February 16, 2012

India: Utilities: Power - Generation

Equity Research

Visibility now on coal supplies but at what price?

Coal India to meet at least 80% of the requirement

The Prime Minister approved the proposal requiring Coal India (CIL) to sign Fuel Supply Agreements (FSAs) with power plants that **1)** are commissioned on or before March 2015; and **2)** enter into long-term PPAs. The FSAs mandate supplying at least 80% of the full quantity of coal for a period of 20 years. CIL (Neutral) will be subject to penalties if supplies fall short of 80%. In case of any shortfall in fulfilling its commitment under the FSAs from its own production, **CIL will arrange to supply coal through imports** or arrangements with state/central PSUs that have been allotted coal blocks.

More visibility on coal supply, but pricing is key; NT issues to persist

While we believe this news flow is positive for the power sector as it ensures higher visibility of coal supplies, clarity is yet to emerge on how CIL will meet this target. It appears that CIL will have to import coal, and Clause 9 of the model FSA allows CIL to pass through the cost of imported coal to power companies. In this scenario, we think private IPPs will still see cost pressures, particularly for plants with no fuel pass-through clauses built into their PPAs.

57 GW will be eligible to receive coal from CIL; sufficient to meet 50%-55% of requirements from its own production

Our bottom-up supply analysis suggests that 57 GW of capacity (from April 2009 to March 2015) are based on CIL coal and are in long-term PPAs. Based on our calculations, we believe incremental supplies of CIL's own coal will be sufficient to meet 50%-55% of the total requirement for FY12E-FY15E (calculated at 80% PLF), with the remainder to be met by imported coal. In the event the 12GW (based on CIL coal but not in a PPA) of capacity becomes tied under a long-term PPA, then CIL's own supplies would meet just 45% of total requirements by FY15E.

Positive for Lanco Infratech and Adani Power

We believe private IPPs will benefit if CIL meets its 80% commitment through: 1) an improvement in production/dispatch growth vs. historical growth rates; 2) the procurement of coal supplies from blocks owned by central and state PSUs; 3) delays in state and central sector projects; and/or 4) the formulation of a mechanism that could reduce the delivered cost of imported coal. Our scenario analysis suggests that Lanco Infratech (Neutral) and Adani Power (Neutral) will benefit if CIL meets at-least 70% of their requirements (at current prices).

SUMMARY OF THERMAL INSTALLED CAPACITY BETWEEN FY10-15E

Thermal capacities commissioned (MW)	Linkage (MW)		Others	Total
	With PPA	Without PPA		
FY10	5,095	300	3,711	9,106
FY11	4,600	1,605	5,046	11,251
FY12 (Dec 2011)	6,025	735	3,525	10,285
April 09 to Dec 11	**15,720**	**2,640**	**12,281**	**30,641**
Jan - March 2012E	2,485	600	1,087	4,172
FY13E	14,240	4,230	16,100	34,570
FY14E	10,310	-	13,765	24,075
FY15E	14,510	4,560	4,054	23,124
FY10-FY15E	**57,265**	**12,030**	**47,287**	**116,582**

Source: CEA, Company data, Goldman Sachs Research estimates.

SUMMARY OF CAPACITY ADDITIONS BETWEEN FY10-15E

Company (MW)	Capacities based on CIL			Other fuels	Total capacity by FY15E
	PPA + Linkage	PPA	Others		
Adani Power	2,744	2,400	1,456	2,640	9,240
Lanco	1,500		4,260	3,450	9,210
Tata Power	1,050			7,272	8,322
NTPC	17,740				41,680
RPWR	1,200		600	3,960	8,420
JSW Energy				3,140	3,140
KSK energy			540	3,322	3,862

Source: Company data, Goldman Sachs Research estimates.
Note: "Others" – Lanco and Adani - capacity having linkage but no PPA.

