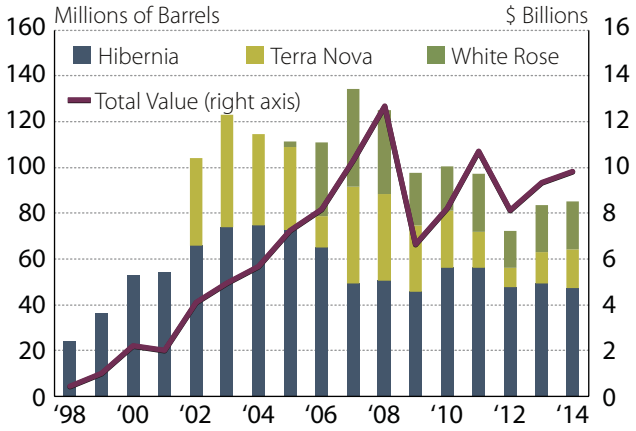
Oil and Gas

Offshore Oil Production



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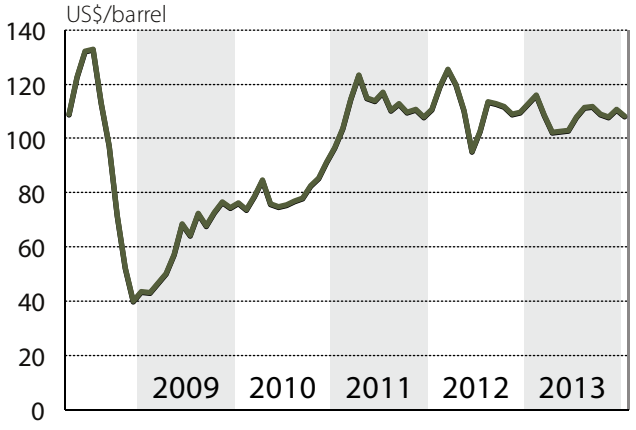
Source: C-NLOPB; Department of Finance

Brent Crude Oil Monthly Spot Prices



Source: U.S. Energy Information Administration

The oil and gas industry is the largest contributor to provincial GDP. It is estimated that oil and gas and support activities accounted for roughly 28% of the province's nominal GDP in 2012. In 2013, direct employment in the oil and gas extraction industry (including support activities) was approximately 8,800 person years. In addition, the industry accounts for a substantial portion of provincial government revenues. In fiscal year 2012-13, offshore oil royalties accounted for approximately 24% of total provincial revenues. Between first oil from Hibernia in November 1997 up to March 2013, oil royalties contributed roughly $14.7 billion to the provincial treasury.

Oil production from the province's three producing projects increased to 83.6 million barrels in 2013, representing growth of 15.8% or 11.4 million barrels from 2012 (see chart). This increase reflects a return to more recent production levels following extended maintenance downtime in 2012. The estimated value of oil production increased 15.1% to $9.4 billion in 2013 as a result of higher production volumes; however, the increase was partially offset by lower crude oil prices. The price of Brent crude oil, a benchmark for Newfoundland and Labrador oil, averaged US$108.56/barrel in 2013 compared to US$111.63/barrel in 2012 (see chart). Cumulative oil production since 1997 (to December 31, 2013) totalled 1.44 billion barrels worth an estimated $102.0 billion. All three producing oil projects in the province have had considerable upward revisions to their recoverable oil estimates since they were initially proposed for development.

Hibernia

Hibernia was the first offshore oil project to be developed in Newfoundland and Labrador. It is located in the Jeanne d'Arc Basin (see map) 315 kilometres southeast of St. John's and is operated by Hibernia Management and Development Company Ltd. Hibernia production occurs by means of a stand-alone concrete gravity based structure (GBS).

When it was initially proposed for development, the project proponents estimated that Hibernia contained 520 million barrels of recoverable oil. Since that time this estimate (including the Hibernia South Extension) has increased to 1,395 million barrels, making Hibernia the largest offshore project in the province and among the largest oil fields ever discovered in Canada.

Over the past few years, Hibernia production has expanded into two development areas south of the main field: the AA Blocks and the HSE Unit, which together make up the Hibernia South Extension. Production from the AA Blocks and the HSE Unit started in November 2009 and June 2011, respectively. The Hibernia South Extension has estimated recoverable reserves/resources of 215 million barrels, which are expected to extend the life of the Hibernia project by five to ten years. The province, through Nalcor Energy, has a 10% equity stake in the HSE Unit.

