

# Global LNG Sector

## INDUSTRY OVERVIEW/ANALYSIS



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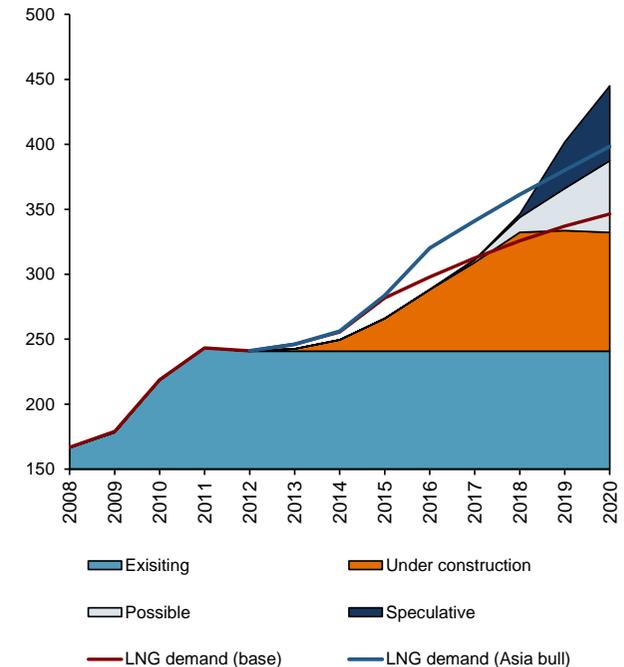
**Tight global market to 2017:** In our third global LNG review we continue to see a reasonably tight market until 2017. After the Fukushima shock of 2011 and initial severe tightness, the global LNG market has found a new equilibrium with Europe reining in its LNG imports as Asia's demand continues to grow. Portfolio sellers will benefit as cargoes are pulled from Europe to the higher value Asian markets.

**We are cautious on the need for further project sanctions near term:** Our detailed US LNG supply scenario analysis concludes that 67 MT of capacity could be sanctioned, but our base case supply / demand balance suggests no meaningful further project sanctions are required to meet demand to the end of the decade, challenging project proponents / contractors' rosy view. A far more bullish China demand scenario would be required to call on multiple new project sanctions.

**Price:** Absolute convergence? No. In the US an abundance of low-cost supply leads us to conclude that domestic gas prices will stay under US\$5/mcf. In Europe, with weak LNG we conclude that landed prices will hover around the US\$9-10/mmbtu range going forward. In Asia, we believe that the US price effect will be to 'calm rather than capitulate' the Asian price premium from the current US\$4 to US\$2/mmbtu.

**Winners and losers across the LNG value chain:** Among the majors we prefer Shell and CVX (pulling ahead as BG pauses) & ENI (Mozambique); for LNG-focused mid-size plays we prefer Inpex (over-sold) & Ophir Energy. In the E&C space we prefer JGC (over Chiyoda), Technip (FLNG leadership) over Saipem, KBR in the US & Worley Parsons (global LNG reach) in Australia & TransCanada (multi-project pipeline provider) in Canada.

Tight LNG market until '17 then lots of potential supply



Source: FACTS Global Energy, Industry data, Credit Suisse estimates.