RELATED RESEARCH

Evaluating potential positives for the sector; Buy Tata Power, *February 3, 2012.*

Durga Dath
+91(22)6616-9047 durga.dath@gs.com Goldman Sachs India SPL

Pritesh Vinay
+91(22)6616-9038 pritesh.vinay@gs.com Goldman Sachs India SPL

Indrajit Agarwal
+91(80)6637-8623 indrajit.agarwal@gs.com Goldman Sachs India SPL

Exhibit 1: We estimate that CIL supplies will be sufficient to meet about 50%-55% of the requirements calculated at government notified 80% of ACQ

	a	b	c = b * 80%	d	e = d/c	f = e * 80%
Year	Cumulative capacity (GW)	ACQ at 80% PLF (mtpa)	80% of ACQ (mtpa)	Cumulative CIL supplies (mtpa)	% requirement met	% requirement met at 80% PLF
FY12E	18,205	80	64	41	64%	51%
FY13E	32,445	143	114	70	61%	49%
FY14E	42,755	188	151	93	62%	49%
FY15E	57,265	252	202	136	67%	54%

Assumptions: 1) Domestic coal CV of about 3500Kcal; 2) all incremental supplies of CIL will be diverted to the power sector.

Source: Company data, CEA, Goldman Sachs Research estimates.

Exhibit 2: Imported coal is almost 50% more expensive vs. domestic coal
Calculations of landed cost of imported

Particulars	Cost
Eco-coal FOB (US$/ton)	55
Shipping costs (average US$12/ton)	12
CIF (US$ ton)	67
Handling charges at port (US$ ton)	3
Total cost at port (US$ ton)	70
Import duty @ 7.5% (US$ ton)	5.25
Total cost at port (US$ ton)	75.25
Total delivered cost using forex of Rs45	3,386
Inland transportation (Rs/ton)	500
Total delivered cost at plant (Rs/ton)	3,886
Total cost per unit (Rs/kwh)	**2.2**

(Assuming CV of coal of 4200Kcal, heat rate of 2150Kcal, auxiliary consumption of 8%, assumed transportation cost of Rs1/km, and coal is sourced from Indonesia. If the coal is sourced from South Africa, the imported duty + CVD is about 10%). Domestic coal price is about Re 1/unit.

Source: Goldman Sachs Research estimates.

Exhibit 3: Improved availability of coal will benefit Lanco Infratech the most among the IPPs in our view, while PPA renegotiation will help incremental upside for Tata Power

Summary of valuation impact for IPPs under our coverage in each scenario

Company	Rating	Implied value (Rs)					
		Base case	Scenario 1		Scenario 2		Scenario 3
		12-m TP	Re-negotiation of PPA with fuel pass through		Higher CIL supplies		Environmental clearance for captive mines
			With ROE	Without ROE	70%	80%	
Tata Power	Buy	124	154	130	No impact		No impact
Lanco Infratech	Neutral	12	20	16	27	36	No impact
Adani Power	Neutral	74	89	74	87	97	87
Reliance Power	Sell	70	73	73	72	73	Excess coal benefit
JSW Energy	Neutral	45	52	49	No impact		No impact
KSK Energy	Neutral	45	No impact		No impact		95

Company	Rating	Potential Upside/(Downside)					
		Base case	Scenario 1		Scenario 2		Scenario 3
			Re-negotiation of PPA with fuel pass through		Higher CIL supplies		Environmental clearance for captive mines
			With ROE	Without ROE	70%	80%	
Tata Power	Buy	12%	40%	17%	No impact		No impact
Lanco Infratech	Neutral	-37%	3%	-14%	41%	89%	No impact
Adani Power	Neutral	-6%	13%	-6%	10%	24%	11%
Reliance Power	Sell	-43%	-41%	-40%	-41%	-40%	Excess coal benefit
JSW Energy	Neutral	-33%	-23%	-27%	No impact		No impact
KSK Energy	Neutral	-36%	No impact		No impact		35%

Note: 1) Scenarios are independent of each other, highlighting possible measures that government could consider to address the fuel issues in the power sector (see *Evaluating potential positives for the sector; Buy Tata Power* Feb 3, 2012); 2) Target prices based on SOTP methodology. 3) Key risks: Upside: Easing coal supply situation and the implementation of Shunglu Committee recommendations; Downside: Higher-than-expected fuel costs and a significant decline in merchant prices.