Total Hibernia production (including the Hibernia South Extension) was 49.4 million barrels in 2013, up 3.3% (1.6 million barrels) from 2012, with 4.7 million barrels coming from the AA Blocks and 0.8 million barrels from the HSE Unit. Cumulative production at Hibernia, since first oil in November 1997 to December 2013, totalled 876.5 million barrels. Approximately 518 million barrels, or roughly 37% of estimated reserves/resources, were remaining as of December 31, 2013.[2]

Terra Nova

The Terra Nova field was the second offshore oil discovery in the province to reach production, with first oil in January 2002. Terra Nova, just southeast of the Hibernia field in the Jeanne d'Arc Basin, is operated by Suncor Energy Inc. using a floating production, storage and offloading vessel (*Terra Nova FPSO*).

In April 2013, the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) increased Terra Nova's estimated reserves/resources from 505 million barrels to 592.4 million barrels, after significant upgrades were made to the *Terra Nova FPSO* and the offshore riser and flowlines were replaced at the field. When it was initially proposed for development, the project proponents estimated that the Terra Nova field contained 400 million barrels of recoverable oil.

The *Terra Nova FPSO* has undergone two relatively lengthy maintenance programs in the past two years. In 2012, the *Terra Nova FPSO* was removed from service from mid-June to early-December to replace its water injection swivel. During this downtime, subsea maintenance work was also carried out at the field. In late September 2013, the FPSO was taken out of service to repair a damaged mooring chain and perform preventive maintenance on the remaining eight mooring chains. Production resumed in early December.

Terra Nova produced 13.8 million barrels in 2013, an increase of 62.6% (5.3 million barrels) over 2012. Cumulative production at Terra Nova, since first oil in January 2002 to December 2013 totalled 349.4 million barrels, representing 59% of estimated reserves/resources.

2 Reserves are considered to be recoverable using current technology and under present and anticipated economic conditions. Resources are assessed to be technically recoverable but have not been delineated and have unknown economic viability.

White Rose (including North Amethyst)

The White Rose project, also located in the Jeanne d'Arc Basin, is operated by Husky Energy. White Rose is the province's most recent offshore oil development to be brought into production. Production from White Rose also occurs using a floating production, storage and offloading vessel (*SeaRose FPSO*). First oil from the main field (South Avalon Pool) occurred in November 2005 and first oil from North Amethyst occurred in May 2010.

When initially proposed for development, the project proponents estimated that the White Rose field contained 230 million barrels of recoverable oil. Since its initial development, the White Rose project has expanded to include several satellite areas (North Amethyst, South White Rose Extension and West White Rose). The current estimated reserves/resources for the entire White Rose project are 379.8 million barrels. The province, through Nalcor Energy, has a 5% equity stake in the White Rose satellite fields.

White Rose annual production for 2013 totalled 20.4 million barrels, up 28.5% from 15.9 million barrels in 2012. The production increase recorded for 2013 mainly reflects a 102-day maintenance shutdown in 2012, primarily for stern tube repairs on the *SeaRose FPSO*. Cumulative production at White Rose, since first oil in November 2005 to December 31, 2013 totalled 218.0 million barrels, representing 57% of estimated reserves/resources.

On June 5, 2013, the C-NLOPB announced its approval of a White Rose Development Plan amendment incorporating the South White Rose Extension (SWRX). The SWRX pools, which are estimated to contain approximately 33 million barrels of recoverable oil, will be developed via a subsea tieback to the *SeaRose FPSO*.

On October 10, 2013, the province and Husky Energy jointly announced that they had reached an agreement to advance the development of the White Rose Extension Project. The agreement will allow for the development of West White Rose via a wellhead platform (WHP) consisting of a concrete gravity structure (CGS) and topsides. The primary function of the WHP will be drilling. There will be no oil storage in the CGS. All well fluids will be transported via subsea flowlines to the *SeaRose FPSO* for processing, storage and offloading. The estimated capital cost of the project is $2.3 billion.

