

Coal and carbon

Stranded assets: assessing the risk

HSBC Metals & Mining: Ratings and target prices

Stock	Ticker	Cur	Price	Target Price	Rating
Anglo	AAL.L	GBP	21.70	34.30	OW
BHP	BLT.L	GBP	18.64	20.50	N
RIO	RIO.L	GBP	30.51	44.60	OW
Xstrata	XTA.L	GBP	8.65	14.30	OW(V)

Source: Thomson Reuters DataStream, HSBC estimates; priced as at close of 19 June 2012.
Note: (V) = volatile (please see disclosure appendix)

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Nick Robins*

Analyst
HSBC Bank plc
+44 20 7991 6778 nick.robins@hsbc.com

Andrew Keen*

Analyst
HSBC Bank plc
+44 20 7991 6764 andrew.keen@hsbcib.com

Zoe Knight*

Analyst
HSBC Bank plc
+44 207 991 6715 zoe.knight@hsbcib.com

View HSBC Global Research at: <http://www.research.hsbc.com>

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- ▶ **To keep global warming below 2°C, coal demand could fall, notably after 2020**
- ▶ **We develop three scenarios to assess this risk for the UK mining majors, with XTA having the highest exposure**
- ▶ **For investors, this adds a new dimension to risk assessment for both corporate strategy and CAPEX plans**

Long-run risks for UK miners

Negotiations have begun for a new climate agreement to be finalised by 2015 and come into effect by 2020. To have a 50% chance of keeping warming below 2°C, scientists estimate that c1440Gt of CO₂ can be emitted between 2000 and 2050. A safer 80% chance cuts the carbon budget to 886GtCO₂; by 2010, just 565GtCO₂ was left.

This has potentially profound implications for the natural resources sector, notably producers of coal, the most carbon intensive fossil fuel. The IEA forecasts that coal demand would need to fall by c3.5% p.a. in the 2020s to meet the 2°C target. A recent report from Carbon Tracker concluded that the total embedded carbon potential of just the proven coal, gas and oil reserves stood at 2795GtCO₂ in 2010, considerably more than can be burned to meet climate goals.

These strategic risks have historically not been considered relevant for stock valuations by institutional investors. To assess the potential implications, we have constructed three scenarios for the UK mining majors. We believe that carbon constraints post-2020 could impact DCF valuations of coal assets by as much as 44%. The actual stock impact is then determined by company exposure to coal. The average impact would be c3-7%. XTA, with 33% of 2011 EBITDA from coal, could face a 7-15% downside risk, on our estimates.

For investors, these risks place a premium on mining companies with a diversified mix of mineral assets (including those that could benefit from low-carbon growth) and with management teams that effectively integrate carbon risks into CAPEX decisions. With investors in mining stocks arguing for the allocation of cash flow to capital returns over organic growth, the climate factor could tip the balance.

The carbon crunch

- ▶ Tomorrow's emissions are contained in today's fossil fuel reserves
- ▶ Proven coal, oil and gas reserves are greater than what can be safely exploited – and carbon capture remains delayed
- ▶ To hit climate targets, coal demand would need to fall after 2020 according to the IEA

Meeting the 2°C target

The financial crisis has certainly depressed global climate ambitions. But in 2010, governments set the political goal of holding global warming to 2°C above pre-industrial levels. To date, governments have not put together the package of measures to realise this objective – and current policies will only deliver half the emission cuts required by 2020. Last year, however, governments agreed on a new round of negotiations to close the emissions gap, with talks scheduled to finish in 2015 – and any new targets taking effect from 2020. The existence of the 2°C target enables investors to evaluate the long-term challenges facing their portfolios.

Curbing carbon

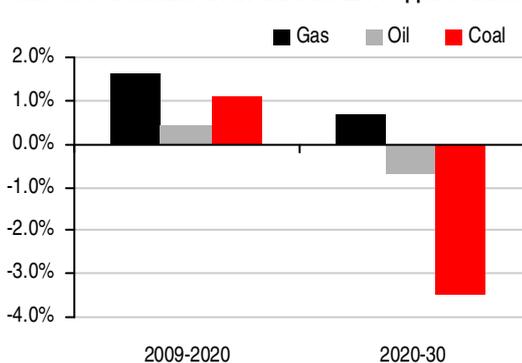
In our 22 March 2011 report, [Energy in 2050](#), we projected the transformation in demand and supply that will be required to power a three-fold expansion of the global economy while respecting environmental limits. We forecast in our low-carbon Solution scenario that world energy demand in 2050 would need to be 37% less than in our baseline – and only 23% above 2010 levels. The supply mix would also need to shift from 81% reliance on fossil fuels today to just 43% by mid-century. In addition, only 10% of the coal and 20% of the gas that is used in 2050 could be burned without carbon capture and storage. In all, we estimate that fossil fuel consumption will need

Nick Robins*
Analyst
HSBC Bank plc
+44 20 7991 6778
nick.robins@hsbc.com

Zoe Knight*
Analyst
HSBC Bank plc
+44 20 7991 6715
zoe.knight@hsbcib.com

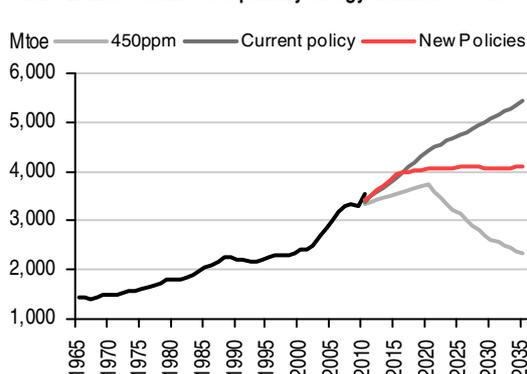
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Chart 1: Coal demand CAGR under the IEA 450ppm scenario



Source: IEA World Energy Outlook 2011

Chart 2: IEA Scenarios for primary energy demand of coal



Source: BP Statistical Review of World Energy, IEA World Energy Outlook 2011

to be 34% less than current levels to ensure climate security, and 66% lower than our baseline scenario. The implications are most severe for coal: gas is half as carbon intensive as coal-fired power generation.

IEA: avoiding carbon lock in

The International Energy Agency (IEA) energy outlooks have highlighted the growing gulf between climate security and conventional energy growth. In its 2011 *World Energy Outlook*, the IEA highlighted the high economic costs of delay, locking in the economy to a high-carbon energy model. This would then require costly remedial action such as shutting down coal-fired power plants before the end of their economic lifetime to meet climate targets.

