

**Nova Scotia Energy Strategy Update**  
**Submission from Petroleum Research Atlantic Canada**  
**(PRAC)**

**Prepared by:**

P. Carey Ryan, P.Eng.  
Vice President  
Petroleum Research Atlantic Canada  
Phone: (902) 494-6633  
E-mail: [carey.ryan@pr-ac.ca](mailto:carey.ryan@pr-ac.ca)

## **Introduction:**

Petroleum Research Atlantic Canada (PRAC) is pleased to respond to the Province of Nova Scotia's invitation to provide input on the consultation paper: "Nova Scotia's Renewed Energy Strategy and Climate Change Action Plan". Our comments are focused on those aspects of Nova Scotia's Energy Strategy that relate to the exploration, development and production of the province's petroleum resources, and in particular the role that research and development (R&D) can play in helping the province to realize the broad economic and fiscal benefits possible from these resources.

Petroleum Research Atlantic Canada (PRAC) is a not-for-profit organization that funds and facilitates collaborative R&D that benefits the Atlantic Canadian petroleum industry. Our goal is to support the safe and environmentally-sound development of Atlantic Canada's petroleum resources through research and technology development that enhances regional prospectivity and reduces exploration, development or production risks and costs. PRAC is a member-based public-private partnership that brings together industry, government, and academic/research members to pursue R&D projects that address industry and government challenges using local, and where necessary, national and international research and development providers.

The Nova Scotia Department of Energy and its predecessor, the Nova Scotia Petroleum Directorate, have been members of PRAC since its beginnings as the Atlantic Canada Petroleum Institute (ACPI) in 1999. Over the years PRAC has worked closely with the province on a wide range of initiatives related to petroleum R&D and has developed a good understanding of the government's priorities and strategy for attracting more offshore and onshore petroleum activity to the province. Most recently PRAC has assisted the Offshore Energy Technical Research Association (OETR) with their call for research proposals, helped organize the very successful Nova Scotia Offshore Basin Forum, is undertaking a project on the application of controlled source electromagnetic imaging in the Nova Scotia offshore as a means of reducing exploration risk, and is working with the Province to organize an East Coast session at the Offshore Technology Conference in 2008. We believe that the close association we have had with the province and our understanding of the challenges facing the province in exploiting its petroleum resource potential provide us with an excellent vantage point from which to provide comments on specific aspects of Nova Scotia's energy strategy update.

## **PRAC Overview and Energy Strategy Interests:**

PRAC's research activities have been directed towards basic geoscience, health and safety, environmental impacts and issues of an operational nature. In the past we have also been active in petroleum policy research although this is no longer an area of activity for PRAC. Using funds provided largely by PRAC's

industry members, research and development projects have generally resulted from open calls for research proposals. Increasingly PRAC is also developing joint industry projects (JIPs), using project specific funding from member companies and others, to address particular problems of common interest. PRAC also manages research projects on behalf of its government members most notably in the area of petroleum geoscience. To complement this support for R&D projects, PRAC is also active in the dissemination of research results through workshops, forums, newsletters and related activities.

In PRAC's early years research projects largely reflected the interests and capabilities of the research community rather than the needs of those companies exploring for and producing petroleum in the region. More recently PRAC has shifted to facilitating, funding and sometimes managing research projects that reflect the identified needs of our industry and government members. This "market pull" approach helps to ensure that R&D activities are relevant, have a direct connection to the industry and are good prospects for commercial application. While still using calls for research proposals, these are now targeted at specific areas (e.g. geoscience, health and safety, asset integrity, etc.) and particular problems. Through our involvement with the work of Atlantic Energy Roundtable's Research and Development Subcommittee, and through our own activities to understand where our research monies are best invested, we have developed an excellent understanding of how properly directed R&D activities can benefit the development of Nova Scotia's and the Atlantic Region's petroleum industry.

As the province's consultation document points out, the energy environment has changed sufficiently since Nova Scotia's last energy strategy in 2001 to warrant a reassessment and update. Having been involved in a number of the initiatives undertaken under the auspices of the Atlantic Energy Roundtable, PRAC is aware of the leadership role that Nova Scotia has taken in addressing many of the regulatory issues that were identified in the 2001 strategy. There is little doubt that these were an impediment to increased petroleum activity in the region, and the province is to be congratulated for the steps it has taken. However, in spite of the importance of improving the regulatory environment, the recent lack of exploration success accompanied by the relinquishment of many of the exploration licenses that had been issued around the time of the 2001 strategy would suggest that the priority today has shifted from regulatory streamlining to the critical need to attract more exploration activity.

