

On the Giants Trail - Deepwater Offshore West Africa

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The poster looks at deepwater giant fields discovered along the western coast of Africa between Mauritania and Angola in the past two decades.

Deepwater giant oil and gas fields deserve special attention as they are significant in terms of reserves. A few figures show this: the total number of giant deepwater fields is less than two percent of all fields discovered offshore but they represent almost 20% of all offshore reserves.

A look at the timing of giant discoveries also shows a clear picture. All giants now part of the two established plays were found between 1995 and 2003. Here we can mention some names such as Zafiro, Girassol, Bonga and Agbami. Then came a period with no giant discoveries and in 2007, Jubilee inaugurated the new transform margin play.

Giant deepwater fields appear to be geographically concentrated in certain areas. Irrespective of play type, they are mostly found in water depths between 800 and 1,500m.

Taking into account the play, a very clear image appears with two basins containing all but one West African giant. The well established plays are the Tertiary Niger Delta and Lower Congo Fan basins. The lone outsider is Ghana's Jubilee field, in an emerging new play, the Cretaceous West African Transform Margin, which is quite different from the Niger Delta and the Lower Congo Fan.

Looking at the geology of deepwater West African fields, they all appear to share three things: turbidite channel sands as reservoirs, an abundance of shale providing good seals and source rock and an overall sediment thickness allowing the source rock to become mature for hydrocarbon generation. Significant differences between groups of giant fields are found in age and trap mechanism.

A word also about 'false giants'. These are clusters of geologically distinct fields, taken individually they are not of giant size and are uneconomic in a deepwater environment but the whole cluster has giant size and can be developed economically. Examples are the PSVM complex (Block 31) and the GCG complex (Block 32) in Angola. These clusters are recent discoveries, they are located outboard of the common giant fields setting.