OERA

Leading Collaborative
Energy Research

ENABLING A SUSTAINABLE ENERGY FUTURE

OERA ANNUAL REPORT - 2020-21

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At OERA (the Offshore Energy Research Association), we are an independent not-for-profit organization that funds and facilitates energy-related R&D. We're helping Atlantic Canada move toward a more sustainable energy future by producing credible and objective data to inform sound energy policies and decisions.

Our current members are St. Francis Xavier University, Acadia University, Cape Breton University, Saint Mary's University, Dalhousie University, Nova Scotia Community College and the Nova Scotia Department of Energy and Mines, with each providing guidance and expertise through our Board of Directors.

Over time, our organization and its mandate have adapted to reflect and encompass the evolving energy landscape. Our predecessor agencies are Offshore Energy Environmental Research (OEER) and Offshore Energy Technical Research (OETR). In April 2012, OEER and OETR amalgamated to become OERA. As has already been our experience, we expect that our organization's mandate and possibly even the name we're known by will continue to evolve to reflect our region's shifting energy-related research and data needs. We welcome these anticipated changes as we expand our perspective to coordinate research and projects that will help to decarbonize our region's economy, mitigate climate change impacts and move Atlantic Canada toward net-zero emissions by 2050.

This report highlights our active and completed projects, new initiatives and outreach and engagement efforts during our 2020-21 fiscal year.

The mandate we're fulfilling

Our current mandate is to foster research and development related to petroleum and renewable energy resources and their interaction with the natural and social environment and to then disseminate the knowledge we gather.

This includes research work that:

- assesses the potential impacts of petroleum exploration, development and production on the natural and social environment,
- assesses the potential impacts of renewable energy technologies on the natural and social environment,
- builds geoscience knowledge about Nova Scotia's oil and gas potential, and
- promotes technical innovations to reduce barriers to development of energy resources.

Where consistent with what's above, we also encourage building research capability in Nova Scotia.

Our mandate is subject to regular review and consideration as we continuously work to ensure the work we're doing is meeting the Atlantic region's energy data needs.

The data we're generating

Each year as we work to fulfill our mandate, we coordinate research and projects that will help to broaden our understanding of energy-related needs, opportunities and risks for our region. To achieve our mandate and the need to consider the full continuum of data needs as we move toward net-zero emissions by 2050, the projects we carry out are inclusive of both renewable and non-renewable forms of energy. Read on for highlights of our recent work.

Validating environmental monitoring for tidal energy

Through The Pathway Program, we're working to solve a critical problem impeding the in-stream tidal energy industry: a lack of reliable and validated technologies and methods to monitor for fish-turbine interactions in high-flow, high-turbulence environments. The suite of research projects that make up The Pathway Program are defining, testing and validating an environmental effects monitoring solution for the in-stream tidal energy industry in Canada. Our research is now 70% complete and The Pathway Program will wrap up by the end of 2021.

Modelling our energy and emissions future

We're developing an open-source energy system model for Atlantic Canada. This tool will help users (anticipated to include policymakers, researchers and others) better understand and contribute to possible next steps on the path to net-zero GHG emissions. The model can be used to evaluate alternative future scenarios to meet interim and long-term greenhouse gas emissions reduction targets and identify the cost implications of changes to our energy system. As a core part of this project, we are collaborating with technical experts and engaging a wide range of stakeholders who could use and benefit from the model. The initial version of the model is expected to be available by fall 2021, with modelling workshops for prospective users to follow.

Contributing to geoscience knowledge

On behalf of Nova Scotia's Department of Energy and Mines, we manage the Offshore Growth Strategy (OGS) – a four-year, primarily geoscience-based research program. With the completion of the OGS-funded Nova Scotia–Morocco Conjugate Margin Reconstruction program, a multi-year study undertaken with Morocco's National Office of Hydrocarbons and Mines, efforts in 2020-21 turned to a new paleogeography-focused geoscience research program. The 'PaGeo' program comprises 10 new projects to be completed over the next two years. Another four projects related to clean growth and Nova Scotia's energy transition were carried out through the OGS. In total, 19 OGS projects representing over $3.6M in funding expenditures were initiated or ongoing in the 2020-21 fiscal year.

