

Ireland's Oil and Gas Industry Update

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Enterprise Ireland - NOF Energy: UK & Ireland International Oil & Gas supply chain exchange 27th November 2014

OUTLINE

- IOOA
- History and current position of E&P
- Benefits and Opportunities

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Irish Offshore Operators' Association (IOOA)

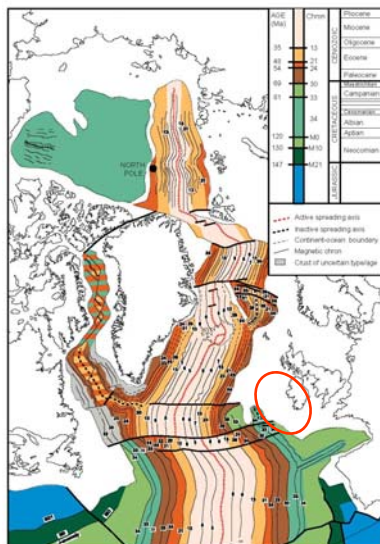
www.iooa.ie

- Founded in 1995, IOOA is the representative organisation for the Irish offshore oil and gas industry.
- Currently 16 members representing multinational and Irish petroleum exploration companies who hold licensing authorisations in the Irish offshore.
- Members of IOOA are active in seismic and other exploration activities in Irish offshore.
- IOOA member companies:

AzEire Petroleum Cairn Energy Plc Chrysaor E&P Ireland Ltd Eni UK Ltd ExxonMobil International Ltd Fastnet Oil and Gas (Ireland) Ltd PSE Kinsale Energy Ltd Kosmos Energy	Lansdowne Oil & Gas Plc Providence Resources Plc Repsol San Leon Energy Plc Serica Energy Shell E&P Ireland Ltd Statoil Woodside Energy (Ireland) Pty Ltd
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REGIONAL GEOLOGICAL SETTING OF IRISH OFFSHORE

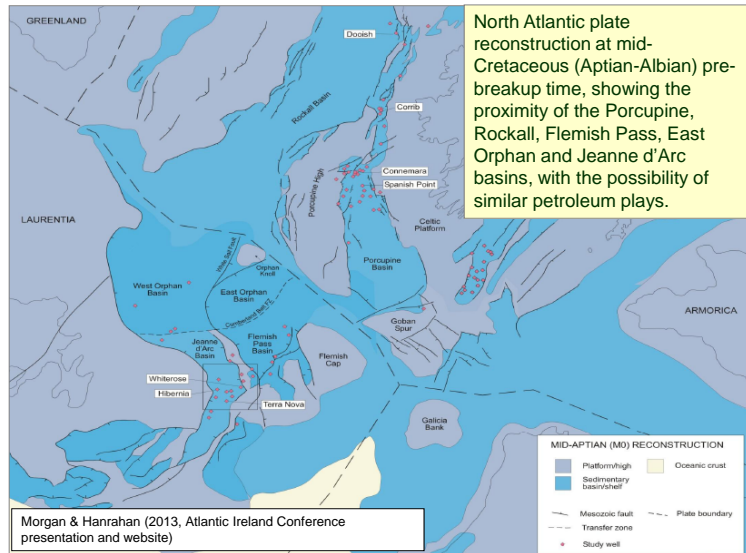


Naylor & Shannon (2011), modified from Lundin (2002)

- The Irish offshore lies in a regionally complex geological setting.
- The collision and separation of continents over geological time controlled the location and orientation of the sedimentary basins.
- The Irish offshore basins are different from each other, and have both similarities and differences with other basins in the region.
- As a result of the geological complexities, exploration is both difficult and expensive.

