Edison investment research

Price weakness on the cards

Oil prices have been bid higher since the early October lows by concerns about possible supply interruptions and falling US inventories. Major supply interruptions, including an EU embargo on Iranian imports, however, are very unlikely while the drawdown in US inventories is from a high base. If supply fears prove grossly exaggerated, as we suspect, and the European debt crisis persists, as seems likely, a renewed period of price weakness is on the cards.

Supply/demand balance: Emerging surplus

The oil market globally has been well supplied in the closing months of 2011 and has probably been somewhere between a balance and a moderate surplus. This contrasts with earlier in the year when the market tightened due to a spate of outages, strikes, civil strife and most notably the cessation of Libyan exports. Rapidly slowing demand growth and firming production have transformed the picture of late. Supply has been driven by recovering non-OPEC production from the outages of the second and third quarters and buoyant OPEC output. In terms of OPEC, the key drivers have been Libya, where output has climbed faster than expected in the aftermath of the civil war, and Saudi Arabia where production has been running at record levels. For 2012 we believe that a supply surplus is looking increasingly likely. The economic backdrop will at best be lacklustre while supply growth should be robust given capacity expansion in the non-OPEC world, continuing recovery in Libya and new capacity in Iraq.

Crude oil prices: WTI surges

The key development in oil markets over the past two months has been the rebound in WTI. By the second week in December, WTI was up about 30% from the early October 12-month low. A fall in inventories at Cushing, the Seaway pipeline announcement and firming US economic data are driving the rebound. Brent has also firmed of late but to a lesser extent than WTI. Improving availability in the eastern Atlantic has kept a lid on Brent.

Brent-WTI spread: Sharply narrower

The surge in WTI has sharply narrowed the Brent-WTI spread over the past two months. From a high of $28.7/barrel in mid-October, the Brent premium was down to about $9 by mid-December. The narrowing has been a little ahead of schedule but by no means unexpected, particularly in view of the resumption in Libyan exports. Near to medium term, we expect the Brent-WTI spread to trend within the $5-$10/barrel zone with rising production in the US Mid-Continent and Canada resulting in an inland North American discount.

16 December 2011

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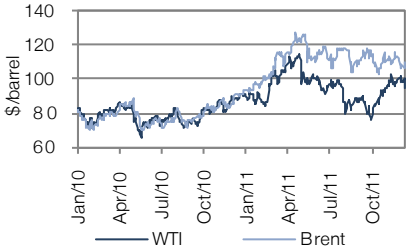
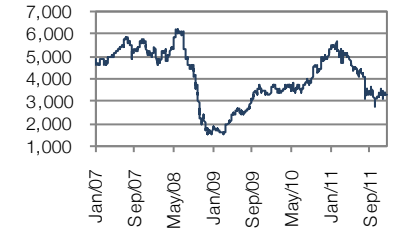
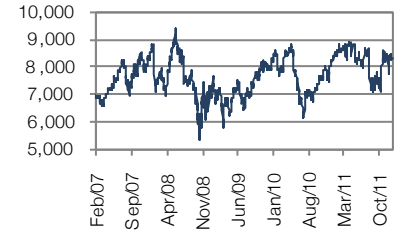
WTI vs Brent



AIM Oil & Gas Index



FTSE 350 Oil & Gas Index



Price trends

	WTI $/barrel	Brent $/barrel	Henry Hub $/mm Btu
2009	62.0	62.0	3.94
2010	79.5	79.7	4.37
2011e	95.1	110.2	4.02
2012e	93.3	102.8	4.14
2013e	97.0	106.0	4.40

Note: Prices are yearly averages

Crude oil market dynamics

Price overview: Supply concerns

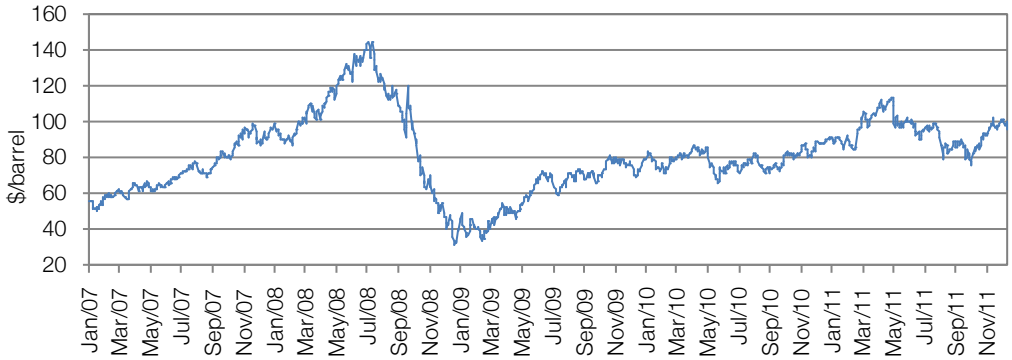
Benchmark light crude prices have rebounded from the six- to 12-month lows plumbed in early October 2011. The rebound has been particularly pronounced in the case of WTI, the US inland benchmark, which for a year or more lagged the performance of the international light crude grades. From the early October lows WTI, as of early December, had climbed about $23/barrel, while the other key light grades are up $10/barrel or less on the same basis. The rebound has occurred despite some virulently bearish influences stalking the market place. These include the rapid build-up in production in Libya and Iraq in recent months, the prospect of a sizeable increase in non-OPEC production in 2012,the continuing European sovereign debt crisis and a decidedly inauspicious outlook for the world economy in 2012 and arguably beyond.

The price rebound of late has been driven essentially by supply concerns. These in turn largely stem from the intensification of the dispute between the western powers and Iran over Iran's nuclear programme. This followed the publication in early November of a report by the International Atomic Energy Agency (an arm of the United Nations) that Iran might have a clandestine research programme for the military applications of nuclear power. The publication corroborated a long-held western view but the conclusion does not appear to have been based on a great deal of new information.

Fears in the marketplace intensified in early December. This reflected the US Senate passing a bill that would give the President power to bar foreign banks doing business with Iran's Central Bank from having correspondent bank accounts in the US. If enacted, the bill could make it very much more difficult for companies to finance imports from Iran. Simultaneously, the EU has moved to tighten sanctions on the Iranian petroleum and banking sectors and is considering a total ban on Iranian imports. It should be noted that Iran is the second-largest OPEC producer and exporter. Exports in 2010 were 2.6mm b/d.

In recent years, Iranian exports have increasingly been directed to south Asia and the Far East but the Mediterranean refining centres of Italy and Greece remain important customers. If there is a complete cessation of Iranian imports, the gap could not be easily filled in the short term and maybe even the medium term. Refining operations in Mediterranean would inevitably be severely disrupted with deleterious implications for refined product prices from a consumer perspective. In addition, the ostracisation of Iran politically, and certainly in the event of a military conflict, could severely disrupt oil shipments from other Gulf sources through the Straits of Hormuz, one side of which is controlled by Iran. Approaching 20% of the world's oil passes through this pinch point. Via a surge in oil prices any disruption to Gulf supplies would have disastrous implications for oil consumers and the world economy.

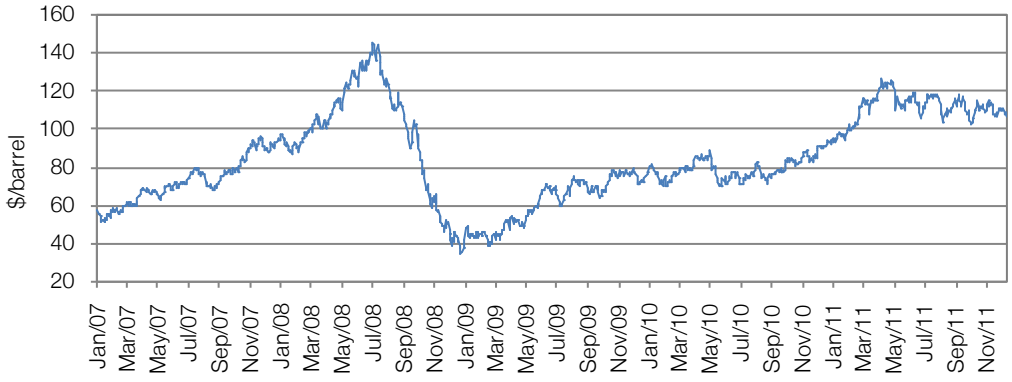
Exhibit 1: WTI crude oil price trend



Source: Bloomberg

Particularly in the case of WTI, there have been some further supportive influences for oil prices of late. These include the downward trend in inventories, the decision to reverse the flow of the Seaway Pipeline from the US Gulf Coast to Cushing, Oklahoma following its acquisition by Enbridge and Enterprise Products Partners, and a spate of economic statistics pointing to firming economic activity in the US. As far as inventories are concerned, however, there is no sense that they have reached critically low levels or that there is a physical shortage of crude. The inventory rundown appears to be largely a voluntary phenomenon related to recessionary concerns and is part of a broader tendency in recent months across the commodity sector. More generally, oil prices were also supported in the week ended 2 December by the Federal Reserve providing emergency dollar funding at favourable interest rates to European central banks. This in turn led to a firming in sentiment in sovereign debt markets. Overall, the perceived positives in late November and early December led to the phenomenon in capital and commodity markets known as 'risk on' trading. This provided support for oil and indeed other commodity prices. The dollar has not been a major factor on average driving oil prices over the past two months or so. In early December the euro was trading at about $1.34, which was not radically different than the rate prevailing in early October at the trough of September/October oil price collapse.

