



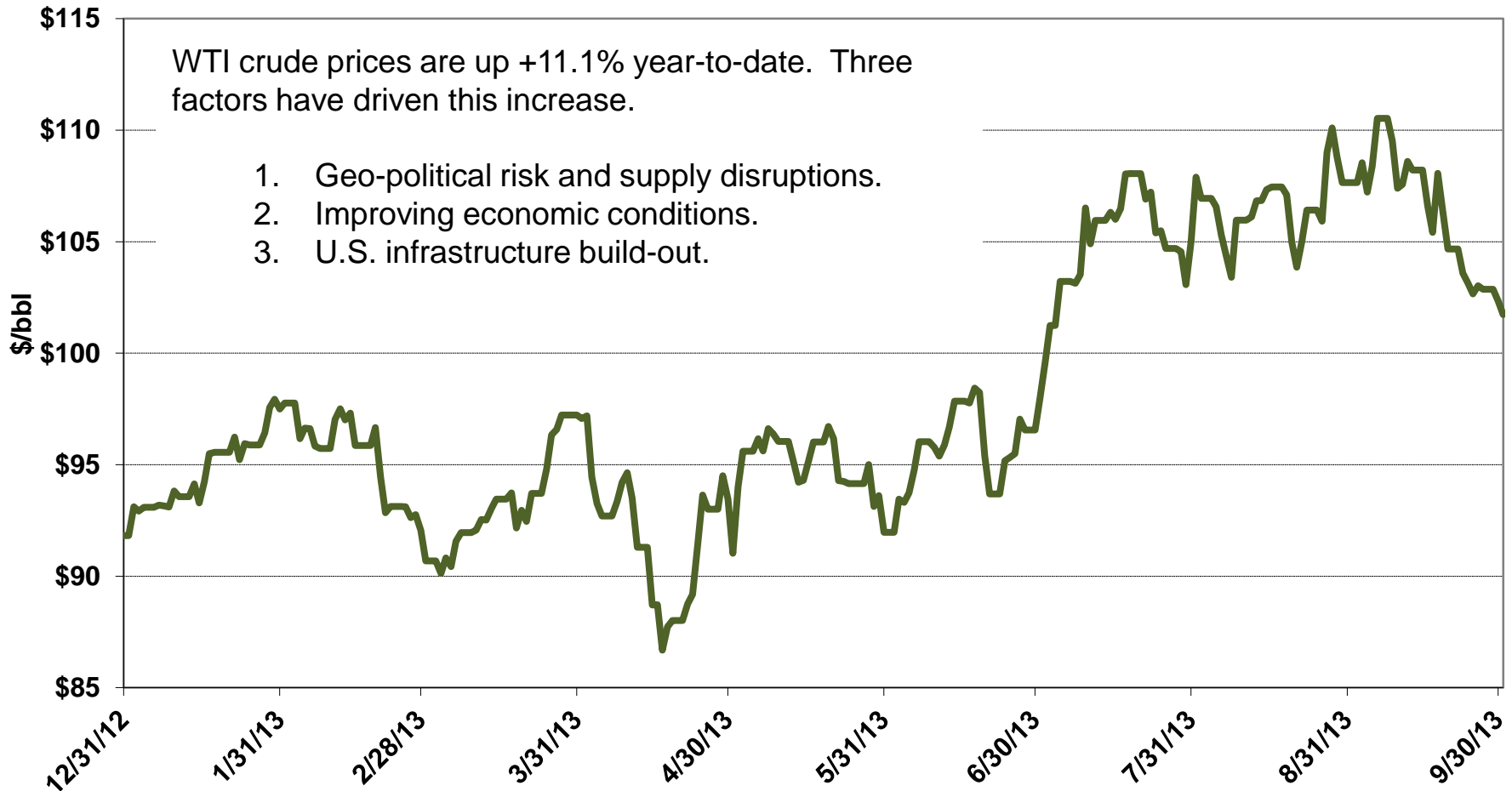
# Energy Macro Review

3<sup>rd</sup> Quarter 2013

# Oil Fundamentals

# WTI Oil Prices are Up in 2013

## Front Month WTI Prices



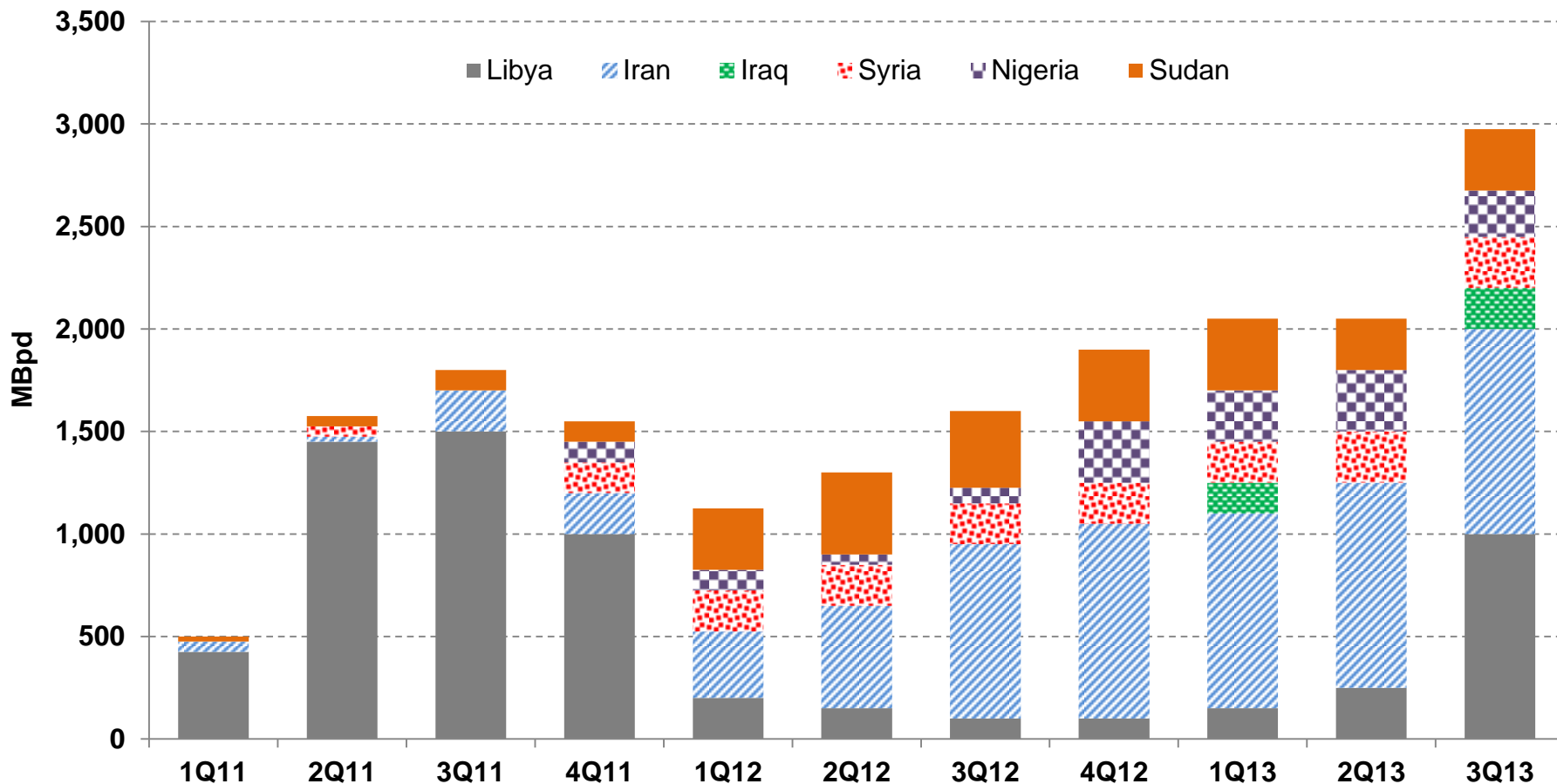
# Geo-Political Risk & Supply Disruptions



1. Labor strikes in Libya removed an estimated 1 million Bbl/Day of production in 3Q13. Libyan officials appear unable to predict when the country's will return to its pre-strike level of production at 1.4 million Bbl/Day.
2. Iraq's exports in July 2013 were down slightly on a year-over-year basis and exports will be down a further 500,000 Bbl/Day in September due to maintenance on a major export terminal.
3. Although all of Syria's exports of 200,000 Bbl/Day have been offline since late 2011, the threat of military action against Assad's regime stoked fears of a broader conflict in the region.
4. Similarly, although a minor producer of oil, the deposition of Egyptian President Mohamed Morsi in July led to concerns that crude oil shipping through the Suez Canal could be at risk.

