

The Way Forward

— on oil and gas



ADVANCE 2030

A Plan for Growth in the
Newfoundland and Labrador Oil and Gas Industry

Oil and Gas Industry Development Council



(left to right) Malcolm Maclean, Bill Fanning, Kimberley Keating, Robert Crosbie, Andrew Bell (Noia representative), Stephanie Hickman, Gisle Stjern (CAPP representative), Gus Doyle, Sean Power

(seated) Honourable Siobhan Coady, Minister of Natural Resources, Chair

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MESSAGE FROM THE MINISTER



The oil and gas industry has played a pivotal role in the growth and development of Newfoundland and Labrador's economy over the past two decades. The industry's impact on local employment, business opportunities and government revenue has made a significant contribution to our standard of living, including the public infrastructure, programs and services we deliver to the people of Newfoundland and Labrador.

Discovered in 1979, it has been 20 years since first oil was produced from the Hibernia project and the projected field life has been extended beyond 2040. The Hebron oil field, discovered in 1980, achieved first oil in 2017 and is expected to produce more than 700 million barrels of oil. In May 2017, Husky Energy and its partners announced they were proceeding with the West White Rose Extension Project with first oil expected in 2022 and an extension of the Terra Nova field is anticipated. These projects offer significant employment and supply and service opportunities. There are also emerging opportunities as new offshore basins are opened up for exploration and development and new entrants are being attracted to our offshore.

Our government is committed to resource development as a key economic driver and to positioning the industry for continued growth. Newfoundland and Labrador's offshore is at a critical stage in its development. A collaborative approach is essential to addressing current challenges and maximizing future opportunities.

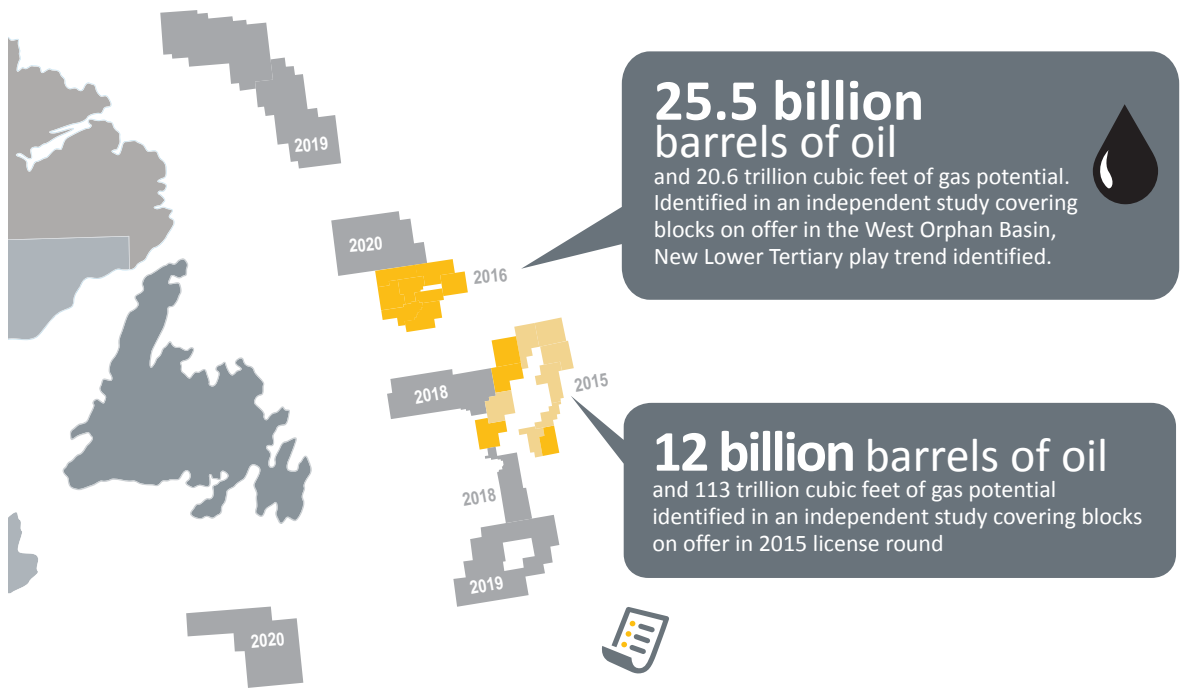
In **The Way Forward**, the government committed to establishing the Oil and Gas Industry Development Council to bring together key stakeholders to work collaboratively towards positioning Newfoundland and Labrador globally as a preferred location for oil and gas development. The council has made a significant commitment to this effort over the past 12 months. The knowledge, foresight, optimism and sense of urgency of council members are reflected in this document.

