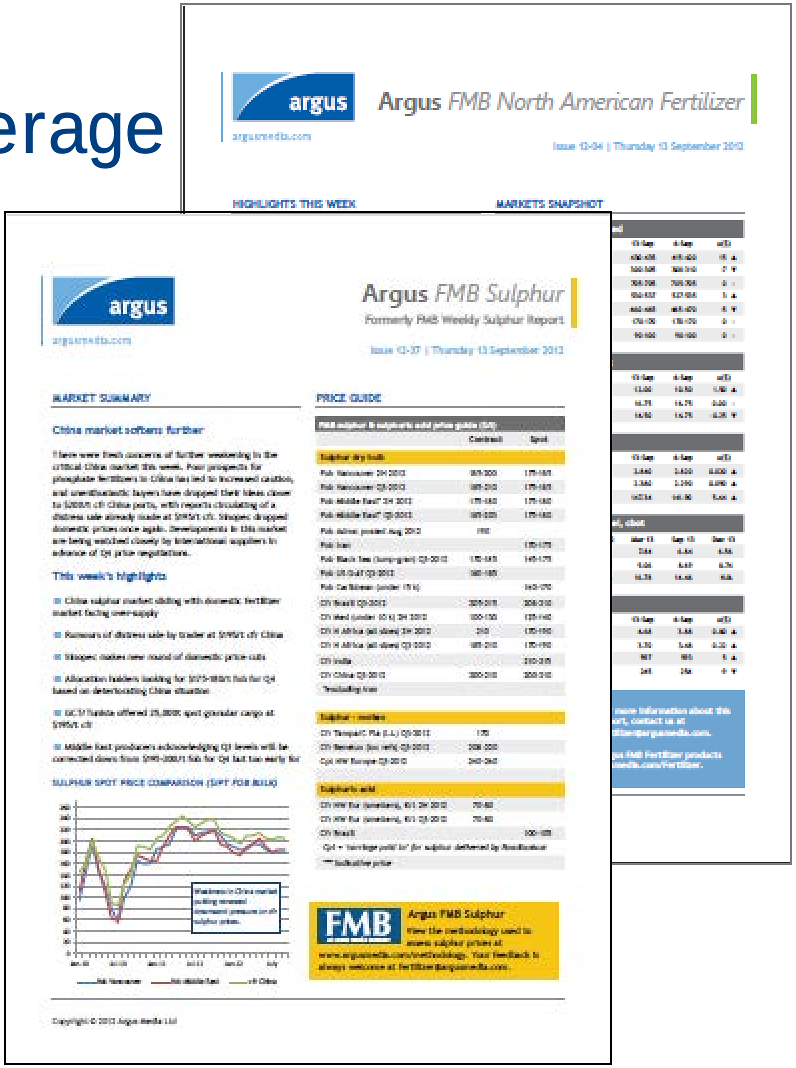
November 14, 2012

Who is Argus?

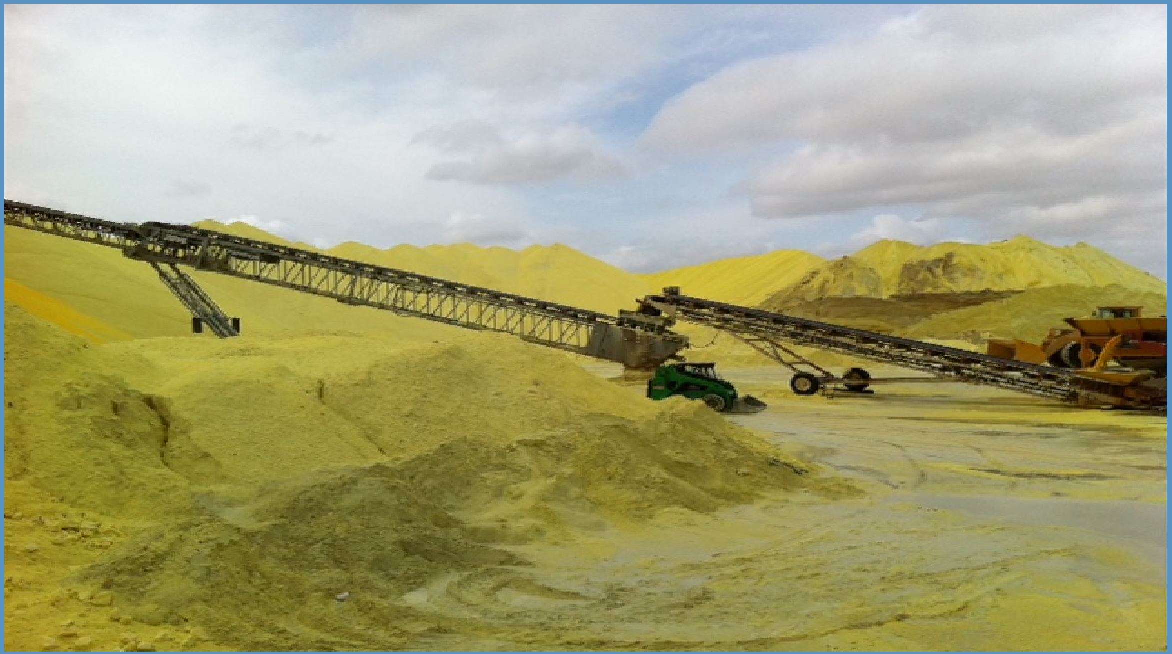
- Report prices in all world markets for
  - Crude and Refined products
  - NGL & LPG
  - Coal and coke
  - Gas
  - Power
  - Fertilizers
  - Emissions
  - Petchems
- More than 400 staff globally with numerous offices
- Rapid growth in spot and term contract indexation, swaps market indexation

Argus Sulphur/Fertilizer Coverage

- NEW North American Fertilizer report
  - o Newly-created sulphur prices
  - o Terminal pricing
  - o Freight rates
- International Sulphur report
- International reports on phosphate, ammonia, nitrogen and potash



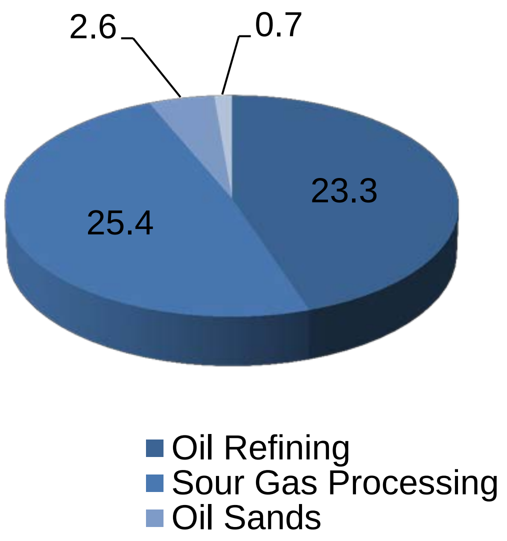
Global Overview



Elemental sulphur supply 2011

- 52.1mn tonnes produced
  - 49% from oil refining
  - 45% from gas processing
  - 5% from oil sands upgrading
  - 1% from Frasch mining

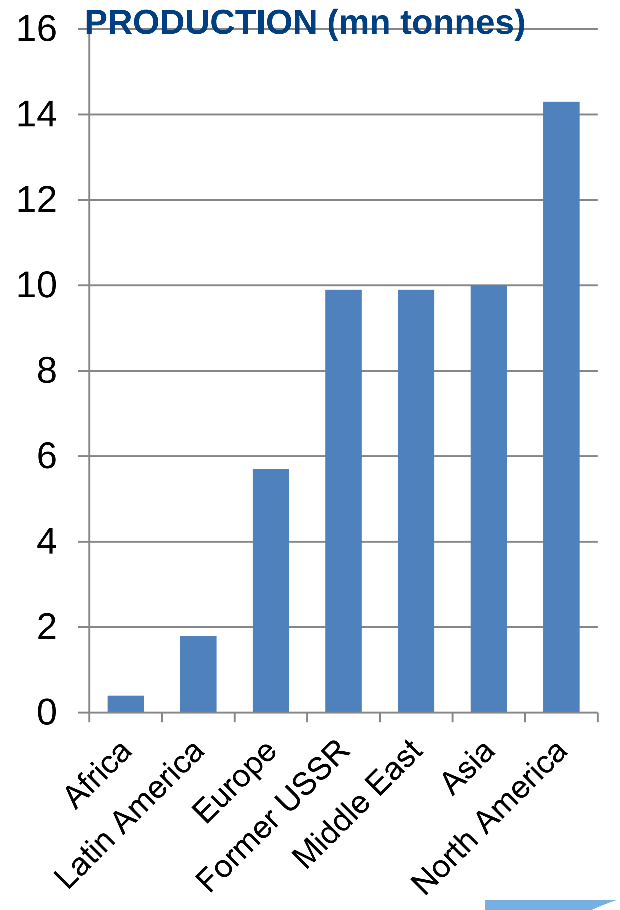
PRODUCTION SOURCES (mn tonnes)