Exhibit 2: Brent crude oil price trend



Source: Bloomberg

Recent trends in Brent and WTI

Brent, the key international light crude benchmark, has pretty much trended flat since early May 2011 following the first of four price collapses during the year. After plumbing a seven-and-a-half month low of $102.2/barrel on 3 October, Brent recovered to $115.5/barrel by 14 October, which was approaching the previous highs reached after earlier rebounds since May. Over the balance of October Brent trended down and finished the month at $109.5/barrel. The average for October was also $109.5/barrel, down $1.4/barrel on September. After slipping to $108.9/barrel on 1 November, Brent firmed over the subsequent five days, hitting $115.3/barrel on 8 November. There was then a significant weakening trend over the next nine days driven by adverse developments in European sovereign debt markets which took Brent down to around a one-and-a-half month low of $106.4/barrel on 21 November. Brent firmed over the balance of the month and on 30 November closed at $111.3/barrel. The average for November was $110.5/barrel. Through the first two weeks of December, Brent traded between $106.7/barrel and $110.4/barrel, with the price buffeted by developments on the sovereign debt, Iranian and macroeconomic fronts. Brent closed at $108.9/barrel, up 20% on a year earlier, but 14% below the 8 April 38-month high of $126.7/barrel.

WTI hit a 12-month low on 4 October of $75.7/barrel reflecting the backwash of the European debt crisis and fears of a renewed descent into recession. Through mid November there was a meteoric rebound with the price hitting $102.6/barrel on 16 November. This was around a five-month high. WTI slipped to $95.9/barrel over the following five days before firming again to $100.4/barrel at the end of the month. The average for November was $97.1/barrel a hefty $10.7/barrel higher than in October. During the first two weeks of December WTI traded in a fairly subdued fashion between $98 and $101/barrel. The closing price on 13 December of $100.1/barrel was up 13% on a year earlier but 12% below the 29 April high of $113.9/barrel.

Light crude spreads

WTI-Brent: WTI discounts narrows sharply

The strong performance of WTI relative to Brent has sharply reduced WTI's discount Brent over recent weeks. In mid-October, WTI was still trading at unprecedentedly wide discounts to Brent. The high water mark came on 14 October when the discount hit $28.7/barrel. By the end of the month, however, it was down to $16.3/barrel and for October as a whole averaged $23.1/barrel, significantly down on the $25.3/barrel of the previous month. The WTI discount was broadly flat through the first half of November but trended sharply down in the second half and ended the month at $9.4/barrel. The average for the month was $13.4/barrel, the lowest monthly average since May. In mid-December WTI was trading at a discount of about $9/barrel to Brent.

The narrowing WTI-Brent spread reflects a combination of factors

A narrowing of the WTI-Brent spread from the elevated levels of October was not unexpected in late 2011 and particularly going into 2012. The speed and scale of the narrowing has, however, been more pronounced than anticipated. There are several factors at play. From a Brent perspective the recent upward trend has been dampened by a combination of recovering North Sea supplies following the completion of major maintenance programmes in the third quarter, a more rapid than-expected recovery in Libyan production in the aftermath of the civil war and increasing supplies from Angola and Nigeria following maintenance work and repairs to the Trans-

Forcados Pipeline respectively. In the case of Libya, production according to the National Oil Corporation was running at 750,000b/d (exports probably at least 550,000b/d) at the end of November against a low 75,000b/d as recently as September. Note, key crude grades sourced from Angola, Libya and Nigeria compete directly with Brent in the eastern Atlantic basin and Mediterranean. The muted performance of Brent may also have been affected by sluggish European demand.

Compared with Brent, the newsflow surrounding WTI has been more bullish for prices of late. This reflects firming US economic data, a significant fall in inventories at the Cushing, Oklahoma tank farm and a pipeline announcement that should help alleviate the Cushing bottleneck. The pipeline news concerns the decision by Enbridge and Enterprise Products to acquire from ConocoPhillips the 500-mile Seaway pipeline from the Gulf Coast to Cushing. Significantly, the plan is to reverse the flow to north-south by the second quarter of 2012 with an initial capacity of 150,000b/d. This is expected to rise to 400,000b/d by early 2013 following the addition of new pumping capacity and after making various other infrastructural upgrades. The reversal of the Seaway pipeline flow will greatly improve the ability of producers to ship oil cost-effectively from the rapidly growing oilfields of the US Mid-Continent and Canada to the refining centres of the Gulf Coast. Tellingly when the Seaway deal was announced on 16 November the WTI-Brent spread narrowed from $13.2/barrel to $8.5/barrel.

Keystone XL decision deferred

President Obama recently announced that a decision on whether to sanction the construction of TransCanada's Keystone XL pipeline from Hardisty, Alberta to the Gulf Coast via a direct route has been deferred until after the next Presidential election in November 2012. A few months ago a decision in the affirmative seemed highly likely given the undoubted energy security of supply and economic benefits. The key stumbling block related to environmental concerns over the pipeline's path over the Ogallala aquifer (a major source of water in the Great Plains) and the Sandhills of Nebraska. Alternative routes are under consideration and TransCanada remains confident Keystone XL will ultimately be constructed. There will, however, be a delay of perhaps two years. Costs will also probably be higher. In the interim, the Seaway pipeline provides an alternative to Keystone XL, given that Enbridge already has a link from Alberta to Cushing via Illinois. The capacity of the Enbridge pipeline is nevertheless significantly less than for Keystone XL. It should also be noted that TransCanada has its Keystone pipeline link from Alberta to Cushing, albeit via a more circuitous route than Keystone XL.

Shale oil production continues to surge

Crude oil supplies continue to surge in the US Mid-Continent and Texas driven by rapid shale oil development in the Bakken/Three Forks formation in North Dakota/Montana and the Eagle Ford formation in Texas. According to the North Dakota Department of Mineral Resources, production in the state hit a record 460,000b/d (90% Bakken/Three Forks) in September. This was up 15,000b/d on the prior month, 116,000b/d on end 2010 and over 100,000b/d on a year previously. The Department of Mineral Resources has recently raised its forecast for oil production in North Dakota in 2015 by 50,000b/d to 750,000b/d. According to the IEA, Eagle Ford production has more than doubled in 2011 to over 300,000b/d currently. Overall, production from shale sources is now

probably running at approaching 800,000 b/d in the US. Anadarko's recent announcement that its Wattenberg field in Colorado has a net resource potential of up to 1.5bn boe is pointing to the emergence of a major new source of shale oil. Petroleum industry expectations for shale oil to boost US crude production by 1.5mm to 2mmb/d by 2015 are looking increasingly plausible.

Exhibit 3: WTI 2007-11 quarterly prices $/barrel

	Q1	Q2	Q3	Q4	Average
2007	58.1	65.0	75.2	90.5	72.2
2008	97.9	123.8	118.2	59.1	99.9
2009	43.2	59.7	68.1	76.0	62.0
2010	78.8	77.9	76.1	85.2	79.5
2011	93.9	102.3	89.5	94.5(e)	95.1(e)

Source: Bloomberg and Edison Investment Research

Exhibit 4: Brent 2007-11 quarterly prices $/barrel

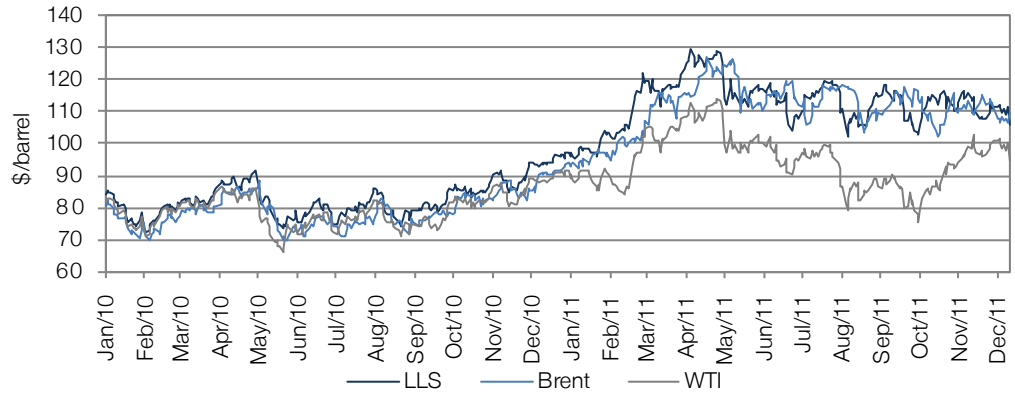
	Q1	Q2	Q3	Q4	Average
2007	58.1	68.7	74.9	88.9	72.7
2008	96.5	122.2	115.9	56.2	97.7
2009	45.1	59.4	68.4	75.0	62.0
2010	76.8	78.6	76.4	86.9	79.7
2011	104.9	116.8	109.1	110.0(e)	110.2(e)

Source: Bloomberg and Edison Investment Research

Which way for the WTI-Brent spread?

At about $9/barrel in mid-December, the WTI-Brent spread has narrowed to within our medium- to longer-term forecast range of $5-$10/barrel. Assuming the early December spread holds over the rest of the month, the average WTI discount for the fourth quarter will be about $15.5 and that for 2011, $15.1/barrel. Near term, we would also expect the WTI-Brent discount to trend in the $5 to $10/barrel zone. Tending to compress the spread will probably be the continuing improvement in supplies on the eastern side of the Atlantic basin and the relative strength of the US economy vis-a-vis its European counterpart. Partly offsetting these two factors will continue to be the supply build-up in the Mid-Continent and Texas. A key point to note is that with the WTI discount having been reduced to less than $10/barrel, the arbitrage opportunity for shipping oil from Cushing to the Gulf Coast by truck or rail will have been largely if not completely eliminated. A widening of the WTI discount could re-emerge assuming either a new round of unplanned outages in the North Sea or a major disruption to exports from the Middle East. Abstracting from these issues, we look for WTI to trade at discounts to Brent of $8 to $10/barrel in both 2012 and 2013. We believe burgeoning Mid-Continent and Canadian supplies will keep the WTI discount significant despite improving pipeline links in the mid-Continent.