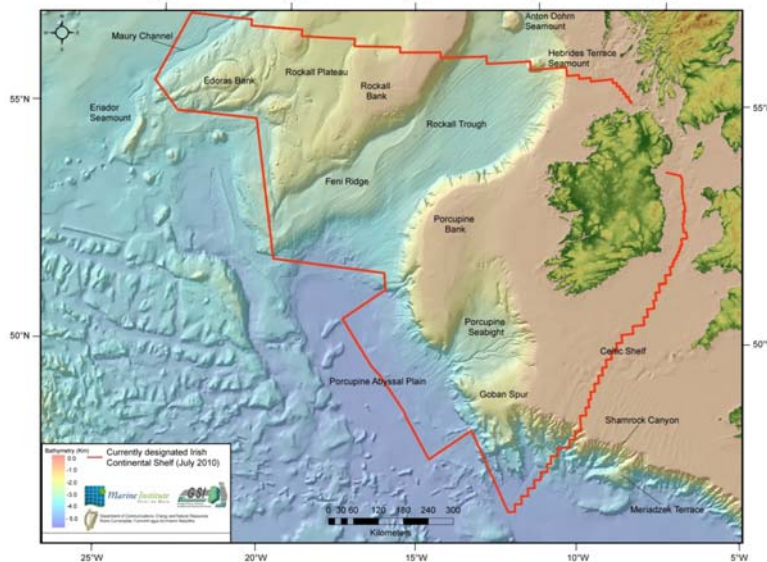
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CRETACEOUS PLATE RECONSTRUCTION



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BATHYMETRIC FEATURES



Basins off the south coast of Ireland lie in relatively shallow water (<100 m); basins off the west coast lie in deep water (200 m +)

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IRISH OFFSHORE BASINS

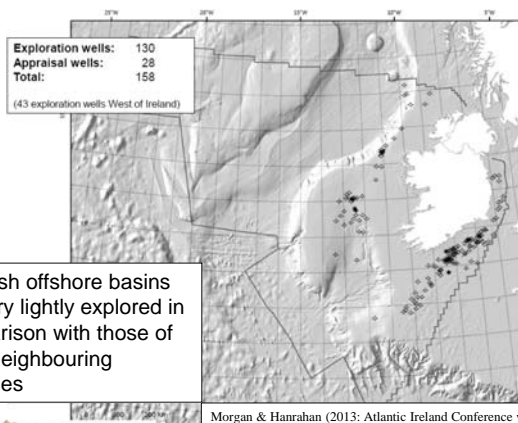


Ireland is surrounded by a series of sedimentary basins of different sizes and orientations, with a range of different geology and exploration plays and prospects.

Exploration in the Irish offshore has been taking place for more than 40 years.

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EXPLORATION AND APPRAISAL WELLS

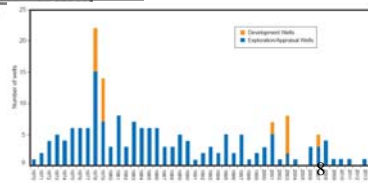


E&A WELLS

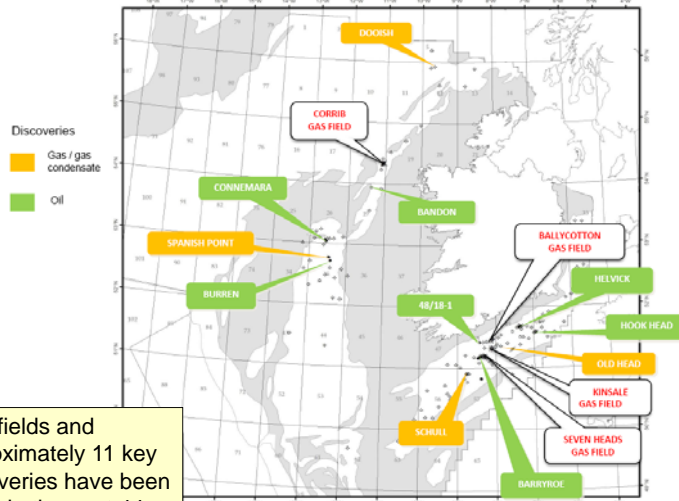
Kish Bank Basin:	4
Central Irish Sea:	5
Goban Spur:	1
Celtic Sea basins:	85
Fastnet Basin:	12
Porcupine Basin:	31
Slyne Basin:	10
Erris Basin:	4
Donegal Basin:	2
Rockall Basin:	4

The Irish offshore basins are very lightly explored in comparison with those of most neighbouring countries

The number of E&A wells drilled per annum in the Irish offshore is very low, and is significantly lower than it was during the 1970s and 1980s.



