



Opportunities and challenges for global deepwater players

An industry on the seach for new growth areas

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With fewer remaining easy-to-access oil fields, the industry has moved into new areas to find growth, including operations in more remote and deeper offshore areas. The 2010 Macondo well disaster in the Gulf of Mexico – which could end up costing BP nearly \$90 billion in fines and other compensation – caused a temporary halt in deepwater drilling in the United States and slowed down developments in other key regions. However, with the assurance of more rigorous safety and emergency preparedness practices, the oil industry has actively resumed investment in promising deepwater basins across the globe. The on-going development of significant deepwater hydrocarbon discoveries creates major opportunities for oil and gas producers as well as for equipment and service suppliers along the value chain. Investors are venturing into the exploration and development of opportunities at record water depth levels (now 3,500 m) and distances from the coast (up to 650 km). This creates challenges in designing, deploying and operating subsea facilities and deepwater platforms in a safe and efficient manner.

Following a slight decline in 2009 due to the global recession, the pace of deepwater drilling has increased by 40% in the last three years. In 2013, it is expected that over 800 deepwater wells will be drilled in the world, with exploration wells accounting for nearly half of the total. Over the current decade deepwater investments will amount to over \$1,200 billion, representing 18% of the overall global capital spending in exploration and production.

Historically deepwater activity has been concentrated in the so-called “Golden Triangle”, a region bounded by relatively mature hydrocarbon basins in Brazil, West Africa,

The pace of deepwater drilling has increased by 40 % over the last three years. While technology is a key enabler for deepwater development, players still face many critical challenges and decisions which require close attention if projects are to be delivered successfully. In this article the authors take a closer look at the global rise in deepwater activities and discuss how to address the challenges this brings.

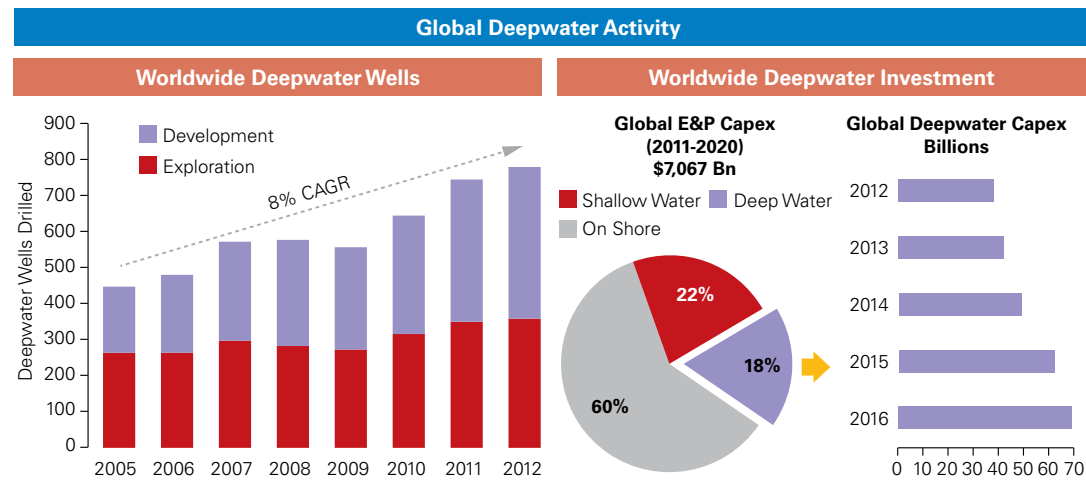


Table 1 Global deepwater activity on the rise Source: IHS CERA, Douglas Westwood; Analysis Arthur D. Little

and the US Gulf of Mexico (GOM). However, aided by technology advances, high oil prices, and striking exploration successes, new, highly prolific deep and ultra-deep water frontier regions are emerging in new places such as Brazil's pre-salt region, East Africa, and more recently, the Mexican side of the Gulf of Mexico. These new plays will demand increasing investment for field development projects, providing not only exciting opportunities but also major challenges for deepwater operators and oil field service firms as discussed below.

Challenges and key success factors for oil and gas deepwater players

Deepwater developments present an array of challenges, even for the most experienced players. While the oil industry has gone through a long learning curve, and technology advancements have helped drive down the costs of deepwater production, players still face a myriad of challenges resulting in lengthy development times of up to twelve years for deepwater projects.

