Energy and commodity price benchmarking and market insights


Illuminating the markets
European gas and global LNG

5 June 2013
IFI EC Europe — Brussels
US shale — coal now
US shale – coal now, LNG later?

Shale drives record US gas production
US shale — coal now, LNG later?

Shale drives record US gas production

bn m³/d


US marketed gas production

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US shale — coal now, LNG later?

Shale drives record US gas production

- 2009 Gustav/Ike
- 2005 Katrina/Rita
US shale — coal now, LNG later?

Shale drives record US gas production

Jan-2001 to Jan-2013

+628mn m³/d

2005 Katrina/Rita

2009 Gustav/Ike
US shale — coal now, LNG later?

or + 2.6 times UK demand each day

Shale drives record US gas production

2009
Gustav/Ike

2005
Katrina/Rita

[Graph showing US marketed gas production with highlights for 2005 Katrina/Rita and 2009 Gustav/Ike]
US shale — coal now, LNG later?

or + 1.6 times Chinese demand each day

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US shale — coal now, LNG later?

Shale drives record US gas production

US production 35pc shale in 2012
US shale — coal now, LNG later?

US production 50pc shale in 2040

US production 35pc shale in 2012
US shale — coal now

US electricity turns away from coal

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US shale — coal now

**2001**
- 16pc gas

**2012**
- 30pc gas

**US electricity turns away from coal**

- 100%
- 90%
- 80%
- 70%
- 60%
- 50%
- 40%
- 30%
- 20%
- 10%
- 0%

- Coal
- Gas
- Nuclear
- Renewable
- Other

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US shale — coal now

Steam coal exports (mn t/yr)

- Net exports
- 2005 AEO

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US shale — coal now

Steam coal exports (mn t/yr)

- Net imports
- 2005 AEO
- 2013 AEO
US shale — coal now

EU27 coal import balance – SA/US/AUS

Australia
South Africa
US

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US shale — LNG later?
US once on course for vast imports
US once on course for vast imports

Planned or proposed import projects

California
Sound Energy
Port Esperanza
Ocean Way
Cabrillo Port
Clearwater Port

Oregon
Bradwood
Oregon LNG
Portwestward
Jordan Cove

New England
Downeast LNG
Quoddy Bay
Calais
Weaver’s Cove
Keyspan

NY/NJ
Crown Landing
Blue Ocean
Broadwater
Liberty
Safe Harbor

Alabama/Mississippi
Bienville
Compas Point
Casotte Landing
Gulf LNG

Maryland
Cove Point II
Sparrows Point

Florida/Georgia
Port Dolphin
Calypso
Elba Island III

Texas
Vista del Sol
Ingelside
Port Arthur
Port Lavaca
Corpus Christi
Beacon Point

Louisiana
Creole Train
Cameron II
Main Pass
Gulf Landing
Pearl Crossing
Port Pelican

1.4bn m³/d of sendout capacity
US once on course for vast imports

LNG imports (mmt)

-20  0  20  40  60  80  100  120  140

Net imports  2005 AEO  2008 AEO
US poised for exports
US poised for exports

Planned or proposed export projects

725.3mn m³/d of liquefaction capacity

Texas
Gulf Coast
Freeport
Golden Pass
Corpus Christie
Lavaca Bay

Louisiana
Main Pass
Sabine Pass
Lake Charles
Cameron

Mississippi
Gulf LNG

Oregon
Oregon LNG
Jordan Cove

Maryland
Cove Point

Georgia
Elba Island

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US LNG — exports, but at what price?
Exporting US shale, but at what price?
Exporting US shale, but at what price?

115pc Nymex - commodity cost

US LNG exports must compete on price

$I/\text{mn Btu}$

Jul 13  Jul 14  Jul 15  Jul 16  Jul 17  Jul 18

- US futures
- +15 pc basis
- NBP
Exporting US shale, but at what price?

115pc Nymex - commodity cost
+$2.85 fixed cost (margin)
Exporting US shale, but at what price?

115pc Nymex - commodity cost
+$2.85 fixed cost (margin)
+Freight
Exporting US shale, but at what price?

115pc Nymex - commodity cost
+$2.85 fixed cost (margin)
+Freight
Gas prices and the power sector
Gas prices and the EU power sector

Costs and P/L scenarios 2015

- Fuel costs
- CO2 cost
- Profit/Loss
- Power price

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Gas prices and the EU power sector

Costs and P/L scenarios 2015

- Implies CO2 price at €48.75/t
- At least 10x higher than current prices

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Gas prices and the EU power sector

Costs and P/L scenarios 2015

Implies CO2 price at €48.75/t
At least 10x higher than current prices

Implies gas price at €18.30/MWh

Fuel costs
CO2 cost
Profit/Loss
Power price
Global shale resources
Global shale resources

Trillion m$^3$ – EIA - April 2011
Global shale resources

Chinese resources estimated to be larger than those of the US

Technically recoverable shale gas resources Trillion m³
China will still require imports

Even at target, shale still insufficient to completely close supply gap

Implied import requirement
Shale target
Shale oil — more of the same?
Shale drives rebound in US oil output
US crude stocks

Crude stocks at or near historic highs

- East Coast (Padd 1)
- Midwest (Padd 2)
- Cushing
- Gulf Coast (Padd 3)
- Rocky Mountain (Padd 4)
- West Coast (Padd 5)

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Observed max

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US-North Sea price spreads

WTI v Brent


$bl

Brent-WTI
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