

for new Coal to Liquid (CTL) plants. There are also proposals in the USA to make electric cars a competitive alternative for road transport. Given the importance of coal in Chinese, Indian and US growth plans, investment in new coal-based generation and CTL plants would undermine all other global efforts to cap CO₂ emissions if there were no means of capturing and storing the carbon released during the lives of those plants.

The USA will take a lead in promoting carbon capture and storage (CCS) technology. If CCS is successful and coal use grows as planned, this will lower demand for other internationally traded fuels. If CCS is not successfully deployed on a widespread basis, and it is still far from clear that it will be, then either coal use will not grow as planned, or the world will face serious climate change problems even sooner than expected.

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Second, US policies to improve energy efficiency could put downward pressure on world oil prices. The USA is a large and inefficient consumer of energy, especially of domestic electricity and transport fuels. It consumes more than twice the amount of energy per capita as the rest of the OECD, and more than ten times as much as the non-OECD countries. Although some of this can be explained by distances travelled and industrial activity, the potential savings are enormous. For example, if the entire USA were to achieve the per capita electricity consumption of California by 2020, US electricity demand would fall by over half. And if the USA were to adopt the 40 mpg standards being proposed by presidential candidates, US oil imports would fall steadily. Energy efficiency measures could therefore

significantly reduce energy demand and, along with other measures, put downward pressure on world oil prices.

Conclusions

The USA came to Bali determined to influence the framework for the upcoming negotiations over the post-2012 climate change framework. It achieved a number of objectives, in particular avoiding any reference to specific targets for cutting greenhouse gas. Nevertheless, the Action Plan is a reasonable compromise and did achieve more than many participants had expected. It calls for ‘deep cuts’ in emissions and fixes a deadline of 2009 for reaching an agreement. It promises more money for poor countries to adapt to climate change and to adopt green technologies. And although it does not specify which countries will bear the burden of emission reductions, all countries will have to play their part.

The US decision to participate in the UN-led negotiations over climate change is an important turning point. Without the United States at the table, the prospects of a meaningful climate change agreement are very poor. The USA will be in a position to bring significant influence and new ideas to the table, once they have passed their own domestic climate change legislation. The latter will depend fundamentally on two things: who the next president is and, ironically, the weather. The more dramatic the weather becomes, the more likely we are to see US legislation being passed and an international agreement in Copenhagen in December 2009.

The editor welcomes letters contributing to debates in this issue

Personal Commentary

Nader Sultan

Over the last few years, there have been many articles, and even a best-selling book, warning us about the potential crisis the world faces as a result of dwindling oil reserves. The expression ‘peak oil’ has entered the dictionary of most energy journalists as well as US politicians!

It may be because I worked for 34 years at a reserve rich National Oil Company, that I do not share this fear. I am in agreement with the IEA who recently acknowledged that there are sufficient energy reserves to meet the projected growth in demand until 2030. However, a critical challenge for the upstream in the medium term is the scarce resource capacity above the ground. What I am referring to include the human capital dedicated to the industry, the capacity available at engineering and procurement companies, the availability of raw materials for construction, and the capacity at building yards.

As this issue is affecting all parts of the energy value chain, my concern is twofold; firstly, that we are not giving enough attention to it; and secondly, it is not clear how long the situation will last. So the question is, as we enter the uncharted waters of \$100 oil, are we also facing a prolonged resource capacity crunch?

What is unique about the current period is that all the diverse activities in the energy chain (upstream, downstream, chemicals, tankers and so on) have enjoyed parallel financial success and now have massive and concurrent expansion plans. This is a departure from a history of different cycles of investment.

The investment challenge in the Middle East is a good example of the issue.

APICORP projects that the energy investment requirement in the MENA region for the period 2008–2012 is about \$490 billion. Petrochemicals capacity is expected to double in the next ten years. Qatar alone anticipates \$70 billion in energy investments over the next few years.