Source: IFA, Argus

Sulphur supply by region 2011

- Countries with 2mn t+/yr
  - US 8.2mn t
  - Russia 6.6mn t
  - Canada 6.1mn t
  - China 4.0mn t
  - Saudi Arabia 3.2mn t
  - Kazakhstan 2.4mn t



Source: IFA, Argus

Supply to increase with new projects

- Oil Refining Growth
  - Primarily in North America
    - driven by heavy crude sources
      - oil sands
    - dependent on
      - coker utilization
      - pipeline development
      - shale impact

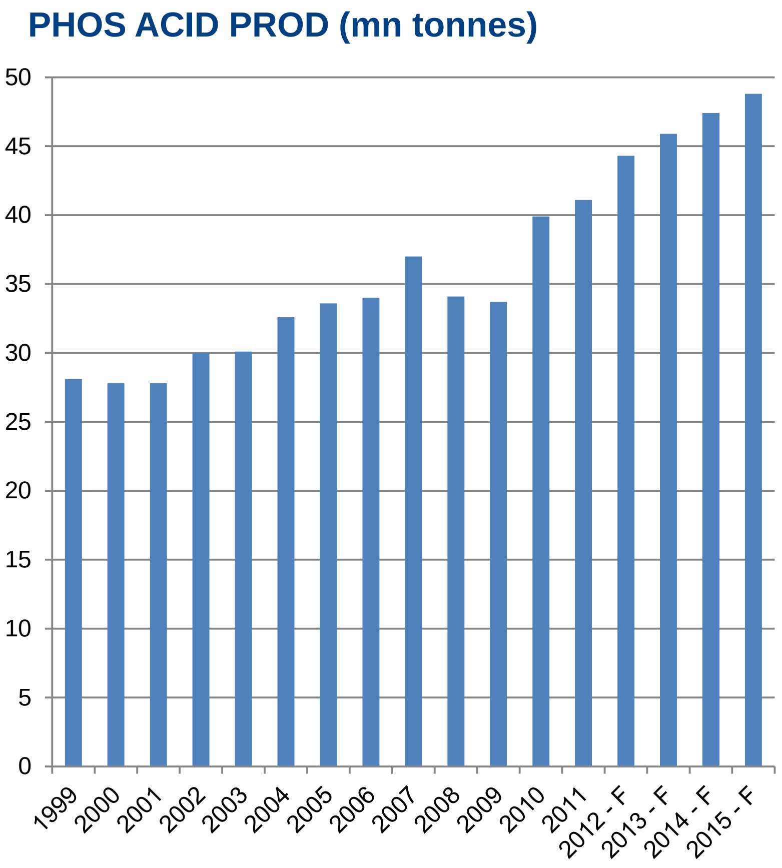
- Gas Processing
  - Sour gas development
    - Middle East
    - FSU
    - China

Sulphur Demand

- Over 90pc used to produce sulphuric acid
  - by-product energy created – significant to plant economics
- 60pc consumed by fertilizer industry
- 40pc consumed by a variety of industries
  - metal leaching – growth in this sector
  - chemicals, rubber/plastics, pulp/paper, pigments

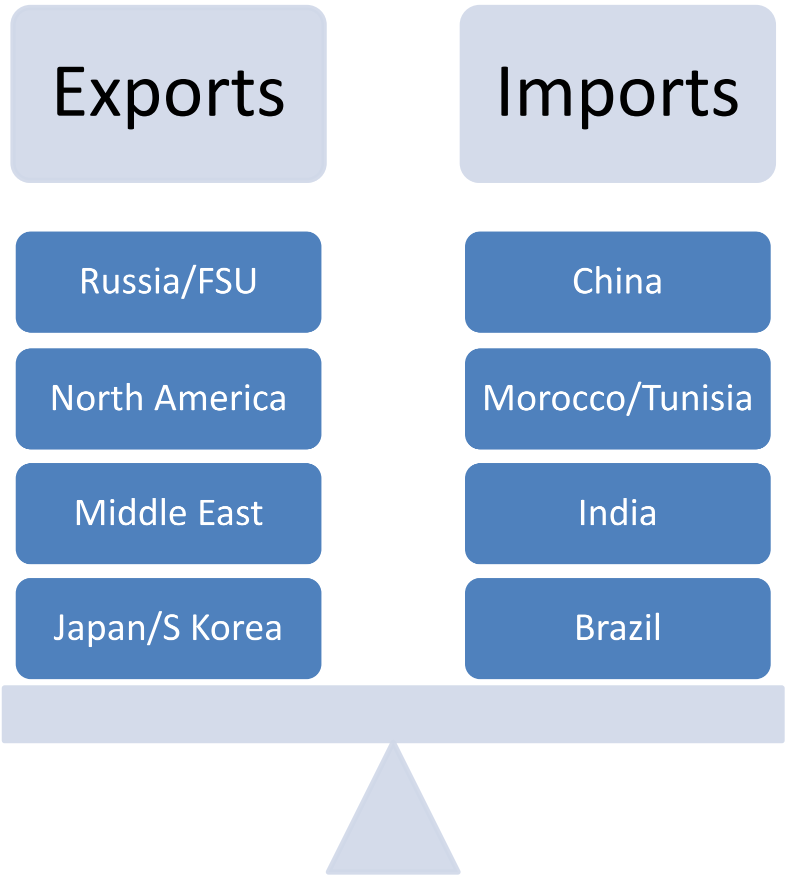
Phosphoric acid production

- 44mn t to be produced in 2012
- Largest producers
  - China 37pc
  - United States 20pc
  - Morocco 10pc
  - Russia 6pc
  - Tunisia 4pc
  - India 3pc
  - Brazil 3pc



Source: IFA, Argus

World sulphur trade – 30mn t in 2011



Source: Argus

Elemental sulphur balance forecast

	2012	2013	2014	2015	2016
Demand					
sul acid	50.7	53.1	54.9	56.5	57.6
non-sul acid	7.7	7.8	8.0	8.1	8.2
Total Demand	**58.4**	**60.9**	**62.8**	**64.6**	**65.9**
Supply					
Oil	25.1	26.2	27.2	28.1	28.6
Gas	27.5	28.7	32.4	35.9	36.2
Other	3.5	3.7	4.0	4.3	4.8
Total	**56.1**	**58.6**	**63.6**	**68.2**	**69.6**
BALANCE	**-2.3**	**-2.3**	**0.8**	**3.6**	**3.7**