Source: Company data, Goldman Sachs Research estimates.

Exhibit 4: We believe the potential benefits from implementing either of the two scenarios (renegotiation of PPA and higher CIL supplies) would not be reflected in Tata Power's share price

Potential changes in our base-case earnings in each scenario and the corresponding P/E and P/B multiples

Tata Power	% change in EPS		P/E (x)		P/B (x)		ROE	
	2013E	2014E	2013E	2014E	2013E	2014E	2013E	2014E
Base case			12.1	15.2	1.7	1.6	14.8%	10.6%
Scenario 1: Renegotiation of PPA								
With ROE	28.4%	81.9%	9.4	8.4	1.6	1.4	18.7%	18.1%
Without ROE	16.4%	45.8%	10.4	10.4	1.7	1.5	17.0%	14.9%

Lanco Infratech	% change in EPS		P/E (x)		P/B (x)		ROE	
	2013E	2014E	2013E	2014E	2013E	2014E	2013E	2014E
Base case			19.4	13.3	1.1	1.0	5.8%	7.9%
Scenario 1: Renegotiation of PPA								
With ROE	0.0%	0.0%	19.4	13.3	1.1	1.0	5.8%	7.9%
Without ROE	0.0%	0.0%	19.4	13.3	1.1	1.0	5.8%	7.9%
Scenario 2: Higher CIL supplies								
70% CIL coal	0.0%	0.0%	19.4	13.3	1.1	1.0	5.8%	7.9%
80% CIL coal	14.3%	10.3%	17.0	12.1	1.1	1.0	6.6%	8.5%

Adani Power	% change in EPS		P/E (x)		P/B (x)		ROE	
	2013E	2014E	2013E	2014E	2013E	2014E	2013E	2014E
Base case			16.3	10.7	2.1	1.8	13.8%	17.9%
Scenario 1: Renegotiation of PPA								
With ROE	49.9%	33.3%	10.8	8.0	2.0	1.6	20.0%	21.9%
Without ROE	19.1%	9.6%	13.7	9.7	2.0	1.7	16.2%	19.0%
Scenario 2: Higher CIL supplies								
70% CIL coal	30.1%	32.7%	12.5	8.0	2.0	1.6	17.5%	22.3%
80% CIL coal	41.3%	43.6%	11.5	7.4	2.0	1.6	18.9%	23.6%

Reliance Power	% change in EPS		P/E (x)		P/B (x)		ROE	
	2013E	2014E	2013E	2014E	2013E	2014E	2013E	2014E
Base case			31.0	34.8	1.9	1.8	6.2%	5.2%
Scenario 1: Renegotiation of PPA								
With ROE	0.0%	0.0%	31.0	34.8	1.9	1.8	6.2%	5.2%
Without ROE	0.0%	0.0%	31.0	34.8	1.9	1.8	6.2%	5.2%
Scenario 2: Higher CIL supplies								
70% CIL coal	4.8%	7.2%	29.6	32.5	1.8	1.7	6.4%	5.5%
80% CIL coal	7.3%	11.0%	28.9	31.4	1.8	1.7	6.6%	5.7%

Source: Company data, Goldman Sachs Research estimates.

Appendix: Extracts of model FSA

As per model FSA of CIL

The extracts of the Model FSA are as follows

"1.1.e Base Price

Base Price shall mean, in relation to a declared grade of coal produced by seller, the pithead price notified from time to time by CIL or seller, as the case may be; and in relation to imported coal, wherever applicable, shall mean its landed cost till the delivery point and service charges intimated by CIL or the seller, as the case may be.

In the event the sellers supply coal from sources, notified by seller on cost plus basis, cost plus basis prices shall be applicable.

9.0 Price of coal

The "As Delivered Price of Coal" for the coal supplies pursuant to this agreement shall be the sum of Base Price, Other Charges and Statutory Charges, as applicable at the time of delivery of coal.

