



شركة وثيقة المالية

Watheeqa Capital Company

## The Oil Story



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## The Oil Story

With the recession eventually receding, oil is back in the lime light. Along with it, back on centre-stage is discussions of oil production peaking (peak oil). Every oil price shock till date has seen fears of “running out of oil” escalating, only to be pushed back into oblivion as soon as the prices come down.

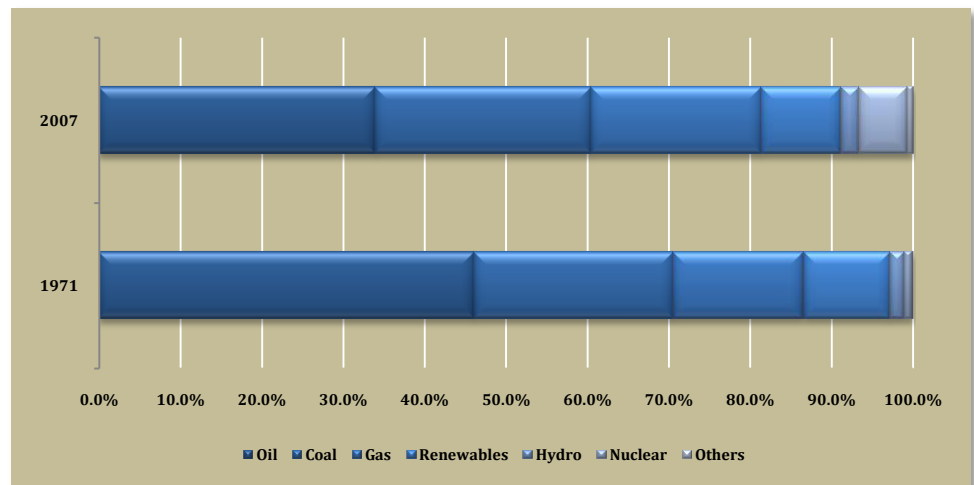
The recent price spike is no different. The voices of proponents of peak oil are ever more loud and panicky this time around. Estimates by many sources are enough to scare a casual reader. When some say the global oil production peak will be in 2010, others pin it at 2015. Still some talk of peak in 2018. While the exact year may vary, all agree that the peak is imminent, and that post the D-day, it’s all downhill for the energy requirements of humanity. Is it really as bad as it sounds?

Of course, there exists a section that thinks differently about oil. Though much fewer in number, there are dissenting views, rebuttals to arguments and diverging set of logic to the peak oil theory. Here is our attempt to independently put together the various pieces of this complex jigsaw puzzle, while keeping an eye on different viewpoints.

### The Demand Story: Very modest growth

Peter Drucker once said “change is the only constant”. We think oil is no exception. The pattern of oil usage, and energy usage in general, is continuously changing and evolving. The amount of oil we consume has undoubtedly gone up over the years. From 48.4 mmbd (million barrels per day) in 1971, it has grown over 74% to 84.32 mmbd by 2009. World oil consumption is on the rise, clearly. Does that say the whole story of oil demand? Let’s take a look.

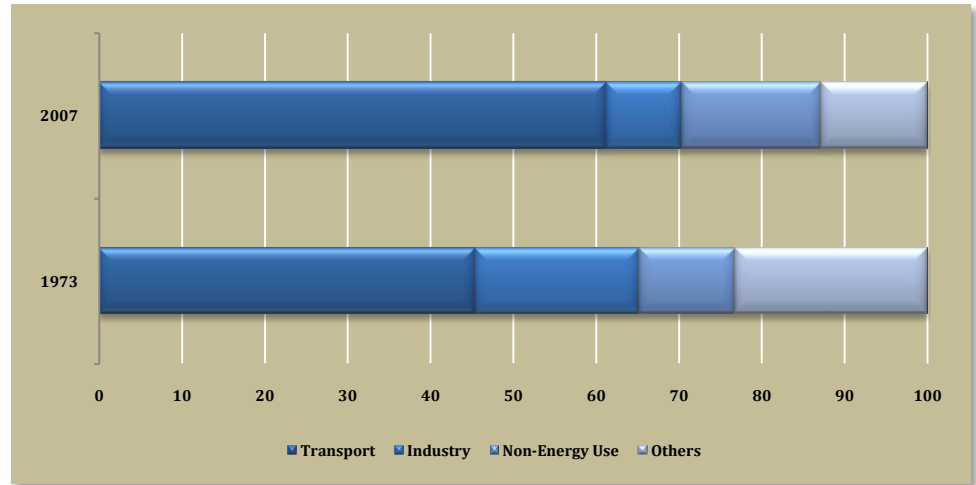
**Exhibit 1. Composition of World Energy Supply in 1971 and 2007**



Source: IEA, Watheeqa

Exhibit 1 shows a snapshot of the global energy supply landscape as in 1971 and 2007. It shows, in percentage terms, world’s dependence on each major energy sources. In 1971, more than 46% of world’s energy needs were met by oil. In 2007, the share has come down to 34%.