### RESEARCH ANALYSTS

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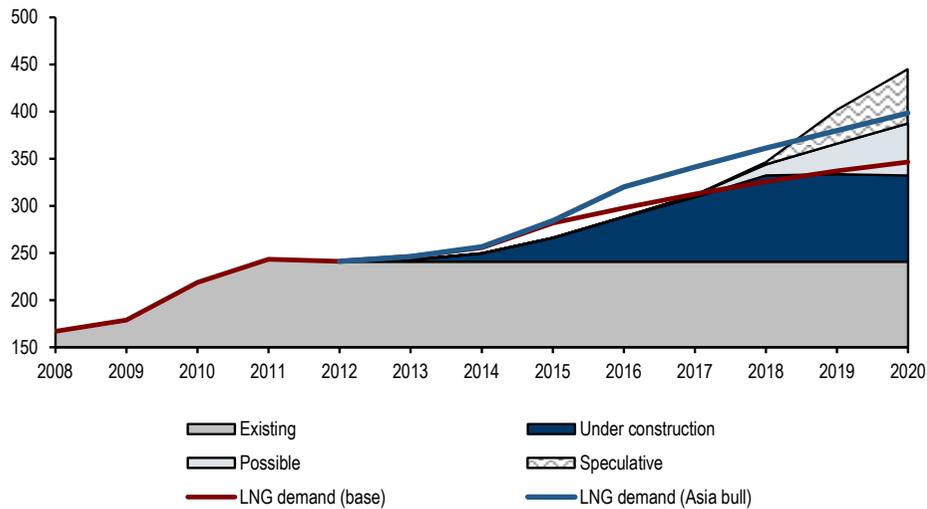
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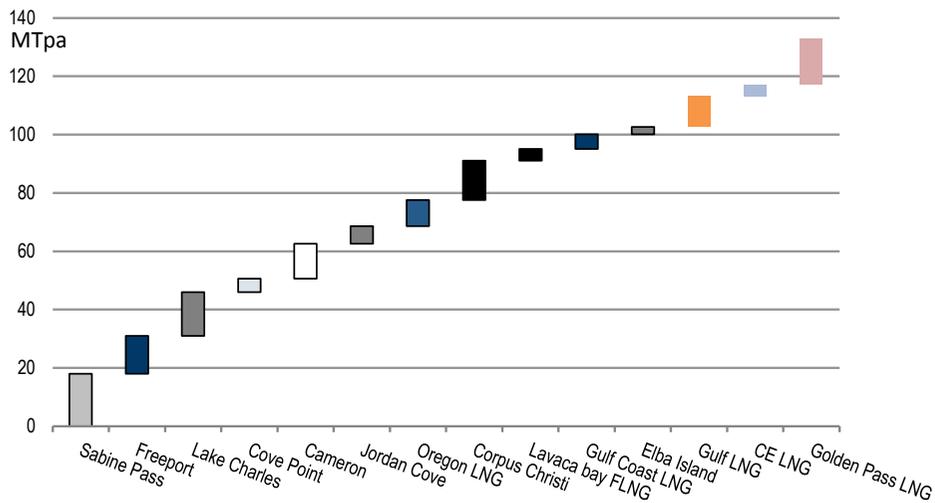
# Key charts

**Figure 1: CS Global LNG demand / supply forecast**



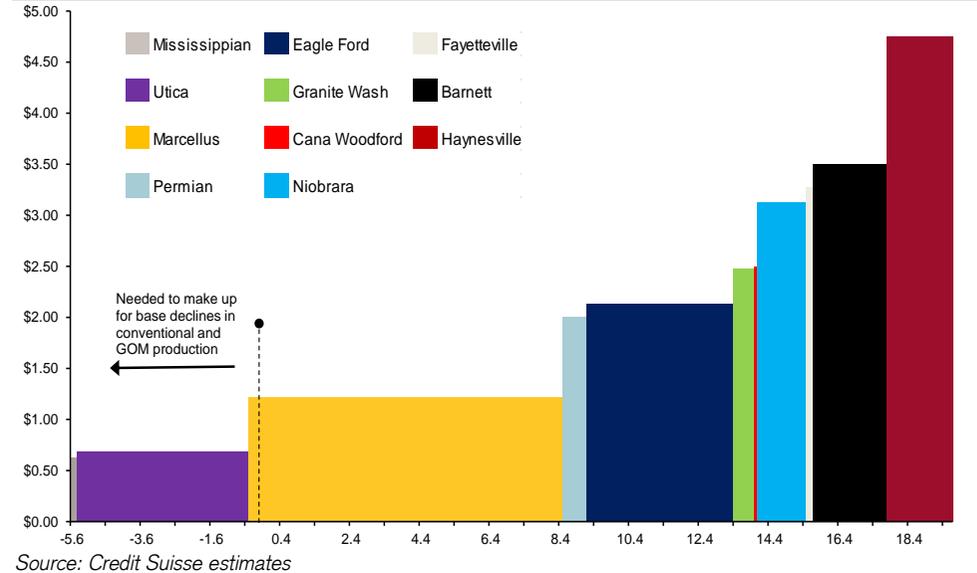
Source: BP Statistical Review, Credit Suisse estimates.