9.1 Base Price

The purchaser shall pay the Base Price of coal in accordance with the provisions of this agreement. ***It is expressly clarified that the Base Price of Imported Coal shall be declared by the Seller/CIL from time to time***.

9.2 Other Charges

9.2.1 Transportation charges: Where coal is transported by the Seller beyond the distance of three (3) kms from Pithead to the Delivery Point, the purchaser shall pay transportation charges, as notified by CIL/Seller from time to time.

9.2.2 Sizing/Crushing charges: Where coal is crushed/sized for limiting the top-size to 250mm, or any other lower size, the purchaser shall pay sizing/crushing charges, as applicable and notified by CIL/Seller from time to time

9.2.3 Rapid Loading Charges: Where coal is loaded through rapid loading system, the purchaser shall pay rapid loading charges notified by CIL/Seller from time to time.

9.2.4 Any other applicable charges: Any other applicable charges as notified by CIL/Seller from time to time.

9.2.4 Statutory charges: The statutory charges shall comprise royalties, cesses, duties, taxes, levies etc., if any, payable under relevant statute but not included in the Base Price and/or other charges pursuant to Clause 9.2, shall be payable by the purchaser. These levies/charges shall become effective from the date as notified by the Government/statutory authority.

9.2.5 In all cases, the entire freight charges, irrespective of the mode of transportation of the coal supplied, shall be borne by the purchaser"

Disclosure Appendix

Reg AC

We, Durga Dath and Pritesh Vinay, hereby certify that all of the views expressed in this report accurately reflect our personal views about the subject company or companies and its or their securities. We also certify that no part of our compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

Investment Profile

The Goldman Sachs Investment Profile provides investment context for a security by comparing key attributes of that security to its peer group and market. The four key attributes depicted are: growth, returns, multiple and volatility. Growth, returns and multiple are indexed based on composites of several methodologies to determine the stocks percentile ranking within the region's coverage universe.

The precise calculation of each metric may vary depending on the fiscal year, industry and region but the standard approach is as follows:

Growth is a composite of next year's estimate over current year's estimate, e.g. EPS, EBITDA, Revenue. **Return** is a year one prospective aggregate of various return on capital measures, e.g. CROCI, ROACE, and ROE. **Multiple** is a composite of one-year forward valuation ratios, e.g. P/E, dividend yield, EV/FCF, EV/EBITDA, EV/DACF, Price/Book. **Volatility** is measured as trailing twelve-month volatility adjusted for dividends.

Quantum

Quantum is Goldman Sachs' proprietary database providing access to detailed financial statement histories, forecasts and ratios. It can be used for in-depth analysis of a single company, or to make comparisons between companies in different sectors and markets.

GS SUSTAIN

GS SUSTAIN is a global investment strategy aimed at long-term, long-only performance with a low turnover of ideas. The GS SUSTAIN focus list includes leaders our analysis shows to be well positioned to deliver long term outperformance through sustained competitive advantage and superior returns on capital relative to their global industry peers. Leaders are identified based on quantifiable analysis of three aspects of corporate performance: cash return on cash invested, industry positioning and management quality (the effectiveness of companies' management of the environmental, social and governance issues facing their industry).

Disclosures

Coverage group(s) of stocks by primary analyst(s)

Compendium report: please see disclosures at http://www.gs.com/research/hedge.html. Disclosures applicable to the companies included in this compendium can be found in the latest relevant published research.

Company-specific regulatory disclosures

Compendium report: please see disclosures at http://www.gs.com/research/hedge.html. Disclosures applicable to the companies included in this compendium can be found in the latest relevant published research.

Distribution of ratings/investment banking relationships

Goldman Sachs Investment Research global coverage universe

	Rating Distribution			Investment Banking Relationships		
	Buy	Hold	Sell	Buy	Hold	Sell
Global	30%	55%	15%	47%	42%	34%

As of January 16, 2012, Goldman Sachs Global Investment Research had investment ratings on 3,593 equity securities. Goldman Sachs assigns stocks as Buys and Sells on various regional Investment Lists; stocks not so assigned are deemed Neutral. Such assignments equate to Buy, Hold and Sell for the purposes of the above disclosure required by NASD/NYSE rules. See 'Ratings, Coverage groups and views and related definitions' below.