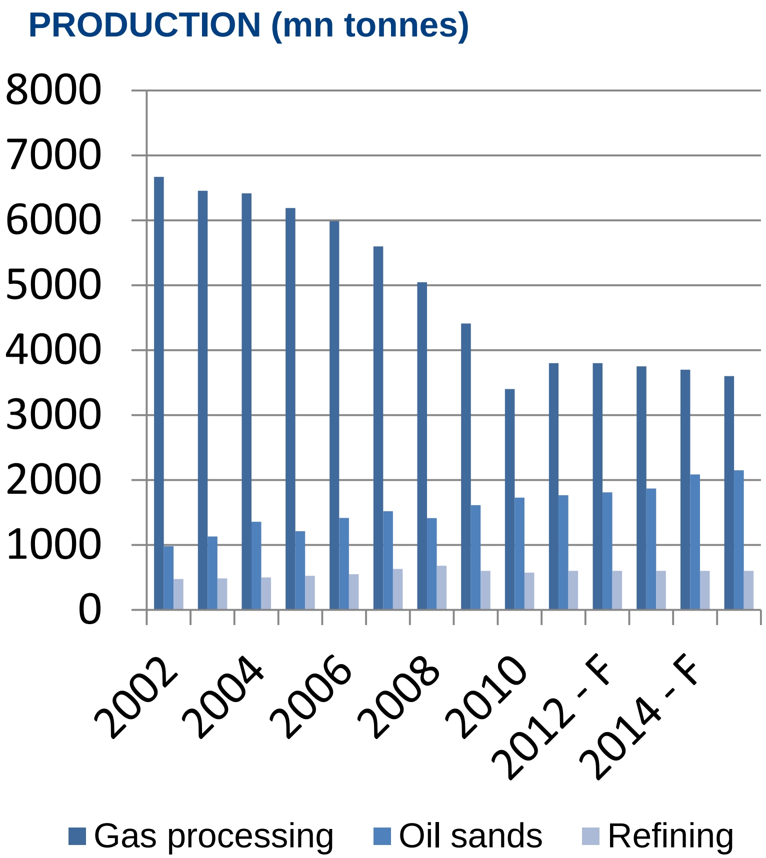
Source: IFA, Argus

argus

Focus on North America

Canada sulphur production

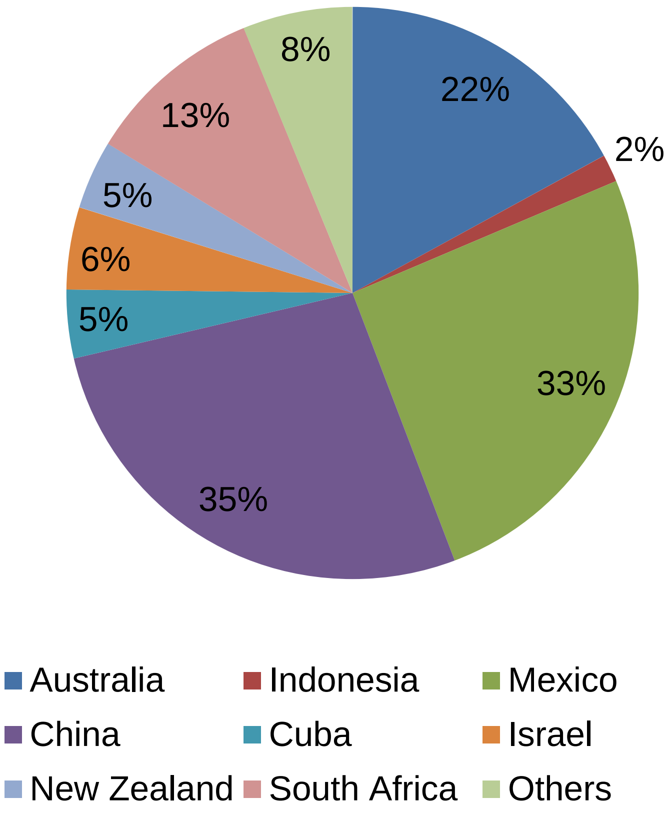
- Gas processing declines as sour gas reserves depleted
- Oil sands to grow
- Refining flat



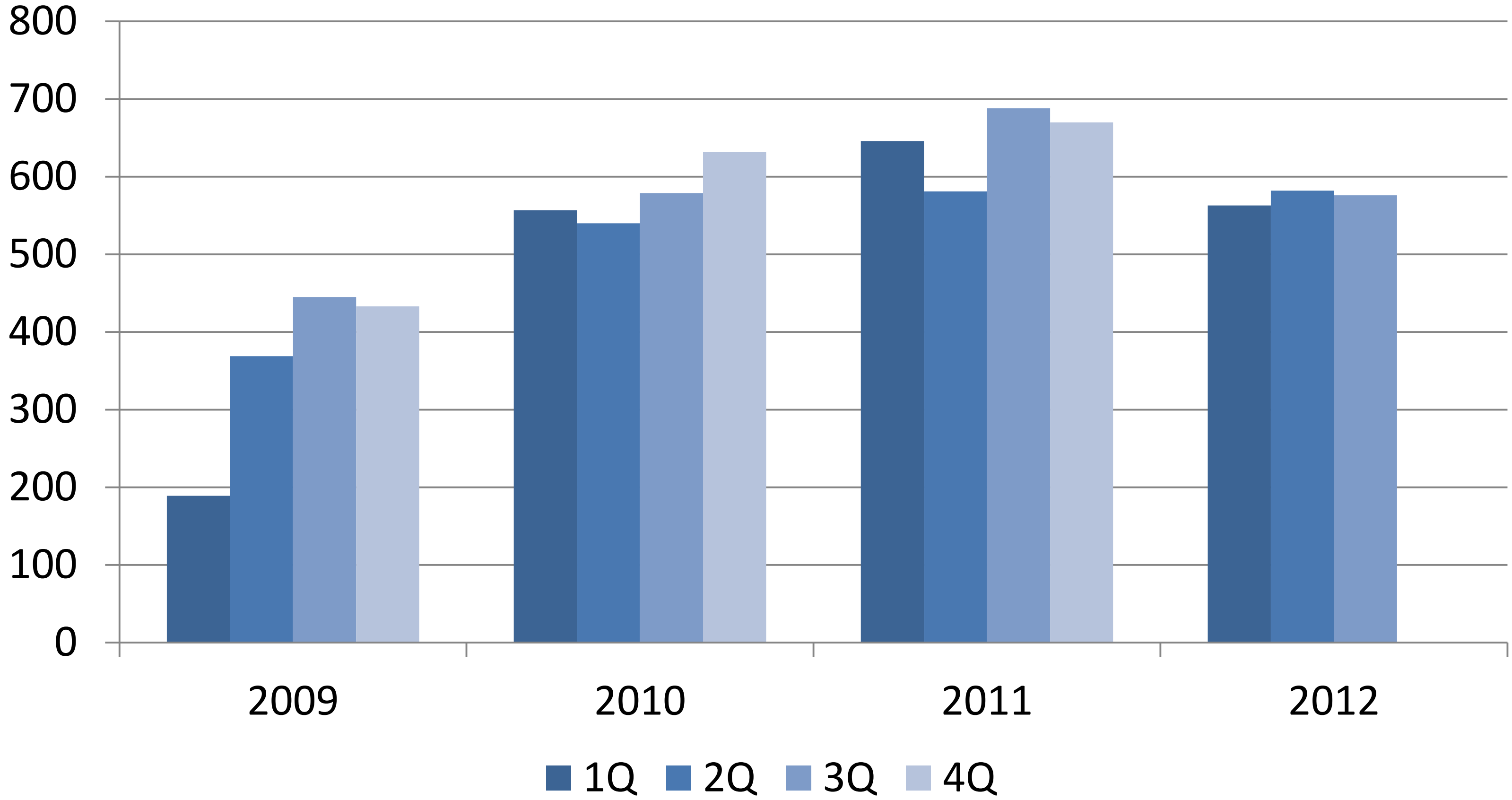
Source: ERCB, BC Gov, Argus

Canadian offshore exports

- 3.4mn t exported in 2011
  - China largest market served
- Exports have decreased as production has declined
- Jan-Sept 2012 exports 2.3mn t, equates to annualized 3.1mn t