Exploring hydrogen's potential for Atlantic Canada

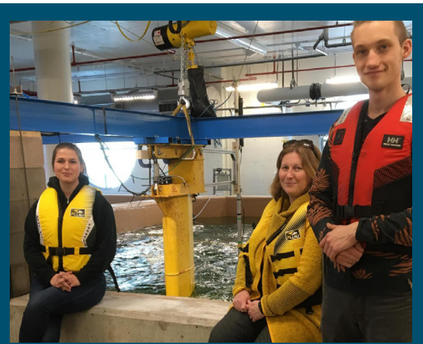
Over the past year, we've coordinated hydrogen studies that present a comprehensive picture of a possible hydrogen future for Atlantic Canada. Through our work, we evaluated the full hydrogen value chain, from production, storage and distribution through to end-use applications for the Maritimes and Newfoundland and Labrador. The study findings can be used to shape research priorities, set development policy, and help local businesses identify energy transition supply chain business opportunities. As a result of our involvement in these studies, we're now coordinating a hydrogen working group that is creating an Atlantic Hydrogen Roadmap.

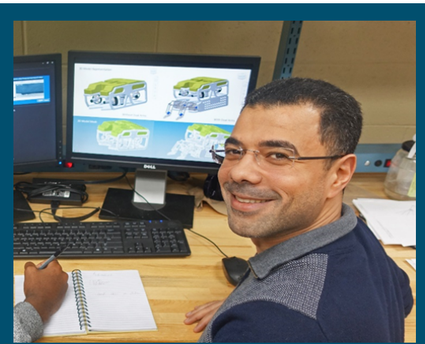
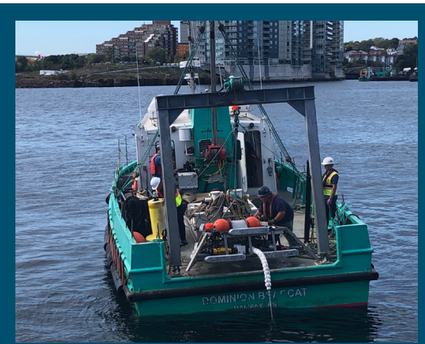
Understanding Nova Scotia's geothermal resources

We've also been investigating the potential for geothermal development in Nova Scotia. We coordinated a study that brought together all available data about Nova Scotia's geothermal resources and compared it with regional, national and global examples. The study team used this information to provide a preliminary favourability ranking for geothermal electricity generation and heat production across the province. Next, we are carrying out a study into the economics of developing one type of geothermal resource in Nova Scotia – direct use of heat for greenhouses and aquaculture.

Investigating offshore wind potential

Offshore wind is an untapped resource in Canada and Nova Scotia. If developed, it could enable energy exports, stimulate the local economy, and contribute to meeting ambitious greenhouse gas emission reduction targets by displacing carbon-intensive electricity generation. In recent months, we've facilitated a study to explore what economic and policy conditions could minimize investor risk and attract investment in offshore wind developments in Nova Scotia waters. Additionally, an offshore wind industry is developing in the eastern seaboard of the US and there is a significant opportunity for the Nova Scotia supply chain to participate, provided there is demonstrated capability. Moving forward, we'll continue to monitor offshore wind initiatives and opportunities in our region and beyond.




How we're building bridges

We want to create positive, long-term relationships that enable sustainable development of our region's energy resources in a truly collaborative manner. It's our goal to ensure everyone has an opportunity to engage in important conversations about our region's energy future, and that we all have access to the same data and resources to inform our decision-making.

In all aspects of our work, we are strongly committed to meaningful engagement with Indigenous Peoples and work on an ongoing basis to build and strengthen our connections and collaboration with First Nations communities.

As well, over the past year, we consulted with more than 200 organizations and explored partnerships with researchers and knowledge holders who can help define Nova Scotia's path to net zero.

OERA

Welcomed more than **900 participants** to a series of online events during the pandemic known as the OERA Online Exchange, embarking on discussions around energy transition and how COVID-19 will change our energy future.

Coordinated **63 active and complete projects**, with a total research value of **$11.5M.** Funding supporting these projects was sourced from **eight different agencies and organizations.**

In 2020-21, we

Presented **14 webinars** to a total audience of more than **1798 viewers** from over **40 countries.**

Informed **3,900 email subscribers** about OERA's ongoing initiatives and educational outreach and also connected with more than **1,200 Twitter followers** and another **1,000 LinkedIn followers**.

Consulted with more than **213 organizations** and explored collaborative partnerships with researchers and knowledge holders who can help define Nova Scotia's path to net zero.

Engaged **78 students** in research projects, continuing to build research capacity of highly qualified personnel – including undergraduate, Masters level, PhD candidates, Post-Doctoral fellows, and recent graduates – within Nova Scotia.

Please join the conversation

If you have comments or questions about our mandate, the research we coordinate or other projects we're undertaking, we would appreciate hearing from you. You can contact us at nperry@oera.ca.

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