IRISH OFFSHORE FIELDS AND DISCOVERIES



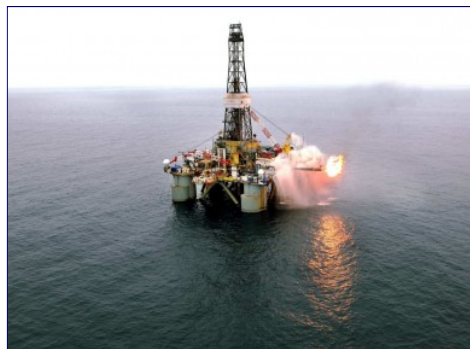
Morgan & Hanrahan (2013, Atlantic Ireland Conference presentation and website)

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TESTING OIL DISCOVERIES IN THE CELTIC SEA



Helvick oil discovery (49/9-2) in 1983

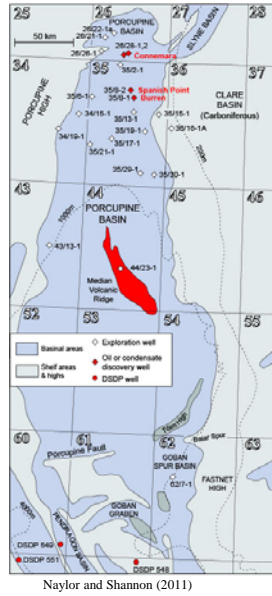


Barryroe oil discovery (48/24-10z) in 2012

In addition to the Kinsale Head, Ballycotton and Seven Heads gasfields, there have been several other gas and oil discoveries made over the years in the Celtic Sea.

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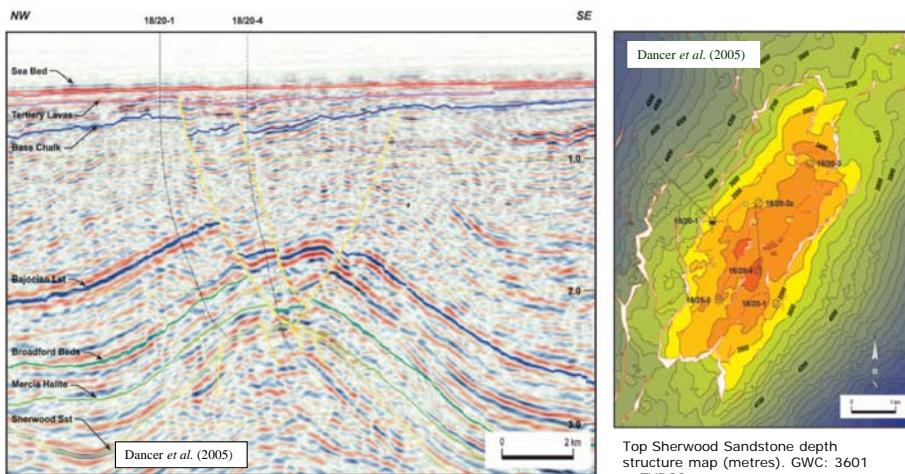
PORCUPINE BASIN: Wells and Discoveries



- 31 exploration and appraisal wells have been drilled to date in the Porcupine Basin.
- Two oil discoveries (Connemara and Burren) have been made in the northern part of the basin.
- One gas condensate discovery (currently under re-appraisal) was made in the northern part of the basin (Spanish Point discovery).
- The Dunquin Prospect is a very large structure in the deep, central part of the basin. It was drilled in 2013 but was not a discovery, although it indicated the ingredients of a working petroleum system in the region and of a new play type.