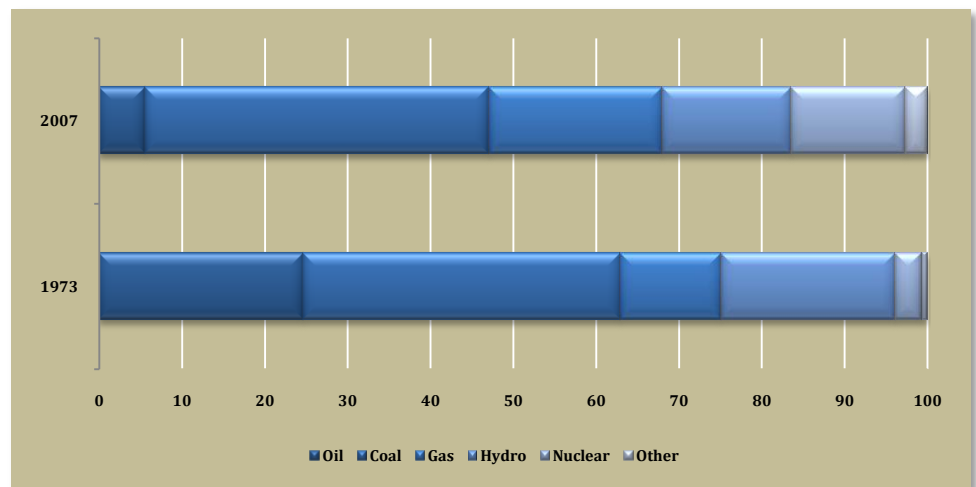
**Exhibit 2. Composition of World Oil Consumption in 1973 and 2007**



Source: IEA, Watheeqa

Transportation, industrial and residential & commercial (heating, power, etc.) sectors have historically been the major sectors driving oil demand. Exhibit 2 shows how the allocation of oil across these various uses has changed over the 24 year horizon. Industrial, commercial and residential uses, which accounted for roughly 43% in 1973, together amounted to only around 22% of total oil usage in 2007. Exhibit 3 shows that while 24.7% of power generated in 1973 had oil going into it, in 2007 it was down to a meager 5.6%.

**Exhibit 3. Composition of Fuels in Electricity Generation in 1971 and 2007**



Source: IEA, Watheeqa

### **What is driving the change? Is it going to continue into the future?**

Technological and behavioral changes are driving efficiency gains in oil usage. In addition, world has increasingly been looking at sources other than oil to meet its growing energy needs, lately. The shares of nuclear, gas, wind and solar energy are only set to go further up, if the historical trend is any indication.

Nuclear power capacity is increasing by leaps and bounds worldwide. According to World Nuclear Association, over 50 reactors are presently under construction in 13 countries. Another significant chunk of capacity is being added through up gradation of existing plant. Current estimates forecasts over 800 GWe production capacities to be in place by 2030. That is more than 140% jump from the existing capacity, pointing to a significant increase in the share of nuclear energy in electricity generation leading to reduced demand for oil.

Transportation needs that make up more than 60% of current oil consumption might find some relief with surging hybrid vehicle sales. Increased environmental awareness and more importantly, tax incentives, are expected to drive up the sales of these vehicles. Auto sales forecasts say hybrid vehicles sales are expected to go up 170% by 2015. JD Power estimates that hybrid cars will account for 7% of total car market by 2015. This is considered a very conservative estimate in auto circles.

Does all these mean absolute oil requirement is about to plunge in the near future? It is highly unlikely, in our view. A major portion of the above stated gains due to efficiency improvements and technological changes is expected to come about from OECD countries. Emerging markets, growing at the current projected rates, will offset a substantial part of OECD gains. As can be seen from Exhibit 4 the oil intensity has come down drastically in OECD countries. According to OECD Economic Outlook, emerging markets oil intensity has gone up during the same time period.