**Figure 2: US LNG projects—sequential applications to the DoE**



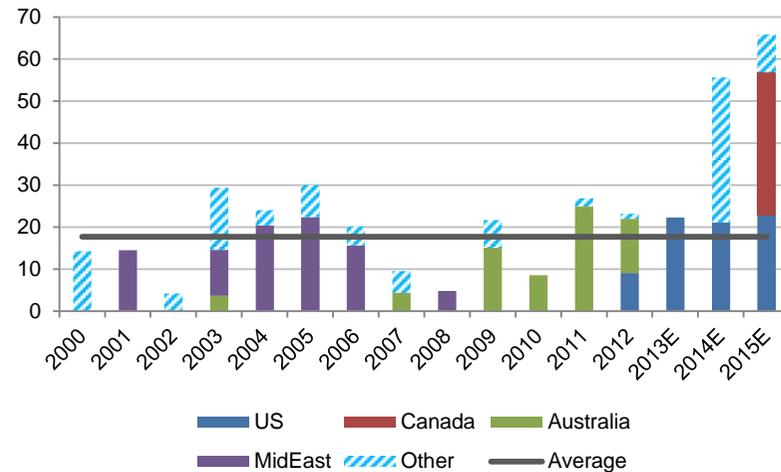
Source: Company data, Credit Suisse estimates

**Figure 3: Incremental new gas supply 2013-2020 by breakeven price for 15% IRR**  
In US\$/mmbtu (y-axis) vs. cumulative Bcf/d (x-axis)



Source: Credit Suisse estimates

**Figure 4: Liquefaction capacity sanctioned by year and region**  
in MTpa of capacity sanctioned



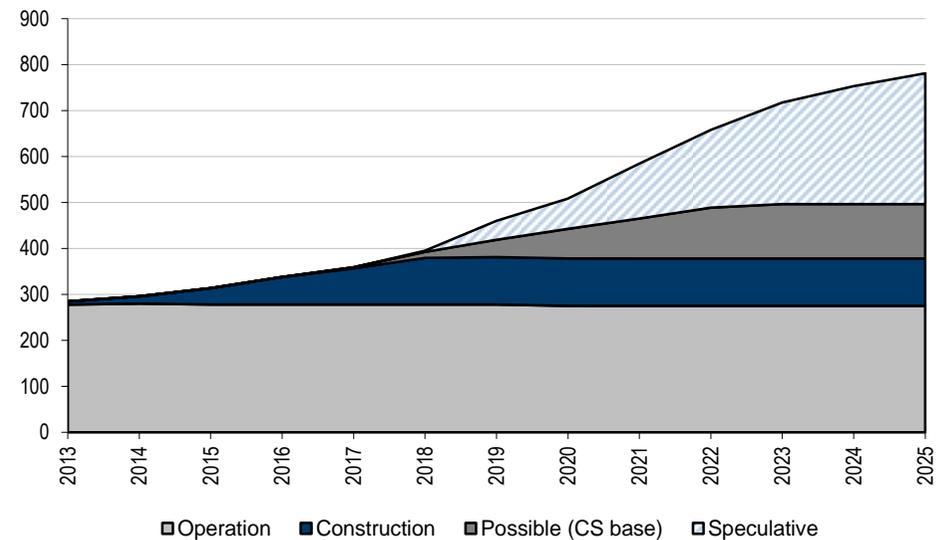
Source: Company data, Credit Suisse estimates

## Executive summary

**'The more things change, the more they stay the same':** LNG is the world's fastest-growing energy commodity, with demand rising at 5% to 2020 (vs oil +1.2% p.a.). The LNG sector is changing rapidly. Multiple new supply sources (and new suppliers) bring the promise of supply to both traditional LNG buyers and a slew of emerging demand sources. As supply becomes more global, some are tempted by the notion that global LNG prices will commoditise, but at Credit Suisse we believe that the sheer scale of project developments will leave the majority of future LNG still in the hands of a concentrated set of like-minded players who aren't driven to take significant capex exposure without adequate returns. Hence, we conclude that, as new supply provinces open up and new buyers enter the market, the same LNG players develop the space, with the same drivers (namely value maximisation). In this report we deep dive both the supply side with a project-by-project update and a detailed look at when US projects might get sanctioned and then start supply, along with global demand dynamics, including a scenario analysis for a nuclear return in Japan. Our main conclusions: a broadly balanced market through to 2017, with potential for excess supply toward the end of the decade if projects not yet sanctioned do so in the next 12 to 24 months, US gas prices hovering in a \$4 to \$5 / mcf range and the maintenance of the Asian price premium, albeit diminished at the end of the decade versus now.