I look forward to working with you to realize our potential for jobs and growth in the oil and gas industry. The long-term success of our industry requires an immediate focus on accelerating exploration drilling. We need to foster a culture of collaboration and entrepreneurship to increase our global competitiveness, maximize economic recovery, drive innovation and supplier capabilities, and reduce the time from prospectivity to production.

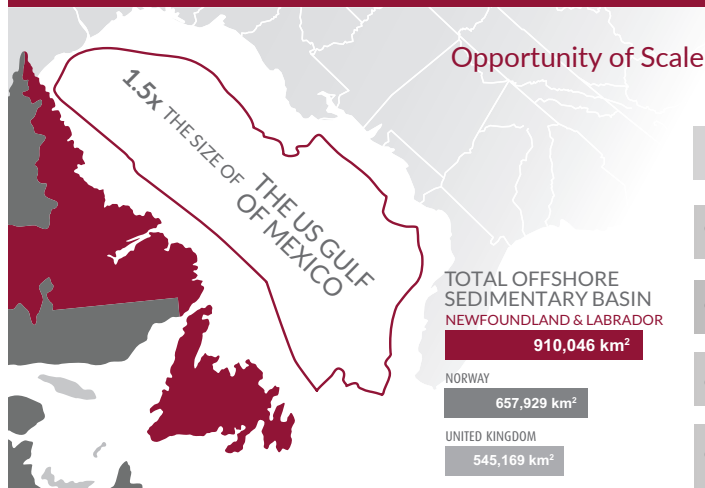
A handwritten signature in black ink, appearing to read 'Siobhan Coady'. The signature is fluid and cursive, written over a white background.

Honourable Siobhan Coady
Minister of Natural Resources

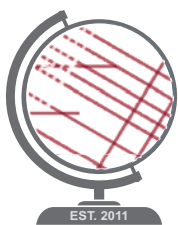
UNLOCKING THE POTENTIAL



OIL AND GAS RESERVES & RESOURCES



- Over **650** leads and prospects
- Less than **7 per cent** licensed
- More than **20** basins mapped
- **7** new entrants in the past **2** years
- **\$2.6** billion in recent exploration work commitments



OUR ONGOING SEISMIC PROGRAM IS ONE OF THE **LARGEST** IN THE WORLD

OVER **170,000** LINE KM
OF NEW 2-D MULTI-CLIENT DATA
ACQUIRED AS OF THE END OF 2017

OUR INDUSTRIAL ASSETS



Recognized operating expertise in harsh environments



Skilled and readily available workforce



Robust supply and service capabilities



World-class education, training and research facilities

ECONOMIC IMPACT OF THE INDUSTRY



Producing 25% of Canada's conventional light crude

1.7 Billion

Barrels of oil produced since 1997

- 25 per cent of provincial GDP and 41 per cent of exports over the past 20 years
- Over \$506 million spent on R&D and education and training since April 1, 2004
- Over \$56.1 billion in industry expenditures since 1966
- 5,251 people directly employed in construction and operations on four offshore projects as of December 2017 (85 per cent were residents of Newfoundland and Labrador)
- \$19.8 billion in cumulative royalties to the Provincial Government as of March 31, 2017