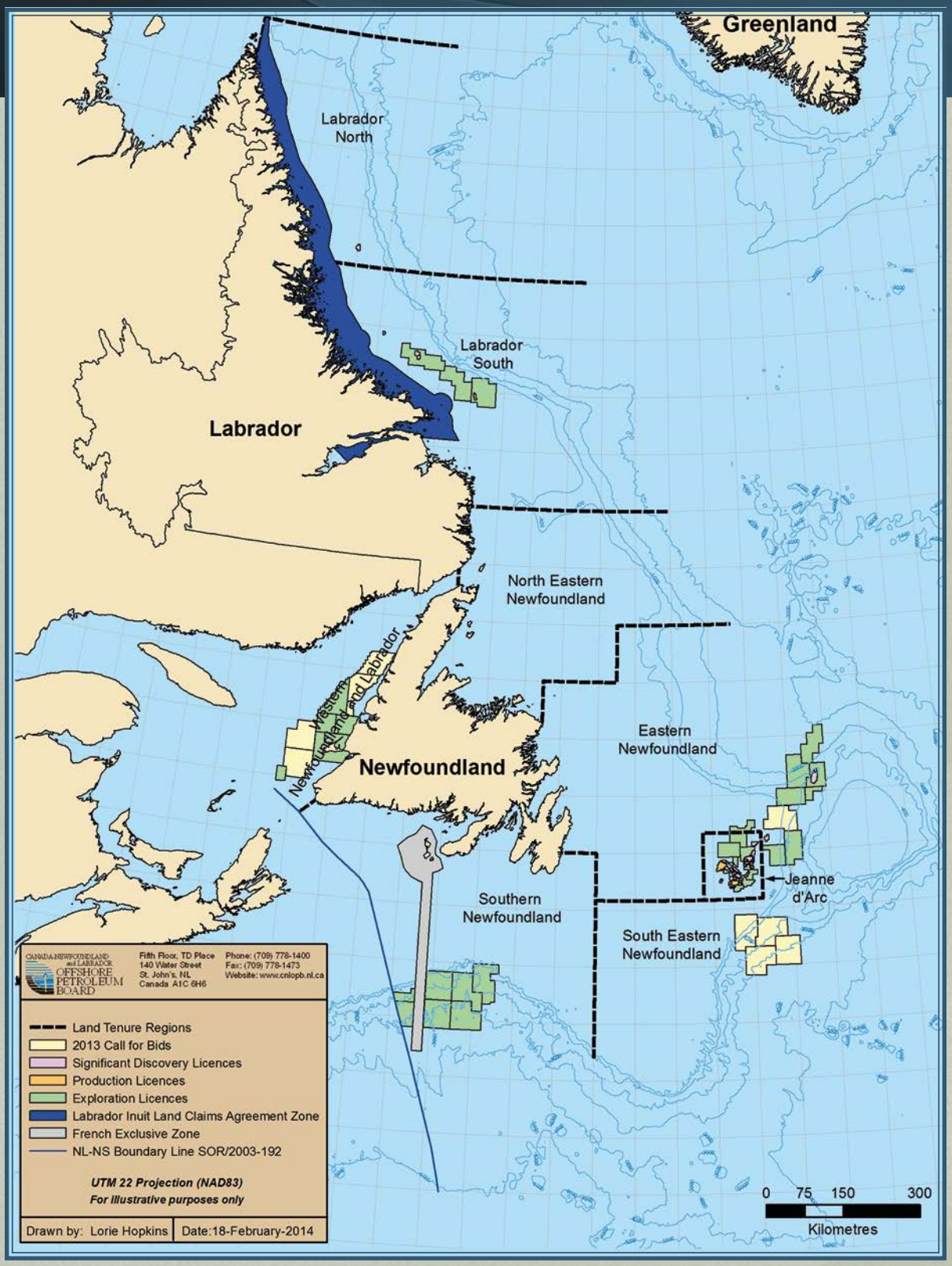
The development phase of the project is expected to generate 2,800 person years of employment in the province. Work in the province includes project and procurement management; engineering and construction of the graving dock complete with gates; construction of the concrete gravity-based structure and accommodations modules; and fabrication of the flare boom, heli-deck and lifeboat stations. In addition to the employment during the construction period, the project is expected to create approximately 250 new long-term platform positions.

The White Rose Extension is a partnership between Husky Energy (68.875%), Suncor Energy Inc. (26.125%) and Nalcor Energy (5.0%). An estimated 115 million barrels of oil are expected to be extracted via the platform over the life of the project. Development of the White Rose Extension Project is projected to return $3 billion to the province in royalties, corporate income tax and return on investment through Nalcor Energy. While the West White Rose project has yet to be officially sanctioned, development activities are proceeding. Oceanside excavation for the graving dock is underway at Argentia and Husky expects to award a contract for the living quarters of the offshore platform before official sanctioning (anticipated by the third quarter of 2014). First oil from the project is expected in 2017.

