Deutsche Bank

11 January 2011

Commodities Outlook

- **Commodities As An Asset Class:** We believe commodities will enjoy a fresh wave of investment inflows during 2011. To exploit the properties of mean reversion, carry and momentum we are introducing the DBLCI Apex index, which performs well when commodity prices are trending.
- **Crude Oil:** We believe oil price rallies will be based on more solid foundations in 2011. This reflects upside risks to global oil demand and falling crude oil inventories, which we expect will push the crude oil forward curve into backwardation.
- **US Natural Gas:** After dry freight, US natural gas was the worst performing commodity market in 2010. We expect natural gas prices will continue to struggle due to excess storage levels. However, we believe market fundamentals will start to tighten from the fourth quarter of this year.
- **EU Power & Gas:** With clean dark and clean spark spreads at three-year lows in Germany, we believe generators will remain cautious in H1. We expect this to lead to greater volatility in both power and carbon prices in the second half of the year as larger volumes of forward production are sold at shorter-dated maturities than usual.
- **Precious Metals:** We believe precious metals will continue to perform strongly. Gold is expected to benefit from a low real interest rate environment, central bank diversification and inflows into physically backed ETFs. Our upbeat assessment towards global growth should also ensure that silver continues to out-perform gold.
- **Industrial Metals:** We expect another strong year for the metals complex with differentiation based on relative scarcity. In this context, copper is expected to outperform. Also, we anticipate that aluminium could be a strong performer as cost inflation and tight energy markets in China create the potential for the country to become a net importer during 2011. Nickel and zinc are expected to be laggards.
- **Agriculture:** We view physical fundamentals in corn as extremely tight. Droughts in South America and lower US plantings should encourage further price advances in soybeans, in our view. Ample inventories should mean wheat under-performs.

Commodity Markets In 2011



Market Update

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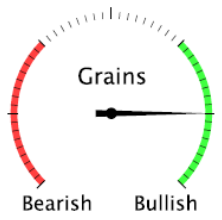
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All prices are those current at the end of the previous trading session unless otherwise indicated. Prices are sourced from local exchanges via Reuters, Bloomberg and other vendors. Data is sourced from Deutsche Bank and subject companies. DISCLOSURES AND ANALYST CERTIFICATIONS ARE LOCATED IN APPENDIX 1. MICA(P) 007/05/2010

Commodity Views

Energy							
USD	**Level**	**YTD 2011**	**YTD 2010**	**12M Low**	**12M High**	**5Y Avg**	**Outlook**
WTI	88.03	-3.67%	10.92%	68.01	91.51	76.07	
Brent	93.33	-1.50%	19.76%	69.55	95.50	76.19	
Heating oil	2.49	-2.26%	17.34%	1.87	2.54	2.11	
Gasoline (RBOB/gallon)	2.41	-1.63%	17.57%	1.85	2.45	2.06	
US natural gas (/mmBtu)	4.42	0.39%	-20.64%	3.29	5.82	6.30	
Coal (API#2/tonne)	126.50	-4.17%	51.95%	70.50	132.00	99.20	
Uranium (/lb)	62.00	0.81%	39.33%	40.50	62.00	60.79	
EUR Emissions Cal'10	14.90	7.19%	18.91%	12.52	16.19	18.81	
Precious Metals							
Spot (USD/oz)	**Level**	**YTD 2011**	**YTD 2010**	**12M Low**	**12M High**	**5Y Avg**	**Outlook**
Gold	1369.57	-3.60%	24.85%	1062.85	1423.75	877.36	
Silver	28.39	-7.31%	67.10%	15.14	30.70	15.04	
Platinum	1733.50	-2.08%	18.29%	1475.50	1784.00	1371.67	
Palladium	751.50	-6.27%	84.28%	404.25	801.75	366.24	
Industrial Metals							
3M Fwd (USD/tonne)	**Level**	**YTD 2011**	**YTD 2010**	**12M Low**	**12M High**	**5Y Avg**	**Outlook**
Aluminium	2518	1.94%	12.91%	1868	2519	2358	
Copper	9415	-1.93%	27.66%	6101	9600	6706	
Lead	2649	3.88%	8.92%	1554	2660	1975	
Nickel	24200	-2.22%	30.63%	17050	27290	23458	
Tin	26450	-1.67%	56.05%	15200	27350	15183	
Zinc	2445	-0.37%	-4.49%	1628	2615	2454	
Agriculture							
1st nearby (USc)	**Level**	**YTD 2011**	**YTD 2010**	**12M Low**	**12M High**	**5Y Avg**	**Outlook**
Cocoa (USD)	2850	-6.10%	-13.35%	2562	3461	2340	
Coffee	231	-4.07%	69.69%	128	241	130	
Corn	595	-5.41%	43.55%	325	629	394	
Cotton	141	-2.91%	85.98%	67	159	65	
Soybeans	1358	-2.58%	30.58%	908	1394	956	
Sugar	32	-1.84%	16.99%	14	34	15	
Wheat	774	-2.55%	42.94%	428	808	591	

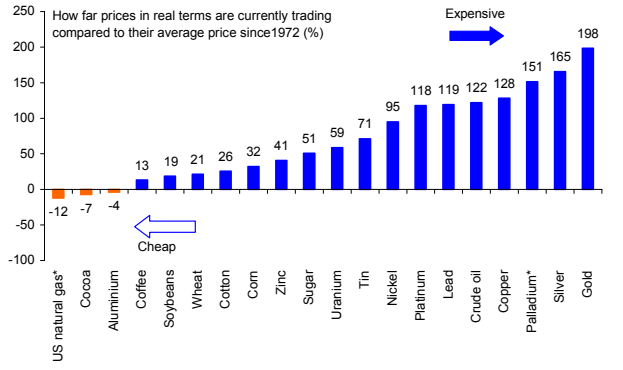
Source: Deutsche Bank, Bloomberg (Prices as of close of business January 8, 2010) Price forecast are in the back of this report

#1 Executive Summary

Bull Markets In 2011

- **We believe the outlook for commodities is broadly bullish.** This is based on four core beliefs: emerging market growth will remain strong, the Fed's efforts to stimulate US growth will be successful, European sovereign risk will eventually be contained and physical fundamentals in many commodity markets are tight.
- **We believe 2011 will be characterized by fresh investment inflows into the commodities complex.** The sector's appeal reflects investor appetite to gain exposure to emerging markets, as a tool to hedge against tail events and market anxiety towards higher inflation ahead. Moreover investors will be able to gain direct exposure to an increasing array of commodities which have typically been outside of the investment universe, such uranium, iron ore and coal.
- **However, we believe the financial system remains fragile and that macroeconomic uncertainty will intermittently contaminate sentiment for risky assets** such as commodities. Of most concern are sovereign risk in Europe, rising inflation in EM and a disorderly sell off in global fixed income markets.
- **Of the five broad commodity sectors, the energy and industrial metals sectors are most vulnerable to disruption risk**. However, we believe a rally in the oil price is becoming more sustainable in response to strong oil demand growth and a decline in crude oil inventories. We expect these factors will encourage the crude oil forward curve to move into backwardation this year.
- **We believe China remains a bullish factor for commodity markets despite short tem disruption risk from monetary tightening.** In 2010, the country had become an even greater source of demand for commodities such as thermal coal, silver, soybeans and cotton. While industrial metals demand has the highest correlation to credit growth and consequently would be the most sensitive to monetary tightening measures, we believe the underlying growth outlook in China remains positive. Indeed if one compares this cycle to previous monetary tightening periods, the central bank has been more pre-emptive today in tackling inflation than in the boom-bust periods of 1989 and 1994.
- **In an environment of heightened levels of macro-economic uncertainty we believe gold prices will continue to benefit** from central bank buying and ongoing inflows into physically backed ETFs. In fact we believe gold price overshooting is a high probability event since investors are buying gold when the US dollar is rising as well as falling and as a hedge against inflation as well as deflation. We estimate that gold prices would need to surpass USD2,000/oz to represent a bubble.
- **Financial factors may also prove bullish for the industrial metals complex in 2011.** The launch of physically backed ETFs in the complex will have the power to significantly tighten market fundamentals. Indeed on our estimates if investment demand in copper was to represent just 2% of global copper demand this would be equivalent to over 60% of copper inventories. As a result, we view copper as the market most susceptible to price spike risk if these new products attract an increasing share of investment capital.
- **With the exception of cocoa, the significant under-valuation of the agricultural sector at the start of 2010 has been eliminated**. We view low inventories and droughts in South America as bullish corn and soybeans.
- **We believe fundamentals in the coking coal and thermal coal markets are structurally tight**. In iron ore we believe seaborne supply will fall short of demand due to a continued export ban in India an infrastructure bottlenecks in Brazil and Australia.

Figure 1: Valuing commodities in real terms



Source: Deutsche Bank

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#2 Trade Recommendations

#1 Long DBLCI-Mean Reversion

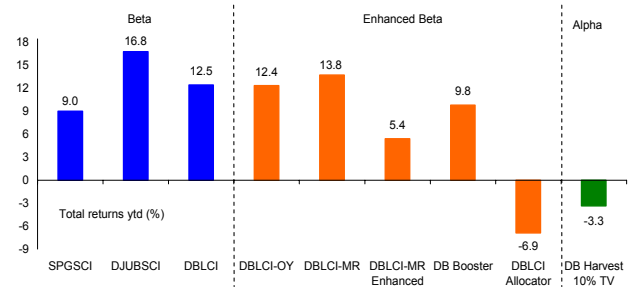
Commodity index returns had a dismal start to 2010 only to rally strongly in the final three months of last year. We believe part of this rally was in response to the Fed's programme of quantitative easing measures. However, looking forward we believe tightening physical fundamentals across the commodity complex will play an increasingly important role.

We believe the DBLCI-Mean Reversion's overweight allocation to the energy sector will prove a winning strategy in 2011. Unlike 2010, we believe oil price rallies are based on more solid foundations this year. This reflects upside risks to global oil demand as well as the ongoing decline in crude oil inventories. We expect this will encourage the WTI forward curve to move into backwardation. As a result, unlike 2010 when the roll return on an energy index was approximately -10%, we believe the roll return in the energy sector will start to contribute positively to overall index returns.

During the second half of the year we believe the outlook for the DBLCI-Mean Reversion Enhanced will start to improve. Total returns on the DBLCI-MRE rose just 5.4% last year significantly under-performing the DBLCI-MR where returns were up 13.8%. The performance of the DBLCI-MRE was punished by the collapse in US natural gas prices. Indeed excluding US natural gas, total returns on the DBLCI-MRE rose 19.3% in 2010.

We believe cold weather will help to remove some of the surplus overhang in US natural gas storage levels. Moreover we expect supply-demand balances will start to improve in US natural gas in response to the ongoing recovery in US industrial production, as rising coal prices prompt utilities to turn to natural gas, as falling US rig counts depression domestic gas production and given our expectation that US Gulf of Mexico gas production will decline 15% this year.

Figure 1: 2010 commodity index scorecard



Source: Deutsche Bank, Bloomberg Finance LP

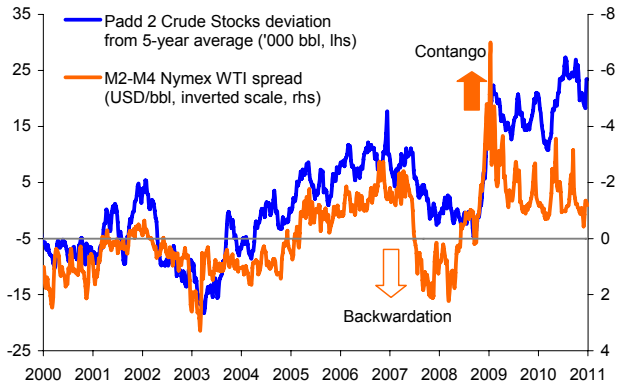
#2 Long crude oil

At the beginning of 2010 we stated that oil price rallies above USD80/barrel would only be sustainable in 2011. This reflected the fact that the high and rising level of crude oil inventories and a crude oil forward curve in contango were both were indicative of an oversupplied market. Entering 2011 we believe oil price rallies will be based on more solid foundations as global oil demand recovers and crude oil inventories decline. Indeed we expect at some point the crude oil forward curve will move into backwardation.

However, one area of concern would be the effect of rising oil prices on the global recovery. We estimate that a USD10 rise in the oil price subtracts approximately 0.5 percentage points off US growth. In late 2007/early 2008 USD95/barrel proved to the tipping point above which US oil demand growth turned negative.

Discussion on OPEC raising production in response to rising prices has surfaced recently. According to one OPEC official higher production is unlikely unless oil prices move towards USD110/barrel. Even so we believe a bullish, but, more cautious route to position for a modest rally in the oil price rather than an outright long position would be to adopt a WTI time spread trading strategy such as going long 1M vs. short 12M WTI.

Figure 2: Padd2 inventories & the crude oil forward curve



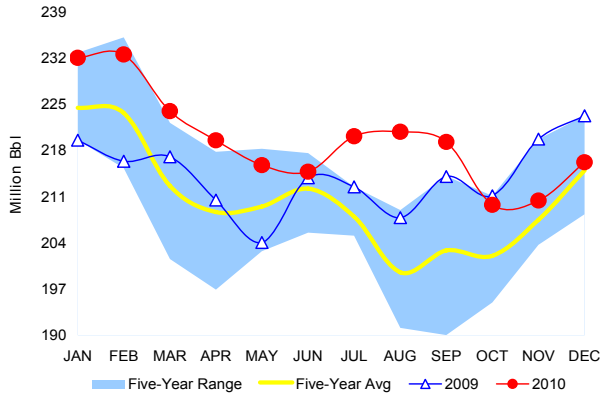
Source: Deutsche Bank, Bloomberg Finance LP

#3 Long Q2 gasoline cracks

We expect a modest improvement in US jobs growth during 2011, which implies an improving picture for US gasoline demand growth. A return to the more typical US gasoline demand growth rate of 1% in 2011 implies average US gasoline demand growth of 90 kbd yoy. All else being equal for 2011, this would imply global gasoline demand growth of 1.7% yoy, which would be the strongest growth rate since 2005.

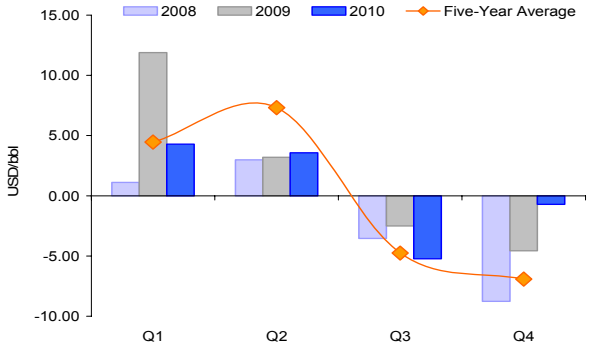
Though it may be too soon to get a clear picture on the US summer gasoline season, it is worth noting the potential for a tighter US gasoline balance given the current inventory deficit, which may be bullish for gasoline cracks. US gasoline inventories ended 2010 in a deficit after holding a surplus since mid-2009, in part thanks to disruptions at French refineries and also strong Latin American demand, which pulled imports from its northern neighbor. From current inventory levels as a starting point, that implies five-year average stock builds from Jan-May will leave inventories at a the start of the summer driving season at a 6 mln bbl yoy deficit.

Figure 3a: Gasoil premium to fuel oil



Data for Nov-Dec are preliminary. Source: US DOE/EIA, Deutsche Bank

Figure 3b: US gasoline cracks quarterly changes



Nymex RBOB crack to WTI. QoQ change. Source: Bloomberg Finance LP, Deutsche Bank

#4 Long gasoil vs fuel oil

During the past two years, the premium of light to heavy narrowed considerably due to:

(i) Structural refinery yield changes that reduced fuel oil production;

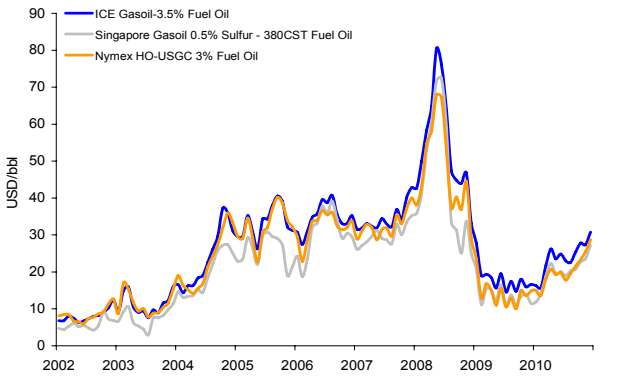
(ii) Declining demand for light products, especially gasoil, during the global downturn;

(iii) As refiners cut distillation runs which further contributed to lower fuel oil supply. This trend has started to reverse in 2010 and will continue into 2011 in our view.

Though fuel oil refinery yields are likely to continue declining in 2011 as new coking capacity comes online, we anticipate that the continuing recovery in gasoil demand and consequently higher refinery runs will result in higher fuel oil supply, which will weigh on prices.

While we see fuel oil weaker in 2011 relative to gasoil, a return to such lofty light-heavy premiums this year similar to the 2007-2008 period is not likely in our baseline scenario given significant refining capacity expansions in the past few years.

Figure 4: Gasoil premium to fuel oil



Source: Bloomberg Finance LP, Deutsche Bank

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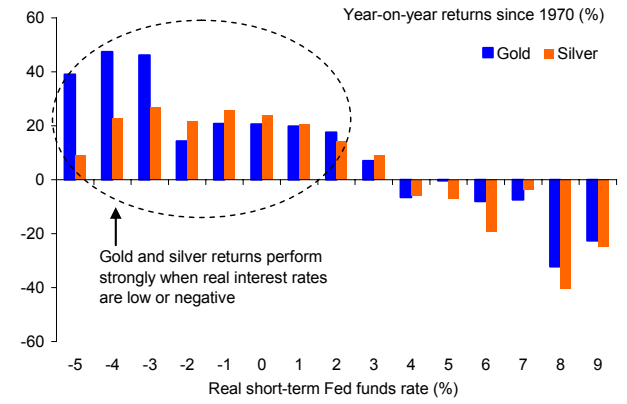
#5 Long gold & silver

The gold price rally is now in its 10th year and the USD1,100 rise in gold price since their 2001 lows represent the most durable and powerful rally in US dollar terms of record. We believe gold prices will perform strongly in response to low US real interest rates, central bank diversification into gold and renewed inflows into physically backed gold ETFs.

The fact that investors are buying gold when the US dollar is rising as well as falling and as a hedge against inflation and deflation suggests the formation of a bubble is a high probability event in the gold market, in our view. Indeed we believe the significant fiscal consolidation required in the US over the next few years would mean that another collapse in the US dollar can not be dismissed out of hand. Historically the specific mix of monetary and fiscal policies that a country pursues can have a profound impact on exchange rates. The combination of a restrictive fiscal policy and an expansionary monetary policy has tended to be extremely bearish for a currency.

Given these risks we believe gold will continue to compete aggressively for investment capital. On our estimates the gold price would need to move above USD2,000/oz to represent a bubble. Given our upbeat assessment towards global growth and US manufacturing sector activity we believe this will provide further upside to the solver price, which has already significantly out-performed gold over the past 12 months. The main risk to the out-performance of silver relative to gold would be if the Us ISM business confidence index fell below 50. We attach a low probability to this scenario over the coming year.

Figure 5: Gold & silver returns in different US real interest rate environments



Source: Deutsche Bank, Bloomberg Finance LP

#6 Long copper & aluminium

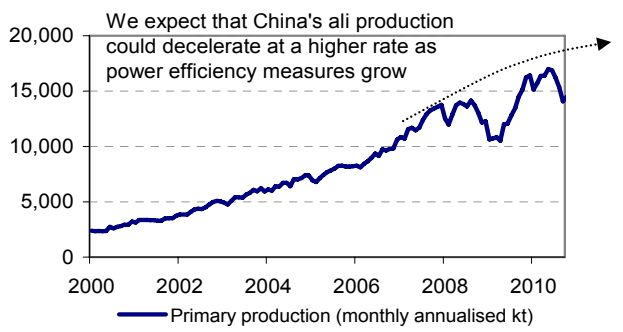
We expect that physical and financial fundamentals will be highly supportive of the base metals complex in 2011. While the group is likely to suffer from volatility caused by periodic financial/debt shocks; we anticipate expansionary monetary policy will continue to support. Those metals with high relative scarcity such as copper should perform well; however we also anticipate that aluminium could surprise on the upside given our view that energy markets in China could be quite tight in 2011.

According to the cyclical stocking pattern experienced in the past, 2011 is expected to be a re-stocking year in China. Therefore imports of copper should be relatively robust. In addition, the launch of copper ETF has allowed financial capital to directly compete with manufacturers in the copper market and could represent meaningful demand. Despite some caution with possible demand destruction and further rate hikes by China's PBOC, we acknowledge that the overall physical fundamentals for the copper market appear very strong. There is a broad consensus that the copper market is likely to remain very tight over the next several years as mine supply struggles to match demand.

The key factor for aluminium in 2011 will be China in our view and the increasing role of energy in determining scarcity in the aluminium market. We believe harsh weather globally could exacerbate issues with respect to both price and availability of power in China in the near-term. The potential for further cuts in aluminium production capacity as colder-than-normal winter weather intensifies is quite high in our view. In addition to the desire by the Chinese government to prioritise power availability, a growing consumer class and orient the economy to 'consumer-driven' could sustain price advances in the medium term.

We believe the main risks to this trade could be lower than expected global economic growth, more aggressive monetary tightening by China's PBOC and a lack of investment flows.

Figure 6: Chinese primary aluminium production



Source: CEIC, Deutsche Bank

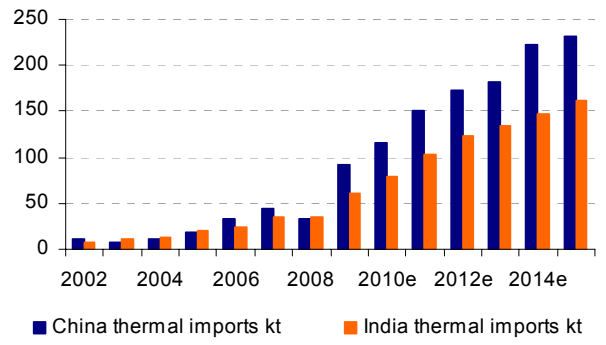
#7 Long thermal coal

Thermal coal has the potential to be the best performer of the bulk commodities in 2011 in our view. We believe that price strength is likely to continue as meteorological conditions could remain extreme (with flooding dissipating slowly in Australia and cold weather approaching in key demand areas such as China). Nevertheless, there is a strong probability of lower pricing into Q2 this year as the weather-related squeeze moderates and supply conditions revert to normal. We believe structural supply-side issues will become more apparent over the course of the year and as the extreme weather conditions subside. We have adjusted our 2011 forecast for thermal coal upwards to USD122/t from USD118/t previously to reflect the impact of Australian flooding. Our 2012 price forecast remains USD140/t.

We remain convinced that coal is a structurally tight market longer-term. Chinese and Indian power demand is expected to be resilient as economic growth remains a priority. Furthermore we expect that infrastructure challenges and industry rationalisation within China combined with constraints from key seaborne supplier regions such as South Africa, Indonesia and Australia will keep the market tight over the next several years. We will watch supply growth from Indonesia closely next year as quality could deteriorate and the government may be increasingly anxious to secure coal for domestic use.

We believe the main risks to this trade could be weakening La Niña conditions and higher than expected supply growth from the key producing regions.

Figure 7: China & India: thermal coal import profiles



Source: McCloskey's, Deutsche Bank

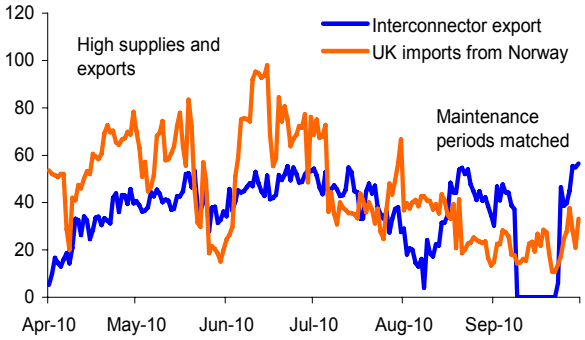
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#8 Long summer 2011 UK gas

Our view on Summer-2011 gas is constructive given the persistence of forward-market gas prices below the oil-indexed contract price. European buyers will seek to replace contract gas with summer spot-market purchases, raising exports through the Interconnector as occurred in Summer-2010.

In addition, reports so far of Norwegian maintenance indicate an earlier start than last year, with Kollsnes gas processing scheduled from 2-12 May and the Ormen Lange field scheduled from 30 May to 19 June. Norwegian maintenance last summer was most severe during the period of Interconnector maintenance and Rough maintenance in September, so the effect was felt less strongly.

Figure 8: Summer 2010 flows (mcm/d)



Source: National Grid, Deutsche Bank

The market may not get away so easily this year. The uptick in Interconnector demand occurred through the month of April last year from 5mcm/d at the start of April to an average of 41mcm/d during the month of May. Last year, UK imports of Norwegian gas were relatively strong during this period. If we experience the same Interconnector demand uptick this year, it will coincide with heavy Norwegian maintenance, so the price effect could be greater.

The risk to our view is that early summer gas supply is boosted by Statoil's Gjøa platform and/or partial output from Qatargas-3 Train 6 and Qatargas-4 Train 7. We estimate that the Gjøa platform is currently contributing 5mcm/d but can process up to 17mcm/d (from Gjøa, Vega and Vega South fields). Similarly, much of the LNG output from newly commissioned Trains 6 and 7 will satisfy long-term Asian contracts, but there is a risk that some of the output could find its way to the UK.

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#9 Long corn & soybeans

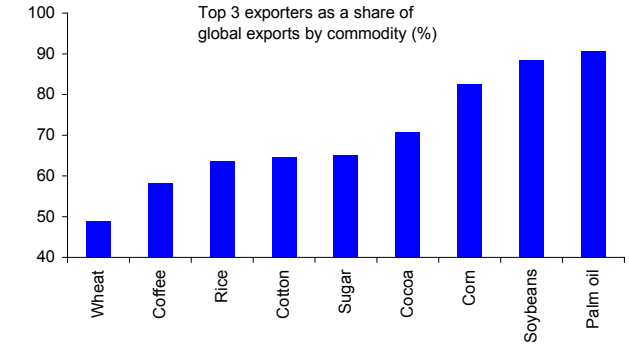
We believe corn has the tightest fundamentals of the major agricultural commodities. Global inventory-to-consumption ratios are at levels last seen in the mid-1970s. This is occurring at a time of ongoing shortage in China and as the US is expected to extend the use of E15 to older car and light truck models.

Although corn prices have already rallied by approximately 95% since their 2010 lows, we believe the rally remains in its infancy. Since 1972 the average duration and magnitude of a corn rally has been 15 months and 130%. To bring the current rally in line with historical averages would require corn prices rising to USD7.85/bushel by October 2011.

We believe the main risk to this trade could be an increase in US corn plantings, which could be announced in the USDA's Prospective Plantings survey to be published at the end of March. However, one way to exploit tight fundamentals today with higher production tomorrow would be via a time spread trade, such as long Jul'11 vs. short Dec'11.

Weather has played a significant role in affecting agricultural markets over the past year. We expect weather will continue to affect agricultural supply heading into 2011. Of most immediate concern is the La Niña phenomenon and the appearance of droughts in South America. This is already leading to downgrades to Argentinean corn and soybean production. We believe the possibility that US farmers switch out of soybeans and into corn in the next crop year would also provide upside price risks for soybeans heading into the second quarter of the year.

Figure 9: More than 80% of global corn, soybean and palm oil exports are in the hands of just three countries



Source: USDA, Deutsche Bank

#10 Short cotton

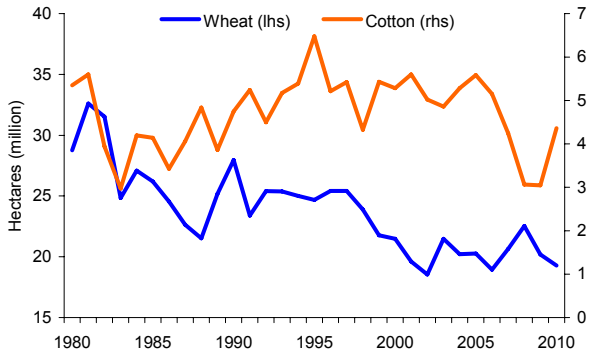
Cotton prices have rallied almost 300% since their 2009 lows. This therefore represents the most powerful rally in cotton prices on record. Indeed last year cotton was the world's best performing commodity in terms of spot price performance rallying by just over 100%. Cotton prices have risen in response to rising import requirements in China and a decline in Indian cotton exports. China represents the world's largest importer of cotton while India is the world's second largest exporter of cotton.

Behavioural finance theory tells us that investors often tend to be overly optimistic about asset markets or securities which have been past winners and overly pessimistic about asset markets or securities which have been past losers. However, evidence suggests this can lead to poor portfolio performance since past winners have a habit of become future losers.

We believe a reduction in Chinese cotton imports and a resumption in Indian exports may reverse recent prices gains. Howveer, we expect the US is worth watching closely since it is the world's largest exporter of cotton, representing 40% of world exports. Since cotton acreage in the US has fallen steadily over the last few years, a key risk going forward is that recent price advances may encourage acreage figures to rebound again when the USDA Prospective Plantings survey is published at the end of March.

Over the past few years wheat and cotton acreage levels have fallen in the US, squeezed out by increased planting in corn and soybeans. In 2009/10 cotton plantings in the US fell to their lowest levels since 1983. As prices recovered in 2009 so did plantings. This trend is at risk of continuing into 2011/12, in our view.

Figure 10: US acreage in wheat and cotton



Source: USDA, Deutsche Bank

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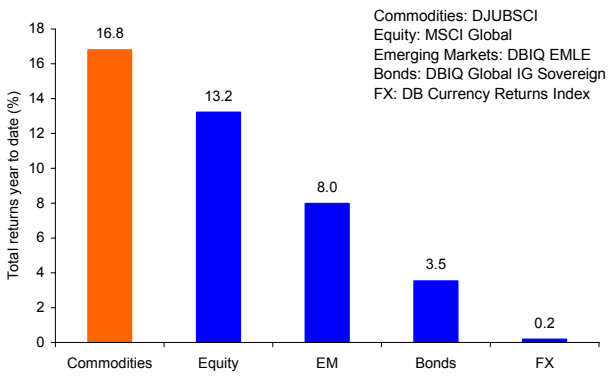
#3 Commodity Indices

Commodity Returns Gather Momentum

- **After a dismal start, commodity index returns recovered strongly in the final three months of 2010. In fact the SPGSCI was only able to extract positive returns last year due to the strong rebound in energy returns in December.**
- **We believe the strength in index returns was not solely a liquidity driven rally following quantitative easing measures by the Fed, but is also reflective of tightening physical fundamentals across the complex.**
- **While all five commodity sectors were able to post positive returns during 2010, precious metals and agriculture were the engine rooms of performance last year, with total returns in these sectors up by over 20%.**
- **We expect parts of the precious and industrial metal sectors will be prone to overshooting risks over the coming 18 months. We also see physical fundamentals in the energy sector tightening this year and next. We therefore expect commodity index returns to post a second year of positive returns in 2011.**
- **Contango forward curves and negative roll returns plagued all commodity sectors in 2010. We expect tightening physical fundamentals will encourage the elimination of contango this year, most notably in the energy sector.**
- **The flattening in commodity forward curves punished the performance of the DB Commodity Harvest in 2010. The bulk of these losses were attributable to the sudden move in the sugar forward curve, which flipped into backwardation during the second quarter in response to a drop in Indian exports. With forward curves set to flatten or remain in backwardation we expect trivial gains in the DB Commodity Harvest during 2011.**
- **The DBLCI-Mean Reversion Enhanced index has significantly under-performed the DBLCI-Mean Reversion due to the weakness in US natural gas. Excluding US natural gas, total returns on the DBLCI-MRE rose 19.2% last year. This compares with returns of 9.0% and 16.8% for the SPGSCI and DJUBSCI respectively.**
- **We believe prospects for US natural gas will start to improve from the end of this year in response to the recovery in US industrial production, lower domestic gas production growth and rising coal prices.**
- **For investors who want to exploit the properties of mean reversion, carry and momentum we are introducing the DBLCI APEX index. The DBLCI APEX is a risk weighted strategy that performs well when commodity prices are trending and across the economic cycle.**

Commodities were the worst performing asset class on a total returns basis in the first nine months of last year. However, in the final quarter index returns rallied strongly allowing commodity returns to outperform other benchmark indices such as equities and emerging markets, Figure 1. We believe commodity strength was a combination of not only a liquidity driven rally triggered by quantitative easing steps by the Fed, but, in some cases a tightening in underling physical fundamentals.

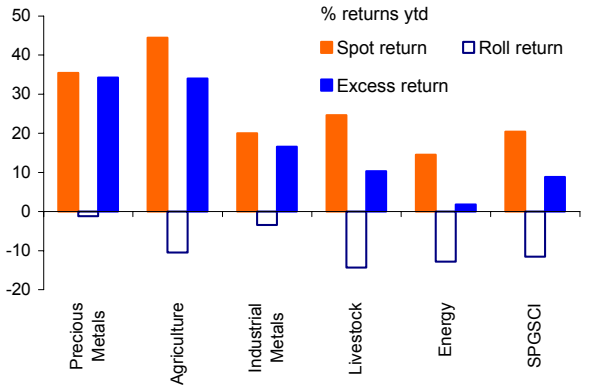
Figure 1: Asset class returns compared in 2010



Source: Deutsche Bank, Bloomberg Finance LP (Data as of end 2010)

Of the five broad commodity sectors, precious metals and agriculture were the engine rooms of performance in 2010. However, while spot returns were positive across the major commodity sectors, roll returns were negative and significantly so in the case of energy and livestock, Figure 2.

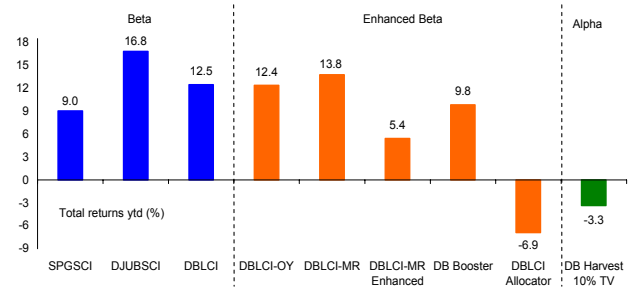
Figure 2: SPGSCI returns by sector and type in 2010



Source: Bloomberg Finance LP (Data as of end 2010)

As a result, those commodity indices that were heavily weighted to agriculture, such as the DJUBSCI, out-performed indices with a substantial exposure to energy such as the DBLCI-MRE and the SPGSCI, Figure 3.

Figure 3: 2010 commodity index scorecard



Source: Deutsche Bank, Bloomberg Finance LP (Data as of end 2010)

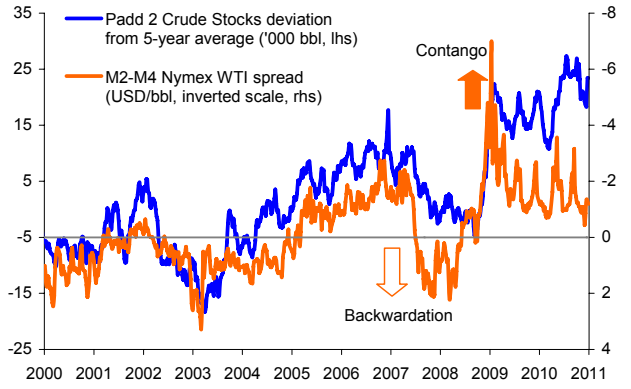
We expect the precious metals complex will remain a strong source of positive returns this year. Indeed we believe the sector has many of the attributes that could encourage the formation of a bubble. Not only are investors buying gold when the US dollar is rising and falling, but also as a hedge against inflation and deflation.

We believe gold will continue to benefit from private sector as well as central bank buying. We expect the appeal of precious metals and specifically gold will be sustained for as long as US real interest rates remain low. This not only allows gold to compete more aggressively for risk capital, but, it also implies encourages a flat forward curve and consequently minimal carrying costs. On our estimates, gold can rise an additional 40% from current levels before prices move into bubble territory. For more details of how to value gold, please see the Precious Metals article in this report.

Up until now, physically backed Exchange Traded Funds (ETFs) have been confined to the precious metals complex. However, the extension of these products into the industrial metals space introduces new price spike risks for this sector, in our view. Indeed as we outlined at the end of September, if investment demand represents just 2% of global copper demand it would be equivalent to approximately 60% of exchange inventories. Alongside tight physical fundamentals we expect industrial metal returns will also post positive returns in 2011 and that in the absence of a slowdown in China, price risks are skewed to the upside.

Energy was the worst performing sector on a total returns basis last year. This was largely due to the roll return, which for the SPGSCI-Energy index amounted to -12.8% in 2010. We expect this will become less of a drag to overall returns in 2011 in response to a decline in crude oil inventories. Given our crude oil spot price forecast, we expect total returns on the DB crude oil index to be in double digits this year.

Figure 4: Padd2 inventories & the crude oil forward curve

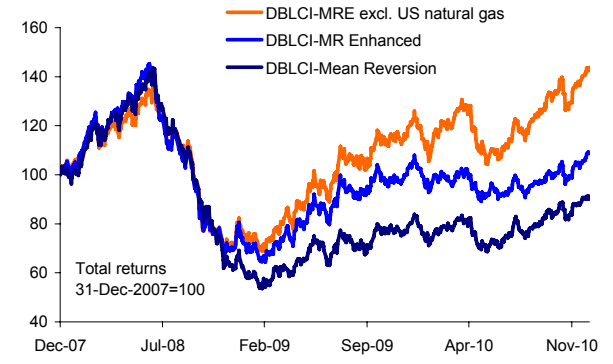


Source: Deutsche Bank, Bloomberg Finance LP

Another factor that drove energy returns lower last year was US natural gas. Excluding US natural gas, total returns on the DBLCI-MRE rose 19.3% compared to total returns of 5.4% for the DBLCI-MR Enhanced over the same period.

Figure 5 examines the performance of the various DBLCI-Mean Reversion strategies. Not surprisingly the outlook for US natural gas will play an important role for the performance of index returns given the significant overweight exposure to the energy sector and specifically US natural gas.

Figure 5: The performance of various DBLCI-Mean Reversion strategies compared

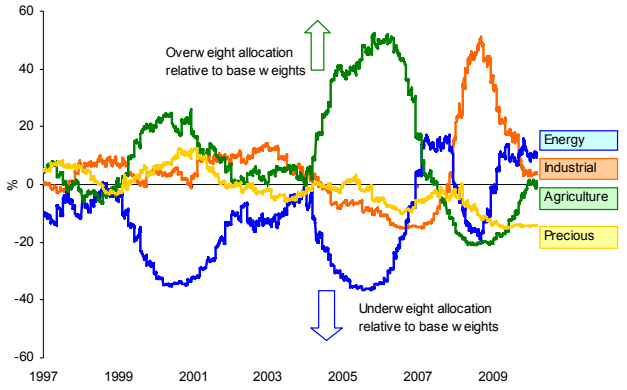


Source: Deutsche Bank

At the moment the DBLCI-MRE has an overweight allocation to energy, an underweight exposure to precious metals and a relatively neutral position in industrial metals and agriculture, Figure 6. Over the next six months we expect the allocations to energy will be increased further and exposures to precious metals and agriculture will be reduced. As a result, performance will be sensitive to the course of US natural gas returns.

Cold weather has helped to improve the inventory situation in US natural gas. However, the overhang in storage levels is not expected to be worked off until much later this year, in our view. As a result, our short term outlook remains relatively bearish. However, we expect an ongoing improvement in US industrial sector activity, rising coal prices and a falling gas rig count will lead to a steady improvement in natural gas supply-demand fundamentals.

Figure 6: The sector allocations of the DBLCI-MRE relative to their base weights

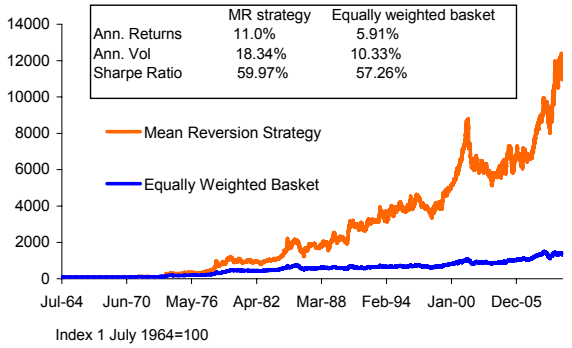


Source: Deutsche Bank

The performance of US natural gas is a cautionary tale for investors trading commodities employing a mean reversion strategy. In 2010, we examined the relative merits of trading commodities via mean reversion. We stated that over the medium to longer term the performance of a mean reversion strategy was superior to a fixed weight strategy.

We examined the performance of a basket of commodities that employed the same 1-year to 5-year moving average approach that governs the DBLCI-Mean Reversion index. Using daily data since 1959, we found that the Mean Reversion mechanism out-performed an equally weighted based over every 5-year period.

Figure 7: Tracking the performance of fixed weight versus floating commodity index mechanisms



Source: Deutsche Bank, Bloomberg Finance LP

Figure 8: Total returns of the equally weighted and MR basket over five year intervals

	Equally weighted basket	MR basket performance	Mean Reversion outperformance
5-year period ending on:			
31-Dec-69	3.4%	5.6%	2.2%
31-Dec-74	76.0%	165.2%	89.2%
31-Dec-79	166.3%	308.6%	142.3%
31-Dec-84	33.3%	53.2%	19.9%
31-Dec-89	-6.9%	32.4%	39.3%
31-Dec-94	13.7%	65.4%	51.6%
31-Dec-99	22.0%	36.1%	14.1%
31-Dec-04	11.4%	20.8%	9.4%
31-Dec-09	52.8%	94.1%	41.3%

Source: Deutsche Bank, Bloomberg Finance LP

However, we recognise that financial market participants have been particularly fond of trend or momentum following trading rules such as the moving Average Crossover Trading (MACT) model. As a result, we have developed the DBLCI-Apex index, which employs a rule based methodology to allocate between:

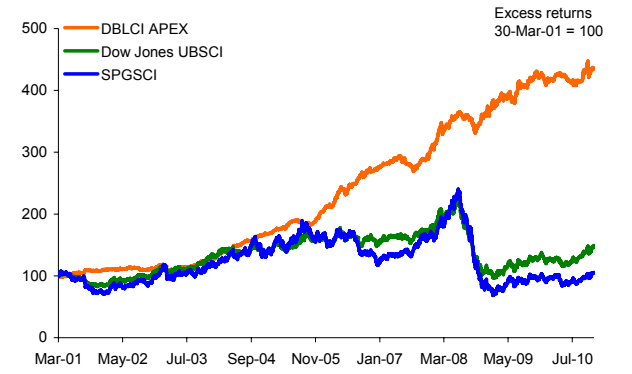
1) **Mean Reversion**: DBLCI-MR Enhanced Index - aims to underweight commodities that have overshot fair value and overweight commodities that are under-priced.

2) **Carry**: DB Commodity Harvest Index – seeks to generate stable non-directional returns in commodities by extracting roll return via roll optimizing technology.

3) **Momentum**: DB Commodity Momentum Index – exploits short term momentum in returns by using technical indicators. The momentum technology means that for any particular commodity, when the 15 day moving average is greater than the 60 day moving average it indicates a bullish signal and a bearish signal otherwise.

The DBLCI-Apex is a risk weighted combination of the three strategies of mean reversion, carry and momentum. Since 2001, DBLCI-Apex has posted excess returns of 6.20% per annum with a volatility of 3.06% with returns showing a stable performance across the economic cycle, Figure 9. The environment where DBLCI-Apex is likely to perform badly is when commodity markets exhibit little price variation, as trading strategies particular momentum strategies will be vulnerable to incorrect signals and consequently trading losses. In 2011, we expect commodity markets to show strong trends.

Figure 9: DBLCI-APEX index returns compared



Source: Deutsche Bank, Bloomberg Finance LP

Conclusion

Trading commodities using the principles of mean reversion have been tested in 2010. The weakness in US natural gas has punished the DBLCI-Mean Reversion Enhanced index, where total returns rose 5.4% last year. Excluding US natural gas total returns would have been up 19.3% in 2010. We believe mean reversion continues to be a superior strategy for trading commodities over the medium to long term. Indeed we expect the physical fundamentals for US natural gas will start to improve by the fourth quarter of this year. However, we recognise that momentum can have an important role to play in driving short term commodity returns. Moreover, where commodity markets are prone to downturns, carry can prove to be an important source of positive returns.

In order to take into account of the various strategies to trade commodities we have launched the DBLCI-Apex index. DBLCI-Apex employs the three trading strategies of mean reversion, carry and momentum. We believe one of the benefits of this index is that the three underlying strategies exhibit low correlation. This enables the index to generate superior results over the economic cycle while the volatility of the resultant portfolio can be controlled at a pre-defined level.