THE GLOBAL OUTLOOK

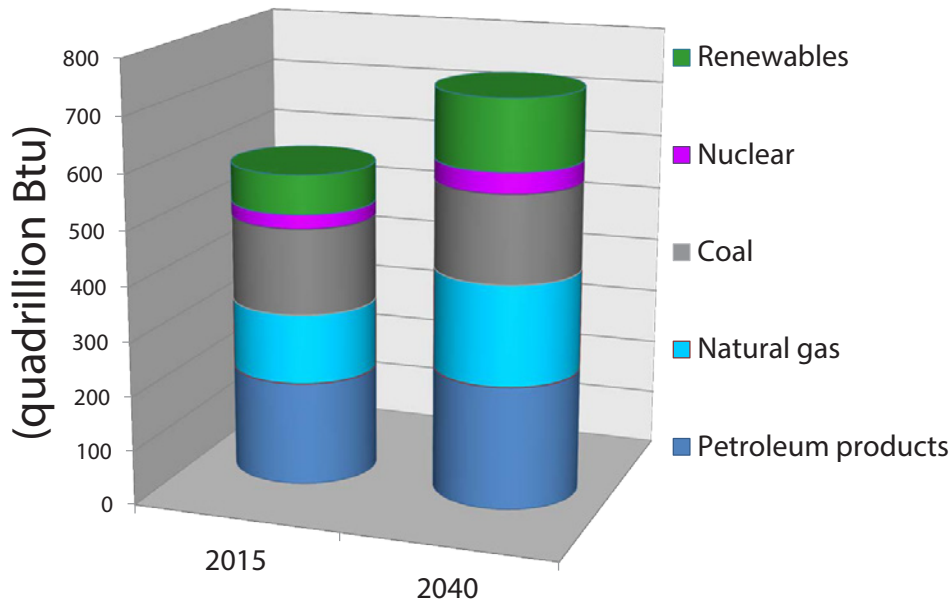
While the demand for oil is forecast to increase through to 2040, the global outlook for energy is changing. The U.S. Energy Information Administration forecasts fossil fuels will still represent 77 per cent of global energy use, but a greening of fossil fuels is anticipated as a result of lower CO₂ emissions and a transition to increased use of natural gas. Renewables are the fastest-growing energy source, with consumption increasing by an average 2.3 per cent per year.

The oil and gas industry, its workforce, and resource-rich economies like Newfoundland and Labrador must plan for what lies ahead. It will require a new lens – one that factors in the sudden emergence of disruptive technologies, climate change, the transition to a lower carbon economy, and a lower-for-longer oil price outlook. Improved fuel efficiency and the electrification of transportation are expected to continue to erode demand growth, while the supply side of the equation is being impacted by increased U.S. shale production and lower capital expenditures.

Moving forward, there are opportunities for growth in offshore oil and gas production. Recent cost reductions, improved project design, standardization and the simplification of project scope have contributed to lower breakeven prices for

Global Energy Consumption

(U.S. EIA International Outlook - September 2017)



offshore projects. Exploration and production (E&P) companies are also rethinking their upstream portfolios with an eye toward optimizing for growth after a period of divesting higher-risk and higher-cost assets. Onshore shale is expected to remain a dominant play, but offshore exploration and development will become increasingly important in many companies' portfolios.

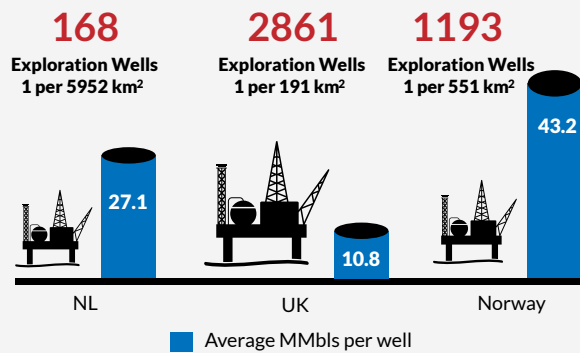
Wood Mackenzie's global upstream outlook for 2018 predicts that oil and gas exploration spending will drop by 7 per cent. There is increasing competition for global E&P investment. Current investments are favouring onshore production, offshore projects tied back to existing infrastructure and larger discoveries that can be phased in for early cash flow and minimize large-scale project execution risks.

To remain competitive, jurisdictions such as the U.K. and Norway have made significant gains in lowering costs by rethinking the way they do business. As production and prospectivity declined in the U.K., there were tax cuts to increase oil and gas industry competitiveness and increased exporting with a large and capable supply chain. The U.K. also continues to expand its capabilities in renewables, including wind, wave and tidal through investments in innovation and manufacturing capabilities. Norway has collaborated with its supply chain to lower costs, while investing in new capabilities ranging from digital to automated drilling in order to build new competences.

DEFINING THE OPPORTUNITY

Newfoundland and Labrador's oil and gas resource potential represents a significant opportunity for jobs and growth in the industry. Relative to other offshore jurisdictions, such as the U.K. and Norway, Newfoundland and Labrador remains relatively unexplored. Less than 7 per cent of our 1.5 million km² of offshore area have been licensed. And despite the fact that far fewer wells have been drilled, similar success has been achieved. Increased exploration drilling is considered a prerequisite to increased development and production offshore Newfoundland and Labrador.