Coupled with this, substantial changes in these directions can occur only over a long period of time. In the near future, we believe world oil requirement will continue to increase, although at a much reduced rate.

The latest forecast by IEA pegs global demand at 105 million barrels per day (mmbd) in 2030. That implies a growth of less than 1 mmbd per year for next 20 years. When OECD oil demand starts declining in earnest, world will be looking up to China and India to make up for the lost demand. China is geared to move away from oil through its many policy initiatives. Energy efficiency improvement targets, fuel taxes and national industry plans will see China going the OECD way in its demand growth in not so far away future. Going forward, Indian story might not be very different. It's doubtful if Indian government will continue to shield the final

petroleum product consumer from high global prices for very long. The end consumer in India being highly price sensitive, a new equilibrium with a lower demand growth is likely to be reached, in such a situation. Given the scenario, will Indo-China combined cover up the decline in OECD demand expected in a decade or so? Or are we going to witness further repeated downgrading of forecasted demand? We think the latter is more likely.

**Exhibit 4. Advanced Economies Oil Intensity as oil consumed per \$ GDP**



Source: BP Statistical Review, IMF, Watheeqa

### The Production Story: Peak or not immaterial

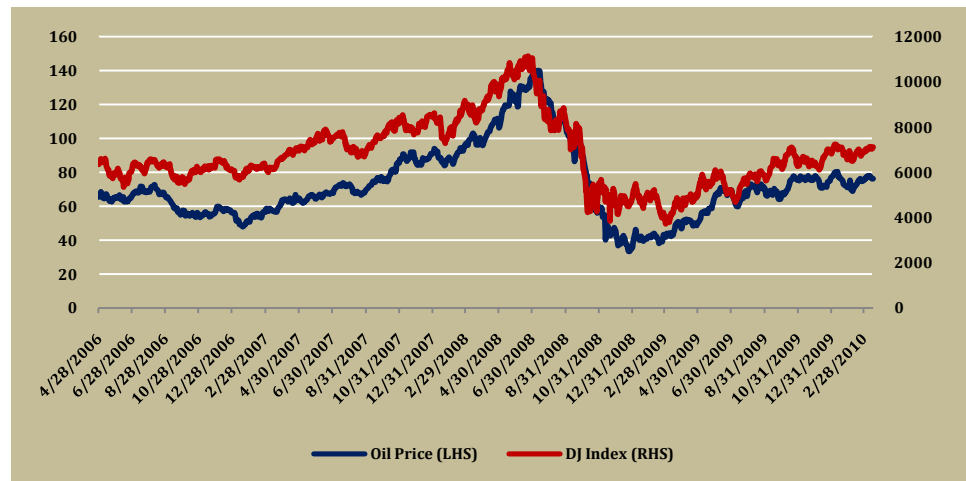
Unlike the demand side, supply side is a highly debated topic. “Oil is a finite resource and, due to geological constraints, production will peak one day.” This seems to be the sole point on which all the debating parties agree. If a peak does exist, where will it be? That seems to be the million dollar question around which the debates are centered.

Proponents of imminent peak point to the “disturbing” trends in conventional oil discovery. Giant oil wells (defined as having more than 0.5 GigaBarrels, Gb, of Ultimate Recoverable Reserves, URR) contribute around 45% of global oil production and account for more than half of total global URR. However, it is argued that most of these giants are either already past their peaks or close to decline stage. The 20 largest oil producing wells in the world (defined in terms of the URR) were discovered before 1980. The largest oil well of them all, Ghawar in Saudi Arabia, has been in production for 60 years now, and more than 50% of Saudi oil supposedly comes from Ghawar. If all these aging giants start declining together suddenly, a major supply crunch will undoubtedly ensue. Is it likely to happen? We assign a low probability to that.

OPEC has the largest number of giants and the largest of the giant fields. Blanket statements, about most of the giant fields being in post-peak stage, fail to recognize that OPEC giants got to post-peak stage not because of geological reasons, but because of political reasons. Most of the OPEC fields in question, started to decline during the oil crisis in 1970s, rather prematurely. Hence, there is still enough easily recoverable oil left in them, though technically they are past their peaks.