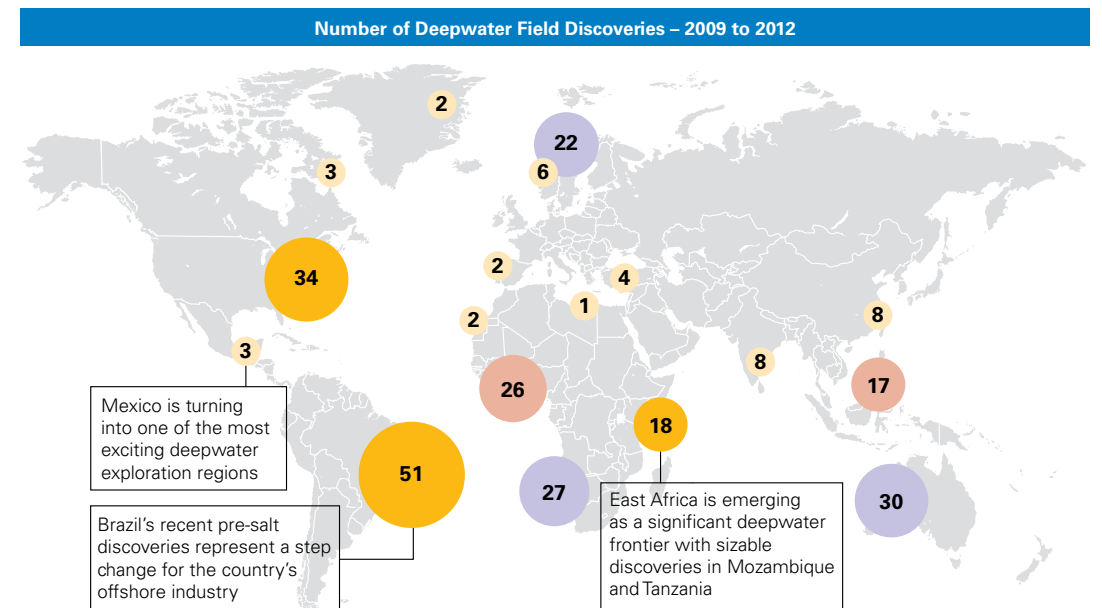


Table 2 Deepwater Discoveries

Source: PFC Energy; Global Data; Analysis Arthur D. Little

The most critical challenges and decisions that deepwater project developers face are:

- **Resource potential uncertainty:** The magnitude of the required investment requires an accurate view of field potential to avoid suboptimal decisions regarding the scale of the infrastructure.
- **Drilling rig availability:** Drilling costs can account for over 60% of the total capital expenditures. The market for deepwater drilling rigs has been very tight, and there are usually long lead times for ordering new equipment.
- **Production facilities/ technology concepts:** The selection of a technology concept for a deepwater platform (e.g., FPSO, semi-sub or Spar) is one of the most critical decisions during the planning stage.

- **Logistics and infrastructure:** Understanding future production profiles and adequately sizing the infrastructure to transport the hydrocarbons is a challenge – particularly in new regions which do not have an established pipeline infrastructure.
- **Project Management:** Deepwater developments are especially susceptible to project delays and cost over-runs, which can quickly ruin payoff for investors.
- **Fiscal terms:** The economic attractiveness of investment in deepwater is largely dictated by the tax and royalty scheme of the host country.
- **Regulatory aspects:** Delays with permits and regulatory approvals lead to projects taking longer and to cost over-runs. These issues are even more critical in emerging deepwater regions where regulators are still trying to catch up with industry players.
- **Environmental risks:** The relative costs of deepwater production have increased as a result of more demanding maintenance and safety standards following BP's Horizon rig accident. Environmental fines can be a burdensome cost as Chevron has also discovered following a spill of less than 4,000 barrels in Brazilian waters that could result in penalties of close to \$17 Billion.

Picture by Petrobras News Agency



- **Weather hazards:** In some regions such as the GOM, the exposure to hurricanes affects design considerations for deep-water developments. This has led to innovations such as more compact FPSO platforms with disconnectable turrets to facilitate rapid escape when storms are forming.

Despite these challenges the industry has proceeded along a steep learning curve, and experienced operators continue to venture into deeper waters. However, the number of seasoned players in deep-water is still relatively small, and global activity is dominated by the major oil companies and some specialized national oil companies like Petrobras in Brazil.

For less experienced players, moving into deepwater is a daunting prospect. Their best approach is to start small and partner with more experienced operators and service companies. However, some NOCs, like PEMEX in Mexico, will not have much room for maneuver since their countries are hungry for the wealth that can be generated through the development of these massive resources. Valuable lessons can be derived from the mistakes and successes of others in this arena.