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CORRIB GAS FIELD (c. 1 TCF)

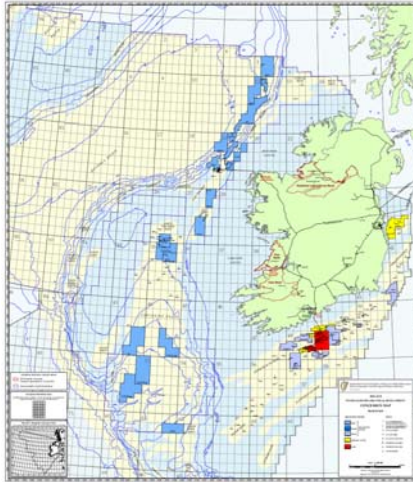


The Corrib gas field, discovered in 1996, is expected to come on stream in mid-2015. It will supply ~60% of Ireland's gas needs for several years.

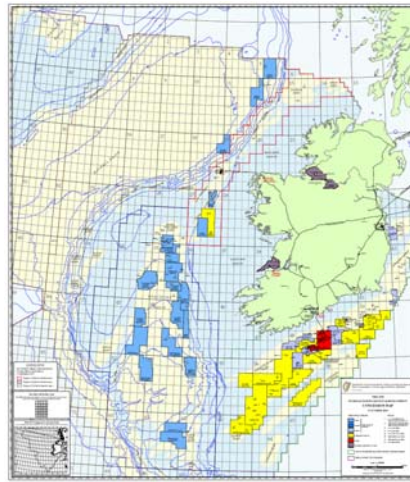
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CONCESSION MAPS

March 2010



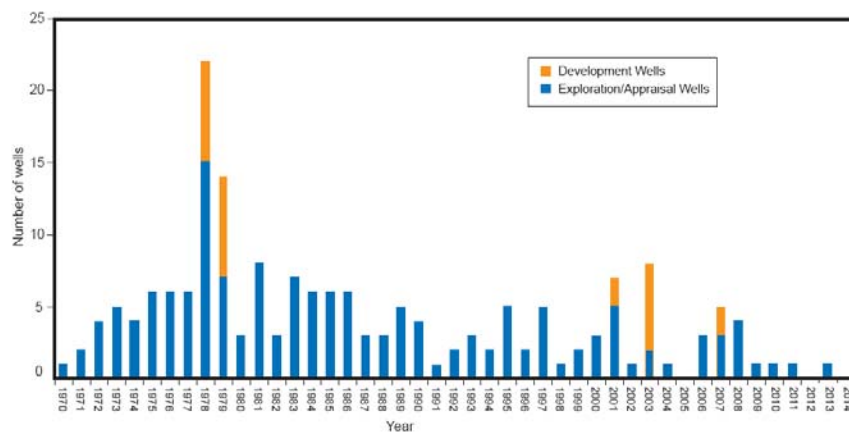
October 2014



During the past ~four years there has been an increase licenses/licensing options in the Porcupine and Celtic Sea basins and a decrease in the Erris, Donegal and Rockall basins.

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WELLS IN IRISH OFFSHORE



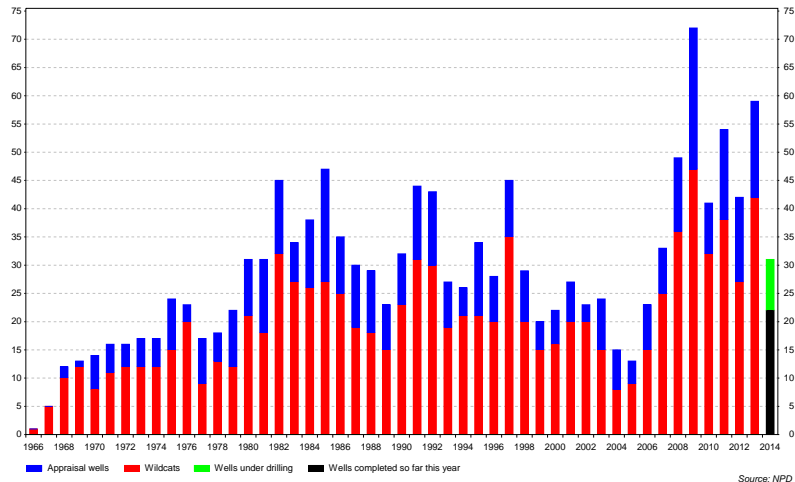
Levels of drilling in the Irish offshore are at an all-time low (4 wells in the past 5 years).