Figure 10: Commodity returns in 2010

USD terms	Δ mom	ΔQTD	ΔYTD	Sharpe
DBLCI-OY	9.29	11.63	12.39	0.62
DBLCI	8.36	11.00	12.48	0.60
DBLCI-MR	8.98	10.93	13.78	0.61
DBLCI-MR Plus	8.61	8.80	2.49	0.13
DBLCI-MR Enhanced	9.90	11.35	5.43	0.27
DBLCI-OY Broad	9.93	14.25	11.93	0.61
DBLCI-OY Balanced	10.16	15.18	15.64	0.84
DBLCI Allocator	5.39	4.44	-6.88	-0.56
DB Commodity Harvest	-0.41	-0.62	-0.65	-0.30
DB Commodity Harvest 10 % TV	-1.75	-2.37	-3.34	-0.30
Components of the DBLCI*				
Crude Oil	8.11	11.86	0.42	0.01
Heating Oil	8.72	9.48	8.64	0.32
Aluminum	8.04	4.38	6.40	0.23
Gold	2.44	8.51	28.83	1.75
Wheat	11.37	10.17	23.26	0.68
Corn	11.63	20.10	35.22	1.12
Performance of other benchmark indices				
S&PGSCI	9.40	13.41	9.03	0.42
DJ-UBSCI	10.69	15.79	16.83	0.96
S&P 500	5.92	10.07	14.83	0.81
EFFAS US Bond	-1.77	-2.67	6.03	1.18

** Returns defined by DBLCI sub-index contract and rolls. For quotes and compositions see Reuters: DBLCI and Bloomberg Finance LP: DBCM*
Source: Deutsche Bank, Bloomberg Finance LP. (Data as of December 31, 2010)

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#4 Global Macro

From Liquidity To Physical Fundamentals

- **We believe the Fed helped to engineer a liquidity driven rally in many commodity prices last year. In 2011, we expect price rallies will be based on a tightening in physical fundamentals.**
- **After rising 4.7% in 2010, we expect world GDP growth to rise 3.9% in 2011 and 4.2% in 2012. We believe global growth will be increasingly skewed to the emerging market countries over the next few years where commodity demand growth is strong.**
- **While rising inflation and monetary tightening across the emerging markets and specifically China may intermittently contaminate the performance of risky assets such as commodities, we believe any price corrections will be short-lived.**
- **We believe the US expansion will gain momentum during 2011. History would suggest that the dangers of the US moving back into recession are a low probability event over the next year. We expect this will help to push the S&P500 to 1550 by the end of the year.**
- **Although the US dollar may find cyclical strength from Europe's financial crisis and as the Fed begins to prepare the market for a turn in the US interest rate cycle in 2011, we believe the US dollar remains on shaky foundations and that another collapse in the greenback can not be ruled out of hand.**
- **We believe overshooting risks are therefore a high probability event in the metals complex over the coming 18 months. Indeed we expect precious metal prices will continue to move higher assisted by central bank gold purchases and investor inflows into physically backed gold ETFs. According to our estimates gold prices would need to surpass USD2,000/oz to represent a bubble.**
- **Industrial metal prices may struggle in the first half of this year as the market anticipates a withdrawal of liquidity from the Fed and Chinese monetary tightening. However, we believe market deficits in parts of the industrial metals complex as well as the launch of physically backed ETFs threaten upside price risks in copper over the coming year.**
- **Unlike 2010, we believe oil price rallies are based on more solid foundations in 2011 as crude oil inventories decline and the oil forward curve moves into backwardation. We would view price corrections as likely to be short-lived since OPEC has a powerful track record in defending crude oil prices when world growth is above 3%.**
- **We are maintaining our broadly constructive view to the agricultural complex. We view fundamentals as tightest in corn. Although rallies in the agricultural sector tend to be shorter in duration and less powerful in magnitude than in the metal and energy sectors, history would suggest that for this rally to match historical averages corn prices would need to rise an additional 20% to USSD7.85/bushel and for this to occur sometime in the second half of 2011.**
- **We believe fundamentals in the coking coal and thermal coal markets are structurally tight. In iron ore we believe seaborne supply will fall short of demand due to a continued export ban in India and infrastructure bottlenecks in Brazil and Australia.**

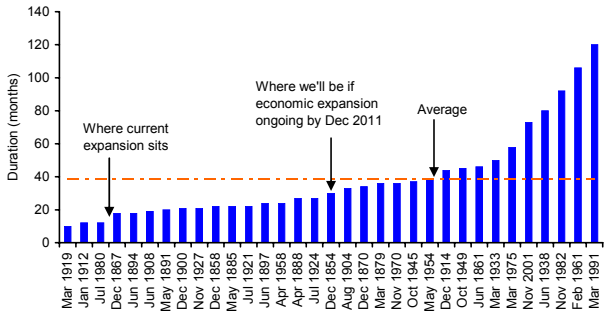
2011 marks the 10th year of the current commodity cycle. Since super cycles in the commodity complex typically last between 15 and 20 years, one could argue that we are at least half way through the current cycle. We believe the ingredients for a structural rise in commodity prices are still in place and are based on the emergence of China and India as super commodity consumers, under-investment in new productive capacity across the commodity complex, the persistence of low interest rates around the world, the increasing frequency of extreme weather events as well as the migration of new risk capital into the complex.

We believe cyclical factors are also supportive for further price gains. This is based on our four core beliefs: emerging market growth will remain strong, the Fed's efforts to stimulate growth will be successful, European sovereign risk will be contained and physical fundamentals in many commodity markets are tight. We view crude oil, copper, thermal coal and corn as possessing the strongest fundamentals over the medium term.

We also expect fresh investment inflows into the commodities complex during 2011. We believe the sector's appeal reflects investor appetite to gain exposure to strong emerging market growth, as a tool to hedge against tail events and market anxiety towards higher inflation ahead. Moreover investors are now able to gain direct exposure to an increasing array of commodities, which have typically been outside of the investment universe such as uranium, iron ore and coal.

We attach a low probability to a renewed slump in US economic activity. Figure 1 examines the duration of the current business cycle with US business cycles since 1854. If the current expansion matches historical averages then it would imply the US economy moving back into recession sometime in the third quarter of next year. For more details, see DB's Global Credit Outlook report published on December 8, 2010.

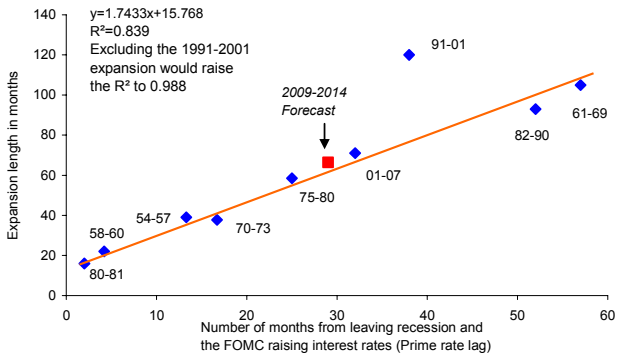
Figure 1: Tracking the duration of US expansions since 1854



Source: Deutsche Bank, NBER

However, according to analysis we presented six years ago, the duration of US expansions are directly proportional to the amount of time the Fed waits until raising interest rates after leaving recession. Not surprisingly, the longer the Fed waits to tighten monetary policy after leaving recession, the longer the economic expansion will be. According to our US Economic team, the Fed is likely to tighten monetary policy in November 2011 or 29 months after leaving recession. Based on the historical correlation outlined in Figure 2 this would imply the US moving back into recession in January 2014.

Figure 2: Timing the next US recession



Source: Deutsche Bank (The January 2014 recession date assumes the Fed hikes rates in November 2011)

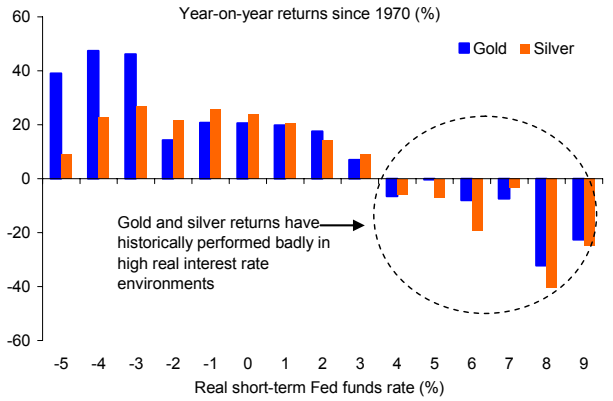
Commodity markets & overshooting risk

We believe low interest rates in the US are increasing the probability of another period of overshooting in commodity prices. We believe this is most likely to occur in the precious metals complex and specifically in gold and silver over the next 12-24 months. Indeed the fact that investors are eager to buy gold on inflation and deflation fears as well as when the US dollar is rising and falling suggest that the formation of a bubble is a high probability event going forward.

On our estimates gold prices need to surpass USD2,000/oz to represent a bubble. This would then bring gold when valued in real terms, relative to income, as share of global GDP and relative to other commodities such as oil and copper to levels that we would view as extreme. Given the tendency of silver prices to outperform gold when the US manufacturing sector is expanding, we believe this would suggest that silver prices can easily move above USD40/oz in an environment where the gold price is overshooting.

While overshooting implies a subsequent crash in prices, we view the forces that have driven precious metal prices higher over the past decade as remaining in place, namely the persistence of low or negative real interest rates, a weak US dollar, skittish equity markets, central bank gold buying, heightened levels of geopolitical risk and producer de-hedging in the gold mining sector. In our judgement, the main hazard for the gold price will be the start of a new monetary tightening cycle by the Fed, which encourages a rise in real interest rates.

Figure 3: Gold & silver returns in different US real interest rate environments



Source: Deutsche Bank, Bloomberg Finance LP

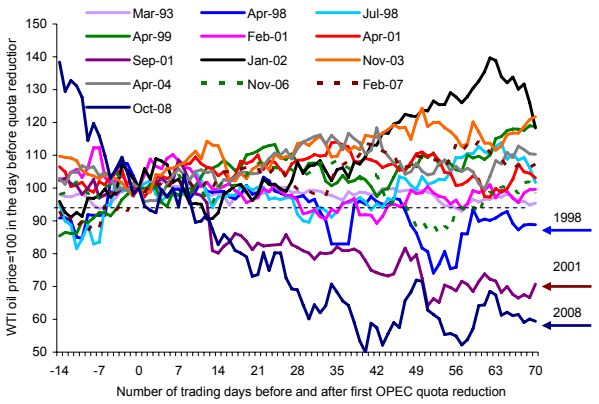
Global growth & the role of OPEC

In the Commodities Outlook 2010 report published 12 months ago we stated that oil price rallies above USD80/barrel would only become sustainable in 2011. This was based on our belief that physical fundamentals in the oil market were weak since the high and rising level of crude oil inventories and contango in the crude oil forward curve were indicative of an over-supplied market.

Entering 2011 we find that the crude oil inventories are declining, which we believe will eventually push the crude oil forward curve into backwardation. As a result, we believe rallies in the crude oil price are based on more solid foundations. The fact that we expect the S&P500 to hit 1550 by the end of this year would also be supportive of further oil price gains. Indeed over the past 80 years, the third year of a US Presidential term has tended to be very favourable for US equity markets. Over this period we find that the S&P500 typically posts returns of 17% with a 95% probability of positive returns in that year. Although the historical correlation of the oil price and the S&P500 has been negative, we believe the current positive correlation can persist for as long as the rise in oil prices does not lead to a deteriorating in the outlook for global growth.

In the event of any oil price weakness we believe OPEC is in a strong position to defend prices. Figure 3 examines the performance of crude oil prices in the weeks before and after OPEC production cuts. We find that in over 75% of the time OPEC action to defend the oil price is successful. Only in years where global growth falls below 2% has the cartel struggled to defend the oil price. Consequently investors and consumers should pay close attention to OPEC's price objectives given our upbeat assessment towards global growth since history would suggest they have a high success rate in enforcing their will in the current economic environment.

Figure 4: OPEC action and the performance of the oil price



Source: Deutsche Bank, Bloomberg Finance LP

Commodity markets & the role of China

We expect Chinese GDP growth will slow from 10% in 2010 to 8.7% in 2011. This is largely occurring in response to a slowdown in G3 GDP growth and the negative effects this will have on Chinese export growth. However, we believe inflation remains the main source of macro-economic uncertainty this year. In the past, monetary tightening has had a negative effect on the domestic stock market and short term growth expectations.

However, we are reassured that the authorities are taking pre-emptive action to tackle inflation risks. Indeed in the boom-bust episodes of 1989 and 1994 the central bank waited until inflation had hit double digits before tightening monetary policy. As a result, we believe the medium term growth outlook remains robust. Consequently we believe the country's appetite for commodities will remain strong, most notably for copper, thermal coal, soybeans and crude oil. In crude oil we have recently revised up our forecasts for Chinese oil demand growth.

Agriculture: Sustaining rallies into 2011

Agriculture was the best performing sector in 2010 in terms of spot price performance. According to data from the CFTC at the end of last year, net speculative length has reached multi-year highs across some parts of the agricultural complex indicating some positioning risk for the sector. Indeed behavioural finance theory would suggest that investors need to be wary about asset classes and securities that have been past winners given their tendency to become future losers. This may be particularly relevant for cotton which has staged its most powerful rally on record over the past two years. Another source of concern is that rallies in the agricultural sector have tended to be shorter in duration than rallies in the energy and metals complex and that in certain markets price rallies may be becoming long in the tooth.

Of the major agricultural commodities, we believe fundamentals are strongest for corn and soybeans. In corn, we believe the low level of inventories sustain upside price risks for the market particularly given the increasing use of corn as a feedstock for ethanol and rising shortages in China. Aside from the risks to Argentinean soybean production from droughts, we believe any reduction in soybean acreage in the US would trigger strong price advances into the second quarter of this year in our view.

Conclusion

We believe the macro economic outlook is supportive for further gains in commodity prices. We expect US growth to gather momentum, the S&P500 to rally 20% this year, the Fed to keep rates on hold until November and after initial strength the US dollar will resume its weakening trend. The man risk to our outlook would be a resurgence in European sovereign risk, monetary tightening across EM and a disorderly sell-off in global fixed income markets.

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#5 Crude Oil

2011: Physical Drivers

- **Crude oil prices grew strongly across H2 2010 as the financial drivers of 2009 began to give way to underlying demand and inventory fundamentals. We expect this trend to continue into 2011-12.**
- **We estimate that global oil demand in 2010 grew by 2.6mmb/d, or more than two times the consensus forecast for 1.2mmb/d from Jan-2010. Global GDP likely grew at 4.8% in 2010, not at the 3.3% consensus expectation from a year ago.**
- **We expect global GDP growth of about 4% in 2011 and that should drive an oil demand rise of close to 1.7mmb/d. This compares to consensus estimates for demand growth nearer 1.3mmb/d. Our estimates incorporate very strong demand in China both in 2010 and 2011.**
- **Non-OPEC grew by circa 1mmb/d in 2010, substantially more than consensus expectations. We expect this out-performance trend to continue in 2011 with positive contributions coming from Latin America, the former USSR, and biofuels.**
- **OPEC NGL production growth is starting to slow down as the LNG plant backlog is streamed, but an output gain of 0.5-0.6mmb/d is likely in 2011.**
- **The "call on OPEC crude" improved by about 0.5mmb/d in 2010, but total global stocks did not decline. We expect OPEC to gain further market share in 2011, while OECD inventories decline by some 2-3 days cover. As the economy normalizes and non-OPEC output fades into 2012, the need for OPEC oil growth should be rising.**
- **OECD stocks near 2700mmb are down from their 2800mmb peak, but still full by historic standards. We believe that stocks are likely to be drawn down toward 2500mmb by the end of 2012.**
- **OPEC spare capacity was circa 4.5-5.0mmb/d in 2010 and should hold close to that level in 2011. In 2012, however, spare capacity is forecast to decline, shrinking to about 2.5mmb/d by 2015.**
- **Trends in demand, supply and stocks, suggest that oil prices will be well supported, and we have raised our forecast prices accordingly. We expect crude oil prices to average above USD95/bbl in 2011, reaching USD98/bbl in 2012.**

Figure 1: Global oil supply and demand comparisons

2011 vs. 2010 (mmb/d)	Demand Growth	Non-OPEC Supply Growth	OPEC NGLs	Call on OPEC Crude	World GDP Growth 2010	World GDP Growth 2011
US DOE/ EIA	1.43	-0.28	0.67	0.40	4.5%	3.7%
Int'l Energy Agency	1.32	0.62	0.55	0.30	4.8%	4.2%
OPEC Secretariat	1.18	0.41	0.46	0.31	4.3%	3.8%
Deutsche Bank	1.74	0.78	0.57	0.41	4.8%	3.9%
Average	**1.42**	**0.38**	**0.56**	**0.36**	**4.6%**	**3.9%**
Big 3 Agency Avg	**1.31**	**0.25**	**0.56**	**0.34**	**4.5%**	**3.9%**

Note: US DOE/EIA GDP figures were adjusted upward by 0.5% to account for FX to PPP conversion

Source: US DOE/EIA, IEA, OPEC, Deutsche Bank

Figure 1 compares key statistics from the leading oil forecasting agencies against our own estimates. On average, demand is forecast to rise in 2011 by about 1.4mmb/d or circa 1.5%. The fact that OPEC's growth estimate for world demand is the lowest is not surprising since the Secretariat has a history of being conservative on demand. We note that the GDP growth forecasts for 2011 are in a relatively narrow range 2011. Our above-consensus demand growth forecast is driven more by our view of developments in China than by GDP. Non-OPEC supply growth estimates for 2011 are divergent, with the EIA and OPEC at the low end and the IEA and DB more optimistic. We believe that strong capital budgets and robust oil prices support our more sanguine view. OPEC NGL increase forecasts are in a fairly narrow range that averages about 0.5mmb/d in 2011. Taken together, the rise in the consensus call on OPEC crude oil is relatively modest, but looks set to improve significantly post-2011.

Global economic outlook

The DB global economics team expects world GDP growth of 3.9% in 2011, not too far from the emerging consensus for the year. Last year, our very bullish 4% growth forecast for 2010 (compared to many forecasts calling for a rise of less than 3%) proved to be conservative. The following material outlines the global economics team's thinking on regional risks to the outlook for growth in the next year or two.

In the US, news about the economy has taken on a better tone, with consumers becoming more active, manufacturing returning to a more robust pace of expansion, and even the labor market showing some signs of entering recovery mode. These developments have not caused us to change our now only slightly above-consensus view of US growth for 2011. But they have shifted the balance of a long list of risks from the downside to a more neutral setting.

In Europe, 2011 will be a crucial year for EMU, and survival in its present form can no longer be taken for granted if policy makers fail to make the right decisions.

Preservation of EMU will take strong political leadership in the face of extraordinary divergence in real growth among EMU countries. With Germany growing strongly and a few other countries remaining in recession, we see intense centrifugal economic pressures on the currency union. We expect the needed leadership will be found but the risk of a repeat of the euro crisis of last spring is real. The 2010 euro crisis had a very negative impact on oil prices during Q2 2010.

In Asia, inflation remains the dominant risk and concern among policymakers, especially as recent data on real activity have tended to surprise to the upside. We expect anti-inflation policies (rate hikes and administrative measures) should limit price increases, with attention focused on the food sector where much of the inflation pressure has originated. The fight against asset inflation continues, with measures being taken in some cases that could do permanent damage to global appetite for investment in Asia. On the geopolitical front, a flare-up of tensions in Korea could temper growth prospects.

Figure 2: DB's global economic growth forecast

y-o-y % change	2008	2009	2010E	2011E	2012E
US	0.2	-3.2	2.9	3.1	3.4
Euro Area	0.0	-2.6	1.7	1.2	1.4
Japan	-1.2	-5.2	4.2	0.6	1.7
Other OECD	1.0	-2.3	3.5	3.5	3.8
OECD	**0.1%**	**-3.1%**	**2.6%**	**2.1%**	**2.5%**
China	9.6	9.1	10.0	8.7	8.4
Other Asia (1)	5.4	4.3	8.6	6.3	6.8
Latin America	4.3	-1.7	5.7	4.1	4.1
Other Non-OECD (2)	3.6	-4.5	4.8	4.3	5.0
Non-OECD	**6.0%**	**2.5%**	**7.6%**	**6.2%**	**6.4%**
World	**2.8%**	**-0.6%**	**4.8%**	**3.9%**	**4.2%**

(1) Non-OECD Asia ex-China, (2) E. Europe, Mid-East, Africa, Frmr.Sov.Un.

Source: IMF, Deutsche Bank

Oil demand

Last year, we expressed concern about the ability of analysts to track oil information in the developing world. Although the statistics outside the OECD are getting better, there are numerous data holes and lags. Non-OECD inventory data is appallingly bad and without that, demand estimates are poor, in our view. With oil demand growth now almost entirely concentrated in nations outside the OECD, we believe the potential for forecasting errors (both up and down) is exacerbated.

Data for 2010 provided a nearly perfect example of this problem. In January 2010 we thought that OECD oil demand would rise by 0.2mmb/d during the year, the highest estimate among the four forecasters from Figure 1. Our non-OPEC growth estimate of 1mmb/d was roughly in line with consensus. As of January 2011, it appears that OECD oil demand will be up about 0.4mmb/d in 2010, but that non-OECD demand will be up almost 2mmb/d. The percentage of error is about the same, but the impact of missing the non-OECD forecast is far more significant in absolute terms (and thus to the call on OPEC and to OPEC spare capacity) than the miss on the OECD.

In 2011, we are looking for global demand growth of 1.7mmb/d, an aggressive forecast in comparison with the consensus. China, India the Middle East and Latin America account for the bulk of the growth in the non-OECD, and non-OECD nations account for nearly all of the global growth. Not having timely and accurate data for this nations will continue to be a problem for forecasters.

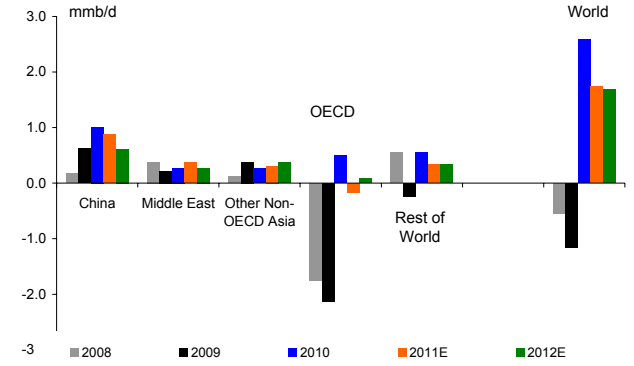
The special case of China oil demand

For 2010 we estimate that China's apparent demand for oil grew 13.6% (1.03mmb/d) to 9.37mmb/d. This is materially higher than our initial estimate of 6% (470kb/d). It is also materially higher than GDP growth (2010E =10%) times elasticity of demand (0.68x) or 6.8%. We suspect China's oil demand 2011 will remain strong despite slower GDP growth (2011E = 8.7%). We estimate China's oil demand 2011E to grow +10% (0.88mmb/d) to 10.25mmb/d.

Four things happened in 2010 that led to higher than anticipated China oil demand: 1) Stronger than anticipated GDP growth. 2) Teapot refiners shifted away from processing fuel oil and into processing crude oil. 3) Commercial and Strategic (SPR) inventory builds added to oil demand in 2010. A lower product-to-crude ratio suggests higher oil to product demand in the system (oil demanded that is not being refined). 4) Increased domestic refining and chemical capacity (2010) added to oil demand.

We are expecting much the same in 2011: 1) GDP growth for 2011, although expected to be lower than 2010 is still very robust by global standards. 2) Teapot refineries will continue to shift demand away from fuel oil and into crude oil. 3) Commercial oil storage capacity continues to grow, and the government is expected to start to fill Phase 2 of its Strategic Petroleum Reserve in 1H11. 4) For 2011, we estimate that China will add circa 400kb/d of new refining capacity as well as substantial new ethylene capacity.

Figure 3: Oil demand by region 2008-2010

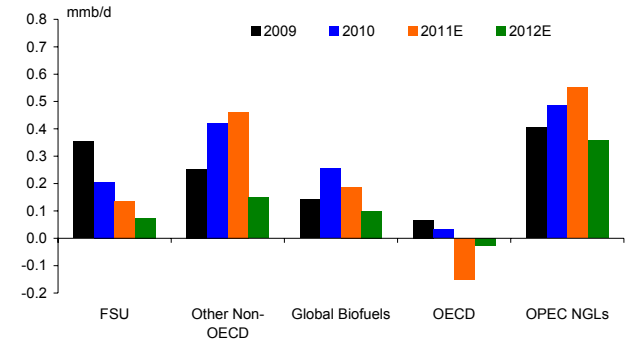


Source: IEA, Deutsche Bank

Non-OPEC oil supply

Output from non-OPEC countries rose by 0.9mmb/d in 2009 and 1.1mmb/d in 2010. The consensus for 2011 growth is circa 0.4mmb/d, but the IEA believes it could grow by 0.6mmb/d and we expect it could even be greater at 0.8mmb/d in 2011. The IEA notes a "significantly brighter outlook for US onshore and unconventional crude as well as gas liquids" and that this should more than offset the impact of expected drilling delays in the Gulf of Mexico. Azerbaijan, Brazil, China, Colombia, and Russia are among the gainers, while declines in the US, Mexico and the North Sea are tempered by higher prices and improved production technology. OPEC NGLs, usually counted as a supplement to non-OPEC output, made a significant and growing contribution across 2009-1010. We believe this trend will slow in 2011 as fewer LNG facilities are streamed, but still expect a gain of circa 400kb/d in 2011.

Figure 4: Non-OPEC oil supply forecast trends

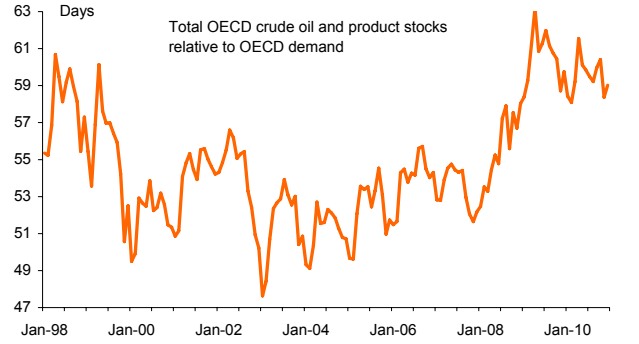


Source: IEA, Deutsche Bank

Inventories

The latest IEA data suggest that OECD industry stocks fell in October 2010 to 2745mmb, or 60 days cover. Preliminary estimates from the IEA for November combined with our estimates for December put OECD stocks near 2700mmb, or 59 days cover, Figure 5. Although stocks are down substantially from their 2800mmb peak, they remain full by historic standards. However, we believe that stocks are likely to be drawn down toward 2500mmb by the end of 2012 as demand growth continues to outpace non-OPEC supply and OPEC remains disciplined. This would bring demand cover down to circa 54-55 days. Floating storage, not included in these estimates, has been reduced from year-ago levels, now accounting for an estimated two additional days cover rather than three.

Figure 5: Total OECD stocks dropping but still high



Source: IEA, Deutsche Bank

Call on OPEC

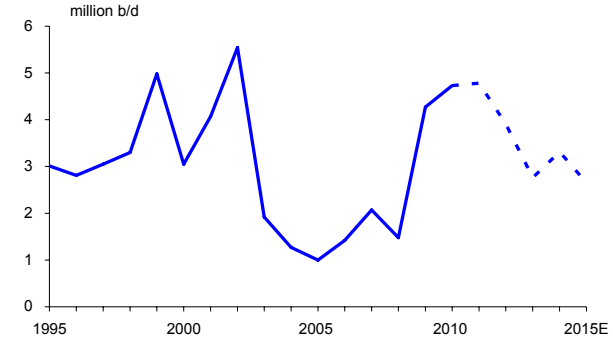
Even with unexpectedly robust non-OPEC growth in 2010, the extraordinarily strong oil demand gains last year allowed for a rise of some 0.4-0.5mmb/d in OPEC output. Although demand growth is likely to slow in 2011, so too will non-OPEC output, so OPEC should gain another 0.4-0.5mmb/d in 2011. As non-OPEC output slows further in 2012 (along with less OPEC NGLs), we estimate that OPEC should pick up 0.8-0.9mmb.d of crude oil market share in 2012. The anticipated growth in OPEC's portion of the market, after the huge drop the cartel experienced in 2009, is one of the key elements in the relatively bullish outlook for oil prices over the next few years.

OPEC spare capacity

Spare capacity is defined as the difference between theoretical output (production levels that can be sustained over a period of time - typically 90 days) and actual production. Generally speaking, non-OPEC producers do not maintain spare oil production capacity. In most countries, oil production tends to follow the maximum levels that fields are capable of producing economically. In a number of OPEC nations, notably Saudi Arabia, capacity has been developed that often remains idle. In some cases, spare capacity is deliberately maintained as a policy choice. In times of extremely low demand, 2009 for example, spare capacity increases can result from production management decisions taken at OPEC ministerial conferences.

Figure 6 depicts the recent history of OPEC spare capacity since 1995, along with our estimates for the 2011-15 period. We estimate that overall OPEC capacity will average about the same in 2011 as the 4.7-4.8mmb/d estimate from 2010, and then decline as the "call on OPEC" grows faster than capacity additions. We are assuming that Iraq's total capacity will grow from circa 2.5mmb/d in 2010 to circa 4.3mmb/d in 2015. Absent this improvement, spare capacity in OPEC in 2015 could be closer to the 1.0mmb/d low hit n 2005.

Figure 6: Trends in OPEC spare capacity



Source: US DOE/EIA, Wood Mackenzie, Deutsche Bank

Figure 7: Deutsche Bank oil and gas price deck

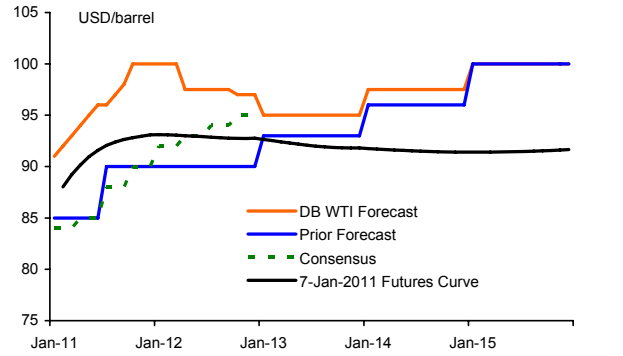
	WTI (USD/bbl)	Brent (USD/bbl)	US Gas (USD/mmBtu)
2009	**62.09**	**62.67**	**4.16**
2010	**79.61**	**80.34**	**4.38**
Q1 2011E	92.00	94.00	4.25
Q2 2011E	95.00	96.00	4.25
Q3 2011E	97.00	98.00	4.00
Q4 2011E	100.00	100.00	4.75
2011E	**96.00**	**97.00**	**4.30**
Q1 2012E	100.00	100.00	5.25
Q2 2012E	97.50	97.50	5.00
Q3 2012E	97.50	97.50	5.25
Q4 2012E	97.00	97.00	5.50
2012E	**98.00**	**98.00**	**5.25**
2013E	95.00	95.00	5.50
2014E	97.50	97.50	5.75
2015E	100.00	100.00	6.00

Source: Bloomberg Finance LP, Deutsche Bank

Conclusion

We believe that oil supply, demand and inventory fundamentals are pointing toward a gradual tightening in the oil markets. It is possible that (1) strengthening in the US dollar against the euro, or (2) weakness in the US equity markets could remove some of the support for oil prices, but in our view, the traditional S/D fundamental are likely to be more powerful.

Figure 8: Forecast comparisons



Source: Bloomberg Finance LP, Deutsche Bank

We have raised our forecast prices accordingly, particularly for 2011 and 2012. We expect crude oil prices to average above USD95/bbl this year, reaching USD98/bbl in 2012

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Figure 9: World Oil Supply and Demand Growth Comparisons for 2010 (mmb/d)

	Deutsche Bank				Change 2011 over 2010			
	2008	2009	2010E	2011E	OPEC	IEA	DOE	DB
CONSUMPTION								
United States	19.50	18.77	19.09	19.20	0.19	0.00	0.19	0.11
OECD Europe	15.36	14.49	14.37	14.26	-0.05	-0.09	-0.12	-0.11
Japan	4.79	4.37	4.38	4.27	-0.07	-0.16	-0.18	-0.11
Other OECD	7.94	7.82	8.10	8.05	0.09	0.02	0.08	-0.05
Total OECD	**47.58**	**45.45**	**45.94**	**45.78**	**0.16**	**-0.23**	**-0.03**	**-0.16**
USSR (former)	**4.23**	**4.00**	**4.24**	**4.35**	**0.04**	**0.11**	**0.13**	**0.11**
Non-OECD Europe	0.76	0.74	0.71	0.71	-0.03	0.01	-0.03	0.01
China	7.75	8.36	9.37	10.25	0.45	0.45	0.53	0.88
Other Asia	9.62	10.00	10.27	10.58	0.19	0.29	0.29	0.31
Latin America	6.00	6.00	6.30	6.45	0.15	0.22	0.16	0.16
Middle East	7.01	7.22	7.50	7.87	0.20	0.35	0.33	0.37
Africa	3.19	3.19	3.23	3.30	0.02	0.12	0.05	0.06
Other Non-OECD	**34.33**	**35.52**	**37.38**	**39.17**	**0.98**	**1.44**	**1.33**	**1.79**
TOTAL CONSUMPTION	**86.14**	**84.97**	**87.56**	**89.30**	**1.18**	**1.32**	**1.43**	**1.74**
SUPPLY								
United States	6.92	7.43	7.78	7.71	-0.01	-0.07	-0.04	-0.07
OECD Europe	4.75	4.53	4.15	4.07	-0.18	-0.07	-0.36	-0.08
Other OECD	7.06	6.84	6.91	6.90	0.06	-0.08	-0.15	-0.01
Total OECD	**18.73**	**18.80**	**18.83**	**18.68**	**-0.13**	**-0.22**	**-0.55**	**-0.15**
USSR (former)	**12.83**	**13.28**	**13.59**	**13.83**	**0.18**	**0.18**	**0.02**	**0.31**
Non-OECD Europe	0.12	0.11	0.11	0.10	0.00	0.00	-0.02	-0.01
China	3.80	3.88	4.09	4.19	0.01	0.12	-0.03	0.10
Other Asia	3.65	3.60	3.66	3.65	0.02	-0.03	0.14	-0.01
Latin America	3.68	3.88	4.07	4.40	0.25	0.29	0.17	0.33
Middle East	1.63	1.70	1.69	1.69	0.01	0.00	-0.04	0.00
Africa	2.67	2.61	2.60	2.64	0.07	0.04	-0.01	0.04
Other Non-OECD	**15.54**	**15.79**	**16.21**	**16.67**	**0.36**	**0.42**	**0.25**	**0.46**
Processing Gains	2.24	2.25	2.30	2.35	0.00	0.05	nf	0.04
Global Biofuels	1.42	1.56	1.82	2.01	nf	0.19	nf	0.19
Total Non-OPEC	**50.76**	**51.69**	**52.76**	**53.53**	**0.41**	**0.62**	**-0.28**	**0.78**
OECD Stock Withdraw	-0.40	0.08	-0.13	0.35	nf	nf	0.26	0.48
OPEC NGLs	4.40	4.80	5.29	5.84	0.46	0.55	0.67	0.55
Other and Balance	0.15	-0.18	0.50	0.00	nf	nf	nf	-0.50
OPEC CRUDE OIL	**31.22**	**28.58**	**29.14**	**29.58**	**0.31**	**0.30**	**0.40**	**0.43**
Memo Items:								
FSU exports	8.60	9.28	9.34	9.47	0.14	0.07	-0.11	0.13
US gross imports	12.38	11.14	11.11	11.29	0.20	0.07	0.23	0.18
Europe imports	10.61	9.97	10.23	10.19	-0.03	0.01	-0.01	-0.03
China imports	3.95	4.48	5.28	6.06	0.44	0.33	0.56	0.78
Demand Outside FSU	81.91	80.97	83.32	84.95	1.14	1.21	1.30	1.63
Non-OPEC Sup. ex-FSU	-0.79	-1.14	2.90	1.96	0.23	0.44	-0.30	-0.94
WTI Oil Price	**$98.52**	**$62.67**	**$80.34**	**$97.00**				

IEA is assuming structural weakness in gasoline, chemicals, heating and power

OPEC is expecting significant demand growth in Canada and Mexico

Impact from continuing strong economic growth, SPR builds, and supported by statistical impact of teapot refinery aggregation into official data

OPEC's conservative estimate reflects expectations for modest global GDP and a policy emphasis on energy conservation

DOE/EIA expecting circa 300kb/d decline in the North Sea

DB sees better prospects in Russia than OPEC, DOE, or the IEA

Brazil and Colombia contribute strongly to results

Project capital expenditures are still strong and oil rig counts are still rising

DOE/EIA expecting declines in the UK, Mexico, Russia and Norway to be substantial

Our estimated call on OPEC is up 400kb/d in 2011 over 2010

Source: OPEC Secretariat (OPEC), International Energy Agency (IEA), US DOE/EIA (DOE), Deutsche Bank (DB)

Figure 10: World Oil Supply and Demand 2008-2010 (mmb/d)

	2010	Q1 2011	Q2 2011E	Q3 2011E	Q4 2011E	2011E	Q1 2012	Q2 2012E	Q3 2012E	Q4 2012E	2012E
CONSUMPTION											
United States	**19.1**	18.9	19.1	19.6	19.2	**19.2**	18.9	19.1	19.7	19.3	**19.2**
OECD Europe	**14.4**	14.1	14.0	14.6	14.3	**14.3**	14.1	14.0	14.5	14.3	**14.2**
Japan	**4.4**	4.7	3.9	4.2	4.4	**4.3**	4.6	3.9	4.1	4.3	**4.2**
Other OECD	**8.1**	8.1	8.0	8.0	8.1	**8.1**	8.2	8.1	8.1	8.2	**8.2**
Total OECD	**45.9**	**45.8**	**45.0**	**46.3**	**45.9**	**45.8**	**45.8**	**45.1**	**46.5**	**46.1**	**45.9**
USSR (former)	**4.2**	**4.3**	**4.2**	**4.5**	**4.4**	**4.4**	**4.4**	**4.3**	**4.6**	**4.5**	**4.4**
Non-OECD Europe	**0.7**	0.7	0.7	0.7	0.7	**0.7**	0.7	0.7	0.7	0.7	**0.7**
China	**9.4**	9.9	10.4	10.3	10.5	**10.3**	10.5	11.0	10.9	11.2	**10.9**
Other Asia	**10.3**	10.6	10.7	10.3	10.7	**10.6**	10.9	11.1	10.7	11.1	**10.9**
Latin America	**6.3**	6.2	6.5	6.6	6.6	**6.5**	6.4	6.6	6.8	6.7	**6.6**
Middle East	**7.5**	7.5	7.9	8.4	7.7	**7.9**	7.8	8.2	8.7	8.0	**8.1**
Africa	**3.2**	3.2	3.3	3.3	3.3	**3.3**	3.3	3.4	3.4	3.4	**3.4**
Other Non-OECD	**37.4**	**38.1**	**39.5**	**39.6**	**39.5**	**39.2**	**39.6**	**41.0**	**41.1**	**41.0**	**40.7**
TOTAL CONSUMPTION	**87.6**	**88.2**	**88.8**	**90.4**	**89.8**	**89.3**	**89.8**	**90.4**	**92.2**	**91.6**	**91.0**
SUPPLY											
United States	**7.8**	7.8	7.8	7.6	7.7	**7.7**	7.9	7.9	7.9	7.9	**7.9**
OECD Europe	**4.1**	4.3	4.0	3.9	4.1	**4.1**	4.1	3.8	3.8	3.9	**3.9**
Other OECD	**6.9**	6.9	6.9	6.9	6.9	**6.9**	6.9	6.9	6.9	6.9	**6.9**
Total OECD	**18.8**	**18.9**	**18.7**	**18.4**	**18.7**	**18.7**	**18.9**	**18.6**	**18.6**	**18.7**	**18.7**
USSR (former)	**13.6**	**13.8**	**13.8**	**13.8**	**13.9**	**13.8**	**13.9**	**14.0**	**14.0**	**14.1**	**14.0**
Non-OECD Europe	**0.1**	0.1	0.1	0.1	0.1	**0.1**	0.1	0.1	0.1	0.1	**0.1**
China	**4.1**	4.2	4.2	4.2	4.2	**4.2**	4.3	4.3	4.3	4.3	**4.3**
Other Asia	**3.7**	3.7	3.6	3.6	3.6	**3.6**	3.5	3.5	3.5	3.5	**3.5**
Latin America	**4.1**	4.2	4.4	4.5	4.5	**4.4**	4.6	4.6	4.6	4.6	**4.6**
Middle East	**1.7**	1.7	1.7	1.7	1.7	**1.7**	1.7	1.7	1.7	1.7	**1.7**
Africa	**2.6**	2.6	2.6	2.7	2.7	**2.6**	2.7	2.7	2.6	2.6	**2.6**
Other Non-OECD	**16.2**	**16.5**	**16.6**	**16.8**	**16.8**	**16.7**	**16.9**	**16.8**	**16.8**	**16.7**	**16.8**
Processing Gains	**2.3**	2.3	2.3	2.4	2.4	**2.3**	2.4	2.4	2.4	2.4	**2.4**
Global Biofuels	**1.8**	1.6	2.0	2.4	2.1	**2.0**	1.6	2.1	2.5	2.2	**2.1**
Total Non-OPEC	**52.8**	**53.1**	**53.4**	**53.8**	**53.8**	**53.5**	**53.7**	**53.9**	**54.3**	**54.1**	**54.0**
OECD Company Stockdraw	**-0.1**	0.4	0.3	0.3	0.4	**0.4**	0.4	0.3	0.3	0.4	**0.4**
OPEC NGLs & Non-Conv	**5.3**	5.7	5.8	5.9	6.0	**5.8**	6.1	6.2	6.2	6.3	**6.2**
Other and Balance	**0.5**	0.0	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	0.0	**0.0**
OPEC CRUDE OIL	**29.1**	**29.0**	**29.3**	**30.4**	**29.6**	**29.6**	**29.6**	**30.1**	**31.4**	**30.8**	**30.5**
Memo Items:											
Company OECD stocks (mmb)		2707	2671	2644	2616		2582	2541	2513	2486	
OECD days forward consumption		59	59	57	57		56	56	54	54	
FSU exports	**9.4**	9.5	9.6	9.3	9.5	**9.5**	9.5	9.7	9.4	9.6	**9.6**
US gross imports	**10.8**	10.8	11.4	11.0	10.8	**11.0**	10.6	11.3	10.9	10.8	**10.9**
China imports	**5.3**	5.7	6.2	6.0	6.3	**6.1**	6.2	6.7	6.6	6.9	**6.6**
Demand Outside FSU	**83.3**	83.9	84.5	85.9	85.4	**85.0**	85.4	86.1	87.6	87.1	**86.5**
Non-OPEC Sup. Ex-FSU	**39.2**	39.3	39.6	40.0	39.9	**39.7**	39.8	39.9	40.3	40.0	**40.0**
Brent (1st Month) $/bbl	**80.34**	94.00	96.00	98.00	100.00	**97.00**	100.00	97.50	97.50	97.00	**98.00**
WTI (1st Month) $/bbl	**79.61**	92.00	95.00	97.00	100.00	**96.00**	100.00	97.50	97.50	97.00	**98.00**
WTI-Brent Differential	**-0.72**	-2.00	-1.00	-1.00	0.00	**-1.00**	0.00	0.00	0.00	0.00	**0.00**

US growing in 2010-11, but flattens in 2012

Europe and Japan growth remains negative

China oil consumption up more than 500kb/d, but with some questons about stocks and exports

Growth in "Other Asia" driven by continuing gains in GDP

Down 1.2mmb/d in 2009,
up 2.6mmb/d in 2010,
up 1.7mmb/d in 2011
up 1.7mmb/d in 2012

Azerbaijan and Kazakhstan growing; Russia holding

Non-OPEC supply keeps growing in 2012 (albeit slower than in 2010-11) at a rate near 0.5mmb/d per year

Estimated 'Call on OPEC Crude' in 2012 is up circa 0.9mmb/d against 2011, yet still allows for further some draw in stocks

Inventories looking much more supportive for pricing by the end of 2011 and continue to erode into 2012, reaching "normal" levels by the middle of 2012

Source: International Energy Agency, Deutsche Bank

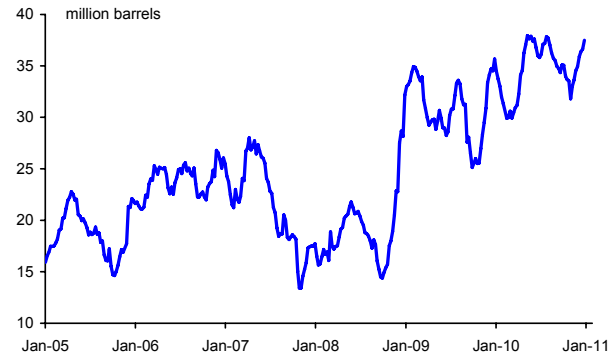
#6 Transatlantic Crude Arb

WTI-Brent Spread: Upside Down?