PRAC recognizes the fundamental importance of increasing understanding of the geology offshore Nova Scotia as a key to increasing exploration and ultimately development activity. Almost 40% of PRAC's research monies have been allocated to geoscience research and in 2006 we issued a call for research proposals directed entirely to geoscience. As an organization with strong roots in Nova Scotia we have an interest in all aspects of the province's energy strategy, however our primary expertise relates to petroleum, and in particular research

and development. Therefore we will concentrate our input on the Nova Scotia energy strategy on those particular aspects where we are most knowledgeable and believe we can provide useful input.

### **Petroleum Related Challenges:**

The province's consultation document identifies a number of challenges affecting the further development of Nova Scotia's offshore petroleum industry. As previously noted we believe that the most critical issue for the province is the decline in offshore exploration activity. Without exploration there will be no development or production and the significant economic and financial benefits that result from these activities will be lost. While there are a number of factors that have contributed to the decline in exploration and the relinquishment of exploration licenses the most important are:

- The lack of exploration success over the past seven years clearly indicating the need for a better understanding of offshore geology, resource potential and opportunities for commercial recovery of hydrocarbons in order to reduce risks and generate adequate returns.
- Barriers to new entrants exploring in the Nova Scotia offshore area that include the high cost of operating in a relatively hostile environment, the lack of availability of mobile drilling units suitable for the North Atlantic, and the perceived rewards relative to the risks.
- Global competition from countries with proven reserves and a variety of incentives including tax treatment and royalty relief for drilling, data availability, and licensing flexibility (promote licenses, fallow fields, and infrastructure access).

However the lack of exploration activity is not the only challenge related to the Nova Scotia offshore petroleum industry:

- With expected declines in production from the Sable Offshore Energy Project and first production from the Deep Panuke Project still several years away, the province will experience reductions in royalty revenues in the years ahead placing pressure on other government revenue sources to maintain services.
- The supply of goods and services to offshore petroleum activities within the region provides local companies with both a market and the opportunity to develop the quality and competitiveness of their products and services to enable them to compete in the export market. Even with renewed exploration the lead time from exploration to eventual production is long, to date 10 years or more on the Scotian Shelf. In the absence of new development opportunities, the local supply community will be forced to rely solely on the export market. Some companies are positioned to do this; others without a proven track record will likely fail.
- Previous exploration activity has resulted in the discovery of a number of undeveloped fields largely held as significant discovery licenses by major

- Although increasing energy prices act as an incentive for increased exploration globally, there has been a significant impact on the costs of exploration, particularly for mobile offshore drilling units. Adding to the difficulty is the global demand for rigs and the limited supply of harsh environment drilling units, making it difficult to secure equipment to drill within the region. When equipment can be secured lead times are long and the limited exploration drilling opportunities means that single wells must carry the cost of mobilization and demobilization, further adding to the costs.
- The availability of human resources in general and highly qualified people in particular, is a growing challenge due to demographics, out-migration, the difficulty attracting immigrants and lack of continuous petroleum related opportunities in the province.

Initiatives to address these challenges are already being undertaken by the province and others with the objectives of developing a better understanding the geology of the Nova Scotia offshore, reducing exploration risks and enhancing the attractiveness of the Nova Scotia offshore relative to other jurisdictions. Central to most of these is technical and qualitative research, policy analysis and development, and targeted promotional activities. One of the most important initiatives is the current gap analysis being conducted for the province to identify where research and other activities should be directed in order to fill those existing informational gaps that will have an impact on companies' decisions on whether or not to explore offshore Nova Scotia.

PRAC commends the province for the proactive and strategic approach that it is taking to rekindle exploration and sustain activity. As a research and development organization we recognize the impact of new technology on reducing exploration risks, increasing geoscience knowledge, and reducing exploration, development and operating costs. In addition to the considerable geoscience capabilities in the region, the local R&D community has niche capabilities in other areas that can contribute to the development of new technologies that not only apply offshore Atlantic Canada, but have broader application for the offshore industry. Given the cyclical nature of activity in the region, developing exportable technologies and skills is essential to the region's supply and service sector. However the ability of local firms and institutions to foster the commercialization of technological innovations is a concern that needs to be addressed.

## **Specific Comments and Suggestions:**

The province is already moving along a path and undertaking work that will help to address many of the challenges affecting current and future offshore petroleum activity. PRAC believes that these are appropriate initiatives with the Nova Scotia government providing both leadership and funding support. Our specific comments and suggestions provided below are intended to complement and hopefully strengthen the direction in which the province is already heading. As previously stated we firmly believe that exploration attraction should be central to the petroleum aspects of the province's renewed energy strategy and therefore we have directed the majority of our comments towards this theme. We also provide some general comments on other areas that should also be basic thrusts of the strategy.