Exhibit 5:Recent trends in WTI, LLS and Brent



Source: Bloomberg

LLS –WTI: LLS premium narrows

Light Louisiana Sweet (LLS) is a Gulf of Mexico-sourced light crude with a specification similar to WTI and Brent. It competes with waterborne-imported grades at Gulf Coast refineries and has traditionally traded at a dollar or so premium to WTI and perhaps $2-3/barrel to Brent. Given that LLS has roughly tracked Brent in 2011, a very wide premium opened up to WTI during September and early October. The high point was a hefty $29.8/barrel on 22 September. Subsequently, the premium has narrowed substantially and by early December was back down to $10.5/barrel. Gulf refineries using LLS feedstock are now clearly at less of a competitive disadvantage to inland refineries using WTI than hitherto. The rapidly increasing availability of supplies of high quality Eagle Ford oil, which is typically priced in line with WTI, is also helping to enhance the competitiveness of Gulf coast refineries.

During the fourth quarter LLS returned to trading at a modest premium to Brent rather than the unusual discount as had been the case in the prior quarter. In the fourth quarter the premium averaged $0.8/barrel and in early December was running at around $2/barrel. The swing from LLS discount to premium is indicative of an easing of Brent supply tightness.

Other key international light benchmarks: Dubai discount to Brent narrows

Sweet-sour spreads for international benchmark grades have narrowed considerably in recent weeks and months. The key Brent-Dubai (Dubai is a Gulf-sourced light but relatively sour crude popular with Far Eastern refineries) spread averaged a normal to slightly sub-par $1.9/barrel in November, after $5.8/barrel in October and a spot high of a highly unusual $9.1/barrel in June During the second half of November Brent, in fact, traded on several occasions at discounts of $1 to $2/barrel to Dubai. On 5 December the Brent premium to Dubai was$0.4/barrel. The sharp narrowing in the Brent-Dubai spread in recent weeks is another indication of the improving supply of light-sweet grades on the eastern side of the Atlantic basin and in the Mediterranean.

Similarly, the premium of the ultra high-gradeMalaysian-sourced Tapis and Dubai has narrowed substantially over the past two or three months. After hitting $17/barrel in early October the premium averaged $11.9/barrel in November and by early December was down to roughly $10/barrel. Historically, Tapis has traded at a premium of $6-7/barrel to Dubai. The key eastern Atlantic basin Brent-Bonny (Nigerian ultra low sulphur grade) spread has also returned to normal

levels. At the beginning of December Brent was trading at a discount of about $1.5/barrel, which is at the low end of the historic range of roughly $1.5 to $2.5/barrel. In September the discount was nearer $4/barrel. The narrowing discount reflects the improving availability of Bonny following pipeline repair work related to earlier sabotage.

Exhibit 6: Recent benchmark light crude prices

Note: All prices are averages for the period shown other than where indicated.

						2011						
$/barrel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec-13
WTI	84.4	89.5	102.9	110.0	101.3	96.3	97.3	86.3	85.6	86.4	97.1	100.1
Brent	96.3	104.0	114.4	123.4	114.5	113.8	116.5	110.8	110.9	110.4	111.3	109.6
Dubai	92.4	100.3	108.6	115.7	108.5	107.5	110.0	105.1	106.0	103.7	108.6	106.3
Bonny	98.5	105.9	117.8	126.2	117.1	116.0	118.6	112.9	114.6	111.4	112	110.8
Tapis	101.2	107.7	118.7	129.2	121.9	122.3	124.2	118.6	120.0	118.6	120.5	118.4
LLS	97.9	106.3	117.6	126.0	116.5	113.2	115.8	109.3	112.8	111.8	111.9	111.4
Spreads												
WTI-Brent	(6.9)	(14.5)	(11.5)	(13.4)	(13.2)	(17.5)	(19.2)	(24.5)	(25.3)	(24.0)	(14.2)	(9.5)
Brent-Dubai	3.9	3.7	5.8	7.7	6.0	6.3	6.5	5.4	4.9	6.7	2.7	3.3
Brent-Bonny	(2.2)	(1.9)	(3.4)	(2.8)	(2.6)	(2.2)	(2.1)	(2.1)	(3.7)	(1.0)	(0.7)	(1.2)
Tapis-Dubai	8.8	7.4	10.1	13.5	13.4	14.8	14.2	13.5	14.0	14.9	11.9	12.1
LLS-WTI	13.5	16.8	14.7	16.0	15.2	16.9	18.5	23.0	27.2	25.4	14.8	11.3
LLS-Brent	1.6	2.3	3.2	2.6	2.0	(0.6)	(0.7)	(1.5)	1.9	1.4	0.6	1.8

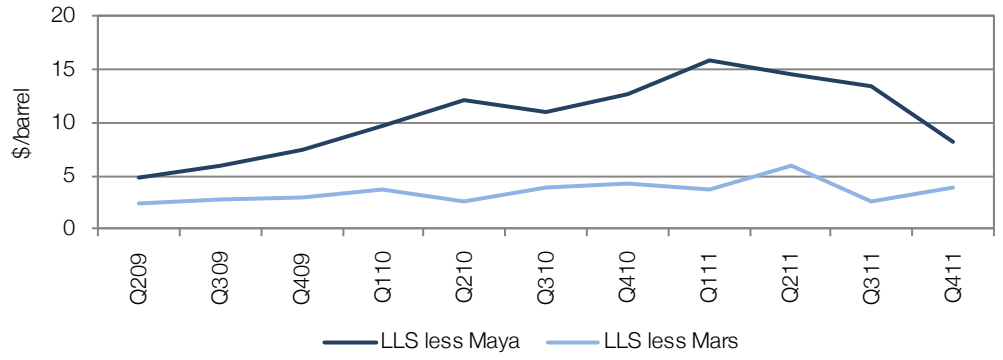
Source: Bloomberg

US heavy crude spreads: Heavy discounts remain below average

US heavy crude discounts, based on waterborne-sourced supplies have trended down considerably since the historically high levels of the second quarter of 2011. Taking Mars, a medium-sour grade sourced from the Gulf of Mexico the discount to LLS in early December was $3.7/barrel. This compares with a high of $6.8/barrel in May 2011. Similarly, the discount of Maya, a Mexican heavy sour grade, fell from a high of $17.3/barrel in April to a recent low of $3.9/barrel in late November. In early December the Maya discount was about $5/barrel. Both the Mars and Maya discounts to LLS are currently significantly below the longer-term averages of $6/barrel and $13/barrel respectively. The reduction in discountslessens the competitive advantage of sophisticated refineries able to process heavy crude grades cost effectively.

Narrowing heavy discounts since the second quarter were initially probably driven by the release of high-grade light crude from the Strategic Petroleum Reserve in June. More recently, however, the phenomenon can probably be attributed to the growing supplies of high-grade feedstock along the Gulf Coast, which may be depressing demand for light waterborne grades, such as LLS.

Exhibit 7: US medium and heavy discounts

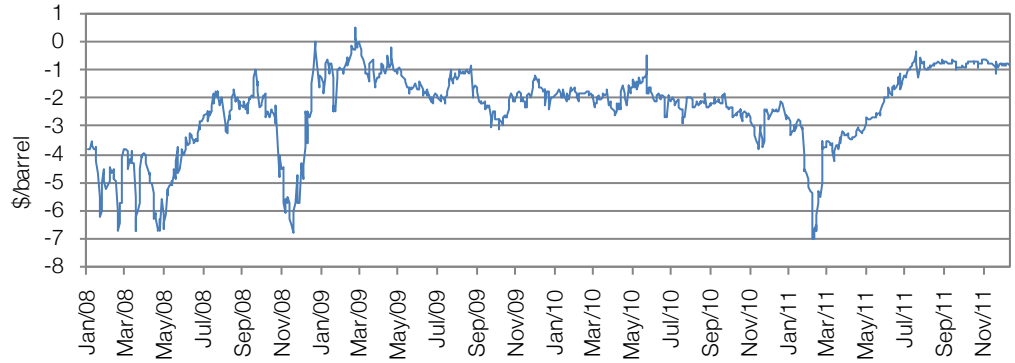


Source: Bloomberg

WTS-WTI discount: WTS discount remains wafer thin

WTS (West Texas Sour) is an inland medium sour grade with a specification similar to Mars and a delivery point of Midland, West Texas. The discount of WTS to higher specification WTI has been fairly stable in recent weeks and indeed over the past four months or so at about $0.8/barrel. This is well under the longer-term average WTS discount of $3.5 to $4.0/barrel. From a specification viewpoint, the WTS discount continues to appear unduly small currently and is another manifestation of the ready availability of premium feedstock in the Mid-Continent and Texas.