# Libyan Labor Strikes Add to Supply Disruptions

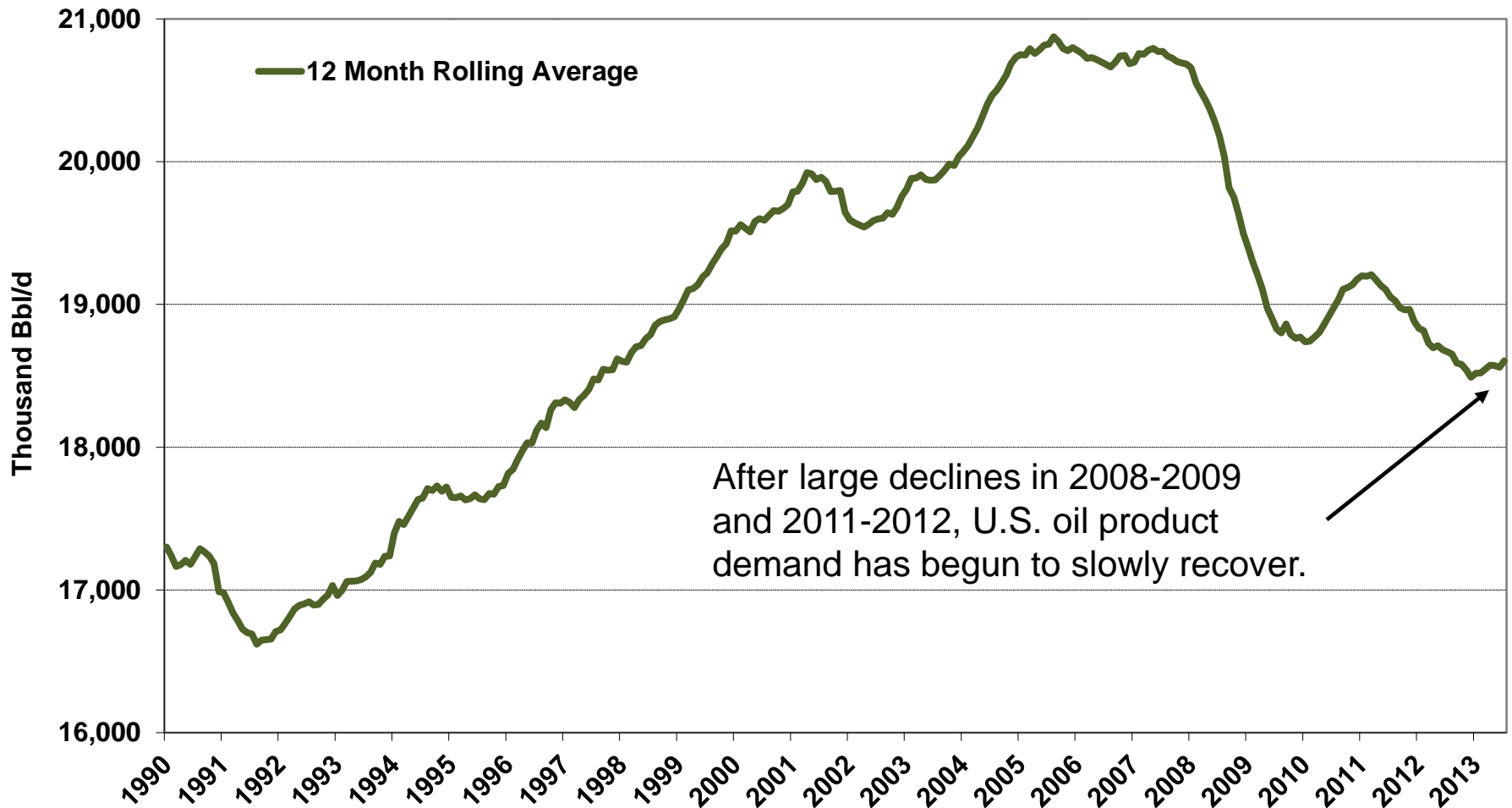
## Major Supply Disruptions (2011 - 2013)