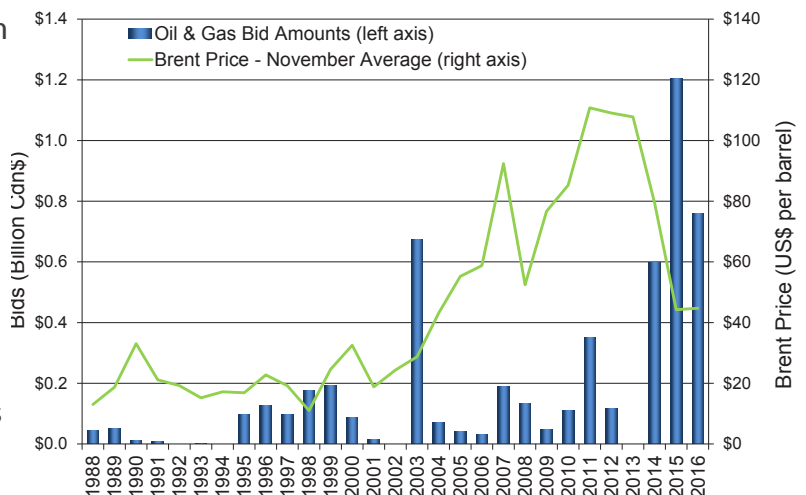
To sustain oil and gas industry growth and development through 2030, increased exploration drilling is an immediate priority.



Newfoundland and Labrador's offshore has 3.9 billion barrels of discovered oil reserves/resources, of which 1.7 billion barrels has already been produced. As well, the province has 12.6 trillion cubic feet of natural gas discovered in the offshore which remains to be developed. The undiscovered resource potential for the province's offshore is even larger. Recent studies in 2015 and 2016 by BeicipFranlab, on behalf of Nalcor Energy, estimate undiscovered resources of 37.5 billion barrels of oil and 133.6 trillion cubic feet of natural gas in call for bids parcels in the West Orphan and Flemish Pass regions. This represents only two of the over 20 offshore basins that have been mapped.

There have been several oil discoveries in the deepwater Flemish Pass offshore area since 2009 and data acquisition and resource assessments in advance of scheduled licencing rounds have resulted in record levels of investment despite the downturn in oil prices. This is illustrated by the fact that recent licencing rounds resulted in \$2.6 billion in exploration work commitments and seven new entrants in the Newfoundland and Labrador offshore.

Oil & Gas Sector Annual Exploration Bid Amounts



THE CHALLENGE AHEAD



Newfoundland and Labrador is at a critical point in the long-term development of its oil and gas industry. The industry has grown significantly as a result of investments in infrastructure, technology and expertise. The challenges of operating in a harsh offshore environment have been met with determined and innovative solutions and there is tremendous exploration and resource development potential over the next decade.

Continued success requires a competitive investment environment that supports the mobilization of long-term capital. Unlike in the past, when the exploration and production industry were willing to take greater risks to gain access to resources, minimizing above-ground risks is crucial to encourage investment in a low commodity price environment.

The industry has identified a number of potential risks to continued investment in exploration and development, including regulatory uncertainty, the Pan-Canadian Framework on Clean Growth and Climate Change, and the United Nations Convention on the Law of the Sea (UNCLOS) levy on production outside 200 nautical miles. Stakeholders are concerned that the impact of longer timelines and higher costs could negatively impact Newfoundland and Labrador's oil and gas industry competitiveness relative to other jurisdictions.

To ensure our full potential is realized, more needs to be done to leverage increased investment in exploration and development. To position itself as a preferred location for oil and gas development, Newfoundland and Labrador must ensure the competitiveness of the oil and gas industry.


The long-term success of our industry requires an immediate focus on accelerating exploration drilling. We need to foster a culture of collaboration and entrepreneurship to increase our global competitiveness, drive innovation and supplier development capabilities, and reduce the time from prospectivity to production. Working collaboratively, Newfoundland and Labrador will reach its full oil and gas potential.

THE VISION

THE WORK OF THE COUNCIL

In January 2017, the council began discussing the opportunities and actions required to grow Newfoundland and Labrador's offshore oil and gas industry. Presentations from industry stakeholders helped inform discussions which led to the identification of five strategic focus areas; Regulatory Environment, Labour, Competitiveness, Innovation, and Strategic Business Development. Working groups were formed for each area to identify key priorities and timelines and five stakeholder engagement sessions were held from January 8 to 10, 2018 to get additional input on the action plan.

Advance 2030 has been developed through a collaborative process and has engaged a wide range of perspectives from government, labour, oil and gas operators, supply and service companies, industry associations, municipalities, academia, and other stakeholders. It reflects the input received to date and our commitment to work together to achieve sustainable growth in the industry.