- **Since the start of 2010, WTI crude oil prices have been trading at about a 70USc/bbl discount to equivalent month Brent prices. Recently, the differential has declined significantly, Figure 2.**
- **Historically, the US was considered the marginal buyer and Brent traded at a discount of around USD1.00-1.50/bbl to WTI to account mostly for transportation from the North Sea to the US.**
- **A number of factors are now contributing to the trend from a positive to a negative spread. These include surplus stocks in Cushing, declining availability of the Brent crude stream and rising demand for Brent's diesel/gasoil content.**
- **With the US no longer acting as the marginal buyer of Brent crude, the WTI discount could continue for some time, perhaps awaiting the completion of the Keystone pipeline extension from Cushing to the US Gulf Coast.**
- **Unless recent moves by Saudi Arabia to deepen the discount on Arab light to European buyers succeeds in offsetting some of the rent shortfalls, we expect the discount of WTI to Brent will roll down the curve to the deferred contracts in our view.**

Cushing, Oklahoma, the oil trading hub that is the delivery point for the Nymex WTI contract, seems to be one of the few places left in the world outside of China where crude oil inventories are building, Figure 1. Recently, the combination of low maintenance-driven Mid-Continent crude runs, increased regional production (Bakken, for example), the full running of Canadian heavy oil upgraders, and the extra crude sent from Padd3 to Padd2 for tax reasons at end-2010 has kept Cushing well supplied.

Figure 1: Crude oil stocks at Cushing

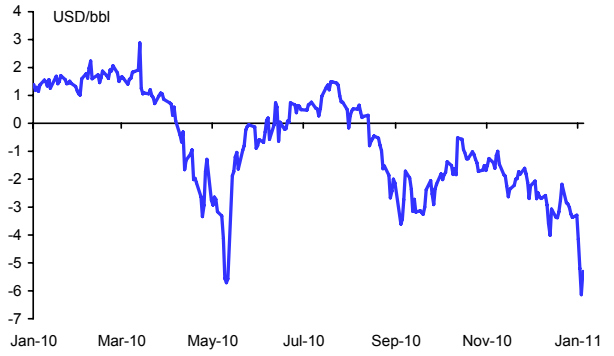


Source: Bloomberg Finance LP, Deutsche Bank

We believe that the current USD5/bbl Brent premium is an anomaly that will change most likely when we establish a pattern of Cushing draws perhaps when runs begin to ramp post turnarounds and potentially later when Canadian upgraders undergo maintenance.

The unusually wide spread is also attributable to upward pressure on Brent from cold weather in Europe, China's thirst for gasoil, and production declines in the physical Brent crude stream and the Nigerian crude, which is a close substitute.

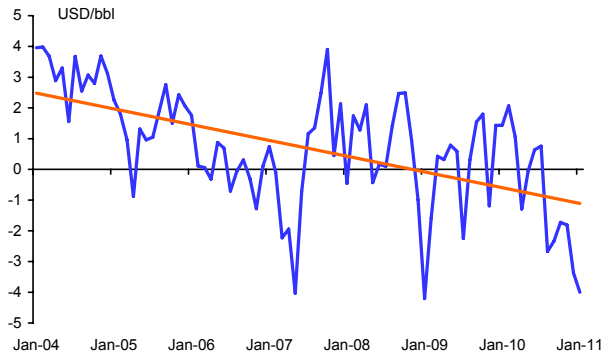
Figure 2: WTI-Brent spread since January 2010



Source: Bloomberg Finance LP, Deutsche Bank

But we do not expect WTI's discount to disappear quickly. In February, the new Keystone Pipeline extension to Cushing will begin deliveries, and the further extension to the Gulf Coast that could relieve some of the pressure on Cushing is a long way off. Furthermore, it seems reasonable to argue for a number of reasons that the US will never again be a consistent marginal destination for Brent crude oil. Consequently, Brent prices seem more likely to be driven by European and Asian market forces.

Figure 3: WTI-Brent spread since January 2004



Source: Bloomberg Finance LP, Deutsche Bank

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#7 Global Refining

Less Room For Surprises

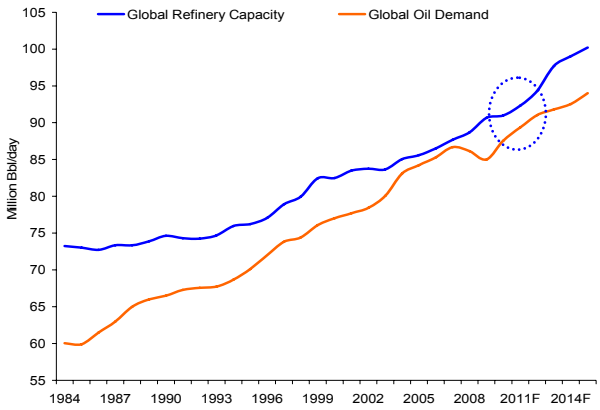
- **Global refining capacity is set to rise by 1.3 mln b/d on a net basis in 2011; demand is forecast to rise by 1.8 mln b/d, which leaves the gap between refining capacity and demand at 3 mln b/d or 3.3%, narrower than the past two years. This implies a better margin environment for this year.**
- **The relative tightness of the global refining supply/demand gap compared with that of the last two years implies less of a cushion to deal with surprises in the form of unexpected demand and unexpected refinery outages in the year ahead.**
- **While the scale of refinery expansions in Asia has captured the spotlight in recent years, refinery closures in mature markets have been dramatic. We show 1.7 mln b/d of refining capacity was shut down permanently in 2009-2010.**

After two plus years of struggling with material overcapacity in the refining sector, the global balance for 2011 looks tighter which implies modestly better refining margins in a baseline scenario. The relative tightness of the supply/demand gap compared with the last two years also implies a smaller refining capacity cushion to deal with surprises in the form of unexpected demand growth and unexpected refinery outages in the year ahead. Beyond 2011, refining capacity growth looks set to swamp demand growth estimates thanks to significant expansions in Asia as well as the Middle East -- that is unless further refining capacity closures occur.

According to our analysis, global refining capacity on a distillation basis is set to rise by 1.3 mln b/d on a net basis, which includes refinery closures scheduled for 2011. Global oil demand is forecast to rise by 1.8 mln b/d, which leaves the gap between refining capacity and demand at 3 mln b/d or 3.3%, see Figure 1. This is an improvement from 2009 and 2010 when the surplus was 5.7 mln b/d and 3.4 mln b/d, respectively. Based on a simple comparison of global refinery surplus versus the Nymex 3-2-1 crack, this implies a modestly better margin environment for 2011, see Figure 2. If not for refining capacity closures that were undertaken in the past few years, the surplus would have been 900kbd greater in 2010 and 1 mln b/d greater in 2011, implying a far worse margin environment.

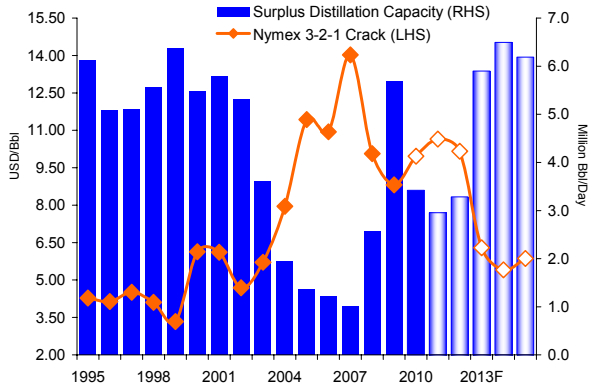
As has been the trend in the past several years, the refining capacity build out in 2011 will be dominated by Asia, see Figure 3. According to our calculations, refining

Figure 1: Global refining capacity vs demand



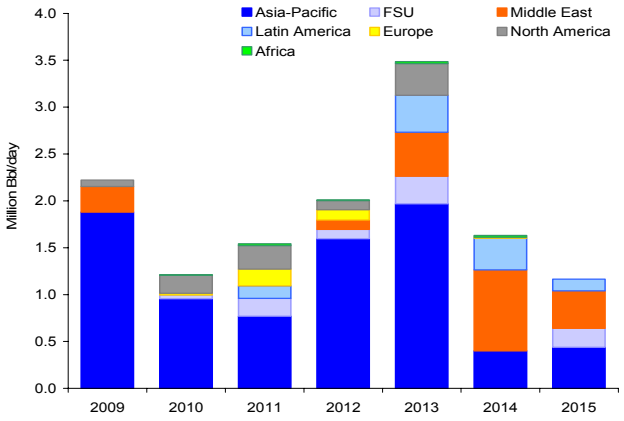
Nameplate distillation capacity. Excludes China's minor or 'teapot' refineries. Source: IEA, JODI, US DOE/EIA, Wood Mackenzie, BP Statistical Review, C1, Reuters, govt & trade data where available, Deutsche Bank

Figure 2: Global refining capacity surplus vs Nymex 3-2-1 crack



Source: IEA, US DOE/EIA, Wood Mackenzie, BP Statistical Review , C1, Reuters, Bloomberg Finance LP, govt & trade data where available, Deutsche Bank

Figure 3: Refinery capacity build out by region



Distillation capacity only, excludes China's minor or 'teapot' refineries. Source: Wood Mackenzie, C1, Reuters, Bloomberg Finance LP, Deutsche Bank

capacity growth in the Asia-Pacific will represent 50% of total growth this year; China alone will represent roughly 40% of the global expansion. We exclude China's minor or so-called' teapot' refineries in our calculations, but if we include them, that would add 150kbd this year to the total growth figure and China would represent 45% of global capacity growth in 2011.

In terms of secondary refinery capacity, hydrotreating or desulfurizing capacity continues to expand to meet ever-stricter global clean fuel standards, see Figure 4. But what is most notable for 2011 in terms of secondary capacity growth is that coking capacity, which converts fuel oil into light ends such as middle distillates and gasoline, is set to be nearly three times greater than what was added in 2010, according to Wood Mackenzie. This will continue the trend of declining fuel oil yields and rising light products yields, particularly for gasoil.

Mothballing Capacity

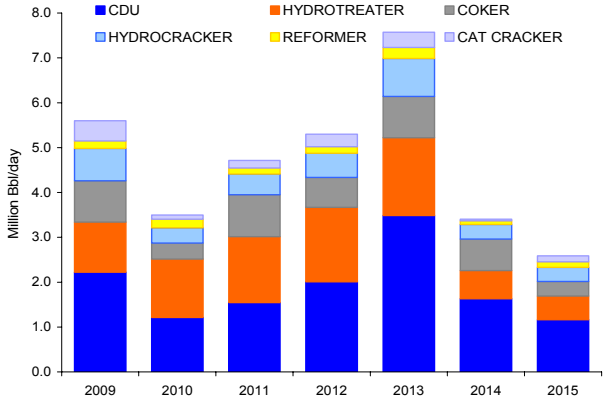
While the scale and pace of refinery expansions in Asia have captured the spotlight in recent years, refinery closures in mature markets have been dramatic and key to helping to balance the global refining landscape. According to our calculations, a combined 1.7 mln b/d of refining capacity was shut down permanently in 2009-2010 with Europe representing 45% of the closures in the period and the US and Canada representing 35%, see Figure 5. As for this year, we show only 100kbd of European capacity scheduled for closure. Depending on market fundamentals, more closures may be ahead given that some 1.7 mln b/d of capacity is officially up for sale in Europe and the US. If this capacity remains unsold in a poor margin environment, it's likely that some portion of what's on offer may be mothballed.

Poor margins, declining domestic demand and now government regulation that requires Japan's refiners to hike the residue/fuel oil cracking yield by 2014 leaves the industry with two options – upgrade or shutdown. Most have opted to trim capacity; Japan's refining industry has announced plans to close at least 800kbd of distillation capacity from 2010 to 2014.

A More Balanced Picture

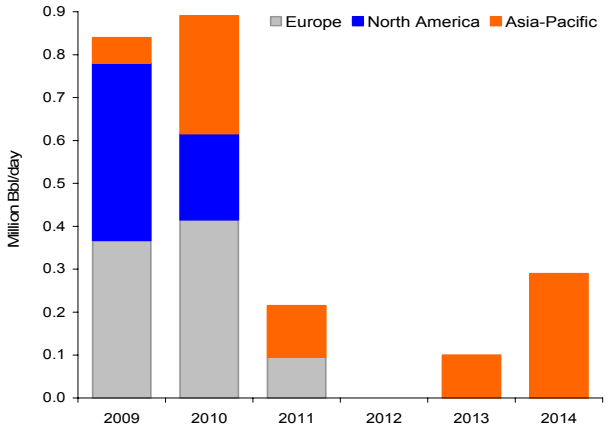
The global refinery balance this year is still a far cry from the 2004-2008 period when margins outperformed globally, see Figure 6. However, the relative tightness this year leaves less room for demand or supply surprises compared to the past few years. While it's unlikely that demand will be more than 1 mln b/d higher than forecast which would narrow the gap back to the pre-2008 level, it's not outside the realm of possibilities that we could

Figure 4: Refining capacity build out by unit type



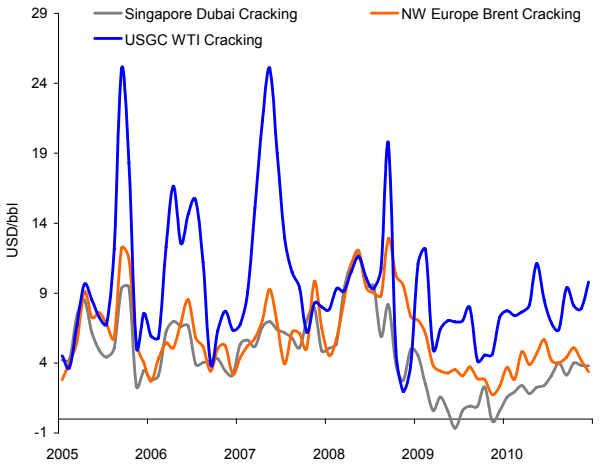
CDU = crude distillation unit; coker = coker, VDU & visbreaker. Excludes China's minor or 'teapot' refineries. Source: Wood Mackenzie, C1, Reuters, Bloomberg Finance LP, Deutsche Bank

Figure 5: Refining capacity closures by region



Source: Reuters, Bloomberg Finance LP, Wood Mackenzie, company, trade & media reports, Deutsche Bank

Figure 6: Indicative refining margins by region



Source: Bloomberg Finance LP, Deutsche Bank

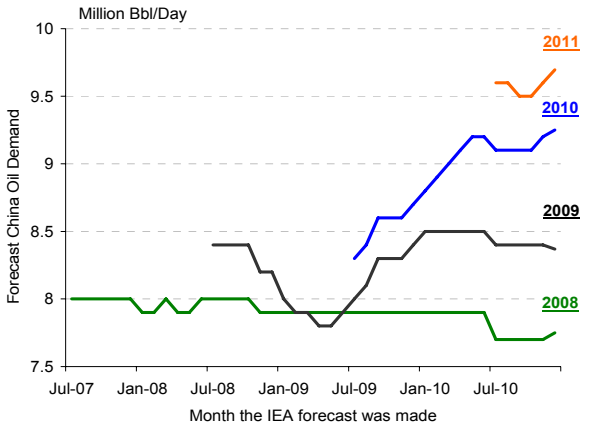
experience some combination of stronger-than-expected demand and refinery outages. After all, a nationwide strike in France in Sep-Oct last year effectively shut down the country's oil supply chain and disrupted the refining industry, which helped to clean up some of the surplus inventories. Hurricanes Katrina and Rita in 2005 effectively shut down US Gulf refining capacity. Upside demand surprises, particularly in China, has been a regular feature of the market for the past several years. The International Energy Agency has revised up its 2010 China oil demand forecast ten times since it was initially published in July 2009, see Figure 7. According to our calculations, if the unplanned US refinery outages of 2005 were repeated in 2011 and global demand was 400 kbd higher than our forecast, then that brings the surplus down to on par with pre-2008 levels implying a far stronger margin environment.

A closer look at China also paints a tighter domestic picture for 2011, see Figure 8. China's refining capacity deficit widens out in 2011 from the surplus/balanced status of the past few years given robust demand growth expectations and the smaller refinery capacity growth planned for this year. This implies China has far less room for demand surprises, such as the one that occurred last year. Larger-than-expected diesel demand in 2010 (which was prompted by the uptick in diesel-fired generation use to make up for power supply reductions imposed as part of a government effort to meet energy conservation targets) pushed diesel demand to double digit levels of 16% yoy growth in Nov after four straight months of single digit growth. If China's refining expansion occurs as planned in the years ahead, then that implies China could be a net exporter of refined products beyond 2011.

China's refining industry also faces significant challenges in 2011 as higher oil prices and potentially stricter control of retail fuel prices as part of a government effort to tame inflation may result in a lower domestic margin environment compared to the past two years, see Figure 9. How the government recalibrates its support for the refining sector in 2011 will be a key catalyst to watch for China's refinery runs trend. China's fuel price mechanism structure, which has been in place since 2009, allows for a 5% margin when oil prices are below USD80/bbl level. Beyond it, margins are cut by 1% with every USD5/bbl increase in crude oil prices. Under the current terms, the price mechanism will no longer be in use when oil prices reach USD130/bbl. Even if the structure of the price mechanism is unchanged, we may at the very least see implementation deferred or the scale of upward adjustments far smaller in size than prior moves.

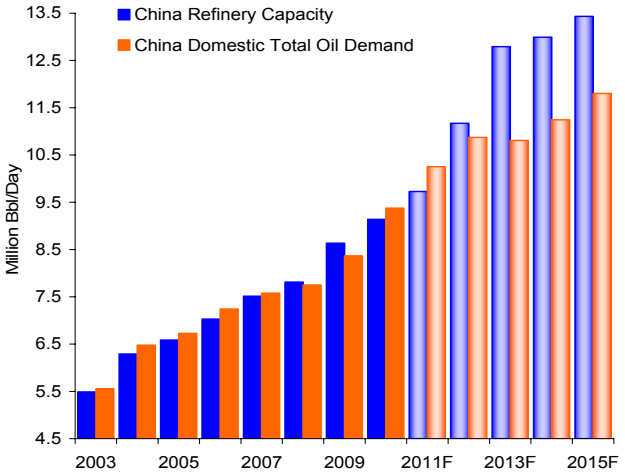
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Figure 7: History of IEA China oil demand forecast revisions



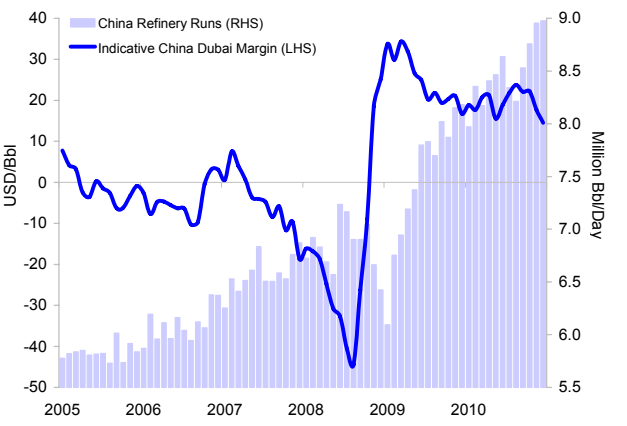
Source: IEA, Deutsche Bank

Figure 8: China's refining capacity vs demand



Excludes China's minor or so-called 'teapot' refineries. Source: China General Administration of Customs, China National Bureau of Statistics, C1, Reuters, Deutsche Bank

Figure 9: China's domestic refining margin trend vs refinery runs



Excludes China's minor or so-called 'teapot' refineries. Source: China General Administration of Customs, China National Bureau of Statistics, Reuters, Bloomberg Finance LP, Deutsche Bank

#8 Refined Products

Running Down The Barrel

- **As the global economic recovery gained traction, gasoil demand growth in 2010 outpaced that of the other major fuels and rose by a robust 5% yoy, in line with the recovery in global industrial activity.**
- **While gasoil demand growth in 2011 will be sustained, it is unlikely to surpass the strong performance of 2010 in a baseline scenario as slower economic growth is expected in the non-OECD, notably China. Material surprises to this year's gasoil balance will be necessary to replicate last year's robust growth rate.**
- **Thanks to a few surprises in 2010 – French refinery disruptions, stronger-than-expected Chinese demand and permanent refinery closures -- that were in addition to an improved demand picture, the refined products balance, although still loose relative to the pre-crisis period, is the tightest it's been in two years.**

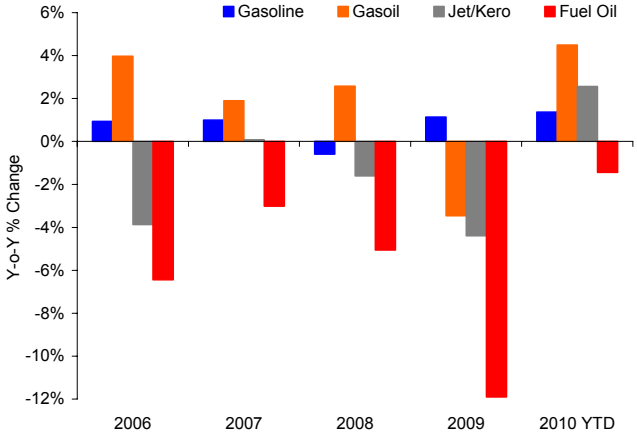
Gasoil was king in 2010 and structurally speaking is likely to hold the position in the medium-long term given fundamental changes underway in the gasoline market and as oil demand growth continues to trend higher in the non-OECD versus the OECD, which typically benefits gasoil over gasoline. That said, while gasoil demand growth in 2011 will be sustained, it is unlikely to surpass the strong performance of 2010 in a baseline scenario. Material surprises to 2011's gasoil balance will be necessary to replicate last year's growth rate.

Gasoline, meanwhile, may surprise to the upside if demand in the US, which represents half of global gasoline demand, ramps up more than expected on an improving US employment picture. Jet fuel demand growth, which was positive for the first year in three in 2010 due to a more robust recovery in air traffic is expected to grow at a more modest rate in 2011. Fuel oil demand is likely to remain in its structural down-trend; however the supply-side of the balance is likely to be a larger weight on the market's dynamics in 2011.

To Recap

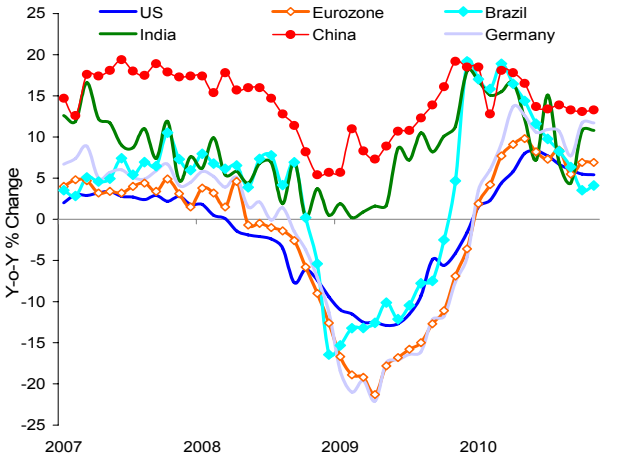
In 2009, during the heart of the global economic crisis, only gasoline demand growth was positive, according to our calculations. This was largely due to strong Chinese demand for gasoline (up 6% yoy) off of 46% growth in vehicle sales. Demand for the other major fuels declined sharply. As the global economic recovery gained traction, gasoil demand growth in 2010 outpaced that of the other major fuels, see Figure 1, and rose by a robust 5% yoy,

Figure 1: Global oil demand growth by major product



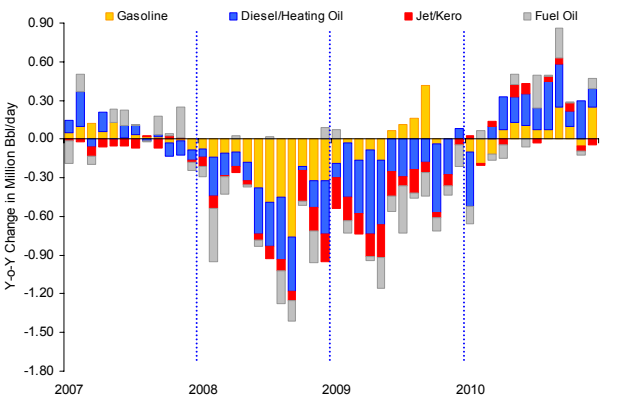
Global = OECD + Non-OECD, which includes Thailand, Taiwan, Philippines, Malaysia, Vietnam, Indonesia, China, India, Iran, Kuwait, Qatar, Saudi Arabia, UAE, Argentina, Brazil, Peru, Colombia, Ecuador, Libya, Nigeria, Algeria, Egypt, South Africa, FSU. Source: IEA, JODI, US DOE/EIA, India OGP, C1, Reuters, govt & trade data where available, Deutsche Bank

Figure 2: Industrial production trends



Source: Bloomberg Finance LP, Deutsche Bank

Figure 3: US oil demand growth by product



Source: US DOE/EIA, Deutsche Bank

according to 2010 YTD figures. The strong recovery in gasoil was in line with the recovery in global industrial activity, see Figure 2. In the top two consuming countries in the world (the US followed by China) gasoil demand growth outpaced the other major fuels, see Figures 3 and 4. Jet/kerosene demand growth in 2010 YTD was also robust, rising by 3% yoy. Gasoline demand growth last year rose by 1.4% YTD, slightly higher from 2009's growth rate. Following the 12% plunge in 2009, fuel oil demand fell by a far smaller 2% yoy in 2010 YTD. The out performance of gasoil relative to the other major fuels is broadly reflected in terms of price performance as represented in the three benchmark regions, see Figure 5.

Some fundamental surprises for the refined products markets in 2010 were:

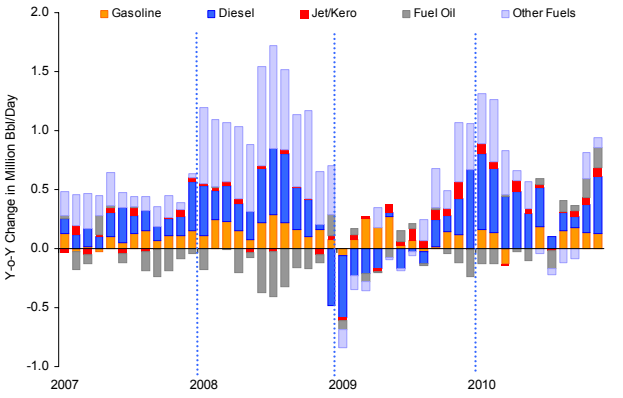
(i) French labour strike action against pension reform that crippled the country's oil supply chain in Sep-Oct disrupting refinery operations, which helped chew through stubbornly high OECD inventories;

(ii) stronger-than-expected China oil demand, particularly for diesel, as industry used diesel-fired generation to make up for power supply reductions imposed as part of a government effort to meet energy conservation targets by year end;

(iii) permanent refinery closures that took place in 2009-2010 in the mature markets of the US, Europe and Japan, which helped to trim the global refinery surplus.

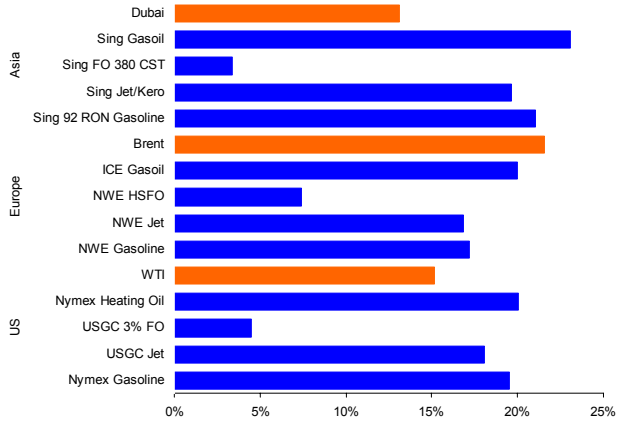
Thanks to these surprises that were in addition to a generally improved oil demand picture, the refined products balance, although still loose relative to the pre-crisis period, is the tightest it's been in two years. Some indications of this are visible in the steady decline in inventories in both the OECD and China. After sustaining significant yoy surpluses since 2H 2008-2009, total oil inventories in the OECD, particularly for refined products, are finally looking like they are cleaning up. By product, OECD middle distillates (gasoil and jet/kerosene) inventories in 2010 ran at a greater yoy deficit relative to gasoline as of end-Oct levels. Middle distillate inventories in the OECD have been trending below the prior year's levels every month since April 2010 with the deficit gapping out to 16 mln bbl in Oct. The available data on China's refined products inventories shows us that inventories of gasoline, gasoil/diesel and jet/kerosene combined as of end-Nov 2010 are down 23 mln bbl from end-Jan 2010 levels. The inventory draws have been larger for gasoil, which are down 24 mln bbl from the start

Figure 4: China oil demand growth by product



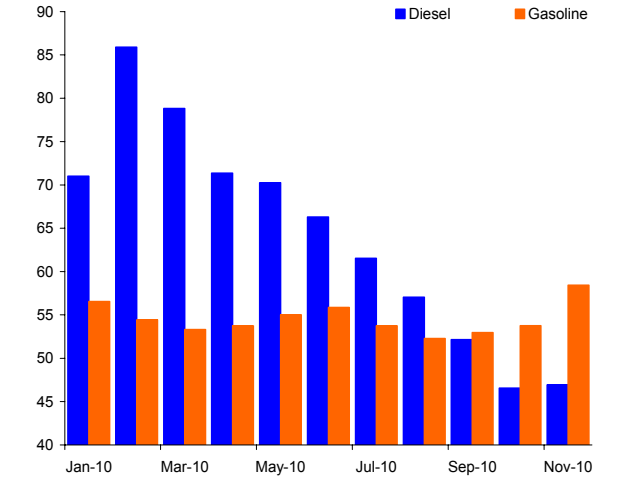
Source: China General Administration of Customs, China National Bureau of Statistics, Reuters, Bloomberg Finance LP, Deutsche Bank

Figure 5: 2010 product price performance comparisons



Source: Bloomberg Finance LP, Deutsche Bank

Figure 6: China gasoil/diesel & gasoline inventories



Source: China OGP, C1, Reuters, Bloomberg Finance LP, Deutsche Bank

of 2010 as of end-Nov, see Figure 6. This is a reflection of unexpectedly strong diesel demand last year due to increased use for diesel-based power generation.

Gasoil : Déjà Vu Unlikely

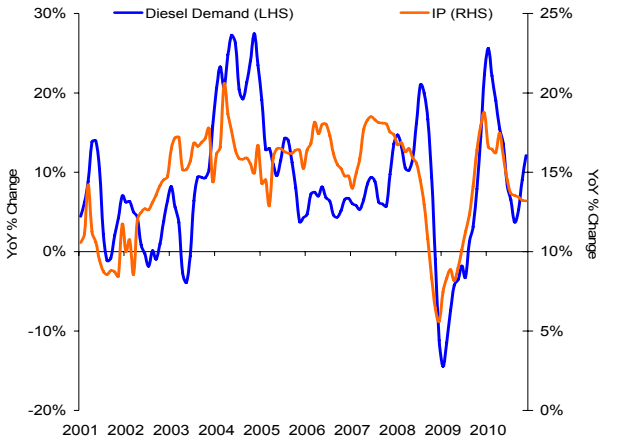
With the global economic recovery having gained traction, we are unlikely to see a return to negative gasoil demand growth. That said, while we don't rule out a repeat of 2010's strong gasoil demand, the likelihood is lower. Part of last year's strong yoy comparison was due to the low base of 2009, but this year the yoy comparison will be tougher.

China was a key driver of demand growth in 2010; China's diesel demand rose 14% YTD. Exceeding that or even repeating it is less likely given that our China economics research team sees lower economic growth and lower industrial activity for 2011. Our China economics research team forecasts IP growth in 2011 at 12%, down from 13.7% in 2010. This implies diesel demand growth will be 3% lower than 2010 levels, see Figure 7. India's diesel demand growth, which gained by 7% in 2010, is also expected to be softer this year; our India economics research team sees slower growth in 2011 with GDP forecast to fall to 8.2% from 9.8% in 2010. Given that the Asia-Pacific region represents more than a third of global gasoil demand with China and India accounting for 20% of the global picture, this illustrates the importance of growth trends in the region for the gasoil balance. In 2010, China and India combined represented 45% of global gasoil demand on a growth basis.

A recovery in industrial activity powered the resurgence in US and European diesel demand, although the growth was more dramatic in the US. US gasoil demand in 2010 rose by 5% following the prior year's 8% drop, while OECD Europe's demand rose by 1% up from the prior year's 4% fall. The 17% growth in 2010 YTD in container traffic for the Ports of Long Beach and Los Angeles, the two busiest container ports in the US, illustrates the recovery in demand for the truck fuel, see Figure 8. For the developed world, while industrial production growth seems to have recovered in 2010, growth momentum has flattened and is unlikely to repeat last year's pace, which has implications for US and European diesel demand growth rates for 2011.

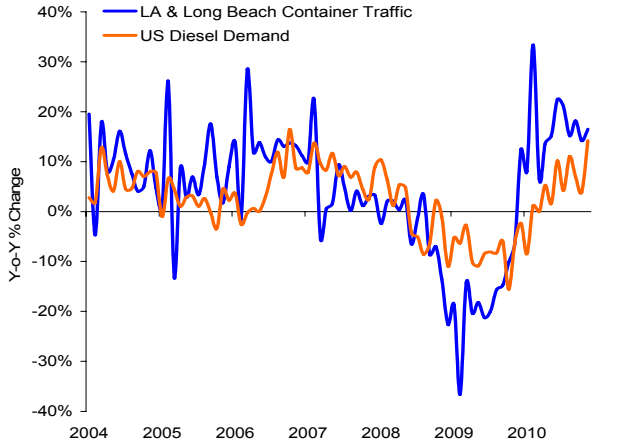
Rising demand in Latin America (gasoil demand rose by more than 8% in 2010 YTD and averaged 6% pre-crisis), which pulls imports from its northern neighbour with ramifications for the US balance, and refinery capacity closures in the US and Europe are trends to watch due to the impact on the Atlantic Basin gasoil balance.

Figure 7: China IP & diesel demand growth



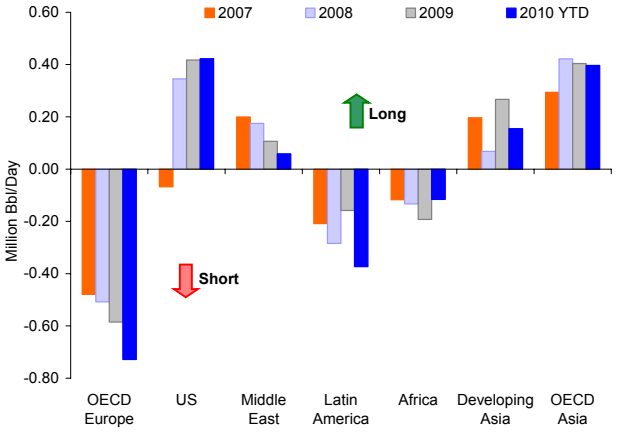
Data is smoothed. Source: China General Administration of Customs, China National Bureau of Statistics, Reuters, Bloomberg Finance LP, Deutsche Bank

Figure 8: US container traffic & US diesel demand



Source: Port of Los Angeles and Long Beach, US DOE/EIA, Bloomberg Finance LP, Deutsche Bank

Figure 9: Gasoil balance by major country/region



Refinery production minus domestic demand. Middle East = Iran, Kuwait, Qatar, Saudi Arabia, UAE; LatAm = Argentina, Brazil, Peru, Colombia, Ecuador. Developing Asia = China, India, Thailand, Taiwan, Phillipines, Malaysia, Indonesia, Vietnam. Africa = Libya, Egypt, Algeria, South Africa, Nigeria. Source: IEA, JODI, India OGP, Reuters, Bloomberg Finance LP, govt & trade data where available, Deutsche Bank

According to our calculations, 1.7 mln b/d of refining capacity was shut down permanently in 2009-2010 with Europe representing 45% of the closures in the period and the US and Canada representing 35%. If this trend persists, it has ramifications for Europe's products balance, which is already in a net short position in terms of gasoil, see Figure 9. According to our calculations, an additional 1.5 mln b/d of refining capacity is up for sale in Europe and 160kbd is up for sale in the US. We can't rule out the possibility that some of the capacity will be mothballed if unsold. This will leave Europe relative to the other regions more vulnerable to disruptions to their oil balance.

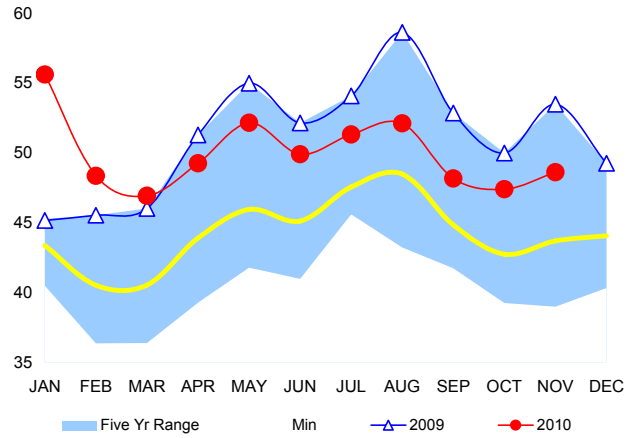
Near-term, extremely cold weather in the northern hemisphere has provided a boost for the gasoil market in the final months of 2010 and into 2011. Some forecasters suggest that this winter will be another colder-than-normal one due to the presence of La Nina conditions. Although last winter was also extreme, the impact on the market was muted as large surpluses were available to meet strong heating fuels demand. Though still relatively comfortable, gasoil inventories going into this winter were not as ample compared with levels going into the last two winters, see Figure 10.

Gasoline – Possible Surprises from the US

Although gasoline demand growth rates in the non-OECD and especially Asia have been notable, on an absolute basis the US remains the largest gasoline consuming country in the world, representing nearly half of global gasoline demand. US gasoline demand growth rates in the past few years have been lackluster averaging 0.5% growth in 2010 and 0.1% growth in 2009 following a 3.2% drop in demand in 2008, see Figure 11 (On average, US gasoline demand growth is around 1% yoy.) The weakness of US demand is reflected in vehicle sales, see Figure 12 (after falling by 20% yoy in 2009, sales recovered and were up 11% in 2010), and more critically in the slow employment recovery picture.

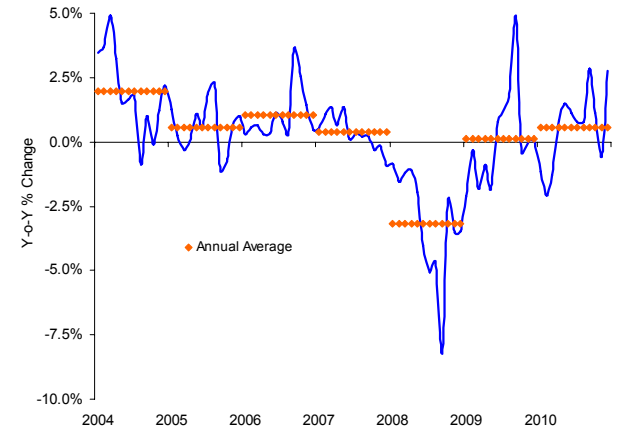
Consensus among economists is for modest improvement in US jobs growth in 2011, which would imply an improving picture for US gasoline demand growth. Our US economics research team forecasts the US unemployment rate will drop to 9.2% in 2011 and 7.3% in 2012 from 9.7% in 2010. A return to a 1% growth rate for gasoline this year, which is predicated on better-than-expected US jobs growth, implies US gasoline demand growth of 90 kbd yoy in 2011. All else being equal for 2011, this would imply global gasoline demand growth of 1.7% yoy, which would be the strongest growth rate since 2005.

Figure 10: OECD gasoil inventories in days cover



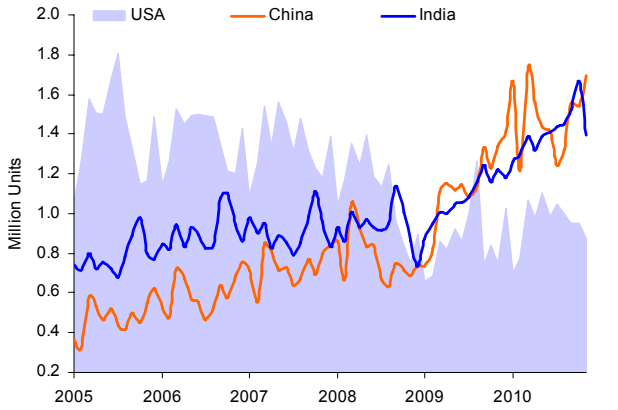
Nov is preliminary. Source: IEA, Deutsche Bank

Figure 11: US gasoline demand growth



Source: US DOE/EIA, Deutsche Bank

Figure 12: US, China & India vehicle sales



Source: Bloomberg Finance LP, Deutsche Bank

It is worth noting that US inventories of the motor fuel ended 2010 in deficit after holding a surplus since mid-2009, in part thanks to disruptions at French refineries and strong Latin American demand. Though it may be too soon to ponder the US summer gasoline balance, current inventory levels imply that five-year average stock builds from Jan-May will leave inventories at a the start of the season at a 6 mln bbl yoy deficit.

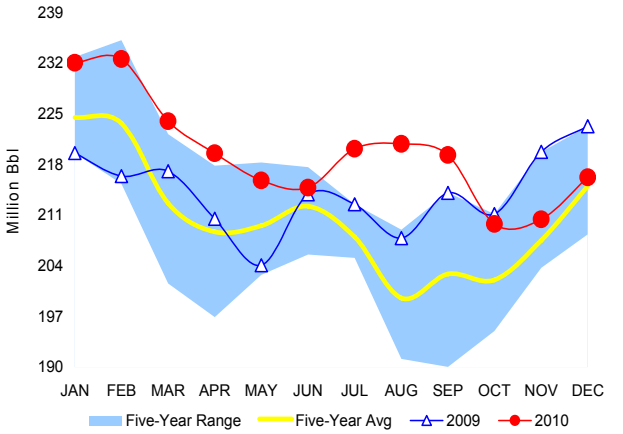
Ethanol is set to continue growing in the US gasoline supply pool with approval granted in late 2010 to raise the maximum blend from 10% to 15%. We view the move as more bullish for corn in 2011 with little impact on gasoline balances without far more attractive blending incentives and the necessary changes to the supply chain to make it available to retail outlets nationwide. In fact, the US gasoline supply pool at present has yet to reach 10% blend. The latest data shows the ethanol blend at just at just below 9%. Although we don't view this as a major issue for the US gasoline market in 2011, rising ethanol targets is part of an ongoing trend that began several years ago that has played a critical part in changing the US gasoline balance – reducing imports and increasing export availability, largely to Latin America which has insufficient refining capacity. One thing to note as ethanol blends increase is the less efficient nature of the fuel relative to standard petroleum-based gasoline. So while the addition of ethanol reduces the need for petroleum-based gasoline, the growing share of ethanol in the total gasoline supply pool will result in a corresponding incremental demand boost as it decreases the overall mileage.

Jet/Kerosene – Air Traffic Takes Off

The stronger-than-expected rebound in air traffic last year for both freight and passengers underpinned the sharp recovery in global jet/kerosene demand in 2010. According to the International Air Transport Association (IATA), passenger traffic rose by 8.3% in 2010 YTD up from the 3.6% yoy decline in 2009, see Figure 14. Air freight traffic fell by 10% in 2009 and rose by 22% YTD in 2010. Correspondingly, global jet fuel demand increased by 3% last year making it the first year of positive growth since 2007 and the strongest annual growth rate since 2005, according to our calculations.

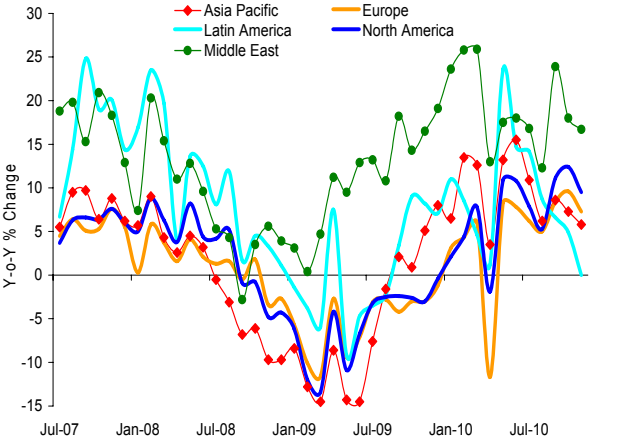
The 2011 outlook is for slower growth with the IATA projecting combined air and freight traffic will rise by 5%, which implies slower jet fuel demand. While global air traffic growth is expected to be slower, regional disparities will persist into 2011, according to the IATA. Middle East and Asia-Pacific traffic growth trends are expected to remain the strongest into 2011 with forecasted growth of 10.4% and 6.7%, respectively. This

Figure 13: US gasoline inventories



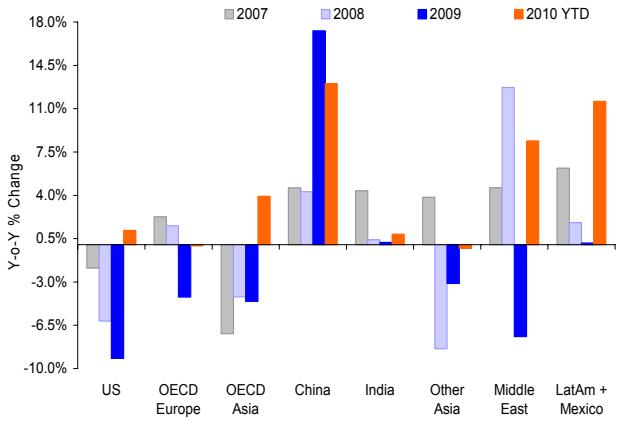
Nov-Dec is preliminary. Source: US DOE/EIA, Deutsche Bank

Figure 14: Global air passenger traffic trends



Source: IATA, Deutsche Bank

Figure 15: Jet/kerosene demand growth by major country/region



Other Asia = Thailand, Taiwan, Philippines, Malaysia, Vietnam, Indonesia; Middle East = Iran, Kuwait, Qatar, Saudi Arabia, UAE; LatAm = Argentina, Brazil, Peru, Colombia, Ecuador. Source: IEA, JODI, US DOE/EIA, India OGP, Reuters, Bloomberg Finance LP, govt & trade data where available, Deutsche Bank

trend, which is observed across the oil barrel, is reflected in the jet demand growth comparisons in Figure 15.