**Supply—everything's getting pushed back, multiple new supply points:** In 2013 CS estimates only ~6 MTpa of nameplate capacity will be added and just 11 MTpa in 2014. Project sanctions have been supported by the first US project approved to date (Cheniere's Sabine Pass T1-4), but activity in APAC is markedly lower, with only Phase 2 of APLNG and Petronas' FLNG-1 announcing sanctions since our last Global LNG report. The approvals season is getting under way in the US which should lead to further project sanctions in the next 36 months (we introduce a multiple scenario analysis for US LNG exports), and in Canada and East Africa there are multiple projects jockeying for position, but we see the timeline for gas from these three new supply areas pushing back toward, and even beyond, the 2020 watershed.

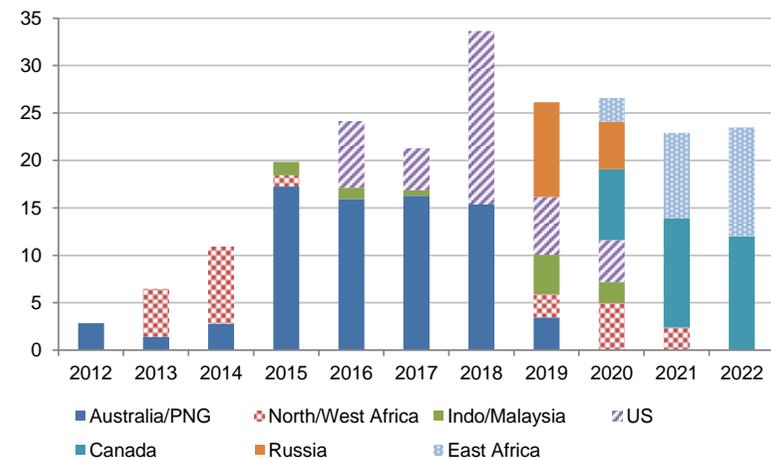
Figure 5: Global LNG nameplate capacity—2013–2025 (MTpa)



NB: Chart shows theoretical nameplate, not available production.

Source: Credit Suisse estimates.

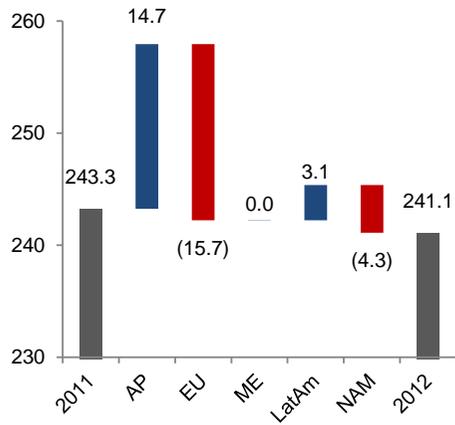
Figure 6: Capacity additions by year and by region/country in MTpa of nameplate capacity



Source: Company data, Credit Suisse estimates

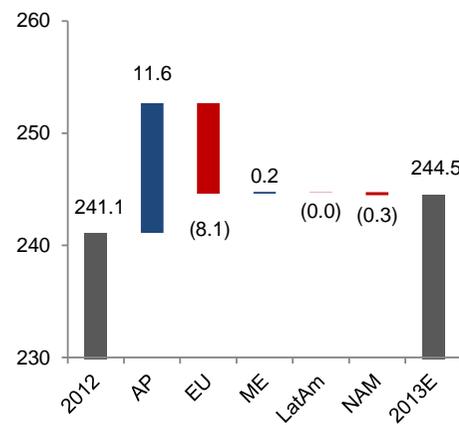
**Demand—Asia strong as Europe fades:** Three major themes dominate the demand picture: The US\$64,000 question is to what degree Japan brings its nuclear fleet back, and within what timeframe. We develop three scenarios, with our base case reducing our end of decade LNG demand in Japan by 5 MT from our previous forecast. Secondly, demand destruction in Europe, which countered almost completely the demand gains in Asia as higher price LNG was substituted by coal and Europe chose to buy more pipeline gas. Thirdly, LNG is becoming more real in SE Asia, with terminals starting operations in Malaysia, Thailand and Indonesia, and Singapore working on its business model for LNG expansions. We increase our 2020 SE Asia demand by 13 MT. Emerging demand centres such as Latam and MidEast could also add a combined 10 MT to global LNG demand. The other major wild card is Chinese LNG demand. Credit Suisse’s base case assumes China has largely bought its LNG for now whilst it waits for its own shale revolution; however, we run a scenario where China ‘gives up’ on shale and decides to meet its 2020 shale production target with as yet uncontracted LNG. This would add 45 MTpa to China’s call on LNG by 2020, which would call in the majority of volume from those LNG projects CS currently categorises as ‘possible’ i.e., pre FID.

