NERGICA

Renewable
Energy Research
and Innovation

2023-2024_Annual Report

For the fiscal year ending June 30, 2024

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From the Chair

It is a great privilege to be wrapping up my second year as chairman of Nergica's board of directors. This continuity enables me to strengthen my commitment to this visionary organization dedicated to driving Canada's energy transition. In these times of increasingly urgent climate issues, Nergica plays a critical role by offering energy solutions that are both innovative and sustainable. A key player for the past two-plus decades, Nergica has made a name for itself by spurring innovation in the field of renewables thanks to its initiatives in research, technical support, technology transfer and support for businesses and communities.

Today, at a time when the energy landscape is rapidly evolving both in Quebec and across Canada, the board of directors is firmly convinced that the expertise and unwavering commitment of its team will continue to position Nergica as an undisputed leader in the shift to cleaner forms of energy. Given this acceleration, we must remain at the forefront, not only by developing technical solutions, but also by helping shape policy and supporting businesses in their transitions.

I see this year's mandate as an opportunity to strengthen our partner relationships, build on our achievements and ambitiously pursue our mission to innovate, share our expertise and strive toward a sustainable energy future for all.

Gérard Mounier, C. Adm.
CHAIRMAN OF THE BOARD

Message from the General Manager

Nergica was founded with the objective of playing a central role in the development of renewable energy in Quebec. Fully aware of the challenges that climate change represents, we have established an approach rooted in collaboration and knowledge sharing. Such an approach has proved essential for navigating a highly dynamic sector.

Today, this vision is becoming a reality. Although the renewable energy sector is beginning to take off, we are still in a phase dominated by announcements and initiatives that concern start-ups. For example, Hydro-Québec's 2035 Action Plan opens up new avenues for the energy transition. The consultations on Bill C-69 are also testimony to the incremental progress our sector is making. I would be remiss not to mention the resounding success of Nergica's most recent Quebec Renewable Energy Conference and its outstanding program that our participants found most gratifying.

Amongst our most noteworthy contributions, our paper on offshore wind power was widely consulted by Quebec decision-makers, further underscoring our key role in the province's energy transition. Furthermore, our new energy-plus building planned for 2025 as well as the 15th edition of our Quebec Renewable Energy Conference are testimony to a growing and renewed interest in our ecosystem.

I would like to express my deepest gratitude to the Nergica team as well as our board members, partners and clients. Thanks to your passion, expertise and dedication, Nergica has expanded the boundaries of renewable energy, opening up new horizons for a more sustainable and innovative future. Together, we will continue to build such an energy future that is beneficial to us all.

Frédéric Côté, MBA, ASC, C. Dir.
GENERAL MANAGER

Nergica

Our mission:

To accelerate the development and adoption of renewable energy.

Nergica is a Canadian centre of applied research that stimulates innovation in the renewable energy industry through research, technical assistance, technology transfer and technical support for businesses and communities.

More precisely, Nergica specializes in developing solutions for renewable energy integration, optimizing wind farm and solar array performance and supporting the growth and expansion of small and medium-sized enterprises. Nergica has been active in renewables for over 20 years.

College Centre for Technology Transfer (CCTT)

Nergica is a college centre for technology transfer (CCTT) affiliated with the Cégep de la Gaspésie et des Îles.

The organization's primary area of focus is renewable energy, including wind and solar PV as well as the integration of these technologies onto the grid.

This strategic positioning enables Nergica to support businesses and communities in their development while at the same time helping CGÎ to reinforce its role as a leader in renewable energy and sustainable development.

Nergica

Secteurs d’activité

Wind Energy

Energy in the Air

Increased production in cold climates, best O&M practices: For more than 20 years, Nergica has been helping to optimize wind farm performance.

Solar PV

Energy Shining Bright

Support for communities and businesses, procurement for remote communities and off-grid sites, solar farms: Nergica leverages its expertise to foster the optimal integration of solar PV.

Renewable Energy Integration

Redefining Energy Supply

Resource assessment, technology selection, greenhouse gas reductions and energy security of off-grid sites: Nergica lends its expertise to innovation in the field of renewables integration.

Nergica

Values

Ingenuity: Outside-the-box thinking to overcome challenges with intelligence, resourcefulness, creativity and innovation in order to support our clients in reaching their objectives.

Commitment: Giving one's best and nurturing one's desire to learn in order to excel in building a greener, more prosperous and more sustainable world for all.

Integrity: Promoting and complying with the highest standards of intellectual integrity and demonstrating sincerity and truthfulness when justifying its actions, decisions and results.

Audacity: Taking difficult steps with courage and valour despite the presence of obstacles. Tackling challenges and striving to diversify and reinvent while respecting the general principles of caution and lucidity.

Client proximity: Listening to the needs of our clients, establishing a relationship built on trust and adapting our practices to ensure their satisfaction and exceed their expectations. Placing them at the heart of our decision-making process every step of the way to foster recurrent, long-term collaborations that ensure that Nergica is able to continue to grow while expanding its reach.

Team work: Collaborate by pooling individual strengths and skills in order to achieve a common goal.

Our services

Optimization of renewable energy production

Support for adapting renewable technologies to cold climates

Accelerated development and implementation of technological innovations

Applied meteorology and energy resources

Decentralized and microgrid production

O&M optimization

Support for obtaining financial assistance

Nergica

Research Infrastructure

Nergica is the only institution in North America to offer full-scale research infrastructure in cold climate conditions and complex terrain, making it a major player in the energy transition.