Parallel to this vast expansion in the energy sector, the region is also enjoying an economic boom. So we are witnessing huge construction projects in hotels, shopping malls and offices. This combination of a general economic boom and the massive energy investments has caused a shortage in critical resources such as manpower, not only engineering and construction labour but also skilled engineers with experience, materials and equipment, EPC contractor capacity and finally construction logistics.

As one example of the huge manpower demand, in Saudi Arabia, Saudi Aramco and SABIC will require more than 200,000 construction workers in the period 2007–09 to work on \$95 billion of projects. At the same time, across all the businesses in the Gulf, whether it is the service or industrial sectors, senior executives commonly cite that the most critical strategic issue they face is to recruit experienced staff for their rapidly expanding businesses.

On the construction side, the reality is that in the last two years there has also been a 'sellers' market' for EPC contractors in the region. However to be fair to them, these contractors are recovering from years of poor results and a prolonged buyer's market.

So what are the implications of this resource tightness?

The first and most obvious one is the increased cost of new projects leading to higher capital and operating costs. As an example, Shell's GTL project in Qatar is now rumoured to cost close to \$18bn, a vast increase from an original estimate of \$5bn. In Kuwait, bids for the fourth refinery came in at \$15–16bn versus a budget of \$6bn. At the same time, costs of petrochemical projects in Saudi Arabia have increased about 60 percent in the last 18 months. Most of the

increase is attributed to EPC costs, of which some 30 percent is due to raw materials. Bechtel estimates that the cost of building an LNG plant is currently close to \$600 t/y versus \$200 t/y in 2000.

The second is the potential negative impact on project economics – for instance in refining and petrochemicals. What assumptions about future refining margins should a company make when it assesses a grassroots refinery project in the region that involves the fantastic costs of \$16 billion? No realistic assumptions will make the project profitable.

In the upstream, the Middle East, because of its relatively low lifecycle production costs, should be able to absorb high project costs. However, this does not apply to other regions. A recent Goldman Sachs report indicated that some 4 million bpd of marginal oil fields now cost \$70/bbl to produce. Will this lead to a higher cost of the marginal supply, thus setting a floor to oil prices?

The third clear impact has been delays or cancellations of projects. We are all aware of the higher projected costs and delays to the 'mega' upstream projects such as Sakhalin and Kashagan. The Kuwait fourth refinery is already two years behind schedule and the same applies to many projects across the Middle East. In Qatar, Exxon cancelled its GTL project as cost estimates rose to \$20bn. Recently India postponed an upstream licensing round due to a shortage of rigs. These delays are leading to a prolonged tightness in the energy supply chain across all the sectors.

With this background, some may even argue that we are in a 'perfect storm', where all the elements concerning resource capacity both above and below the ground are acting against us.

Although some steps can be taken by individual companies to mitigate the impact of high project costs, the signs in a \$100 per barrel oil world are there to indicate that investors will be competing for the same scarce resources, whether it is for rigs or experienced engineers or other resources.

I believe that there is a need for a greater pooling of resources between the key players in the industry. At a simple level it could just be that IOCs and NOCs add a new dimension to their potential cooperation, whereby IOCs provide additional resources to the NOCs to meet their national objectives.

However, if both the NOCs and IOCs wish to achieve their mutual goal – to provide sustainable and secure energy to feed the insatiable appetite of the developing countries – then I believe that it is important to go beyond simple joint ventures and consider strategic alliances across the full energy value chain. What I am suggesting is that individual IOCs and NOCs should embrace the model of a broad strategic alliance which extends beyond individual projects and countries. Such an alliance could cover working together globally in one activity only, say the upstream, or across a number of activities, such as chemicals, downstream and so on.

As an example, in Kuwait, on the chemicals front, we were able to take our relationship with Dow Chemical beyond an individual joint venture into a global strategic alliance, tied to a portfolio of products. In the process genuine additional value was created for each side.

I believe that such a model can equally work between IOCs and NOCs. The complex challenges that the industry faces today, whether it concerns below the ground reserves or above the surface resources, requires that we consider new structures for cooperation, more suited to aligning the interests of each side. The two sides bring complementary assets and capabilities to the table. The strategic alliance model is a better mechanism to create mutual value.