Historical data shows there is a distinct peak in 1960s in discovery of giant oil wells. Around 120 giant fields with over 400 Gb of URR were discovered during this period. Since then the number of giant fields discovered and URR estimates of the newly discovered fields have consistently been coming down. Does that mean giant-field-discovery is a thing of the past? Perhaps. However, we think there is no reason to panic yet. Around 14 giant fields were discovered in the first half of the last decade alone. Though a meager number by 1960's standards, this is no mean achievement in itself. The lower number of discoveries since 1980s should be seen along with consistently lower oil prices towards the end of last century that disincentivised exploration activities. The same pattern was repeated during this recession as well. Exploration & expansion activities, initiated during high oil prices preceding recession, were put on hold once oil prices plunged, as can be seen from Exhibit 5. With oil prices hovering around \$80 a barrel, we should witness much higher levels of exploration activities. Together with technological advances, this should mean higher amount of oil discoveries, at least for another decade or so.

**Exhibit 5. Index of Exploration & Production and Oil Prices**



Source: Bloomberg, Watheeqa

Lack of data is the major constraint in arriving at the global oil production capacity. Estimates of reserves recoverable from oil fields are just estimates and not precise figures. Coupled with this, lack of transparency in production data makes it even more challenging to estimate global oil reserves accurately. A study of reserves data of OPEC countries shows that the reserves were hiked substantially by most of these

countries in mid-1980s. Even the fiercest detractors of OPEC admit that some amount of revising of reserves was warranted, as the reserves were inherited from foreign companies before they were expropriated. Conservative estimate of URR of Ghawar was pegged at 60 Gb. Recent estimate is that, more than 60 Gb has already been extracted from Ghawar and it is still going strong with 5 mmbd production. Ghawar URR is now estimated to be even 150 Gb. Such huge revisions, hence, might not be totally out of line. Even if the stated figure is the most optimistic P50 (proved reserves + possible reserves) figure, there is no reason to panic, as P90 reserves (proved reserves), which is supposed to be 75% of P50, is still a substantial reserve.

**Exhibit 6. Proved Reserves in Gb**

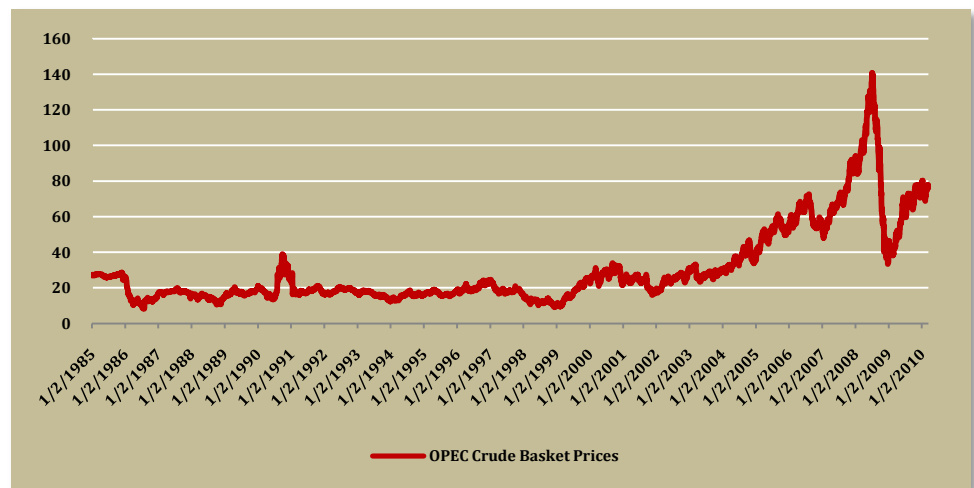
Fig. in gb.	Saudi Arabia	Iraq	Iran	Kuwait	UAE
12/31/80	165.0	30.0	57.5	64.9	32.2
12/31/81	164.6	29.7	57.0	64.5	32.4
12/31/82	162.4	41.0	55.3	64.2	32.3
12/31/83	166.0	43.0	51.0	63.9	32.5
12/31/84	169.0	44.5	48.5	90.0	33.0
12/31/85	168.8	44.1	47.9	89.8	33.1
12/31/86	166.6	47.1	48.8	91.9	98.1
12/31/87	167.0	100.0	92.9	91.9	98.1
12/31/88	255.0	100.0	92.9	94.5	98.1
12/31/89	255.0	100.0	92.9	94.5	98.1
12/31/90	257.5	100.0	92.9	94.5	98.1
12/31/91	257.8	100.0	92.9	94.0	98.1
12/31/92	257.8	100.0	92.9	94.0	98.1
12/31/93	261.2	100.0	92.9	96.5	98.1
12/31/94	261.2	100.0	89.3	96.5	98.1
12/31/95	261.2	100.0	88.2	96.5	98.1
12/31/96	261.5	112.0	93.0	96.5	97.8
12/31/97	261.5	112.5	93.0	96.5	97.8
12/31/98	261.5	112.5	93.7	96.5	97.8
12/31/99	263.5	112.5	89.7	96.5	97.8
12/31/00	261.7	112.5	89.7	96.5	97.8
12/31/01	261.8	112.5	89.7	96.5	97.8
12/31/02	262.8	115.0	130.7	96.5	97.8
12/31/03	262.7	115.0	133.3	99.0	97.8
12/31/04	264.3	115.0	132.7	101.5	97.8
12/31/05	264.2	115.0	137.5	101.5	97.8
12/31/06	264.3	115.0	138.4	101.5	97.8
12/31/07	264.2	115.0	138.2	101.5	97.8
12/31/08	264.1	115.0	137.6	101.5	97.8