US takes large volume of Canadian production



Source: CN Rail, CP Rail, Argus

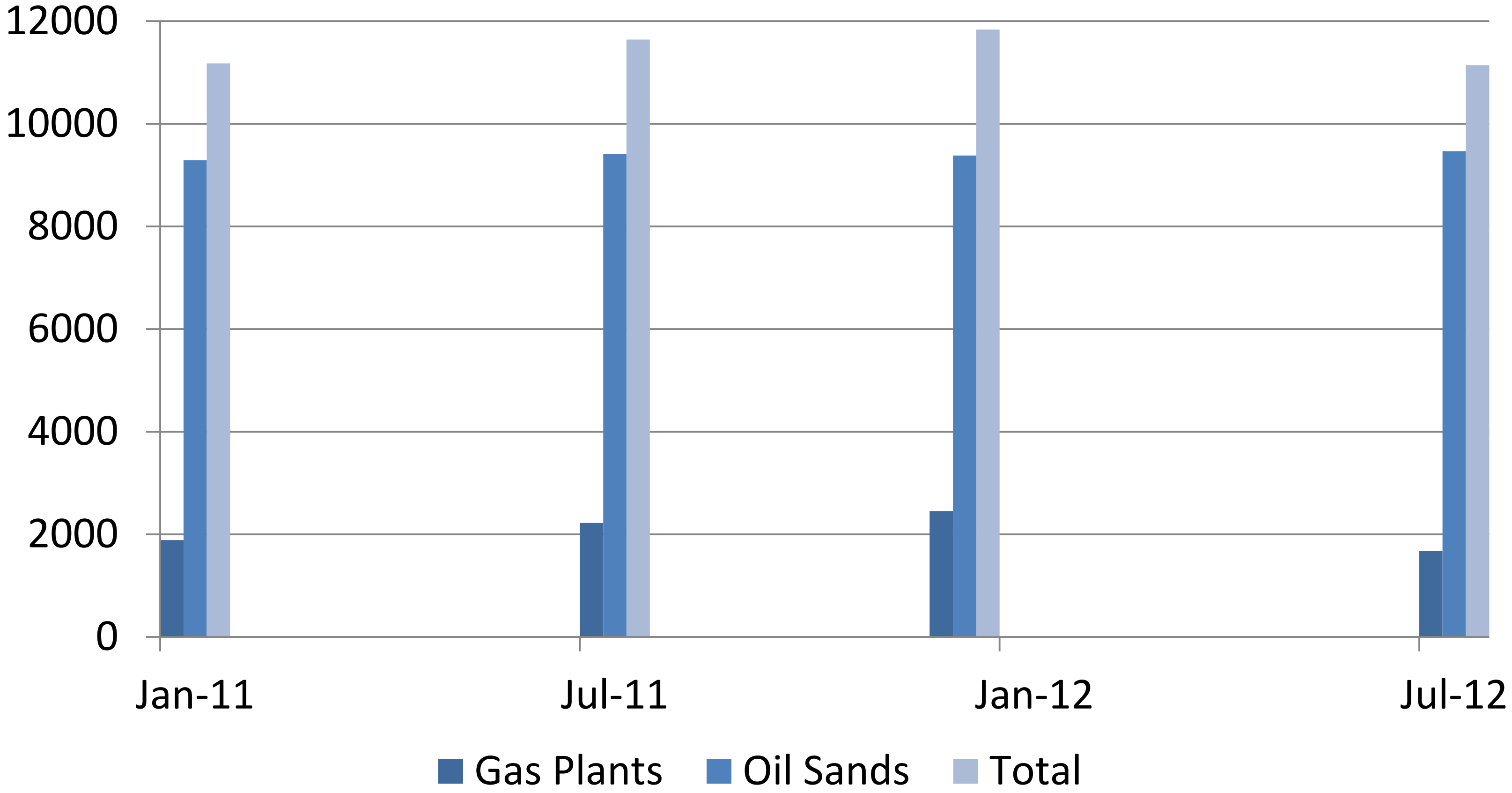
illuminating the markets

Canadian inventory augments supply

- Inventory at gas plants depleted
  - 9.1mn t end of 2002
  - 1.9mn t end of 2011
- Inventory at oil sands grows
  - 9.4mn t end of 2011
    - Most held at Syncrude
      - Remelt program to commence