# U.S. Oil Demand Recovering

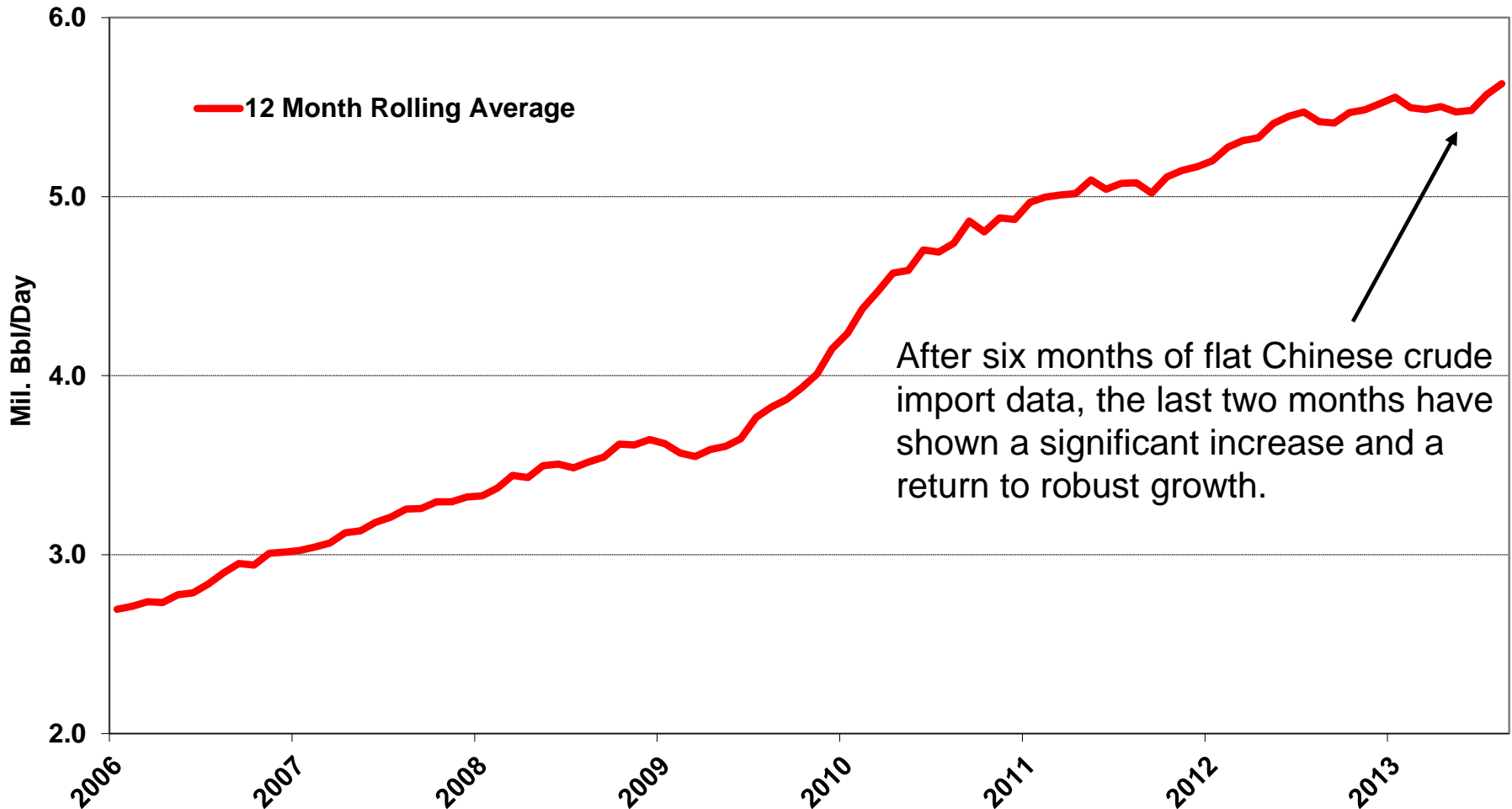


## EIA U.S. Total Oil Product Demand

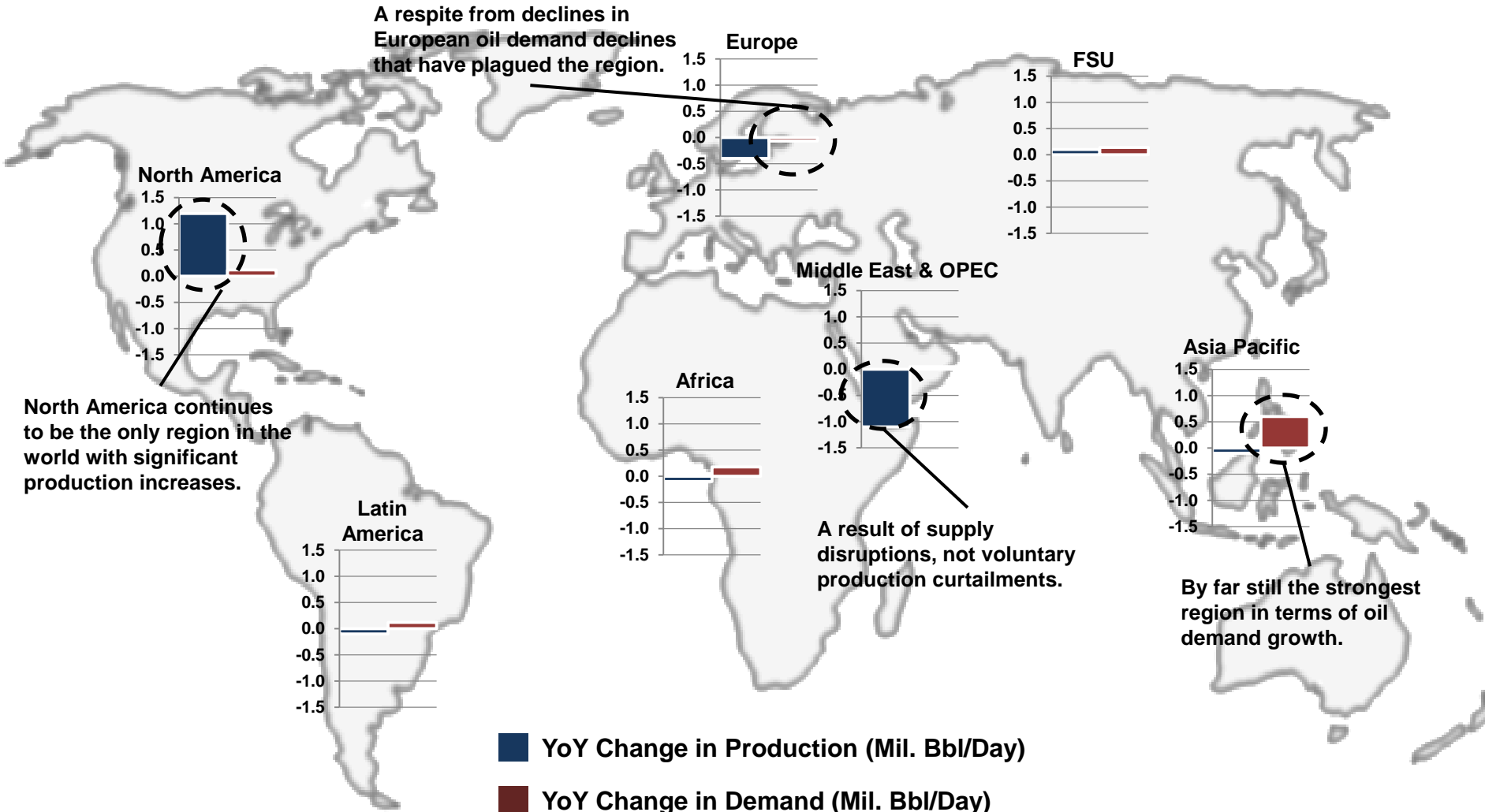


# Chinese Oil Imports Also Resume Their Growth Trend

## China Crude Oil Imports



# Year Over Year Changes in Worldwide Oil Supply<sup>1</sup> and Demand

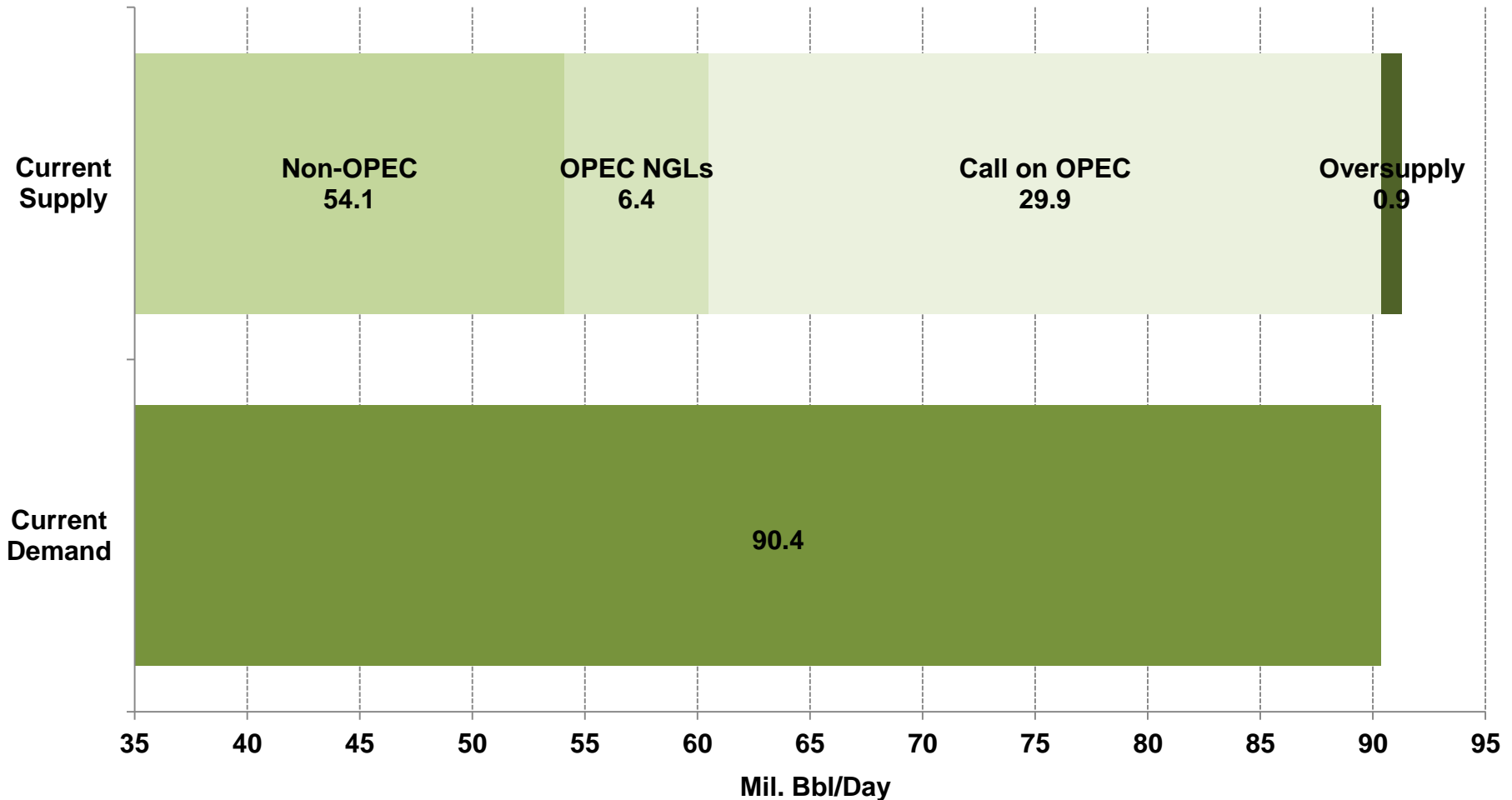


<sup>1</sup> Supply does not include OPEC NGLs, Biofuels and Processing Gains. These collectively add 0.3 Mil. Bbl/Day to the change in global oil supply.