Exhibit 8: WTS-WTI spread



Source: Bloomberg

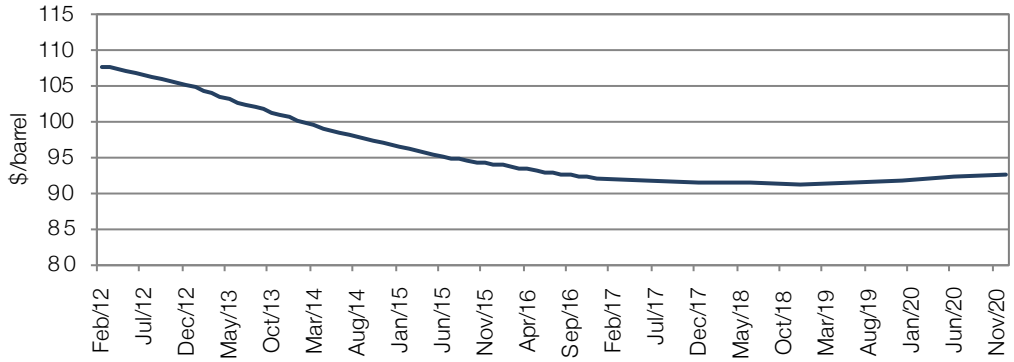
Forward curves: WTI switches to backwardation

Over the past two months the WTI forward curve has switched from contango (near-term prices lower than for forward dates) to backwardation (near-term prices higher than for forward dates) for all but the first five forward dates. This leaves the WTI curve more in tune with that of Brent. From a spot price of about $98/barrel on 12 December, the curve rises marginally to $98.6/barrel in March 2012. It then switches to backwardation over the next four years dropping to a low of $90.5/barrel in mid 2016. A modest contango emerges over the next four years taking the curve up to $93.5/barrel by end 2020. The recent switch to backwardated WTI is the first time that this has occurred since early September 2008 and reflects perceptions of a tightening marketplace. This in turn is a lagged response to sharply falling inventories at the Nymex WTI pricing point of Cushing,

Oklahoma and declining crude imports. We would expect the curve to flatten in the coming months as fears of supply tightness dissipate.

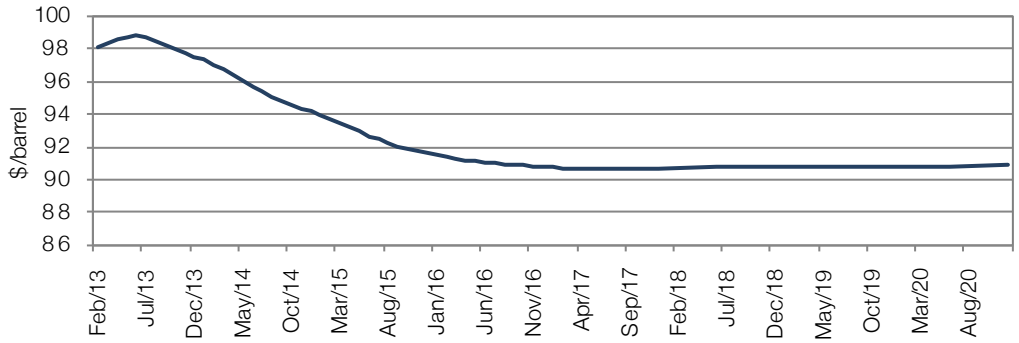
The Brent forward curve has flattened slightly over the past two or three months but remains in significant backwardation through the front end. From a spot and January 2012 forward price of $107/barrel, the curve dips fairly steeply to $92/barrel by end 2016. There is then a marginal dip to $91.5/barrel through end-2018 before a return to a mild contango in the two years to end 2012. This took the forward price upwards to $93/barrel at end 2020. As the supply position on the eastern side of the Atlantic basin improves and Libyan exports gather pace, we would continue to expect the Brent curve to flatten in the coming months. However, it is possible that lingering fears over the possibility of a supply interruption in Iran could keep the curve backwardated for longer than might otherwise be expected. The imposition of a European import embargo on Iran would probably result in a dramatic steepening in the backwardation.

Exhibit 9: Brent forward curve



Source: Bloomberg

Exhibit 10: WTI forward curve



Source: Bloomberg

Supply/demand balance

Recent developments and 2011 outlook: Slowing demand growth and firming production

In the closing months of 2011 the oil market globally looks like being somewhere between balance and a moderate surplus. This contrasts with earlier in the year when the market tightened due to a wave of production outages reflecting technical problems, prolonged periods of maintenance, strikes, civil strife and most significantly the civil war in Libya. Transforming the picture in the fourth

quarter has been a combination of slowing demand growth and firming production. The former reflects broad macroeconomic developments while the latter stems both from a rebound in non-OPEC output from the outages of the second and third quarters and a potentially robust increase in OPEC output. In terms of the latter, we see Libya as being the key driver but Iraq could also make a significant contribution. Industry reports suggest that Saudi production remained at a historically high level in November at around 10mmb/d. This was up about 0.5mmb/d on the previous month and the highest level in about 30 years. There have indeed recently been reports that Saudi production has been running at record levels.

The IEA has continued to trim its global demand forecast for 2011 as economic growth expectations have been revised downwards. The current forecast calls for demand to increase from 2010 by 0.9mmb/d or 1% to a record 89.2mmb/d. According to the IEA, demand grew year-on-year by 2.5% (2.2mmb/d) in the first quarter, 0.5% (0.5mmb/d) in the second quarter and 0.6% (0.5mmb/d) in the third quarter. The estimated gain for the fourth quarter is 0.5% (0.5mmb/d). The non-OECD world is expected to show growth of 3.0% (1.3mmb/d) while the OECD records a decline of 0.8% (0.4mmb/d). OPEC's forecast of demand growth for 2011 is similar to that of the IEA while the EIA is more bullish on 1.1mmb/d. Given the stage in the year, we believe that 2011 demand growth of about 1mm b/d is plausible although bearing in mind developments in the world economy along with the mild conditions so far this winter in much of the northern hemisphere, we suspect the risk is to the downside.

Based on IEA data, global oil production rose by 1.1mmb/d between September and October driven by rebounding output in the non-OPEC world. Key contributors were the US, Canada, Brazil and the North Sea. Compared with a year earlier, production in October was up 1.2mmb/d with roughly 0.5mmb/d accounted for by OPEC crude, 0.2mmb/d by non-OPEC and 0.2mmb/d by OPEC natural gas liquids (NGLs), which are not subject to quotas. For 2011 as a whole the IEA is looking for an increase in non-OPEC crude supply of only 0.13mmb/d due to the various outages mentioned earlier plus the natural decline in mature producing areas. OPEC NGL production is, however, expected to increase by around 0.5mmb/d so the shortfall in world demand growth would be about 0.25mmb/d using the IEA's numbers. In practice, we think that the shortfall will be a little lower due to a weak demand trend in the fourth quarter. This, we believe, will be largely if not completely covered by higher OPEC output.

2012/13 outlook: Surplus increasingly likely

We continue to believe that the consensus global oil demand forecasts for 2012 by the likes of the IEA, EIA and OPEC are unduly bullish. The IEA is forecasting growth of 1.3mmb/d (1.5%) while the EIA and OPEC are on 1.4mmb/d (1.6%) and 1.2mmb/d (1.4%) respectively. Significantly, all three forecasters are showing gains in demand that are significantly higher than in 2011. Given the decidedlyinauspicious outlook for the world economy in 2012, we fail to see that this is plausible. Remember also that structural factors, most notably improving vehicle fuel economy, are reducing fuel use per unit of output in the OECD world. In all probability, abstracting from a major banking crisis or sovereign debt defaults, we are looking next year at a European economy in recession, modest growth at best in North America, unchanged output in Japan and sharply lower economic growth in the developing world. This might add up to world economic growth of 3.0% rather than

consensus forecasts that are 3.5% plus. If we factor in a major banking crisis plus at least one sovereign debt default in Europe, the result in terms of growth would be considerably weaker. On the former scenario we believe that global oil demand growth is very unlikely to exceed 1mmb/d and might well be closer to 0.5mmb/d. Based on the latter scenario we think that global oil demand could drop by at least 2mmb/d.

As far as 2013 is concerned, global economic growth might be a little stronger than in 2012 but probably not drastically so. Over the medium term,OECD growth is likely to be severely constrained by balance sheet de-leveraging by governments, consumers and the banking sector. The developing world will not be immune due to feedback loops in terms of trade and finance. Specifically in the case of China, we think that an unravelling of the great investment boom of recent years will dampen economic growth significantly between 2012 and 2015, compared with the performance of recent years. Given this background and assuming a muddling-through approach to the European sovereign debt crisis, we would tentatively look for world oil demand growth of about 1mmb/d in 2013.

Significant new non-OPEC capacity remains scheduled to come on-stream in 2012. Based on IEA and OPEC data this should boost production by 0.8mm to 0.9mmb/d with the key drivers being Canada, US, Brazil, Colombia, Ghana and the Caspian region. In addition, the major facility outages in the North Sea will hopefully be non-recurring while new OPEC NGL capacity might add another 0.4mmb/d. We therefore believe that demand growth of possibly 1mm b/d can very comfortably be accommodated in 2012 without tapping OPEC crude capacity. It should also be noted that Libyan production will be heading north of 1mmb/d in 2012 and Iraq, which is not subject to OPEC quotas, may be capable of producing another 0.5mm b/d. A supply surplus therefore remains a distinct possibility in 2012, although at some stage this could trigger a Saudi production cutback from current historically high levels of about 10mmb/d.