Offshore Basins

Source: Department of Natural Resources

Land Tenure Regions



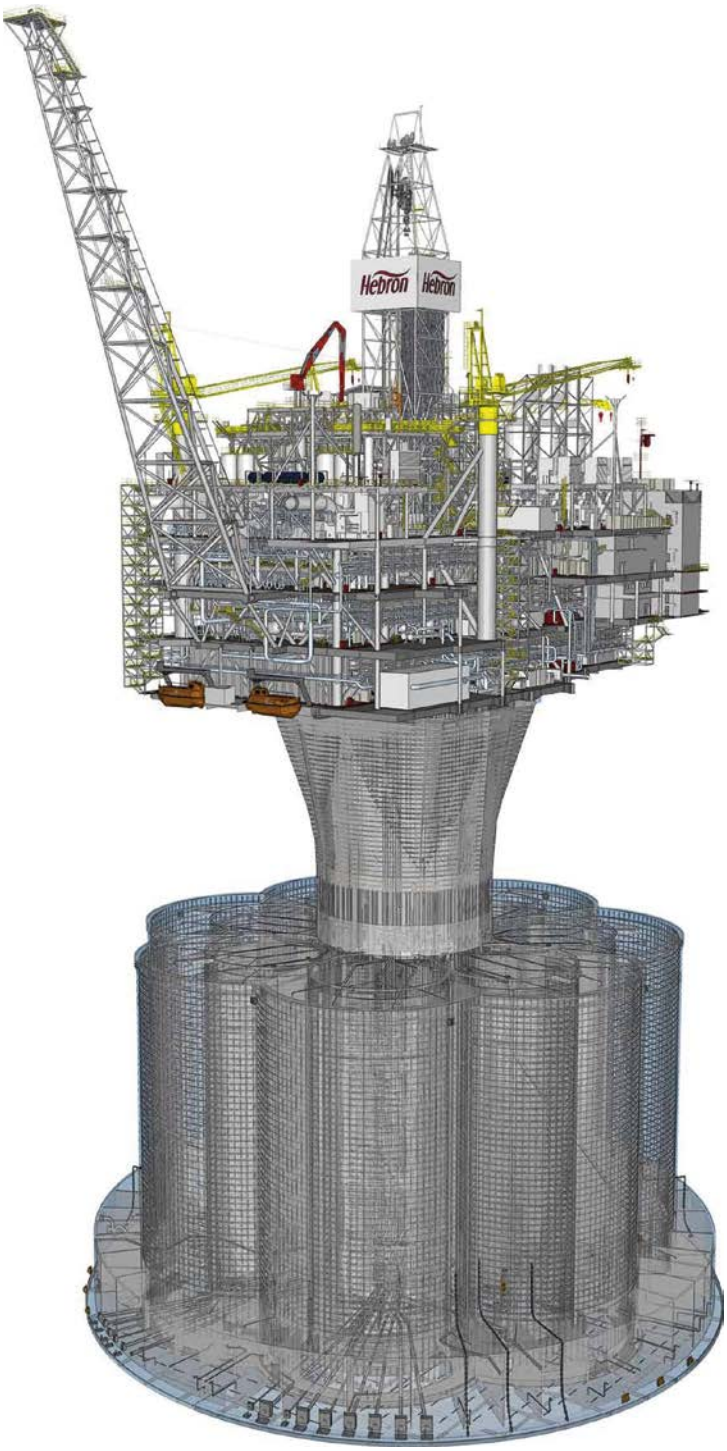
Hebron

The Hebron field was discovered in 1981 and is estimated to contain in excess of 700 million barrels of recoverable oil, making it the second largest oil field in the province after Hibernia. Hebron is located just nine kilometres northwest of Terra Nova in the Jeanne d'Arc Basin, in a water depth of approximately 92 metres. The Hebron project received official sanction on December 31, 2012, becoming the province's fourth stand-alone offshore oil project.