**Figure 7: 2012 vs. 2011—Demand change by region (MTpa)**



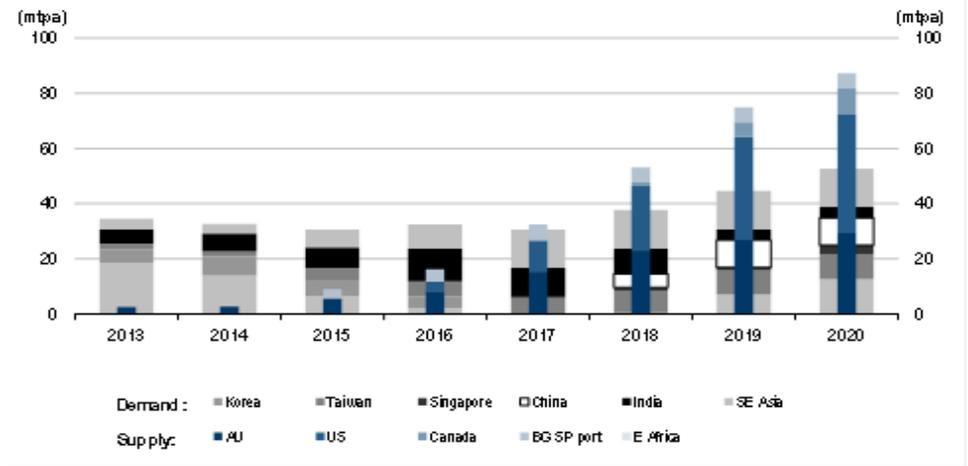
Source: BP Statistical Review

**Figure 8: 2013 vs. 2012—Demand change by region (MTpa)**



Source: Credit Suisse estimates

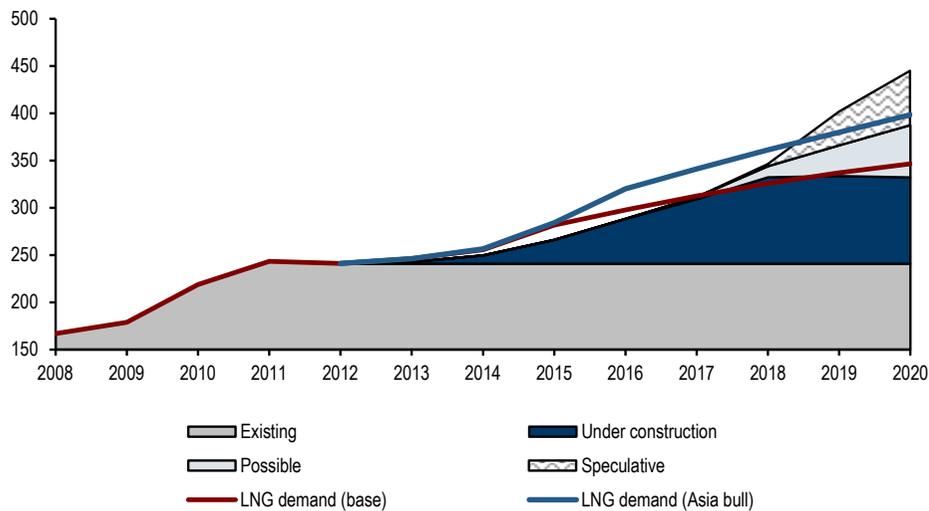
**Figure 9: APAC un-contracted demand / un-contracted supply 2013 - 20E**



Source: Credit Suisse estimates

**Supply-demand: broad balance to 2017—juries out thereafter:** Our base case forecasts suggest a broadly balanced to slightly tight global LNG market through 2017 (but regional in-balances will continue, with Asia calling cargoes away from Europe). Few of the ‘possible’ projects in our database are required in the latter part of the decade, with only a 14 MTpa shortfall vs expected demand if no projects are sanctioned from here. To absorb the supply from those projects would, for example, require a more bullish assumption on Chinese, Japanese or European import requirements to balance the global market.