Saudi Aramco abandons capacity expansion plans

The Saudi Aramco CEO, Khalid al-Falih, has recently announced that the planned capacity expansion in Saudi Arabia from 12mmb/d to 15mmb/d is unlikely to go ahead. Interestingly, the reason given isadvances in technology in the fields of deepwater frontier exploration and unconventional hydrocarbons, notably oil sands and shale oil. Khalid al-Falih makes the highly relevant point that in 2010, despite world consumption of 30bn barrels of oil that not only was the petroleum industry able to replace production but it was also able to increase reserves by almost 7bn barrels. Effectively Khalid al-Falih is arguing that development of frontier zones and unconventional hydrocarbons has pre-empted Aramco's own expansion plans. Aramco's emphasis near to medium term, at least, is developing Saudi gas reserves to meet growing domestic demand in the power utility field. This strategy would have the added advantage of releasing oil for export.

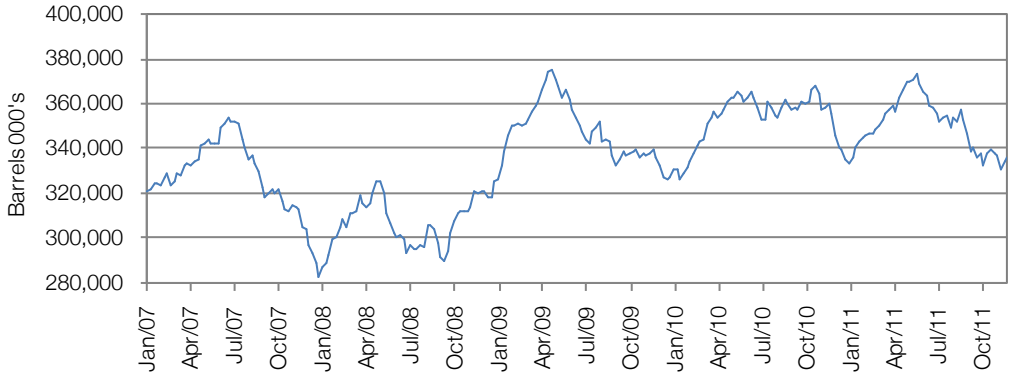
US inventories

Crude oil: Very comfortable both absolutely and relatively

The 38m barrel decline in US crude oil inventories since the recent peak in May has caused consternation in some quarters. Crude oil inventories, however, remain very comfortable both absolutely and relative to supply. It needs to be remembered that inventories had been built up to

historically high levels in early 2011. Based on EIA data, commercial inventories on 2 December were 336.1m barrels, up 1.3m barrels on the previous week but down 19.8m barrels or 5.6% on a year earlier. Since end September,the trend has been flat and inventories remain towards the top of the historical range for the time of year. Crude oil inventories for the week ending 2 December were equivalent to 22.7 days. This was down on the 24.7 days of a year ago but in line with the 22- to 23-day average for the period since 2000.

Exhibit 11: US crude oil inventory



Source: Bloomberg

Cushing: The trend has flattened of late

Inventories at the Cushing tank farm, the world's largest, trended sharply down from the record high of 41.9m barrels in April 2011 to mid-September but subsequently have followed a flat trend. For the week ending 2 December Cushing's inventories stood at 31.1m barrels, 57% of the working capacity of 55m barrels. The former was marginally down on the previous week and 10.8m barrels below the April high. From a longer term perspective, inventories at Cushing remain at a high level. Earlier in the year concerns were expressed that capacity at Cushing would be exhausted due to the build-up in supply from Mid-Continent shale sources and from Canada. This has proved to be wide of the mark due partly to capacity expansion and partly to shipping out surplus oil by road, rail and barge to the more lucrative Gulf coast markets. In addition, as loading capacity has increased large scale rail shipments can now be made directly from the Bakken to the Gulf and Pacific coasts. However, the pronounced narrowing of the WTI discount will have reduced the attraction of making such shipments.

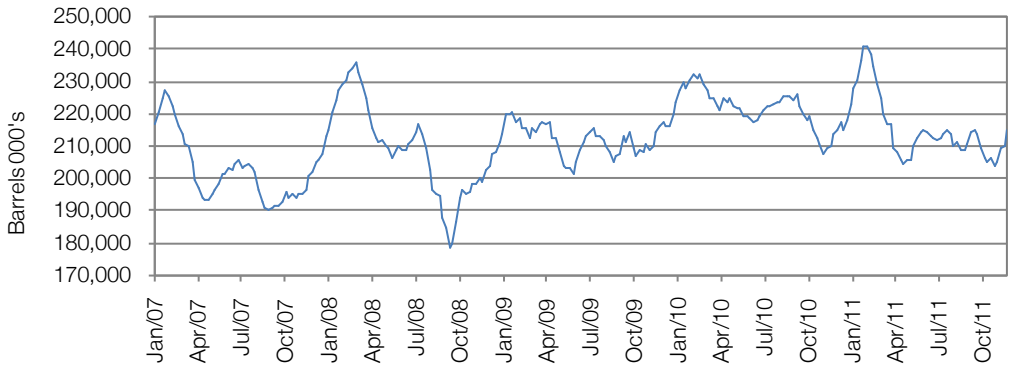
Exhibit 12: Cushing crude oil inventory

Source: Bloomberg

Gasoline: Seasonally high

US gasoline inventories are running at seasonally high levels. According to the EIA, in the week ending 2 December inventories were at 215m barrels, up 5.1m barrels on the previous week and 1m barrels on a year earlier. In terms of days supply, inventories were the equivalent of 24.9 days, which is one day higher than in the corresponding period of 2010. This is broadly in the middle of the range since 2000 of 20 to 28 days.

Exhibit 13: US gasoline inventory

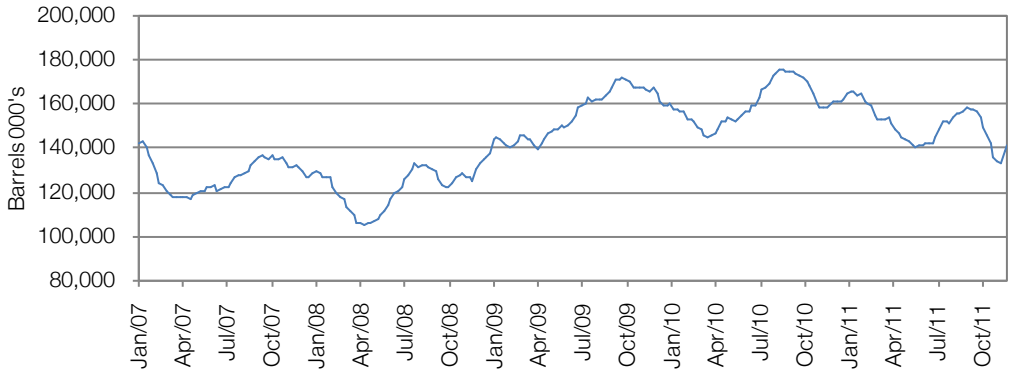


Source: Bloomberg

Distillates: At the low end of the seasonal range

US distillate inventories are seasonally low but above the lower limit of the range for the time of year. For the week ending 2 December inventories came in at 141m barrels, well down on the 160.2m barrels of a year earlier. They have nevertheless climbed 8m barrels since the recent low on 18 November. Distillate inventories on 2 December were equivalent to 36.6 days supply, which was 6.4 days below a year previously. The days supply currently, however, is much in line with the longer-term average and have been trending higher in recent weeks.

Exhibit 14: US distillate inventory



Source: Bloomberg

All product commercial inventories: Significant recovery from the recent low

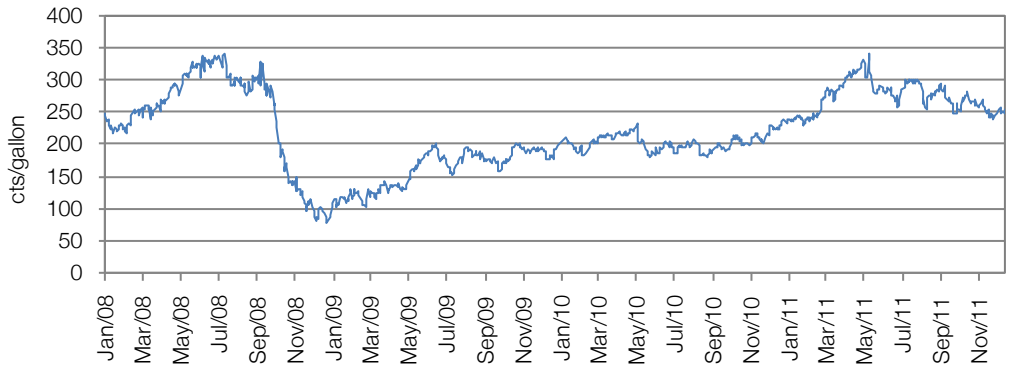
US crude oil and refined product inventories fell by a sharp 55m barrels between end-August and mid-November 2011. Subsequently there has been a partial recovery with inventories rising by 17m barrels to 1.054bn barrels. Although about 4% lower than a year earlier, inventoriesoverall remain at a relatively high level from a longer historical perspective. Meanwhile refinery utilisation at 87.7% in early December was running in line with a year ago.

Refinery crack spreads: The party is over in the Mid-Continent

The party appears to be over for Mid-Continent and other refineries with access to what was until recently ultralow cost WTI feedstock. This is manifested by the plunge in the Bloomberg Gulf Coast/WTI 321 crack spread (the margin before refining costs on converting three barrels of WTI into two barrels of gasoline and one of diesel) from a high of $36.5/barrel on 25 August 2011 to around $10.5/barrel in early December. The GC/WTI 321 spread, however, currently remains above the level a year ago of about $8.5/barrel and of course, from a historical perspective constitutes a perfectly viable level. The average GC/WTI 321 spread in the year-to-date early December 2011 of $23.2/barrel is also a stunning result by historic standards and is massively up on the previous year's $7.3/barrel.