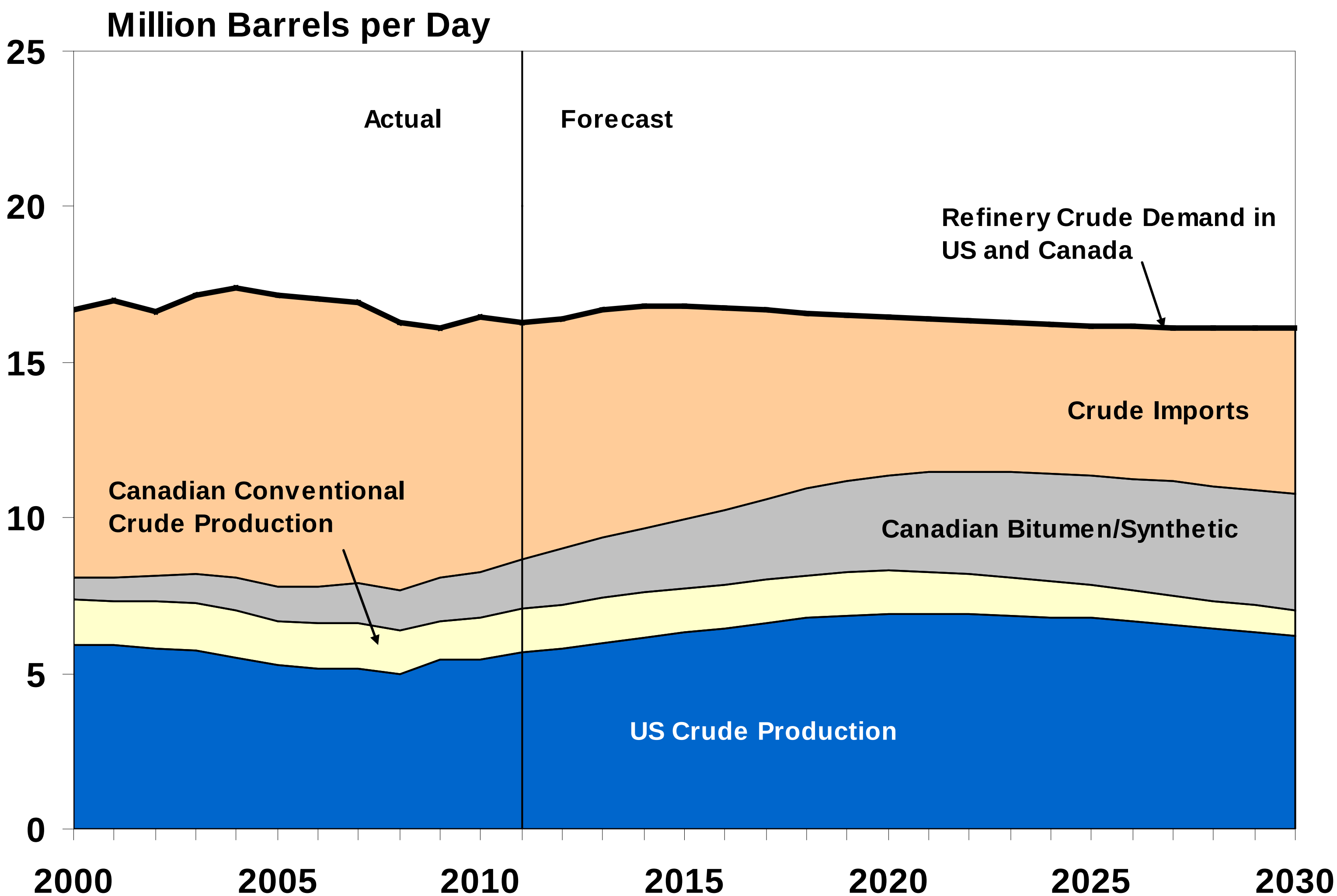
argus

Canadian inventory



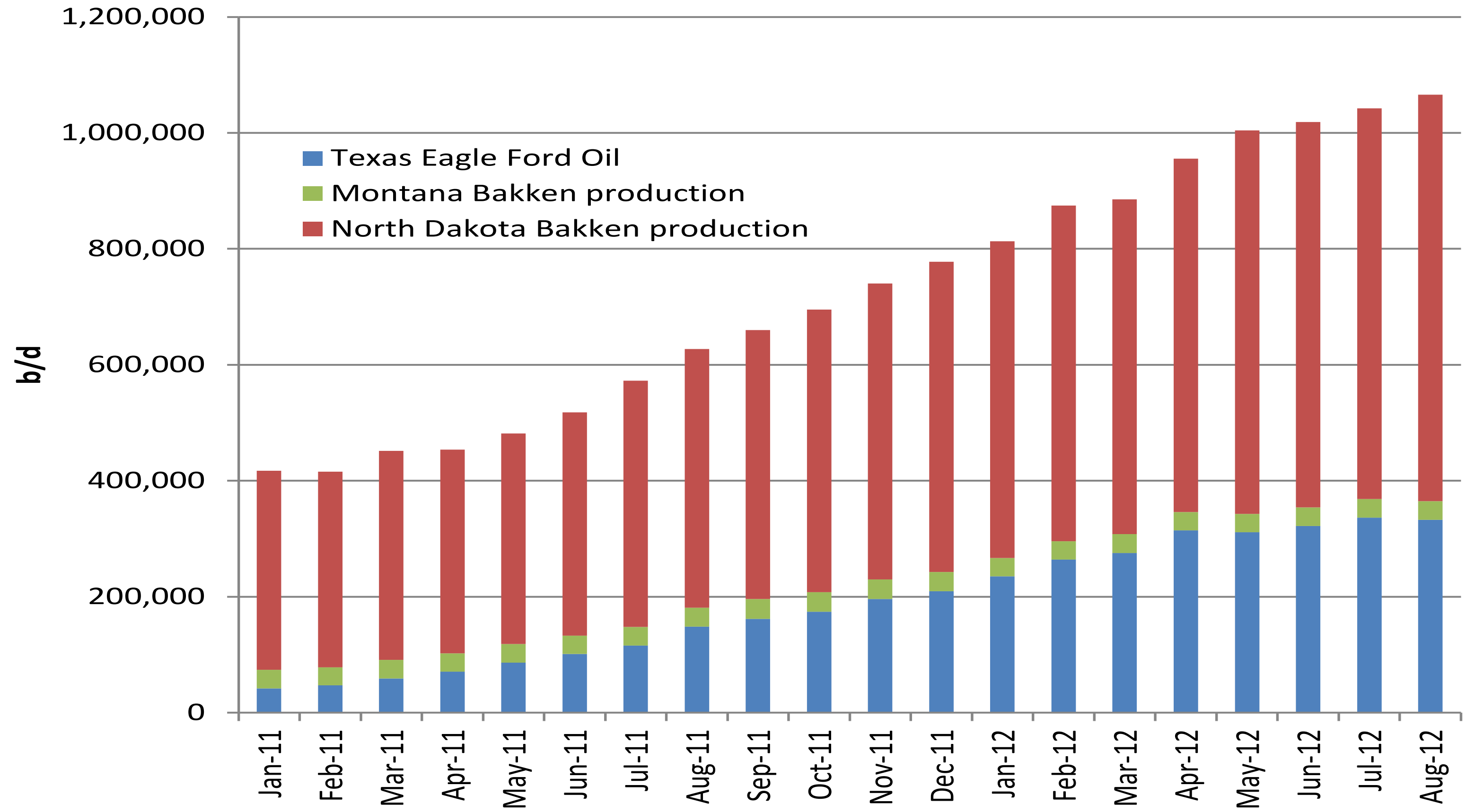
illuminating the markets

North American crude imports to decline



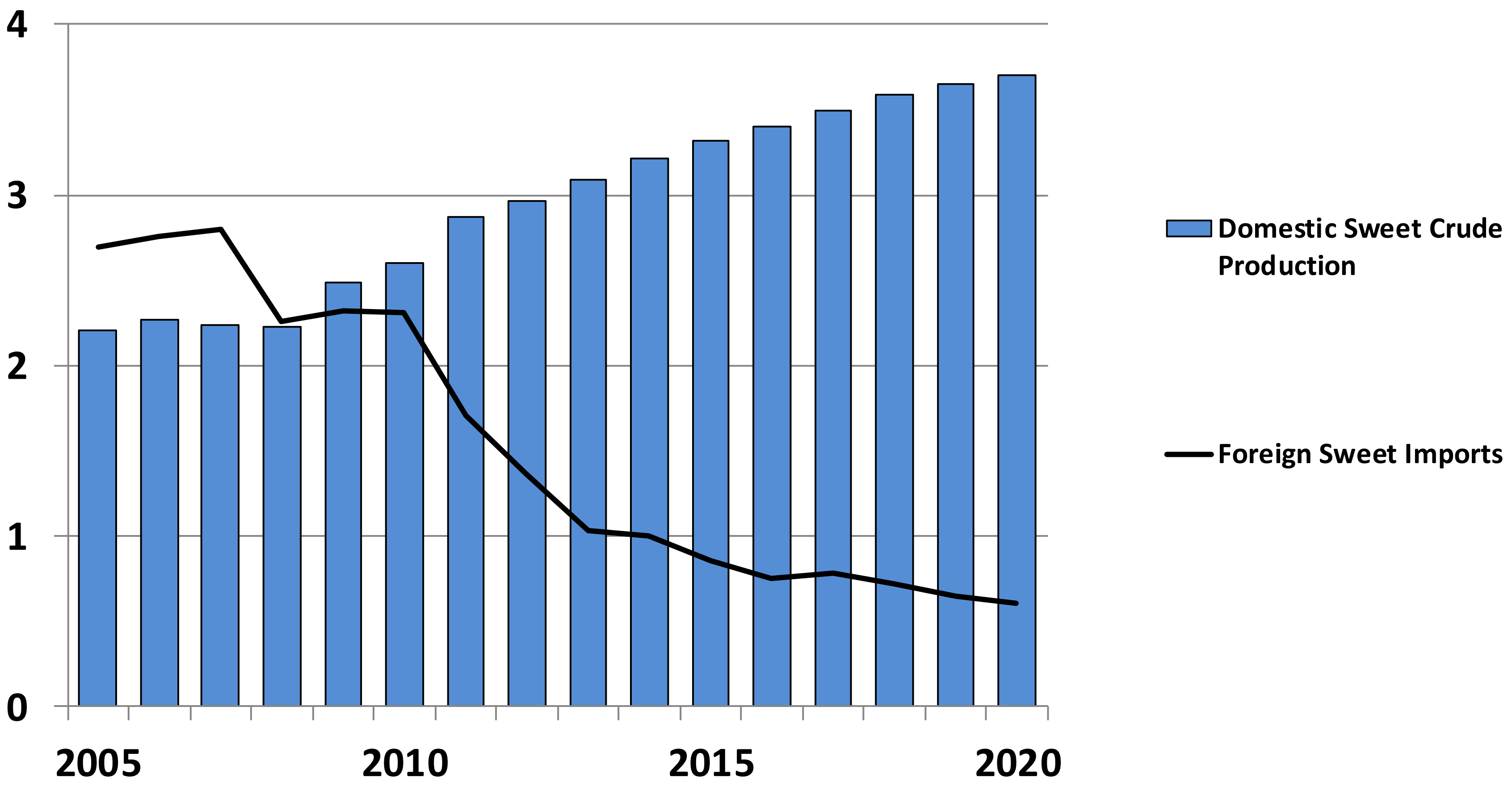
Source: IHS Purvin & Gertz

US shale production



Sources: Texas Railroad Commission, North Dakota Oil and Gas Division, Montana Board of Oil and Gas

US sweet crude balance

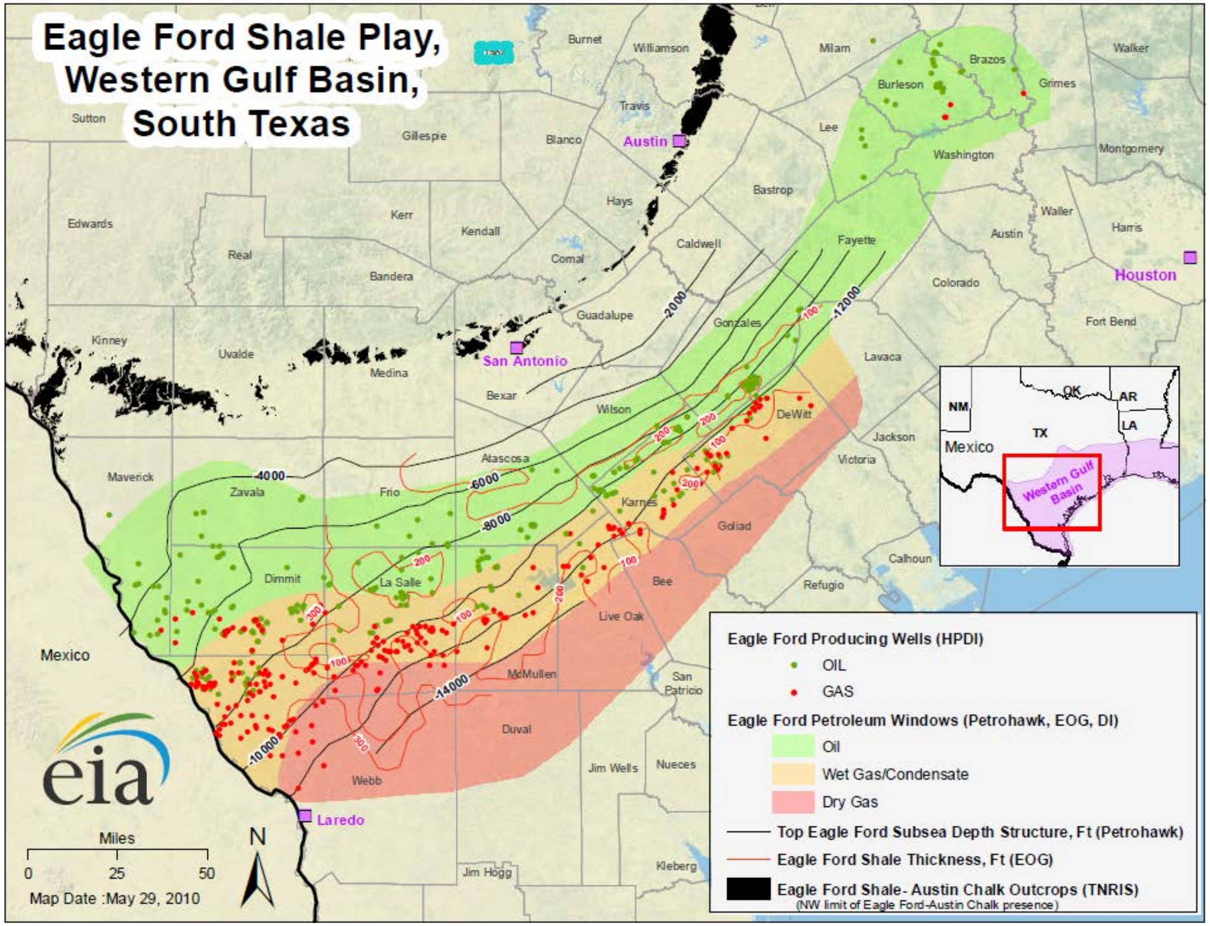


Source: IHS Purvin & Gertz

Bakken production

- Bakken crude production has more than doubled over the past 2 years
- While initially constrained, Bakken crude now reaches all corners of the US
  - Railing to west and east coasts increased markedly
  - Pipeline expansions and additions continue
- Demand for Bakken has increased along with its ability to move
  - Refiners in the east and west coasts have committed to taking the grade