Figure 10: CS Global LNG demand / supply forecast (MTPa)



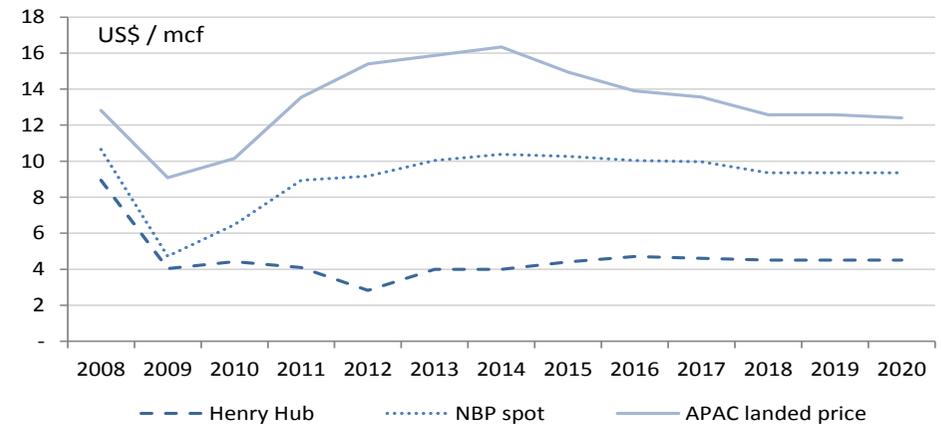
NB1: Asia bull demand case includes an additional 45 MTPa from China and 7 MTPa from Japan

NB2: LNG production is available capacity, not nameplate capacity.

Source: BP Statistical Review, Credit Suisse estimates.

**Price: USHH \$4 to \$5/mcf, Asian premium closes from \$4 to \$2/ mmbtu:** With the supply-demand balance tightening through 2013 and 2014 we do not see near-term price pressure on spot LNG prices. In the US, the abundance of low cost gas sources and the back end loaded nature of LNG exports in this decade lead us to conclude that US gas prices will stay sub-US\$5/mcf for the remainder of the decade. Commentators are focused on the effect of US exports to the Asian LNG price environment but we believe who is selling the gas will be important, with 'portfolio' sellers representing nearly 70% of total US exports by 2020 in our base case. We assume Asian LNG prices 'calm rather than capitulate', moving to a US\$12-13/mmbtu range (real) preserving a US\$2/mmbtu premium to the US domestic gas price (vs. a theoretical US\$4/mmbtu at the moment). European spot gas prices should remain in the US\$9-10/mcf range, just below competing piped gas from Russia and Norway, and high enough to attract marginal LNG cargoes in times of tight supply or strong seasonal demand.

Figure 11: Credit Suisse natural gas price forecast



Source: Credit Suisse estimates

**E&C—a large capex opportunity (but some will be delayed):** We expect the second half of 2013 to be slow in terms of liquefaction construction awards, with only one project (Freeport) likely to be sanctioned by year-end. We believe EPC awards will accelerate in 2014 and 2015, with as many as 6 or 7 projects up for FID in each year. More than half of these are in the US (pending export approval) and Canada, with the remainder in PNG, Indonesia, Russia, Nigeria and Mozambique. In addition, up to 20 Front End Engineering and Design (FEED) contracts could be awarded on less mature projects in the next two years, but FEEDs represent a much lower spend opportunity than construction (5% of EPC value). Importantly, we do not believe that all EPC contracts will be awarded on time—if they were, the amount of liquefaction sanctioned and built would be running at over twice historical peaks of activity (60 Mt vs less than 30 MT sanctioned in the 2003-05 and 2009-11 highs). We see Technip, KBR, Foster Wheeler and Worley Parsons as well placed to win LNG contracts.