Looking to 2020 and beyond, the IEA developed three energy scenarios. Its low-carbon scenario would keep atmospheric concentrations of CO₂ under 450 parts per million (PPM). This gives just a 50% chance of keeping warming below 2°C (450PPM scenario). This contrasts with the Current Policy scenario which models the implications of government policies in place by mid-2011. Its New Policies scenario is its central forecast, and is based on commitments and announced plans in addition to the Current Policies. This assumes, for example, that fossil fuel subsidies are phased out.

Chart 1 shows that under the 450 PPM scenario, coal, oil and gas demand would all grow up to 2020. But from 2020-2030, coal demand would fall in this scenario by 3.5% per annum, resulting in just 2,606 MTOE of coal demand, over 20% less than 2009 levels. Indeed, coal demand would peak at 3880mtoe in 2016 (Chart 2).

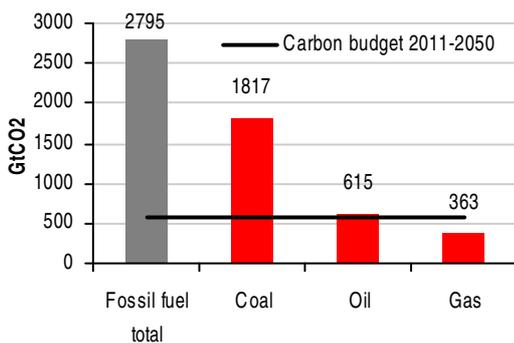
To deliver this outcome, the IEA assumes that carbon capture and storage (CCS) is deployed at scale, with 100 major scale projects by 2020 and c3,400 by 2050. Currently, there are 65 projects under development, but none are operational at scale and only 4 include sufficient monitoring of permanent storage. Another issue is that the geology of India and China does not seem to be well suited for CCS.

Carbon Tracker: an asset bubble

Fundamentally, climate change is a matter of strategic risk management. If a more cautious 80% chance of not exceeding 2°C warming is taken as the level of risk tolerance, then the global economy's carbon budget from 2000-2050 falls from 1,440GtCO₂ to just 886GtCO₂. Continuing emission growth has meant, however, that by 2010, just 565GtCO₂ was left.

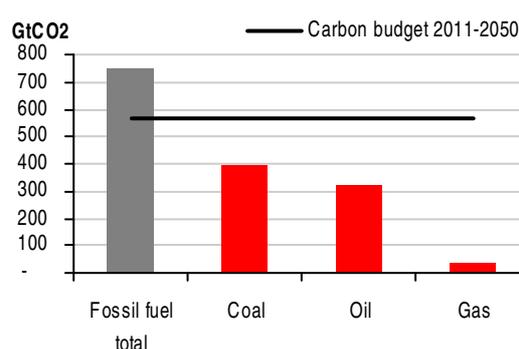
Tomorrow's emissions are embedded in today's reserves of coal, oil and gas reserves. The Carbon Tracker initiative has estimated that the total carbon potential of just the proven coal, gas and

Chart 3: Carbon potential of proven fossil fuel reserves



Source: Carbontracker 2011

Chart 4: Carbon potential of listed fossil fuel reserves,



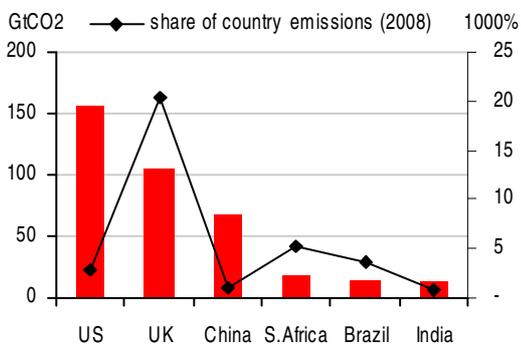
Source: Carbontracker 2011

oil reserves stood at 2795GtCO₂ in 2010, nearly five times the remaining budget (see Chart 3). Much of this is held by private or state-owned companies. But the reserves held by the world's top 100 listed coal companies, along with the top 100 listed oil and gas companies amount to an estimated 745GtCO₂, still in excess of the global carbon budget (Chart 4).

Globally, the Russian, US and UK stock markets have the largest volumes of embedded carbon held by companies listed on their exchanges. In the UK, most of these assets are located in other countries and held by diversified companies. One consequence is that the carbon embedded on the LSX is estimated to be more than 200 times greater than the annual emissions of the UK as a country (see Chart 5).

This analysis has prompted concerns that fossil fuel assets – and not just power generation facilities in the IEA scenarios – could become stranded in the transition to a low-carbon economy. Indeed, Carbon Tracker argues that equity investors could be facing a potential ‘carbon bubble’, with assets in excess of what can be safely and profitably exploited.

Chart 5: Carbon potential of listed companies on stock exchanges compared to the country's emissions in 2008

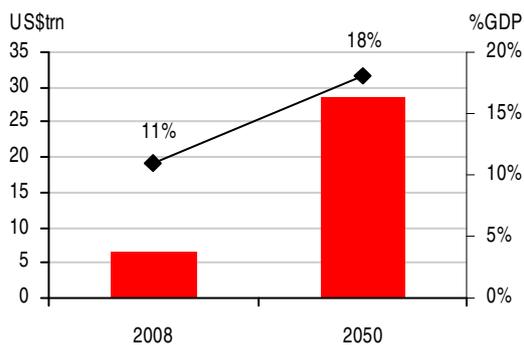


Source: WRI CAIT, Carbontracker 2011

Explaining the disconnect

A number of factors explain this disconnect between investments in fossil fuel assets and climate change targets.

Chart 6: Estimates of damage costs



Source: UNEP FI and UN PRI 2011

- ▶ First, the damage cost of carbon is not included in market prices, encouraging over-investment. Chart 6 presents estimates of the damage costs of all environmental externalities, with the cost of GHGs rising from 11% of global GDP in 2008 to 18% by 2050 if no action is taken.
- ▶ Second, global climate policy currently fails to provide the market with robust signals of the financial risks attached to these assets.
- ▶ Third, the carbon risk information available to investors from companies is often incomplete and insufficient. Only two of London's fossil fuel companies, for example, publish the carbon price assumptions they use for investment appraisal (and these are lower than estimates of carbon damage costs).

▶ Fourth, short-termism and discounting minimises the current perception of future risk. Equity markets do not effectively integrate long-term factors into share valuations. Indeed, short-termism is “both statistically and economically significant in capital markets” according to Andrew Haldane, Executive Director of Financial Stability at the Bank of England.

▶ And fifth, even if these issues could be tackled, current benchmarking and passive strategies may constrain the ability of investors to shift their asset allocation to take account of potential risks of stranded assets.

In the next section, we present a scenario analysis of how this carbon risk could impinge on one fuel type in one market: the UK coal mining majors.