Eagle Ford producing wells



argus

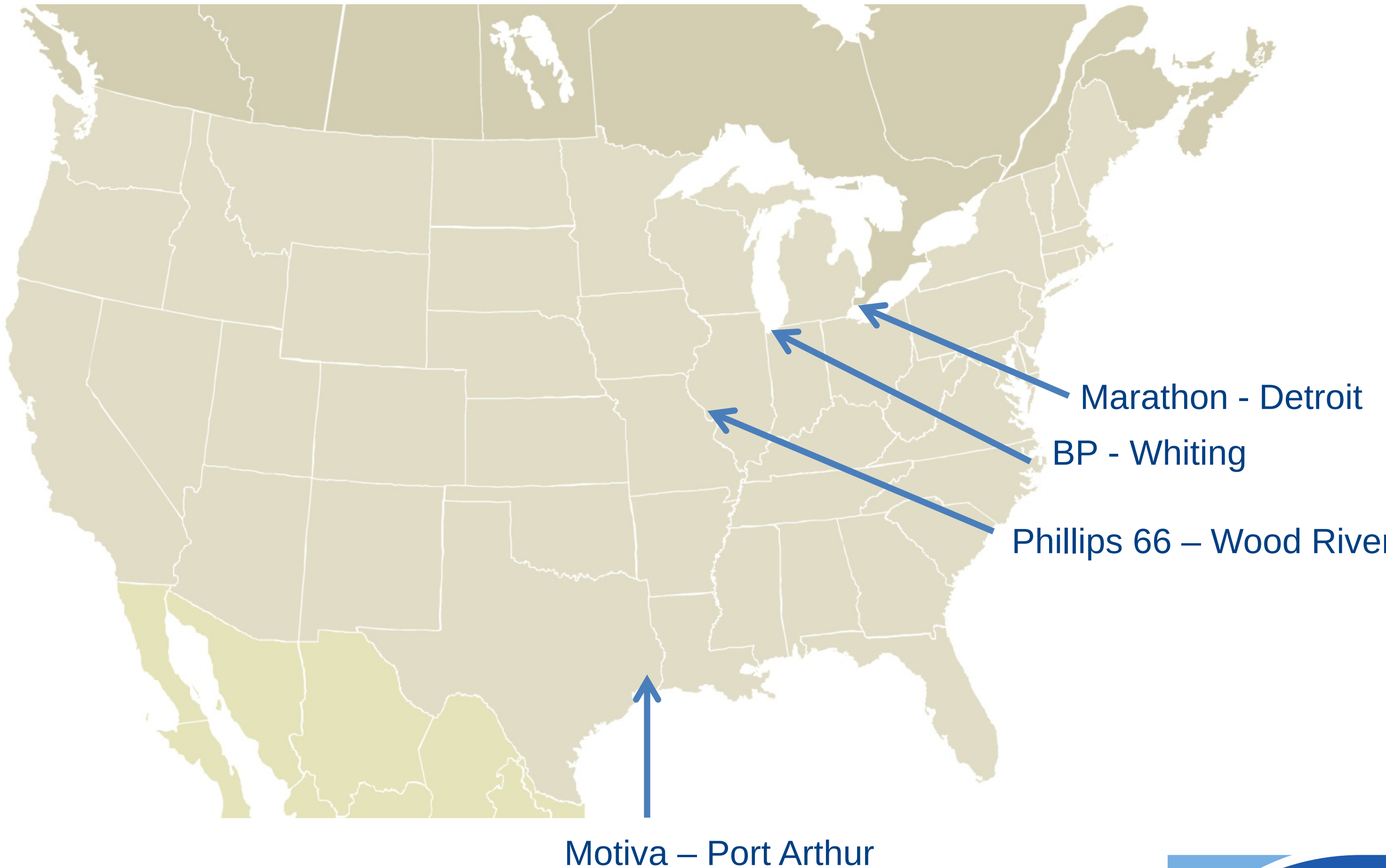
Eagle Ford production

- Total crude production eclipsed 300,000 b/d
  - Forecasts pin 2017 liquids production ~1.6mn-2mn b/d
  - Oil trends extremely light, much of it condensate
  - But condensate share waning in favor of crude
- Moving by pipeline
  - Valero's 90,000 b/d refinery at Three Rivers
  - Corpus Christi/Houston/Texas city refining complexes
- Railed to St James and barged to entire USGC
- By Jones Act tankers
  - Delaware Bay refining complex

Projects galore in shale

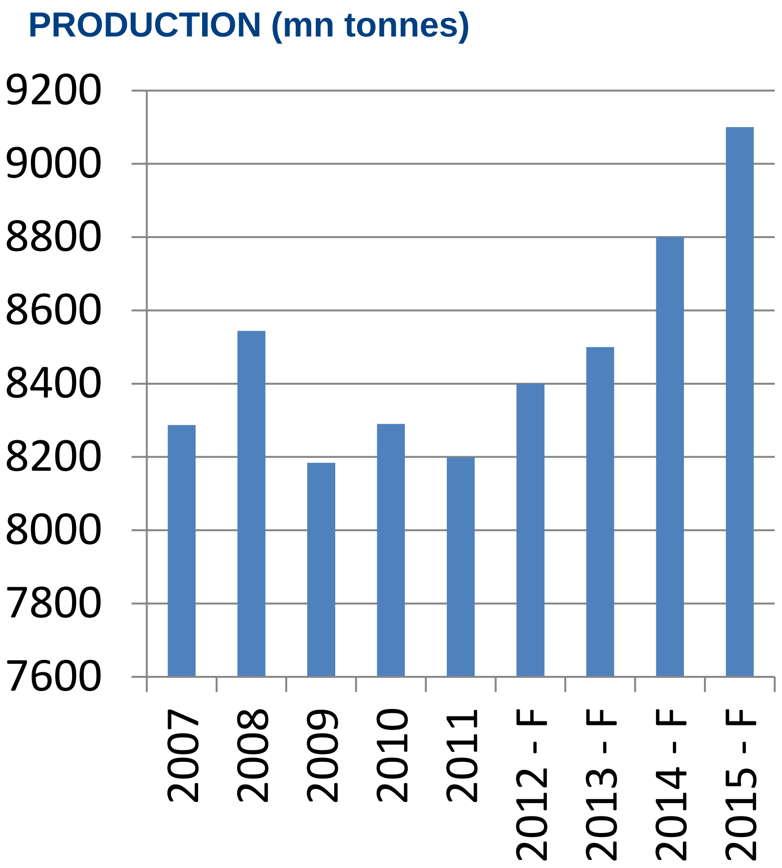
- Bakken pipeline projects
- About 2mn b/d of liquids takeaway capacity is planned for Eagle Ford
- Most of it is under construction or is in service already
- Question on infrastructure remains: How much is too much? Or too little?

New US coking capacity



US sulphur production

- 60pc of production in Gulf Coast (Padd 3)
- 10-15pc from natural gas, balance from oil refining
- Growth expected as coking capacity increases