Price target and rating history chart(s)

Compendium report: please see disclosures at http://www.gs.com/research/hedge.html. Disclosures applicable to the companies included in this compendium can be found in the latest relevant published research.

Regulatory disclosures

Disclosures required by United States laws and regulations

See company-specific regulatory disclosures above for any of the following disclosures required as to companies referred to in this report: manager or co-manager in a pending transaction; 1% or other ownership; compensation for certain services; types of client relationships; managed/co-managed public offerings in prior periods; directorships; for equity securities, market making and/or specialist role. Goldman Sachs usually makes a market in fixed income securities of issuers discussed in this report and usually deals as a principal in these securities.

The following are additional required disclosures: **Ownership and material conflicts of interest:** Goldman Sachs policy prohibits its analysts, professionals reporting to analysts and members of their households from owning securities of any company in the analyst's area of coverage. **Analyst compensation:** Analysts are paid in part based on the profitability of Goldman Sachs, which includes investment banking revenues. **Analyst as officer or director:** Goldman Sachs policy prohibits its analysts, persons reporting to analysts or members of their households from serving as an officer, director, advisory board member or employee of any company in the analyst's area of coverage. **Non-U.S. Analysts:** Non-U.S. analysts may not be associated persons of Goldman, Sachs & Co. and therefore may not be subject to NASD Rule 2711/NYSE Rules 472 restrictions on communications with subject company, public appearances and trading securities held by the analysts.

Distribution of ratings: See the distribution of ratings disclosure above. **Price chart:** See the price chart, with changes of ratings and price targets in prior periods, above, or, if electronic format or if with respect to multiple companies which are the subject of this report, on the Goldman Sachs website at http://www.gs.com/research/hedge.html.

Additional disclosures required under the laws and regulations of jurisdictions other than the United States

The following disclosures are those required by the jurisdiction indicated, except to the extent already made above pursuant to United States laws and regulations. **Australia:** Goldman Sachs Australia Pty Ltd and its affiliates are not authorised deposit-taking institutions (as that term is defined in the Banking Act 1959 (Cth)) in Australia and do not provide banking services, nor carry on a banking business, in Australia. This research, and any access to it, is intended only for "wholesale clients" within the meaning of the Australian Corporations Act, unless otherwise agreed by Goldman Sachs. **Brazil:** Disclosure information in relation to CVM Instruction 483 is available at http://www.gs.com/worldwide/brazil/area/gir/index.html. Where applicable, the Brazil-registered analyst primarily responsible for the content of this research report, as defined in Article 16 of CVM Instruction 483, is the first author named at the beginning of this report, unless indicated otherwise at the end of the text. **Canada:** Goldman, Sachs & Co. has approved of, and agreed to take responsibility for, this research in Canada if and to the extent it relates to equity securities of Canadian issuers. Analysts may conduct site visits but are prohibited from accepting payment or reimbursement by the company of travel expenses for such visits. **Hong Kong:** Further information on the securities of covered companies referred to in this research may be obtained on request from Goldman Sachs (Asia) L.L.C. **India:** Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (India) Securities Private Limited; **Japan:** See below. **Korea:** Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (Asia) L.L.C., Seoul Branch. **Russia:** Research reports distributed in the Russian Federation are not advertising as defined in the Russian legislation, but are information and analysis not having product promotion as their main purpose and do not provide appraisal within the meaning of the Russian legislation on appraisal activity. **Singapore:** Further information on the covered companies referred to in this research may be obtained from Goldman Sachs (Singapore) Pte. (Company Number: 198602165W). **Taiwan:** This material is for reference only and must not be reprinted without permission. Investors should carefully consider their own investment risk. Investment results are the responsibility of the individual investor. **United Kingdom:** Persons who would be categorized as retail clients in the United Kingdom, as such term is defined in the rules of the Financial Services Authority, should read this research in conjunction with prior Goldman Sachs research on the covered companies referred to herein and should refer to the risk warnings that have been sent to them by Goldman Sachs International. A copy of these risks warnings, and a glossary of certain financial terms used in this report, are available from Goldman Sachs International on request.