Scenarios for UK Mining

- ▶ A declining coal industry could impact valuations of coal assets as much as 44%
- ▶ Impact on UK major miners could be -7% under the most extreme scenario and as much as -15% for coal-heavy miners such as XTA
- ▶ Long lead times means that this has real relevance for the current capital allocation debate

Coal valuations in UK Miners

An environmental constraint to burning coal resources poses a theoretical risk to the price of mining stocks if these resources are valued as potential future earnings by the market. Given that the mining sector comprises around 12% of the FSTE100 index, the risk is potentially also relevant to the broader market. Our aim in this section is to attempt to quantify this risk.

Our focus is on the four major global diversified miners listed in London (Rio Tinto, BHP Billiton, Anglo American and Xstrata) which comprise the bulk of the sector's market capitalisation and coal

production. It should be noted that although these are significant UK, FTSE 100 firms, none have UK coal operations, with the bulk of production in South Africa, Australia and Central America.

These firms have coal businesses that produce between 30Mt/y and 100Mt/y of thermal coal (used in power generation) and metallurgical coal (used in steelmaking). Both types of coal generate CO₂ when consumed, so both would be impacted by environmental constraints.

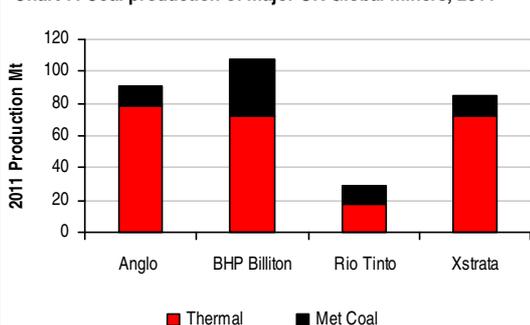
How do analysts (and the market) value mining stocks

Mining stocks are typically volatile, with movements being driven by changes in commodity prices and shifts in sentiment towards economic growth, particularly in China. It is fair to say that long-run concerns about carbon constraints to coal production have not yet been considered as relevant by institutional investors. Mining analysts typically use a mix of earnings multiples and discounted cash flow (DCF) analysis to value assets. Unlike the oil sector, reserve/resource multiples are rarely used, except occasionally as referencing points for undeveloped assets. The reason for this approach is

Andrew Keen*
Analyst
HSBC Bank plc
+44 20 7991 6764
andrew.keen@hsbcib.com

*Employed by a non-US affiliate of HSBC Securities (USA) Inc, and is not registered/ qualified pursuant to FINRA regulations

Chart 7: Coal production of major UK Global miners, 2011



Source: Corporate reports

that mineral reserves tend to require significant additional capital and operating costs before they can be converted into earnings, and the timing and economics of this can be uncertain. Assets therefore tend to be valued on known production or planned production rates discounted over the life of an asset. Longer-run DCF/NPV valuations are often combined with shorter-term EV/EBITDA or P/FE multiples for simplicity or cross checking.

If there is a problem with the ability to monetise longer-dated coal reserves, it is likely to impact DCF valuations. Where analysts use short-run DCF approaches with terminal growth or a use a near-term multiple approach, both of which will exclude a longer-dated risk, there will be no impact to analyst's valuations. But this is more a function of these short-cuts missing the issue rather than there being no impact on underlying valuation.

To assess the impact on stock valuation, we must first isolate the coal businesses of these diversified miners, and assess the contribution to their valuation. We can then flex this valuation for different assumptions on marketing conditions if environmental constraints are imposed.

And how much does coal contribute?

Our analysis indicates that the value of coal assets within the big four UK miners is in the order of USD60Bn. We base this conclusion on both historical earnings attribution and our own forward DCF calculations.

- ▶ First, our historical earnings attribution assessment. Coal accounted for 10-33% of 2011 earnings for each of the miners (see table below). We have divided the current market capitalisation according to the earnings split to give an indication of the value placed on coal assets. Market value should generally be proportional to EBITDA as analysts tend to apply uniform valuation multiples to different commodities.

Chart 8 : EBITDA attribution valuation of UK coal assets within Major diversified miners

	Coal 2011 EBITDA	Market Cap USD Bn	Value USD Bn
Anglo American	22%	44.7	10.0
BHP Billiton	12%	168.3	20.4
Rio Tinto	10%	92.7	9.6
Xstrata	33%	47.9	15.8
Total "Big Four"		353.5	55.9

Source: Corporate reports and HSBC analysis

- ▶ Second, our DCF valuation assessment. We do run detailed divisional models for each of the major four miners, and construct divisional DCF calculations for each in turn. But, for the purposes of this analysis we thought it clearer to aggregate these into one entity, which we have titled "Big Four Coal" (or BFC) to explore the impact on value of various scenarios (see Chart 9). This entity produced 344Mt of coal (we have combined thermal and coking for simplification), earned USD31Bn in revenue, and USD12.6Bn in EBITDA. The earnings split valuation of USD56Bn calculated above would represent 4.4x 2011 EBITDA, which is reasonable in the current market.

Chart 9 : BFC – Headline totals and per tonne metrics

	2011 (USD Bn)	Per t
Production (Mt)	344	
Revenue	31.0	90
EBITDA	12.6	36.6
COST		
EBIT	10.0	29
Capex	6.0	17
Tax	2.8	8
Cash Flow	3.8	11

Source: Corporate reports and HSBC analysis

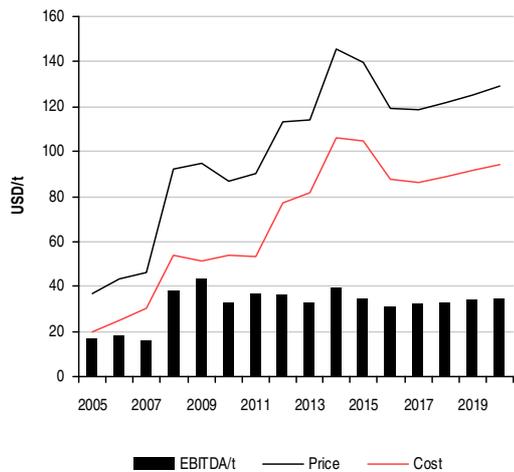
Three scenarios of the future

To explore the potential impact of a carbon constraint on these stocks, we have constructed three scenarios.