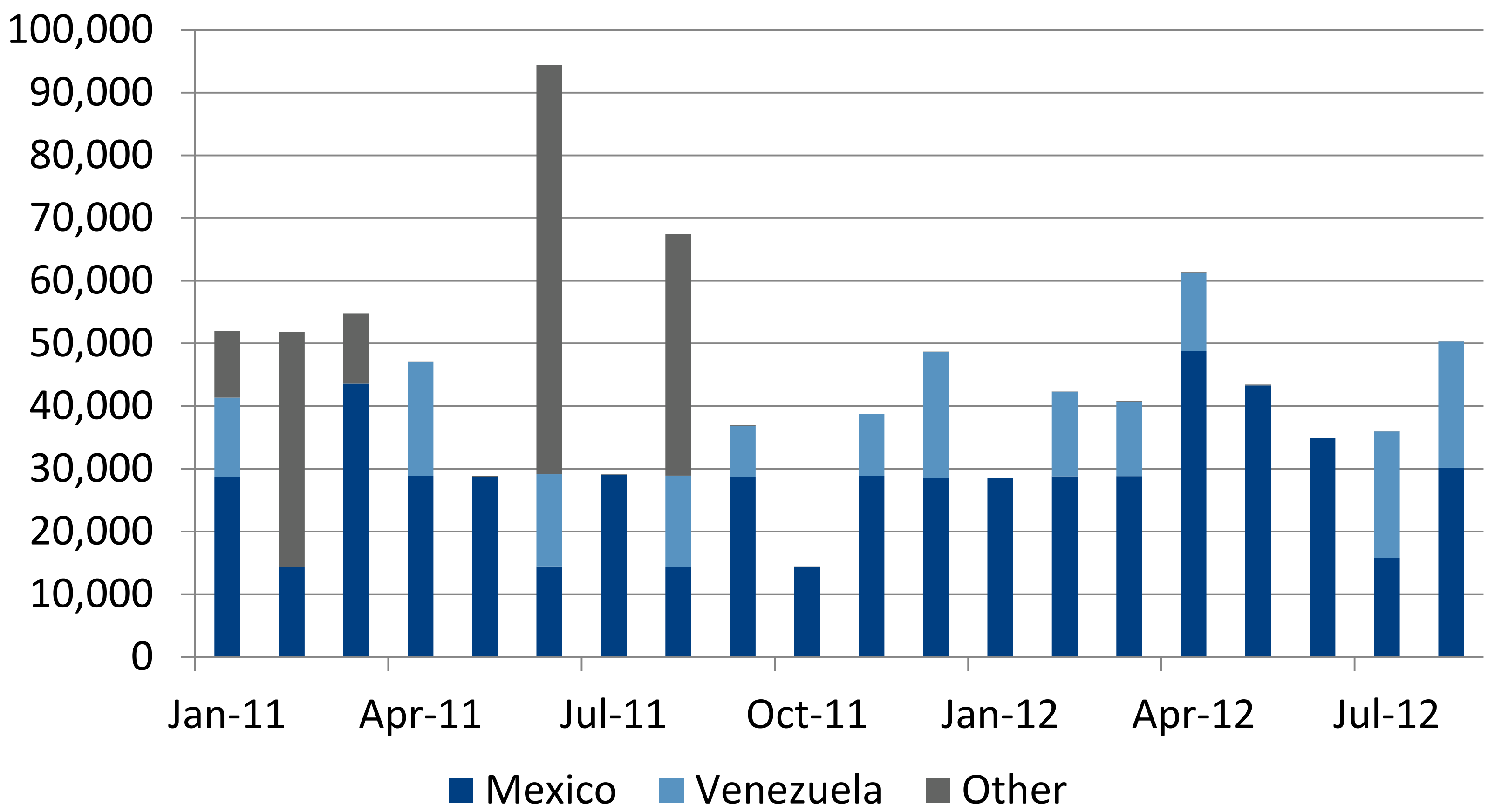


Source: USGS, Argus

US imports and exports

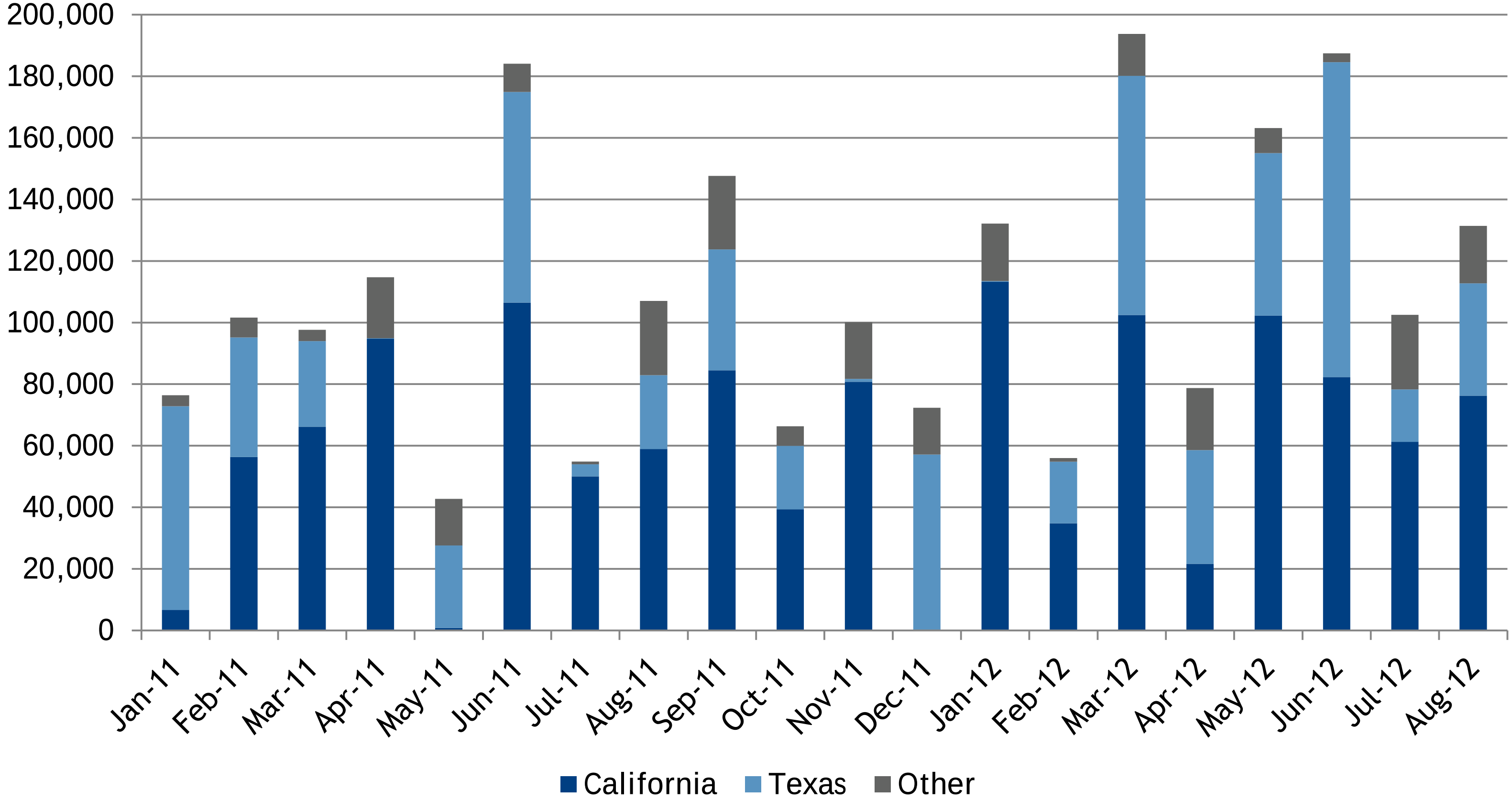
- Imports regularly from
  - Venezuela (molten)
  - Mexico (molten)
- Imports solid when needed
  - 2010 and 2011 during tight market
- Exports from the US Gulf
  - Brazil – displaces Canada as key supplier as prilling capacity developed
- Exports from California
  - Similar markets as Vancouver (South Africa, China, etc)

