The start of Ireland's Revolution?

The deepwater basins of the southern Atlantic have had plenty of publicity in recent years but why not the north? Parts have been off-limits to licensing. Parts have technical problems such as Titanic busting icebergs that can gouge the seafloor. It may be that people are too busy looking at the well known plays of the North Sea where the seabed is shallower and the waves do not have the same fetch and where there is a considerable UK market. However last autumns upgrade of Barryroe to 1.8 bln barrels in place has prompted further interest in the Celtic Sea and the long awaited 44/23-1 Dunquin well was spudded on 23 April in the Porcupine Basin and the latter has the potential to cement Ireland’s place on the world hydrocarbons map and is one of the largest undrilled prospects in Northwest Europe.

The Basins

Ireland ranks 111th in the world for production, partly as some identified fields are yet to come on stream. Of 24 oil and gas fields, 8 are discoveries, 11 are appraising, Corrib (1.5TCF PP) is developing and Seven Heads, Kinsale Head (1.7TCF), Kinsale SW, and Ballycotton are producing. Only 163 newfield wildcat wells have been drilled. The huge Rockall Trough is virtually unexplored with only 4 non DSDP/ODP wells and even the 45,000 sq km Porcupine Basin has only had 34 wells drilled (compare with over 4000 in the 60,000 sq km Central Graben). Only 23 wells have been drilled in the Slyne Erris Trough (aka Northwest Ireland Basin) leaving the Celtic Sea Graben system as the best penetrated by the well bit.
There are a variety of different source and reservoir rocks in these basins. Namurian-Westphalian coals could have good gas and condensate potential, having sourced the Corrib Field. The Serpukhovian Clare Shale has up to 15% TOC and is being explored for shale gas and oil seeps are known (Goodhue and Clayton 1999). Early Jurassic (Toarcian) mudstones are an interesting potential source in the Celtic Sea Basin and Middle Jurassic mudstones have good potential on the NW flank of the Porcupine Basin. Late Jurassic rocks probably generated most of the hydrocarbons in the Porcupine Basin though are immature in the north and at the margins. Early Cretaceous mudstones could be a source in the southern part of the Porcupine Basin and in the Celtic Sea graben the Lower Wealden has TOC from 0.95-4.2%.

In the Celtic Sea Cretaceous Greensands and Wealden sands are the main reservoirs with porosities of 22-31%. Barremian sandstone reservoirs (15% porosity) are present in the Burren discovery in the NE Porcupine Basin. Middle and Late Jurassic marine sandstone reservoirs host the Connemara and Spanish Point fields. In the Slyne-Erris Trough, the Corrib field is in a Triassic sandstone reservoir (8.5%) and the Bandon discovery is in Jurassic sandstones. The Dooish discovery in the Permian-Middle Jurassic of the Rockall Basin has an average porosity of 15%.

The Dunquin Prospect
The Dunquin prospect is located in the central part of the southern Porcupine Basin 150 km from the Irish mainland. It measures 10 x 50 km and is interpreted as a reef sitting over a structural high at a depth of 4.6s (4500m). The prospect is located at a water depth of 2.3 s (1700 m). There appear to be other smaller reefs at the edge of the basin to the NW also. Prior to drilling the age is not known for certain but a mid Cretaceous age seems most likely. Discoveries at the edge of the basin to the north indicate an active petroleum system. Well 35/29-1 to the north has a temperature of 142 F at TD (2888m) and was spudded in 828 m of water which suggests a geothermal gradient of 49F (27C)/km. The likely temperature at prospect depth is 81C which is within the oil window. In well 43/13-1 to the west the likely late Jurassic rich source rocks were immature at a depth of 3145m, though shows were encountered beneath at a depth of 3550 m. One of the risks will be the reservoir quality of the reef and there are intrusions in the basin which could impact both reservoir quality and maturity. Nevertheless oil company sources suggest P50 recoverable resources of 1.7 Bln Boe which would be a world class development. It would also initiate infrastructure that would allow other prospects to tie in.
The players