VISION STATEMENT

Newfoundland and Labrador is an internationally preferred location for oil and gas exploration and development driven by an innovative, sustainable, local industry that is globally competitive, environmentally responsible, and maximizes benefits to the people of the province.

By **2030** we envision:

- Over **100** new exploration wells drilled
- Multiple basins producing over **650,000** barrels of oil equivalent per day (boe/d) from new and existing projects including near-field tiebacks
- Shortened time from prospectivity to production
- Sustainable operations phase direct employment of more than **7,500** people
- A robust, innovative global supply and service sector
- Commercial gas production
- Renewables and oil and gas integrated in a world-class energy cluster

To advance this vision, the following are required:

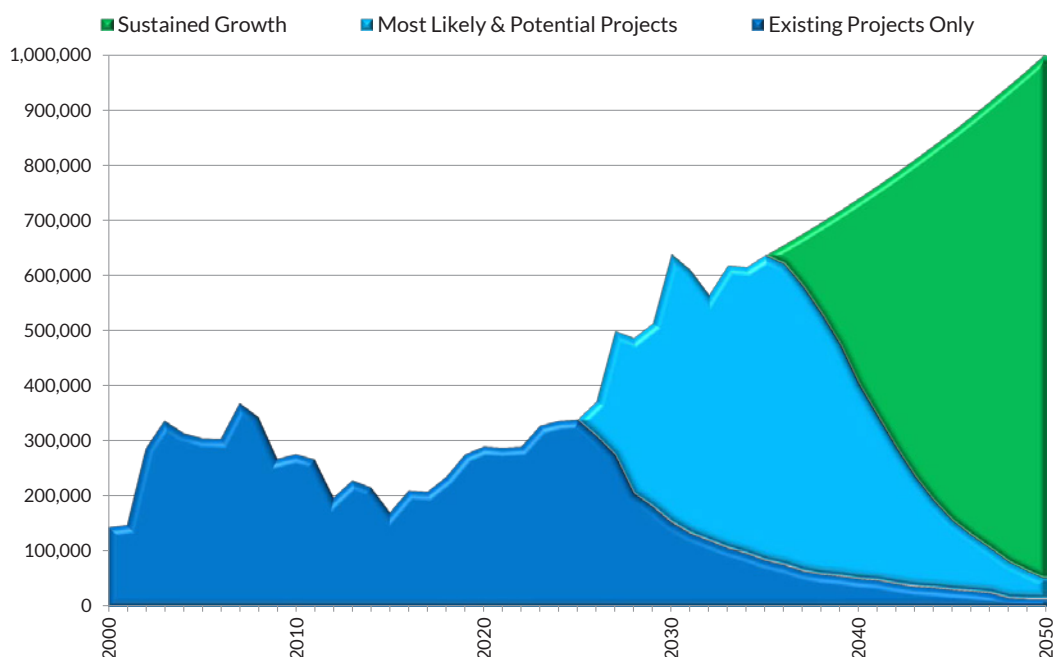
- A competitive, global position built on a modern and efficient governance structure, including an efficient regulatory process, attractive fiscal policy, optimal infrastructure planning, and a collaborative approach where stakeholders work together to maximize value;
- Increased supply and service sector capabilities that align with, and capitalize on, our energy future;
- A highly competent, technical, agile and professional workforce that leverages our resource developments and forms a foundation for broader economic prosperity;
- An industry that recognizes the value of gender equity and diversity, and the innovation and strength that comes with inclusivity and increasing the participation of under-represented groups; and
- An innovation ecosystem that supports technology development, industry growth, diversification and exports.

We will leave no stone unturned, no action not taken, no effort undone, to achieve the success of this industry. The time is now to advance this opportunity.

The future outlook for offshore production is shown below. While there is significant potential for growth to 2030 and subsequent decades, our potential can only be achieved through collaboration and a strong stakeholder commitment to achieving that vision.

Potential NL Oil and Gas Production

(Barrels of oil equivalent per day)



▶ PRINCIPLES

Our success will also be influenced by the following principles which will guide decision making processes as we move forward:

We will pursue responsible development.

- Stewards of our environment, consultative with Indigenous groups, maintaining a strong health and safety culture, and dedicated to innovation to reduce project footprints and achieve the lowest carbon barrel

We will collaborate.

- Governments, business, labour, and other stakeholders work together to achieve results, reduce regulatory burden, and enhance supply and service capabilities

We will innovate to stay ahead of the curve.