US imports more from Mexico and Venezuela

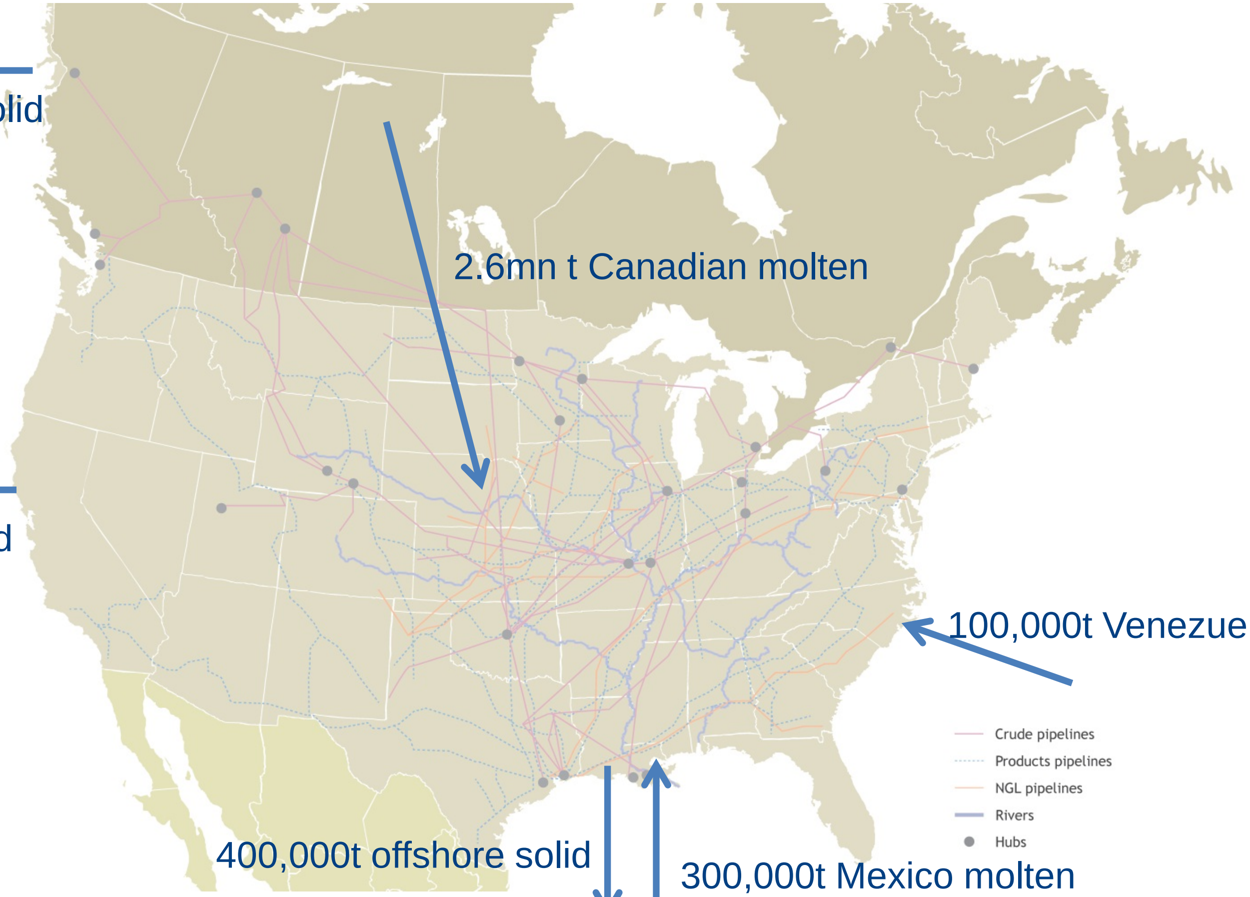


illuminating the markets

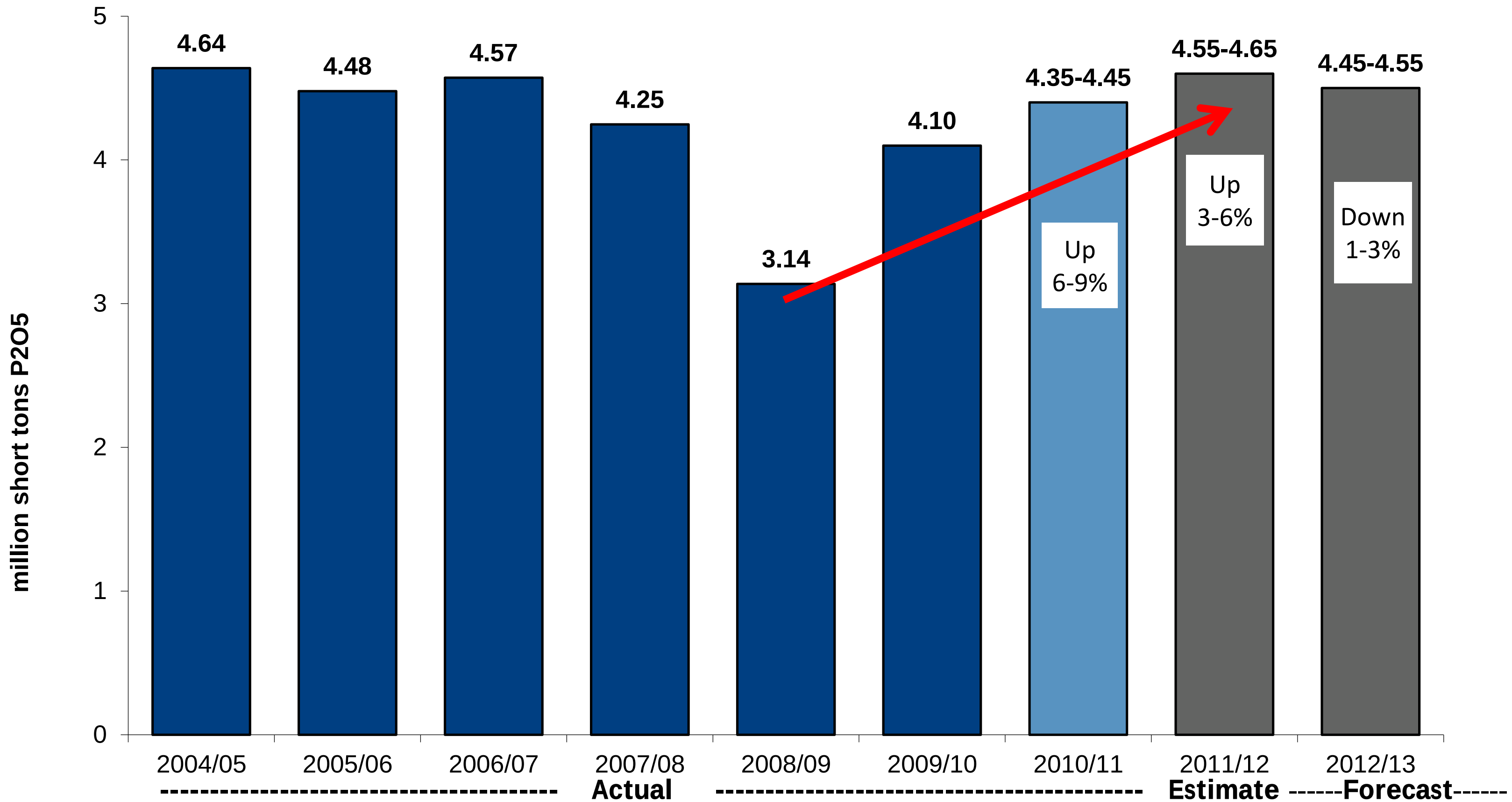
US exports increase



North American sulphur flow 2011



US phosphate forecast



Source: AAPFCO and The Fertilizer Institute (TFI), 2004/05-2009/10; TFI , 2010/11-2012/13

North American sulphur balance Jan-Aug

	Aug-12	Jan-12 to Aug-12	Jan-11 to Aug-11	Percent Change
Production				
US natural gas processing	98	744	753	-1.2%
US crude refining	635	4,864	4,649	4.6%
Total US production	733	5,608	5,402	3.8%
Canada natural gas processing	239	2,091	2,560	-18.3%
Canada oil sands/refining	155	1,288	1,150	12.0%
Total Canada production	394	3,379	3,710	-8.9%
Total North American Production	**1,127**	**8,987**	**9,112**	**-1.4%**
Trade				
Vancouver exports	170	1,991	1,999	-0.4%
California exports	76	594	440	35.0%
US Gulf exports	36	343	256	34.0%
Other exports	19	107	83	28.9%
Total US exports	131	1,044	779	34.0%
Total North American Exports	**301**	**3,035**	**2,778**	**9.3%**
Mexico imports	30	259	202	28.2%
Venzuela imports	20	78	60	30.0%
Other imports	0	0	163	-100.0%
Total North American Imports	**50**	**337**	**425**	**-20.7%**
BALANCE	**876**	**6,289**	**6,759**	**-7.0%**

argus

North American sulphur balance forecast

	2011	2012	2013	2014	2015
Production					
US natural gas processing	1.1	1.1	1.1	1.1	1.1
US crude refining	7.1	7.3	7.4	7.7	8.0
Total US production	8.2	8.4	8.5	8.8	9.1
Canada natural gas processing	3.7	3.8	3.8	3.7	3.6
Canada oil sands/refining	2.4	2.5	2.6	2.7	2.8
Total Canada production	6.1	6.3	6.4	6.4	6.4
Total North American Production	**14.3**	**14.7**	**14.9**	**15.2**	**15.5**
Trade					
Vancouver exports	3.4	3.1	3.2	3.3	3.4
California exports	0.9	0.9	1.0	1.1	1.1
US Gulf exports	0.4	0.5	0.7	0.8	0.9
Other exports	0.1	0.1	0.1	0.2	0.2
Total US exports	1.4	1.5	1.8	2.1	2.2
Total North American Exports	**4.8**	**4.6**	**5.0**	**5.4**	**5.6**
Mexico imports	0.3	0.4	0.4	0.4	0.4
Venezuela imports	0.1	0.1	0.1	0.1	0.1
Other imports	0.2	0.0	0.0	0.0	0.0
Total US Imports	**0.6**	**0.5**	**0.5**	**0.5**	**0.5**
PRODUCTION+US IMPORTS-EXPORTS	**10.1**	**10.6**	**10.4**	**10.3**	**10.4**
US CONSUMPTION	**10.0**	**9.8**	**9.7**	**9.6**	**9.5**
CANADA CONSUMPTION	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**
BALANCE	**-0.5**	**0.2**	**0**	**0**	**0.2**

argusmedia.com

London
Houston
Washington
New York
Portland
Calgary
Santiago
Bogota
Rio de Janeiro
Singapore
Beijing
Tokyo
Sydney
Dubai
Moscow
Astana
Kiev
Porto
Johannesburg

illuminating the markets

argusmedia.com

Petroleum

LPG/NGL

Petrochemicals

Power

Natural gas/LNG

Coal

Bioenergy

Emissions

Transportation

Fertilizers

illuminating the markets

Any questions?

Fiona Boyd
Editor, North American Sulphur
fiona.boyd@argusmedia.com
713.429.6302