In 2015 it is expected that there will be one or two wells drilled.

Depending upon the results of evaluation of currently licensed acreage 2016 could see a further increase in drilling.

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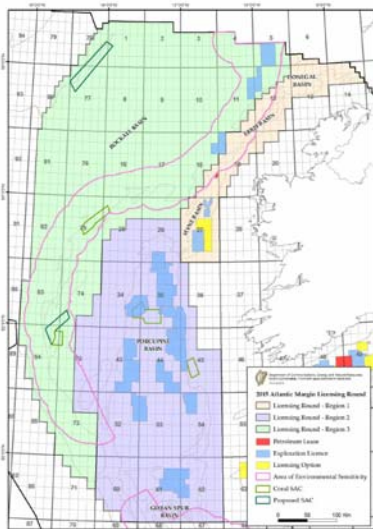
EXPLORATION AND APPRAISAL WELLS ON NORWEGIAN CONTINENTAL SHELF



In contrast to Ireland, the numbers of wells drilled on the Norwegian Continental Shelf have remained high in the past 5 years. This reflects the perceived levels of risk and prospectivity of the regions.

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2015 LICENSING ROUND: ATLANTIC MARGIN



- Involves 995 full blocks and 93 part blocks, with a total area of approx. 256,700 km².
- Closing date 16th September 2015.
- Three main regions:
 1. Donegal, Erris, Slyne basins: 1-4 block tranches
 2. Porcupine and Goban Spur: 1-6 block tranches
 3. Rockall Basin: 1-10 block tranches.
- Licensing Options up to 2 years' duration (3 years for blocks within recognised area of environmental sensitivity and work programmes in this area should not propose seismic acquisition).

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RECENT EVENTS LIKELY TO INFLUENCE PERCEPTION OF RELATIVELY RISK/PROSPECTIVITY IN IRISH OFFSHORE

IRELAND

- 2014 changes in licensing terms, with increased tax take on discoveries made in licensing option/licence/lease areas taken out post-June 2014.
- Significant amount of new available 2D and 3D seismic data, including DCENR/Eni regional survey.
- 2015 Licensing Round with availability of Licensing Options.
- Corrib gas field coming on stream, 19 years after initial discovery.
- Energy White Paper (2015).

INTERNATIONAL

- Falling oil price.
- Licensing terms in other competitor countries.
- Shale gas revolution in USA.
- International political instability and security of supply concerns.

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BENEFITS/OPPORTUNITIES FROM OIL AND GAS DEVELOPMENT

Kinsale Head

The Kinsale Head gas field (and associated satellite developments) transformed Ireland:

- Primary enabler for Bord Gáis Éireann and the gas pipeline infrastructure.
- Stimulated industrial development in the Cork area (Aghada and Poolbeg power plants, NET fertiliser plant at Marino Point constructed on foot of the Kinsale Head development).
- Availability of gas enabled development of chemical and pharmaceutical companies in Cork Harbour region.
- Catalyst for formation and growth of new companies (e.g., PM Group, Mainport).
- Kinsale Energy currently spends around €30 million annually in the local Cork economy.

Corrib

Since 2006, the Corrib gas project has had a major impact on development and prosperity in the west of Ireland:

- Sustained more than 1,000 full-time jobs through the construction phase (more than 1,400 people at peak) in Co. Mayo (58% are Mayo people, with more than 300 Irish contracting companies).
- 175 direct long term high-quality jobs, not including indirect employment, in Erris for the life of the field. Over €1 billion spent directly with Irish companies to date.
- The project will contribute €6 billion to Ireland's GDP over its lifecycle.
- Ten towns in Co. Mayo and Co. Galway have been connected to the national gas grid as a result of the Corrib project, with others planned for connection in the future.
- Local infrastructure has been upgraded as a result of Corrib with €22 million spent on local road upgrades locally by Shell, Statoil and Vermilion.