Key success factors for project developers and operators include:

- **Strategic approach:** Offshore development demands executive commitment, long-term vision and sound decision making based on comprehensive data analysis and economic evaluations. Technology is not necessarily a limitation when the appropriate resources (human and financial) and executive vision are present.
- **Resource Evaluation:** Do the science upfront to predict performance accurately. Given the scale of the investment, there is no room for error on the economics. Significant geological evaluation must be completed before committing to drilling. Successful players explore multiple opportunities with options for consolidated development to minimize risks.

- **Infrastructure planning:** Many deepwater platforms have been overbuilt due to over-estimation of production. It is better to start with an infrastructure capacity that can be expanded with new reserves. A clustering approach for geological opportunities helps reduce risks, captures development synergies and minimizes capital expenditures. Options include use of less permanent solutions like FPSOs and tankers which can be redeployed if fields fail to meet expectations.
- **Project management:** Project schedules need to consider company processes, value assurance procedures, market conditions, equipment availability, and other technical and economic variables. It is also critical to start verifications and approvals processes as early as possible to minimize costs and time delays.



Picture by etrobrias News Agency

- **Multi-disciplinary approach:** Large-scale deepwater projects call for the integration of many disciplines. Integrated project management, systems engineering and supply management are key to their success.
- **Contracting:** Current demand for deepwater and ultra-deepwater high specification drilling rigs is outpacing supply. Contract daily rates are volatile, so it is important to lock in contracts for existing rigs or new builds early (many years in advance) to avoid high contract rates or potential delays.

Challenges and key success factors for oilfield services and equipment suppliers

Besides the oil and gas companies that are responsible for drilling exploration wells and operating production platforms, there are a myriad of contractors and equipment suppliers involved in any deepwater development. These players include large oil field service firms which provide drilling rigs and other essential services; manufacturers of key components such as subsea equipment, umbilical, risers and anchors; engineering firms involved in the design of platforms and subsea solutions; logistical and transportation companies such as helicopter operators, pipeline laying specialists, satellite telecommunication providers, and many others. Despite strong growth in global demand for their solutions, large-scale service players as well as more specialized smaller niche suppliers are facing increasing cost competition and pressure to achieve economies of scale. Key challenges in these segments include:

- **Increasing national content requirements:** Global service players are increasingly facing the added complexity of needing to invest in local content driven by host country policies – this has created bottlenecks for development in Latin America and East Africa.
- **Technology commoditization:** Cutting-edge offshore technologies that commanded a premium a few years ago are now becoming widely available in the industry.

- **Increasingly complex supply chains:** The emergence of new deepwater regions is creating a dislocation between traditional supply bases and operational areas, requiring an entire new level of supply chain capabilities for global oilfield service players.
- **Shortages of skilled personnel:** The shortfall in technical specialists affecting the global oil industry is becoming more accentuated in the subsea equipment and deepwater platform design sectors, where scientific knowledge is significantly more critical.
- **Capacity constraints and escalating material costs:** Increases in the prices of such commodities as steel and energy, combined with the need for more robust and reliable equipment for deepwater solutions, continue to drive higher capital intensity in the industry.

To survive and succeed in this increasingly complex and evolving global deepwater sector, oilfield service and equipment players must innovate and adapt their business models to respond to rising industry challenges. Key areas of opportunity include:

- Increased investment in **local capability development** by service companies.
- Adoption of **collaborative models** between operators, service providers and equipment manufacturers for the deployment of integrated deepwater technical solutions.
- Increasing **modularization** through the development of compact plug-and-play production systems that can be configured for maximum efficiency over the life of a deepwater field.
- Disciplined **capital program and contractor management** to ensure high return on assets through effective alignment of capacity with shifting demand across geographies and operating basins.
- Growth through **mergers and acquisitions** to expand into new geographies, gain market share and benefit from increasing global scale.



Picture by Markha40 / dreamstime

In conclusion, it is clear that deepwater activity will continue to be a driving force behind the growth of the global oil industry for decades to come. This sector is characterized by increasing technological challenges, unprecedented levels of capital commitment and risk. The ability of the global petroleum industry to discover and exploit successfully the vast amounts of hydrocarbons still residing at increasingly deeper water depths in remote locations will require relentless innovation, clear vision and flawless strategic execution by a large number of players. Many governments and regulators around the globe will also be challenged to put in place effective policies that provide proper incentives for deepwater investors while, at the same time, helping to harmonize the development needs of their countries with the absolute necessity to protect the environment.

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