# Global Crude Markets Balanced

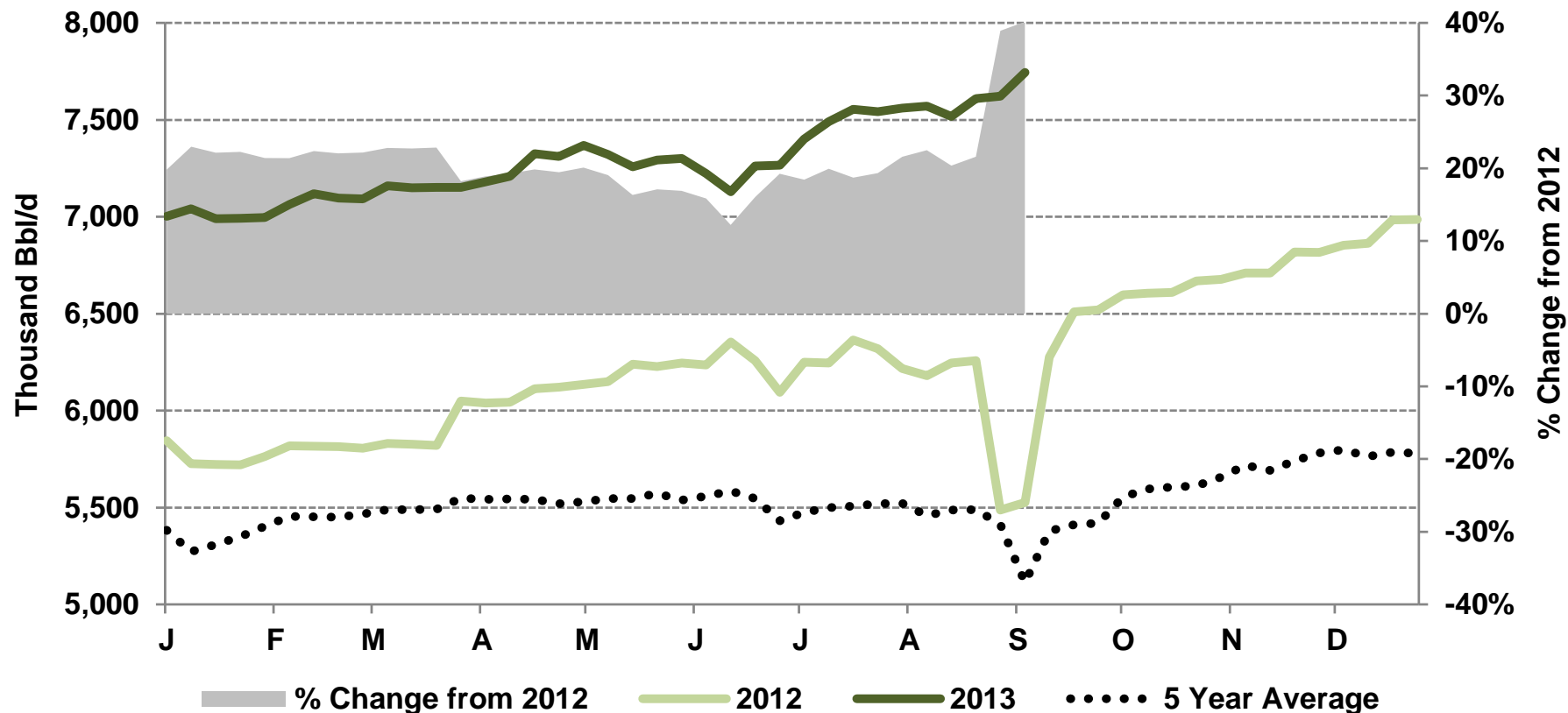
## Current IEA Supply & Demand



# U.S. Oil Supply Growth Still Going Strong



## EIA U.S. Crude Oil Production

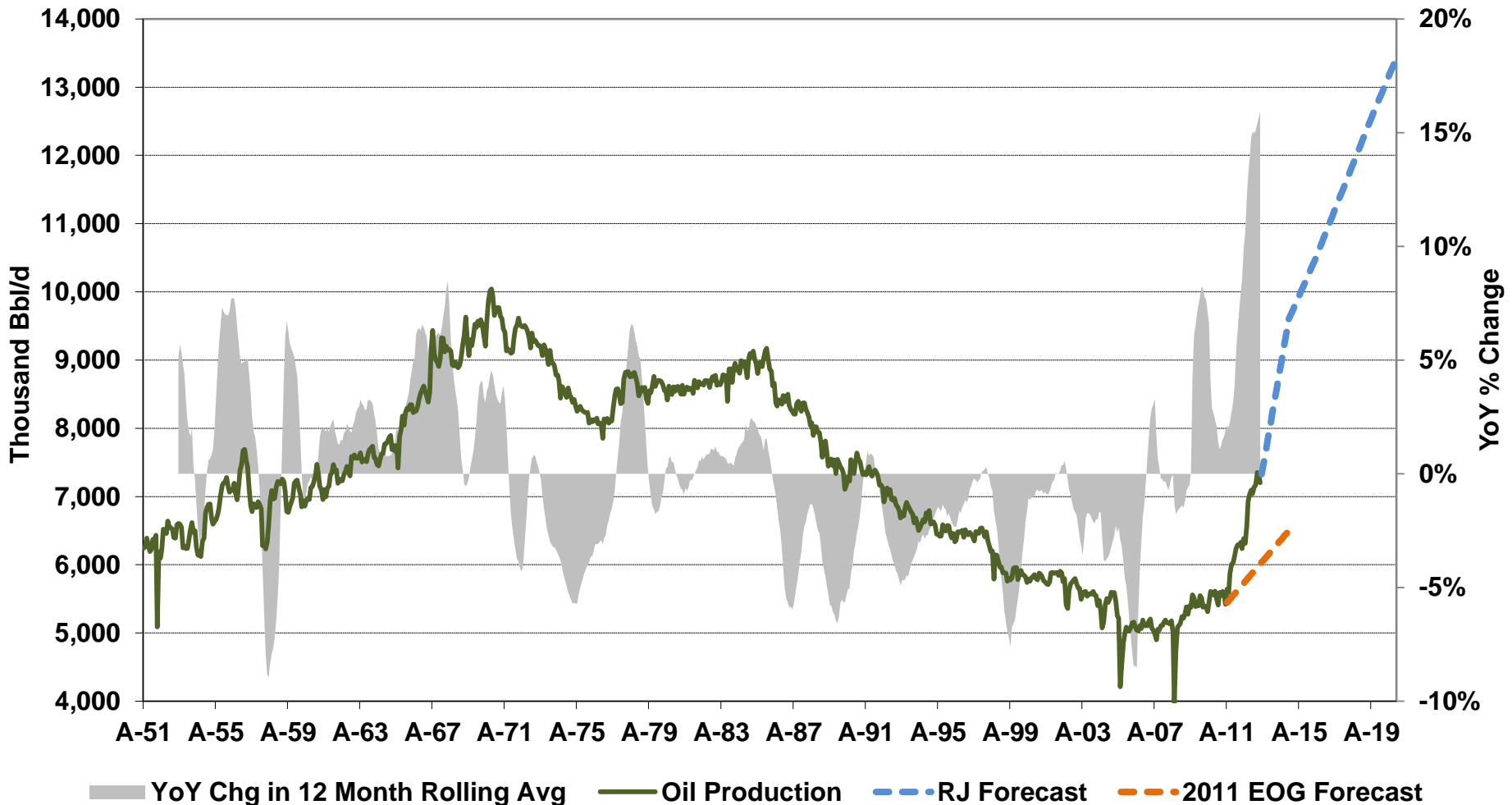


- U.S. crude oil production is up +825,000 Bbl/Day since the end of 2012 and up 1.35 Mil. Bbl/Day over the same period last year. (We have excluded the two latest data points due to a skewed year-over-year comparison due to loss of GoM production from a hurricane in 2012.)