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BENEFITS/OPPORTUNITIES FROM OIL AND GAS EXPLORATION DRILLING

In addition to the economic, social investment and infrastructural rewards, there are significant local benefits to the economy from exploration and appraisal drilling. For example, as a result of Corrib-related drilling activity in the Slyne Basin:

- In 2011 in excess of €3 million was generated in business-related activity in Donegal.
- The main beneficiaries were the port of Killybegs and Carrickfinn Airport but 31 companies/businesses in Donegal shared some slice of the business generated.
- These included taxi and road haulage, crane hire and stevedoring, freight, scaffolding, waste management, accommodation, electrical, refrigeration and welding services, chandlery and marine repair, pilotage, storage, office rental, portacabin hire, flights and ground works, local hotels, taxis, coach services, accommodation and service providers and the hospitality industry.
- Oil and gas exploration and development in the Irish offshore provides significant opportunities to Irish-based companies involved in the sector to benefit and grow their business but also to expand their operations internationally.
- Although the level of exploration drilling in Ireland is currently low, Irish companies that developed from earlier exploration are 'open for business' in international markets, while other companies in Ireland with key skillsets (e.g., software development) could evolve oil and gas applications.

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SUMMARY

- The 2015 licensing round offers blocks in the Atlantic Margin (Slyne, Erris, Donegal, Porcupine, Rockall and Goban Spur basins).
- There are farmout opportunities for companies in most of the Irish offshore basins, especially in the Celtic Sea.
- The level of exploration drilling for the past five years has been low, and while it may improve it is likely to remain low in the coming 2-3 years.
- The new tax regime only applies to acreage awarded post-June 2014.
- There are limited opportunities for oil and gas service companies in Ireland at present due to the low levels of drilling but there are international opportunities for Irish companies with the appropriate specialised skillsets.
- There are likely to be significant opportunities in the event of progressing to development and production.

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**Enterprise Ireland - NOF Energy: UK & Ireland International Oil & Gas supply chain
exchange conference**

Enterprise Ireland event, 27th November 2014

Ireland's Oil and Gas Industry Update

Pat Shannon, Chairman, Irish Offshore Operators' Association

(Slide 1). Thank you for the invitation to speak this morning at this gathering of companies in the oil and gas supply and service chain.

(Slide 2). I would like to provide a brief introduction to the Irish Offshore Operators' Association (IOOA), and to the current and recent Exploration and Production position of the Irish offshore and take a quick look at some of the benefits from discoveries to date and the opportunities that may exist in the near future. Ireland is still at the early stage of E&P compared to many of our European competitor countries and the opportunities for many service companies who operate in the North Sea, and who are here today, are likely to be somewhat limited. We are at a crucial stage in the development of the oil and gas industry in Ireland and depending on what happens in the next couple or three years the industry may take off with successes, or may stagnate if the optimism of the past couple of years dissipates.

(Slide 3). The Irish Offshore Operators' Association (IOOA) is the representative organisation for the Irish offshore oil and gas industry. IOOA was founded in 1995 and currently has 16 members. We have a range of companies from the majors and large independents to the smaller and junior companies, all of whom are actively exploring in the Irish offshore.

(Slide 4). The exploration industry is a complex, expensive and risky business, and differs from place to place and from country to country depending upon the unique geological setting and evolution. The Irish offshore basins developed as ancient continents separated by rifting and ultimately breakup leading to the separation of Europe from North America. This was further complicated by the effects of older faults and structures that existed in the basement rocks and by such major effects as the opening of the Bay of Biscay, the creation of the Alps and the extrusion of large volumes of basalt in the North Atlantic (Iceland and the Giant's Causeway). As a result, each basin is different as it reflects both local and regional effects as the crust thins and ruptures. This sets the geological scene for the challenges we face in trying to locate oil and gas trapped in structures in sedimentary basins.

(Slide 5). If we roll back the geological history to about 140 million years ago and close up the Atlantic Ocean we see that some of the Eastern Canadian petroliferous offshore basins lay close to their Irish and UK counterparts. Understanding this regional basin system will help us predict and hopefully de-risk exploration on both sides of the Atlantic.