Downward pressure on the GC/WTI 321 crack spread since August and more particularly since mid-October has been driven principally by the surge in the price of WTI. The margin squeeze has been compounded by downward trends in wholesale gasoline and diesel prices over the past three or so months. Since the end of August, the decline in gasoline has been particularly marked with a drop in Gulf Coast regular-grade fuel of about 15% to $2.49/gallon. Diesel has shown a more modest decline of 5% on the same basis. Further upward pressure on WTI will probably begin to reverse the trend in prices but for the moment refineries being squeezed from both feedstock costs and product prices. Such, in fact, has been the margin squeeze that three large refineries in the Philadelphia area owned by Sunoco and ConocoPhillips are at risk of closure in the coming months. Significantly the refineries at risk are dependent on high-cost waterborne light feedstock and are also incapable of refining low cost, heavy sulphurous crude.

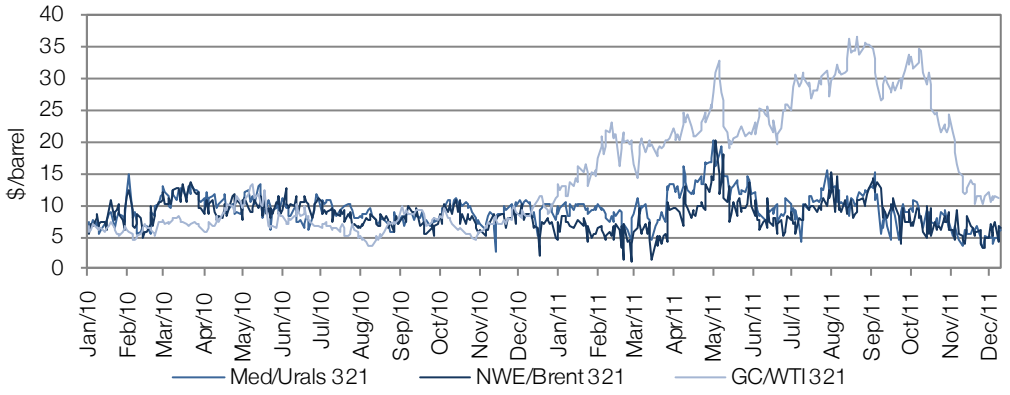
Exhibit 15: US GC wholesale gasoline price trend



Source: Bloomberg

Despite the plunge in Gulf Coast crack spreads over the past few months they remain considerably higher than in Europe. For example, the NWE/Brent spread was running in early December at a mere $6.4/barrel while the Mediterranean/Urals 321 spread was slightly lower at $5.5/barrel. European crack spreads have also come under pressure since August with the NWE/Brent 321 and Mediterranean/Urals 321 spreads both narrowing from peak levels of $12 to $15/barrel. The recent low for both spreads was in late November when they hit around $3.2/barrel. This is a highly unprofitable situation for refineries after taking into account processing costs and overheads. Narrowing spreads mainly reflect decidedly lacklustre domestic product markets other than perhaps for middle distillates and constrained export markets. Given the weak economic backdrop European crack spreads will probably remain depressed for the foreseeable future unless there is a collapse in feedstock costs.

Exhibit 16: Recent trends in crack spreads



Source: Bloomberg

US refined product demand: Continuing lacklustre trend

The trend in US petroleum product demand remains lacklustre. Based on EIA data for products supplied (a proxy for demand) during the four weeks ending 2 December, demand overall averaged 18.55mm b/d, down 2.8% from a year earlier. Compared with the previous four-week period ending 25 November, supply showed a significant drop of 432,000b/d. If anything, the signs of weakening are becoming more pronounced.

The key area of weakness remains gasoline, the largest product group. In the four weeks to 2 December supply averaged 8.64mmb/d which was 3.5% below a year previously. Partly offsetting the weakness in gasoline were gains of 3.1% in kerosene, 3.4% in distillates (heating oil and diesel) and 8.7% in propane/propylene. Residual fuel oil, however, showed a hefty decline of 17.4% while the large derived miscellaneous items group showed a drop of 12.0%. Cumulatively in 2011,US petroleum product has fallen 0.9% from a year earlier, which constitutes a widening of the shortfall compared with the 0.6% decline for the period to October. In terms of product categories the cumulative year-on-year movements in the year to early December have been gasoline -1.6%, kerosene +2.4%, distillates +1.5%, residual fuel oil -1.2%, propane/propylene -2.4% and miscellaneous -2.3%.

Exhibit 17: US petroleum products supplied

Source: EIA

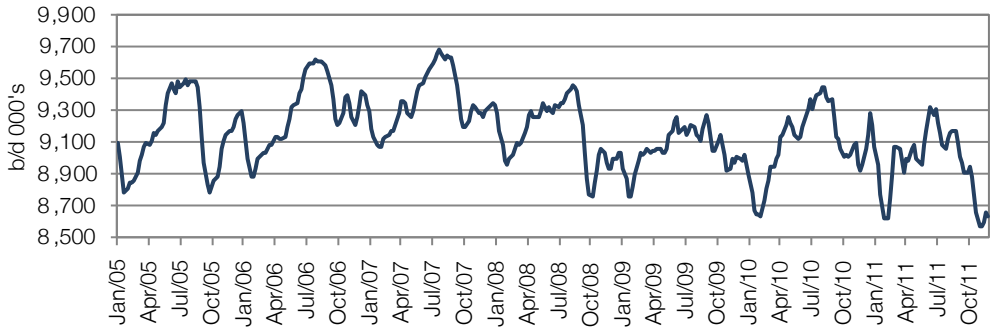
Lacklustre product demand continues to be consistent with a sluggish US economy. However, this is not the whole story. Demand is also being trimmed by two other factors – improvements in the fuel efficiency of the vehicle fleet and straight-forward economising. The former stems from advances in powertrain technology, downsizing and changes in the vehicle mix. Improvements in vehicle fuel efficiency look like cutting into petroleum demand for the foreseeable future, reflecting tightening CAFE (corporate average fuel economy) regulations in the US. These call for fleet fuel efficiency to be boosted from about 25mpg (cars and light trucks) currently to 35.5mpg in 2016 and 54.5mpg in 2025. Economising in fuel use is partly a function of a sluggish economy and partly what are still historically high prices both in nominal and real terms.

In tune with the downward trend at the wholesale level, retail gasoline and diesel prices have also been falling of late. According to the EIA in early December, regular gasoline in the US was selling for $3.29/gallon while diesel was at $3.93. Compared with the May highs, gasoline was off 17% while diesel was down 5%. On a year-on-year basis, however, gasoline and diesel are still showing increases of 11% and 23% respectively.

The EIA has continued to trim its forecasts for US petroleum product demand in 2011 and 2012. The latest forecast for 2011 calls for a decline in overall demand of 1.4% while gasoline is expected to drop 2.6%. Forecast gasoline demand of 8.76mmb/d is the lowest since the early 2000s and is well down from peak levels of 9.6mmb/d recorded in 2007. For 2012 the EIA is looking for demand overall of 19.03mmb/d, which would imply growth of 0.6%. Given the less than auspicious outlook

for the economy, along with the structural constraining influences mentioned earlier, this forecast could prove optimistic.

Exhibit 18: US gasoline supplied



Source: EIA

Exhibit 19: US distillates supplied

Source: EIA

Exhibit 20: US petroleum product demand trend

Mm b/	2004	2005	2006	2007	2008	2009	2010	2011e	2012e
Gasoline	9.11	9.16	9.25	9.29	8.99	9.00	8.99	8.76	8.78
Other	11.62	11.64	11.44	11.39	10.51	9.77	10.19	10.16	10.25
Total	20.73	20.80	20.69	20.68	19.50	18.77	19.18	18.92	19.03

Source: EIA

Refined product trade balance: Swing to net exports

One of the most interesting developments of 2011 in the US petroleum industry has been a sharp swing from net refined product imports to exports. This is the first time that this has happened on a sustained basis since 1949. The trend in the net import balance has, in fact, been clearly downward since 2008 when it was running at about 2mmb/d. By 2010 net imports were down to 270,000b/d and in 2011 the EIA is looking for a swing to net exports of 320,000b/d. As recently as 2005 the net import balance was 2.5mmb/d. Presently US gross refined product exports are running at about 2.7mmb/d against 1mmb/d or so in the early to mid-2000s and account for 15% of refinery capacity. The swing in the balance reflects both a decline in imports due to falling

domestic consumption and most significantly of late, a surge in exports mainly to South America. Buoyant South American export demand reflects a combination of strong economic growth and refinery capacity constraints in the region.

Rising exports have been a major positive for US coastal refineries in 2011 enabling utilization to be maintained at high levels. Demand for crude has, of course, also been boosted, which has probably contributed to the drawdown of US inventories in recent months. The EIA is forecasting that net export product balance will continue in 2012, albeit at the somewhat lower level of 160,000b/d.

Crude oil price outlook: Near-term price weakness

We believe the market is implicitly taking too bullish a view of the economic backdrop to oil prices presently. Rather than a tight marketplace, we think we will be looking at a relatively loose one in 2012 and in all likelihood in 2013. Demand growth, we suspect, will be more subdued than expected by the bulls while supply advances considerably more strongly than in 2011. As 2012 progresses we would expect to see demand forecasts cut by the likes of the IEA and EIA. According to the bulls, supply is tight but this view seems to have little substance. The downward trend in inventories in recent months is largely, if not wholly, voluntary and in any case inventory levels remain at comfortable levels in terms of days supply in the absence of a very major supply interruption. It is of course possible that the EU will implement its ill-conceived plan to embargo imports of Iranian crude.