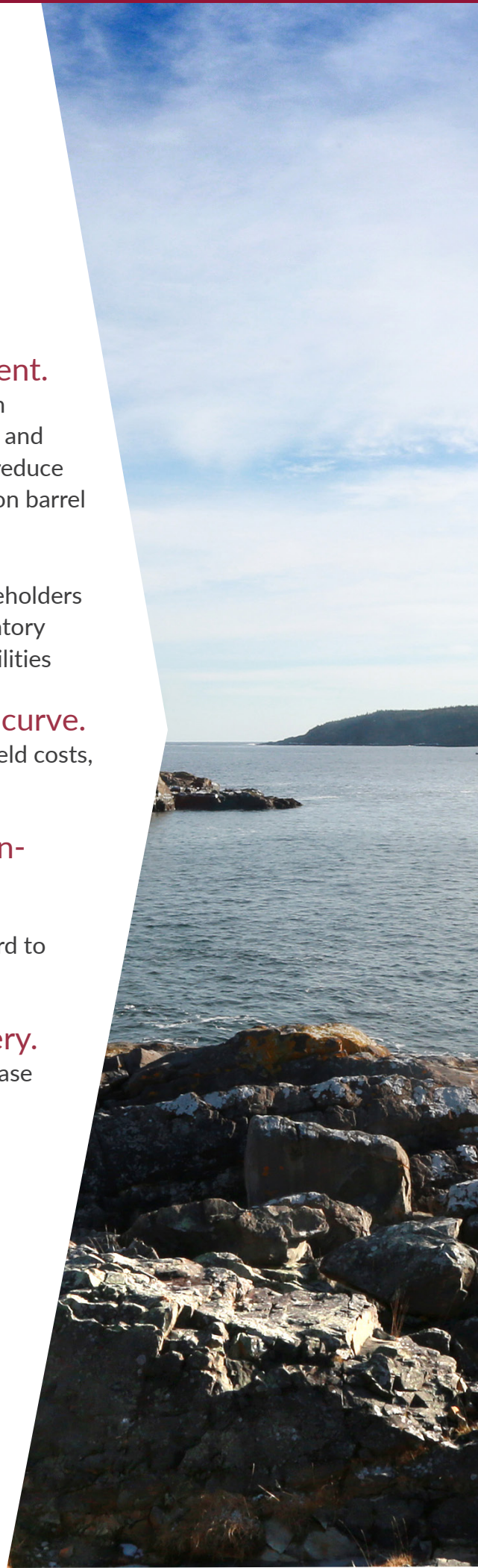
- Develop the skills of the future, lower life-of-field costs, and invest in innovation

We will be timely, proactive and action-oriented in our approach.

- A focus on immediate actions and continuous improvement will identify how we move forward to increase exploration and development

We will maximize economic oil recovery.

- Adoption of technology and processes to increase reserves and recovery factors, and extend field production





► FOCUS AREAS

A concerted effort is necessary to improve industry performance and accelerate the pace of oil and gas development for the benefit of all stakeholders. The council has identified a number of focus areas for collaboration and proposed timelines for action.

Immediate (within 24 months)

- Drive Exploration
- Modernize the Governance Structure
- Ensure Global Competitiveness
- Enhance Local Supply Chain
- Accelerate Development
- Support Innovation
- Increase Industry Promotion
- Workforce of Tomorrow

Mid-Term (2022)

- Develop Basin-Specific Plans
- Expand Integrated Operations
- Develop a Natural Gas Development Plan
- Supply and Service Diversification

Long-Term (2030)

- Commercial Natural Gas Production
- Sustained Energy Production
- Exploitation of Value Added Opportunities
- Supply and Service Industry Growth
- World-Class Energy Cluster

ACTION PLAN

The continued growth and development of Newfoundland and Labrador's oil and gas industry requires immediate and decisive action through 2030. Collaboration and the collective actions of governments, industry, labour, education, training and research institutions, and other stakeholders will be required to action the vision of growth for Newfoundland and Labrador's oil and gas industry. The identified priorities for action include:

► **Immediate Priorities (within 24 months)**

Drive Exploration – to grow the oil and gas industry in Newfoundland and Labrador, increased exploration drilling is an immediate priority