# Forecasts Having Trouble Keeping Up with U.S. Oil Supply Growth

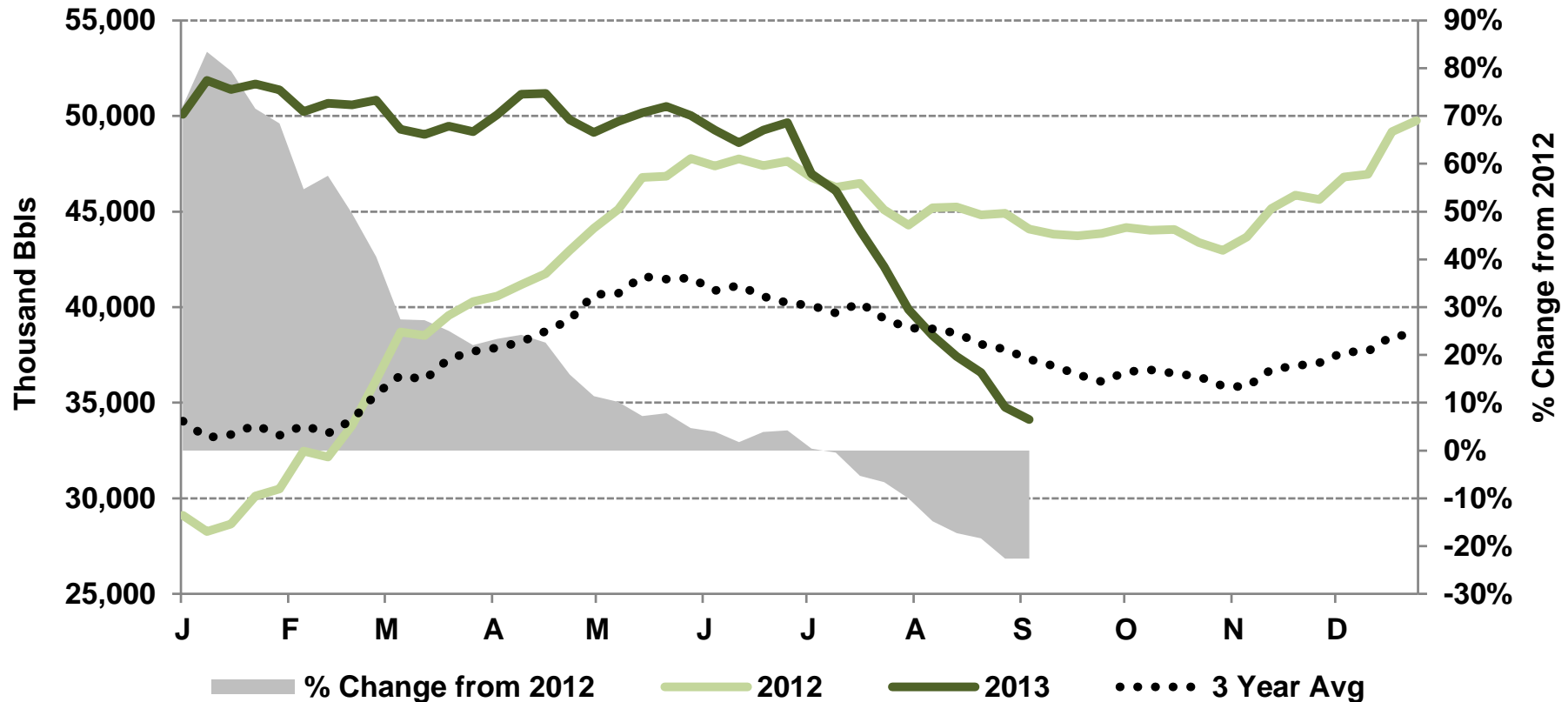


EIA U.S. Crude Oil Production with Previous EOG & Current RJ Forecasts



# New Pipeline Capacity Causing Steep Draw from Cushing Inventory

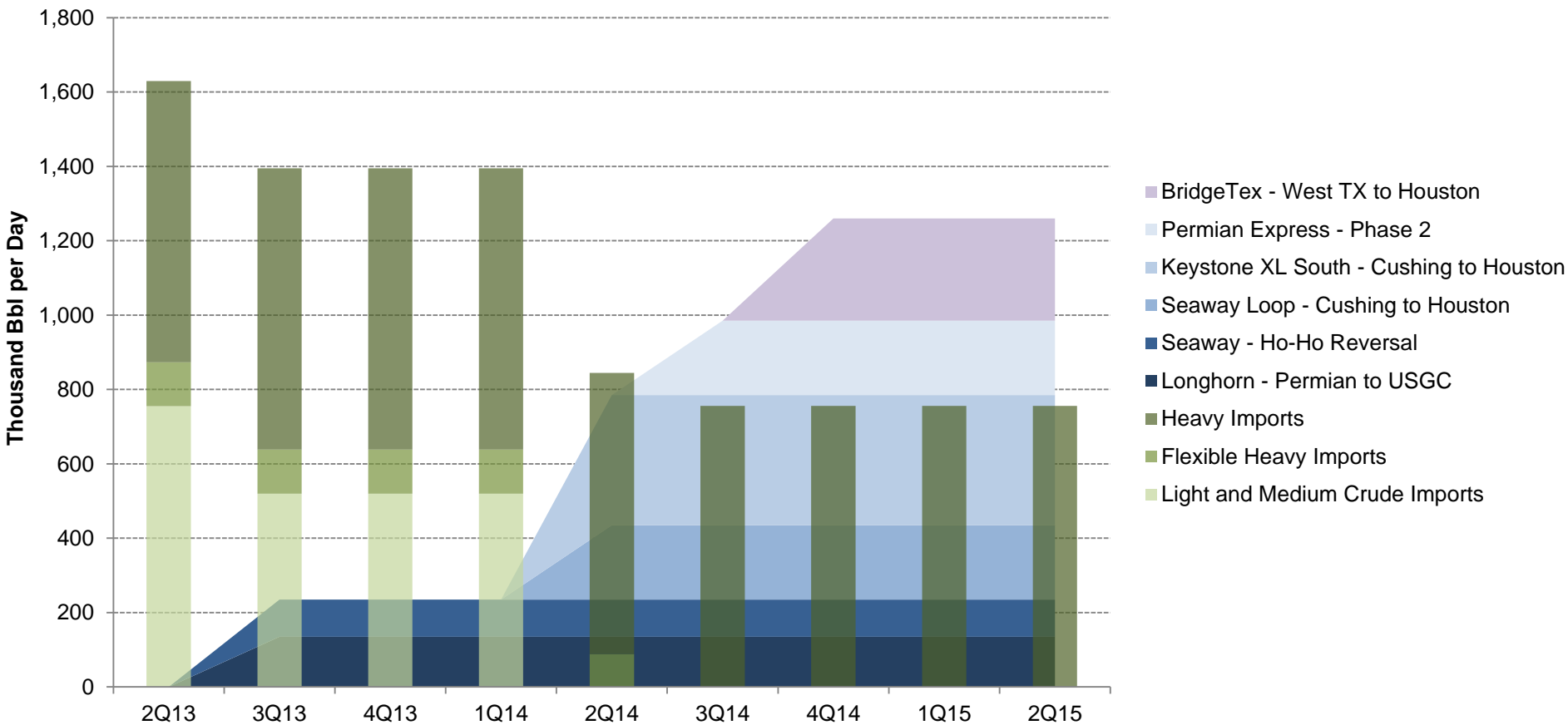
## EIA Cushing Inventory



- Despite the rise in U.S. production, WTI pricing has been supported by Cushing inventories that are drawing rapidly due to a number of new pipeline projects that are diverting volumes away and increasing outbound volumes from Cushing (the delivery point for WTI). Over the long-term we foresee domestic production growth exceeding imported light and medium crude volumes, but in the short-term, this debottlenecking of Cushing is supportive of WTI pricing.

# U.S. Light & Medium Supply to Exceed Refining Capacity

## Texas Gulf Coast Crude Imports vs. New Pipeline Capacity



- We believe that this new pipeline capacity will eliminate the need for light and medium crude imports into the Texas Gulf Coast region by late 2014. Given the growth in U.S. oil production, it is likely that the East and West Coasts of the United States will also no longer need to import light and medium crude volumes by 2016.

# Possible Solutions to Forecast U.S. Sweet Crude Oversupply



Potential Upstream Solutions	Result
Reduce rate of drilling to allow declines to reduce supply	Negative for N.A. Service and E&P
Shut in producing wells until wellhead price recovers	Negative for N.A. E&P
Presidential permission to export light sweet crude	Positive for N.A. Service and E&P

Potential Midstream Solutions	Result
Increased long-haul shipments of condensate to Canada as diluent	Positive for Midstream Volumes
Rail, barge, truck and/or new pipelines to regions not yet out of balance	Positive for Midstream Volumes
Absorbing some light crude by blending with heavy crudes	Positive for Midstream Volumes
Installation of condensate splitters to qualify for export status	Positive for Midstream Volumes, Exporters of Distillates and Naptha

Potential Downstream Solutions	Result
Increased usage of condensate by petrochemical companies	Increase in Demand is Positive for N.A. Service, E&P and Midstream, Negative for Refiners
Refiners modify to accommodate more light sweet crude	Positive for Refiners (may require locking-in crude supply at a discount)

- With no additional light and medium sweet imports to push out of the market, a variety of solutions may need to be implemented by industry participants in the U.S. (OPEC supply reductions are not likely to be effective.)

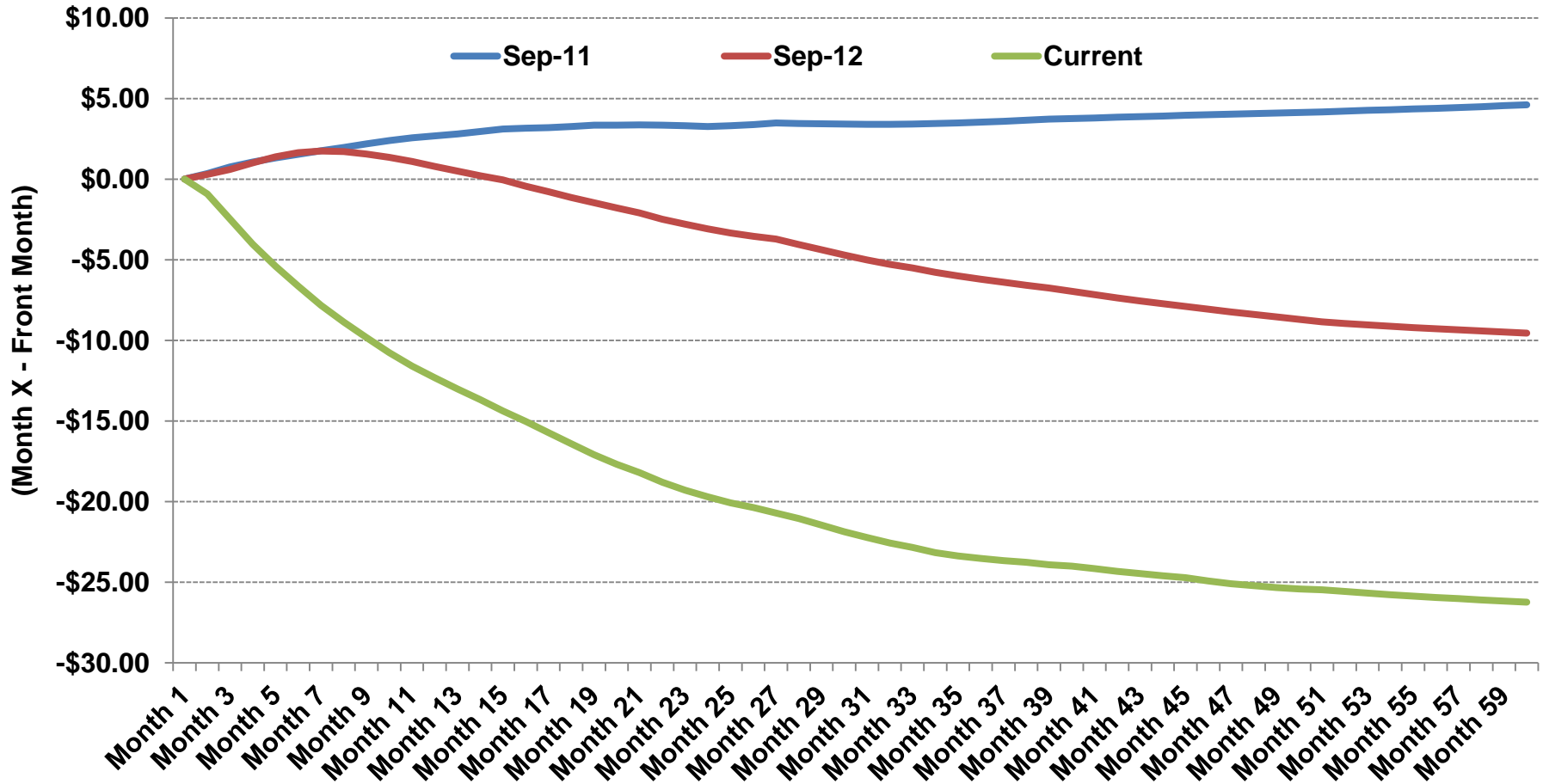
# One Potential Solution is the U.S. Export of Crude Oil



- 1) U.S. Crude Oil Exports are being discussed by energy staffers and the issue has come up at public policy conferences.
- 2) However, it is unlikely to be a 2013 issue and there are no hearings scheduled.
- 3) Allowing the export of crude oil will likely require at least one of the following:
  - a) Congressional repeal of the Energy Policy and Conservation Act of 1975 that directed the President to restrict the export of crude oil.
  - b) The President is allowed to permit crude oil export in circumstances where the President determines that such exports are in the national interest. The President made such determinations for limited export of heavy crude oil from California in 1992, crude oil produced from Alaska's Cook Inlet in 1985, and oil exports to Canada for use or consumption therein in 1985 and 1988.
- 4) We believe that b is the more likely scenario and it will most likely take the form of a swap for heavier Mexican volumes. No net exports will give the president political cover. The [EIA has mentioned this possibility publicly](#) and there have been mentions of this possible solution in the [business press recently](#).
- 5) With regard to timing, it seems likely that the president would not take any action until the price of oil dropped and rigs would be laid down. This would again allow him political cover by justifying his decision to export crude oil with the prospect of saving American jobs.
- 6) Implications of such a change in the law would be positive E&P companies and service providers, but negative for refiners.