Fuel Oil – A Heavier Balance Ahead

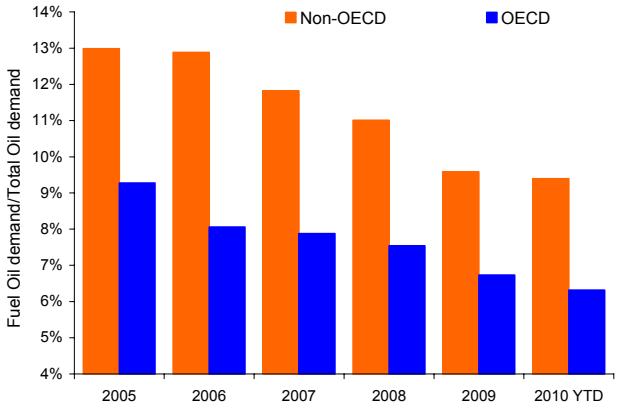
Long regarded as an unwanted by-product, fuel oil demand has been in a structural decline for several years due to: environmental regulations; the growing availability of natural gas and price incentives to spur the power sector in the OECD to increase use of cleaner fuels specifically natural gas and reduce use of fuel oil. This trend is now being observed in the non-OECD markets as well, which is best observed in the 9% yoy drop in Indian fuel oil demand in 2010 YTD due to increased use of domestic natural gas supply for power generation. Consequently, fuel oil's share of global oil demand is in decline across the board in the OECD and non-OECD, see Figure 16. Consistent positive growth rates have only really been observed in the Middle East, which can in part be explained by strong demand in the region for fuel oil for power generation. Middle East fuel oil demand 2010 YTD is up 4% yoy, the strongest positive growth rate of any major consumer or regional block.

As a consequence of the consistent decline in the demand-side of the balance, supply tends to be an important driver of fuel oil price dynamics. In recent years, a structural rise in global light-ends refinery yields, specifically gasoil, at the expense of fuel oil yields has had a dramatic impact on fuel oil market dynamics, see Figure 17. This was in response to wide light-heavy spreads (i.e. gasoil premium to fuel oil) that prompted the refining industry to invest in costly upgrades that converted heavy fuel oil into light products such as gasoline, gasoil and jet/kerosene. In the past two years, the premium of light to heavy narrowed considerably, see Figure 18, due to a combination of: (i) structural refinery yield changes that reduced fuel oil production; (ii) declining demand for light products, especially gasoil, during the global downturn; (iii) and as refiners cut distillation runs which further contributed to lower fuel oil supply.

This trend has started to reverse in 2010 and will continue into 2011 in our view. Fuel oil refinery yields are likely to continue declining as new coking capacity comes online, but the continuing recovery in gasoil demand and consequently higher refinery runs will result in higher fuel oil supply, which will weigh on prices. While we see fuel oil weaker in 2011 relative to gasoil, a return to such lofty light-heavy premiums observed in the 2007-2008 period isn't likely in a baseline scenario given significant refining capacity expansions in the past few years.

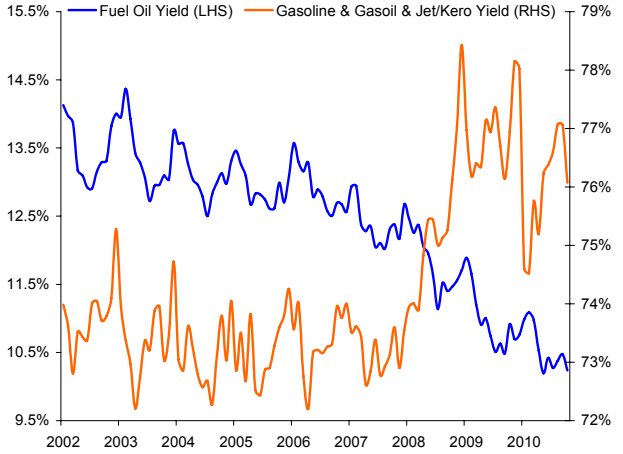
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Figure 16: Fuel oil share of OECD & Non-OECD total oil demand in decline



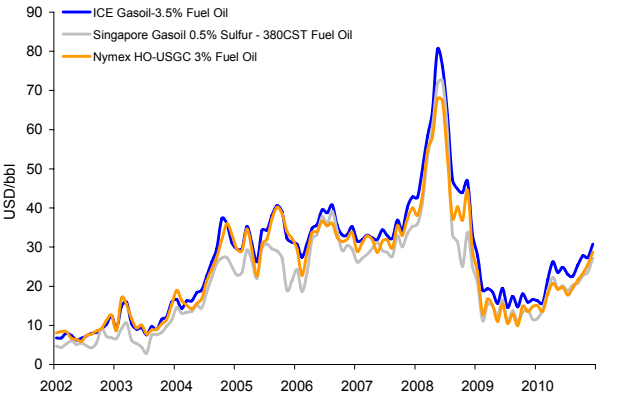
Non-OECD = Thailand, Taiwan, Philippines, Malaysia, Vietnam, Indonesia, China, India, Iran, Kuwait, Qatar, Saudi Arabia, UAE, Argentina, Brazil, Peru, Colombia, Ecuador, Libya, Nigeria, Algeria, Egypt, South Africa, FSU. Source: IEA, JODI, US DOE/EIA, India OGP, Reuters, govt & trade data where available, Deutsche Bank

Figure 17: Global light vs heavy refinery yields



Global = OECD + Non-OECD, which includes Thailand, Taiwan, Philippines, Malaysia, Vietnam, Indonesia, China, India, Iran, Kuwait, Qatar, Saudi Arabia, UAE, Argentina, Brazil, Peru, Colombia, Ecuador, Libya, Nigeria, Algeria, Egypt, South Africa, FSU. Source: IEA, JODI, US DOE/EIA, India OGP, C1, Reuters, Bloomberg Finance LP, govt & trade data where available, Deutsche Bank

Figure 18: Gasoil premium to fuel oil



Source: Bloomberg Finance LP, Deutsche Bank

#9 US Natural Gas

Balance Regained in 2011

- **We believe that 2011 will mark the transition from over-supplied to more balanced supply and demand conditions in the US gas markets.**
- **With US GDP expected to increase by 3.0-3.5% across 2011-12, natural gas would typically from rising industrial and electric utility demand, but with normalized weather and the potential for more coal to be burned in the electric power sector during 2011, demand growth may be postponed until 2012.**
- **US natural gas production displayed amazing resiliency in 2010 with dry gas production climbing by 2bcf/d, despite low prices. Shale gas production has continued to rise, aided by hedging, NGL revenue, cost carries and lease holding requirements.**
- **A declining gas rig count (as operators shift away from gas toward higher-priced oil) should begin to impact supply growth in late 2011.**
- **Global LNG markets grew with the deluge of new capacity that came on-line in 2009-10, but this growth should start to ease in 2011-12 as the development of new liquefaction projects slows.**
- **Recent cold weather has reduced the storage overhang, but the outlook for the April-November build season still looks very full. We expect gas prices to hover for a while in the USD4.00-4.25 range to allow gas to compete effectively with coal in the power markets.**
- **We expect natural gas prices to average USD4.30/mmBtu in 2011, roughly in line with 2009-2010. However, by the end of this year, we believe that prices will begin to recover.**

Consumption

We expect US natural gas consumption to be essentially flat in 2011 after bouncing up by more than 5% in 2010 as a result of a cold Q1 and a hot Q3. Figure 1 shows our demand forecasts by major sectors: industrial consumption is expected to improve as factory production recovers, especially in H2 2011. Electric utility consumption of natural gas should pick up some market share as lower natural gas prices relative to coal (see Figure 3) encourage switching to natural gas for base-load electric power generation.

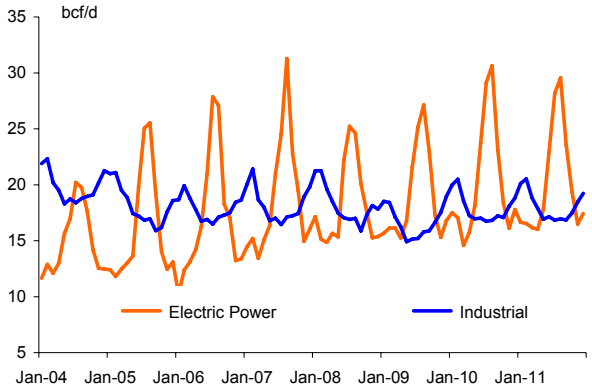
Figure 1: Key US gas statistics

	2008	2009	2010	2011E	2012E
CONSUMPTION					
Residential	13.3	13.0	13.7	13.8	14.0
Commercial	8.6	8.5	8.7	8.7	8.8
Industrial	18.2	16.8	17.9	18.1	18.2
Electric Utilities	18.2	18.9	20.2	20.3	20.8
Other	5.2	5.3	5.5	5.5	5.5
Total Demand	**63.5**	**62.5**	**66.1**	**66.3**	**67.2**
DOMESTIC SUPPLY					
Alaska	1.1	1.1	1.0	1.0	1.0
Gulf of Mexico Offshore	6.4	6.7	6.2	5.4	5.3
Other US	51.7	53.3	54.9	55.7	56.0
Total Dry Gas Production	**55.4**	**57.4**	**59.4**	**59.7**	**59.7**
Net Storage Withdraw	0.1	-0.9	-0.1	0.1	0.0
Other & Balance	-0.3	-1.5	-0.5	-0.6	0.5
Total Domestic Supply	55.2	55.0	58.8	59.2	60.2
Exports	2.6	2.9	3.0	2.9	2.9
IMPORTS	**10.9**	**10.3**	**10.2**	**10.1**	**9.9**
Canada	8.2	7.3	8.9	8.6	8.5
LNG	1.0	1.2	1.3	1.5	1.4

Source: US DOE/EIA, Deutsche Bank

Residential and commercial gas use in 2011 may be helped by the cold weather that continues to hold across much of the US, and electric utility use could benefit in the summer by the potential for warmer temperatures that often follow the La Niña weather pattern that the US is now experiencing.

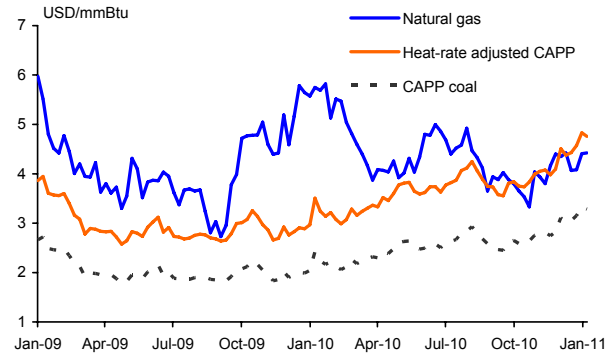
Figure 2: US natural gas use in industry and power



Source: US DOE/EIA, Deutsche Bank

Figure 3 depicts how Central Appalachian Coal (CAPP) competes with natural gas prices. Due to much higher cash mining costs, coal shut-ins are more likely than gas shut-ins; those costs set low-end coal and gas prices. With very strong global coal demand (driven in part by rising use in China), coal prices have outpaced natural gas. This reversal could create conditions for a surprising rise in natural gas use by power plants.

Figure 3: US gas competition with coal



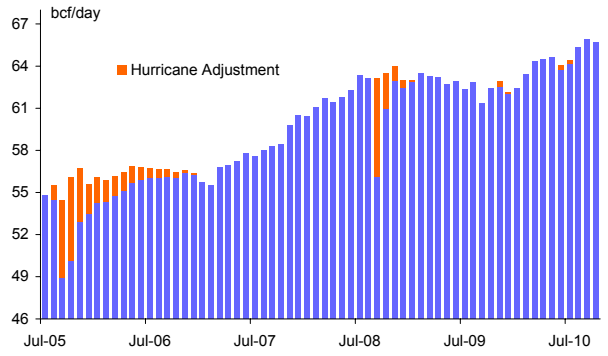
Source: Bloomberg Finance LP, Deutsche Bank

Over the long-term, tighter regulation on cola being promulgated by the US EPA could have the same effect.

Production

US shale gas production has benefited from more effective well completions (longer lateral legs, multi-stage fracturing, denser fracturing clusters, optimized fluid "recipes") and pad-based drilling. Shale gas production has also been assisted by hedging, NGL revenue, cost carries and lease holding requirements. As we move into 2011-12, we believe these benefits will begin to diminish, and the declining gas rig count and rising industry-wide oil field service costs will begin to weigh down on output.

Figure 4: US gas production shows resilience

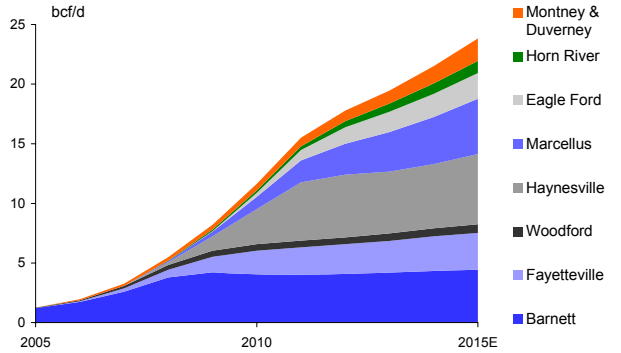


Source: US DOE/EIA, Deutsche Bank

Shale gas

US shale gas production grew from circa 3.2bcf/d in 2007 to 5.5bcf/d in 2008 according to the US DOE/EIA. We believe that production is likely to have exceeded 7bcf/d in 2009 and was over 10bcf/d in 2010, representing almost 20% of domestic output.

Figure 5: Key North American shale plays



Source: Wood Mackenzie, Deutsche Bank

Global LNG

The wave of new and ramped-up LNG projects around the globe during 2009-2010 should start to fade. Facilities streamed in 2009 included Tangguh 1&2, Qatargas 2, Sakhalin 2, and Yemen 1.1. In 2010, Ras Laffan 3, Yemen 1.2, Peru, and Qatargas 3 streamed. Over the course of 2011-13, the LNG team at Wood Mackenzie expects only four new facilities: Qatargas 4, Pluto, Angola and Skikda.

Factors adversely impact the development of new liquefaction projects, particularly in the Atlantic Basin, identified by WoodMac include:

- Strong demand for gas from 'local' markets and prioritisation of that demand over LNG exports
- Moratoria on new LNG projects in some countries
- Requirements for additional exploration success in order to secure sufficient gas feedstock for LNG trains
- Permitting and approval challenges
- Gas price uncertainty in project economics
- Higher capital costs
- Tough project financing environment

Although LNG not sold in Asia may try to find its way to the US, we believe economic growth in Asia will absorb most of the volumes there. Meanwhile, cold weather in Europe in late 2010 and early 2011 will likely result in depleted storage levels that will need to be refilled. We expect that there will be little LNG in excess of contract minimums (1bcf/d) coming to the US.

Figure 6: Deutsche Bank oil and gas price deck

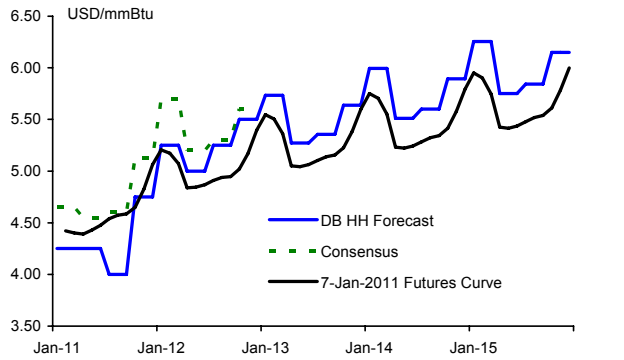
	WTI (USD/bbl)	US Gas (USD/mmBtu)	Oil/Gas Ratio
2009	**62.09**	**4.16**	**14.9**
2010	**79.61**	**4.38**	**18.2**
Q1 2011E	92.00	4.25	21.6
Q2 2011E	95.00	4.25	22.4
Q3 2011E	97.00	4.00	24.3
Q4 2011E	100.00	4.75	21.1
2011E	**96.00**	**4.30**	**22.3**
Q1 2012E	100.00	5.25	19.0
Q2 2012E	97.50	5.00	19.5
Q3 2012E	97.50	5.25	18.6
Q4 2012E	97.00	5.50	17.6
2012E	**98.00**	**5.25**	**18.7**
2013E	95.00	5.50	17.3
2014E	97.50	5.75	17.0
2015E	100.00	6.00	16.7

Source: Bloomberg Finance LP, Deutsche Bank

US gas price outlook

We are maintaining our 2011 calendar year forecast at USD4.30/mmBtu, which incorporates a low of USD4/mmBtu in Q3, followed by a modest recovery throughout 2012. For 2013-15 we expect gas prices to gradually move back toward the USD6.00/mmBtu level we feel is consistent with long-term reserve replacement. With ample supplies available from the shale plays and imported LNG, we do not expect a return to the long-term 10 to 1 oil/gas price ratio. We believe that USD5-6/mmBtu prices are sufficient to generate supply under normal market conditions over the next few years.

Figure 7: Forecast comparisons



Source: Bloomberg Finance LP, Deutsche Bank

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#10 German Power

The Time Is (Still) Out of Joint

- **With clean spreads at three-year-lows and full EUA auctioning from 2013, we think that many of Germany's older coal and gas-fired plants will not be able to cover their fixed costs after 2012.**
- **Moreover, although forward power prices remain well below new-entrant levels over 2010-14, we estimate that 39GW of new capacity (12GW of fossil-fuel and 27GW of renewables) will nonetheless come onstream over this period.**
- **With our base-case scenario assuming that Germany's nuclear plant will receive average lifetime extensions of 12 years, capacity margins today look more comfortable than at any time in the last five years, while the recovery in demand seen so far in 2010 looks set to slow into 2011 (we assume a rebound of 3.5% in 2010, and then a CAGR of 0.75% over 2011-14).**
- **Based on generic operating lifetimes of 45 years for coal and lignite stations, 30 years for CCGTs and 40 years for other fossil-fuel plant, we see potential for 17.6GW of closures by the end of 2014, against which we expect 12.1GW of new fossil-fuel capacity to come on-stream over the period.**
- **Taking our assumptions on demand, changes in the capacity mix over 2011-14, and our updated outlook for key commodity prices over this period (notably oil, coal, and gas), our revised base-case scenario for power prices and spreads sees slightly higher baseload prices than the current forward curve over 2011-12, with clean dark spreads worse and clean spark spreads better than the market is currently projecting over this period.**
- **We think full EUA auctioning from 2013 will force coal and gas-fired generators to think about higher levels of closures over 2011-14 than the 17.6GW assumed in our model.**
- **We estimate that an extra 4-5GW of closures above and beyond our base-case scenario – i.e. net fossil-fuel closures over the period of c.10GW -- would bring the de-rated capacity margin down below 10% by the winter of 2014/15, and to below 15% already by the winter of 2013-14 (or possibly slightly sooner if demand from neighbouring markets over the period is higher than we are assuming). In turn, this would in our view bring prices and spreads back towards sustainable levels for remaining coal and gas plant by 2014/15.**
- **We conclude that capacity closures in excess of 20GW will be needed by 2014-15 to restore sustainable margins.**

Dark and spark spreads now looking even worse

Our colleagues in the DB commodities research team have raised their forecasts for both oil and thermal-coal prices, and this has once more prompted us to revise slightly higher our forecasts for baseload and peakload German power prices over 2011-14. Figure 1 shows our previous forecasts for oil, coal, and traded-gas prices in Europe over 2010-14, and Figure 2 our previous forecasts for German power prices and spreads over the same period.

Figure 1: Previous DB commodity-price forecasts

	2010	2011	2012	2013	2014
Oil (Brent, $/bbl)	78	80	85	90	95
Coal (ARA, $/t)	98	115	135	120	105
German gas (TTF, EUR/MWh)	18.6	16.8	17.8	21.3	25.1

Source: Deutsche Bank

Figure 2: Previous DB power-price forecasts (EUR/MWh)

	2010	2011	2012	2013	2014
Baseload	48.4	52.1	58.2	57.3	60.7
Peakload	63.0	65.4	73.5	71.8	90.1
Clean dark spread*	3.5	-0.2	-2.4	0.0	6.7
Clean spark spread**	10.5	16.2	19.4	12.2	8.9

*Source: Deutsche Bank; *assumes 36% efficiency; **assumes 58% efficiency*

Figure 3 then shows our updated forecasts for the key commodity prices, and Figure 4 our revised forecasts for German power prices and spreads.

Figure 3: Revised DB commodity-price forecasts

	2010	2011	2012	2013	2014
Oil (Brent, $/bbl)	78	97	98	95	97.5
Coal (ARA, $/t)	98	120	140	120	105
German gas (TTF, EUR/MWh)	18.6	21.2	22.8	25.0	27.0

Source: Deutsche Bank

Despite higher absolute power prices over 2011-14 under our revised base-case assumptions, we continue to see a negative outlook for incumbent coal and gas-fired generators.

Figure 4: Revised DB power-price forecasts (EUR/MWh)

	2010	2011	2012	2013	2014
Baseload	48.4	55.4	62.0	59.3	62.6
Peakload	63.0	69.7	77.2	74.7	92.6
Clean dark spread*	3.5	-0.2	-2.3	0.1	6.8
Clean spark spread**	10.5	11.9	14.7	8.0	7.4

*Source: Deutsche Bank; *assumes 36% efficiency; **assumes 58% efficiency*

On our revised commodity-price forecasts, our updated projections for baseload power prices over 2011-14 are on average EUR3/MWh higher than before, with clean dark spreads essentially unchanged, but clean spark spreads on average EUR3/MWh lower owing to our higher forecasts for traded German gas prices (in turn a function of higher oil-price projections).

On our updated projections, clean dark spreads remain negative over 2011-12, coming back into positive territory in 2013 once coal prices start to fall.

By contrast, spark spreads for CCGT operators over 2011-12 remain healthy (albeit lower than before), but drop markedly from 2013 onwards given our expectation that gas prices will trend back to oil-price convergence by 2015.

Adjusting clean dark spreads to include fixed costs (which we estimate on average to be EUR10/MWh generated), we project that coal generators will still be making an all-in negative spread of about -EUR12/MWh over 2011-12 (in line with our previous estimates). Even though we project healthier spreads by 2014 of EUR7/MWh, coal generators will still be making a loss of -EUR3/MWh under our updated base-case scenario when our estimates of fixed costs per MWh generated are factored in.

With regard to the all-in costs for a new CCGT plant, with clean spark spreads on our revised estimates averaging EUR13/MWh over 2011-12 and fixed costs of only about EUR3/MWh generated, our revised base-case scenario projects that such plant will actually be making a positive all-in return of about EUR10/MWh over the next two years. However, with spark spreads then dropping sharply from 2013, we see even the most efficient new gas plant in Germany failing to make an adequate return on capital from 2013.

Clean spreads for older OCGT gas plant using our updated peakload prices average EUR2/MWh over 2011-12, so assuming fixed costs of EUR10/MWh generated such plant would be making an all-in loss of -EUR8/MWh (although with free EUAs over 2011-12 it would at least be close to covering its fixed costs). With the disappearance of free EUAs from 2013, however, we estimate that in 2013 OCGT plant will make an all-in loss of -EUR16/MWh.

Moreover, we are here using market-gas prices to calculate spreads and all-in costs, rather than the oil-indexed gas price, which flatters all of these numbers for gas generators.

In short, our updated base-case scenario for power prices and spreads continues to project that coal generators will be running at an all-in loss over the entire 2011-14 period. Despite lower spreads than under our previous forecasts, gas generators continue to do better than coal over 2011-12.

However, with our base-case DB forecast for a recovery in gas prices from 2013, clean spark spreads drop sharply over 2013-14, with older gas plant then making an all-in loss, and CCGT plant failing to make an adequate return on capital from 2013.

Conclusion: closures of >20GW needed to restore margins

As explained in depth in our report *The Time Is Out of Joint* (17 November 2010), we think that the outlook for Germany's incumbent hard-coal and gas-fired generators over 2011-14 is bleak. With capacity margins currently very comfortable and the outlook for demand still muted, the forward curves for baseload power out to 2014 are well below new-entrant levels, and with clean spreads at three-year-lows and the prospect of full EUA auctioning from 2013, we think that many older, less efficient coal and gas plants will not be able to cover their fixed operating costs beyond 2012.

Moreover, although the forward baseload curve currently indicates that prices will remain well below fossil-fuel new-entrant levels for the foreseeable future, a material amount of new capacity will nonetheless come onstream by that date because (i) there is already 13.2GW of fossil-fuel capacity under construction, and (ii) the generous subsidies for renewables mean that wind, solar, and bio-mass capacity will carry on rising aggressively over the next few years irrespective of what happens to wholesale prices.

Worse still for incumbent fossil-fuel generators, most of this new renewable capacity will produce zero-marginal cost electricity once it is built, and will therefore displace fossil-fuel output in the merit order.

This means that fossil-fuel plants in general -- and incumbent coal and gas-fired generators in particular --- will likely be running fewer hours with each year that passes while also receiving lower average baseload prices in the hours that they do run owing to the impact more low or zero-cost output will have on the price-duration curve.

Against this background we think that the move to full EUA auctioning from 2013 will force the owners of coal and gas-fired plant to think about shutting down more of their old capacity than they ordinarily would do based purely on standard operating lives, and the key here will be the responses of two major sets of players in the German power market: (i) the major generators/integrated utilities, and (ii) the 'long tail' in the German generation system.

If the major generators (the integrated utilities) are unwilling to cross-subsidize peaking stations from the cashflows of their lignite and nuclear output then a more rapid attrition of capacity can be expected from 2013 than we have assumed in our base-case scenario.

Just as important to the overall balance of the system, however, could be the behavior of the 'long tail' in the German generation system, i.e. the smaller units operated by regional companies, the combined heat and power capacity of the industrial users, and the co-gen stations of the district heating operators.

If these operators cross-subsidize generation from their other revenues then over-capacity may be a long-term systemic problem. However, if they prove less able to absorb lost generation revenues than the integrated utilities, then the tail could dwindle rapidly, and capacity margins reach tighter levels more quickly than our base-case scenario assumes.

Overall, the conclusion from our modeling is that while the 17.6GW of fossil-fuel closures we have assumed in our base-case scenario – or 5.5GW of net fossil-fuel closures after adjusting for assumed new build -- will not be enough to enable much of Germany's coal and gas-fired capacity to cover its fixed costs over 2013-14, an extra 4-5GW of closures on top would likely be enough for the remaining coal and gas plant to return to sustainable margins by the winter of 2014-15.

In short, whether the margins for Germany's coal and gas-fired generators return to acceptable and sustainable levels from 2014-15 is to a large extent in their own hands, depending as it does above all now on the strategic decisions they make on capacity closures and new build.

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#11 UK Gas

Summer NBP prices: risk is to the upside

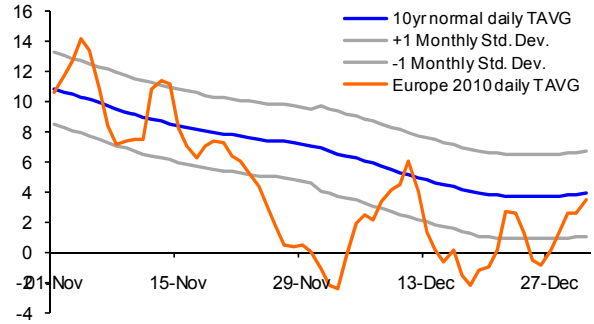
- **An early cold spell this winter drove November and December total demand up 11% over 2009 with residential and commercial heating demand (LDZ) up 20%. November & December LDZ demand was also 23% greater than the seasonal normal level. In comparison, total power demand in November & December rose by c.5% over 2009.**
- **LNG provided a significant degree of supply flex, with flows increasing from 53mcm/d in the first half of November to 71mcm/d for the balance of the year, and over 100mcm/d on peak days, thereby helping to keep prices contained.**
- **For the balance of the current Winter (through to March 31, 2011), the market will be more sensitive to a repeated cold shock than it was in December, owing to the seasonally low level of storage.**
- **During the period of highest prices in December, January & February prices did not go above 63p/th, and December's system average price (SAP) on out-turn was 61.6p/th. Currently, the forward Winter 2011/12 contract is at 60.3p/th which would seem to indicate either an equally cold winter next year, or a supply failure (which on current information we see no reason for).**
- **LNG has brought much greater winter supply flexibility on the one hand, and greater summer seasonality (due to maintenance) on the other. Together with strong European demand for summer spot gas, it has been largely responsible for the compression in winter-summer spreads.**
- **Our outlook for the Summer-2011 season is above the forward curve as we build in a likelihood of Qatari LNG maintenance again from June through August, although the impact could be moderated by commissioning of Trains 6 and 7.**
- **Strong Interconnector exports should help lift summer demand as the persistence of forward prices below the oil-indexed curve encourages European demand for UK gas through the Interconnector. Moreover, additional summer maintenance could be opportunistically scheduled in this price environment.**
- **Our outlook for the Winter-2011/12 season is below the forward curve as we believe the UK market will remain well supplied and can attract a small amount of Interconnector imports even while being below the oil-indexed curve as it did in Winter 2009/10.**

Weather-led demand spike

Temperatures in Europe dropped much below normal for extended periods at the end of November and again in mid-December. During each of these periods, total UK daily gas demand rose to equal the highest levels on record (c.460mcm/d), triggering two gas-balancing alerts on 20 & 21 December 2010. These alerts are an indication that demand-side response and additional supplies may be necessary, based on National Grid's supply-demand assumptions.

Demand for gas from gas-fired power stations remained strong between 70 and 80mcm/d on weekdays, even as gas prices rose beyond 60p/th, owing to high power demand, which reduces spare generating capacity. Weekly average power demand rose from 40GW in mid-November to 45GW by early December.

Figure 1: Average European daily temperature (°C)



Source: Speedwell Weather, Deutsche Bank

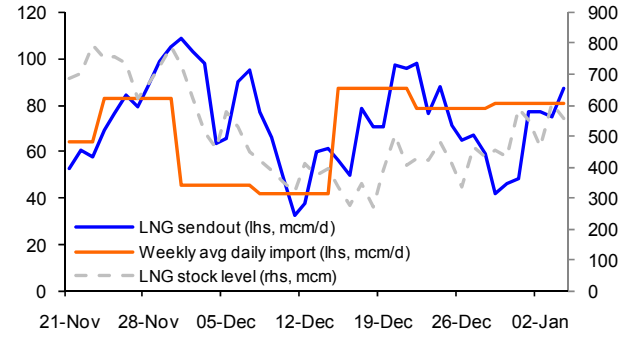
LNG supply response

A broad-based supply response resulted, most notably from regasified LNG as flows increased from all three import terminals, Isle of Grain, Dragon, and South Hook. Total LNG sendout in the period from 21 November to 31 December 2010 showed an 86% correlation with total daily demand. This comes from the hybrid nature of LNG terminals, which play both supply and storage roles. During the period in question, Day-Ahead gas prices traded at a premium to January. As a result, the storage logic kicked in, incentivizing additional supply to be regasified and sold into the grid.

As LNG sendout rates escalated in early December, cargo unloadings failed to keep pace, resulting in a sharp drawdown in LNG storage. Cargo unloadings picked up only in the week beginning 15 December, allowing stocks to rebuild in the second half of the month. Given that all major supply sources (Qatar, Algeria, Trinidad, Norway) are within 14 days' sailing time, it is likely that this upswing was a response to the low stock levels. Now, the average rate of imports is more closely matched to the sendout rate, indicating that this sendout is more

sustainable. Over the last three weeks, this rate has been around 80mcm/d, which is equivalent to a standard-sized LNG cargo every day.

Figure 2: LNG imports and sendout (mcm/d)



Source: National Grid, Deutsche Bank

In the chart above, where the sendout (blue) exceeds average imports (orange) in late November, this results in stock drawdowns. In mid-December, a boost to imports allowed the stock level to gradually rebuild, especially when sendout dropped over the holiday period.

As great as the LNG supply response was, the magnitude of the demand spike was such that additional increases were necessary from Rough long-range storage, the Interconnector pipeline, and imports from Norway. This highlights the rapidity with which the UK market has become dependent on LNG imports. Just two years ago, the average winter LNG sendout rate was 9.3mcm/d, in comparison to 63mcm/d in Q4-2010. It also indicates that prices would have had to go much higher in December in the absence of LNG.

Rough storage supply response

The backwardation in the prompt curve helped drive Rough December withdrawal to the highest level on record, for a monthly total of 1,214mcm, or 39mcm/d. The stock level now stands at 1,463mcm versus a maximum capacity of 3,514mcm. This is a record-low level for this time in the gas year, and is constructive for both the balance of Winter price as well as Summer, as it increases expectations of summer-injection demand.

Rough storage flows displayed a 62% correlation over the 21 November to 31 December 2010 period as withdrawals ramped up quickly in late November. This correlation is somewhat lower than the LNG correlation because flows reached the maximum withdrawal rate and then stayed constant at that level.

Interconnector supply response

The late-November demand increase pushed the NBP price above Zeebrugge, above the 1.0-1.2p/th threshold level, driving the switch from Interconnector exports ("forward flow") to imports ("reverse flow"). The spread required was in line with historical levels despite the potential European reluctance to release storage in Q4-2010 in favor of ensuring security of supply in Q1-2011.

Interconnector imports showed a relatively low 52% correlation owing to local supply-demand imbalances in Belgium's domestic market. On 1 December, Zeebrugge LNG sendout into Belgium dropped just as Belgian and UK demand increased, reducing the amount of gas which could respond to the shortage.

NCS and UKCS supply response

Imports from Norwegian Continental Shelf (NCS) production ramped up from 80 to 100mcm/d around 1 December, but remained flat at 100mcm/d even during the brief warm spell on 11 December, through to the Christmas holiday. Therefore the flow increase was probably a seasonal step-up in supply which was already planned, but executed in advance of schedule.

Notably absent from the supply response was any increase from the Sean peak-shaving field in the UK, which remains under contract to Centrica as far as we know. There appeared to be several days of testing just before the coldest period, but no production during the days of highest demand and highest price.

DB base case for NBP delivered price

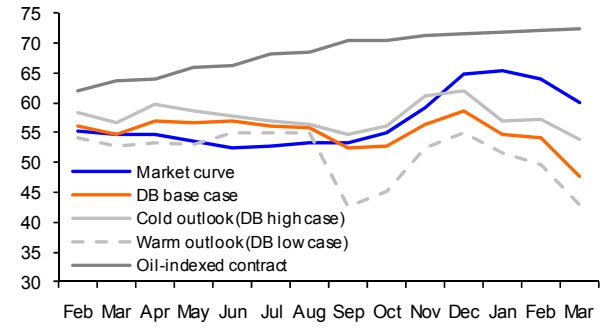
For the remainder of Q1-11, the market is at an elevated risk of price spikes owing to the reduced level of storage available. At 1,463mcm, Rough long-range storage is 663mcm lower than the lowest level on record for 9 January. This represents 40 days of withdrawal remaining (with maximum rates declining from 44 to 25mcm/d as the facility is emptied). Given that temperatures in late February and March can still be quite cold we think there is limited downside risk to Q1 prices even with the seasonal-to-warm temperatures prevailing since early January.

Our outlook for Summer-2011 is above the market curve as we expect renewed European interest in importing UK spot gas below the oil-indexed contract price. This spot gas could be used both for filling existing storage sites as well as projects under construction, such as the Bergermeer project in the Netherlands. According to TAQA, injection of cushion gas, which is to be supplied by Gazprom, will be price sensitive and should favour summer months. It is conceivable that some of this could be sourced from the spot market.

However, contractual commitments may limit this impulse on the part of other European buyers as the amount of

gas partially paid for but undelivered from previous years under Russian contracts alone is at least 10bcm.

Figure 3: NBP delivered price outlook (p/th)



Source: Deutsche Bank

Figure 4: NBP delivered price outlook (p/th)

NBP (p/th)	Q1-11	Sum-11	Win-11/12
Market	55.0	53.2	60.3
DB base case	55.4	56.4	54.0

Source: Deutsche Bank

Additionally, we build in the likelihood of maintenance at Qatari LNG liquefaction facilities in a reprise of last year's schedule. While some have speculated that Qatari maintenance is a disguise for price support, we believe it would be irrational to shut down liquefaction trains unnecessarily at any price, given the high value of liquids output from the North Field. Maintenance could very well be necessary given the technological complexity of the "mega-train" liquefaction plants.

Maintenance at Centrica's Rough long-range storage facility is as yet unannounced, but we have assumed it will occur in September. Maintenance at the Interconnector UK pipeline linking Bacton with Balgzand, Belgium, is scheduled for 7-21 September. Together, these events will reduce demand by 47-55mcm/d in the base-case outlook. At the same time, we expect that Norwegian maintenance will be front-loaded, with Kollsnes and Ormen Lange already scheduled to go offline in May and June. As a result, our price outlook shows a month-on-month drop in price in September. In a warm scenario, prices could drop quite significantly to force a curtailment of supply and/or greater Interconnector exports.

In our base-case scenario, we expect the out-turn (delivered price) in Winter-2011/12 to be below the forward curve as the UK market remains well supplied in winter months, as producers target volumes for the sweet spot in the forward curve.

We expect that a small amount of Interconnector import is possible below the oil-indexed curve in Q1-2012, as stored gas is shipped from Europe to the UK (this occurred in Winter 2009/10). We assume imports from Norway to be flat year-on-year, as Gjøa production (estimated 5mcm/d) is likely to be used for supply diversity rather than lifting overall production. We expect the UKCS decline to be 11% in our base case, although if the Sean field produces at capacity the decline rate would be 9%. Finally, we assume that Nordstream does not add incremental volumes to the European market but carries gas redistributed from other supply routes, thereby reducing the risk of a disruption.

In addition to our base case, we have run two sensitivities (as shown in Figure 3 above). We call these our cold and warm outlook, and for each we use residential and commercial demand (LDZ) sensitivities to temperature varying by one standard deviation of monthly average temperatures.

In summary, strong supply availability and a lack of infrastructure failures enabled the UK market to accommodate an exceptionally high Q4-2010 demand. The greater degree of seasonal-production profiling and opportunistic European demand for summer UK spot-market gas justifies tighter winter-summer spreads and could even cause a reversal of the traditional seasonality of delivered prices, as occurred in Winter 2009/10 (average price of 31p/th) compared with Summer 2010 (average price of 41p/th).

Risks to our base-case view on the NBP delivered price

In the face of a very material demand shock, this winter has so far been exceptional from a supply point-of-view, not only with regard to LNG but also in that UK and Norwegian production, UK storage, and pipelines have all performed without serious fault.

Accordingly, the biggest risk to our Winter 2011/12 outlook is an extended infrastructure outage (lifting winter prices). For the out-turn on the Summer 2011 contract, our base case assumes summer LNG imports of c.45mcm/d, and the biggest risk to this view is a higher rate of summer LNG imports, with Qatargas-3 Train 6 and Qatargas-4 Train 7 coming online.

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#12 Carbon Emissions

German Power Key to EUA Prices in 2011

- **The COP-16 conference in Cancun made progress on a range of issues, but did nothing to re-assure us that a globally binding climate deal to succeed Kyoto can be secured at COP-17 later this year.**
- **Indeed, reaching a binding global agreement on a second international commitment period through the UN process looks very difficult to us for the foreseeable future. In turn, this makes it unlikely in our view that the EU will raise its 2020 emissions-reduction target in 2011.**
- **Accordingly, we think the key to EUA prices over the next 12 months will continue to be the dynamics of the German power market.**
- **We continue to project a need for 378Mt of abatement in the EU-ETS over 2010-20 under our base case for the 20% target.**
- **With the generation capacity we expect to be in place by 2012-13 more than adequate to achieve this level of abatement, the EUA price should ordinarily be determined by the short-run marginal cost (SRMC) of fuel switching.**
- **Based on our approach to modelling short-run UK gas prices, we derive an EUA price of €21/t for year-end 2011, rising to €30/t by 2020.**
- **Beyond 2011, a move to a 30% emissions-reduction target in the EU is still a very real possibility.**
- **On our estimates for the ETS cap under a 30% target, ETS operators would have a residual abatement requirement of 1,235Mt over 2010-20.**
- **In terms of the EUA price required for this new capacity, we see the LRMC of fuel switching at €26/t by year-end 2011, and €37/t by 2020.**

Cancun delayed further a new global climate deal

With the US mid-term elections in November likely having wiped out any residual chance of legislation on a federal cap-and-trade scheme there until 2013 at the earliest, and with Japan, Russia, and Canada refusing at COP-16 to countenance a two-year extension of existing Kyoto commitments (in large part because neither the US nor China have binding commitments under Kyoto), we do not see any prospect of a second international commitment period being in place by 1 January 2013. Indeed, we think it is now likely to take some years for a new legally binding global deal to be negotiated. This raises the prospect of the CDM existing beyond 2012 without a second international commitment period, a scenario that while perfectly possible under the governance arrangements of the CDM was nonetheless not the original assumption when the Kyoto Protocol was ratified.

Hard for EU to go to a 30% reduction target in 2011

With no realistic prospect of a new global deal in the foreseeable future, we do not think there will be sufficient appetite amongst EU Member States for raising the EU's 2020 emissions-reduction target to 30% over the next 12 months, particularly if the Commission succeeds in imposing qualitative restrictions on the admissibility of industrial-gas credits into the EU-ETS from 2013.

This is because we estimate that the imposition of qualitative restrictions on industrial-gas credits from 1 January 2013 would raise compliance costs for ETS operators already under the existing 20% scenario, thereby making some Member States more wary of the further costs to be incurred by raising the 2020 emissions-reduction target to 30%.

In this respect, it is also interesting to note that the EU Presidency in 2010 will be held by two eastern European Member States, namely Hungary and then Poland. This is potentially significant given that in our view it is western European countries such as the UK, France, and Germany that are most in favour of the EU's raising its 2020 emissions-reduction target, while the newer Member States of eastern Europe are, we think, less enthusiastic.

In short, we think that while the Commission, EU Member States, and the EU Parliament, will certainly continue to debate the merits of moving to a 30% emissions-reduction target over the course of 2011, it is unlikely in our view that a decision to raise the current 20% target will actually be made this year.

German power-market the key to EUA prices in 2011

In our report *Hammer to Fall* (26 April 2010), we outlined our rationale for expecting EUA prices to reach €18-20/tonne by year-end 2010. Our argument was based on the need for EU power generators in general, and German power generators in particular, to start hedging the carbon liabilities associated with meaningful forward sales of electricity for 2013 delivery.

In turn, this argument was based on the assumption that German generators would over the course of 2010 sell 30% of their 2013 power production, in keeping with the pattern observed in previous years whereby at the end of a given calendar year German generators have typically sold 30% of power for delivery three years forward.

As explained in *Hammer to Fall*, on this basis we were assuming that the total demand from EU generators in 2010 for EUAs/CERs/ERUs would be 352m, comprising

74m to cover the shortfall in 2010 itself, and 278m to hedge liabilities against 2013 forward power sales.

However as dark and spark spreads declined in H2 of 2010, the demand from German generators for hedging 2013 forward-power sales simply did not materialize in the volumes we had forecast, and at the end of 2010 we estimate that they had sold only about 10% of their total output for 2013 (see our report *German Power: The Time Is Out of Joint*, 17 November 2010, for more background on this).

In short, with German generators having only sold about one third of the volumes for 2013 delivery that we had previously been expecting they would have sold by this stage, and with other EU generators outside Germany probably not having started selling forward for 2013 at all, the deficit to be plugged by generators in 2010 turned out to be much lower than the 352m we were previously assuming.

As a result, it has in all likelihood been possible for the power sector to cover its total 2010 shortfall (i.e. actual 2010 deficit plus forward-hedging requirement) via a combination of EUA purchases from industrials with surplus allowances, CERs/ERUs, and a lower amount of fuel switching than we continue to think is consistent with achieving the cap out to 2020 at the lowest cost (in other words, we think the market is still being inefficient)

In our view, this explains why prompt EUA prices ended the year at €14/tonne, instead of the €18-20/tonne we had been forecasting over the second half of 2010.

At this stage, our price forecasts for 2011 onwards are still assuming an efficient market that anticipates the future need for abatement over Phase 3 of the ETS already in prices over 2011-12.

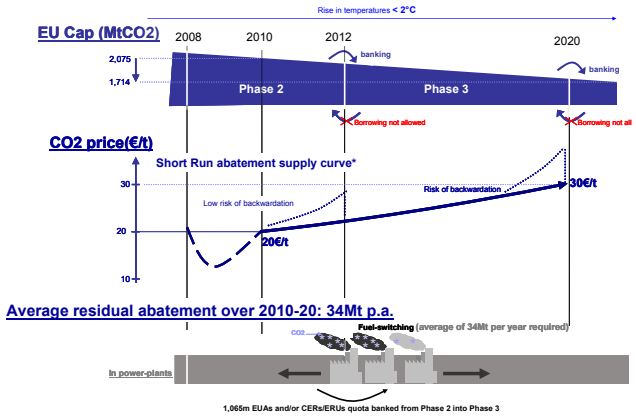
In this respect, we still project a need for 378Mt of abatement over 2010-20, comprising a Phase-2 surplus of 1,065Mt and a Phase-3 deficit of 1,443Mt.