Base Case

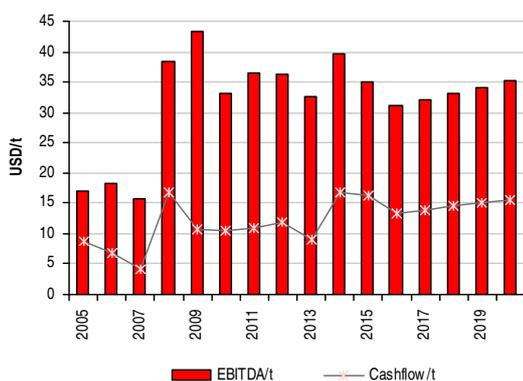
Our base-case projections for per tonne prices and costs are presented in the chart below. We are expecting some moderation in prices towards the decade, although margins should remain relatively static and stabilise around EBITDA of USD35/t (costs and prices are strongly linked through exchange rates and other mechanisms). This EBITDA of USD35/t translates into a sustained cash flow of approximately USD15-16/t.

Chart 10 : BFC – Average prices, costs and EBITDA/t to 2020



Source: Corporate reports and HSBC analysis

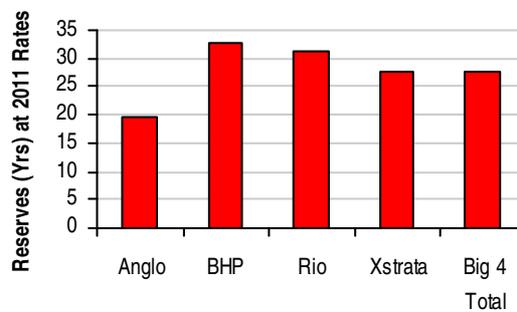
Chart 11 : BFC – Base Case EBITDA/t and cash flow/t



Source: Corporate reports and HSBC analysis

Our standard DCF calculations are over a 20 year time horizon, which in the case of coal is conservatively within reserves at current production rates (27 years at static rates for BFC – although this falls to 20 years if 3% demand growth is assumed). In reality, these represent coal in the higher “reserves” categorisation – broadening out to a broader “resources” and this ratio rises eightfold to 218 years.

Chart 12 Years of reserves at current mining rates

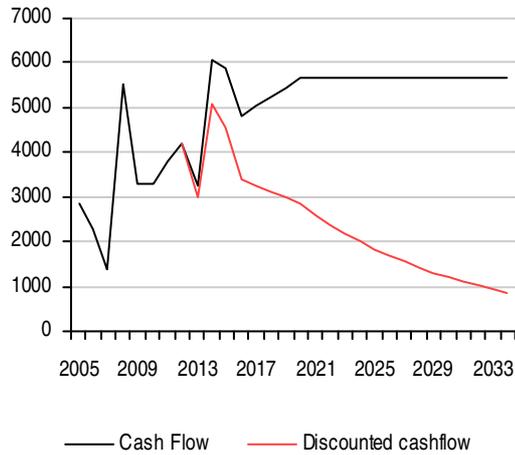


Source: Corporate reports and HSBC analysis

Naturally a DCF calculation will be determined by the period discounted, the assumed margin or cash flow and the discount rate. We are assuming a 9% discount in this analysis, which is broadly representative of the mining sector.

Under our base case scenario, cash flow stabilises at around USD15/t which, for a 360Mt/y coal business equates to approximately USD5.5Bn/yr in cash flow. Projecting this forward 20 years and applying a discount rate of 9% yields a sum of USD54Bn, similar to the earnings split calculation above (USD56Bn).

Chart 13 : BFC – Base Case – Projected total cash flow and discounted cash flow USD Mn



Source: HSBC analysis

demand growth in commodity markets, prices tend to revert to marginal cost, with historical precedents indicating prices falling to the 90th percentile on an annual average basis (the point at which 10% of the industry makes cash operating losses) and as low as the 75th percentile in extremely poor markets.

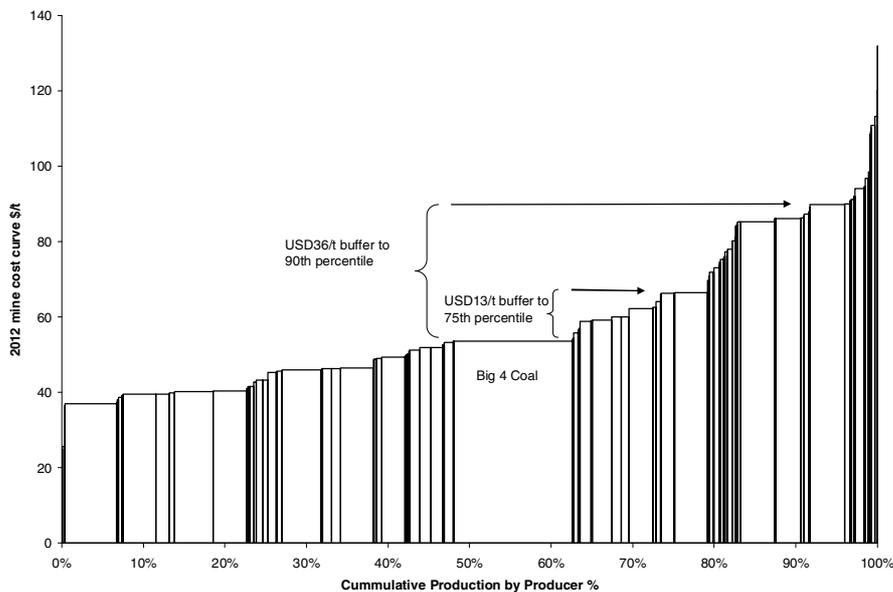
We have constructed a corporate cost curve for BFC by combining their collective assets and comparing them to a global cost curve (see Chart 14). We acknowledge that this is a significant simplification, as each company will have different cost bases, and individual operations will hold different positions on the cost curve. This said, the simplification is reasonable in our view – we indicate a business that is largely middle to third quartile on the global cost curve, and most of the coal assets within global UK miners do occupy this position, with significant assets in Australia and South Africa, which are generally moderately competitive. This curve indicates a competitive position relative to the 90th percentile of USD36/t, similar to 2011 margins.

Carbon scenarios

The question then arises of how this might be impacted under different coal output scenarios. The most realistic scenario in our view is to force our assumptions of industry earnings to low levels at the point in time where demand is impacted.