# Lower Expectations for Long Term WTI Prices

## Historical WTI Forward Curve (Month X - Front Month)





# Crude Oil Summary



## Worldwide Supply & Demand

- Currently, the world crude oil market appears balanced with Saudi Arabia producing at 30 year highs to offset production interruptions elsewhere in the Middle East.
- U.S. oil demand and Chinese oil imports have rebounded and are showing signs of growth.

## Forecast U.S. Production Growth

- In a reversal of long-term oil project trends, U.S. oil shales outperformed forecast volumes in 2012.
- U.S. light and medium sweet crude will likely outstrip U.S. refining capacity in the next 3 years. Due to the prohibition on the exportation of crude oil, light and medium sweet crude will need to find a market or be suppressed by 2016.

## Oil Prices

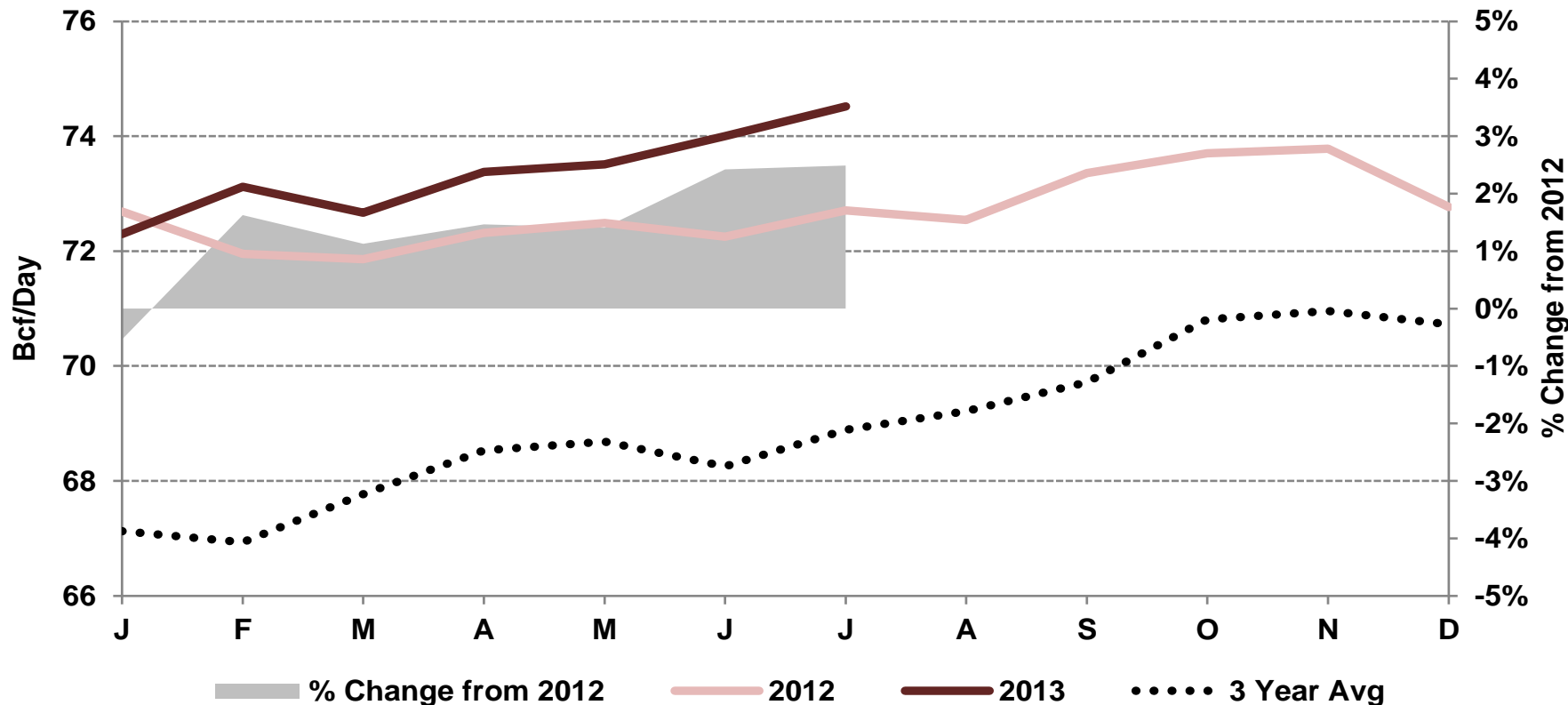
- High impact North American shales (Eagle Ford, Bakken) have fairly low breakeven oil prices and should maintain activity as long as WTI prices do not persist below \$70/Bbl for an extended period of time.

# Natural Gas

# Natural Gas Production Remains Elevated



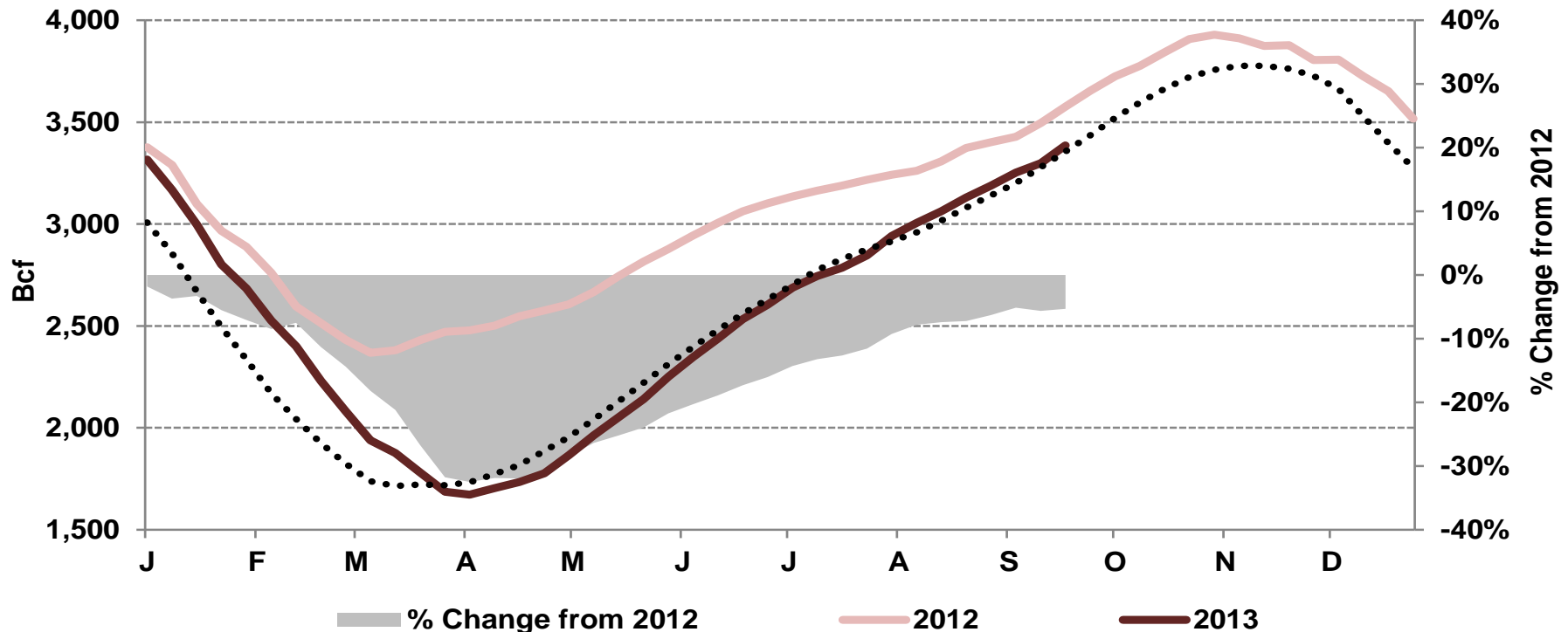
## EIA Form-914 Natural Gas Production



➤ As anticipated, natural gas production has continued to remain stable despite a fall in the rig count. Current production is 74.5 Bcf/Day, up +1.8 Bcf/Day from last year despite the natural gas rig count falling by 27% during this time frame.

