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SECTOR FORECASTS

To go deep is to go into the future



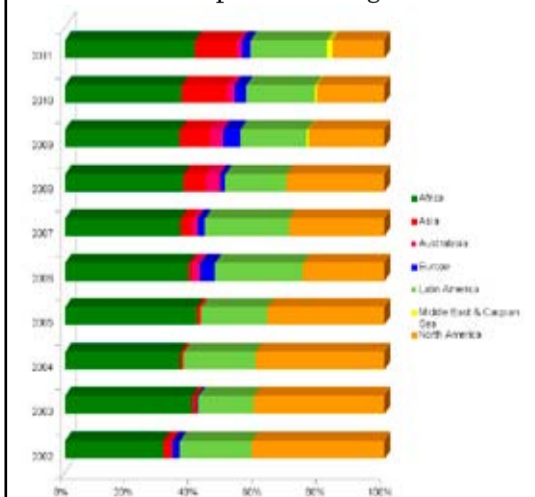
During the past five years the major oil companies and many of the independents have seen much of their growth come from deepwater developments, **Dr Roger Knight** (left) and **Howard Wright** (right) of Infield Systems (**Booth 2559**) try to predict if this will continue to be the case over the next five years.

Deepwater developments are traditionally characterised by being high profile, costly, technologically challenging and delayed. Nonetheless due to the insatiable global demand for hydrocarbons, the depletion of current known reserves and the nationalization of onshore hydrocarbon reserves, deepwater projects remain a very attractive option for operators. The major challenge facing the deepwater market now seems to stem from the supply side which is seeing dramatic cost increases causing project delays. Thus securing appropriate assets, equipment and vessels continues to be a priority for operators.

From a regional perspective, it will be the Atlantic Margin that will continue to see the focus of new projects in the next five years. We expect Africa to retain its dominant status with over 30% of deep water capex to 2011 and alongside Brazil and the Gulf of Mexico will make up to 83% of the deepwater market. Most notable going forward is the emergence of Asia which in 2007 comprises just 4% of global capex which we see accelerating to 13% by 2011.

The diminishing year on year percentage of capex spent within North America is an important trend as it reflects the growing importance of deepwater developments in other regions. However, it is one which could well change depending on the success of developments exploiting Lower Tertiary reserves.

Gulf of Mexico - Lower Tertiary
Currently there is extensive anticipation concerning the Lower Tertiary trend within the Gulf of Mexico. This area is estimated to contain from 3 billion to 15 billion barrels of recoverable oil equivalent but with wells drilled between 4000m and 7500m oil exploitation of this resource poses serious technological challenges. Beyond the difficulties of drilling at these depths, under such high temperatures and pressures, there are concerns over the remoteness of the fields, the lack of infrastructure, reservoir quality and flow assurance. Essentially, the reservoirs of the Lower Tertiary trend are expected to push technology to the limit and the success of the initial fields will be a key indicator of how much and how quickly the reserves will be able to contribute to US production figures.



2002 - 2011 regional percentage of deepwater capex
(Source: OFFPEX Market Modelling and Forecasting System)

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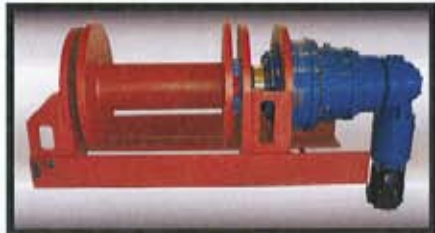
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SECTOR FORECASTS

Southeast Asia – The presence of Murphy in the list of the 10 operators bringing the highest level of reserves onstream in Southeast Asia over the period between 2008 and 2012 is particularly intriguing, as they are widely regarded as a pathfinder for the development of the region's deepwater reserves. Deepwater activity in Southeast Asia remains very much an emerging area, characterised by isolated projects. However, we fully expect to see further deepwater developments pushed through within South Asia in the period to 2012 following on from Murphy's development of Kikeh, with Petronas expected to be particularly active. Once hubs, such as Kikeh, are established we expect a cluster of deepwater developments to go-ahead.

Brazil – Petrobras's move towards physical asset standardisation facilitates easier relocation of assets to different prospects. In addition, their practice of deploying a vessel on a field quickly before committing to a complete development plan means that we are seeing smaller initial capex outlay, with potential to expand given favorable drilling results. This strategy has seemingly been duplicated for the development of the Cascade/Chinook fields in the Gulf of Mexico.

Post 2011, further growth in SURF activity is anticipated driven by Petrobras's ambition to boost oil production from 2.4mboe/d to 4.5mboe/d in 2015, its drive to secure more rigs to meet its E&P drilling campaign and increased flexible pipeline capacity from key players in the sector. We are extremely optimistic about continuing activity in deepwater Brazil. The only caveat to this is that limited refining capacity for heavy crude oil will constrain developments until investment (\$11.4 billion) earmarked for doubling the country's heavy oil refining capacity is realised.

West Africa – Deepwater annual Capex rose from \$2.9 billion in 2002 to \$5.4 billion in 2006, buoyed by key projects such as Total's Dalia and Girassol, ExxonMobil's Kizomba A & B and Xikomba, Shell's Bonga and ExxonMobil's Erha.

Market prospects suggest that although such growth will plateau, particularly in 2007, total period expenditure will increase from \$19.6 billion between 2002 and 2006 to \$39.2 billion through 2007 to 2011. Key developments over the forecast period will include Total's Block 17, BP's Block 18 and 31 developments and ExxonMobil's Kizomba C & D projects offshore Angola and Chevron's Agbami, Total's Akpo and Usan and ExxonMobil's Bosi offshore Nigeria.

Despite strong expenditure increases we see that the market is severely constrained by a limited capacity on the supply side with West Africa appearing particularly susceptible to delays and cost overruns. One often-quoted reason, among many, is that there has been a significant lengthening in the contract negotiation process caused by prolonged discussions over the scale of local content, particularly

Southeast Asia participant reserves onstream, 2003–2012 (mmboe)

in Nigeria. Despite the local and supply difficulties, we expect the next five years to be as productive as the last five years.

Has deepwater growth reached its limits? Not by a long way.

(MMBOE)	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
CNOOC	721	295	411	295	287	740	401	481	870	511
Petronas	266	319	370	85	223	430	590	417	1,007	459
Chevron	429	291	47	62	69	532	511	1,207	168	332
BP	29	11	56	21	47	1,382	228	112	333	0
PTT	0	6	30	2	49	1,029	339	42	204	383
Shell	444	288	44	480	249	217	370	212	643	224
ConocoPhillips	123	216	0	21	111	555	261	412	222	73
Inpex	5	149	11	24	142	54	190	26	947	0
PetroVietnam	213	14	0	69	81	381	224	468	81	44
Murphy	35	14	0	0	527	21	350	220	102	363

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