- Evaluate options to incentivize exploration through fiscal, land tenure options and other global practices
- Modernize and streamline the offshore regulatory regime through the Frontier and Offshore Regulatory Renewal Initiative (FORRI) to ensure effective, efficient regulation that accepts international standards
- Undertake new multi-year, multi-client seismic acquisition and resource assessment in conjunction with the offshore land tenure system
- Implement digital data repository for offshore non-privileged data and reports
- Conduct research on international best practices for fallow field management

Modernize the Governance Structure – a new approach is required that extends beyond the current focus on offshore regulatory requirements

- Review and modernize the governance structure
- Review regulatory models in other jurisdictions to identify new structures for improved outcomes
- Create a best-in-class regulatory framework that supports goal-based regulations
- Modernize regulatory guidelines to support timely project development

Ensure Global Competitiveness – the cost and timeline from exploration to production is a major consideration for companies when making global investment decisions

- Initiate and complete regional environmental assessments in advance of offshore activity
- Complete a comprehensive review and analysis of Newfoundland and Labrador’s global competitiveness position (regulatory environment, prospectivity, fiscal regime, international standards, supply and service capability, project life-cycle costs, etc.)
- Continue to support initiatives identified through the Atlantic Offshore Competitiveness Roundtable
- Examine productivity, including labour models and project management best practices

Enhance Local Supply Chain – collaboration is needed to be cost competitive, enhance local supply chain capabilities, and pursue diversification opportunities such as renewables and export markets

- Assess current local supply chain capabilities and gaps
- Develop new initiatives to enhance supply chain awareness, education, and training, including global best practices, industry standards, key success factors for competitiveness, and export readiness
- Explore and advance business growth options including joint venture opportunities, business diversification, export markets, and start-ups
- Establish a networking and information sharing forum to facilitate operator-supplier collaboration to increase access to global supply chains

Accelerate Development – collaboration and innovation play an important role in accelerating the pace of offshore oil and gas development

- Accelerate the approval process in advance of project development (e.g. Impact Assessment Agency of Canada approval process, benefits requirements, detailed engineering to fabrication, development plan approval process)
- Develop a Supply Chain Action Plan that demonstrates how procurement strategies and processes can deliver best value specific to life-of-field development plans
- Identify and advance regulatory changes required to accelerate development, including FORRI initiatives, environmental assessment legislation, and land tenure
- Maximize economic recovery and reserve replacement as measures for growth
- Identify opportunities to advance near-field tie-back developments
- Investigate an industry-led best practice on third party access to infrastructure
- Initiate a framework for natural gas exploration and development

Support Innovation – investments in innovation are critical to the long-term growth and development of Newfoundland and Labrador’s oil and gas industry

- Develop a blueprint for innovation in the local oil and gas sector, including digital, remote operations in harsh environments, subsea technology, automation, cost reduction, etc.
- Develop a digitalization strategy that identifies necessary skill sets, research and development opportunities, education and training needs, and employment opportunities (e.g., data analytics, machine learning, robotics, artificial intelligence, virtual reality, and other technologies)
- Advance subsea technology solutions (e.g. modular subsea systems, lean tiebacks, subsea factory, and towed solutions) and build subsea engineering expertise, technology capabilities, and support infrastructure that can leverage export opportunities, with a particular focus on harsh environment and deepwater solutions

- Implement collaborative approaches to find innovative solutions to industry challenges (e.g. hackathons and challenge competitions)
- Investigate the concept of an innovation hub/technology park to grow research and development and innovation capabilities
- Support development of an oceans cluster

Increase Industry Promotion – our resource potential, expertise, supply and service capabilities, world-class education and training, research and development, and innovation environment are competitive advantages

- Strengthen the value proposition for exploration and development offshore Newfoundland and Labrador (branding) through increased marketing and promotion
- Develop a comprehensive digital portal to coordinate and provide a full range of oil and gas information and data (prospectivity, supply and service capability, and fiscal regime etc.) in one location
- Prioritize the oil and gas industry within national and regional initiatives designed to promote trade
- Promote the value and importance of the industry to residents of the province, including as a viable employment option for young people

Workforce of Tomorrow - the jobs of the future will require employers, labour, education and training institutions, and government to work collaboratively to develop new skills and competencies

- Identify, and communicate current and future oil and gas workforce education and training requirements to support an evolving industry
- Work with post-secondary institutions to align training and development programs that target priority areas
- Develop a jobs strategy focusing on labour market needs, a knowledge based economy, skills development, recruitment and retention, and workforce stability and transferability across sectors

► **Mid-Term Priorities (2022)**

Develop Basin-Specific Plans – a regional focus may be needed to support exploration attraction, far offshore supply logistics, improved operational efficiencies, and maximize economic recovery