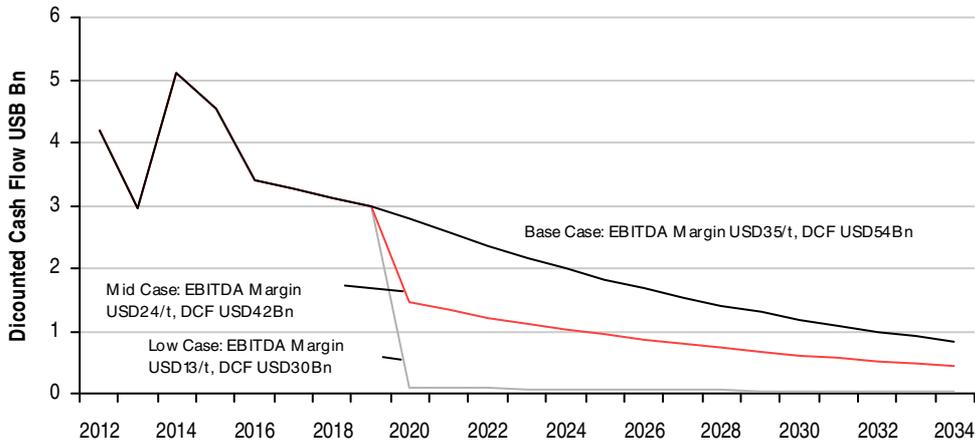
To measure this, the relative competitiveness of BFC must be considered. In periods of weak

Chart 14 : Illustrative corporate global coal Cost Curve



Source: Corporate reports, AME and HSBC analysis

Chart 15 : BFC: Annual Discounted Cash Flow under base case and two downside EBITDA/t margin scenarios



Source: HSBC analysis

If the coal industry were to be impacted to the extent that the industry no longer grew, or went into decline, the commodity prices would not need to incentivise fresh capital, and pricing would move from incentive pricing to a gradual run down of the cash cost curve over time.

We have considered two carbon scenarios in addition to our base case.

Low demand case

In our low case, prices revert to the 75% percentile from 2020, which generates and EBITDA margin of USD13/t, but very little cash-flow once sustaining capital and tax are taken into account. We assume that capital spending falls to USD11/t post 2020, much less than the current industry average (USD17/t in 2011), and a reasonable assumption of sustaining capex in an industry no longer expanding.

Under this scenario, our DCF falls to USD30Bn, a 44% fall from the base case.

Mid demand case

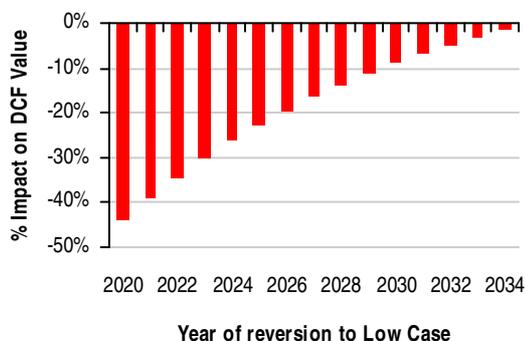
We have also used a mid-case scenario of EBITDA margin USD 24/t. Under this scenario, the impact on DCF valuation is halved. The most likely outcome under a scenario where coal production is constrained is a shift to zero growth as some point in the outlook – the impact of this on the DCF accordingly is shown in Charts 15-17.

Chart 16 : Mid and Low case impacts on BFC valuation

	EBITDA/t	DCF	Value Impact
Base Case	35	54	
Mid Case	24	42	-22%
Low Case	13	30	-44%

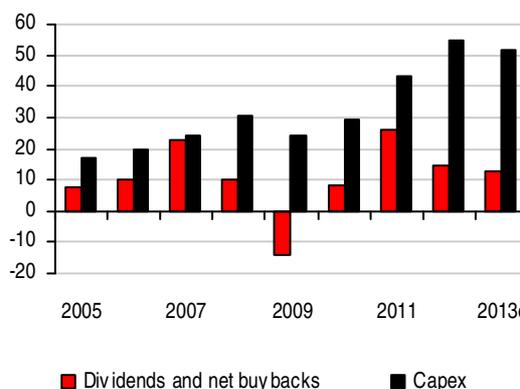
Source: HSBC analysis

Chart 17 : Impact on DCF on timing of reversion to zero growth



Source: HSBC analysis

Chart 19 : The great divergence: Cash use of major UK miners USD Bn



Source: HSBC analysis of capital returns through dividends and net buybacks vs capex

Impact on stocks & strategy

The potential effect on mining stock valuations in the UK market is dulled by the fact that the bulk of coal assets are held within large diversified miners. The impact of our mid and low case scenarios is presented in Chart 18 below – showing a 3% and 7% downside to current market valuation respectively. For particular stocks, however, the impact becomes increasingly material. For XTA, for example, we estimate that a reversion to very low margins from 2020 could have an impact of up to 15% on valuation according to this methodology.

Why this is relevant for investors today

The long lead time for mining projects (often 5-8 years or longer) means that the potential impact of structural changes to coal demand next decade is more immediate than might be expected. It has real relevance for capital allocation decisions in the nearer term. This is a very current debate – investors in mining stocks are beginning to

complain vocally about the allocation of cash flow towards organic growth rather than capital return (see Chart 19).

Although the particular project plans for the diversified miners are too complex for inclusion in the scope of this analysis, we believe investors should challenge management assumptions on capital allocation towards longer-term coal expansion projects. Project appraisals may need to be stress tested for assumptions around coal demand growth and its impact on profitability.

Whilst the approval process for projects does include stress testing at different long-run pricing assumptions, it is unclear to us whether firms look at the potential for structural change to the growth rate, and hence profitability, of carbon intensive assets such as coal. Carbon risks place a premium on stocks with a diversified mix of mineral assets (including those with low-carbon upside).

Chart 18 : Scenario impacts on UK diversified mining stocks

	BHP	AAL	RIO	XTA	Big 4
Mkt Cap (USD bn)	168	45	93	48	353
Coal %	12%	22%	10%	33%	16%
Coal Value (USD bn)	20	10	9	16	55
Mid Case (-22%) (USD bn)	16	8	7	12	43
Stock impact (vs current price)	-3%	-5%	-2%	-7%	-3%
Low Case (-44%) (USD bn)	11	5	5	9	30
Stock impact (vs current price)	-5%	-10%	-4%	-15%	-7%

Source: Thomson Reuters DataStream, HSBC estimates

Investors also need to see management integrating these risks into strategy and project appraisal.

What are the market catalysts?

In our view, there are two methods by which these negative carbon scenarios could be incorporated into actual stock valuations.

- ▶ The first is via a reassessment of long-run commodity prices by sell-side analysts. These are typically set by commodity analysts at banks and brokerages, and should be a function of incentive prices required to justify capital investment for a given rate of industry growth. The past few years has seen a significant increase in incentive prices as demand has accelerated, with ever more marginal minerals projects now being needed to fulfil accelerating demand. If we see a broad-based recognition of a slowing outlook for demand, this should reverse this process, and lead to a revision down in incentive pricing, in our view.
- ▶ The second is the cutting of growth projects from analysts' NPV estimates. Mining companies typically trumpet a wide range of growth projects to increase the likelihood that these are incorporated as option value by analysts – a visible move by management in the mining industry to talk up the negative impact of carbon constraints on investment growth is likely to lead to analysts cutting organic growth estimates.