We estimate that 30Mt per year of this could be achieved from existing power plants, and that a further 30Mt would be possible from the 9GW of new CCGT capacity that we expect to be on the grid by 2013. This means we see potential for up to 480Mt of fuel switching over 2013-20 from the capacity we expect to be in place by 2013, more than enough to meet the 378Mt abatement that we are now projecting will be required.

With the capacity we expect to be in place by 2012-13 more than adequate to achieve the abatement required, the EUA price under our base-case scenario for the 20% target should ordinarily be determined by the SRMC of fuel switching.

As per the methodology set out in our report *May You Live in Interesting Times* (30 August 2010), based on our analysis of fuel-switching costs in the UK our base-case scenario for EUA prices under the EU's existing 20% emissions-reduction target is €21/t by year-end 2011, rising to €30/t by 2020 assuming a 4% cost of carry (Figure 1).

Figure 1: DB base-case EUA forward curve over 2010-12 under the 20% target (€/t)



Source: Deutsche Bank

We would emphasize, however, that owing to the volatility of short-run gas prices in the UK, the further out we go on our SRMC shown in Figure 1, the less likely it is that prices will actually turn out at the level shown in practice. This is because our estimate of the SRMC of fuel switching will inevitably change over time as our modelling of the UK gas market and global coal markets responds to events. In this respect, the SRMC curve is intrinsically less robust than the LRMC curve because our long-run commodity-price estimates are less volatile.

Moreover, there is a risk of prices remaining below our forecast trajectory for 2011 if clean dark and clean spark spreads in the German power market remain at their current depressed levels, as this would continue to discourage German generators from selling significant volumes of electricity forward for 2013 delivery.

At the same time, of course, with German and EU generators having barely begun to hedge their 2013 power sales yet, both power and carbon prices are likely to be more volatile in 2011. This is because as and when German generators do begin selling power for 2013 delivery in earnest, larger volumes of electricity will have to be contracted at shorter-dated maturities than usual.

In short, we see EUA prices trending higher over the course of 2011, but with greater volatility than has been the case in 2010.

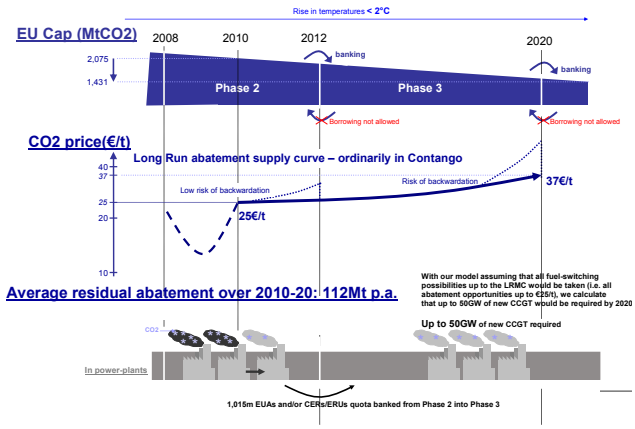
Whether prices rise up as far as our fundamental year-end fair value of €21/t will depend mainly on the behaviour of the German generators and specifically the amount of forward hedging they undertake for post-2012 forward power sales. In turn, this will largely be a function of clean dark and spark spreads.

DB base-case EUA pricing analysis under a 30% target

On our estimates for the ETS cap under a 30% EU-wide target, ETS operators would have a residual abatement requirement of 1,235Mt over 2010-12, comprising a Phase-2 surplus of 1,015Mt and a Phase-3 deficit of 2,250Mt. This implies average abatement of 112Mt per year over 2010-20 to meet the cap.

This is significantly more than the 480Mt per year that we estimate will be possible via coal-to-gas switching from the capacity in place by 2013, and as a result under a 30% EU-wide target the EUA forward curve would clearly be determined by the LRMC of fuel switching rather than the SRMC, as significant new CCGT capacity would be required over 2013-20.

Figure 2: DB base-case EUA forward curve over 2010-12 under the 30% target (€/t)



Source: Deutsche Bank

After taking into account a small amount of ETS abatement possibilities from sources other than coal-to-gas switching, we estimate that the total abatement gap that would need to be plugged via new CCGT capacity over 2013-20 would be 705Mt, or an average of 88Mt per year. In turn, this means that on our projections there would need to be an extra 176TWh per year of extra CCGT output over 2013-20.

Assuming that the new capacity to produce this output were to run at a load factor of 85%, this would indicate a need for 24GW of new CCGT capacity per year on average over the period (relative to projected 2012 levels) , or 48GW by 2020 if this new capacity were built in linear fashion over the period.

In short, we estimate that in order to meet the cap implied by a 30% EU-wide emissions-reduction target, up to 50GW of new CCGT capacity would have to be built over 2013-20.

In terms of the EUA price that would be required today to make gas-fired generation the new entrant of choice over coal so that this required new CCGT capacity could be built, we now see the LRMC of fuel switching at €25/t.

Assuming a cost of carry of 4%, this would give us a year-end 2011 fundamental fair value for EUAs under a 30% scenario of €26/t, rising to €37/t by 2020.

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#13 US Carbon Trading

US Climate Policy after Cancun

- **The United Nations Climate Change Conference in Cancun Mexico made progress on some issues, but did nothing to secure a globally binding climate deal to succeed Kyoto.**
- **Cancun parties agreed on a framework for monitoring and verification of emission mitigation pledges made under the Copenhagen agreement.**
- **The EPA is moving ahead under its own authority to regulate GHG emissions. One difficulty with this approach is that Congress could yet enact legislation that would preclude EPA regulation in favor of its own regulatory prescription.**
- **The US DC Circuit Court of Appeals rejected motions to stay EPA's greenhouse gas (GHG) endangerment finding and other rulemakings associated with that finding.**
- **A year ago, the consensus view in Washington was that some form of GHG regulation might make it into law in 2010, but the US mid-term elections have dramatically altered that outlook toward inaction.**
- **Coal emissions may end up being constrained more by rules on mercury emissions than CO2.**
- **Health care, Social Security and foreign policy issues continue to weigh on the time and stamina needed to move on this issue.**

COP-16 made progress on an emissions monitoring and verification plan, but did nothing to convince us that a globally binding climate deal to succeed Kyoto can be secured any time soon. A second international commitment period remains a long way away, as Japan, Russia, and Canada refused at COP-16 to countenance a two-year extension of existing Kyoto commitments, in large part because neither the US nor China have binding commitments under Kyoto.

The US mid-term elections in November wiped out any residual chance of legislation on a federal cap-and-trade scheme in America until 2013 at the earliest. Consequently, the focus in the US is likely to shift to California at the state level and the EPOA at the federal level. In California, the AB32 legislation is now set to move forward, with a cap-and-trade scheme beginning in 2012 (power generators only to start, and then covering all of heavy industry from 2015).

Proposals by EPA to regulate CO2 emissions

Authorised by the April 2007 US Supreme Court ruling that the harms associated with climate change are serious and well recognized, the US Environmental Protection Agency (EPA) has taken a series of steps to regulate GHG emissions. In April 2009 the EPA issued an "Endangerment Finding" that GHGs endanger public health and welfare and thus must be regulated under the Clean Air Act (CAA) from motor vehicles.

As of January 2, EPA has ruled that many new or significantly modified facilities with large increases in greenhouse gas (GHG) emissions will have to obtain Prevention of Significant Deterioration (PSD) permits. According to legal experts at Van Ness Feldman, these permits will require those sources to abide by GHG emission limits that reflect "best available control technology" (BACT) for GHG emissions. This will be new territory for industry, states, and the EPA.

The EPA's guidance on BACT provides information on GHG emission control technologies covering several sectors including: 1) coal-fired power plants, 2) petroleum refining, 3) iron and steel, 4) cement, 5) pulp and paper, 6) nitric acid, and others. According to the EPA, energy efficiency will likely be BACT in many or most instances because they cost less than other environmental controls and may reduce costs. EPA recognises that carbon capture and sequestration (CCS) may be the only "add-on" control option for reducing GHG emissions for fossil-fuel power plants, cement production, and iron and steel manufacturing but would not likely be considered BACT because of its high cost and technical complexity. The guidance also does not say that fuel switching (e.g. from coal to natural gas) should be BACT for coal-fired power plants because it would fundamentally redefine how the power plant operates.

The American Petroleum Institute (API) has come out with strong criticism of the EPA guidance to state air regulators. While API agrees with the EPA's focus on energy efficiency, it is concerned the guidance is too vague for permitting authorities to know where to set their priorities. API fears that confusion surrounding the programme at the state level could create a permitting gridlock, causing construction freezes across the country/ API is calling for a delay to the 2012 start to the permitting programme in order to allow for more time to transition.

In addition, EPA is scheduled to start developing GHG New Source Performance Standards (NSPS) for categories of major emissions sources. Although legal challenges to the endangerment finding could result in its invalidation by the courts, the US DC Circuit Court of

Appeals rejected motions to hold EPA's GHG rules in abeyance while the case is being heard.

Congressional opposition to GHG regulation

The EPA's rule-making process could falter if public opposition led Congress to eliminate EPA's funding for GHG regulatory activities. Republican Jerry Lewis, the new chair of the powerful House appropriations committee, says he will oppose federal funding for EPA to regulate GHGs. This committee has say over how funds allocated in the federal budget. Lewis disagrees with the EPA endangerment finding, and believes the Clean Air Act was never intended to regulate carbon or other GHGs. His views are important since Congress was unable to pass a federal budget for fiscal year 2011 last year and is operating under a "continuing resolution" – a bill that extends the previous budget. An official budget will need to be passed next year, when Republicans like Lewis will have a greater say in the process.

Meanwhile, a number of Senators and Representatives are pushing legislation to suspend EPA's authority to regulate stationary source GHG emissions for two years. Van Ness Feldman estimates the likelihood of passage will depend on several factors, including the extent to which moderate Senate Democrats are persuaded that EPA regulation threatens jobs. President Obama could use his veto power to derail such a bill, or he might attempt to develop a bipartisan political deal. In any event, the lawsuits and potential for Congressional action will cast a shadow over EPA's regulatory initiatives.

Other EPA rules might be harder to derail

Due to a series of statutory deadlines and court consent decrees, a suite of major impending EPA rulemakings are creating concerns about costs, tight deadlines, and even the reliability of the electricity grid. The regulations cover the transport of ozone and fine particulate matter pollution, emissions of heavy metals such as mercury and other toxics, disposal of coal combustion residuals, and the environmental impact of cooling water use.

According to Van Ness Feldman, the rules would result in retirement of some of the power sector's older, coal-fired generating plants, for which retrofit costs would exceed revenues. For clean energy advocates, this is a "second prize" in the climate policy fight. Natural gas advocates would like the demand enhancement implications. Meanwhile, some utilities decry the planning nightmare they see occasioned by the delays and they are exploring options for at least moderate relief via the EPA, the courts, or the Congress. In our view, because these rules pertain to traditional pollutants, they may have more public and political support than regulations on CO2.

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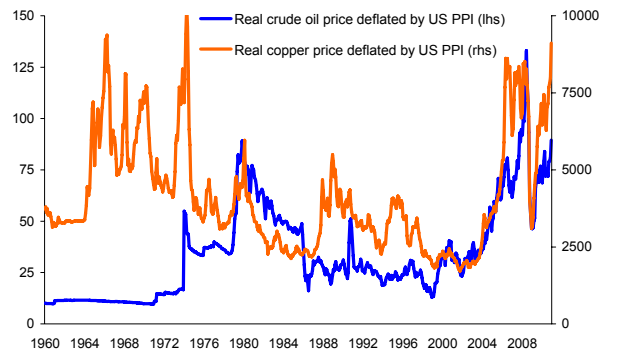
#14 Precious Metals

A Market Moving Towards A Bubble

- **We believe the factors that have driven gold prices higher over the past few years are likely to continue into 2011.**
- **We expect the complex will continue to compete aggressively for risk capital in an environment where real interest rates remain low or negative.**
- **We expect central banks will continue to be net buyers of gold as emerging market countries and specifically Asian central banks continue to build their gold holdings relative to total reserves.**
- **We believe investor inflows into physically backed gold ETFs will continue to increase. We believe the appeal of gold reflects investor attempts to seek tail event protection and to hedge against higher inflation ahead as well as the threat of deflation.**
- **During the course of this year we believe European leaders will establish a credible road map towards future debt restructuring. We expect this will be presented to EU leaders at the end of the first quarter and help to ease European sovereign risk fears. However, if the plan disappoints, we believe it would trigger renewed inflows into physically backed gold ETFs.**
- **On our estimates, gold prices would need to surpass USD2,000/oz to represent a bubble. While US dollar strength may be a feature for the next few months, a collapse in the greenback can not be dismissed out of hand, in our view.**

One of the distinguishing features of the commodity price cycle over the past decade has been the significant appreciation in prices in real terms. Moreover for certain commodities, prices have risen to or surpassed the levels that prevailed during the 1970s or early 1980s. Figure 1 examines the performance of crude oil and copper prices since 1960. We find that despite the correction in oil prices over the past 18 months, prices in real terms are back to their previous all time highs reached at the beginning of the 1980s. The rally in copper prices over the past few years has been similarly powerful. Prices in real terms are now just shy of where they were in 1974.

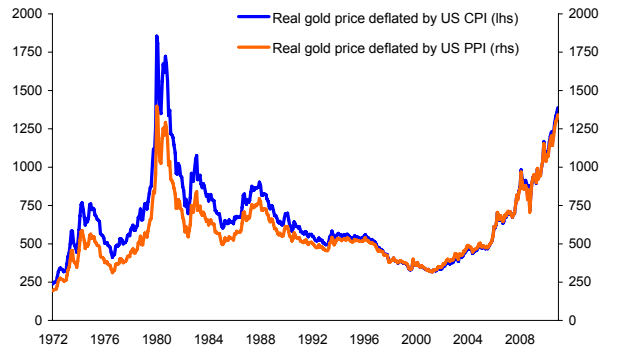
Figure 1: Commodity prices in real terms since 1960



Source: Deutsche Bank, IMF, Bloomberg Finance LP (2009 US dollars)

Like crude oil and copper, precious metal prices have rallied strongly in real terms, Figure 2. However, gold prices on a PPI and CPI adjusted basis would need to surpass USD1,455/oz and USD1,850/oz respectively to represent an all time high.

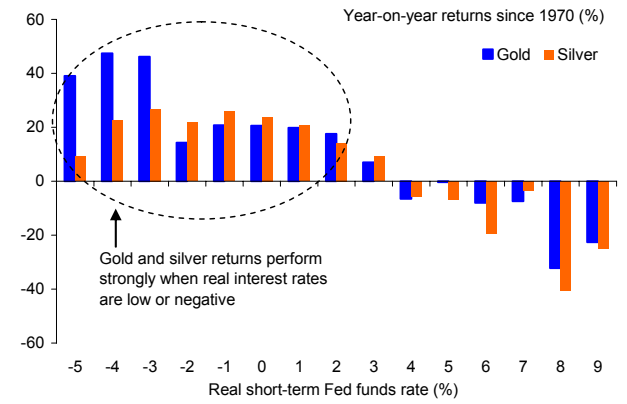
Figure 2: Gold prices in real terms



Source: Deutsche Bank, IMF, Bloomberg Finance LP (2009 US dollars)

We believe the ingredients for a bubble lie in the combination of super low interest rates, central bank diversification and strong retail investment demand. Historically when US real interest rates are negative this has traditionally been the environment where gold and silver returns have performed strongest, and vice versa Figure 3. This makes intuitive sense since the opportunity cost of investing in gold when real interest rates are low or negative is small.

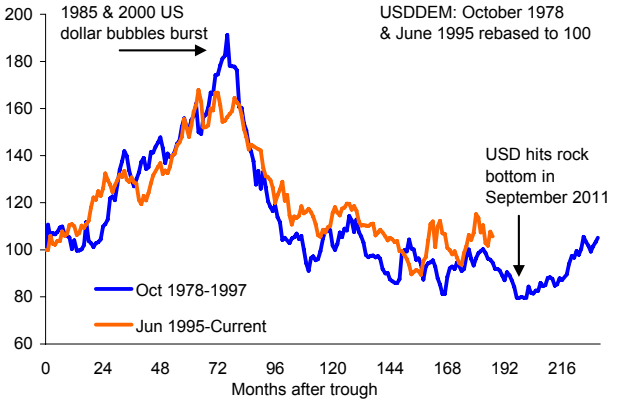
Figure 3: Gold & silver returns in different US real interest rate environments



Source: Deutsche Bank, Bloomberg Finance LP

While the US dollar has benefited from stronger US economic data and Europe's financial problems, we believe a renewed weakening in the US dollar can not be dismissed out of hand. Indeed if one compares the collapse in the US dollar since 2000 it bears a striking resemblance to the decline in the US dollar between 1985 and 1995. If the current bear cycle of the US dollar continues to track what happened back then it would imply the greenback hit fresh lows in September 2011, Figure 4. Although this is not the central scenario of our FX Research team, we believe it highlights where the risks might lie and could be in response to a tight fiscal-loose monetary policy mix, which historically has been a bearish environment for an exchange rate.

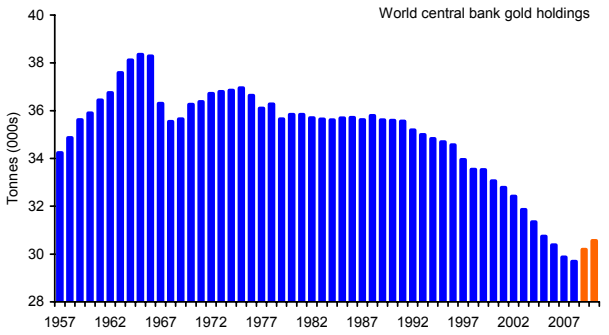
Figure 4: 1985 & 2000 US dollar bubbles compared



Source: Deutsche Bank, Bloomberg Finance LP

Central bank activity has been another factor boosting gold in 2010. According to IMF data, after almost 500 tonnes of net buying in 2009, central bank gold purchases are expected to amount to at least 400 tonnes in 2010, Figure 4. In comparison inflows into physically backed gold ETFs have amounted to approximately 325 tonnes per annum over the past five years.

Figure 5: Global central bank gold reserves

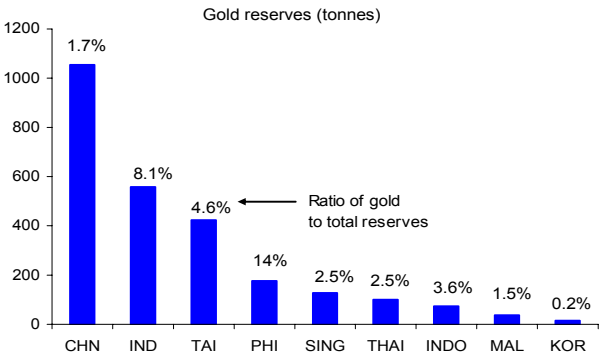


Source: Deutsche Bank, IMF (2010 data relates to October 2010)

Central bank gold holdings continue to be concentrated in the industrialised world, with the US and euro area constituting just over 60% of gold reserves held by central banks globally. However, the past few decades has seen the emergence of strong gold demand among the emerging market central banks and specifically those in Asia.

Currently the majority of central banks across the Asia region have gold to total reserve ratios significantly below the global average, which stands at 11.1%. We estimate that if gold to total reserves for the nine Asian countries outlined in Figure 6 were to increase by just 0.1%, this would be equivalent to 100 tonnes of gold.

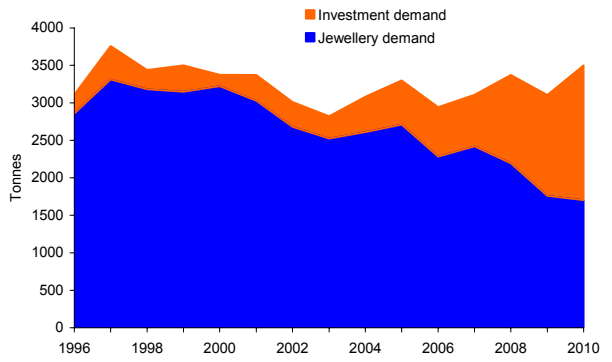
Figure 6: Central bank gold reserves across Asia



Source: IMF (October 2010)

While rising gold prices has led to a steady decline in jewellery demand, it has not deterred investor inflows into gold. Indeed investment demand has become an increasing source of gold demand over the past decade. In 2000, investment demand accounted for just over 10% of total gold demand. By 2010 we estimate this ratio had risen to over 40%.

Figure 7: The increasing importance of investment demand for gold



Source: Deutsche Bank, World Gold Council

Conclusion

We believe the main risk to the precious metals outlook is a turn in the US interest rate cycle and a new long term uptrend in the US dollar. However, we believe any cyclical strength in the US dollar in the first few months of this year will fade. Indeed history would suggest a renewed collapse in the US dollar over the coming year can not be dismissed out of hand. We are therefore maintaining our bullish outlook. On our estimates, gold prices would need to surpass USD2,000/oz to represent a bubble.

Figure 8: The level of gold prices required to represent extreme levels of valuation versus a variety of indicators

Indicator	Gold price level
In real terms (PPI)	1,455
As a share of global GDP	1,500
In real terms (CPI)	1,880
Versus base metals	2,100
Relative to per capita income	2,390
Versus crude oil	2,890
As a share of the S&P500	2,960
Average	**2,168**

Source: Deutsche Bank

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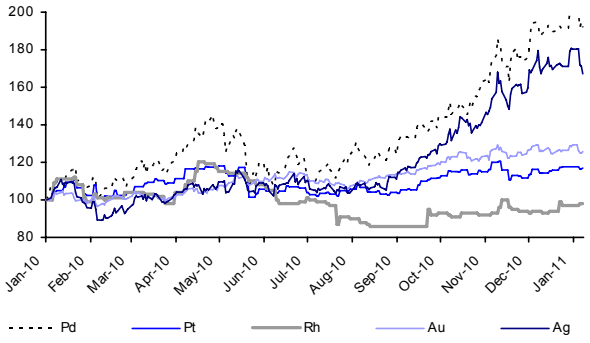
#15 Platinum Group Metals

Platinum - Regional growth discrepancies dampen demand

European auto sales (a key platinum demand driver) were generally stronger than expected over the course of 2010, with the removal of scrappage schemes having less of a negative impact than we had forecast. Our Auto team is forecasting European passenger vehicle sales to decline by a modest 2% in 2011, due to a combination of rapidly fading incentive schemes and austerity budgets. In contrast vehicle production should be marginally up, due to strong export demand, especially in the luxury segments from Emerging markets. The recovery of global heavy duty vehicle orders and new legislation on off-road vehicles is a positive offset, but not quite enough for platinum to out-perform its sister PGM palladium in our view. Despite stronger than expected industrial demand, particularly in the Chemical and Glass segments for 2010, we still forecast the platinum market to be in deficit only by virtue of inflows into the ETFs for 2011 and 2012. Therefore we maintain our view that the platinum price will be driven to a certain extent by the gold price in 2011, as investors look for "cheaper" alternatives to gold.

Palladium took the honours as the best performing precious metal for 2010. We think the factors that lead to the palladium's out-performance 2010 will largely be in place for 2011 and 2012. Low vehicle penetration rates in emerging market countries combined with favourable GDP growth rates in India and China should continue to drive robust double-digit growth in gasoline vehicle sales over the next two years. Similarly, the continued recovery in the US, should augment palladium demand in the Autocat segment for 2011 and 2012. Based on our expectation of the continuation of more robust vehicle sales in China and the US, **we reiterate our preference for Palladium over Platinum in 2011.**

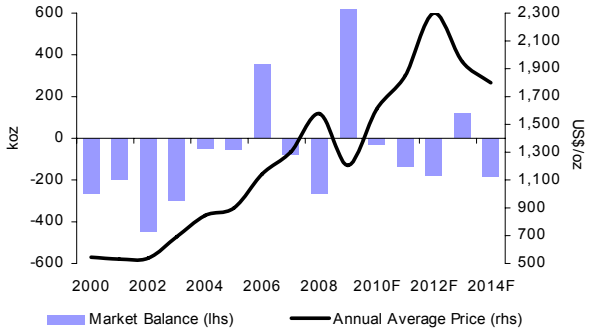
Figure 1: Precious metals prices from 2010, rebased



Source: Deutsche Bank, Thomson Financial Datastream

We are forecasting a small deficit of 33koz in the platinum market with the deficit widening in 2011 and 2012, to an estimated 140koz and 180koz. We expect demand growth to outstrip supply, with investment demand tipping the balance. In the absence of investment demand, we estimate the platinum market will be in a surplus of 400koz in 2011F and 320koz in 2012F. The key upside risk in our view, is a continued under-performance in recovery growth out of South Africa. The possibility of a further sovereign risk event in Europe is likely to weigh on the metal's sentiment however, and in it is only in 2012 that we see the market tightening up significantly.

Figure 2: Platinum supply – demand balance



Source: Deutsche Bank, Bloomberg Finance LP

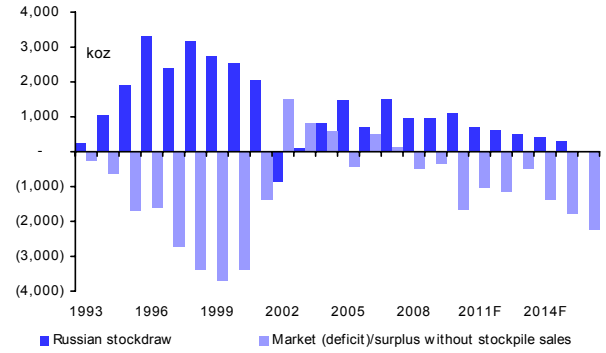
Palladium – sustained deficits over the next five years

Strong inflows into the various ETFs should offset any Russian stockpile sales (which we estimate at c.1.1Moz for 2010) to leave the Palladium market in a deficit for the first time in 10 years. We are forecasting autocat demand will end 2010 1Moz above the 2009 level, driven by a strong recovery of auto sales in the US and another year of c.30% growth in Chinese auto sales. We expect this sharp recovery in demand (up 23% including ETF inflows) to moderate in 2011 and 2012, with growth in autocat's up 400koz in both years, and investment demand slowing, but still adding 760koz and 640koz respectively. Supply increases are likely to be fairly modest at c.3% over the next two years. We expect Russian stockpile sales to slow, offset by modestly increasing South African production and a strong growth in recycled material from autocats. We are forecasting the market to remain in a deficit of c.330koz in 2011F and 560koz in 2012. ETF outflows in 2013 are likely to balance the market before a deficit market re-establishes itself over the next few years.

We would point out that if Russian stockpile sales are excluded, the Palladium market has been in deficit since 2008. Above ground stocks estimated by GFMS to be around 8Moz, are simply making their way into a more visible form. We expect this process to continue over the next decade, and by the end of 2016, Swiss stocks should be consumed either by industrial demand or by

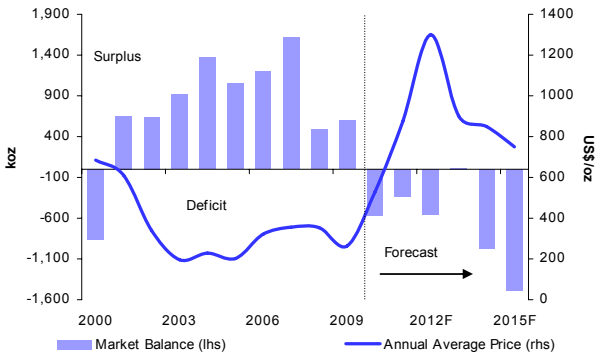
investment instruments. In the interim period however, these high stock levels should keep the brakes on prices. Furthermore if palladium prices become too onerous, substitution back into platinum is a likely scenario. At what price ratio this will occur is a subject of much debate. In diesel auto-catalysts, the ratio of Pt:Pd is on average 3:1, although we expect that this ratio may continue to decline as long as the price differential remains. Although gasoline catalysts are almost exclusively Palladium, both metals can exhibit superior activity rates depending on the specific conditions. Based on discussions with some of the auto-catalyst manufacturers, platinum and palladium can be considered as roughly equivalent in a gasoline environment. In theory this means that palladium could re-rate to a 1 to 1 price ratio before substitution takes place. In practice this is likely to happen a lot earlier, as manufacturers become concerned about the impending scarcity of palladium.

Figure 3: Palladium market deficits without Russian stockpile sales



Source: Deutsche Bank, Bloomberg Finance LP

Figure 4: Palladium supply – demand balance with DB forecasts



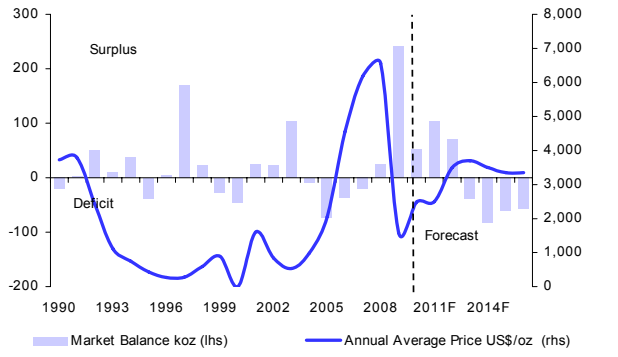
Source: Deutsche Bank, Bloomberg Finance LP

Rhodium – Surpluses likely to continue until 2012

Despite improving demand, particularly in the Glass segment after a resurgence in for LCD television sales (+35% in 2010), Rhodium's fortunes are still heavily tied to the auto sector with 85% of demand from this segment. Whilst we are forecasting a growth in global vehicle (Passenger & light commercial vehicles) sales of 4% Y/Y, this does represent a deceleration in growth from 2010, where we estimate a growth of 15%. The implementation of Euro 6 in 2013 for heavy duty vehicles and 2014 for light duty vehicles has the potential to give the Rhodium market a significant boost. Diesel cars are required to cut NOx emissions by 55% to 80mg/km over Euro 5, and Rhodium is the most effective PGM at controlling this form of emission. However there are two competing technologies; Lean NOx traps which use PGM's including Rhodium and SCR's (Selective Catalytic Reduction) which do not. Our base case demand forecast assumes that there will be a decent take-up in the passenger vehicle segment, where SCR's are likely to prove too cumbersome to install.

On the supply side, we are forecasting roughly flat volumes for 2010 at c.960koz, with a 7% decline in South African mined production offset by an increase in recycled volumes. There have been significant mined supply disruptions in South Africa, especially in H1 which has resulted in supply across the PGM spectrum being down. However, some of the miners mentioned a "long pipeline" in Rhodium which we understand has led to a build-up of inventory at the producers. These inventories will need to be depleted before prices are likely to rebound strongly, but it is unlikely that producers will "flush" pipelines at current prices. We are forecasting a surplus of c. 50 -100koz over the next two years, until the market reverts to a deficit in 2013, when the impact of Euro 6 legislation is more evident.

Figure 5: Rhodium supply – demand balance with DB forecasts



Source: Johnson Matthey, Deutsche Bank

PGM prices – upgrades in the metal prices offset by stronger Rand forecasts

We have upgraded our platinum price forecasts in 2011 by a modest 6%, predominantly as a result of our stronger gold price expectations. Our upgrades in platinum forecasts for the next three years are more significant,

averaging c.27%. It is only during this period when we estimate the market to be fundamentally tight.

Given the strong price appreciation in Q4, we have increased our palladium price expectations significantly over the next four years (an average of 80%). We expect palladium will continue to re-rate against platinum, peaking at US$1300/oz in 2012 implying a ratio of 1.8:1 – Pt:Pd.

We have re-assessed our view on Rhodium and upgraded our forecasts from 2012 onwards by an average of 34%. We remain more cautious on the outlook for Rhodium relative to both Platinum and Palladium, but the introduction of Euro 6 legislation should support demand.

We have upgraded our long-term platinum price forecast by a modest 5% adjusting for cost inflation during 2010. The upgrade in Palladium is much more significant given our expectation of a structurally stronger price in the future.

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#16 Industrial Metals

Copper

We expect that physical and financial fundamentals will be highly supportive of the base metals complex in 2011. While the group is likely to suffer from volatility caused by periodic financial/debt shocks; we anticipate expansionary monetary policy will continue to support. We believe those metals with high relative scarcity such as copper should perform well.

With the recent 'risk-on' market sentiment, copper has appreciated considerably over the past month to hit new record highs. We believe the launch of physically-backed base metals ETFs represents an important step in the evolving behaviour of industrial metals; whereby investment perceptions with respect to currencies, stores-of-value, inflation, etc. could have consequences on the value of these commodities. The outlook for 2011 appears quite promising in our view.

The launch of the copper ETF has allowed financial capital to directly compete with manufacturers in the copper market and could represent meaningful demand which we are unable to quantify. The copper price could be increasingly difficult to forecast and there is a danger that prices could meaningfully deviate from that which would be justified by physical fundamentals alone.

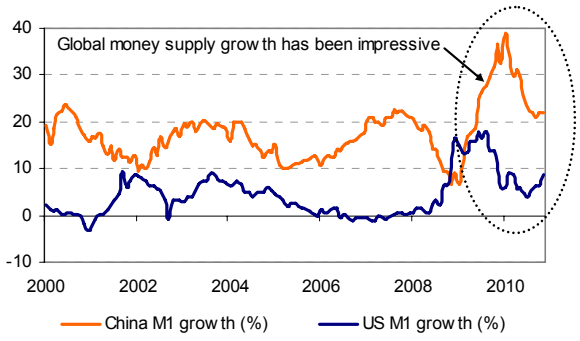
Despite some caution with respect to possible demand destruction and further interest rate hikes by China's PBOC, we acknowledge that the overall physical fundamentals for the copper market appear very strong. There is a broad consensus that the copper market is likely to remain very tight over the next several years as mine supply struggles to match demand.

2011 – a re-stocking year

Our analysis of Chinese trade data suggests that the country has experienced quite surprisingly regular re-stocking/de-stocking cycles over the past decade. We have calculated the apparent change in stocks in China by comparing apparent consumption (essentially net imports of copper) with Industrial Production (IP). If, for example, IP is 18% YoY and apparent consumption of copper is 10% YoY, then we interpret this to mean that the economy is consuming more copper than it is buying, suggesting a drawdown in domestic stockpiles.

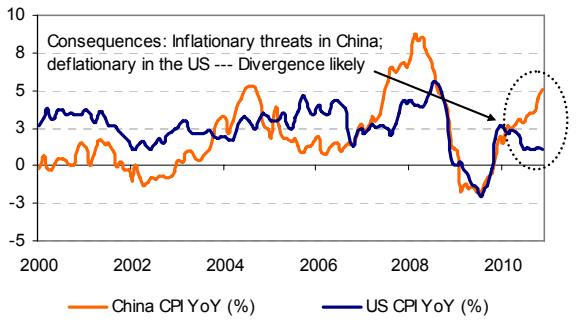
According to the cyclical stocking pattern experienced in the past, 2011 is expected to be a re-stocking year. Therefore imports of copper should be relatively robust.

Figure 1: M1 money supply – China & US



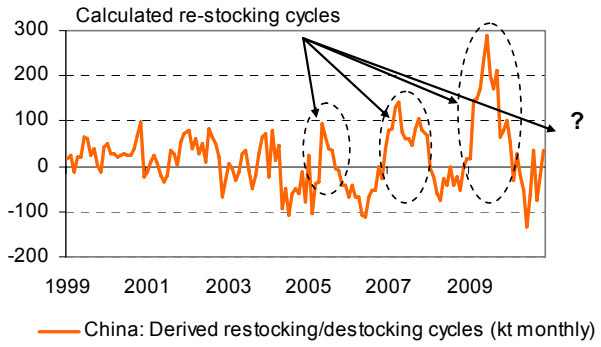
Source: Deutsche Bank, Bloomberg Finance LP

Figure 2: Inflation (CPI) – China & US



Source: Deutsche Bank, Bloomberg Finance LP

Figure 3: China: calculated re-stocking cycles



Source: Deutsche Bank, Bloomberg Finance LP

Market dynamic

We anticipate that the sizeable market deficit experienced in 2010 will continue in 2011, with the market expected to be short roughly 500kt. Key areas of supply growth are expected to be Central Africa, Chile, Mexico and Canada (the restart of nickel mines which have copper by-products being important there). Indonesian output is expected to continue to decline. Scrap availability is expected to improve, but at a much slower rate than 2010, although as prices rise this is likely to give way to sourcing of lower quality scrap the consequences being that volumes are difficult to forecast.

Demand will, as usual, be critical. We anticipate a higher rate of copper consumption growth in China vs. 2010, but low relative to the average rate of 13.5% of the past 10 years. We expect that an element of demand destruction could emerge over the course of the year as prices rise and we expect that the effects of tighter monetary policy could have a moderating impact on industrial/consumer demand. Nevertheless, given the high relative scarcity of the metal and the added potential of increased investor buying, particularly via physically-backed ETFs, we anticipate record pricing for copper in 2011 and 2012.

Figure 4: Global Copper Supply/Demand Model

		2008	2009	2010e	2011e	2012e	2013e
Chile production	Mt	5.39	5.45	5.58	5.85	6.25	6.24
Production Growth		*-3.8%*	*1.2%*	*2.2%*	*4.9%*	*6.8%*	*-0.1%*
Chile share of global production		*35%*	*34%*	*34%*	*34%*	*34%*	*34%*
Peru production	Mt	1.23	1.24	1.19	1.21	1.31	1.49
Production Growth	*%*	*6.0%*	*0.8%*	*-4.1%*	*1.4%*	*8.4%*	*14.1%*
Africa production	Mt	1.04	1.24	1.41	1.59	1.78	1.82
Production Growth	*%*	*14.7%*	*19.5%*	*13.2%*	*13.1%*	*11.8%*	*2.3%*
Global Mine Production	**Mt**	**15.58**	**16.19**	**16.47**	**17.25**	**18.36**	**18.55**
World Mined Production Growth	*%*	*0.3%*	*3.9%*	*1.9%*	*2.3%*	*6.2%*	*3.2%*
Copper smelting capacity	Mt	17.19	17.77	18.60	19.17	19.60	19.70
Utilisation		*73%*	*73%*	*71%*	*70%*	*72%*	*75%*
Anode production	Mt	14.32	14.21	14.75	15.15	15.92	16.50
Production Growth		*1.7%*	*-0.8%*	*3.8%*	*2.7%*	*5.1%*	*3.6%*
Total scrap consumption	Mt	3.68	2.88	3.37	3.70	3.84	3.94
Consumption Growth	*%*	*8.2%*	*-21.9%*	*17.0%*	*9.9%*	*3.7%*	*2.6%*
Total SxEw Production	Mt	3.0	3.3	3.3	3.5	3.8	3.8
Global Copper Supply	**Mt**	**18.34**	**18.23**	**19.00**	**19.71**	**20.84**	**21.47**
Global Supply Growth	*%*	*1.8%*	*-0.6%*	*4.3%*	*3.7%*	*5.7%*	*3.0%*
Chinese Consumption (apparent)	Mt	5.73	8.03	8.30	8.80	9.06	9.06
Consumption Growth	*%*	*2.2%*	*40.1%*	*3.4%*	*6.0%*	*3.0%*	*0.0%*
OECD Consumption	Mt	6.92	5.90	6.25	6.25	6.25	6.38
Consumption Growth	*%*	*-7.4%*	*-14.7%*	*6.0%*	*0.0%*	*0.0%*	*2.0%*
Brazil/India/Russia Consumption	Mt	1.66	1.39	1.53	1.66	1.80	1.95
Consumption Growth	*%*	*5.4%*	*-16.5%*	*10.0%*	*8.5%*	*8.6%*	*8.6%*
Global Consumption	Mt	**17.86**	**17.49**	**19.43**	**20.23**	**20.81**	**21.16**
Global Consumption Growth	*%*	*-0.5%*	*-2.0%*	*11.1%*	*4.1%*	*2.9%*	*1.7%*
Market balance	**Mt**	**0.48**	**0.73**	**-0.43**	**-0.52**	**0.03**	**0.31**
Average LME cash price	USD/t	**6,964**	**5,178**	**7,498**	**10,250**	**11,500**	**10,000**
Average LME cash price	USc/lb	**316**	**235**	**340**	**465**	**522**	**454**

Source: ICSG, WBMS, Brook Hunt, Deutsche Bank

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Aluminium

Power re-emerging as a driver

While the aluminium industry faces considerable challenges in the form of excess capacity and extremely high inventories, we believe that the prospects for the metal are improving significantly. Furthermore, we believe that the metal could be a surprisingly strong performer in 2011 as the market moves more quickly into balance than expected.

The key factor for aluminium in 2011 will be China in our view and the increasing role of energy in determining scarcity in the aluminium market. As we have written previously, we see the recent move by Chinese authorities to improve on energy efficiency within the country as an indication of a long-term desire to use energy in a more disciplined manner as the economy matures, rather than simply a reaction to targets expressed in the 11th 5-year plan (which expires this month).

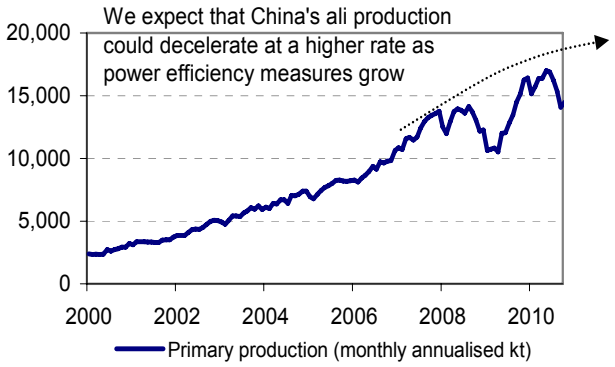
We recently increased our price forecasts for Thermal Coal (USD121/t in 2011, USD140/t in 2012), a function of our expectation of a much tighter seaborne market for this important energy source going forward. Weather issues are a key near-term factor: 1) extensive flooding in the coal fields of Australia will negatively impact shipments of thermal coal to key customers in Asia and 2) the recent cold weather in the northern hemisphere and which is now expected in China, could exacerbate issues with respect to both price and availability of power in China in the near-term. The potential for further cuts in aluminium production capacity as colder-than-normal winter weather intensifies is quite high in our view.

This, in addition to the desire by the Chinese government to prioritise power availability to a growing consumer class and orient the economy to that of 'consumer-driven' rather than 'export/industrial driven' is a key longer-term consideration in our view.

This evolving dynamic in China should, in our opinion, constrain aluminium production (therefore keep utilisation rates quite low for the aluminium industry in China), while demand could remain elevated as important aluminium consuming sectors oriented to a consumer-based economy blossom (packaging, transport, etc.).

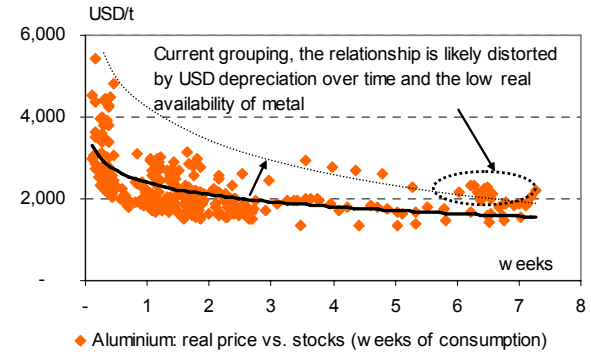
Monthly aluminium production in China has contracted sequentially by about 200kt per month over the past quarter according to statistics. While we anticipate a modest rebound in output we expect that China could become a net importer of metal next year.

Figure 1: Chinese primary aluminium production



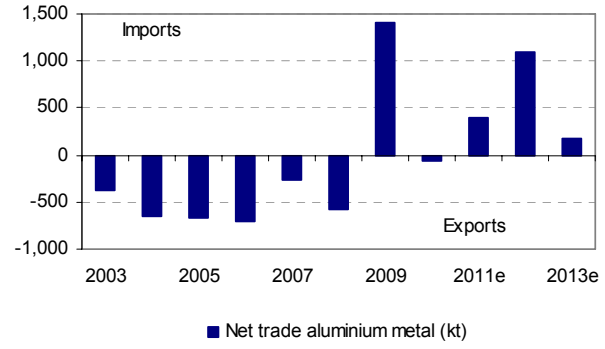
Source: CEIC, Deutsche Bank

Figure 2: Aluminium: Price vs. Stocks



Source: Deutsche Bank, Bloomberg Finance LP

Figure 3: China: Net trade aluminium metal (kt)



Source: CEIC, Deutsche Bank

Balances

The figure below outlines our assumptions for the global aluminium market going forward. What may be surprising is our expectation that the market will only experience a small surplus in 2011, furthermore we would suggest that if financial demand for aluminium builds (via physically-backed ETFs for example), the market could conceivably move into deficit sooner than we anticipate. We forecast a small deficit in 2012 as we believe that energy, particularly thermal coal, could trade at a significant premium in that year.

Importantly, we expect that China's utilisation of aluminium smelter capacity to in fact *fall* in 2011. We believe that overall smelting capacity could climb to nearly 24mt in 2011, with 16.3mt expected production this equates to a 68% utilisation rate, down from an estimated 71% in 2010.

In summary, we anticipate a relatively strong pricing environment for aluminium in 2011 as the energy component of the metal re-rates and demand in key markets remains resilient.