- Integrate geoscience data to understand resource potential to establish regional basin development plans
- Investigate open access infrastructure practices
- Review decision criterion for award of offshore exploration parcels to provide best value to the province
- Investigate regional models for supply and service sourcing (e.g. logistics, vessel sharing, and infrastructure)

Expand Integrated Operations – new technology and operating practices create opportunities for integrated ice management, environmental response, offshore supply logistics, emergency response, shared support infrastructure, and onshore technical support services

- Implement initiatives to build capacity for integrated operations in the province, including collaboration with operators to develop technical expertise, new applications, support infrastructure and access data
- Collaborate with industry and post-secondary institutions to advance integrated operations education and training programs
- Support opportunities for business start-ups and diversification toward integrated operations

Develop a Natural Gas Development Plan – with the discovery of additional resources, market opportunities for natural gas are anticipated

- Advance initiatives to ensure provincial readiness for gas commercialization, including regulation, development models, local supply opportunities, and labour requirements
- Focus activity on attracting global investment for commercial gas production
- Examine domestic utilization strategies for natural gas as a low-carbon fuel

Supply and Service Sector Diversification – local supply and service companies need to pursue diversification opportunities through investments in export capabilities, supply chain collaboration and joint ventures

- In support of export readiness, identify and pursue technology and market specific opportunities that align with supply and service capabilities
- Develop a procurement registry consistent with supply chain action plans and communicate supply and service opportunities
- Launch energy sector supply and service accelerator initiatives, including mentoring, incubation, and seed financing

► **Long-Term Priorities (2030)**

Commercial Natural Gas Production – the production of commercial natural gas creates both local and global market opportunities

- Promote investment in new infrastructure, technology and leverage expertise in order to pursue market opportunities for commercial gas production
- Focus on expanding natural gas resource exploration and development opportunities

Sustained Energy Production – the long term sustainability of both oil and gas and renewable energy production is critical to employment and economic growth

- Continuous improvement of regulatory and industry practices to sustain production
- Continue to benchmark provincial competitiveness vis-à-vis other jurisdictions
- Increase focus on low carbon technologies and operational processes to achieve leading emissions intensity

Exploitation of Value Added Opportunities – to increase opportunities for job creation and economic growth, opportunities in secondary processing and industrial use will also need to be explored

- Pursue job creation opportunities through secondary processing, alternative carbon use and industrial use of our energy resources
- Explore opportunities associated with petrochemicals as natural gas production increases

Supply and Service Industry Growth – continuous improvement, collaboration, investment in expertise, and technology are critical to new business opportunities

- Focus on continuous improvement and operator-supplier collaboration to sustain industry growth
- Transfer expertise and technology capabilities to develop export market opportunities

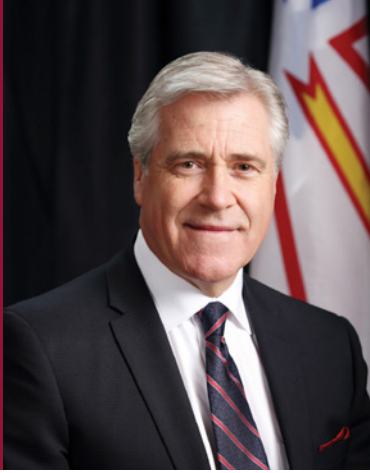
World Class Energy Cluster – a recognized energy cluster offers opportunities to diversity our energy mix and expand existing fabrication, port infrastructure, and supply and service industry capabilities

- Develop an energy cluster for offshore installation expertise through the integration of Newfoundland and Labrador's oil and gas and renewable resource development opportunities
- Commercialize new energy sector development opportunities including gas-to-wire, wind, hydrogen, and others

MEASURING SUCCESS

- ▶ **Increased** exploration results in new discoveries and higher production.
- ▶ **New** supplier capabilities, natural gas and value-added opportunities contribute to supply and service growth, industry diversification and export opportunities.
- ▶ **Improved** global competitiveness is achieved through collaboration, regulatory and fiscal certainty, innovation, new skills and lower costs.
- ▶ **Stakeholders** are supporting growth opportunities, while committed to gender equity and diversity, health, safety and environmental best practices.





“Our vision for the future of Newfoundland and Labrador is a place where potential is realized and opportunities abound. Through unprecedented partnerships with high potential industries, we are fostering the economic growth, innovation, and job creation needed to support bright futures for the people of our province.”

Premier Ball