### Exploration Attraction

- The province should focus its geoscience research spending on those areas that are identified by the gap analysis study. This will help to ensure that the research activities will provide information that is of interest to and help influence industry decisions on whether or not to explore offshore Nova Scotia. It will also result in the greatest impact from the available funds.
- The geoscience research needs to be directed (i.e. driven by the identified needs), results oriented and coordinated to ensure that the individual projects within the overall geoscience research program are properly linked to one another; are carried out in the proper sequence; use the best talent available for the specific projects; have clear decision points (stage gates) to determine if proceeding to the next phase or project is warranted; and are integrated to develop as complete a picture as possible.
- A considerable amount of the geoscience research capacity and capabilities required to carry out the necessary research resides in the province's universities. The role of universities has traditionally been fundamental research and the development of highly qualified people. While it is perhaps not realistic to expect that all university based researchers will embrace more needs driven and results oriented research, processes need to be put in place to provide the right incentives to mobilize the research talents that exist to undertake projects that contribute to the attainment of the province's objectives.

Sustained and sufficient funding is critical in order to ensure that the research and follow-up activities identified through the gap analysis are properly resourced and will lead to the intended outcomes. Without the commitment of multi-year funding it will be difficult to conduct the range of research activities necessary to improve understanding of the province's offshore geology and to attract the ongoing interest of geoscience researchers, particularly those that

already have sizeable research grants from national funding councils.

The province has a unique chance to make such a commitment as a result of expected revenues from forfeitures arising from relinquished exploration licenses. These monies provide an opportunity to invest in the needed research and supporting activities using what amounts to industry exploration dollars with no impact on the provincial budget. PRAC encourages the province to dedicate a significant portion of the revenues from forfeitures to geoscience research and other activities intended to attract renewed offshore exploration. We also feel that the outcomes are more important than who does the work. Therefore where local university researchers are unable or unwilling to respond to specific project requirements and timeframes the province should utilize private sector consultants or researchers from elsewhere if they have the expertise and can respond to the province's needs.

- A number of universities, the GSC Atlantic, the CNSOPB, the Department of Energy, the OETR Association and PRAC are involved in some way in geoscience initiatives, many of which can contribute to the Department's objectives. We strongly believe that an overall coordinating structure is essential to get the greatest benefit from the available resources and work being done, avoid duplication, help develop and undertake broader collaborative projects, provide a forum for reviewing activities, and identifying changes to the overall research program based on results achieved to date. PRAC has gained considerable experience and credibility in coordinating large projects and programs with multiple stakeholders and would be pleased to work with the province and others to develop the appropriate structure and processes to enhance the coordination of key geoscience activities.
- The availability of data is essential to any geoscience research. All reasonable steps should be taken to make non-proprietary data available in a format most useful to both researchers and potential explorers. The creation of the data management centre by the CNSOPB with the support of the province and federal government is certainly a very positive step to improve the availability of all data that is no longer confidential. However much of the more recent seismic data remains unavailable to the research community unless the data owners agree to release it, and then usually under strict non-disclosure agreements. The other avenue is through the Accord Acts which give the Minister the right to request all data submitted to the Board. Even in those circumstances the release of the data to others is restricted by non-disclosure agreements. The province should continue working with data owners to develop mechanisms to enable the release of seismic and other data for research purposes while protecting the commercial interests of those that have acquired and own the data.

- The forfeiture monies expected to be returned to the province may provide a means of supplementing available data by enabling the province to fill important gaps to further develop the understanding of the province's offshore geology. With the continued advancement of controlled source electromagnetic imaging technology to reach greater reservoir depths and more effectively deal with shallow water, scans of relatively large, more prospective areas offshore Nova Scotia become possible. This allows for the identification of resistive anomalies that with relatively high probability point to the existence of hydrocarbons. When used in conjunction with seismic surveys these provide a powerful set of tools for improving knowledge, reducing exploration risks and identifying areas that should be subject to calls for bids for exploration licenses. We would encourage the province to work with EM and seismic companies to find innovative ways to fund the acquisition of necessary data including the use of a portion of forfeiture monies.

### General

The Nova Scotia offshore area is perceived by industry as a relatively high cost area in which to operate. Factors contributing to this are the harsh environment, lack of local support infrastructure, and regulatory regime. New information and technologies arising from R&D activities can help to reduce costs associated with exploration, development and production activities. Some of the R&D is driven by local needs; more generally it comes about as a result of the global evolution of the industry to explore and produce in deeper water or more remote areas, and to better manage the recovery of petroleum from existing reserves. A number of local companies, sometimes with university involvement, have developed new technologies that have broad application throughout the industry. In other cases technologies developed elsewhere may be adopted and adapted for local conditions.