The Hebron field will be developed using a stand-alone concrete gravity based structure similar to, but smaller than the Hibernia GBS. The Hebron GBS, the second of its type to be built in the province, is currently under construction at Bull Arm. It is designed to withstand sea ice, icebergs and extreme meteorological and oceanographic conditions. The Hebron GBS will support an integrated topsides deck that includes living quarters and facilities to perform drilling and production operations. In addition to the GBS itself, two of the four topsides modules are also being built in the province—the accommodations module is being constructed at Bull Arm and the drilling support module is being fabricated in Marystown. As of December 31, 2013, the Hebron project employed 4,937 people in the province, of which 4,227 (85.6%) were residents of Newfoundland and Labrador.

The province, through Nalcor Energy, holds a 4.9% equity stake in the Hebron project. ExxonMobil Canada Properties (36.0%), Chevron Canada Resources (26.7%), Suncor Energy Inc. (22.7%) and Statoil Canada Ltd. (9.7%) make up the remaining Hebron consortium participants. ExxonMobil is the operator of the project. The capital cost for the project is estimated at $14 billion and first oil is expected towards the end of 2017.

Hebron Gravity Base Structure



Source: ExxonMobil

Exploration

Most offshore exploration and significant oil discoveries in the Newfoundland and Labrador offshore area to date have been concentrated in the Jeanne d'Arc Basin. Given the immense size of the province's offshore area (see basins map), there is considerable potential for further exploration and possible new discoveries in other basins.

Statoil announced two new discoveries in the deep water (approximately 1,100 metres) Flemish Pass Basin in 2013. The Harpoon discovery (whose resource potential has not yet been determined) was announced in June and the Bay du Nord discovery (estimated to contain between 300 and 600 million barrels of recoverable oil) was announced in August. Bay du Nord was the world's largest conventional oil discovery of 2013 and the largest Statoil-operated discovery made by the company outside of Norway. The Harpoon and Bay du Nord discoveries are in close proximity to the 2009 Mizzen discovery which is estimated to contain 100-200 million barrels of recoverable oil. Statoil holds a 65% interest in the Mizzen, Harpoon and Bay du Nord fields and Husky Energy holds the remaining 35% interest.

Statoil is an international energy company with operations in 33 countries and 40 years of experience in oil and gas production on the Norwegian continental shelf, a comparable environment to the Newfoundland and Labrador offshore area. Statoil has indicated that the Flemish Pass Basin is a strategic part of its global exploration portfolio and has the potential to become a core producing area for the company post-2020. The company has formed a task force to assess the feasibility of an accelerated development of the Bay du Nord discovery.

Statoil recently announced that it plans to drill more wells in the Flemish Pass Basin over the next year and a half, particularly in the Bay du Nord area. A deep water semi-submersible drill rig will arrive in the province in the third quarter of 2014 to start drilling. In addition to the exploratory drilling, Statoil plans to begin a 1,900 square kilometre seismic program in the same area this spring.

Husky also has several drill ready exploration and delineation prospects in the Newfoundland and Labrador offshore region and will be utilizing the *Henry Goodrich* drilling unit in 2014 to progress these prospects, which include the Aster prospect in the Flemish Pass Basin/Central Ridge.

On the province's west coast, there are plans to target the Green Point formation with several onshore-to-offshore wells. In addition, Corridor Resources and Ptarmigan Energy have indicated their intentions to drill at prospects in the Western Newfoundland and Labrador offshore region, including Corridor's Old Harry Prospect. These plans are subject to various regulatory approvals including strategic and project specific environmental assessments.

Onshore exploration activity continues. Investcan Energy Corporation (Investcan) has plans for a four-well appraisal pilot project in the Flat Bay area. The first appraisal well was drilled in late 2012 and re-entered in 2013 to perform an acid stimulation. Further evaluation of this well is planned before any decision to proceed with the pilot project is made. Investcan also re-entered and deepened an existing well in the area this past summer and the well data is currently being evaluated. Black Spruce Exploration (BSE) has announced memorandums of understanding with Enegi and Deer Lake Oil and Gas to farm-in on the Garden Hill South production lease lands and Deer Lake's exploration permit lands. BSE is continuing with plans to mobilize a drill rig to the area.

In early November 2013, the Minister of Natural Resources announced that any applications for petroleum exploration involving hydraulic fracturing (fracing) will not be accepted pending a department jurisdictional review, geological review and public engagement process.

On May 16, 2013, the C-NLOPB announced the 2013 Calls for Bids in three offshore areas—one 266,139 hectare parcel in the Flemish Pass; four parcels totaling 1,138,399 hectares in the Carson Basin; and four parcels totaling 1,004,482 hectares in the Western Newfoundland and Labrador offshore region. The closing date for each Call shall be 120 days after the completion of the relevant Strategic Environmental Assessments (SEA) which have yet to be completed.