However, reflecting buoyant trends in recent weeks particularly for WTI, we are upgrading our 2011 oil price forecasts. For Brent the 2011 forecast increases from $109.2/barrel to $110.2/barrel while for WTI it goes up from $92.7/barrel to $95.1/barrel. The quarterly breakdowns are Brent Q1 $104.9.0, Q2 $116.8, Q3 $109.1, Q4 $110.0 and WTI Q1 $93.9, Q2 $102.3, Q3 $89.5, Q4 $94.5.The fourth-quarter forecasts reflect actual outcomes for October and November and a December forecast based on spot prices at the beginning of the month.

For 2012 we are anticipating a quasi-recessionary scenario in the OECD world and sharply lower growth in the developing world. We look for the world economic growth to decelerate through the first three calendar quarters before stabilising in the fourth quarter. However, based on recent trends, oil prices are likely to show significant carryover strength going into 2012. As the business environment deteriorates we expect to see prices soften in the first and second quarters. A modest firming is looked for in the third and fourth quarters reflecting the anticipated stabilisation in the broader economy and possible OPEC production cutbacks. Our quarterly forecasts for 2012 are Brent Q1 $102.5, Q2 $100.0, Q3 $103.5, Q4 $105.0; WTI Q1 $94.0, Q2 $90.5, Q3 $93.6, Q4 $95.0. For 2012 as a whole we look for Brent to average $102.8/barrel and WTI $93.3/barrel. Compared with our earlier forecasts, Brent is up $2.5/barrel while WTI shows a gain of $6.3/barrel. The higher price forecast for Brent reflects in part greater carryover strength from 2011 and in part a readjustment of the quarterly profile. WTI reflects the impact of greater carryover strength from 2011 to 2012 plus the assumption of a narrower WTI discount than previously.

As far as 2013 is concerned, we still do not see a lot of scope for upside in Brent and WTI from forecast fourth quarter 2012 levels given the extended period of weakness in the world economy foreseen. Essentially, we believe that supply will be capable of keeping pace with demand which

we would expect to grow by no more than 1mmb/d in 2013 and probably also through 2015. Based on this scenario we look for averages in 2013 of $106/barrel for Brent and $97/barrel for WTI.

What happens if Iranian imports are embargoed?

We believe that embargoing Iranian imports could have potentially disastrous consequences for oil consumers. Removing such a large quantity of oil from the marketplace in Europe would not only result in a severe dislocation to supplies at Mediterranean refineries but also a surge in prices. We suspect that benchmark light crude prices could increase in short order to $150/barrel, with even $200/barrel not being too fanciful. This would in turn push gasoline and diesel prices to over $2/litre in Europe with major negative implications for economic activity and ultimately petroleum demand.

Exhibit 21: WTI and Brent price trends

Note: All prices are yearly averages.

$/b	2004	2005	2006	2007	2008	2009	2010	2011e	2012e	2013e
WTI	41.5	56.6	66.1	72.2	99.8	62.0	79.5	95.1	93.3	97.0
Brent	38.3	54.5	65.4	72.7	97.7	62.0	79.7	110.2	102.8	106.0

Source: Bloomberg and Edison Investment Research

US natural gas market

Production/consumption: Production is buoyant while demand is subdued

US natural gas production remains in robust good health. In September 2011, the most recent period for which data is available, production was 2.01tcf, up 6.6% on a year previously. Cumulatively production through the nine months to September was 6.7% higher than in 2010. Production continues to be driven by large scale development activity in the lower 48 states. By contrast, Federal Gulf of Mexico production has fallen 18% year-on-year through September. Reflecting buoyant production, net imports have been on a notable downward trend in 2011. Through the nine months to September they were down 26% to 1.50tcf. Pipeline imports from Canada and Mexico are off 5% while LNG imports have fallen 18%. In contrast, pipeline exports have increased by 44% and LNG exports have almost doubled, albeit from a low base.

US natural gas consumption has also increased in 2011 but growth has trailed that of production. In September, in fact, consumption was little different from the previous year. Growth in the year-to-date has been 2.0% driven by industrial usage. Interestingly, gas for vehicle applications now appears in the statistics, although the amounts are still very small at about 25bcf in the year-to-date September. Looking at the other key gas markets, consumption in the year-to-date is roughly unchanged from a year ago in residential and up 1.9% in both the commercial and electric power sectors. An important constraint on natural gas consumption over the past two months or so has been mild weather across much of the US. This has adversely affected both residential/commercial use for space heating and power generation.

The EIA continues to look for a buoyant trend in US natural gas production in 2011 and to some extent in 2012. In the case of production, growth of 6.1% to 65.6bcf/d or 23.9tcf is now expected for 2011. This constitutes a slight reduction from the levels forecast a few months ago but would

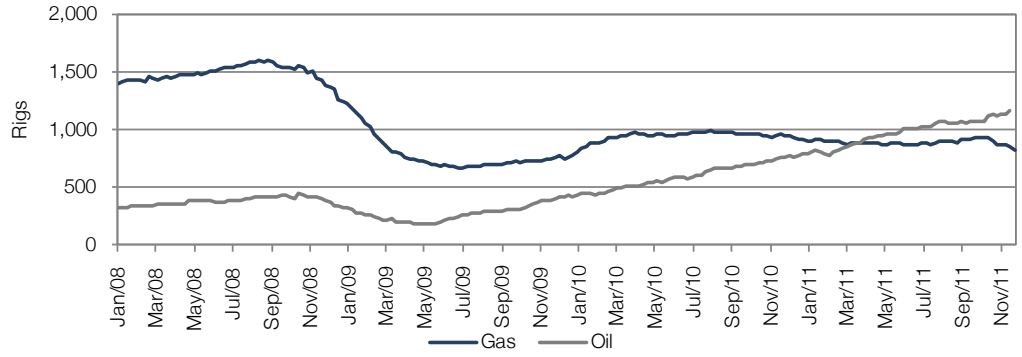
nevertheless comfortably exceed the 1973 record of 22.7tcf. It would also make the US the world's largest producer of natural gas. For 2012 the EIA is forecasting production growth of 2.0% to 66.9bcf/d or 24.4tcf. The EIA continues to refer to potential upside risks to its 2012 production forecast, given still high levels of drilling activity. Gas consumption is forecast by the EIA to grow by 1.7% in 2011 and 1.1% in 2012. An increase on inventories is therefore likely to result.

Drilling activity: The gas rig count has dipped

US natural gas drilling activity has slipped noticeably in recent weeks. This follows the surprisingly robust trend, given deteriorating industry economics, between end May and mid-October. Based on Baker Hughes data, the US natural gas rotary drill count for the week ending 9 December 2011 was 820, down 116 or 12% on the recent high on October 14. Over the most recent week the rig count was down 36, while compared with a year ago there has been a fall of 14%. Belatedly perhaps, it would appear that drilling for gas is now coming under pressure from unattractive economics.

Contrasting with gas, US oil-related drilling continues to surge, driven by very buoyant development activity in the shale plays of the Lower 48 states. On 9 December the Baker Hughes oil rig count stood at 1161, up 29 or 2.6% on the prior week and 398 or 52% on a year earlier. The oil related rig count is now running about 6X higher than at the recent low in mid 2009. It is at record levels.

Exhibit 22 Baker Hughes US rig count



Source: Bloomberg/Baker Hughes

Inventories: Record levels

US natural gas inventories in late November were at record levels for the time of year reflecting the diverging trends of production and consumption mentioned previously. According to the EIA, inventories on 2 December 2011 were 383bcf. This was 102bcf or 2.7% higher than a year earlier and 307bcf or 8.7% above the five-year average. In the absence of a sustained period of really severe weather over the next three months, inventories at the beginning of the injection season in April are likely to be at record levels seasonally. Near term, at least, there are no signs of severe weather along the Eastern Seaboard or the Midwest.

Price trend and outlook: Seasonally a very weak trend

The trend in US natural gas prices has been seasonally very weak of late. The key Henry Hub, Louisiana benchmark, for example, fell from about $3.50/mmBtu at the beginning of October to around a two-year low on November 23 of $2.83/mmBtu. The price firmed to a recent high on 30 November of $3.55mm b/d on the back of signs of colder weather along the Eastern Seaboard

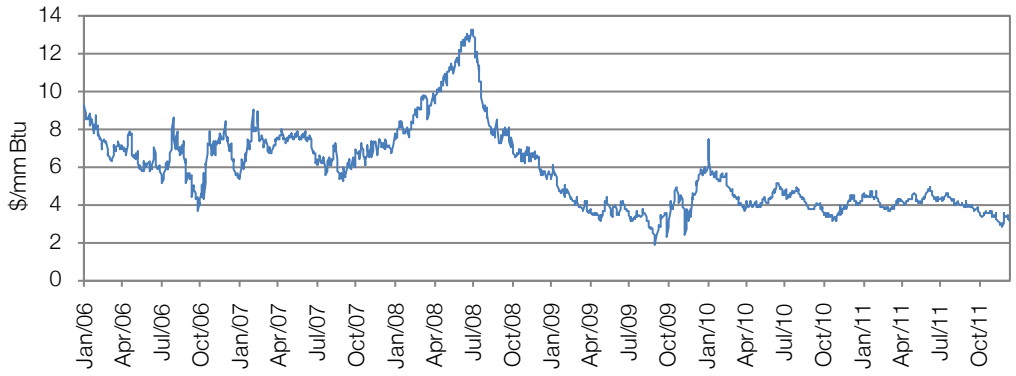
and Midwest. Subsequently, the Henry Hub quote has dipped and on 12 December was trading at $3.29/mmBtu. This was down 27% on a year previously and 33% on the 9 June 2011 high of $4.92/mmBtu. Elsewhere, prices at key hubs on 12 June were $3.83/mm Btu at Algonquin City Gate (New England Hub), $3.96/mmBtu at Iroquois Zone 2 in New York, $3.13mm/Btu at Carthage, Texas and $3.23/mmBtu at Cheyenne, Wyoming. The seasonally weak trend of late reflects the remorseless supply build up mentioned previously, record inventories and the extended period of generally mild temperatures. Any appearance of winter has been short-lived and muted.