In PRAC's view the operators and supply and service sector should lead and fund those R&D activities that are intended to reduce the costs of supplies, services and operations associated with exploration, development and production. Funding for this R&D will either be through pooled monies for non-proprietary research or individually where it will give the company some competitive advantage. Government's role should be supportive by assisting local companies with such things as applied research; product development, testing and pre-commercialization costs; market development; and accessing capital. There are already a range of available federal and provincial programs with these objectives. However we feel that the effectiveness of these government programs could be enhanced by involving external organizations at the review stage with knowledge of the industry and market potential for the product or technology. In addition the likelihood of a local company being successful would be improved if there is better linkage between assistance

programs to ensure that a lack of support at a critical stage does not negate the value of governments' investments upto that point.

Governments have a direct role in reducing costs when those costs are impacted by government regulations, policies, procedures or processes. Since the previous energy strategy the provinces and federal government have been successful in addressing many of the issues affecting regulatory approval times, inter-agency co-ordination, import duties on drilling rigs, environmental assessment requirements for exploration drilling, etc. PRAC would encourage the province to continue its efforts to reduce regulatory burden, harmonize regulatory requirements across jurisdictions, streamline or amend regulations that affect operating costs, and in general adopt best practices based on lessons learned from other more mature petroleum producing areas. At the same time we stress that any changes that are made should strive to improve offshore safety and reduce the environmental impacts of petroleum operations.

The cyclical nature of activity offshore Nova Scotia means that local suppliers need the export market in order to sustain themselves. Therefore there is a need to understand the goods and services that can be provided by the local supply sector, their export capabilities and experience, potential international markets and factors affecting market access, and what governments can and should do to improve the ability of local companies to be able to supply to and compete in export markets. We are aware of the Department of Energy's recent request for proposals to analyze these questions and see this as an important step in helping to develop a strategy to improve export opportunities for Nova Scotia's supply and service sector.

We also believe that as part of any export strategy is the need to improve the ability to develop innovative goods and services in niche areas that address issues or problems faced by the petroleum industry globally. To accomplish this requires a good knowledge of the opportunities, the ability to pick potential winners, needs-driven applied research, programs to support development and pre-commercialization, and assistance with business planning and accessing markets. Also needed by at least some of the companies in the supply and service sector is a better understanding of the product development cycle and related business aspects including supply chain management, product management, technology life cycles and value to prospective customers. Among the challenges are the low levels of spending by businesses in the region on R&D, the ability to identify market opportunities, the difficulty in effectively moving research to commercialization, the limited funding available for pre-commercialization activities, and the receptor capacity of the province's SMEs. All of these need to be considered in strategy development.

## **Conclusion:**

PRAC appreciates the opportunity to provide its views to assist the province in updating its energy strategy, particularly with respect to the contribution that research can make to the development of the province's offshore and onshore petroleum industry. Our close working relationship with the Department of Energy since PRAC/ACPI was formed in 1999 has given us a good understanding of many of the issues the province is faced with in encouraging increased petroleum activity in today's environment of global competition, high costs and limited recent exploration success offshore Nova Scotia. Our comments are supportive of the proactive approach that the province is taking to attract more exploration and are meant to complement and hopefully strengthen what has already been initiated.

Clearly the greatest petroleum-related challenge facing the province is the decline in exploration activity, without which there can be no development or production. The geoscience gap analysis study currently underway will provide the province with a clear roadmap for those initiatives that will help fill important voids in geoscience knowledge that will have the greatest impact on industry exploration decisions. This will require a coordinated multi-year geoscience research program that will integrate the results of specific research projects to develop a better understanding of Nova Scotia's offshore geology. The expected forfeiture monies from relinquished exploration licenses provides a unique opportunity to fund geoscience data collection and research, using what amounts to industry dollars, with the goal of attracting renewed exploration. With the number of university researchers, government and regulatory agencies, private researchers, data owners and organizations with some role to play in this geoscience research effort, effective coordination will be essential. PRAC would be pleased to work with the province and others to develop the appropriate structure and processes to enhance the coordination of key geoscience activities.

Although we have focused most of our comments on exploration attraction we also recognize that the province's supply and service sector is at risk from the lack of sustained exploration, development and production activity and needs the export market to survive. Within the petroleum industry much of the innovation takes place in the supply and service sector, including local companies that have developed niche products and capabilities. Some of these have successfully entered the export market while others either need assistance to achieve success or are simply not going to make it. The energy strategy should consider how to increase R&D spending within the supply and service sector to enable more innovation to occur and how to provide programs to support applied research, product development and testing, pre-commercialization activities, business planning and market access.

PRAC believes that with the changes that have occurred in the global energy environment since 2001, it is timely to be updating the provincial energy strategy.

The exploration for and development of the province's petroleum resources are an important part of the overall strategy. PRAC sincerely hopes that its input will help the province to develop a strategy that will enable it to take full advantage of its offshore and onshore hydrocarbon potential in a manner that is safe and environmentally sound.