(Slide 6). Some of the Irish basins lie close to shore and in relatively shallow water (such as Celtic Sea) while others (such as the Porcupine and Rockall basins) lie in very deep waters in the Atlantic Ocean. The water depth is a function of the geological structure and history (thin continental crust and recent underfilled basins in large Atlantic Margin basins).

(Slide 7). Ireland is surrounded by sedimentary basins of different sizes, shapes and orientation and these have a range of different geology and petroleum prospects. They have been the subject of exploration for more than 40 years with more than €3 billion spent – all of this paid for by the oil industry, with no financial risk to the State which licences the acreage for exploration and development by the industry. The exploration to date shown that there are indications of petroleum systems in all the basins but the challenge is finding and developing sufficient quantities to make discoveries commercial.

(Slide 8). Despite 40 years of exploration the Irish basins are all underexplored, due largely to the slow pace of drilling. This is the result of a series of factors including the perceived relative geological and financial risk both in Ireland and compared to competitor countries, the licensing terms, the oil price and the quality and quantity of seismic data to de-risk drilling. Worryingly, the overall trend of numbers of wells drilled has been flat or downwards. It is much lower now than it was in the 1970s and 1980s.

(Slide 9). While the general results have been disappointing there have been a number of successes and encouraging discoveries. Four fields and approximately 11 key discoveries have been made in the past 44 years of exploration. Some of these discoveries have the potential to become producing fields in the future.

(Slide 10). Oil flowed on test from the Helvick discovery in 1983, and there has also been significant encouragement from recent appraisal by Providence Resources of the Barryroe oil accumulation, especially with the latest appraisal well drilled in 2012. Several of the other oil and gas discoveries in the Celtic Sea, lying in shallow water and close to shore, are also encouraging and several may see commercial production given the right circumstances.

(Slide 11). Two oil discoveries (Connemara and Burren) have been made in the northern part of the basin and are currently. A gas condensate discovery (Spanish Point) was made in the northern part of the basin and is currently under appraisal, with a well expected to be drilled on it by Cairn Energy and partners in 2015. The last well drilled in the basins (the Dunquin Prospect) in 2013 was not a discovery, although it indicated the ingredients of a working petroleum system in the region and demonstrated a new play.

(Slide 12). In the Slyne Basin, the Corrib gas field, discovered in 1996, is due to come on stream in mid-2015. It is somewhat smaller than the Kinsale Head gasfield but will supply ~60% of Ireland's gas needs for several years.

(Slide 13). During the past ~four years there has been an increase licenses/licensing options in the Porcupine and Celtic Sea basins and a decrease in the Erris, Donegal and Rockall basins.

(Slide 14). Levels of drilling in the Irish offshore are at an all-time low (4 wells in the past 5 years). In 2015 it is expected that there will be up to 3 wells drilled. Depending upon the results of evaluation of currently licensed acreage 2016 could see a further increase in drilling.

(Slide 15). In contrast to Ireland, the numbers of wells drilled on the Norwegian Continental Shelf have remained high in the past 5 years. This reflects the perceived levels of risk and prospectivity of the regions.

(Slide 16). Involves 995 full blocks and 93 part blocks, with a total area of approx. 256,700 Km². Closing date for applications is 16th September 2015. There are three main regions: 1. Donegal, Erris, Slyne basins: 1-4 block tranches; 2. Porcupine and Goban Spur: 1-6 block tranches; 3. Rockall Basin: 1-10 block tranches. Licensing Options up to 2 years' duration (3 years for blocks within recognised area of environmental sensitivity and work programmes in this area should not propose seismic acquisition).

(Slide 17). There are a number of key factors, some local and others international, that will have a significant influence on driving and stimulating, or alternatively slowing, the rate of exploration and ultimately likely success and commercial development. The major factors within Ireland include (a) 2014 changes in licensing terms, with increased tax take on discoveries made in licensing option/licence/lease areas taken out post-June 2014, (b) Significant amount of new available 2D and 3D seismic data, including DCENR/Eni regional survey, (c) 2015 Licensing Round with availability of Licensing Options, (d) Corrib gas field coming on stream, 19 years after initial discovery, and (d) the forthcoming Energy White Paper (2015) that will set Ireland's energy strategy and policy for the coming decade. The major international factors impacting on Irish offshore oil and gas exploration include (a) Falling oil prices, (b) Licensing terms in other competitor countries, (c) Shale gas revolution in USA, and (d) International political instability and security of supply concerns.