Figure 4: Global Aluminium Supply/Demand Model

		2008	2009	2010e	2011e	2012e	2013e
Pimary Aluminium							
Chinese Production	Mt	13.2	13.0	15.6	16.3	16.8	19.0
growth	%	*5%*	*-1%*	*20%*	*5%*	*3%*	*13%*
Russia Production	Mt	4.2	3.8	4.0	4.1	4.3	4.7
growth	%	*6%*	*-8%*	*3%*	*3%*	*5%*	*9%*
Middle East Production	Mt	1.8	2.1	2.7	3.3	3.5	3.5
growth	%	*4%*	*18%*	*26%*	*24%*	*4%*	*0%*
Europe & N. American Production	Mt	10.4	8.6	8.6	8.8	8.9	9.0
growth	%	*5%*	*-18%*	*0%*	*2%*	*1%*	*2%*
Global Production	**Mt**	**39.6**	**36.8**	**40.1**	**41.6**	**43.6**	**46.6**
growth	%	*4%*	*-7%*	*9%*	*4%*	*5%*	*7%*
Global Capacity	Mt	45.7	47.2	48.5	50.6	52.6	54.9
utilisation rate	%	*87%*	*78%*	*83%*	*82%*	*83%*	*85%*
Primary Aluminium Consumption							
China Consumption	Mt	12.6	14.4	15.5	16.7	17.9	19.2
growth	%	*2%*	*15%*	*8%*	*8%*	*7%*	*7%*
China net imports (exports)	Mt	-0.6	1.4	-0.1	0.4	1.1	0.2
OECD Consumption	Mt	17.6	14.2	16.4	16.4	16.6	16.9
growth	Mt	*-5%*	*-19%*	*15%*	*0%*	*2%*	*2%*
Global Consumption	**Mt**	**37.9**	**35.2**	**39.4**	**41.4**	**43.6**	**46.0**
growth	%	*-1%*	*-7%*	*12%*	*5%*	*5%*	*6%*
Market balance	**Mt**	**1.64**	**1.67**	**0.67**	**0.20**	**-0.01**	**0.59**
Avg. LME cash price	**$/t**	**2,571**	**1,671**	**2,191**	**2,650**	**3,025**	**2,800**
Avg. LME cash price	**c/lb.**	**116.6**	**75.8**	**99.4**	**120.2**	**137.2**	**127.0**

Source: WBMS, Brook Hunt, Deutsche Bank

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Nickel

Not a clear outperformer

We expect that the nickel market will remain reasonably tight in 2011, largely a function of the strong possibility that production will disappoint this year in the context of resilient consumption growth (albeit decelerating from 2010 levels). However we don't believe that there is a clear case for out-performance for the metal, in other words we believe that the market does not misunderstand the upside risks for the commodity which could be argued from some other metals (copper or aluminium for example).

On the supply-side, the risks for potential production problems from new Western nickel operations, particularly those that are Pressure Acid Leach (PAL), have been well flagged. Operations such as Goro, Abitovy and Ravensthorpe have, in our view, a higher relative risk of delays as production is ramped up. This is a function of the track record witnessed fo such operations over the past ten years or so.

Other operations, such as Onça Puma or Barro Alto which will produce a ferro-nickel product we expect will have a greater chance of coming on stream with less risk of delay.

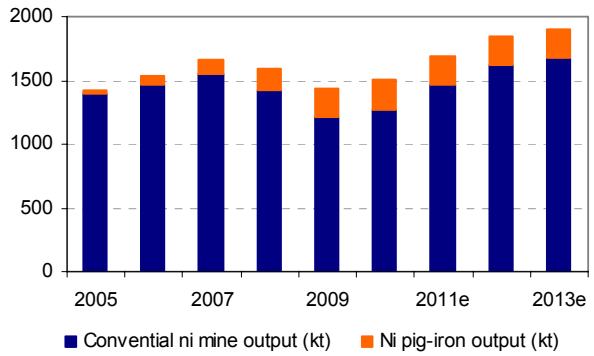
In general we expect supply growth to exceed 11% in 2011, nevertheless this could be closer to 7-8% if in fact delays hit some project.

Another key supply issue is the production of nickel pig-iron (Ni PI) in China. As illustrated in the chart on the right, China's imports of nickel ores rebounded significantly in 2010, and will likely represent an equivalent of nearly 240kt of nickel according to our estimates. The danger of further growth into 2011 decreasing however; as we note the increased pressures in China from higher energy pricing and lower power availability combined with the increased tightness in coking coal markets, we expect that the environment for Ni PI production is likely to become much more challenging. In fact we expect that there is a high probability that Ni PI production falls in 2011. Our current estimate is a fall of only 15mt but there is a risk that this could be much larger in our view.

Demand: not straightforward

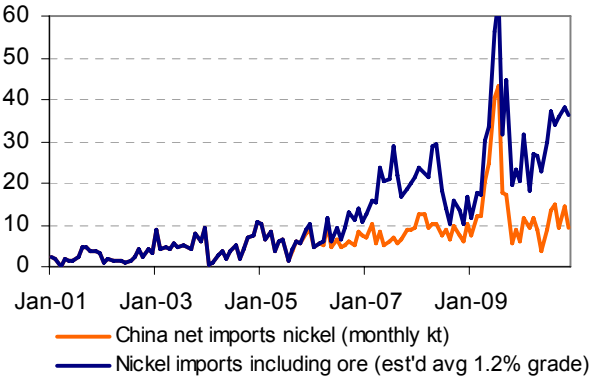
On the face of it, global stainless demand in 2011 should be reasonably robust, particularly given the likelihood of stronger consumer-related demand in the Emerging World. Nevertheless, we are concerned that the popularity of 200 series stainless steels (which have about half the nickel content that the popular 300 series stainless steels) in China could result in lower growth in nickel consumption than normal.

Figure 1: Nickel supply



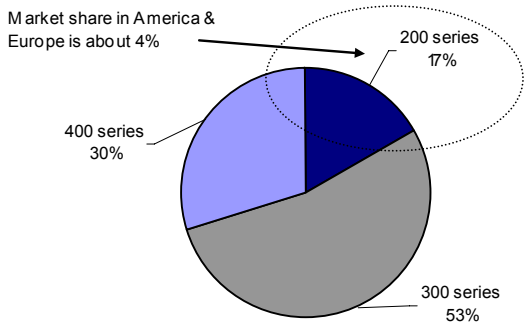
Source: Brook Hunt, Company documents, Deutsche Bank

Figure 2: China: Nickel and nickel ore imports



Source: CEIC, Deutsche Bank

Figure 3: Market share of stainless grade: Asia



Source: COMC, Deutsche Bank

Balances

We expect that the market deficit for nickel will be modest in 2011, at around 5kt, although we acknowledge that there are risk elements to both supply and demand which could result in a meaningful deviation from this estimate. Furthermore, we highlight that the recent introduction of a physically-backed nickel ETF (bloomberg ticker PHNI_LN) which allows investors the ability to buy physical nickel and that this combined with the potential for the launch of other such ETFs could result in an 'investment demand' component which we currently do not address in our model.

Figure 4: Global Nickel Supply/Demand Model

		2008	2009	2010e	2011e	2012e	2013e
Australia mine production	kt	200.4	164.1	167.4	184.4	197.9	199.9
Production growth		*5.3%*	*-18.1%*	*2.0%*	*10.1%*	*7.3%*	*1.0%*
Canada mine production	kt	250.4	134.4	117.8	166.3	205.2	209.9
Production growth		*-0.5%*	*-46.3%*	*-12.3%*	*41.2%*	*23.4%*	*2.3%*
CIS mine production	kt	269.3	259.0	267.1	275.8	280.4	280.9
Production growth		*-3.8%*	*-3.8%*	*3.1%*	*3.2%*	*1.7%*	*0.2%*
New Caledonia mine production	kt	102.9	93.0	121.0	147.0	165.0	175.0
Production growth		*-17.9%*	*-9.6%*	*30.1%*	*21.5%*	*12.2%*	*6.1%*
Total world mine production	**kt**	**1,594**	**1,444**	**1,510**	**1,685**	**1,839**	**1,907**
World mine production growth rate		*-4.0%*	*-9.4%*	*4.6%*	*11.6%*	*9.2%*	*3.7%*
Total refined availability	**kt**	**1,395**	**1,334**	**1,400**	**1,515**	**1,669**	**1,737**
World refined availability growth rate		*-2.1%*	*-4.4%*	*5.0%*	*8.2%*	*10.2%*	*4.0%*
Global stainless production	mt	26.6	25.1	30.3	31.9	34.3	35.3
Growth		*-7.9%*	*-5.7%*	*20.7%*	*5.4%*	*7.2%*	*3.0%*
Austenitic stainless demand	mt	18.8	18.6	22.0	23.3	25.3	26.1
Austenitic ratio		*71%*	*74%*	*73%*	*73%*	*74%*	*74%*
Total nickel demand for stainless	kt	1,456	1,395	1,648	1,749	1,901	1,932
Nickel content		*7.7%*	*7.5%*	*7.5%*	*7.5%*	*7.5%*	*7.4%*
Nickel scrap consumption	kt	661	572	708	752	779	792
Scrap ratio		*45.4%*	*41.0%*	*43.0%*	*43.0%*	*41.0%*	*41.0%*
Primary Nickel in Stainless	kt	795	823	939	997	1122	1140
Primary Nickel in Non-Stainless	kt	519	484	499	523	550	566
Total world nickel consumption	**kt**	**1,314**	**1,307**	**1,438**	**1,520**	**1,671**	**1,706**
World nickel consumption growth	%	*-4.2%*	*-0.6%*	*10.0%*	*5.7%*	*9.9%*	*2.1%*
Balance	**kt**	**80.4**	**26.6**	**-37.7**	**-5.2**	**-2.0**	**30.5**
Annual Average Prices	**USD/t**	**21,098**	**14,712**	**21,742**	**27,250**	**30,000**	**28,000**
Annual Average Prices	**USD/lb**	**9.57**	**6.68**	**9.86**	**12.36**	**13.61**	**12.70**

Source: Deutsche Bank

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Zinc

In general, we believe that the zinc market over the course of the next 12 months will be relatively supported by resilient EM demand, new source of demand from physically backed zinc ETFs as well as a significant slowdown in mine production growth from China. We expect prices to weaken into Q2 and rebound in the second half this year. We have upgraded our zinc price forecasts to USD2,475/t and USD3,125/t respectively for 2011 and 2012. However, we believe price advance in zinc is likely to lag behind other industrial metals.

Demand

While we believe OECD zinc consumption is likely to grow at a lower 'new normal' levels, but we expect that Chinese zinc consumption will remain strong and potentially surprise on the upside as Chinese policy-makers push consumer-lead economic activity. The usage of coated, flat steels is likely to increase significantly as sales of products such as autos and appliances could continue to grow rapidly over the next several years. We note that, due to cost reasons, only 30% of domestic produced cars use hot galvanized plate. As competition increases between domestic and imported fabricators, the penetration of galvanized steel should increase in these markets. Meanwhile we expect demand from infrastructure, in particular, the construction of new railways and expansion of the power grid could be quite beneficial for zinc. (galvanized steel for cars/carriages and for pylons that hold high voltage power lines.)

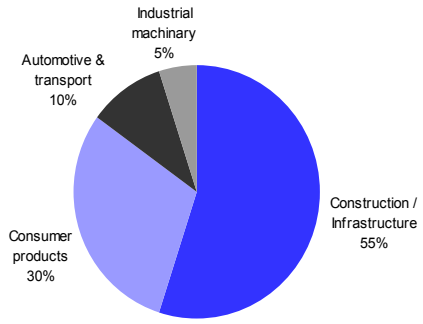
Moreover, we believe the introduction of investor capital through ETFs could have important repercussions for industrial metals and provide additional support for zinc this year.

Supply

Due to declining mine grades, consolidation and environmental efforts within China, zinc mine supply growth is expected to decelerate to an average 2% in the coming years. We believe this is likely to significantly increase China's zinc concentrate imports going forward. Furthermore, we expect that constraints on power availability could remain an important theme in China over the longer-term. This factor could also keep Chinese zinc smelting under some pressure in future, albeit to a lesser degree than for some other industries (such as aluminium for example).

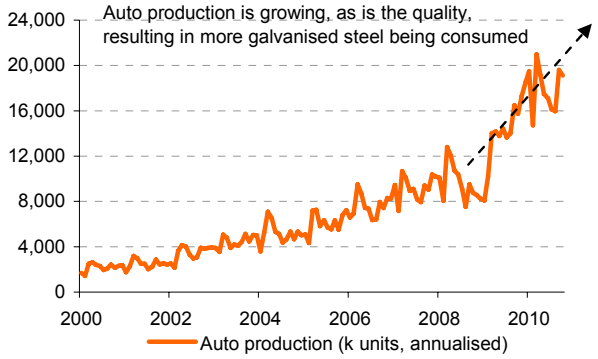
We believe global zinc mine supply growth could experience considerable contraction in the current decade. Most declines are likely to come from mine closures, which may represent nearly 5,000k tonnes in aggregate between 2011 and 2025. We expect this could pose considerable challenges for the market to meet strong zinc consumption requirements globally, particularly from emerging markets.

Figure 1: Chinese zinc consumption by end use



Source: Brook Hunt, Deutsche Bank

Figure 2: Chinese automobile production



Source: Deutsche Bank, CEIC

Figure 3: Chinese mine supply to decelerate (kt)



Source: Brook Hunt, Deutsche Bank

Model summary

Figure 4 shows our assumptions for the zinc market. In 2011, we expect the market fundamentals to tighten on Chinese demand and potential launch of physically backed zinc ETF. We are forecasting a near balanced market in 2012 and a deficit in 2013.

Figure 4: Deutsche Bank Global Zinc Supply/Demand Model

		2008	2009	2010e	2011e	2012e	2013e
China mine production	Mt	3.1	3.2	3.5	3.4	3.5	3.6
China mine production growth	*%*	*-2%*	*3%*	*9%*	*-2%*	*3%*	*1%*
Australia mine production	Mt	1.5	1.3	1.5	1.6	1.6	1.6
Australia mine production growth	*%*	*7%*	*-13%*	*13%*	*8%*	*-1%*	*1%*
Peru mine production	Mt	1.5	1.4	1.4	1.4	1.5	1.5
Peru mine production growth	*%*	*11%*	*-8%*	*1%*	*-1%*	*3%*	*5%*
North America mine production	Mt	1.5	1.4	1.4	1.5	1.4	1.1
North America mine production growth	*%*	*8%*	*-6%*	*3%*	*4%*	*-9%*	*-16%*
World Mine Production	**Mt**	**11.44**	**11.28**	**12.19**	**12.79**	**13.06**	**12.90**
World Mine Production Growth	*%*	*5%*	*-1%*	*8%*	*5%*	*2%*	*-1%*
Concentrate for smelting	Mt	11.44	11.28	12.12	12.58	12.92	12.95
Secondary & other zinc	Mt	0.9	0.8	0.9	0.9	1.0	1.0
Losses	Mt	-0.7	-0.6	-0.7	-0.8	-0.8	-0.8
Total Refined Availability	**Mt**	**11.49**	**11.19**	**12.40**	**12.76**	**13.11**	**13.14**
World refined availability growth		*3%*	*-3%*	*11%*	*3%*	*3%*	*0%*
China Refined Consumption	Mt	3.8	4.2	4.6	4.9	5.3	5.7
Consumption growth	*%*	*8%*	*10%*	*10%*	*8%*	*8%*	*8%*
OECD Consumption	Mt	4.1	3.6	4.2	4.4	4.4	4.4
Consumption growth	*%*	*-8%*	*-12%*	*15%*	*5%*	*0%*	*0%*
Brazil/India/Russia Refined Consumption	Mt	0.9	0.8	1.0	1.1	1.2	1.3
Consumption growth	*%*	*0%*	*-9%*	*12%*	*10%*	*10%*	*10%*
World Refined Consumption	**Mt**	**11.21**	**10.15**	**11.51**	**12.35**	**13.05**	**13.79**
World Refined Consumption Growth	*%*	*-2%*	*-9%*	*13%*	*7%*	*6%*	*6%*
Market balance	**Mt**	**0.28**	**1.04**	**0.89**	**0.42**	**0.06**	**-0.65**
Annual average LME cash prices	**USD/t**	**1,880**	**1,662**	**2,158**	**2,475**	**3,125**	**2,800**
Annual average LME cash prices	**USc/lb**	**85**	**75**	**98**	**112**	**142**	**127**

Source: Ilzsg, Deutsche Bank

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Lead

We have raised our lead price forecasts for 2011 and 2012 to USD2,600/t and USD2,950/t respectively, a function of strong EM demand growth, a new source of inventor demand (from physically backed ETFs),. a substantial decline in the global mine growth and supply disruptions due to environmental concerns and power constraints.

Demand

The lead market has witnessed an impressive rally over the past month driven by strong Chinese car sales and seasonal demand for replacement batteries. We remain constructive in our outlook for lead prices in Q1 as the current cold front in the northern hemisphere should continue to provide boost to demand for replacement batteries. Nevertheless, we expect prices to weaken in Q2 as weather related tightness recedes.

In general, we believe the lead market will be relatively supported in 2011. Despite the expiration of the automobile tax incentives in China, we expect car demand growth to remain resilient. In fact in the latest government effort to reduce congestion in Beijing, car sales quota could encourage sales in other cities due to fears of such policy being extended.

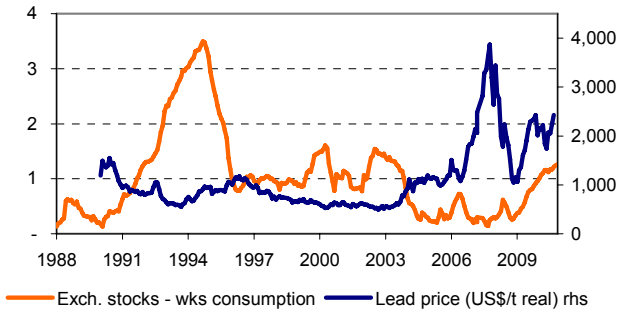
The market is expecting the launch of the first physically backed lead ETF by ETF Securities in Q1 this year, we expect this could provide additional demand for the lead market. Based on our analysis, ETF demand could have meaningful impact on copper and lead on relative scarcity.

Supply

In the near term, cold weather in central and southern China is expected to intensify over the coming weeks and this, in our view, could exacerbate the squeeze in power availability within the country. Similar to steel and aluminium, we believe power shortage could lead to production cuts as power may be prioritized for residential use. Figure 2 shows that central and southern provinces of Henan, Hunan and Guangxi account for the lion's share of domestic lead production. Moreover, lower production in Febraury is expected as Chinese New Year approaches.

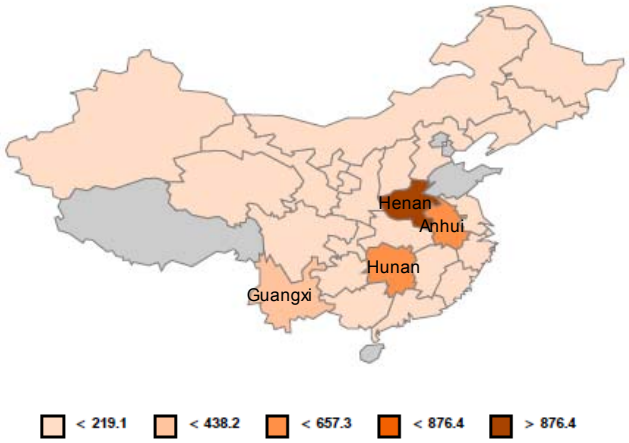
A number of drivers are likely to constrain global lead supply in the medium. 1) Lower mine production growth globally is could put an increasing strain on the already low lead inventory and limit smelter capacity growth. After experiencing a rapid expansion in 2009 and 2010 by an average of 20% per annum, we believe that Chinese lead mine production is unlikely to be able to keep pace. With our forecasts of 2% of Chinese mine production growth in the coming years, we expect that both lead concentrate and refined imports into China will need to rise substantially to meet demand. In addition, mine output growth from the world's major producers such as Peru, Australia and the US is also slated to decelerate.

Figure 1: Lead inventory vs prices



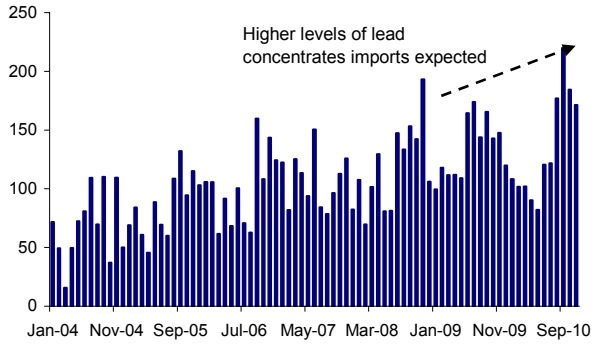
Source: Deutsche Bank, Bloomberg Finance LP

Figure 2: Chinese lead production by province(Kt)



Source: China non ferrous metals year book,, Deutsche Bank

Figure 3: China lead concentrates imports, Kt



Source: Deutsche Bank, Reuters

We have factored in 350Kt of global smelter cutbacks for this year on concentrate shortages.

2) Supply disruptions due to health, pollution problems could persist. In fact, operations at the Magellan lead mine in Australia have been suspended in early January due to environmental concerns. The mine has capacity of c85Kt of lead production per year, or roughly 2% of the global market.

3) We believe energy conservation and overcapacity reduction will remain the key focus in China's 12th 5 year plan. We believe power restrictions could continue to limit lead production growth and could result in smelter capacity closures.

Model summary

The table below shows our assumptions for the lead market. In 2011, we expect the market fundamentals to tighten on Chinese demand and potential launch of physically backed zinc ETF. Mine cutbacks coupled with a recovery in lead demand are likely to result in a market deficit in 2012 and 2013. We care forecasting lead prices to peak in 2012.

Figure 4: Global Lead Supply/Demand Model

		2008	2009	2010	2011	2012	2013
China mine production	Mt	1.2	1.4	1.8	1.8	1.9	1.9
China mine production growth	*%*	*1%*	*15%*	*27%*	*1%*	*3%*	*2%*
Australia mine production	Mt	0.6	0.5	0.6	0.7	0.7	0.7
Australia mine production growth	*%*	*0%*	*-10%*	*15%*	*12%*	*2%*	*4%*
Peru mine production	Mt	0.3	0.3	0.2	0.3	0.3	0.3
Peru mine production growth	*%*	*6%*	*-16%*	*-8%*	*8%*	*4%*	*5%*
North America mine production	Mt	0.5	0.4	0.4	0.4	0.4	0.4
North America mine production growth	*%*	*-3%*	*-8%*	*-5%*	*7%*	*-1%*	*-19%*
World Mine Production	**Mt**	**3.46**	**3.53**	**4.02**	**4.30**	**4.43**	**4.45**
World Mine Production Growth	*%*	*3%*	*2%*	*14%*	*7%*	*3%*	*0%*
Losses	Mt	0.26	0.25	0.26	0.28	0.29	0.29
Scrap	Mt	1.3	1.1	0.9	1.0	1.1	1.2
Primary refined prodcution capability	Mt	4.6	4.4	4.6	5.0	5.2	5.3
Secondary refined prodcution capability	Mt	4.0	4.1	4.4	4.5	4.6	5.0
Total Refined Availability	**Mt**	**8.57**	**8.55**	**8.98**	**9.50**	**9.80**	**10.31**
World refined availability growth	*%*	*5%*	*0%*	*5%*	*6%*	*3%*	*5%*
China Refined Consumption	Mt	3.1	3.5	3.9	4.2	4.6	5.1
Consumption growth	*%*	*15%*	*15%*	*10%*	*9%*	*9%*	*9%*
OECD Consumption	Mt	3.7	3.1	3.2	3.3	3.4	3.4
Consumption growth	*%*	*7%*	*-15%*	*3%*	*3%*	*2%*	*1%*
Brazil/ India/ Russia Refined Consumption	Mt	0.4	0.4	0.4	0.4	0.4	0.5
Consumption growth	*%*	*10%*	*-8%*	*9%*	*5%*	*5%*	*3%*
World Refined Consumption	**Mt**	**8.49**	**8.23**	**8.76**	**9.30**	**9.83**	**10.43**
World Refined Consumption Growth	*%*	*3%*	*-3%*	*6%*	*6%*	*6%*	*6%*
Market balance	**Mt**	**0.08**	**0.31**	**0.22**	**0.20**	**-0.02**	**-0.12**
Annual average LME cash prices	**USD/ t**	**2,087**	**1,723**	**2,147**	**2,600**	**2,950**	**2,900**
Annual average LME cash prices	**USc/ lb**	**94.7**	**78.2**	**97.4**	**118.0**	**133.8**	**131.6**

Sources: ILZSG; WBMS; Brook Hunt; Deutsche Bank

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#17 Bulk Commodities

Thermal Coal

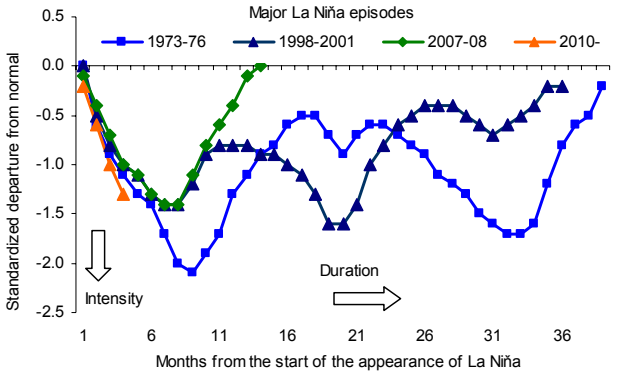
More than just weather

Thermal coal prices (API4) have appreciated considerably over the past quarter, rising over 40% to around USD130/t. The strength has come about on the back of re-stocking, cold temperatures in some parts of the northern hemisphere and the recent severe flooding in key coal production areas of Australia. We believe that this strength is likely to continue as meteorological conditions could remain extreme (with flooding dissipating slowly in Australia and cold weather approaching in key demand areas such as China) and structural supply-side issues become more apparent over the course of the year and as the extreme weather conditions subside.

- Winter temperatures could remain lower than normal according to some long-range meteorological forecasts (NOAA) which is largely based on the continuation of strong La Niña conditions, see Figure 1. Freezing temperatures in parts of China are already causing shortages in coal due transport disruptions.
- In Australia and Indonesia, heavy rains have caused severe supply disruptions, with an estimated 75% of coal mines closed as a result of record flooding. We expect that some mines could be off-line for as long as two months; and currently estimate that about 8-10mt of production could be lost.
- Beyond winter, we expect that the thermal coal market will remain tight as strong demand from emerging markets, particularly China and India drives record levels of imports. Chinese and Indian power demand is expected to be resilient as economic growth remains a priority.
- Supply is anticipated to be constrained in key producing regions such as China, Indonesia and Australia. Chinese supply could remain hobbled by infrastructure bottlenecks, safety/environmental requirements and the growing view that domestic coal reserves are strategic. Indonesian export growth has been impressive, however coal quality is expected to continue to fall and the government appears to be increasingly insistent that volumes be available for domestic power requirements.

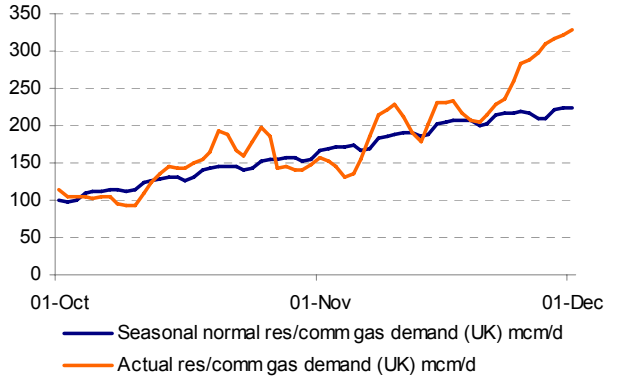
We expect the thermal coal market will remain tight over the current quarter. We have adjusted our 2011 forecast for thermal coal upwards to USD122/t from USD118/t previously to reflect the impact of Australian flooding. Our 2012 price forecast remains USD140/t.

Figure 1: La Niña episodes



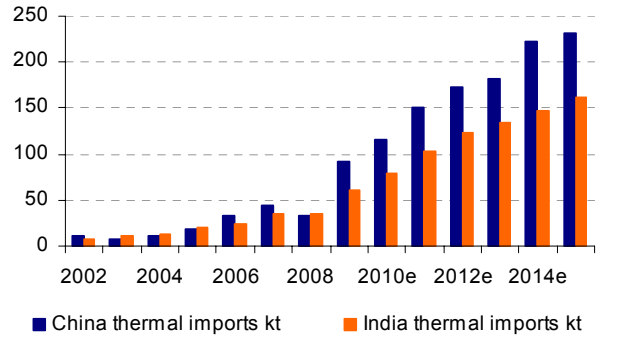
Source: NOAA, Deutsche Bank

Figure 2: Cold winter weather is lifting energy demand



Source: National Grid, Deutsche Bank

Figure 3: China & India: thermal coal import profiles



Source: McCloskey's, Deutsche Bank

Thermal coal has the potential to be the best performer of the bulk commodities in 2011 in our view. We expect the thermal coal market will remain tight in Q1. Nevertheless, we believe that there is a strong probability of lower pricing into Q2 this year as the weather-related squeeze moderates and supply conditions revert to normal.

We remain convinced that coal is a structurally tight market longer-term. We believe that the resilience in demand from key regions such as India and China is an important consideration. Furthermore we expect that infrastructure challenges and industry rationalisation within China combined with constraints from key seaborne supplier regions such as South Africa, Indonesia and Australia will keep the market tight over the next several years. We will watch supply growth from Indonesia closely next year as quality could deteriorate and the government may be increasingly anxious to secure coal for domestic use.

Figure 4: Global seaborne thermal coal supply/demand model

		2008	2009	2010e	2011e	2012e	2013e
Indonesian exports	Mt	200	233	273	293	307	323
growth	%	*3%*	*17%*	*17%*	*7%*	*5%*	*5%*
Australian exports	Mt	125	139	138	137	159	167
growth	%	*12%*	*11%*	*-1%*	*-1%*	*0%*	*5%*
South African exports	Mt	68	67	67	68	69	70
growth	%	*1%*	*-2%*	*1%*	*1%*	*2%*	*2%*
Columbian exports	Mt	69	63	70	71	73	75
growth	%	*6%*	*-8%*	*10%*	*1%*	*3%*	*3%*
US exports	Mt	18	12	14	20	45	50
China exports	Mt	36	18	18	16	16	16
Other exports	Mt	143	147	165	185	201	219
Total seaborne thermal supply	**Mt**	**658**	**680**	**746**	**789**	**871**	**920**
growth	%	*1%*	*3%*	*10%*	*6%*	*10%*	*6%*
Japanese imports	Mt	131	113	120	123	124	125
growth	%	*4%*	*-14%*	*7%*	*2%*	*1%*	*1%*
Korea & Taiwan imports	Mt	139	131	137	140	143	145
growth	%	*6%*	*-6%*	*5%*	*2%*	*2%*	*2%*
European imports	Mt	153	143	146	148	149	151
growth	%	*5%*	*-7%*	*2%*	*1%*	*1%*	*1%*
China imports	Mt	34	92	117	151	173	181
growth	%	*-24%*	*171%*	*27%*	*29%*	*15%*	*5%*
India imports	Mt	35	60	79	102	123	135
growth	%	*1%*	*70%*	*31%*	*30%*	*20%*	*10%*
Other imports	Mt	166	142	146	162	180	194
Total seaborne thermal imports	**Mt**	**658**	**680**	**746**	**826**	**892**	**932**
growth	%	*1%*	*3%*	*10%*	*11%*	*8%*	*4%*
Notional market balance	**Mt**	**0**	**0**	**0**	**-36**	**-21**	**-12**
Contract thermal coal (JFY)	**USD/t**	**125**	**71**	**98**	**115**	**135**	**120**
API 4 (Richard's Bay)	**USD/t**	**121**	**65**	**92**	**122**	**140**	**115**

Source: Deutsche Bank

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Iron Ore

Supply remains key

For several quarters now we have been skeptical of steel production growth that is likely to be witnessed in China going forward. This skepticism remains very much in place, and in fact enhanced by the actions last quarter by Chinese authorities in closing down capacity in various parts of the country in order to ensure that the energy efficiency targets of the past 5-year plan would be met.

We expect that crude steel production growth for China will decelerate to roughly 5% in 2011 from levels of over 10% in 2010. This expectation is driven by two key factors, 1) our conviction that Chinese authorities will maintain their desire for improvements in overall energy efficiency for the next 5-yr plan (putting pressure on heavy industry in particular), and 2) the level of consumption intensity in China is nearing levels experienced for the US economy in the 1950's and 1960's (see chart).

On a demand basis alone, this demand view would translate into a rather pessimistic forecast for the iron ore market. Supply however has disappointed. The availability of spot iron ore cargoes in the seaborne market has been poor, frustratingly so for many traders. An important contributor to this has been the steady withdrawal of Indian material from the Asian market.

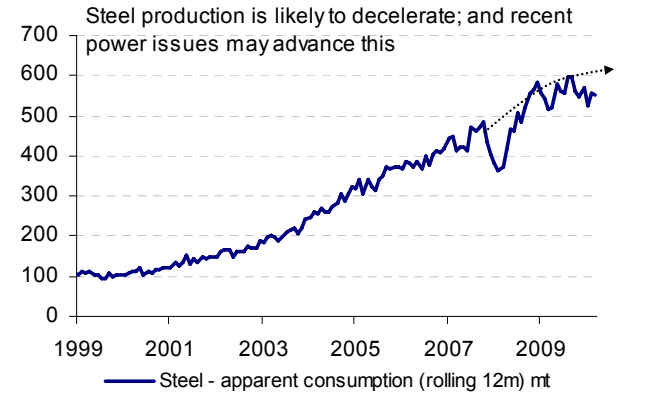
For years the Indian steel industry has called for the outright ban of iron ore exports. Recently, governments in Orissa and Karnataka have cracked down on illegal mining, this and further constraints on exports of higher quality ores have resulted in a significant reduction of output from the country. We expect that 2011 output could fall roughly 20% YoY (to around 70mt).

Furthermore, we note that output from Brazil has lagged Australia badly over the past several years, After the 2008 correction, it took Brazil about 18 months to recover to previous peak levels while Australia barely missed a beat from its upward trend. This may be partially reflective of Brazil's exposure to the European market, vs. Australia's almost exclusive exposure to Asia. Furthermore, we understand that Vale has had some difficulties in rail/port infrastructure in Brazil and this may also go some way to explaining the relatively poor performance.

In summary, despite our conservative view of steel production growth in 2011, we anticipate that poor iron ore availability could keep prices supported near current levels over the next couple of years.

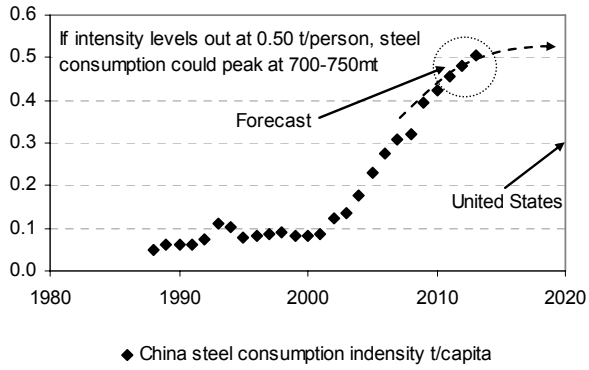
We have upgraded our forecasts for both 2011 and 2012 to USD175/t and USD180/t respectively (from USD125/t and USD135/t previously).

Figure 1: Chinese crude steel production



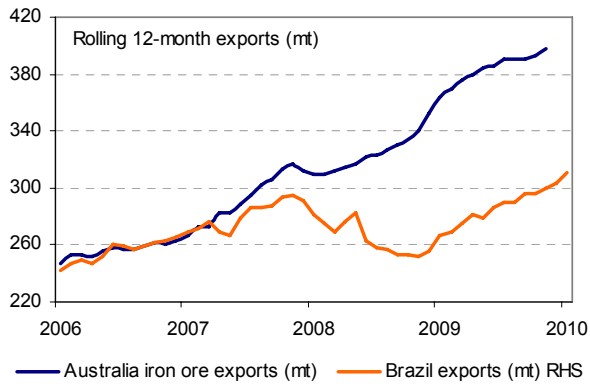
Source: CEIC, Deutsche Bank

Figure 2: China steel consumption intensity (t/capita)



Source: Deutsche Bank

Figure 3: Brazil/Australia iron ore exports



Source: Bloomberg Finance LP, Deutsche Bank

Iron ore

Below outlines our disaggregated view of the iron ore market by region.

Figure 4: Global seaborne iron ore supply/demand model

		2008	2009	2010e	2011e	2012e	2013e
Brazil exports	Mt	282	267	280	302	318	341
growth	%	*5%*	*-5%*	*5%*	*8%*	*5%*	*7%*
Australian exports	Mt	307	363	400	429	460	526
growth	%	*10%*	*18%*	*10%*	*7%*	*7%*	*14%*
South African exports	Mt	33	43	43	45	46	47
growth	%	*8%*	*32%*	*0%*	*4%*	*2%*	*2%*
India exports	Mt	61	98	88	70	53	28
growth	%	*-17%*	*60%*	*-10%*	*-20%*	*-24%*	*-48%*
Other exports	Mt	127	119	130	139	150	158
Total seaborne iron ore supply	**Mt**	**810**	**890**	**941**	**985**	**1,027**	**1,100**
growth	%	*5%*	*10%*	*6%*	*5%*	*4%*	*7%*
Global steel production (BOF)	Mt	891	847	1001	1061	1136	1225
growth	%	*-1%*	*-5%*	*18%*	*6%*	*7%*	*8%*
China steel production	Mt	455	516	583	613	642	676
growth	%	*1%*	*13%*	*13%*	*5%*	*5%*	*5%*
China iron ore production	Mt	785	875	1,050	1,124	1,180	1,215
China iron ore imports	Mt	444	628	599	641	671	715
growth	%	*16%*	*41%*	*-5%*	*7%*	*5%*	*7%*
Japan imports	Mt	140	109	132	136	140	140
growth	%	*1%*	*-22%*	*21%*	*3%*	*3%*	*0%*
S. Korea & Taiwan imports	Mt	65	53	69	77	82	81
growth	%	*5%*	*-19%*	*31%*	*11%*	*7%*	*-1%*
European imports	Mt	134	87	119	121	123	125
growth	%	*-4%*	*-35%*	*37%*	*1%*	*2%*	*2%*
Other imports	Mt	27	13	25	26	28	29
Total seaborne iron ore imports	**Mt**	**810**	**890**	**944**	**1,000**	**1,043**	**1,091**
growth	%	*5%*	*10%*	*6%*	*6%*	*4%*	*5%*
Notional market balance	**Mt**	**0**	**0**	**-3**	**-15**	**-17**	**9**
China imported fines (62% CFR)	**USD/t**	**149.2**	**79.8**	**146.6**	**175.0**	**180.0**	**120.0**

Source: Deutsche Bank

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Coking Coal

A market of extremes

The potential shortage in the coking coal market could become extreme over the course of the current quarter; just as extreme is the cause, unprecedented flooding which has devastated large parts of Queensland Australia over the past several weeks. We expect that the market for coking coal could tighten to such an extent that significant volumes of steel production are negatively impacted. Thus there could be ancillary impacts in other markets, particularly steel and iron ore, but also thermal coal (high/medium rank thermal may be used as a proxy for coking coal).

While challenging to predict, we expect that the flooding may meaningfully impact coking coal output from Australia for two months. Flood levels remains high although there is evidence that in many places it is starting to recede. Nevertheless, the damage to mines (ground conditions) and mine equipment may result in a considerable delay in returning to normal output rates; this of course depends on how quickly the flood levels receded, which itself is dependent on weather conditions over the next month.

Australian miners are better prepared vs. the previous flooding which impacted the region in early 2008. Many miners will use de-watering equipment to facilitate the rehabilitation of mining operations more quickly than that experienced historically.

We expect that the seaborne coking coal market could loose approximately 18mt of total volume this year due to the event.

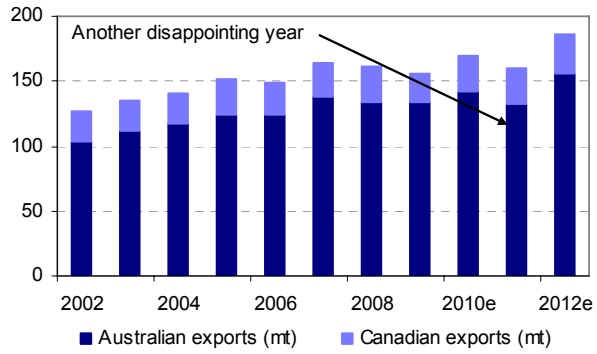
This will exacerbate the deficit we had already forecast for this market in 2011. A deficit brought on by growing demand from the Emerging World (particularly India, Brazil and China) and resilient demand from the West. Supply growth from Canada is likely to decelerate in 2011 after a strong 2010.

The US in fact may be a key source of marginal supply but will likely be constrained by port capacity on the east and gulf coasts. Notwithstanding, we now expect exports to exceed 50mt this year.

On the back of our expectation of a larger market deficit in coking coal in 2011, we have upgraded our calendar-year forecast to USD265/t (this assumes that Q2 contracted coal reaches USD300/t).

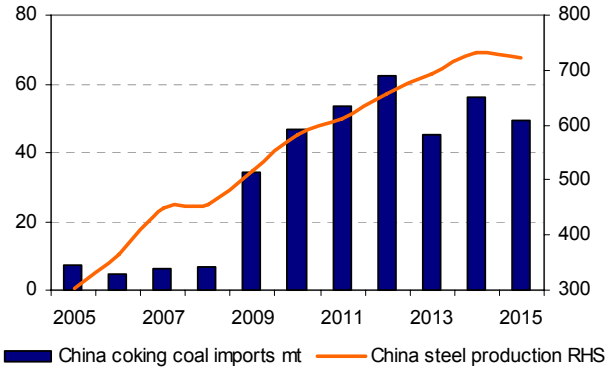
We expect spot coking coal pricing to retrace in Q2, but remain supported at the USD260-275/t level over the following year.

Figure 1: Export trend for Australia/Canada



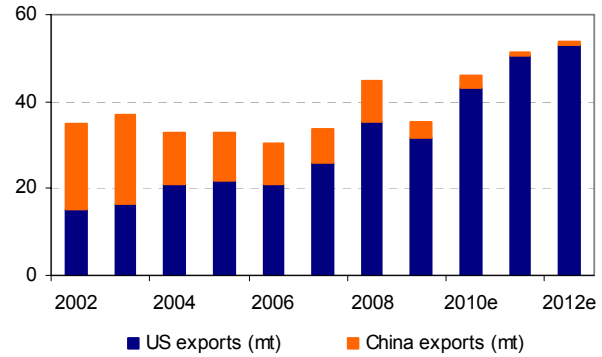
Source: AME, McCloskey's, Bloomberg Finance LP, Deutsche Bank

Figure 2: China coking coal imports & steel prod'n



Source: AME, McCloskey's, Bloomberg Finance LP, Deutsche Bank

Figure 3: Marginal supply: US vs. China



Source: AME, McCloskey's, Bloomberg Finance LP, Deutsche Bank

Coking coal

Key areas of supply growth will be scarce in 2011 in our view; with the US one of the few regions that may be able to take advantage of what could potentially be record coking coal prices.

We expect that steel production is very likely to be adversely impacted by the decline in coking coal availability. We currently expect a meaningful deceleration in steel production from China this year, with growth of about 5% vs. around 13% last year. This will allow China to see significant deceleration in coking coal imports in 2011; we expect that Chinese steel production is more likely to be impacted by power availability issues within the country, environmental pressures and the impact of higher interest rates as the PBOC looks to minimise inflationary pressures.