A crucial driver for change will be market assessments of the likelihood and strength of carbon pricing and regulation. Currently the global picture is mixed. Modest carbon controls have been in place within the EU since 2005, confirming a long-run decline in coal consumption of 2.46% per annum from 1990 to 2010; it is instructive to note that is less than the IEA's forecast decline of 3.5% from 2020 in its

450PPM scenario. Australia will introduce a carbon price of AUD23/t in July this year, which is scheduled to be replaced by a cap and trade system in 2015. But the measure is politically divisive and the opposition have pledged to repeal the legislation. Beyond this, key industrialised economies such as Canada, Japan, Russia and the USA have announced that they will not be part of any successor to the Kyoto Protocol set to start in 2013 – although that does not mean that domestic action is not being taken.

Emerging economies are making their first steps towards reducing the carbon intensity of growth. Korea has passed cap and trade legislation which will come into effect in 2015, while China has decided to cut carbon per unit of GDP by 17% during the current 12th Five Year Plan period. As part of this, pilot cap and trade initiatives are scheduled for five cities and two provinces, with a national scheme possible from 2015. But China missed its 2011 carbon target (see [Is China too big to filter down](#), 21 March 2012).

Political constraints on carbon are likely to be met with vocal resistance from the mining industry, usually accompanied by the threat of withdrawing from new projects. There are strong precedents for this in Australia in the response to the Minerals Resource Rent Tax and carbon pricing.

Sell-side mining analysts are unlikely to yet integrate a potential carbon constraint into their valuations. There are more immediate and volatile factors, notably commodity price volatility. But the example of a rise in resource specific taxation is a good precedent for how this might be incorporated: an unexpected external event, popularised and exaggerated by management and incorporated by the sell side as a negative shock. In fact, given the volatility of the sector and the focus on the immediate, any form of structural change is likely to come as a genuine surprise.

Valuation, risks and ratings

Anglo American (AAL.L, Overweight, Current Price 2,170p, TP 3,430p): We have a one-year target price of GBP34.3. This is based on a 75:25 blended average of our discounted cash flow model (USD53, risk-free rate 3.0%, 4.5% risk premium, beta 1.4) and 2013e EV/EBITDA yielding USD61 (multiple 5.5x) converted at the spot USD/GBP rate of 1.61. **Risks:** Major downside risks to our rating include a broad market downturn (Anglo American is a high-beta stock), potential cost inflation in South Africa due to currency and electricity tariff pressures and talk of nationalisation of South African mining assets scaring investors. Anglo American is also currently involved in a complex legal dispute with Chilean state producer Codelco which could negatively affect the stock.

Rio Tinto (RIO.L, Overweight, Current Price 3,051p, TP 4,460p): We have a one-year target price of GBP44.6. We base our target price on a 75:25 blended average of our economic residual income model (USD65 per share, risk-free rate 3.0%, 4.5% risk premium, beta 1.5) and 2013e EV/EBITDA (USD92 per share, multiple 5.7x) translated at the spot USD/GBP rate of 1.61.

Risks: The major downside risk relates to economic growth. As a high-beta commodity play, another leg to the economic downturn could result in the stock underperforming the market. In addition, price expectations for iron are growing and an unexpected drop in spot prices could lead the stock to underperform the market and its peers.

BHP Billiton (BLT.L, Neutral, Current Price 1,864p, TP 2,050p): We have a one-year target price of GBP20.5. We base our target price on a 75:25 blended average of our economic residual income model (USD30.6, (risk-free rate 3.0%, 4.5% risk premium, beta 1.4) and 2013e EV/EBITDA (USD40, multiple 6.0x) translated at the spot USD/GBP rate of 1.61. **Risks:** The main

upside risk to our rating relates to commodity prices: if oil and metals prices continue to increase (and exceed consensus expectations) the stock could outperform the market. Conversely, on the downside, as a high-beta commodity play, another leg to the economic downturn could result in the stock underperforming the market and its peers.

Xstrata (XTA.L, Overweight (V), Current Price 865p, TP 1,430p): We have a one-year target price of GBP14.3. We base our target price on a 75:25 blended average of our discounted cash flow model (USD24.9 per share, risk-free rate 3.0%, 4.5% risk premium, beta 1.6) and 2013e EV/EBITDA (USD17.6, multiple 5.0x) which we translate at the USD/GBP rate of 1.61. **Risks:** The major risk to our Overweight (V) rating is short-term movements in spot commodity markets, particularly coal and copper. If the copper market does not tighten as widely expected in 2011, prices could weaken, leading to negative revisions and the stock underperforming.

Ratings: Under our research model, the Neutral band for UK stocks without a volatility indicator is 5 percentage points above and below the hurdle rate of 7.5%. At the time we set our target prices for Anglo American and Rio Tinto, they implied potential return that was above this range, and as such we rate Anglo American and Rio Tinto Overweight. At the time we set our target price for BHP Billiton, it implied potential return within the Neutral band, and as such we rate BHP Billiton Neutral. Under our research model the Neutral band for UK stocks with a volatility indicator is 10 percentage points above and below the hurdle rate of 7.5%. At the time we set our target price for Xstrata, it implied potential return that was above this band, and as such we have an Overweight (V) rating on Xstrata. Potential return equals the percentage difference between the current share price and the target price, including the forecast dividend yield when indicated.

Disclosure appendix

Analyst Certification

Each analyst whose name appears as author of an individual chapter or individual chapters of this report certifies that the views about the subject security(ies) or issuer(s) or any other views or forecasts expressed in the chapter(s) of which (s)he is author accurately reflect his/her personal views and that no part of his/her compensation was, is or will be directly or indirectly related to the specific recommendation(s) or view(s) contained therein.

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HSBC believes that investors utilise various disciplines and investment horizons when making investment decisions, which depend largely on individual circumstances such as the investor's existing holdings, risk tolerance and other considerations. Given these differences, HSBC has two principal aims in its equity research: 1) to identify long-term investment opportunities based on particular themes or ideas that may affect the future earnings or cash flows of companies on a 12 month time horizon; and 2) from time to time to identify short-term investment opportunities that are derived from fundamental, quantitative, technical or event-driven techniques on a 0-3 month time horizon and which may differ from our long-term investment rating. HSBC has assigned ratings for its long-term investment opportunities as described below.

This report addresses only the long-term investment opportunities of the companies referred to in the report. As and when HSBC publishes a short-term trading idea the stocks to which these relate are identified on the website at www.hsbcnet.com/research. Details of these short-term investment opportunities can be found under the Reports section of this website.