# Natural Gas Inventories Steadily Returning to Last Year's Levels

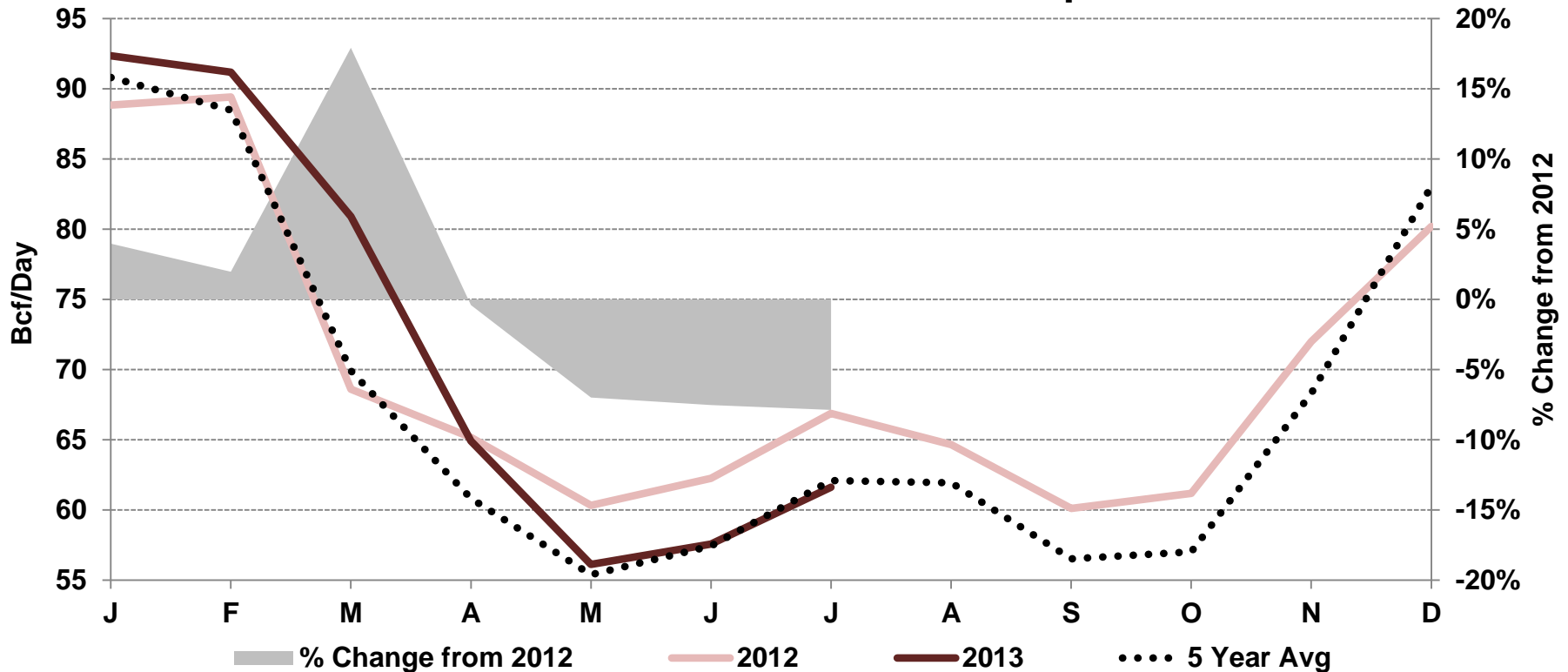
## EIA U.S Natural Gas Storage



- Storage injections have exceeded last year's levels for the last two months. This is not surprising given that production curtailments in 2012 helped to manage the volume of natural gas in storage. The year-over-year decrease in natural gas storage volumes has been steadily narrowing and storage volumes now exceed the 5-year average.

# Total Natural Gas Consumption Falls YoY After Short-term Prices Increase

## EIA U.S. Total Natural Gas Consumption

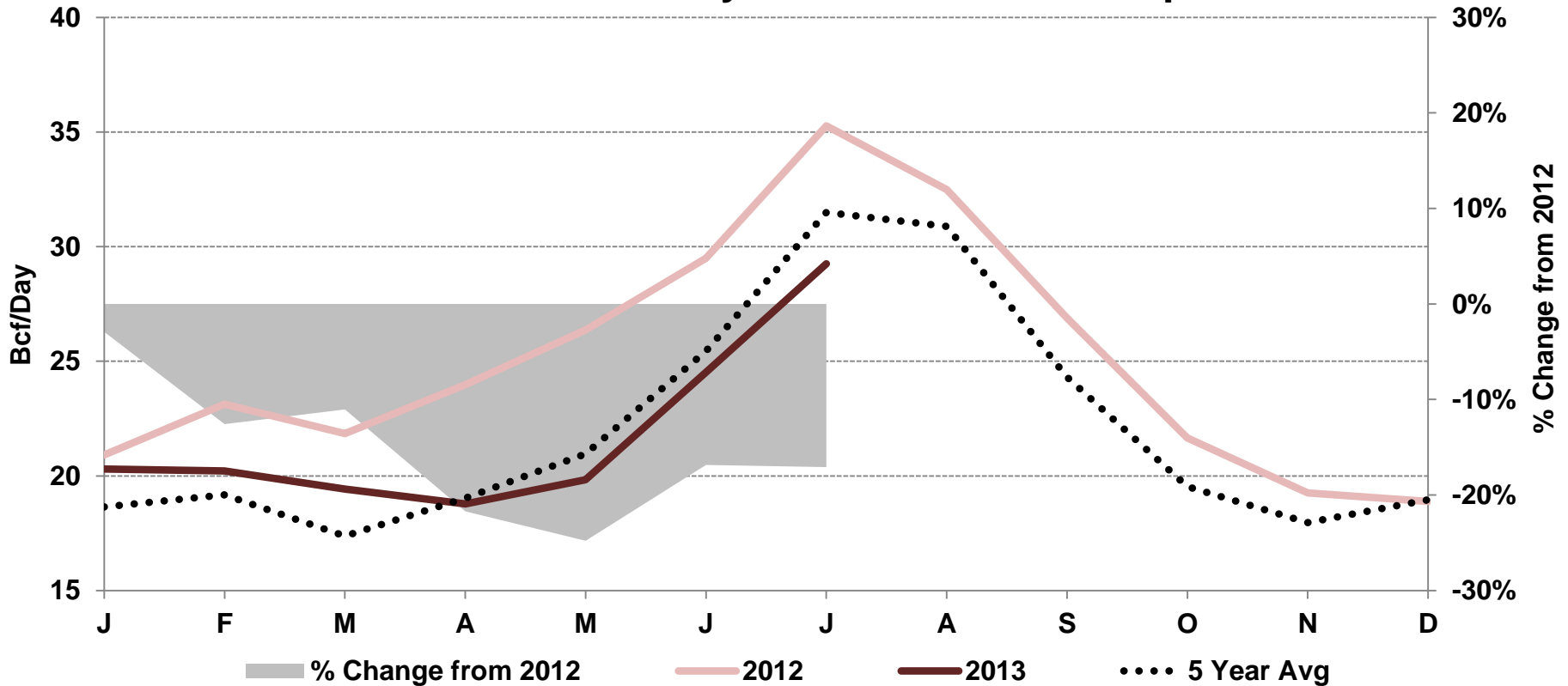


- A return to more normal seasonal weather in May moderated commercial and residential demand for natural gas. Industrial demand has been up steadily throughout the year, but its total contribution to year-over-year demand growth is less than 1.0 Bcf/Day. Declines in natural gas demand for electric generation was by far the most significant driver of the overall decline.

# Reverse Coal to Natural Gas Switching



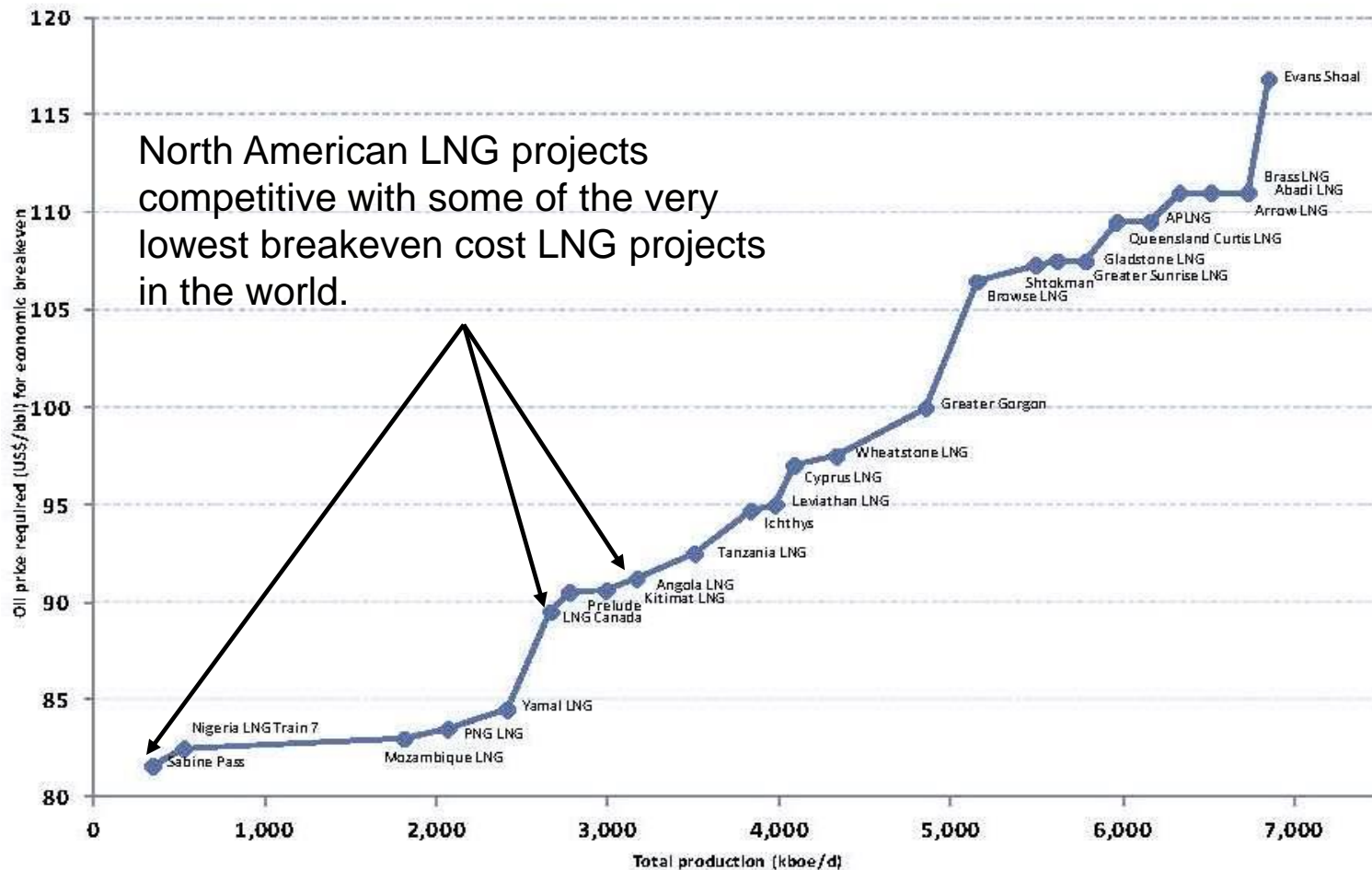
## EIA U.S. Electric Utility Natural Gas Consumption



- The rise in natural gas prices earlier in the year caused electric utilities to switch from natural gas to coal. Year to date natural gas demand from electric utilities is down an average of -4.1 Bcf/Day in 2013. In the month of July, natural gas demand from electric generation was down -6.0 Bcf/Day. Although we expect this demand loss to moderate as natural gas prices have corrected, this also confirms the view that coal demand will benefit strongly from natural gas prices in the \$3.80 to \$4.40/MMBtu range.