European Union: Disclosure information in relation to Article 4 (1) (d) and Article 6 (2) of the European Commission Directive 2003/126/EC is available at http://www.gs.com/disclosures/europeanpolicy.html which states the European Policy for Managing Conflicts of Interest in Connection with Investment Research.

Japan: Goldman Sachs Japan Co., Ltd. is a Financial Instrument Dealer under the Financial Instrument and Exchange Law, registered with the Kanto Financial Bureau (Registration No. 69), and is a member of Japan Securities Dealers Association (JSDA) and Financial Futures Association of Japan (FFAJ). Sales and purchase of equities are subject to commission pre-determined with clients plus consumption tax. See company-specific disclosures as to any applicable disclosures required by Japanese stock exchanges, the Japanese Securities Dealers Association or the Japanese Securities Finance Company.

Ratings, coverage groups and views and related definitions

Buy (B), Neutral (N), Sell (S) -Analysts recommend stocks as Buys or Sells for inclusion on various regional Investment Lists. Being assigned a Buy or Sell on an Investment List is determined by a stock's return potential relative to its coverage group as described below. Any stock not assigned as a Buy or a Sell on an Investment List is deemed Neutral. Each regional Investment Review Committee manages various regional Investment Lists to a global guideline of 25%-35% of stocks as Buy and 10%-15% of stocks as Sell; however, the distribution of Buys and Sells in any particular coverage group may vary as determined by the regional Investment Review Committee. Regional Conviction Buy and Sell lists represent investment recommendations focused on either the size of the potential return or the likelihood of the realization of the return.

Return potential represents the price differential between the current share price and the price target expected during the time horizon associated with the price target. Price targets are required for all covered stocks. The return potential, price target and associated time horizon are stated in each report adding or reiterating an Investment List membership.

Coverage groups and views: A list of all stocks in each coverage group is available by primary analyst, stock and coverage group at http://www.gs.com/research/hedge.html. The analyst assigns one of the following coverage views which represents the analyst's investment outlook on the coverage group relative to the group's historical fundamentals and/or valuation. **Attractive (A).** The investment outlook over the following 12 months is favorable relative to the coverage group's historical fundamentals and/or valuation. **Neutral (N).** The investment outlook over the following 12 months is neutral relative to the coverage group's historical fundamentals and/or valuation. **Cautious (C).** The investment outlook over the following 12 months is unfavorable relative to the coverage group's historical fundamentals and/or valuation.

Not Rated (NR). The investment rating and target price have been removed pursuant to Goldman Sachs policy when Goldman Sachs is acting in an advisory capacity in a merger or strategic transaction involving this company and in certain other circumstances. **Rating Suspended (RS).** Goldman Sachs Research has suspended the investment rating and price target for this stock, because there is not a sufficient fundamental basis for determining, or there are legal, regulatory or policy constraints around publishing, an investment rating or target. The previous investment rating and price target, if any, are no longer in effect for this stock and should not be relied upon. **Coverage Suspended (CS).** Goldman Sachs has suspended coverage of this company. **Not Covered (NC).** Goldman Sachs does not cover this company. **Not Available or Not Applicable (NA).** The information is not available for display or is not applicable. **Not Meaningful (NM).** The information is not meaningful and is therefore excluded.