The diverging price trends in US oil and natural gas have resulted in natural gas sitting at a massive discount to US oil on an energy equivalent basis. At $3.29/mmBtu the Henry Hub quote is currently trading at only about $20/boe, while WTI is nearer $100/barrel. On an international comparison US natural gas prices are also ultra low and along with those of Canada are easily the lowest in the OECD world. Currently, the Henry Hub is trading at a discount of a hefty 74% to the UK NBP price of 58.5p therm or $9.13/mmBtu. Meanwhile, the Henry Hub quote stands at around 27% of international LNG prices.

We are again lowering our Henry Hub price forecasts for both 2011 and 2012. In the case 2011 we are reducing our forecast from $4.11/mmBtu to $4.02/mmBtu reflecting the weaker than expected showing so far in the fourth quarter. Our new full-year forecast reflects a fourth quarter average of $3.41/mmBtu. This is in line with the average for the period through early December. For 2012 we are now looking for a full-year average for the Henry Hub quote of $4.14/mmBtu against $4.20/mmBtu earlier. The modest downgrade mainly reflects lower than previously expected carryover going into 2012. Essentially in 2012, we expect the strong production trend and high inventories to keep a lid on prices. However, we are assuming that weather conditions will probably not remain as benign as over the past year and that declining drilling activity in the coming months may prevent a complete rout in prices. Near term, the key downside risk to our 2012 forecast is an extended period of mild weather. This would probably result in the Henry Hub quote dropping significantly below $3/mmBtu in the first quarter.

For 2013 we are provisionally looking for a modest recovery in the average Henry Hub price to $4.40/mmBtu. The drivers behind this are a combination of an expected weakening trend in drilling activity as oil and gas companies continue to refocus on oil and what we believe will be a boost to demand from a sustained period of depressed prices. These factors will, we think, begin to erode the supply surplus. As always, much will depend on weather conditions in 2013.

Exhibit 23: Henry Hub price trend



Source: Bloomberg

Shell evaluates new gas markets

At the recent World Petroleum Congress in Doha, Qatar, Shell CEO Peter Voser discussed new markets for gas in the US and Canada given surging production and ultra competitive prices of the commodity. It should be noted that Shell is a major player in gas in North America with proved reserves of 40tcf, about 12% of the continent's total. Production is currently running at about 1.2bcf/d (200,000boe/d) and is expected to double over the next three years. Shell's exposure to gas in the US increased significantly in 2010 with the $4.7bn acquisition of East Resources Inc, which has major exploration and production interests in the Marcellus in Pennsylvania and the Mid-Continent.

Voser's gas market development plans in North America focus on three areas: chemical production, LNG export and vehicle fuel. Shell has already announced plans to build an ethylene plant in Appalachia (locations in Pennsylvania, Ohio and West Virginia are being considered). It will be the first ethylene cracker built in the US in 10years and the first in Appalachia in about 50 years. In LNG export Shell is participating in a joint venture to construct a facility in British Columbia to supplyAsia. Most significant of all, perhaps, are Shell's plans to develop the market for gas as a fuel for heavy trucks. Initially this involves supplying LNG for use on the Calgary to Edmonton highway, one of the most intensively-used heavy truck routes in Canada. Shell is also considering building a GTL (gas to liquid) plant in the US along the lines of the Pearl plant in Qatar, which was commissioned several months ago. A GTL plant could be capable of producing several hundred thousand barrels per day of diesel.

Shell's discussion of the market development opportunities for gas in North America follows an earlier announcement in 2011 by Chesapeake, the second-largest producer of gas in the US. Chesapeake announced a $150m investment in Clean Energy Fuels (Nasdaq CLNE), the leading vehicle gas business in the US. The purpose of the investment is to accelerate the development of an LNG fuelling infrastructure for heavy trucks across the US Interstate highway network. The initial plan is to add 250 to 300 LNG fuelling points. Heavy truck diesel usage is currently about 3mmb/d (about 6tcf per year) in the US and 0.4mmb/d (about 0.9tcf per year) in Canada so there is potentially a very large market for gas to tap. The key incentive to convert to gas is fuel cost savings of about 35% (equivalent to $1.4/gallon of diesel). Natural gas also has a superior

performance on emissions compared with diesel, an increasingly important consideration in congested zones such as the Port of Los Angeles/Long Beach where emission regulation is being tightened. The disadvantage of natural gas fuelled heavy trucks is the high cost of conversion for existing vehicles and some loss of on-highway performance. These disadvantages will probably be at least partially overcome with the introduction of LNG compliant engines as original equipment.

The upshot of the comments and strategic initiatives of both Shell and Chesapeake regarding gas market development opportunities is that demand for gas could well gather momentum surprisingly quickly as new markets come on-stream. This should help tighten the market, although it will inevitably be a medium- to long-term rather than a short-term phenomenon.

Exhibit 24: Henry Hub quarterly price scenario

$/mm Btu	Q1	Q2	Q3	Q4	Average
2007	7.19	7.38	6.18	7.10	6.96
2008	8.66	11.37	9.06	6.45	8.89
2009	4.54	3.70	3.17	4.37	3.94
2010	5.15	4.15	4.32	3.86	4.37
2011	4.18	4.37	4.12	3.41(e)	4.02

Source: Bloomberg and Edison Investment Research

Exhibit 25: Henry Hub natural gas price trend

Note: All prices are yearly averages.

$/mm Btu	2004	2005	2006	2007	2008	2009	2010	2011e	2012e	2013e
	5.85	8.79	6.72	6.96	8.89	3.94	4.37	4.02	4.14	4.40

Source: Bloomberg and Edison Investment Research.

Share price performance

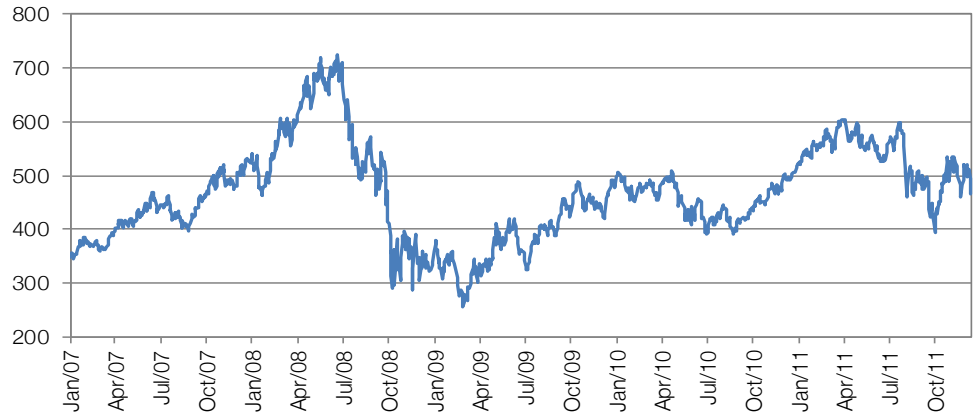
The AIM Oil & Gas Index has recovered modestly from the 25-month lows of early October but remains depressed from an historic perspective. As of 14 December the index was up 16% from the 4 October low but down 34% from a year earlier. Compared with the 7 February 2011 high, the decline has been even more pronounced at 42%. For comparison, over the past year the AIM All Share Index has fallen 23% while the FTSE 100 is off 9%. The underlying problem for the AIM junior E&P stocks in recent months has been the flight from perceived high-risk assets against the background of a deteriorating macroeconomic environment and the ongoing sovereign debt and banking crises in Europe. Junior E&P stocks are, of course, particularly exposed to risk aversion due to the cash hungry nature of the businesses and generally speaking their lack of cash flow from operations. In our view, the financing backdrop for the juniors is likely to remain challenging through the first half of 2012 given the likely persistence of the twin sovereign debt and banking crises in Europe and the spectre of downward pressure on oil prices.

Interestingly, the FTSE 350 Oil & Gas, which is dominated by the majors, has also increased by 16% since the recent low in early October. This Index, however, fell by considerably less than the

AIM juniors in the second and third quarters and as of 14 December was 0.5% ahead of a year previously. Over the past two months or so the FTSE 350 Oil & Gas Index has also at times traded within 5% of the early April three-year high.

The larger US independent E&P concerns, having come under very heavy pressure in the third quarters of 2011, rebounded sharply from their early October lows. The S&P 500 Oil & Gas Exploration and Production Index, for example, climbed by 35% in a little over a month propelled by the surge in the price of WTI and speculation regarding M&A activity. Since mid-November, however, the S&P 500 Oil & Gas Index has once again lost ground with a decline of 13%. This largely reflects the loss of momentum in the WTI upsurge in recent weeksand indeed the hefty fall about 5% on 14 November. As of 14 December, the S&P 500 Oil & Gas Index was down 6% from a year earlier and 23% from the April 2011 near three-year high.

Exhibit 26: S&P 500 Oil & Gas Exploration & Production Index



Source: Bloomberg

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