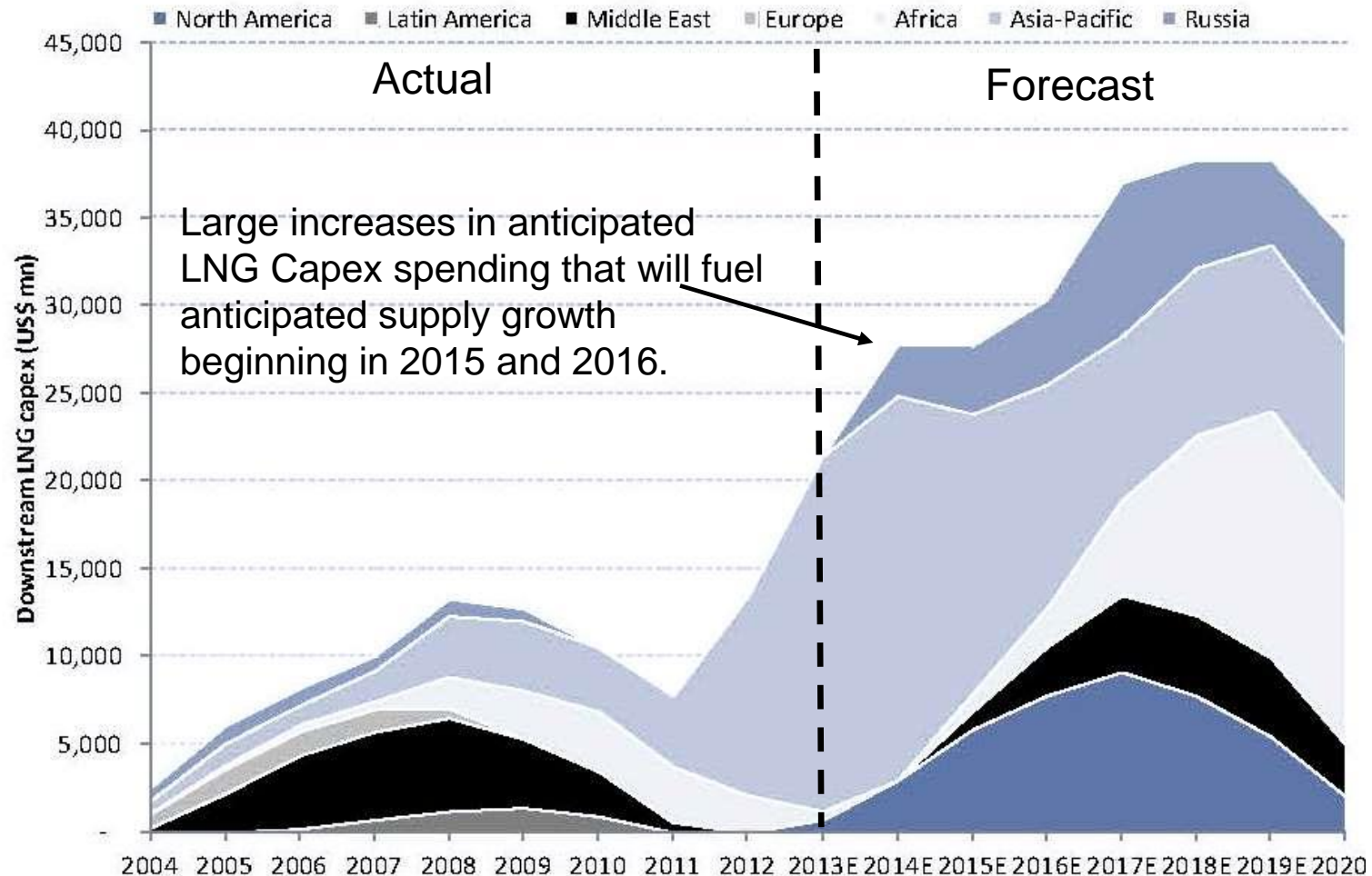
# Global LNG Project Economics

## Global LNG Projects by Breakeven Oil Price



# Worldwide LNG Capex

## LNG Capex by Region





# Portfolio Performance



LNG production (Mmcf/d)	2012	2013E	2014E	2015E	2016E	2017E	2018E	2019E	2020E
Algeria	1,449	1,376	1,307	1,307	1,307	1,307	1,307	1,307	1,307
Egypt	668	602	541	541	541	541	541	541	541
Libya	0	0	70	300	500	500	500	500	500
Israel/Cyprus	0	0	0	0	0	0	0	167	600
<b>Mediterranean</b>	<b>2,117</b>	<b>1,978</b>	<b>1,919</b>	<b>2,149</b>	<b>2,349</b>	<b>2,349</b>	<b>2,349</b>	<b>2,516</b>	<b>2,949</b>
Trinidad	1,687	1,687	1,687	1,687	1,687	1,687	1,687	1,687	1,687
Nigeria	2,619	2,619	2,619	2,619	2,619	2,619	2,619	2,619	2,748
Equatorial Guinea	493	493	493	493	493	493	493	493	493
Angola	0	129	579	669	669	669	669	669	669
Norway	456	443	498	526	526	526	526	526	526
Russia	1,435	1,480	1,480	1,480	1,480	1,480	2,124	2,767	3,411
United States	73	73	73	73	394	587	1,102	1,617	2,003
<b>Atlantic</b>	<b>6,764</b>	<b>6,924</b>	<b>7,429</b>	<b>7,547</b>	<b>7,869</b>	<b>8,062</b>	<b>9,220</b>	<b>10,379</b>	<b>11,537</b>
Oman	1,062	1,062	1,062	1,062	1,062	1,062	1,062	1,062	1,062
Qatar	10,198	10,379	10,560	10,620	10,650	10,650	10,650	10,650	10,650
UAE	734	734	734	734	734	734	734	734	734
Yemen	673	772	862	862	862	862	862	862	862
Mozambique								129	515
<b>Middle East &amp; East Africa</b>	<b>12,668</b>	<b>12,948</b>	<b>13,219</b>	<b>13,279</b>	<b>13,309</b>	<b>13,309</b>	<b>13,309</b>	<b>13,438</b>	<b>13,824</b>
Australia	2,725	2,957	2,957	3,858	6,007	8,690	10,344	11,103	11,605
PNG			0	257	708	888	1,017	1,274	1,313
Brunei	900	900	900	900	900	900	900	900	900
Indonesia	2,383	2,242	2,116	2,059	2,005	1,954	1,905	2,232	2,430
Malaysia	3,038	3,038	3,038	3,038	3,038	3,038	3,038	3,038	3,038
Peru	511	566	566	566	566	566	566	566	566
Canada					0	0	257	901	1,519
<b>Pacific</b>	<b>9,557</b>	<b>9,703</b>	<b>9,577</b>	<b>10,678</b>	<b>13,224</b>	<b>16,036</b>	<b>18,027</b>	<b>20,015</b>	<b>21,371</b>
<b>Total supply</b>	<b>31,106</b>	<b>31,553</b>	<b>32,144</b>	<b>33,653</b>	<b>36,751</b>	<b>39,756</b>	<b>42,906</b>	<b>46,347</b>	<b>49,681</b>
% growth	-2%	1%	2%	5%	9%	8%	8%	8%	7%

The U.S. and Australia are forecast to be the largest sources of global LNG growth until the end of the decade.

LNG markets are likely to remain tight until new supplies from the U.S. and Australia begin operations.

# Natural Gas Summary



## Natural Gas Supply & Demand

- The falling natural gas rig count has yet to significantly affect production U.S. levels.
- We believe that this is due to two major factors. First, the extreme increase in dry gas well productivity in areas such as the Haynesville and Marcellus can add significant natural gas volumes with relatively few rigs. Second, oil and NGLs can add significantly to a gas well's economics.

## Natural Gas Prices

- After a bump in winter heating demand for commercial and residential use, natural gas prices are re-settling into a range below \$4.00/MMBtu as inventory levels grow seasonally.
- These levels are near the price at which reverse coal to gas switching occurs, dampening the demand for natural gas demand for electric generation.

## Waiting for Sustainable Increases in Natural Gas Demand

- Sustainable rises in natural gas demand will come from an increase in industrial demand, electric generation and LNG exports.
- However, these are mid to long-term changes in natural gas demand growth that will occur slowly over the next several years as projects are slowly completed.