Ireland has managed to attract a variety of explorers to its acreage. The Dunquin acreage is drilled by a group including ExxonMobil (27.5%), ENI (27.5%), Repsol (25%), Providence (16%) and Sosina (4%). Other operating companies include Antrim, Bluestack, Exola, Europa, Fastnet, Lansdowne, Milestone, Petrel, San Leon, Serica, Shell, Statoil, TwoSeas. Enegi Oil has announced that it has applied for a license to explore for shale gas in the Clare Basin where a Fugro Robertson Ltd report indicates 1.5-3.8 TCF recoverable within the option area. The size of some of these companies suggest there is potential for farming in to prospects as well as exploring in your own right.

Finance

Although drilling cost in a deepwater frontier are high, there are a variety of seismic surveys of various vintages released at low cost. The Dunquin well will be drilled by the semi-submersible Eirik Raude rig and is reported to cost $112 MM including mobilisation (from Africa) and demobilisation. A QUESTOR cost estimate shows that a pipeline to shore in the event of discovery would add a further $0.75 bln.

The State take is relatively straightforward. No bonuses are due on discovery. There is no royalty or profit sharing on new licenses but the Irish state takes a corporation tax of 25%. Allowable exploration and development expenses may be deducted immediately. In addition there is a Profit Resource Rent Tax (PRRT) of 0-15% depending on the ratio of a field’s cumulative after tax profits to its cumulative capital expenditure. State take is therefore a competitive 27-39% depending on various factors such as size of field, costs and current price obtained for product and is half that of the UK for economic gas fields. This easily puts Ireland in the top ten for fiscal attractiveness.

Licensing

Petroleum Exploration is regulated by the Department of Communications, Energy and Natural Resources through the Petroleum Affairs Division. Explorers can prospect on a non-exclusive basis under a petroleum prospecting license (PPL), or obtain a Licensing Option (LO) which gives exclusive rights for up to 3 years in return for a agreed work obligation or obtain an exploration license (EL) allowing all types of work including development and production. In the case the discovery is non-commercial, a lease undertaking (LU) allows the licensee to retain the discovery until it is commercial. The political and regulatory regime is stable.

Other prospects

There are a variety of other prospects offshore Ireland. In the Celtic Sea, the identification of older basal Wealden reservoirs at Barryroe will promote exploration for an extension to that play and Fastnet plan a 3D survey this year on their Mizzen prospect. Fastnet are also exploring the Sherwood Sandstone Molly Malone prospect and the combined potential of these prospects reaches 14.3 bln bl oil or 24.7 TCF (P. Griffiths, Atlantic Ireland 2012). Within the Porcupine Basin BP suggested 500 MM bl near 43/13-1 well was non-recoverable on the assumption that reservoir quality was insufficient. Antrim are reprocessing seismic over an undrilled Lower Cretaceous fairway to the NE of Dunquin. Marathon encountered a 50m net gas pay in 35/30-1 and Bluestack are working on multi-TCF Middle and Upper Jurassic prospects nearby. Petrel has mapped two Eocene sand units in the north of the Porcupine Basin which lie above other Early Cretaceous and Late Jurassic closures. Two Seas have mapped a series of Late Paleocene fans which could contain 400MMbo. Brent type faulted blocks could contain Middle and Late Jurassic prospects. To the southwest of Dunquin Providence have identified the Aptian-Albian Drombeg prospect which is a down dip equivalent of 33m of 19% porosity sands in the BP well 43/13-1. Chimneys appear to link these sands to the Late Jurassic source rocks. Early Cretaceous basinal clastics sourced from Late Jurassic marine shales are also being pursued by Europa on the western (Mullen prospect) and eastern (Kiernan) sides of the Porcupine Basin and the Mullen prospect alone has P50 reserves of 318MMbo.

It can thus be seen that there are a multiplicity of prospects at different stratigraphic levels in addition to the Dunquin prospect. The good fiscal terms, favourable geology and nearby European markets should ensure Ireland develops a significant petroleum industry in the coming years whether or not that is provoked by the publicity and infrastructure that Dunquin might provide.

References