**Winners and losers in the Global LNG space:** Amongst the majors we prefer Shell and CVX (pulling ahead as BG pauses) & ENI (Mozambique); for LNG focused mid-size plays we prefer Inpex (over-sold) & Ophir Energy. In the E&C space we prefer JGC (over Chiyoda), Technip (FLNG leadership) over Saipem, KBR in the US & Worley Parsons (global LNG reach) & in Canada TransCanada (multi-project pipeline provider).

## Companies Mentioned *(Price as of 28-Jun-2013)*

**Anadarko Petroleum Corp.** (APC.N, \$85.93)  
**Apache Corp.** (APA.N, \$83.83)  
**Avner Oil Explor** (AVNRp.TA, agora260.5)  
**BG Group plc** (BG.L, 1118.5p)  
**BP** (BP.L, 455.25p)  
**BP** (BP.N, \$41.74)  
**Bharat Petroleum** (BPCL.NS, Rs366.95)  
**CNOOC Ltd** (0883.HK, HK\$13.16)  
**Cameron International Corp.** (CAM.N, \$61.16)  
**Centrica** (CNA.L, 360.2p)  
**Cheniere Energy Partners, LP** (CQP.A, \$29.89)  
**Chevron Corp.** (CVX.N, \$118.34)  
**Chicago Bridge & Iron** (CBI.N, \$59.66)  
**Chiyoda Corporation** (6366.T, ¥1,167)  
**ConocoPhillips** (COP.N, \$60.5)  
**ENI** (E.N, \$41.04)  
**EOG Resources** (EOG.N, \$131.68)  
**Encana Corp.** (ECA.N, \$16.94)  
**ExxonMobil Corporation** (XOM.N, \$90.35)  
**Exxonmobil Chemi** (FXON.PA, €45.0)  
**Fluor** (FLR.N, \$59.31)  
**Foster Wheeler** (FWLT.OQ, \$21.71)  
**Freeport-McMoRan Copper & Gold** (FCX.N, \$27.61)  
**GAIL** (GAIL.NS, Rs313.3)  
**GDF Suez** (GSZ.PA, €15.04)  
**Gas Natural Fenosa** (GAS.MC, €15.49)  
**Gazprom** (GAZP.MM, Rbl108.85)  
**INPEX Corporation** (1605.T, ¥414,000)  
**Imperial Oil Ltd** (IMO.TO, C\$40.15)  
**Itochu Corp** (8001.T, ¥1,145)  
**JGC Corporation** (1963.T, ¥3,570)  
**KBR Inc.** (KBR.N, \$32.5)  
**Keppel Corporation** (KPLM.SI, S\$10.4)  
**Marubeni Corp** (8002.T, ¥663)  
**Mitsubishi Corp** (8058.T, ¥1,699)  
**Mitsui & Co** (8031.T, ¥1,246)  
**NOVATEK** (NVTkq.L, \$119.5)  
**Noble Energy** (NBL.N, \$60.04)  
**Oil & Natural Gas Corporation Limited** (ONGC.BO, Rs330.1)  
**Oil India** (OILI.NS, Rs574.55)  
**Oil Search** (OSH.AX, A\$7.73)  
**Ophir Energy plc** (OPHR.L, 357.0p)  
**Osaka Gas** (9532.T, ¥419)  
**PetroChina** (0857.HK, HK\$8.25)  
**Petronas Chemicals Group BHD** (PCGB.KL, RM6.62)  
**Petronet LNG Limited** (PLNG.BO, Rs124.75)  
**Ratio Oil Expl** (RATIp.TA, agora34.2)  
**Rosneft** (ROSN.MM, Rbl226.9)  
**Saipem** (SPMI.MI, €12.49)  
**Santos Ltd** (STO.AX, A\$12.53)  
**Shell** (RDSb.L, 2176.0p)  
**Sinopec Corp** (600028.SS, Rmb4.18)  
**Spectra Energy Partners, LP** (SEP.N, \$46.0)  
**Statoil** (STL.OL, Nkr125.3)  
**Technip** (TECF.PA, €78.01)  
**Total** (TOT.N, \$48.7)  
**TransCanada Corp.** (TRP.TO, C\$45.28)



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