Global product; distributing entities

The Global Investment Research Division of Goldman Sachs produces and distributes research products for clients of Goldman Sachs on a global basis. Analysts based in Goldman Sachs offices around the world produce equity research on industries and companies, and research on macroeconomics, currencies, commodities and portfolio strategy. This research is disseminated in Australia by Goldman Sachs Australia Pty Ltd (ABN 21 006 797 897); in Brazil by Goldman Sachs do Brasil Banco Múltiplo S.A.; in Canada by Goldman, Sachs & Co. regarding Canadian equities and by Goldman, Sachs & Co. (all other research); in Hong Kong by Goldman Sachs (Asia) L.L.C.; in India by Goldman Sachs (India) Securities Private Ltd.; in Japan by Goldman Sachs Japan Co., Ltd.; in the Republic of Korea by Goldman Sachs (Asia) L.L.C., Seoul Branch; in New Zealand by Goldman Sachs New Zealand Limited; in Russia by OOO Goldman Sachs; in Singapore by Goldman Sachs (Singapore) Pte. (Company Number: 198602165W); and in the United States of America by Goldman, Sachs & Co. Goldman Sachs International has approved this research in connection with its distribution in the United Kingdom and European Union.

European Union: Goldman Sachs International, authorized and regulated by the Financial Services Authority, has approved this research in connection with its distribution in the European Union and United Kingdom; Goldman Sachs AG, regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht, may also distribute research in Germany.

General disclosures

This research is for our clients only. Other than disclosures relating to Goldman Sachs, this research is based on current public information that we consider reliable, but we do not represent it is accurate or complete, and it should not be relied on as such. We seek to update our research as appropriate, but various regulations may prevent us from doing so. Other than certain industry reports published on a periodic basis, the large majority of reports are published at irregular intervals as appropriate in the analyst's judgment.

Goldman Sachs conducts a global full-service, integrated investment banking, investment management, and brokerage business. We have investment banking and other business relationships with a substantial percentage of the companies covered by our Global Investment Research Division. Goldman, Sachs & Co., the United States broker dealer, is a member of SIPC (http://www.sipc.org).

Our salespeople, traders, and other professionals may provide oral or written market commentary or trading strategies to our clients and our proprietary trading desks that reflect opinions that are contrary to the opinions expressed in this research. Our asset management area, our proprietary trading desks and investing businesses may make investment decisions that are inconsistent with the recommendations or views expressed in this research.

The analysts named in this report may have from time to time discussed with our clients, including Goldman Sachs salespersons and traders, or may discuss in this report, trading strategies that reference catalysts or events that may have a near-term impact on the market price of the equity securities discussed in this report, which impact may be directionally counter to the analysts' published price target expectations for such stocks. Any such trading strategies are distinct from and do not affect the analysts' fundamental equity rating for such stocks, which rating reflects a stock's return potential relative to its coverage group as described herein.

We and our affiliates, officers, directors, and employees, excluding equity and credit analysts, will from time to time have long or short positions in, act as principal in, and buy or sell, the securities or derivatives, if any, referred to in this research.

This research is not an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. It does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual clients. Clients should consider whether any advice or recommendation in this research is suitable for their particular circumstances and, if appropriate, seek professional advice, including tax advice. The price and value of investments referred to in this research and the income from them may fluctuate. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. Fluctuations in exchange rates could have adverse effects on the value or price of, or income derived from, certain investments.

Certain transactions, including those involving futures, options, and other derivatives, give rise to substantial risk and are not suitable for all investors. Investors should review current options disclosure documents which are available from Goldman Sachs sales representatives or at http://www.theocc.com/about/publications/character-risks.jsp. Transaction costs may be significant in option strategies calling for multiple purchase and sales of options such as spreads. Supporting documentation will be supplied upon request.

In producing research reports, members of the Global Investment Research Division of Goldman Sachs Australia may attend site visits and other meetings hosted by the issuers the subject of its research reports. In some instances the costs of such site visits or meetings may be met in part or in whole by the issuers concerned if Goldman Sachs Australia considers it is appropriate and reasonable in the specific circumstances relating to the site visit or meeting.

All research reports are disseminated and available to all clients simultaneously through electronic publication to our internal client websites. Not all research content is redistributed to our clients or available to third-party aggregators, nor is Goldman Sachs responsible for the redistribution of our research by third party aggregators. For all research available on a particular stock, please contact your sales representative or go to http://360.gs.com.

Disclosure information is also available at http://www.gs.com/research/hedge.html or from Research Compliance, 200 West Street, New York, NY 10282.