Source: Bloomberg, Watheeqa

Though oil is a finite resource, we do not expect a dramatic drop in world oil production. Even skeptics opine that around 50% of OPEC giant fields are estimated to be in the pink of their health (far from decline). Most of the other giants are admittedly not yet in decline, but expected to soon decline. Technological innovations, even if not sufficient to increase the total recoverable resources, can substantially increase the rate of recovery and subsequently, push off decline farther away. The current healthy production fields plus fields awaiting production, together with new discoveries are expected to be sufficient to offset inevitable declines. Hence, we do not expect a supply shock in the near future.

### The Price Story: To stay high, but well below 2008 highs

Exhibit 7. Crude price over the years

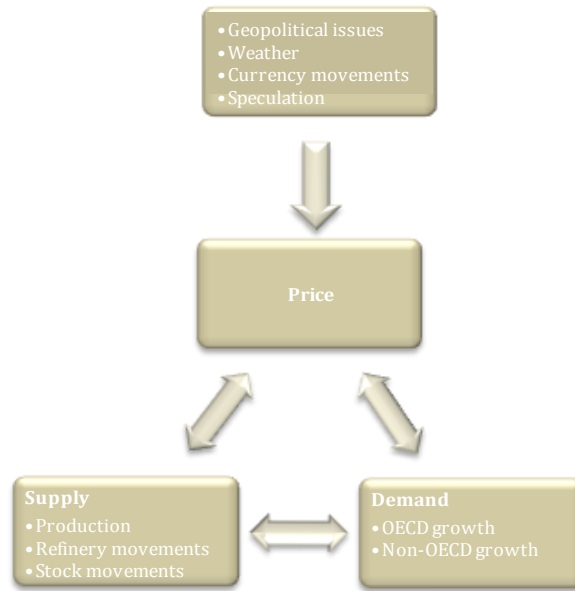


Source: Bloomberg, Watheeqa

Like in all commodities, it is the supply and demand of oil that drives the fundamental oil price movements. A number of other factors contribute to short-term movements in price. Exhibit 8 depicts the most important factors. We have already examined the demand side and the production aspect (supply side) from a long term perspective. It shows oil demand growth will be modest over a long term period. In the short-term, before the slow structural changes result in flattening of demand growth, how will the demand growth pan out?

The improved confidence in economic recovery has prompted many analysts to raise their price targets for crude oil for this year and the next. And rightfully so. If the global economic growth is back on track, prices will inevitably rise, as renewed economic growth entails demand generation. Does that mean we will see 2008 highs soon?

