

North Celtic Sea Basin, Offshore Ireland; New Opportunities in a Mature Basin

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ABSTRACT

The North Celtic Sea Basin is located off the south coast of Ireland in relatively shallow waters (100-200m). It is structurally linked to the Fastnet Basin to the west and to the St. Georges Channel and Cardigan Bay Basins to the east. It is separated from the South Celtic Sea Basins by the Labadie Bank - Pembrokeshire Ridge basement highs. The basins in the Celtic Sea are elongate Mesozoic extensional basins which have a general ENE-WSW orientation. They were subject to multiple phases of rifting (Early Triassic, Early Jurassic, Late Jurassic and Early Cretaceous) as well as multiple phases of inversion (Paleogene and Neogene). The North Celtic Sea Basin has seen active petroleum exploration since the early 1970s and production since the late 1970s. The first well offshore Ireland was drilled in the North Celtic Sea Basin in 1970 (48/25-1). The third well (48/25-2) drilled in 1971 discovered the Kinsale Gas Field, which has produced approximately 1.7 Tcf to date. The targets have primarily been Paleogene inversion structures with Lower Cretaceous reservoirs (e.g. the producing Kinsale Head, Ballycotton and Seven Heads gas fields and the Barryroe oil discovery) and tilted Jurassic fault block structures (e.g. Helvick oil discovery). Despite a significant number of discoveries over the years (19 discoveries from 63 exploration wells) success has been hindered by inadequate trap definition due largely to poor 2D seismic imaging caused by hard chalk located at the sea bed. Only 5 exploration wells have been drilled in the North Celtic Sea Basin since the year 2000, only one of which has been drilled on modern 3D seismic data. In recent years there has been a significant improvement in seismic data quality with the acquisition of 3D and long offset 2D data together with modern processing of new and legacy data. This allows for re-evaluation of old discoveries and the definition of underexplored plays. A number of regional studies have been on-going in the area which will provide further insight into the potential of the Celtic Sea basins and their key risks. The relatively shallow water, existing infrastructure, proven petroleum systems, geo-politically stable operating environment and the improvement in seismic data quality in the basin in recent years makes the North Celtic Sea an attractive exploration target and also highlights the need to refocus exploration efforts on the underexplored Fastnet, South Celtic Sea and Cockburn basins in the Celtic Sea.