Figure 4: Global seaborne coking coal supply/demand model

		2008	2009	2010e	2011e	2012e	2013e
Australian exports	Mt	134	134	142	133	156	162
growth	%	*-2%*	*0%*	*6%*	*-7%*	*4%*	*4%*
Canadian exports	Mt	27	22	27	28	30	32
growth	%	*0%*	*-18%*	*23%*	*4%*	*7%*	*7%*
US exports	Mt	35	32	43	51	53	53
growth	%	*36%*	*-10%*	*37%*	*17%*	*5%*	*0%*
China exports	Mt	10	4	3	1	1	1
growth	%	*22%*	*-59%*	*-23%*	*-67%*	*0%*	*0%*
Other supply	Mt	34	31	51	55	58	61
Global traded coking coal supply	**Mt**	**240**	**222**	**266**	**267**	**298**	**309**
growth	%	*1%*	*-8%*	*20%*	*0%*	*12%*	*4%*
Japanese imports	Mt	55	49	53	55	57	58
growth	%	*-7%*	*-12%*	*9%*	*3%*	*3%*	*2%*
Korea & Taiwan imports	Mt	33	27	30	35	38	39
growth	%	*9%*	*-16%*	*10%*	*17%*	*7%*	*5%*
European imports	Mt	68	44	56	57	58	59
growth	%	*-3%*	*-35%*	*26%*	*1%*	*2%*	*2%*
China imports	Mt	7	34	47	54	62	45
growth	%	*10%*	*403%*	*36%*	*14%*	*16%*	*-28%*
India imports	Mt	28	30	35	39	45	52
growth	%	*13%*	*6%*	*18%*	*9%*	*16%*	*15%*
Brazil imports	Mt	17	13	16	18	19	20
growth	%	*8%*	*-23%*	*29%*	*10%*	*6%*	*6%*
Other imports	Mt	33	23	27	30	34	33
Global traded coking coal demand	**Mt**	**241**	**221**	**265**	**287**	**313**	**306**
growth	%	*1%*	*-8%*	*20%*	*8%*	*9%*	*-2%*
Notional market balance	**Mt**	**0**	**0**	**0**	**-21**	**-15**	**3**
Contract Hard Coking Coal (JFY)	**USD/t**	**300**	**129**	**195**	**265**	**260**	**200**

Source: Deutsche Bank

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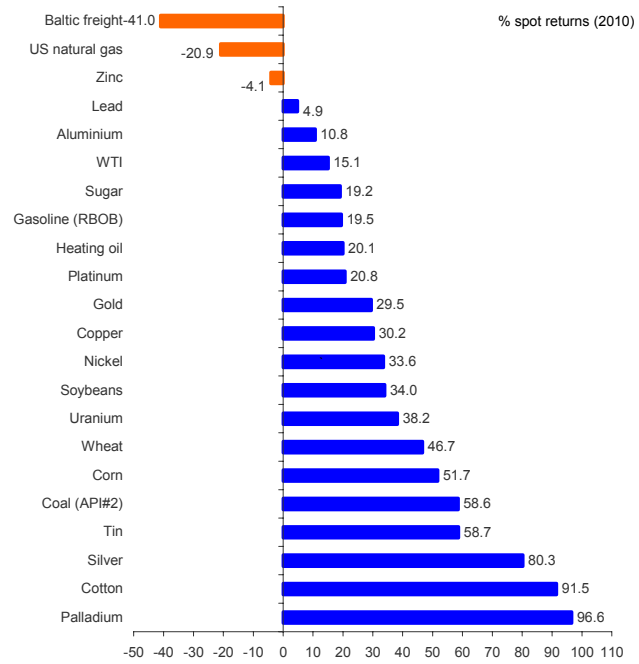
#18 Agriculture

Running Out Of Corn

- **We believe price risks are still skewed to the upside. However, unlike the beginning of last year the agricultural complex is not trading at significantly cheap levels of valuation, which we believe makes long positions slightly more hazardous at the start of this year than last.**
- **We view physical fundamentals in corn as extremely tight. Inventory to use ratios are precariously low, Chinese shortages are rising and the US ethanol industry is absorbing an increasing share of the US corn harvest. We believe price rallies in corn could therefore significantly exceed historical averages, which could mean prices moving towards USD8/bushel this year.**
- **In an environment of strong Chinese demand for soybeans, we believe upside price risks will be sustained if Argentinean droughts trigger further downgrades to domestic soybean production and/or if soybeans in the US lose acreage to corn or wheat.**
- **US framers' planting intentions will be announced at the end of March. We believe any reduction in soybean acreage would deliver a new leg to the soybean rally.**
- **Wheat prices have been driven higher by droughts in the former Soviet Union and a decision to ban exports in Russia. Production problems have also occurred in the EU, Canada and Australia due to too much rain. However, in the absence of any further supply disruptions we would expect wheat to under-perform relative to corn and soybeans given the more generous level of inventories.**
- **Cotton was the world's best performing commodity last year in terms of spot price performance. Price advances were in part triggered by rising shortages in China. Behavioural finance theory would suggest investors need to be wary of past winners as they have a habit of turning into future losers. We are on alert for a reduction in Chinese cotton imports and a possible rebound in India exports in the next crop year.**
- **In contrast, cocoa is the only agricultural commodity price trading at a discount to its long run historical average in real terms. It is therefore under-pricing any negative supply event in the Ivory Coast, Ghana or Indonesia.**

At the beginning of last year we outlined the bullish case for the agricultural complex. We stated that the sector was trading cheap in an environment where inventories were low. Since then the agricultural sector has performed strongly, Figure 1. However, the outlook for the sector is slightly more hazardous this year as valuations have moved back to more normal levels and as some supply shocks fade. We are therefore becoming more selective in our recommendations to the complex.

Figure 1: 2010 commodity scorecard



Source: Deutsche Bank, Bloomberg Finance LP

Figure 2 examines price rallies of seven agricultural commodities since 1972. We compare the average price rally in US dollar terms, percentage terms and duration terms and compare these with the most recent rally to assess where prices may have further room to appreciate or may be starting to move into overbought territory.

We find that price rallies in the agricultural sector tend to average 140% from trough to peak and are approximately 20 months in duration. In comparison, rallies in the energy and metals sector tend to be 2-3 years in duration and around 300% in magnitude. We believe the smaller magnitude and shorter durations of rallies in the agricultural sector reflect the more rapid supply response compared to the metal and energy sectors. For example, it can take anywhere between five and seven years to bring a new mine from discovery to production while agricultural production can recover within a 12 to 24 period.

Figure 2: Agricultural price rallies since 1972 compared

		Change (USD)	Change (%)	Duration (months)
Corn	Average	2.46	129%	17
	Current	*3.04*	*94%*	*7*
Wheat	Average	3.77	165%	26
	Current	*3.78*	*88%*	*7*
Soybeans	Average	5.72	127%	15
	Current	*4.33*	*47%*	*7*
Sugar	Average	13.7	219%	22
	Current	*20.7*	*152%*	*7*
Coffee	Average	1.34	218%	16
	Current	*1.39*	*137%*	*24*
Cocoa	Average	16.68	171%	26
	Current	-	-	-
Cotton	Average	0.45	111%	22
	Current	*1.19*	*298%*	*21*

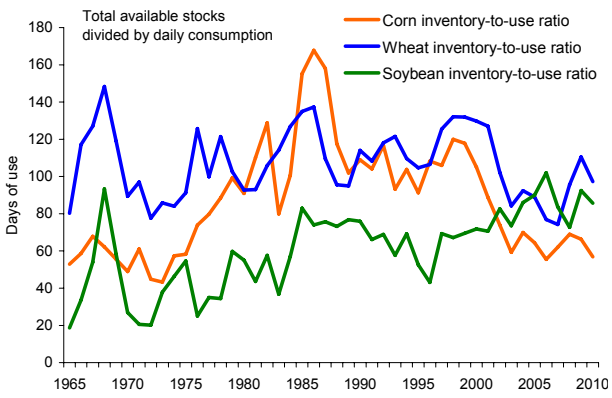
Average rallies relate to trough to peaks since 1972
Source: Deutsche Bank, Bloomberg Finance LP

We also find that rallies in corn, soybeans and coffee tend to be shorter in duration than wheat, cocoa, sugar and cotton. Meanwhile rallies are typically more powerful in magnitude for sugar and coffee than cotton, soybeans and corn. According to historical averages, the current price rallies in corn and soybean are still in their infancies. Indeed for the current corn rally to match historical averages would require corn prices rising a further 20% to USD7.85/bushel by October. In soybeans, prices would have to rise to over USD20/bushel or an additional 50% by July 2011 in order to conform to historical norms.

We believe underlying physical fundamentals in corn and soybeans justifies further price advances. In corn, we expect price gains will be triggered by a combination of factors. First, inventory-to-use ratios are at multi decade lows, Figure 3. In fact global corn inventories are equivalent to just 57 days of consumption, close to its lowest since the mid-1970s.

In comparison, wheat inventories are close to historical averages. As a result, in the absence of any new negative supply events, we expect the weather induced rally in wheat prices to fade during the coming year. Indeed we believe the effect of the Australian floods on domestic wheat production will be relatively modest since Queensland represents just 7% of the country's wheat production, with most of this having already been harvested.

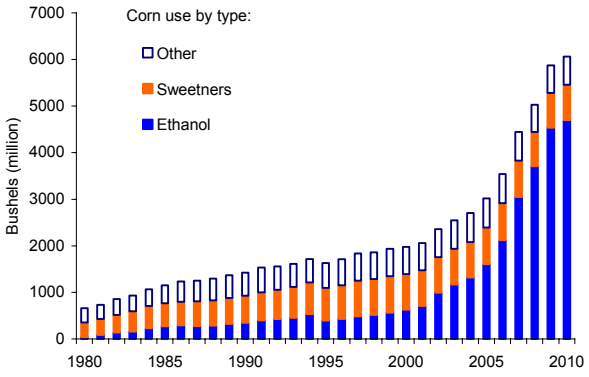
Figure 3: Inventory-to-use ratios in grains and beans



Source: USDA

Second, the US ethanol industry will remain an important source of global corn consumption growth. Despite close to record corn harvests in the US over the past four years, US corn exports have drop by 20% since 2007 as more domestic production stays at home to be used as a feedstock for ethanol, Figure 4. Today 37% of US corn production is used as a feedstock for ethanol compared to 23% three years ago.

Figure 4: Ethanol now represents the lion's share of corn use

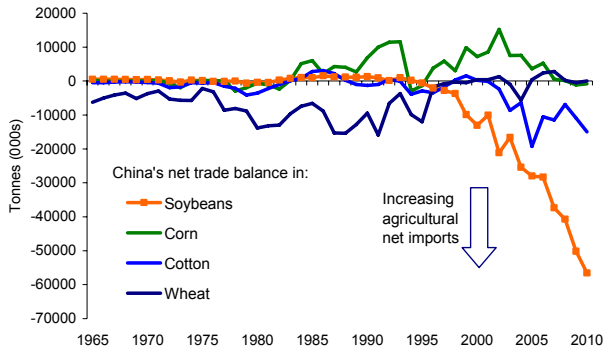


Source: USDA

We expect the demand for corn as a feedstock for ethanol will continue to grow. Last year the US Environmental Protection Agency approved raising the blend of ethanol in gasoline from 10% to 15%. At that stage, the increase was restricted to car and light trucks less than three years old and so affecting just 18% of the US car fleet. However, this year we expect the EPA will decide to extend the use of E15 for car and light truck models of up to 10 years old. This would then affect more than 50% of the US car fleet.

Third, China's agricultural trade position continues to deteriorate. Although the country's largest import requirements in agriculture are for soybeans and cotton, the country has more recently had to import corn, admittedly in small volumes. In the absence of adverse weather, Chinese corn imports are expected to be little changed in 2011 at just under 2 million tonnes.

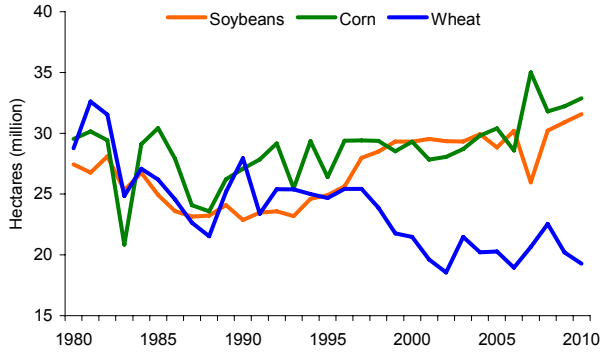
Figure 5: China's trade position in various agricultural commodities



Source: USDA

We believe the main risk to corn will come in the next crop year given the possibility that US farmers increase acreage. We find that over the past decade corn acreage in the US has been increasing steadily, Figure 6. We therefore recommend going long the Jul'11 vs. Dec'11 corn time spread to express tightening fundamentals today and the threat of higher acreage and production tomorrow.

Figure 6: Land harvested in the US by major crop



Source: USDA

One implication of an increase in corn acreage in the US would be the likelihood that soybean acreage is cut. Moreover the appearance of La Niña implies not only cold winters to the US and increased precipitation to Australia but also droughts during the South American growing season. Indeed dry conditions are already leading to downgrades to Argentinean corn and soybean production and alongside lower US acreage we believe this could deliver a new leg to the soybean rally.

Cotton: a strong performer in 2010

Cotton was among the world's best performing commodities in 2010 in terms of spot price performance. In fact since its 2009 lows, cotton prices have rallied by approximately 300%. Consequently, this is not only more than twice as powerful as the average of the nine bull runs since 1972, but, it also represents the most powerful rally in cotton prices on record. In terms of duration, at 21 months the rally is also one of the most durable.

We believe the main threats to the cotton outlook are a reduction in Chinese imports, an increase in US plantings and a rebound in India exports in the next crop year. This would also encourage a normalisation in ending stocks, which had hit critically low levels. Moreover, behavioural finance theory suggests investors need to be wary of asset classes or securities that have been past winners given their tendency to become future losers.

Conclusion

Long positions in the agricultural have become more hazardous entering 2010 given price rises across the sector. However, we view rallies as still in their infancies for corn and soybeans. We believe barring an unforeseen supply disruption wheat inventories are sufficiently high that this market will under-perform. We would view cotton as in danger of reversing recent price advances while cocoa is significantly under-pricing any unforeseen supply event in the Ivory Coast, Ghana or Indonesia.

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#19 Uranium

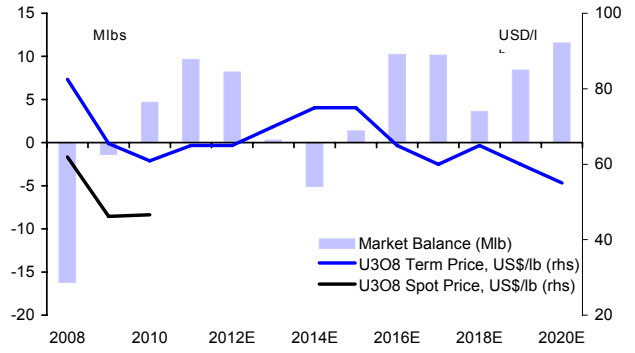
Surplus To Remain Until 2014

The spot and term uranium price finished at USD62.5/lb and USD65/lb respectively at the end of 2010 bouncing off their lows of USD40.75/lb and USD58/lb earlier in the year as opportunistic Chinese buying, producer buying (ERA and Cameco), seasonal utility demand and investor demand (ETC launch) created a short term market squeeze in 4Q10. Despite these events, we see limited upside in the spot and term price in 2011 and forecast an average term price of USD65/lb in 2011 and 2012. However, we do believe the uranium spot price has found a new floor at around USD50/lb and the term price at USD60/lb.

It appears that the price in 2011 will be driven by Chinese and Indian stockpiling, investor and producer purchasing, production disruptions and Kazakhstan supply. We see secondary supply (US DOE, Russian HEU) as having a smaller impact on price in 2011 than has been the case over the past few decades.

We forecast a market surplus of approx. 10Mlb in 2011 due to a further increase in Kazakhstan production from 46Mlb to 54Mlb, further production growth from Africa (Niger, Namibia) and a recovery in Australian production (Ranger and Olympic Dam). This should more than offset our forecast demand growth of 2.8% or 7Gw of net new generating capacity from China, India, Russia and Japan.

Figure 1: DB uranium market balance and term price forecasts



Source: Deutsche Bank, UxC, WNA

The Medium to Long Term – market to tighten in 2013 but supply wave hits in 2015

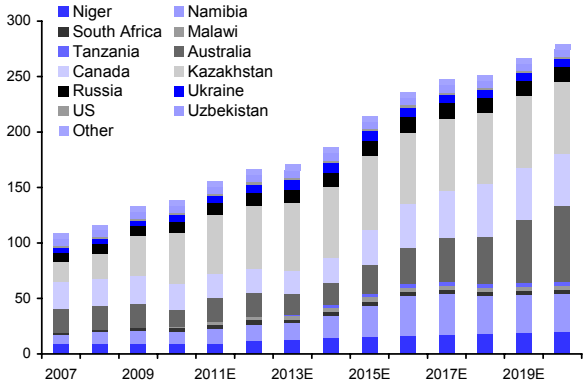
The market should tighten in 2013/14 with the expiry of the US USEC and Russian TENEX HEU agreement. This will coincide with a big lift in Chinese generating capacity. As a result we forecast an increase in the term price to US$75/lb by 2014. From 2015 onwards though expect a surplus to return as big projects such as Cigar Lake, Husab (Rossing South) and Imouaren reach full production. The expansion of Olympic Dam should ramp-up around 2019/20 with design capacity of around 40Mlbpa to be reached by 2025.

The big market drivers in 2011

1. **Kazakhstan supply growth – continues to beat forecasts**

In 2010 primary global mine supply increased by just 4.1Mlb to 136Mlb. The majority of the primary mine supply growth came from Kazakhstan once again, with production increasing from 36Mlb to 46Mlb. This offset production disruptions from Olympic Dam, Ranger, Langer Heinrich and Kayelekera to name a few. In 2011, Kazakh uranium production should increase to 54Mlb. We expect production to peak at 66Mlbpa in 2015.

Figure 2: Primary mine supply – Kazakhstan production continues to climb



Source: Deutsche Bank, UxC, WNA

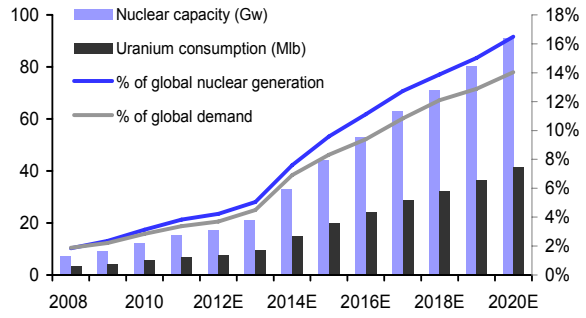
2. **Chinese buying and nuclear generating targets**

China may hold anywhere between 20-40Mlb of uranium in a strategic inventory. It seems obvious that the Chinese are price sensitive and opportunistic and may have pushed the spot price off its low of US$40.75/lb back in May 2010. Going forward we expect China to increase its spot purchases, particularly from Kazakhstan, however the clearing price for these volumes will likely continue to be extremely opaque. Recent term price deals with Areva and Cameco is simply supply diversification by the Chinese. Either way it appears that Chinese purchasing should increase further in 2011. However, putting Chinese purchases into perspective, by 2020 we forecast annual Chinese demand of around 41Mlbpa. Kazakhstan production alone could fulfill Chinese demand requirements.

China has currently 28 x 1Gw reactors either in construction or planning phase. By 2020, it is targeting 80Gw of total capacity, although we forecast 91Gw. Roughly 5 units will be constructed between 2011-2013 and 8-12 units between 2014 and 2020. By 2020 we

estimate that China will have around 17% of the installed global nuclear generating capacity.

Figure 3: Chinese uranium demand and forecast nuclear generating capacity

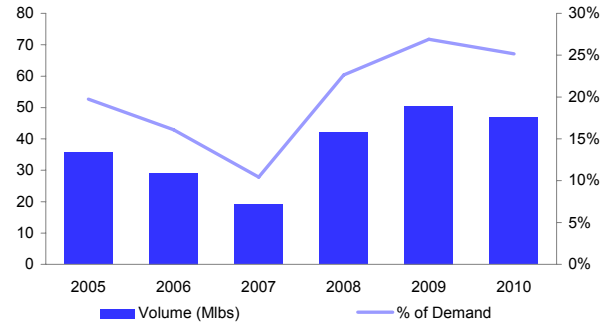


Source: Deutsche Bank, UxC, WNA

3. Financial demand

Spot volumes in 2010 totaled 47Mlb or 25% of total demand. The big spot market news of 2010 was the launch of a uranium ETC by a financial institution which generated new investor purchasing. We believe investor purchasing will continue to be a big factor in 2011.

Figure 4: Spot volumes remain around 25% of total demand



Source: Deutsche Bank, UxC, WNA

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Figure 5: DB Uranium Supply/Demand model

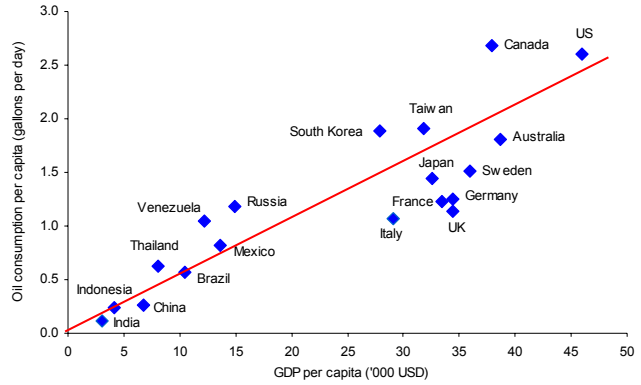
	Unit	2010	2011E	2012E	2013E	2014E	2015E	2020E
Existing mine supply	tonnes U	49,682	54,525	57,258	57,256	61,288	69,285	85,217
Existing mine supply	Mlbs	129.2	141.8	148.9	148.9	159.3	180.1	221.5
New mines (cumulative)	tonnes U	2,626	3,922	4,798	5,942	7,401	9,450	15,813
New mines (cumulative)	Mlbs	6.8	10.2	12.5	15.4	19.2	24.6	41.1
Total mine supply	tonnes U	52,308	58,446	62,056	63,198	68,689	78,735	101,030
Total mine supply	**Mlbs**	**136.0**	**152.0**	**161.3**	**164.3**	**178.6**	**204.7**	**262.7**
HEU Feed	tonnes U	4,616	4,616	4,616	4,616	0	0	0
USEC	tonnes U	385	385	385	385	0	0	0
Other Secondary Supply	tonnes U	16,047	13,816	13,116	12,962	14,539	13,501	11,962
Total Secondary Supply	tonnes U	21,047	18,816	18,116	17,963	14,539	13,501	11,962
Secondary Supply	**Mlbs**	**54.7**	**48.9**	**47.1**	**46.7**	**37.8**	**35.1**	**31.1**
Total Supply	tonnes U	73,355	77,263	80,172	81,161	83,228	92,236	112,992
Total Supply	**Mlbs**	**190.7**	**200.9**	**208.4**	**211.0**	**216.4**	**239.8**	**293.8**
Supply growth	**%**	**3.5%**	**5.3%**	**3.8%**	**1.2%**	**2.5%**	**10.8%**	**4.5%**
Global nuclear generating capacity	Mwe	383,671	390,804	402,600	416,665	434,270	459,543	551,453
New nuclear generating capacity less decommissions	Mwe	2,172	7,133	11,796	14,065	17,606	25,273	18,700
Reactor Requirements	tonnes U	66,758	68,298	70,850	74,623	78,296	84,454	100,264
Stockpiling	tonnes U	4,006	4,098	4,251	4,477	4,698	5,067	6,016
Investment demand	tonnes U	796	1,154	1,923	1,945	1,968	1,991	2,109
Total Demand	tonnes U	71,560	73,550	77,025	81,046	84,962	91,513	108,389
Total Demand	**Mlbs**	**186.0**	**191.2**	**200.3**	**210.7**	**220.9**	**237.9**	**281.8**
Demand growth	**%**	**0.2%**	**2.8%**	**4.7%**	**5.2%**	**4.8%**	**7.7%**	**3.5%**
Market Balance	Kt U	1795	3713	3148	115	-1733	723	4603
Market Balance	**Mlbs**	**4.7**	**9.7**	**8.2**	**0.3**	**-4.5**	**1.9**	**12.0**
U3O8 Spot Price - annual avg	**USD/lb**	**46.60**						
U3O8 Term Price - annual avg	**USD/lb**	**60.90**	**65.00**	**65.00**	**70.00**	**75.00**	**75.00**	**55.00**

Source: Deutsche Bank

Commodities Chartbook

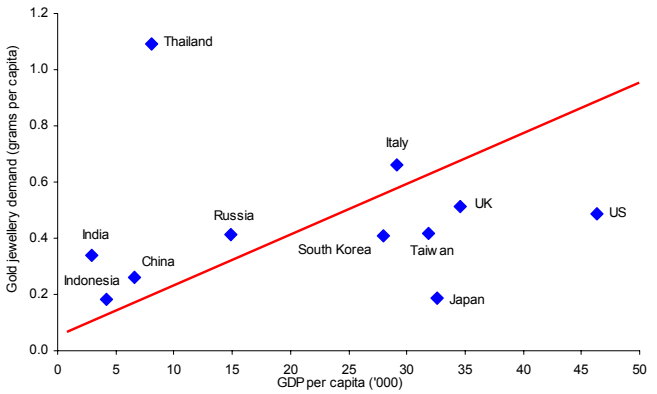
Commodity consumption around the world relative to per capita income

Figure 1: Oil consumption intensity



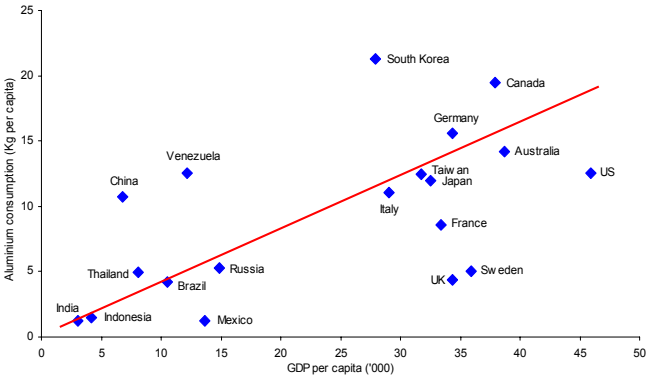
Source: DB Global Markets Research, IMF, IEA (2009)

Figure 2: Gold consumption intensity



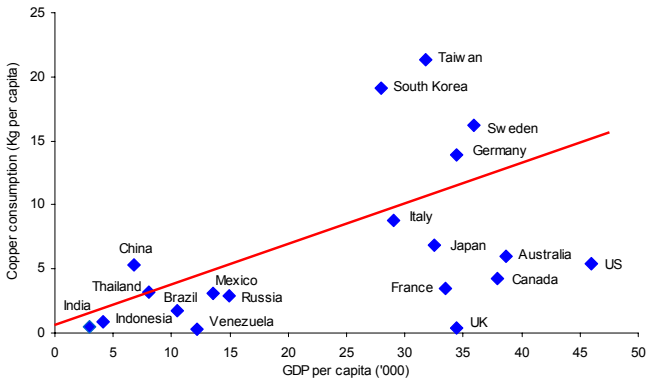
Source: DB Global Markets Research, WGC, IMF (2009)

Figure 3: Aluminium consumption intensity



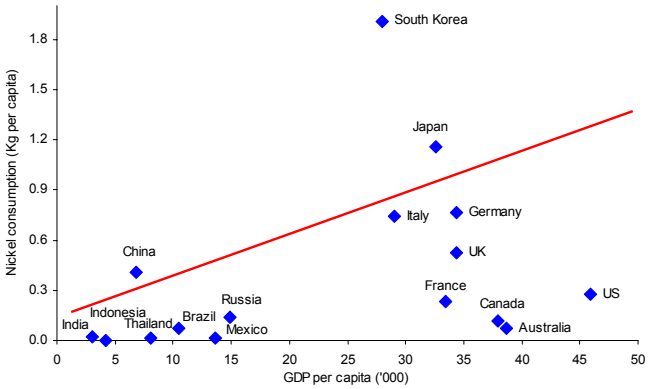
Source: DB Global Markets Research, IMF, WBMS (2009)

Figure 4: Copper consumption intensity



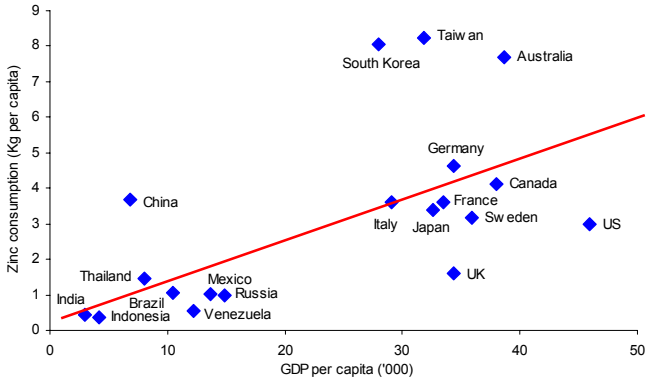
Source: DB Global Markets Research, IMF, WBMS (2009)

Figure 5: Nickel consumption intensity



Source: DB Global Markets Research, IMF, WBMS (2009)

Figure 6: Zinc consumption intensity

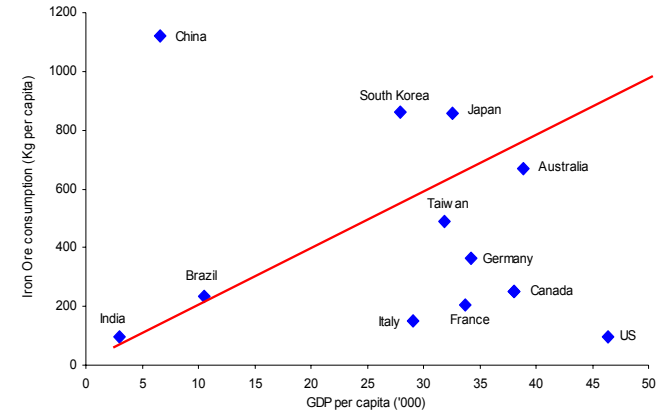


Source: DB Global Markets Research, IMF, WBMS (2009)

Commodities Chartbook

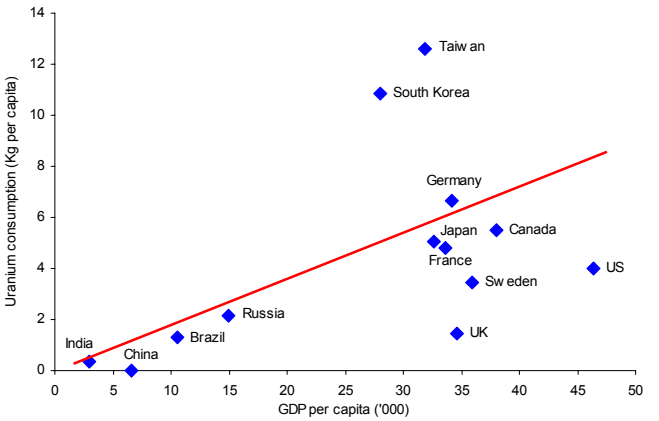
Commodity consumption around the world relative to per capita income

Figure 7: Iron ore consumption intensity



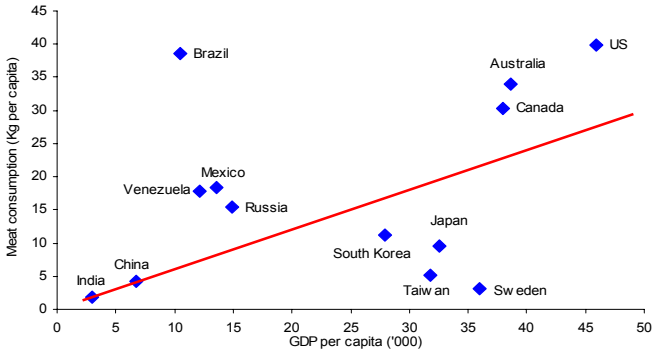
Source: DB Global Markets Research, AME, IMF (2009)

Figure 8: Uranium consumption intensity



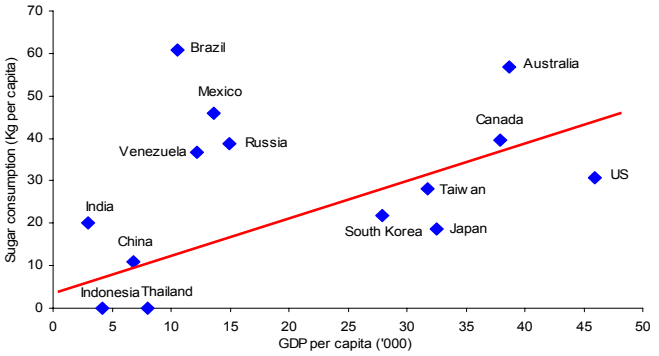
Source: DB Global Markets Research, (2009), IMF

Figure 9: Meat consumption intensity



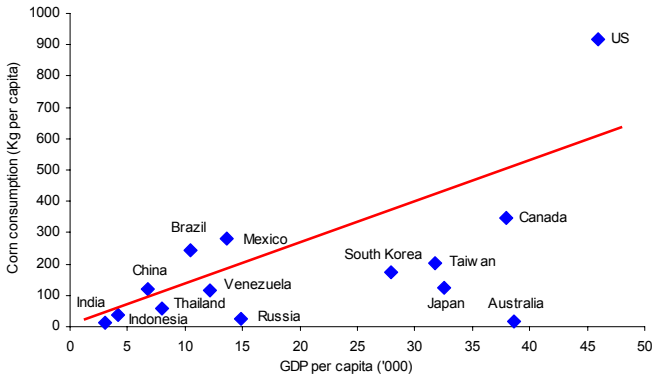
Source: DB Global Markets Research, USDA (2009), IMF

Figure 10: Sugar consumption intensity



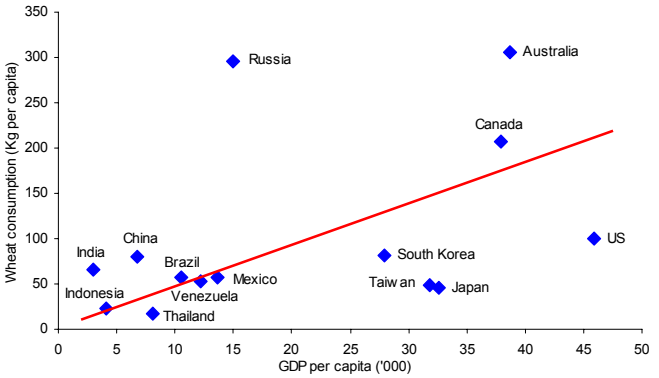
Source: DB Global Markets Research USDA (2009), IMF

Figure 11: Corn consumption intensity



Source: DB Global Markets Research, USDA (2009), IMF

Figure 12: Wheat consumption intensity

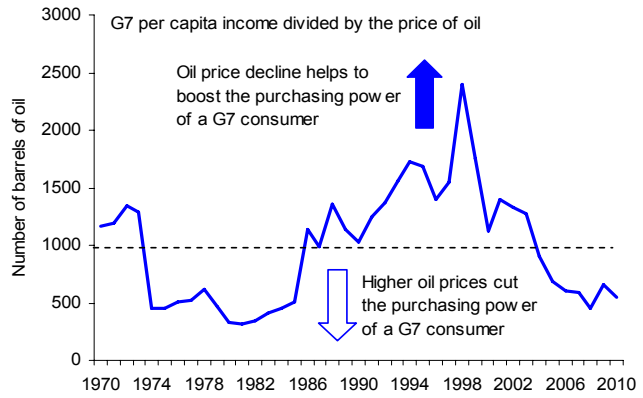


Source: DB Global Markets Research, USDA (2009), IMF

Commodities Chartbook

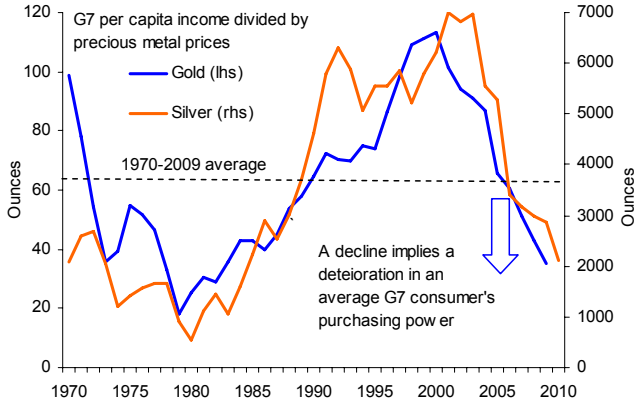
Commodities relative to G7 per capita income