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Rating definitions for long-term investment opportunities

Stock ratings

HSBC assigns ratings to its stocks in this sector on the following basis:

For each stock we set a required rate of return calculated from the cost of equity for that stock's domestic or, as appropriate, regional market established by our strategy team. The price target for a stock represents the value the analyst expects the stock to reach over our performance horizon. The performance horizon is 12 months. For a stock to be classified as Overweight, the potential return, which equals the percentage difference between the current share price and the target price, including the forecast dividend yield when indicated, must exceed the required return by at least 5 percentage points over the next 12 months (or 10 percentage points for a stock classified as Volatile*). For a stock to be classified as Underweight, the stock must be expected to underperform its required return by at least 5 percentage points over the next 12 months (or 10 percentage points for a stock classified as Volatile*). Stocks between these bands are classified as Neutral.

Our ratings are re-calibrated against these bands at the time of any 'material change' (initiation of coverage, change of volatility status or change in price target). Notwithstanding this, and although ratings are subject to ongoing management review, expected returns will be permitted to move outside the bands as a result of normal share price fluctuations without necessarily triggering a rating change.

*A stock will be classified as volatile if its historical volatility has exceeded 40%, if the stock has been listed for less than 12 months (unless it is in an industry or sector where volatility is low) or if the analyst expects significant volatility. However, stocks which we do not consider volatile may in fact also behave in such a way. Historical volatility is defined as the past month's average of the daily 365-day moving average volatilities. In order to avoid misleadingly frequent changes in rating, however, volatility has to move 2.5 percentage points past the 40% benchmark in either direction for a stock's status to change.

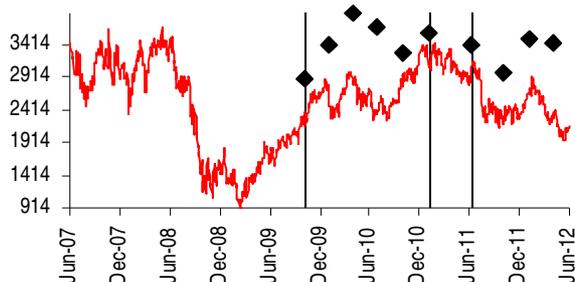
Rating distribution for long-term investment opportunities

As of 20 June 2012, the distribution of all ratings published is as follows:

Overweight (Buy)	50%	(26% of these provided with Investment Banking Services)
Neutral (Hold)	37%	(25% of these provided with Investment Banking Services)
Underweight (Sell)	13%	(17% of these provided with Investment Banking Services)

Share price and rating changes for long-term investment opportunities

Anglo American (AAL.L) Share Price performance GBp Vs HSBC rating history



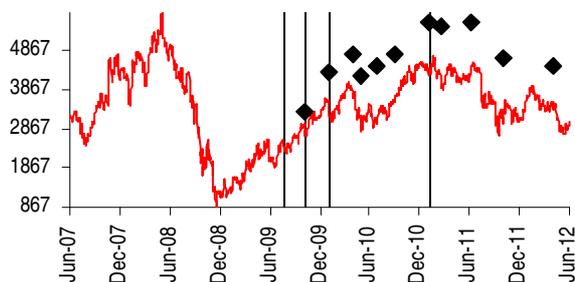
Source: HSBC

Recommendation & price target history

From	To	Date
N/A	Overweight (V)	26 October 2009
Overweight (V)	Neutral	25 January 2011
Neutral	Overweight	27 June 2011
Target Price	Value	Date
Price 1	2900	26 October 2009
Price 2	3400	22 January 2010
Price 3	3900	19 April 2010
Price 4	3700	16 July 2010
Price 5	3300	17 October 2010
Price 6	3600	25 January 2011
Price 7	3400	27 June 2011
Price 8	3000	21 October 2011
Price 9	3500	24 January 2012
Price 10	3430	24 April 2012

Source: HSBC

Rio Tinto (RIO.L) Share Price performance GBp Vs HSBC rating history



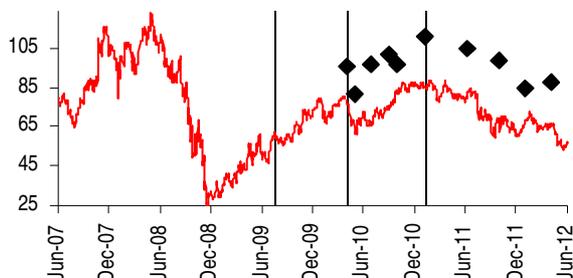
Source: HSBC

Recommendation & price target history

From	To	Date
Restricted	N/A	04 August 2009
N/A	Neutral (V)	26 October 2009
Neutral (V)	Overweight (V)	22 January 2010
Overweight (V)	Overweight	25 January 2011
Target Price	Value	Date
Price 1	3300	26 October 2009
Price 2	4300	22 January 2010
Price 3	4800	19 April 2010
Price 4	4200	21 May 2010
Price 5	4500	16 July 2010
Price 6	4800	22 September 2010
Price 7	5600	25 January 2011
Price 8	5500	07 March 2011
Price 9	5600	27 June 2011
Price 10	4700	21 October 2011
Price 11	4460	24 April 2012

Source: HSBC

Rio Tinto (RIO.AX) Share Price performance AUD Vs HSBC rating history



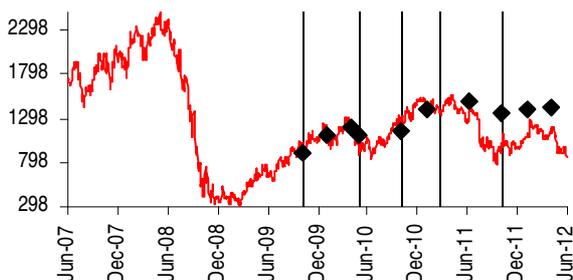
Source: HSBC

Recommendation & price target history

From	To	Date
Restricted	N/A	04 August 2009
N/A	Overweight (V)	19 April 2010
Overweight (V)	Overweight	25 January 2011
Target Price	Value	Date
Price 1	96.00	19 April 2010
Price 2	82.00	21 May 2010
Price 3	97.00	16 July 2010
Price 4	102.00	22 September 2010
Price 5	97.00	17 October 2010
Price 6	111.00	25 January 2011
Price 7	105.00	27 June 2011
Price 8	99.00	21 October 2011
Price 9	85.00	24 January 2012
Price 10	88.00	24 April 2012