(Slide 18). The potential benefits to the country, to local communities and to businesses in the event of commercial success and petroleum development are enormous and we have witnessed these on two occasions in Ireland; one in the 1970s with Kinsale Head and associated satellite fields, the other in the past decade or more with the Corrib project. Some examples of the transformative impact from Kinsale Head are (a) Primary enabler for Bord Gáis Éireann and the gas pipeline infrastructure, (b) Stimulation of industrial development in the Cork area, (c) Availability of gas enabling development of chemical and pharmaceutical companies in Cork Harbour region, (d) Catalyst for formation and growth of new companies, and (e) Investment by Kinsale Energy of around €30 million annually in the local Cork economy. Corrib has had a comparable enormous benefit on the prosperity and development of the west of Ireland including (a) Sustaining more than 1,000 full-time jobs through the construction phase in Co. Mayo (58% are Mayo people, with more than 300 Irish contracting companies), (b) 175 direct long term high-quality jobs, not including indirect employment, in Erris for the life of the field, (c) Over €1 billion spent directly with Irish companies to date (d) The project will contribute €6 billion to Ireland's GDP over its lifecycle (e) Ten towns in Co. Mayo and Co. Galway have been connected to the national gas grid as a result of the Corrib project, with others planned for connection in the future, and (f) Local infrastructure has been upgraded as a result of Corrib with €22 million spent on local road upgrades locally by Shell, Statoil and Vermilion.

(Slide 19). In addition to the economic, social investment and infrastructural rewards, there are significant local benefits to the economy from exploration and appraisal drilling. For example, as a result of Corrib-related drilling activity in the Slyne Basin, in excess of €3 million was generated in business-related activity in Donegal in 2011. The main beneficiaries were the port of Killybegs and Carrickfinn Airport but 31 companies/businesses in Donegal shared some slice of the business generated. These included taxi and road haulage, crane hire and stevedoring, freight, scaffolding, waste management, accommodation, electrical, refrigeration and welding services, chandlery and marine repair, pilotage, storage, office rental, portacabin hire, flights and ground works, local hotels, taxis, coach services, accommodation and service providers and the hospitality industry. Oil and gas

exploration and development in the Irish offshore provides significant opportunities to Irish-based companies involved in the sector to benefit and grow their business but also to expand their operations internationally. Although the level of exploration drilling in Ireland is currently low, Irish companies that developed from earlier exploration are 'open for business' in international markets, while other companies in Ireland with key skillsets (e.g., software development) could evolve oil and gas applications.

(Slide 20). To sum up, Ireland is at a crucial stage in our oil and gas exploration and development evolution. Explorers are always optimistic and hope that next year will be the one when we crack the geological code, understand Nature's secrets and find that elusive big discovery. We take risks – exploration is extremely expensive and development is even more expensive. Our IOOA members have spent a very large amount of money (individual wells may cost up to \$200 million each) with relatively little success. For the past couple of years there has been an increasing level of optimism about the Irish offshore, although we have seen similar optimism in the past for it to be dashed and fade away. The IOOA members are optimistic about the Irish offshore – we would not be here and spending money otherwise. The 2015 licensing round offers some interesting blocks in the Atlantic Margin (Slyne, Erris, Donegal, Porcupine, Rockall and Goban Spur basins). There are farmout opportunities for companies in most of the Irish offshore basins, especially in the Celtic Sea. The level of exploration drilling for the past five years has been low, and while it may improve somewhat realistically it is likely to remain low in the coming 2-3 years. There are probably fairly limited opportunities for oil and gas service companies in Ireland at present due to the low levels of drilling but there are international opportunities for Irish companies with the appropriate specialised skillsets. However, there are likely to be significant opportunities in the event of progressing to development and production, and that is the scenario we all hope and work towards. Thank you for your attention.