Figure 1: Crude oil prices relative to per capita income



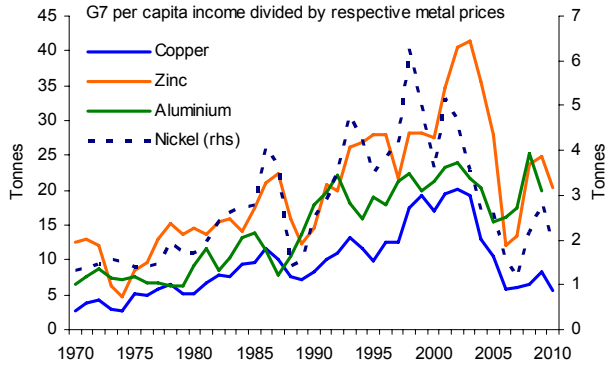
Source: DB Global Markets Research, IMF

Figure 2: Gold & silver prices relative to per capita income



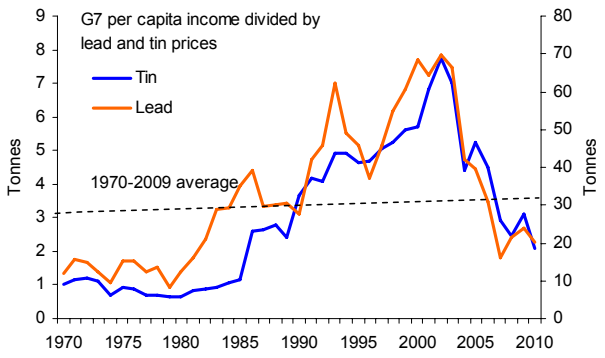
Source: DB Global Markets Research, IMF

Figure 3: Industrial metal prices relative to per capita income



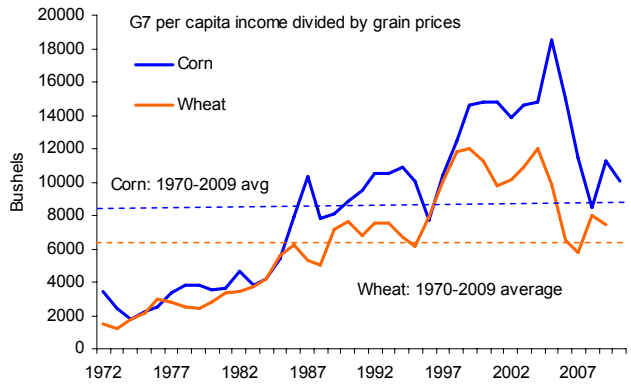
Source: DB Global Markets Research, IMF

Figure 4: Lead & tin prices relative to per capita income



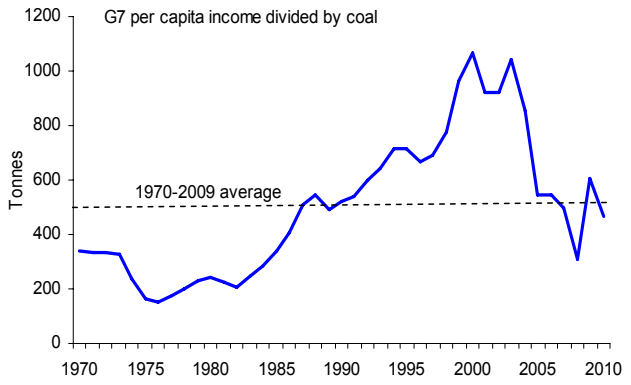
Source: DB Global Markets Research, IMF

Figure 5: Grain prices relative to per capita income



Source: DB Global Markets Research, IMF

Figure 6: Coal prices relative to per capita income

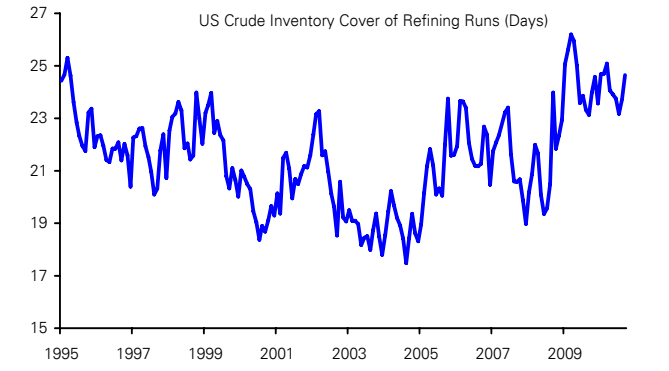


Source: DB Global Markets Research, IMF

Commodities Chartbook

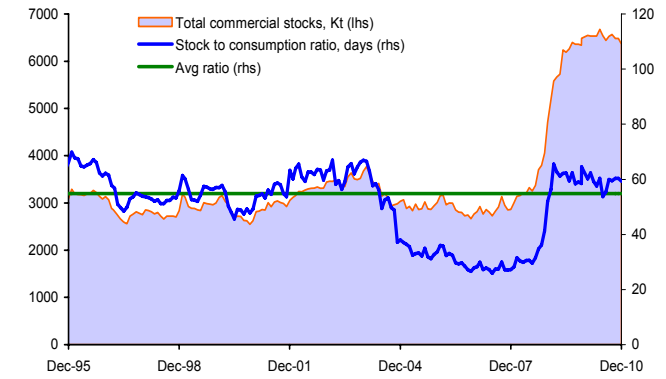
Commodity inventory-to-use ratios

Figure 1: US oil inventory-to-consumption ratio



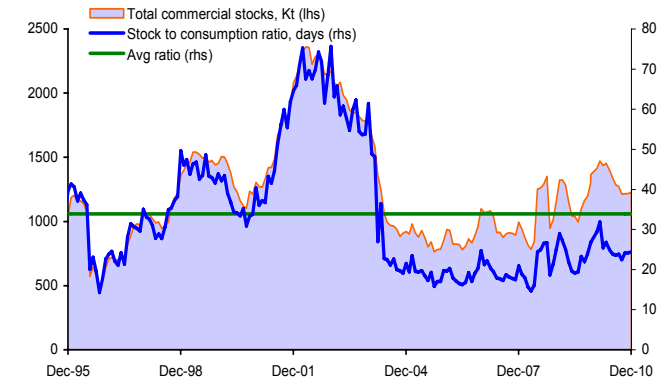
Source: IEA

Figure 2: Aluminium stock-to-consumption ratio



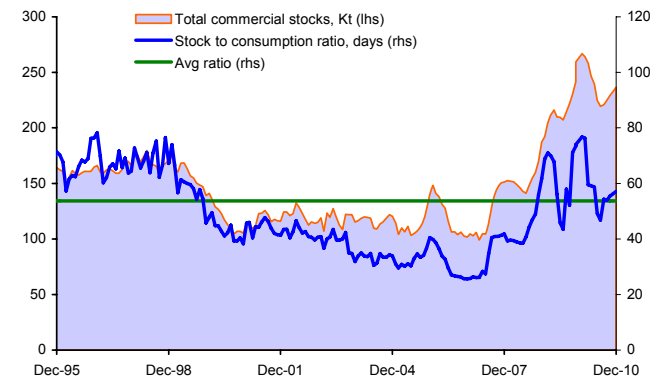
Source: Reuters, WBMS

Figure 3: Copper stock-to-consumption ratio



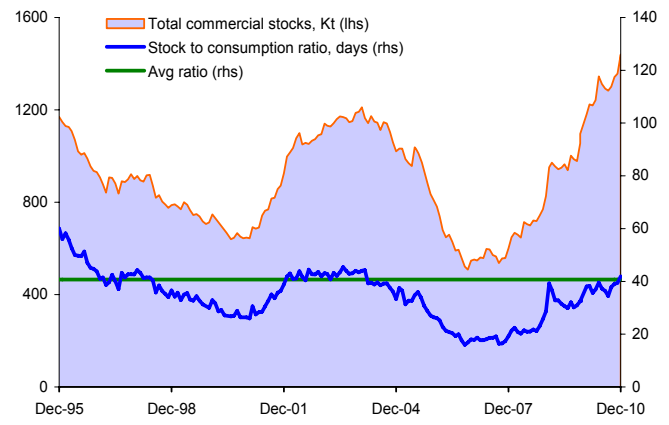
Source: Reuters, ICSG, WBMS

Figure 4: Nickel stock-to-consumption ratio



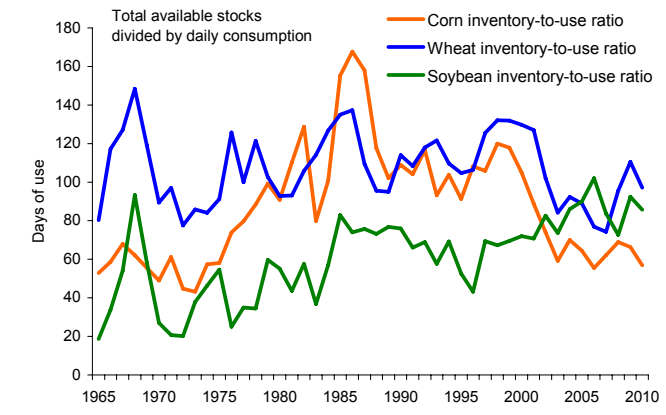
Source: Reuters, INSG, WBMS

Figure 5: Zinc stock-to-consumption ratio



Source: Reuters, ILZSG, WBMS

Figure 6: Corn, soybeans & wheat stock-to-consumption ratio

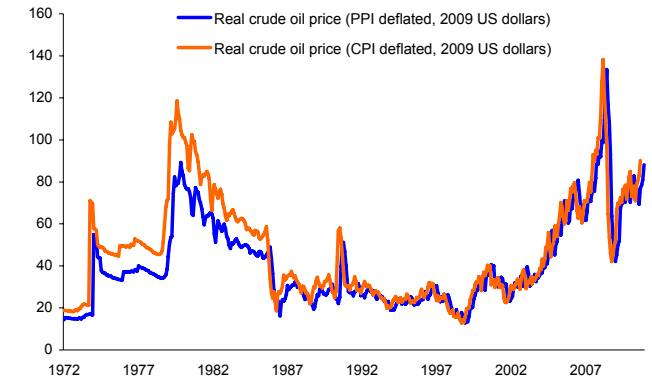


Source: USDA

Commodities Chartbook

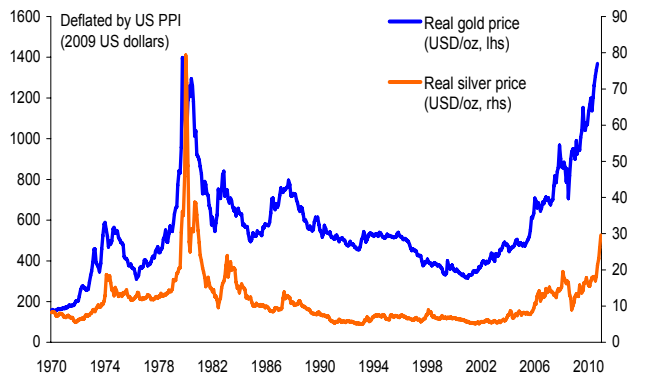
Commodities prices in real terms

Figure 1: Crude oil prices in real terms



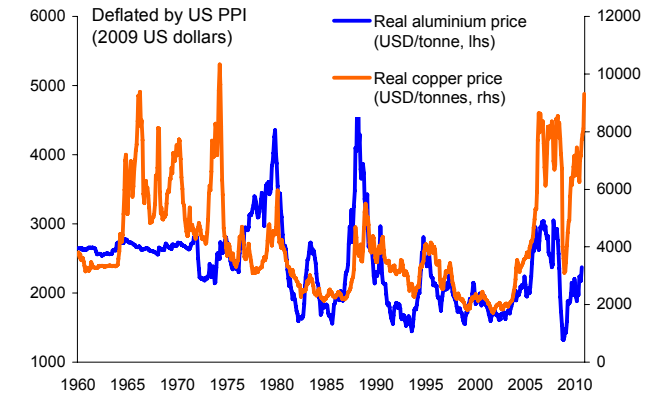
Source: IMF, Bloomberg Finance LP

Figure 2: Precious metal prices in real terms



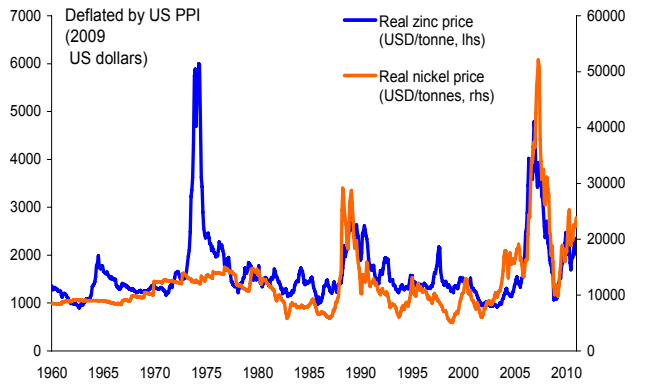
Source: IMF, Bloomberg Finance LP

Figure 3: Aluminium & copper prices in real terms



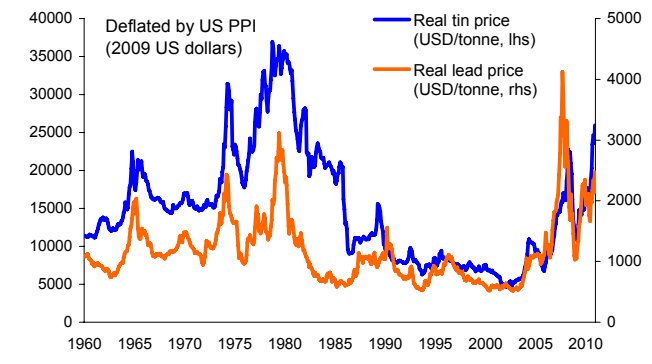
Source: IMF, Bloomberg Finance LP

Figure 4: Nickel & zinc prices in real terms



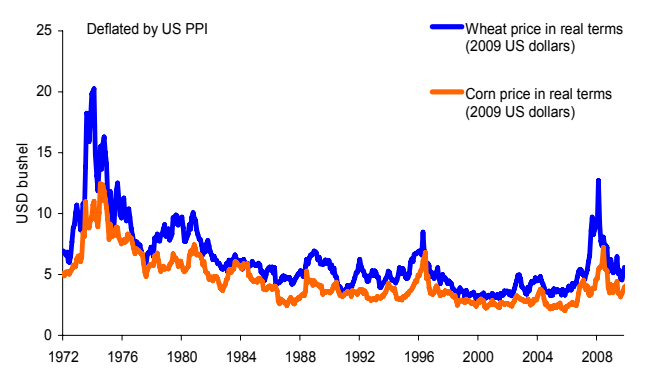
Source: IMF, Bloomberg Finance LP

Figure 5: Lead & tin prices in real terms



Source: IMF, Bloomberg Finance LP

Figure 6: Corn & wheat prices in real terms

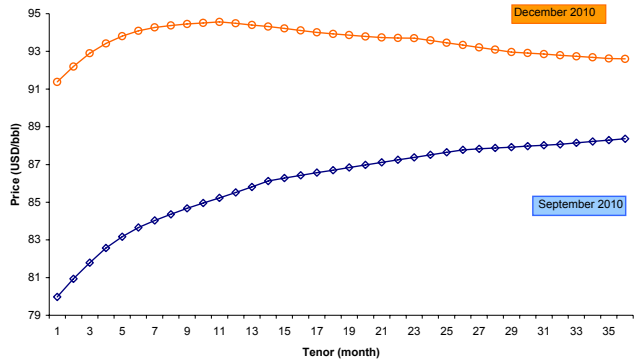


Source: IMF, Bloomberg Finance LP

Commodities Chartbook

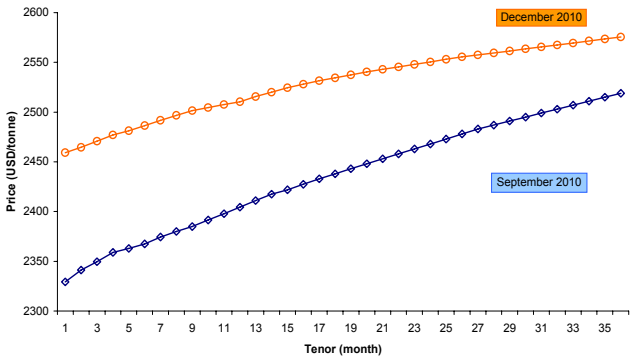
Commodity Forward Curves

Figure 1: WTI crude oil forward curve



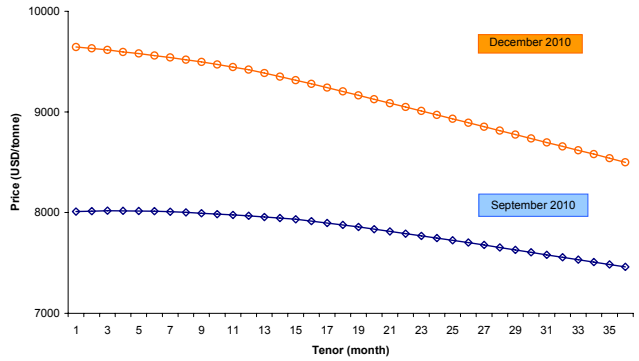
Source: DB Global Markets Research

Figure 2: Aluminium forward curve



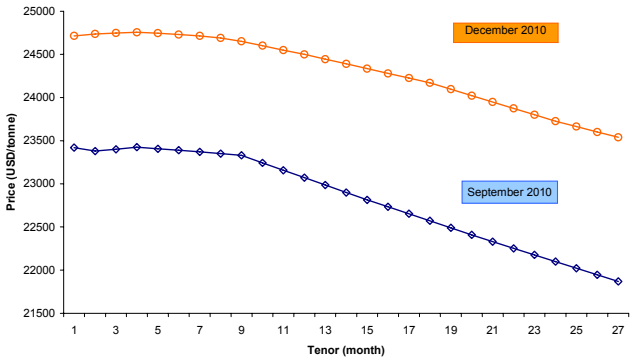
Source: DB Global Markets Research

Figure 3: Copper forward curve



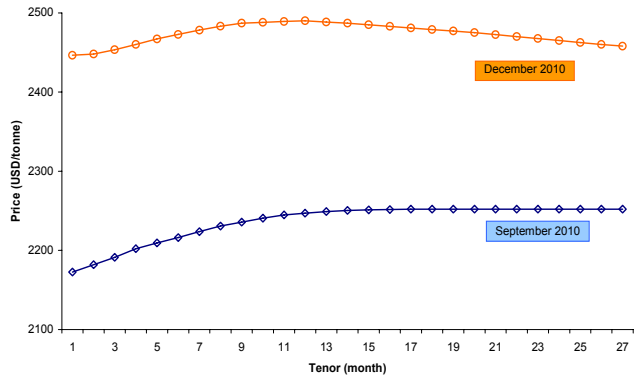
Source: DB Global Markets Research

Figure 4: Nickel forward curve



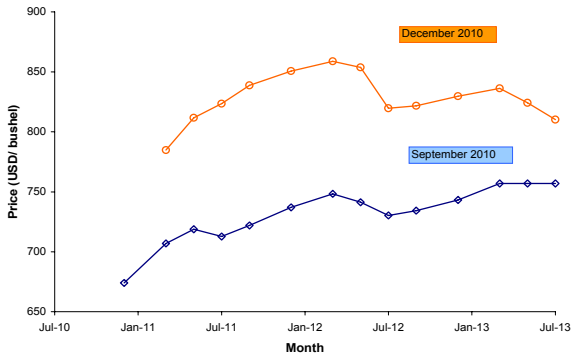
Source: DB Global Markets Research

Figure 5: Zinc forward curve



Source: DB Global Markets Research

Figure 6: Wheat forward curve

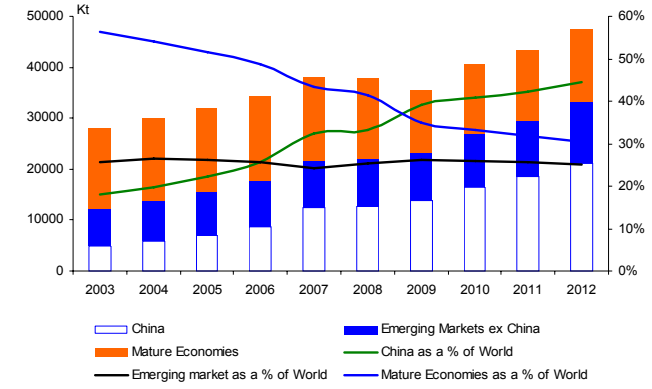


Source: DB Global Markets Research

Commodities Chartbook

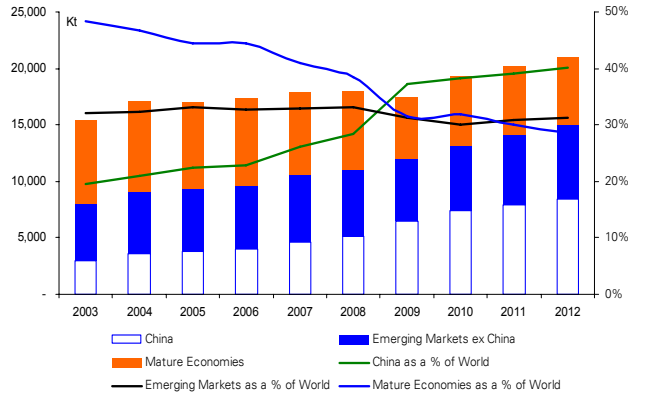
BRIC & OECD commodity demand

Figure 1: Aluminium demand



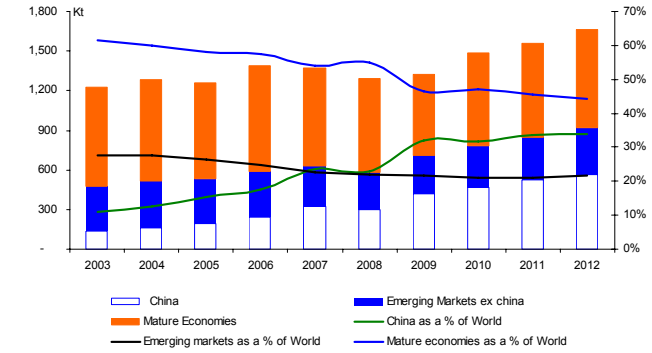
Source: DB Global Markets Research, Brook Hunt

Figure 2: Copper demand



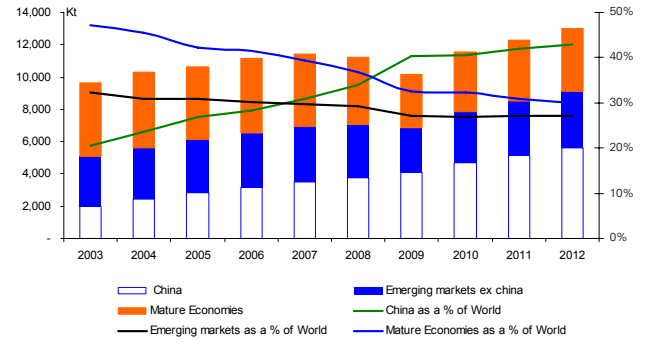
Source: DB Global Markets Research, Brook Hunt

Figure 3: Nickel demand



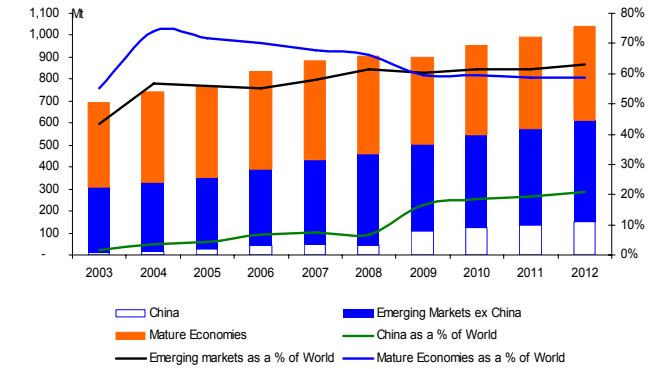
Source: DB Global Markets Research, Brook Hunt

Figure 4: Zinc demand



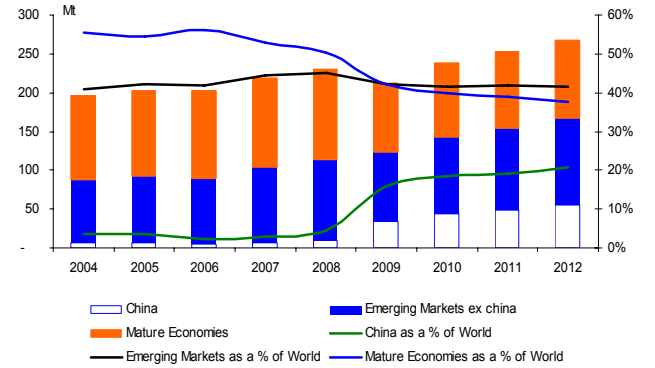
Source: DB Global Markets Research, Brook Hunt

Figure 5: Thermal coal demand



Source: DB Global Markets Research, AME

Figure 6: Metallurgical coal demand



Source: DB Global Markets Research, AME

Commodity Price Forecasts

Energy Commodities Price Forecasts

USD	Q1 11	Q2 11	Q3 11	Q4 11	Q1 12	Q2 12	Q3 12	Q4 12	2011	2012	2013	2014
WTI (bbl)	92.00	95.00	97.00	100.00	100.00	97.50	97.50	97.00	96.00	98.00	95.00	97.50
% Change from previous forecast	*22.7%*	*18.8%*	*21.3%*	*17.6%*	*17.6%*	*14.7%*	*14.7%*	*14.1%*	*20.0%*	*15.3%*	*5.6%*	*0.0%*
Brent (bbl)	94.00	96.00	98.00	100.00	100.00	97.50	97.50	97.00	97.00	98.00	95.00	97.50
% Change from previous forecast	*25.3%*	*20.0%*	*22.5%*	*17.6%*	*17.6%*	*14.7%*	*14.7%*	*14.1%*	*21.3%*	*15.3%*	*5.6%*	*0.0%*
RBOB gasoline (g)	2.40	2.45	2.50	2.60	2.60	2.50	2.50	2.50	2.49	2.55	2.50	2.55
% Change from previous forecast	*20.0%*	*16.7%*	*19.0%*	*15.6%*	*15.6%*	*11.1%*	*11.1%*	*11.1%*	*17.9%*	*13.1%*	*6.4%*	*0.0%*
Heating oil (g)	2.45	2.55	2.55	2.65	2.80	2.70	2.70	2.70	2.55	2.75	2.65	2.70
% Change from previous forecast	*22.5%*	*21.4%*	*21.4%*	*20.5%*	*27.3%*	*22.7%*	*22.7%*	*22.7%*	*21.4%*	*24.8%*	*15.2%*	*0.0%*
IPE gasoil (t)	770	785	800	815	815	795	795	795	793	800	845	865
% Change from previous forecast	*16.7%*	*11.3%*	*13.5%*	*7.9%*	*11.6%*	*8.9%*	*8.9%*	*8.9%*	*12.3%*	*9.6%*	*14.2%*	*0.0%*
Singapore Jet (bbl)	105	105	110	110	110	110	110	105	108	110	115	115
% Change from previous forecast	*23.5%*	*16.7%*	*22.2%*	*15.8%*	*10.0%*	*10.0%*	*10.0%*	*5.0%*	*19.4%*	*9.7%*	*4.5%*	*0.0%*
US Natural Gas (mmBtu)	4.25	4.25	4.00	4.75	5.25	5.00	5.25	5.50	4.31	5.25	5.50	5.75
% Change from previous forecast	*-9.6%*	*-9.6%*	*-2.4%*	*5.6%*	*0.0%*	*-4.8%*	*0.0%*	*4.8%*	*-4.2%*	*0.0%*	*0.0%*	*0.0%*
UK Natural Gas (p/th)	55.00	57.00	55.00	56.00	52.00	54.00	54.00	56.00	55.75	54.00	56.00	58.00
% Change from previous forecast	*34.1%*	*29.4%*	*37.5%*	*34.1%*	*20.9%*	*25.6%*	*25.6%*	*30.2%*	*32.7%*	*25.6%*	*24.4%*	*36.5%*
API4 (Richard's Bay) FOB (t)	125	115	120	125	130	135	145	150	121	140	115	90
% Chg from previous forecast	*13.6%*	*0.0%*	*0.0%*	*0.0%*	*-7.1%*	*-3.6%*	*3.6%*	*7.1%*	*3.2%*	*0.0%*	*0.0%*	*0.0%*
Uranium (U3O8) (lb) [term]	65	65	65	65	65	65	65	65	65	65	70	75
% Change from previous forecast	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*8.3%*	*8.3%*	*8.3%*	*8.3%*	*0.0%*	*8.3%*	*16.7%*	*25.0%*

Source: Deutsche Bank, Figures are period averages

Industrial Metals Price Forecasts

	Q1 11	Q2 11	Q3 11	Q4 11	Q1 12	Q2 12	Q3 12	Q4 12	2011	2012	2013	2014
Aluminium												
USc/lb	118.0	113.4	122.5	127.0	136.1	149.7	136.1	127.0	120.2	137.3	127.0	113.4
USD/t	2600	2500	2700	2800	3000	3300	3000	2800	2650	3025	2800	2500
% Chg from previous forecast	*7.2%*	*-12.7%*	*2.1%*	*5.9%*	*4.7%*	*15.2%*	*4.7%*	*-2.3%*	*0.2%*	*5.6%*	*27.0%*	*0.0%*
Copper												
USc/lb	431.0	453.7	476.4	499.1	544.5	589.8	499.1	453.7	465.1	521.8	453.7	363.0
USD/t	9500	10000	10500	11000	12000	13000	11000	10000	10250	11500	10000	8000
% Chg from previous forecast	*23.2%*	*21.0%*	*27.0%*	*24.8%*	*36.1%*	*47.5%*	*24.8%*	*13.4%*	*24.0%*	*30.4%*	*65.0%*	*0.0%*
Lead												
USc/lb	118.0	108.9	118.0	127.0	131.6	136.1	136.1	131.6	118.0	133.8	131.6	113.4
USD/t	2600	2400	2600	2800	2900	3000	3000	2900	2600	2950	2900	2500
% Chg from previous forecast	*18.0%*	*-9.3%*	*7.2%*	*15.5%*	*9.6%*	*13.4%*	*13.4%*	*9.6%*	*7.2%*	*11.5%*	*46.2%*	*0.0%*
Nickel												
USc/lb	1225.0	1134.3	1225.0	1361.2	1361.2	1451.9	1361.2	1270.4	1236.4	1361.2	1270.4	1134.3
USD/t	27000	25000	27000	30000	30000	32000	30000	28000	27250	30000	28000	25000
% Chg from previous forecast	*22.5%*	*3.1%*	*2.1%*	*4.7%*	*13.4%*	*21.0%*	*13.4%*	*5.9%*	*7.5%*	*13.4%*	*58.8%*	*0.0%*
Tin												
USc/lb	1225.0	1134.3	1225.0	1361.2	1451.9	1542.6	1361.2	1134.3	1236.4	1372.5	907.4	816.7
USD/t	27000	25000	27000	30000	32000	34000	30000	25000	27250	30250	20000	18000
% Chg from previous forecast	*53.1%*	*33.4%*	*44.1%*	*60.1%*	*61.3%*	*71.4%*	*51.2%*	*26.0%*	*47.6%*	*52.5%*	*21.0%*	*0.0%*
Zinc												
USc/lb	108.9	108.9	113.4	118.0	127.0	136.1	145.2	158.8	112.3	141.8	127.0	108.9
USD/t	2400	2400	2500	2600	2800	3000	3200	3500	2475	3125	2800	2400
% Chg from previous forecast	*8.9%*	*-12.9%*	*-5.5%*	*2.6%*	*-2.3%*	*4.7%*	*11.7%*	*22.2%*	*-2.4%*	*9.1%*	*27.0%*	*0.0%*

Source: Deutsche Bank, Figures are period averages

Commodity Price Forecasts

Precious Metals Price Forecasts

USD/oz	Q1 11	Q2 11	Q3 11	Q4 11	Q1 12	Q2 12	Q3 12	Q4 12	2011	2012	2013	2014
Gold	1450	1550	1650	1750	1850	2000	2000	2150	1600	2000	1800	1500
% Chg from previous forecast	*0.0%*	*10.7%*	*13.8%*	*16.7%*	*15.6%*	*25.0%*	*25.0%*	*34.4%*	*10.3%*	*25.0%*	*50.0%*	*0.0%*
Silver	30.85	36.05	40.24	43.75	46.25	50.00	50.00	53.75	37.72	50.00	40.00	30.00
% Chg from previous forecast	*28.5%*	*80.2%*	*61.0%*	*68.3%*	*65.2%*	*78.6%*	*78.6%*	*92.0%*	*55.6%*	*78.6%*	*100.0%*	*0.0%*
Platinum	1750	1850	1800	2000	2150	2300	2350	2400	1850	2300	1950	1800
% Chg from previous forecast	*0.0%*	*5.7%*	*2.9%*	*14.3%*	*16.2%*	*24.3%*	*27.0%*	*29.7%*	*5.7%*	*24.3%*	*39.3%*	*0.0%*
Palladium	750	850	900	1000	1150	1250	1350	1450	875	1300	900	850
% Chg from previous forecast	*29.3%*	*46.6%*	*55.2%*	*72.4%*	*76.9%*	*92.3%*	*107.7%*	*123.1%*	*50.9%*	*100.0%*	*125.0%*	*0.0%*
Rhodium	2400	2600	2500	2500	2700	3500	4000	3800	2500	3500	2700	3200
% Chg from previous forecast	*-4.0%*	*4.0%*	*0.0%*	*0.0%*	*-3.6%*	*25.0%*	*42.9%*	*35.7%*	*0.0%*	*25.0%*	*8.0%*	*18.5%*

Source: Deutsche Bank, Figures are period averages

Minor Metals Price Forecasts

	Q1 11	Q2 11	Q3 11	Q4 11	Q1 12	Q2 12	Q3 12	Q4 12	2011	2012	2013	2014
Molybdenum (USD/lb)	17.00	20.00	24.00	25.00	25.00	25.00	25.00	25.00	21.50	25.00	20.00	16.00
% Chg from previous forecast	*-22.7%*	*-25.9%*	*-7.7%*	*0.0%*	*25.0%*	*25.0%*	*25.0%*	*25.0%*	*-14.0%*	*25.0%*	*33.3%*	*0.0%*

Source: Deutsche Bank, Figures are period averages

Bulk Materials Price Forecasts

	Q1 11	Q2 11	Q3 11	Q4 11	Q1 12	Q2 12	Q3 12	Q4 12	2011	2012	2013	2014
Iron Ore Spot Landed Fines Price in China CIF (t)	180	160	175	185	180	180	180	180	175	180	120	100
% Chg from previous forecast	50.0%	28.0%	34.6%	23.3%	33.3%	33.3%	33.3%	33.3%	33%	33%	20%	0%
Hard Coking Coal JFY (t)	225	300	275	260	260	260	260	260	265	260	200	160
% Chg from previous forecast	28.6%	50.0%	22.2%	4.0%	4.0%	4.0%	4.0%	4.0%	11%	4%	0%	0%
Low-volatile PCI JFY (t)	180	255	227	208	208	208	208	208	217	208	160	128
% Chg from previous forecast	12.5%	50.0%	22.6%	1.5%	-1.0%	-1.0%	-1.0%	-1.0%	14%	-1%	0%	2%

Source: Deutsche Bank, Figures are period averages

Agriculture Price Forecasts

USD/bushel	Q1 11	Q2 11	Q3 11	Q4 11	Q1 12	Q2 12	Q3 12	Q4 12	2011	2012	2013	2014
Corn	6.25	6.75	7.15	5.50	5.25	5.00	5.00	5.00	6.41	5.06	4.50	4.60
% Chg from previous forecast												
Wheat	7.75	8.00	8.00	7.00	6.75	6.25	7.00	6.75	7.69	6.69	6.50	6.60
% Chg from previous forecast												
Soybeans	13.50	14.00	12.70	12.10	11.85	11.35	10.90	10.50	13.08	11.15	10.00	10.12
% Chg from previous forecast												
Sugar (USc/lb)	30.00	27.50	22.50	22.00	20.00	22.00	22.00	23.00	25.50	21.75	19.50	20.00
% Chg from previous forecast												

Source: Deutsche Bank, Figures are period averages

Global Economic Indicators

	Real GDP % growth[b]			Consumer Prices % growth[c]			Current Account % of GDP[d]			Fiscal Balance % of GDP		
	2010F	2011F	2012F	2010F	2011F	2012F	2010F	2011F	2012F	2010F	2011F	2012F
US	2.9	3.1	3.4	1.6	1.7	1.9	-3.7	-4.1	-4.3	-8.8	-9.7	-6.9
Japan	4.2	0.6	1.7	-0.7	-0.6	-0.6	3.8	4.5	4.7	-6.8	-7.6	-7.6
Euroland	1.7	1.2	1.4	1.6	2.0	1.8	-0.6	0.0	0.4	-6.0	-4.8	-3.7
Germany	3.7	2.0	1.4	1.1	1.5	1.7	5.4	4.8	4.1	-3.7	-2.8	-2.0
France	1.5	1.2	1.6	1.7	1.7	1.6	-1.9	-2.2	-2.6	-7.6	-6.2	-4.8
Italy	1.1	0.9	1.2	1.6	2.1	1.9	-3.2	-2.8	-2.4	-5.0	-4.1	-3.1
Spain	-0.3	0.2	1.1	1.7	1.8	1.6	-5.0	-4.5	-3.6	-9.0	-6.5	-4.8
UK	1.8	2.2	2.0	3.2	3.1	1.7	-2.4	-2.0	-1.7	-9.5	-7.9	-4.4
Sweden	5.2	3.5	2.5	1.1	1.5	2.0	6.8	6.5	6.0	-1.0	-0.5	0.5
Denmark	2.1	2.4	2.0	2.3	2.0	2.0	5.0	4.0	3.5	-4.1	-3.5	-3.0
Norway	-0.3	1.5	2.5	2.3	1.5	2.0	12.8	12.9	13.0	6.8	7.5	8.5
Poland	3.8	3.9	3.5	2.8	3.1	2.6	-2.8	-3.2	-3.8	-7.9	-6.6	-5.7
Hungary	0.8	3.0	3.2	4.9	3.4	3.0	1.5	0.3	-0.4	-3.8	-2.9	-4.0
Czech Republic	2.4	2.3	3.1	1.4	1.9	2.0	-1.5	-1.0	-1.2	-5.2	-4.6	-4.2
Australia	2.7	3.2	3.1	2.9	2.9	3.0	-2.7	-2.7	-4.0	-4.5	-3.5	-2.2
Canada	2.9	2.6	3.2	1.8	2.3	2.4	-3.3	-3.6	-3.4	-3.5	-2.0	-1.7
Asia (ex Japan)	9.4	7.6	7.7	4.5	4.7	4.3	3.8	3.0	2.9	-3.2	-2.9	-2.4
India	9.8	8.2	8.5	9.2	6.9	6.7	-2.9	-3.0	-3.0	-8.5	-7.8	-7.2
China	10.0	8.7	8.4	3.3	4.1	3.5	4.8	4.1	3.6	-2.5	-2.0	-1.5
Latin America	5.7	4.1	4.1	8.3	8.0	6.8	-0.9	-1.5	-2.0	-2.3	-2.1	-2.0
Brazil	7.5	4.5	4.6	5.8	5.4	4.8	-2.4	-3.0	-3.7	-2.1	-2.2	-2.1
EMEA	4.5	4.5	5.0	7.7	7.1	6.8	0.5	-0.4	-1.2	-4.7	-3.4	-3.0
Russia	4.0	5.0	5.3	6.8	8.2	7.4	5.2	3.7	2.1	-4.0	-2.0	-1.7
G7	2.9	2.3	2.6	1.4	1.5	1.5						
World	4.8	3.9	4.2	3.1	3.3	3.1						

(a) Euroland forecasts as at the last forecast round on 10/12/10. Bold figures signal upward revisions, bold, underlined figures signal downward revisions. (b) GDP figures refer to working day adjusted data. (c) HICP figures for euro-zone countries and the UK (d) Current account figures for Euro area countries include intra regional transactions

Forecasts: G7 quarterly GDP growth

% qoq saar/annual: % yoy	Q1 10	Q2 10	Q3 10	Q4 10F	*2010F*	Q1 11F	Q2 11F	Q3 11F	Q4 11F	*2011F*	*2012F*
US	3.7	1.7	2.6	3.5	***2.9***	3.2	3.3	3.3	3.2	***3.1***	***3.4***
Japan	6.8	3.0	4.5	-2.0	***4.2***	-0.1	0.8	0.3	1.4	***0.6***	***1.7***
Euroland	1.5	4.0	1.5	0.7	***1.7***	0.8	0.9	1.1	1.3	***1.2***	***1.4***
Germany	2.3	9.5	2.8	1.6	***3.7***	1.5	1.1	1.3	1.4	***2.0***	***1.4***
France	0.8	2.4	1.2	0.9	***1.5***	1.0	0.8	1.6	1.5	***1.2***	***1.6***
Italy	1.7	1.9	1.0	0.8	***1.1***	1.0	0.7	0.8	1.4	***0.9***	***1.2***
UK	1.3	4.6	2.9	2.3	***1.8***	1.3	2.1	2.1	2.0	***2.2***	***2.0***
Canada	5.6	2.3	1.0	1.4	***2.9***	3.4	3.7	3.3	2.1	***2.6***	***3.2***
G7	3.6	3.0	2.7	1.9	***2.9***	2.0	2.2	2.2	2.3	***2.3***	***2.6***

Sources: National authorities, DB Global Markets Research

Glossary

API#2 – TFS API#2 ® average price index for coal delivered CIF ARA. A**PI#4** – TFS API#4 ® average price index for coal loading FOB Richards Bay, South Africa.

ARA: Amsterdam-Rotterdam-Antwerp – major delivery hub for cargo entering Northwest Europe.

ATS: Aviation Trading Scheme – this is a carbon-trading scheme for the aviation sector in the EU, and will run parallel to the broader EU-ETS from 2012. All flights entering and leaving the EU will be covered by the ATS from this date.

Bcf: Billion cubic feet – macro measure of natural gas volume.

Bunkers: Fuel oil used to power ships.

CAT: Cumulative average temperature. The sum of daily high + low)/2, usually over a month or season.

CDD: Cooling degree day – excess of daily average temperature over 65°F; usually cumulated over time.

CDM: Clean Development Mechanism – one of the Kyoto Protocol's two "flexible mechanisms" that allows carbon offsets known as CERs (Certified Emissions Reductions) to be produced. CERs can then be used in the EU-ETS for compliance purposes.

CIF: Cost, Insurance, and Freight – denotes commodity price delivered to destination, e.g. fuel oil CIF Rotterdam.

Clean Spread: The spark spread minus the cost of emissions.

Crack: Price spread between crude oil and refined product (after the refining process of "cracking" large molecules to make smaller).

DBLCI: Deutsche Bank Liquid Commodities Index – tracks six commodities, rolling positions in crude oil and heating oil monthly, and in gold, aluminum, corn and wheat once per year. Reuters: DBLCI. Bloomberg: DBCM. **DBLCI-MR**: DBLCI-Mean-reverting – rule-based variant of the above.

Distillate: Class of refined oil products including heating oil (aka gasoil) and diesel, and usually jet fuel and burning kerosene.

EUAs: European Unit Allowances – these are the carbon credits allocated for use in the EU-ETS, and can be supplemented with CERs and ERUs.

EU-ETS: The European Union' Emissions Trading Scheme – the EU's carbon-trading scheme for large industrial companies. Phase 1 of the ETS ran over 2005-07, Phase 2 runs over 2008-12, and Phase 3 will run over 2013-20.

FOB: Free on Board – denotes commodity price loaded and cleared for export at load port, e.g. coal FOB Richards Bay, South Africa.

Fuel oil (FO) – Dense refined oil product used to fuel ships and generating stations.

German Dark Spread: The spread between German power and coal -- Dark Spread = German power – coal/(2.65*EURUSD)

HDD: Heating degree day – deficit of daily average temperature below 65°F in US, 18°C elsewhere.

Henry Hub: Louisiana delivery point for NYMEX natural gas.

HSFO: High sulphur fuel oil.

JI: Joint Implementation Mechanism – one of the Kyoto Protocol's two "flexible mechanisms" that allows carbon offsets known as ERUs (Emissions Reduction Units) to be produced. ERUs can then be used in the EU-ETS for compliance purposes.

LNG: Liquefied natural gas – can be shipped on special-purpose tankers.

PADD: Petroleum Area of Defense District – US regions for petroleum market data, defined approximately as:

PADD1 – East coast
PADD2 – Midwest
PADD3 – Gulf coast
PADD4 – Inter-mountain west
PADD5 – West coast

Spark Spread: Price spread between electricity and the fuel (see also UK Spark Spread and German Dark Spread).

UK Spark Spread: The spark spread represents the marginal value of selling UK electricity and buying UK natural gas for a gas fired power station. Market standard UK Spark Spread = UK power – UK Natural Gas * 0.6944

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Correlation Matrix

Commodities Correlation Matrix

	CL	LCO	HU	HO	LGO	NG	MAL	MCU	HG	MNI	MZN	GC	PL	SI	W	C	DBLCI	DBLCI-MR	GSCI-TR	EUR	GBP	NOK	CAD	AUD	JPY	ED	ECU 3m	AUD 3m	SPX	iBOX
Light Crude		0.96	0.91	0.96	0.68	- 0.08	0.40	0.54	0.58	0.36	0.45	0.48	0.42	0.32	0.57	0.61	0.93	0.94	0.95	0.44	0.37	- 0.53	- 0.69	0.68	- 0.12	0.07	0.06	0.17	0.68	- 0.06
Brent	0.96		0.94	0.97	0.69	- 0.06	0.41	0.52	0.58	0.37	0.46	0.45	0.43	0.34	0.59	0.62	0.92	0.93	0.94	0.43	0.35	- 0.53	- 0.70	0.66	- 0.05	0.04	0.04	0.13	0.70	- 0.10
Unleaded Petrol	0.91	0.94		0.93	0.64	- 0.09	0.43	0.52	0.55	0.38	0.42	0.34	0.35	0.24	0.54	0.53	0.88	0.90	0.89	0.37	0.31	- 0.46	- 0.64	0.57	0.03	0.09	- 0.04	0.11	0.70	- 0.07
Heating Oil	0.96	0.97	0.93		0.69	- 0.12	0.39	0.51	0.56	0.37	0.45	0.39	0.39	0.26	0.53	0.58	0.90	0.92	0.93	0.42	0.36	- 0.52	- 0.68	0.64	- 0.01	0.04	0.06	0.12	0.70	- 0.12
Gas Oil	0.68	0.69	0.64	0.69		- 0.02	0.37	0.50	0.48	0.41	0.48	0.35	0.39	0.28	0.38	0.34	0.65	0.66	0.68	0.24	0.26	- 0.30	- 0.55	0.42	- 0.07	0.03	0.05	0.17	0.53	0.01
Natural Gas	- 0.08	- 0.06	- 0.09	- 0.12	- 0.02		0.23	0.16	0.10	0.25	0.11	0.23	0.26	0.23	0.33	0.10	0.10	0.08	0.09	0.22	0.18	- 0.14	- 0.14	0.11	- 0.22	0.13	0.11	0.06	0.05	0.27
LME Al	0.40	0.41	0.43	0.39	0.37	0.23		0.75	0.68	0.52	0.67	0.39	0.50	0.32	0.36	0.37	0.57	0.61	0.53	0.31	0.30	- 0.36	- 0.36	0.39	- 0.07	0.04	0.06	0.30	0.52	0.10
LME Cu	0.54	0.52	0.52	0.51	0.50	0.16	0.75		0.95	0.73	0.83	0.52	0.65	0.52	0.47	0.44	0.66	0.67	0.67	0.40	0.36	- 0.46	- 0.44	0.48	- 0.12	0.14	0.02	0.21	0.60	0.00
High Grade Copper	0.58	0.58	0.55	0.56	0.48	0.10	0.68	0.95		0.67	0.79	0.61	0.72	0.60	0.48	0.53	0.71	0.71	0.71	0.41	0.37	- 0.51	- 0.43	0.54	- 0.15	0.16	0.02	0.19	0.60	- 0.08
LME Nickel	0.36	0.37	0.38	0.37	0.41	0.25	0.52	0.73	0.67		0.65	0.41	0.54	0.42	0.41	0.42	0.52	0.52	0.52	0.33	0.31	- 0.45	- 0.39	0.36	- 0.08	- 0.00	- 0.06	0.16	0.52	0.12
LME Zinc	0.45	0.46	0.42	0.45	0.48	0.11	0.67	0.83	0.79	0.65		0.47	0.66	0.48	0.40	0.31	0.57	0.58	0.58	0.28	0.26	- 0.37	- 0.39	0.38	- 0.07	0.15	0.20	0.12	0.57	0.07
Comex Gold Future	0.48	0.45	0.34	0.39	0.35	0.23	0.39	0.52	0.61	0.41	0.47		0.79	0.85	0.48	0.47	0.61	0.55	0.59	0.31	0.40	- 0.44	- 0.35	0.60	- 0.57	0.06	0.08	0.08	0.31	0.25
NYMEX Platinum	0.42	0.43	0.35	0.39	0.39	0.26	0.50	0.65	0.72	0.54	0.66	0.79		0.86	0.46	0.44	0.56	0.53	0.58	0.31	0.28	- 0.45	- 0.35	0.52	- 0.47	0.01	0.16	0.07	0.39	0.20
Comex Silver	0.32	0.34	0.24	0.26	0.28	0.23	0.32	0.52	0.60	0.42	0.48	0.85	0.86		0.41	0.33	0.45	0.40	0.47	0.23	0.26	- 0.35	- 0.19	0.47	- 0.48	0.08	0.09	0.04	0.23	0.21
Wheat CBOT	0.57	0.59	0.54	0.53	0.38	0.33	0.36	0.47	0.48	0.41	0.40	0.48	0.46	0.41		0.70	0.72	0.70	0.69	0.28	0.27	- 0.39	- 0.45	0.40	- 0.13	0.08	0.06	- 0.05	0.52	0.16
Corn	0.61	0.62	0.53	0.58	0.34	0.10	0.37	0.44	0.53	0.42	0.31	0.47	0.44	0.33	0.70		0.77	0.74	0.74	0.39	0.34	- 0.52	- 0.45	0.54	- 0.20	0.09	- 0.01	0.03	0.44	- 0.02
DBLCI	0.93	0.92	0.88	0.90	0.65	0.10	0.57	0.66	0.71	0.52	0.57	0.61	0.56	0.45	0.72	0.77		0.99	0.99	0.47	0.45	- 0.60	- 0.69	0.70	- 0.14	0.11	0.05	0.15	0.73	- 0.01
DBLCI-MR	0.94	0.93	0.90	0.92	0.66	0.08	0.61	0.67	0.71	0.52	0.58	0.55	0.53	0.40	0.70	0.74	0.99		0.98	0.47	0.43	- 0.59	- 0.69	0.69	- 0.10	0.10	0.05	0.17	0.75	- 0.02
GSCI-TR	0.95	0.94	0.89	0.93	0.68	0.09	0.53	0.67	0.71	0.52	0.58	0.59	0.58	0.47	0.69	0.74	0.99	0.98		0.47	0.42	- 0.59	- 0.68	0.71	- 0.15	0.09	0.05	0.17	0.73	0.00
EUR	0.44	0.43	0.37	0.42	0.24	0.22	0.31	0.40	0.41	0.33	0.28	0.31	0.31	0.23	0.28	0.39	0.47	0.47	0.47		0.68	- 0.89	- 0.56	0.78	- 0.47	0.32	0.10	0.27	0.57	- 0.01
GBP	0.37	0.35	0.31	0.36	0.26	0.18	0.30	0.36	0.37	0.31	0.26	0.40	0.28	0.26	0.27	0.34	0.45	0.43	0.42	0.68		- 0.67	- 0.49	0.66	- 0.39	0.35	0.01	0.10	0.49	- 0.03
NOK	- 0.53	- 0.53	- 0.46	- 0.52	- 0.30	- 0.14	- 0.36	- 0.46	- 0.51	- 0.45	- 0.37	- 0.44	- 0.45	- 0.35	- 0.39	- 0.52	- 0.60	- 0.59	- 0.59	- 0.89	- 0.67		0.63	- 0.86	0.46	- 0.27	- 0.04	- 0.20	- 0.62	- 0.05
CAD	- 0.69	- 0.70	- 0.64	- 0.68	- 0.55	- 0.14	- 0.36	- 0.44	- 0.43	- 0.39	- 0.39	- 0.35	- 0.35	- 0.19	- 0.45	- 0.45	- 0.69	- 0.69	- 0.68	- 0.56	- 0.49	0.63		- 0.75	0.18	- 0.10	0.12	- 0.24	- 0.72	- 0.01
AUD	0.68	0.66	0.57	0.64	0.42	0.11	0.39	0.48	0.54	0.36	0.38	0.60	0.52	0.47	0.40	0.54	0.70	0.69	0.71	0.78	0.66	- 0.86	- 0.75		- 0.53	0.21	0.00	0.27	0.66	0.10
JPY	- 0.12	- 0.05	0.03	- 0.01	- 0.07	- 0.22	- 0.07	- 0.12	- 0.15	- 0.08	- 0.07	- 0.57	- 0.47	- 0.48	- 0.13	- 0.20	- 0.14	- 0.10	- 0.15	- 0.47	- 0.39	0.46	0.18	- 0.53		- 0.23	- 0.13	0.02	0.00	- 0.34
ED	0.07	0.04	0.09	0.04	0.03	0.13	0.04	0.14	0.16	- 0.00	0.15	0.06	0.01	0.08	0.08	0.09	0.11	0.10	0.09	0.32	0.35	- 0.27	- 0.10	0.21	- 0.23		0.16	0.09	0.16	0.11
ECU 3m	0.06	0.04	- 0.04	0.06	0.05	0.11	0.06	0.02	0.02	- 0.06	0.20	0.08	0.16	0.09	0.06	- 0.01	0.05	0.05	0.05	0.10	0.01	- 0.04	0.12	0.00	- 0.13	0.16		- 0.06	- 0.02	0.05
AUD 3m	0.17	0.13	0.11	0.12	0.17	0.06	0.30	0.21	0.19	0.16	0.12	0.08	0.07	0.04	- 0.05	0.03	0.15	0.17	0.17	0.27	0.10	- 0.20	- 0.24	0.27	0.02	0.09	- 0.06		0.20	0.05
SPX	0.68	0.70	0.70	0.70	0.53	0.05	0.52	0.60	0.60	0.52	0.57	0.31	0.39	0.23	0.52	0.44	0.73	0.75	0.73	0.57	0.49	- 0.62	- 0.72	0.66	0.00	0.16	- 0.02	0.20		- 0.05
iBOXX Euro Corp All	- 0.06	- 0.10	- 0.07	- 0.12	0.01	0.27	0.10	0.00	- 0.08	0.12	0.07	0.25	0.20	0.21	0.16	- 0.02	- 0.01	- 0.02	0.00	- 0.01	- 0.03	- 0.05	- 0.01	0.10	- 0.34	0.11	0.05	0.05	- 0.05	

Source: Deutsche Bank

This Pearson moment correlation matrix is calculated from the daily returns of the 60 most recent business days' data. For most, the first nearby futures contract is used. A roll adjustment is made by back-creating the price series according to the daily return of the prompt contract on the roll date. This avoids severe consequences for those commodities with significant term structure, where rolls introduce spurious jumps, which lower correlations. The shading scheme is as follows: numbers in interval [-0.4, 0.4] are unshaded; numbers in [-0.85, -0.4] and [0.4,0.85] have a light grey background; the highly correlated pairs (with a magnitude >=0.85) are shown with the darker grey.

Appendix 1

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