Source: HSBC

Xstrata (XTA.L) Share Price performance GBP Vs HSBC rating history



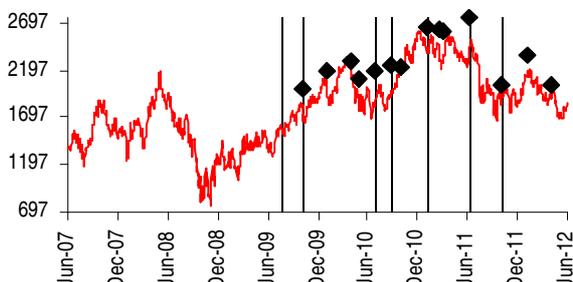
Source: HSBC

Recommendation & price target history

From	To	Date
N/A	Underweight (V)	26 October 2009
Underweight (V)	Neutral (V)	21 May 2010
Neutral (V)	Underweight (V)	17 October 2010
Underweight (V)	Neutral (V)	07 March 2011
Neutral (V)	Overweight (V)	21 October 2011
Target Price	Value	Date
Price 1	900	26 October 2009
Price 2	1100	22 January 2010
Price 3	1200	19 April 2010
Price 4	1100	21 May 2010
Price 5	1150	17 October 2010
Price 6	1400	25 January 2011
Price 7	1500	27 June 2011
Price 8	1350	21 October 2011
Price 9	1410	24 January 2012
Price 10	1430	24 April 2012

Source: HSBC

BHP Billiton (BLT.L) Share Price performance GBP Vs HSBC rating history



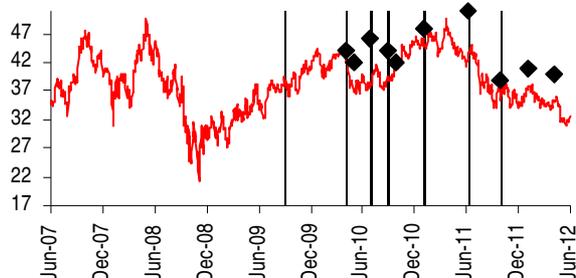
Source: HSBC

Recommendation & price target history

From	To	Date
Restricted	N/A	04 August 2009
N/A	Neutral (V)	26 October 2009
Neutral (V)	Overweight (V)	16 July 2010
Overweight (V)	Neutral (V)	17 September 2010
Neutral (V)	Neutral	25 January 2011
Neutral	Overweight	27 June 2011
Overweight	Neutral	21 October 2011
Target Price	Value	Date
Price 1	N/A	04 August 2009
Price 2	2000	26 October 2009
Price 3	2200	22 January 2010
Price 4	2300	19 April 2010
Price 5	2100	21 May 2010
Price 6	2200	16 July 2010
Price 7	2250	17 September 2010
Price 8	2230	17 October 2010
Price 9	2650	25 January 2011
Price 10	2640	07 March 2011
Price 11	2620	25 March 2011
Price 12	2760	27 June 2011
Price 13	2050	21 October 2011
Price 14	2350	24 January 2012
Price 15	2050	24 April 2012

Source: HSBC

BHP Billiton (BHP.AX) Share Price performance AUD Vs HSBC rating history



Source: HSBC

Recommendation & price target history

From	To	Date
N/A	N/A	14 September 2009
N/A	Neutral (V)	19 April 2010
Neutral (V)	Overweight (V)	16 July 2010
Overweight (V)	Neutral (V)	17 September 2010
Neutral (V)	Neutral	25 January 2011
Neutral	Overweight	27 June 2011
Overweight	Neutral	21 October 2011
Target Price	Value	Date
Price 1	44.00	19 April 2010
Price 2	42.00	21 May 2010
Price 3	46.00	16 July 2010
Price 4	44.00	17 September 2010
Price 5	42.00	17 October 2010
Price 6	48.00	25 January 2011
Price 7	51.00	27 June 2011
Price 8	39.00	21 October 2011
Price 9	41.00	24 January 2012
Price 10	40.00	24 April 2012

Source: HSBC

HSBC & Analyst disclosures

Disclosure checklist

Company	Ticker	Recent price	Price Date	Disclosure
ANGLO AMERICAN	AALL	21.70	19-Jun-2012	1,2,4,5,6,7,11
BHP BILLITON	BLT.L	18.64	19-Jun-2012	4,7,11
RIO TINTO	RIO.L	30.51	19-Jun-2012	1,2,4,5,6,7,11
XSTRATA	XTA.L	8.65	19-Jun-2012	1,4,5,7,11

Source: HSBC

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Issuer of report

HSBC Bank plc

8 Canada Square
London, E14 5HQ, United Kingdom
Telephone: +44 20 7991 8888
Fax: +44 20 7992 4880
Website: www.research.hsbc.com

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Global Climate Change & Clean Technology Team

Climate Change Centre of Excellence

Nick Robins
Head, Climate Change Centre of Excellence
+44 20 7991 6778 nick.robins@hsbc.com

Zoe Knight
Director, Climate Change Strategy
+44 20 7991 6715 zoe.knight@hsbcib.com

Wai-Shin Chan
Director, Climate Change Strategy - Asia-Pacific
+852 2822 4870 wai.shin.chan@hsbc.com.hk

Clean Technology

Jenny Cosgrove
Regional Sector Head of Utilities - Asia-Pacific
+852 2996 6619 jennycosgrove@hsbc.com.hk

Sean McLoughlin
Vice President - Clean Technology
+44 20 7991 3464 sean.mcloughlin@hsbcib.com

Charanjit Singh
+91 80 3001 3776 charanjit2singh@hsbc.co.in

Gloria Ho
+852 2996 6941 gloriapyho@hsbc.com.hk

Summer Y Y Huang
Research Associate
+852 2996 6976 summeryyhuang@hsbc.com.hk

Christian Rath
+49 211 910 3049 christian.rath@hsbc.de

Murielle André-Pinard
+33 1 56 52 43 16 murielle.andre.pinard@hsbc.com

Pedro Herrera
+1 212 525 5126 pedro.herrera@us.hsbc.com

Ravi Jain
+1 212 525 3442 ravijain@us.hsbc.com

HSBC Climate Change Indices

Joaquim de Lima
Global Head of Equity Quantitative Research
+44 20 7991 6836 joaquim.delima@hsbcib.com

Vijay Sumon
Director, Head of Indexation
+44 20 7991 6839 vijay.sumon@hsbcib.com

Rajen Gokani
+44 20 7991 6850 rajen.gokani@hsbcib.com

Utilities

Verity Mitchell
+44 20 7991 6840 verity.mitchell@hsbcib.com

Specialist Sales

Mark van Lonkhuyzen
+44 20 7991 1329 mark.van.lonkhuyzen@hsbcib.com

Billal Ismail
+44 20 7991 5362 billal.ismail@hsbcib.com