**Exhibit 8. Key factors driving oil price**

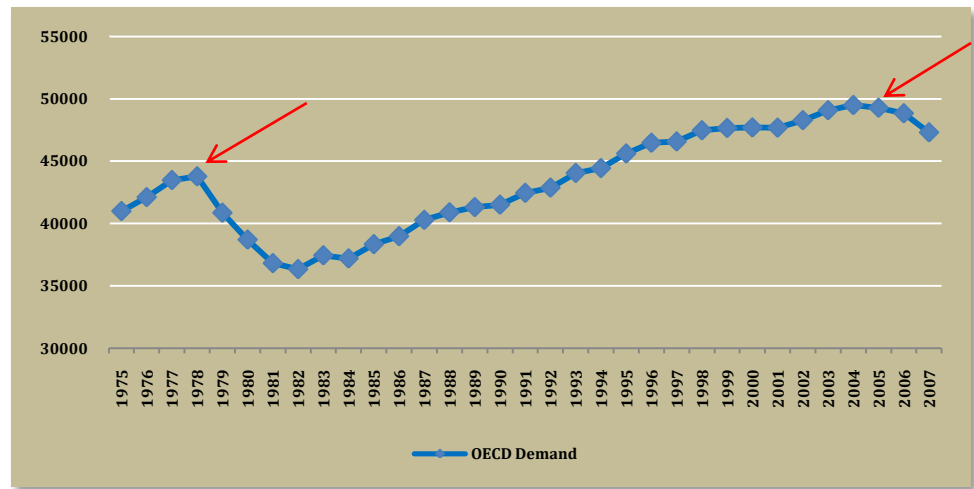


In the short-term demand growth discussions, the low base of 2009 should be particularly noted. A negative demand growth of 1.6% was seen in 2009, leading to a low demand averaging 84.32 mmbd last year. Hence, the demand growth in this year will only be regeneration of a part of the earlier destroyed demand. Additionally, the current global economic growth is attributed to the massive stimulus packages, which can reasonably be expected to be at least partially rolled-back in the course of next two years. We do not see any immediate catalyst for major economic growth in this scenario.

Demand and supply affect price and, price in turn affects demand and supply. Oil demand is not totally price inelastic (i.e. demand is not indifferent to price movements). This is a point that is usually lost in most of the discussions on oil price. Since the world is still highly dependent on oil, oil price shocks can significantly derail progress of economies and hence, the demand. Energy consultant, Steven R Kopits argues that when oil consumption exceeds 4% of GDP in the US, a recession ensues. Historically, all oil price shocks have been followed by drastic cut back of demand. As shown in Exhibit 9, when oil prices went up from \$14 in 1978 to \$36 in 1981, OECD consumption went down by a whopping 6.9 mmbd. The most recent oil price rise saw OECD demand going down from 49.34 mmbd in 2006 to 45.46 mmbd in 2009. This, we see, is a self correcting process.

On the production side, since the recession started, OPEC has progressively cut the production targets thrice, including the record 4.2 mmbd cut of Dec. 2008. These cutbacks reportedly saw a compliance of 80% from OPEC countries initially, resulting in an estimated spare capacity of over 6 mmbd, as of beginning 2010. Very low prices and increasing inventories had prompted this step, so as to support the oil prices.

Exhibit 9. OECD Demand in thousand barrels



Source: BP Statistical Review, Watheeqa

On the other hand, very high oil prices are not to the benefit of OPEC in the long run either, as that might result in reduced global economic growth, pulling down oil demand with it. So, OPEC, which accounted for more than 43% of oil supply in 2008, has incentive to keep prices within a reasonable range. Venezuelan Finance Minister Ali Rodriguez has reportedly said that OPEC is seeking an oil price of \$70 a barrel in order to maintain new investments in the industry. With the current prices comfortably above that figure, OPEC production can increase as per requirements.

The impact of weather on oil has been waning in the recent past, with reduced dependence on oil and petroleum products for heating. However, other factors have a strong hold on oil prices. The political instability and volatility in many oil producing regions like Nigeria, Iran, etc. can substantially affect the supply side dynamics. Fears of supply cut offs due to heightened political tensions can put pressure on prices to the upside. With improvement in global economy, more money will find its way to commodities, putting upward pressure on commodity prices. Non-commercial positions in NYMEX crude oil futures are on the rise since mid-2009. The US dollar, on the other hand, is not expected to slip much due to lower inflationary expectations in the US economy. Treasury Inflation Protected Securities (TIPS) indicate an inflation expectation of slightly over 2.1%, which is much below the last 6 year average.

### **Concluding thoughts**

Demand is expected to grow sedately and supply is not a constraint in the near future, in the absence of any major supply cut offs. Given the demand-supply dynamics, we expect the oil prices to stay high (above \$65-70 a barrel) but do not expect to breach the \$100 per barrel this year. In our view, a near term price band of \$70-100 a barrel is the most likely range in 2010. However, from a longer term perspective, we expect the oil prices to stay below the \$110-115 a barrel during 2011. Oil prices will have to rise more than 36% from \$80.68 (as of 19<sup>th</sup> March 2010) to breach \$110 a barrel. Currently, given the weak global macroeconomic landscape – we suspect if such a sharp rise would happen by the end of 2011.

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