Scheduled Land Tenure System

On December 19, 2013, the C-NLOPB announced the implementation of a new scheduled land tenure system which will provide longer lead times for exploratory work in frontier areas and improve transparency, predictability and industry input. Under the new system, the Newfoundland and Labrador offshore area is divided into eight regions (see map/table), each of which are designated as either low activity, high activity or mature depending on variances in the volume of data collection in the basins and geoscientific knowledge of the region.

Offshore Land Tenure Regions	Current Activity Designation	Land Tenure Cycle
Labrador North; Labrador South; Northeastern Newfoundland; Southeastern Newfoundland; Southern Newfoundland; Western Newfoundland and Labrador	Low Activity	Call for Bids will close four years after a Call for Nominations (Areas of Interest)
Eastern Newfoundland	High Activity	Call for Bids will close within two years after a Call for Nominations (Areas of Interest)
Jeanne d'Arc Basin	Mature	Call for Bids will close within one year after a Call for Nominations (Parcels)

The activity designation of each region will determine the amount of time available following the Call for Nominations for interested parties to assess the hydrocarbon prospects before the Call for Bids is announced. The land tenure process for low activity regions will follow a four year cycle, high activity regions a two year cycle and mature regions a one year cycle. Calls for Nominations (Areas of Interest) will go out in the fall of the year and the respective Call for Bids (Parcels) will close four years later in low activity regions and two years later in high activity regions. For mature regions, the land tenure process will remain the same as in the past—a Call for Nominations (Parcels) will go out in the fall of each year, the Call for Bids will be announced in the spring of the following year and the Call for Bids will close in the fall of the same year.

The Call for Bids cycles will be repeated bi-annually for low activity regions and annually for high activity regions. In the second and subsequent rounds for a given region, land parcels which were previously offered, but not awarded, will be re-assessed and, if deemed prospective, re-posted in the next Call for Bids. This will allow for a cumulative increase of land being available in the scheduled land tenure system.

The new land tenure system is designed to attract more interest in the Newfoundland and Labrador offshore area by allowing exploration companies additional time to conduct geoscientific assessments of the hydrocarbon potential of lesser explored basins. In turn, this is expected to support increased exploration activity, new discoveries and subsequent new developments.

On December 19, 2013, the C-NLOPB also announced its initial Call for Nominations (Areas of Interest) under the new scheduled land tenure system. The 2013 Call for Nominations (Areas of Interest) includes the Labrador South Region (4-year cycle) and Eastern Newfoundland Region (2-year cycle). The Calls for Nominations close March 17, 2014, after which the C-NLOPB will define and announce a Sector from the industry area of interest nominations. The Sector will designate the specific location over which the subsequent Call for Bids will be issued. The Call for Bids in the Eastern Newfoundland Region and Labrador South Region will close in November 2015 and November 2017, respectively, and exploration licences will awarded within two months of the closing of Calls.

Outlook 2014
Oil and Gas

- Oil production is expected to increase 1.8% to 85.1 million barrels.
  - Hibernia (including the AA Blocks and HSE Unit) is expected to produce 47.5 million barrels, down from 2013 levels.
  - Terra Nova is expected to produce 16.8 million barrels, 3.0 million barrels more than 2013.
  - White Rose (including North Amethyst and West White Rose) is expected to produce 20.8 million barrels, close to 2013 levels, as natural production declines from the main South Avalon Pool are offset by increases at the White Rose Expansion projects.
- Annual average Brent crude prices are expected to decline 2.7% to US$105.64/barrel.
- Official sanctioning of the White Rose Well Head Platform project is expected by the third quarter of 2014. Construction of the graving dock will continue at Argentia and the awarding of the living quarters contract is anticipated.
- Hebron construction will continue at Bull Arm, Marystown and other fabrication sites in the province.
- Exploration activity is expected to intensify:
  - Statoil plans to drill more wells in the Flemish Pass Basin, particularly in the Bay du Nord area.
  - Statoil will conduct a 1,900 square kilometre seismic program in the Flemish Pass Basin.
  - Husky has several exploration and delineation prospects which it plans to drill in the Flemish Pass Basin/Central Ridge.
  - Black Spruce Exploration is planning to drill conventional targets on the province's west coast.