This research site comprises 14 major pieces of equipment with a combined worth of over $21 million, namely:

- **Two 2.05 MW wind turbines connected to Hydro-Québec's distribution network and fitted with a number of measurement instruments including icing, vibration and weather sensors, etc.;**
- **16 kW of solar PV panels;**
- **One 200 kW microgrid comprising small wind turbines, diesel generators, solar panels and energy storage systems;**
- **Two 126 m meteorological masts as well as two 15 m towers, all of which are fully equipped with cutting-edge instrumentation;**
- **One 3D lidar and one vertical wind profiling lidar;**
- **One powerful data processing and archiving system (OSIsoft PI system); and**
- **One real-time microgrid simulator (HIL) for the development and validation of innovative energy solutions.**

Nergica

Strategic Plan 2023-2026

Nergica undertakes to strengthen its leadership role in the energy transition by focusing its efforts on strategic initiatives. The objective is to accelerate innovation and expand our impact on users and partners while boosting our capacity to rise to the challenges of the industry. These actions also aim to consolidate our client relationships and attract the very best talents to support the future growth of the organization.

Strategic Orientations

Identify and support users in their energy transition programs as well as producers and innovators in their keystone projects
Optimize business development activities
Develop infrastructure and capacities
Attract, develop and retain top talent
Strengthen our approach to customer relation management

These different strategic orientations will manifest themselves in a variety of key projects.

Organization

Board of Directors
October 31

Gérard Mounier

CHAIR

Project financing consultant

Carole Barbeau

VICE-CHAIR

Director, Power Market Expansion at BBA

Jean-François Nolet

SECRETARY AND CHAIR, GOVERNANCE AND HUMAN RESOURCES COMITTEE

Vice President, Government Relations and Public Affairs

Sébastien Huynh, CPA

TREASURER

Vice President, Finance and Administration at Fayolle

Francis Lacombe

MEMBER

President of Technostrobe

Marie-Pierre Morel, ing., M.B.A

MEMBER

Director of Development at Boralex

Suzann Méthot

MEMBER

Consultante

Julie Poulin, biol., M.Sc., ing. f.

OBSERVER

Representative nominated by Quebec Ministry of the Economy, Innovation and Energy
Director, Renewable Electricity Development

Charles Flageole, MA

OBSERVER

Representative nominated by Cégep de la Gaspésie et des Îles
Coordinator, Department of Research and Innovation

Audit Committee

Sébastien Huynh, CPA

CHAIR

Lynda Beaudin CPA, ASC, C. Dir.

MEMBER

Administratrice de société certifiée ASC et consultante stratégique

Suzann Méthot

MEMBER

Governance Committee and Human Resources

Jean-François Nolet

PRESIDENT

Carole Barbeau

MEMBER

Marie-Pierre Morel

MEMBER

Organization

Team

Nergica is proud to have the support of a team of passionate, highly qualified experts. With 29 employees from various backgrounds, our team reflects the quality and expertise necessary to complete innovative projects. Through close collaboration and agility, our staff forms a close-knit group that is able to adapt to the complex challenges of the renewable energy sector.

29 employees and 7 interns
as of June June 30, 2024

Areas of study

Management and administration
Natural sciences and engineering

Education

Professional studies
College
University (graduate)
University (post-graduate)

2023-2024 Highlights

Over the past year, Nergica has led numerous initiatives and enjoyed many opportunities to promote renewable energy deployment:

• PREPARATORY STEPS FOR A PAPER

Nergica has taken an interest in the bill presented at the National Assembly that aims to ensure the responsible governance of energy resources. In this context, first steps have been taken to draft a paper that expresses Nergica's views on clean energy development in Quebec.

• PARTICIPATION IN "DIALOGUE" TOUR

Nergica actively participated in Hydro-Québec's consultations during the utility's so-called "Dialogue" tour, which was a unique opportunity to discuss key issues for renewable energy development.

• FINANCING

Announcement of renewed funding for the Canada Economic Development for Quebec Regions (CED) program.

Non-repayable contributions totalling $3,525,000 for Nergica from the Honourable Diane Lebouthillier (MP for Gaspésie–Les Îles-de-la-Madeleine and Minister of Fisheries, Oceans and the Canadian Coast Guard), on behalf of Honourable Soraya Martinez Ferrada (Minister of Tourism and Minister responsible for CED).

• PARTNERSHIPS

Nergica initiated collaboration with the Acadia Center with a view to developing a forum for fostering cross-border cooperation in the realm of energy planning. The Northeast Grid Planning Forum envisions a future in which a new collaborative approach to energy planning will allow various stakeholders to create a resilient and economically competitive energy system in the northeastern US and eastern Canada.

• INVESTMENTS

The announcement of funding for a new building is a major milestone for Nergica that promises to bolster our capacity to innovate and host research projects. This Cégep de la Gaspésie et des Îles building will be entirely reserved for Nergica. With construction set to be completed in Fall 2025, the building should be ready in time to celebrate our 25th anniversary! This future structure will be net energy positive, meaning it will produce more energy than it consumes, a concrete example of sustainable innovation.

• MOBILIZATION

The Cégep obtained NSERC funding for the mobilization project that will enhance our ability to carry out groundbreaking research.

• TECHNOLOGICAL ADVANCES

The launch of CFI-funded microgrid and hydrogen (H2) projects illustrates our commitment to exploring innovative and sustainable energy solutions. Nergica is also pleased to see the resurgence of wind – a key sector for the energy transition – in connection with Hydro-Québec's development strategy.

• EVENTS

The 15th edition of our annual conference was a true success, bringing together experts and industry players to promote knowledge-sharing and best practices. Showcasing recent advances in the industry, the gala enjoyed a record year with an unprecedented number of guest speakers and sponsors, each of whom helped increase the visibility of their respective organization.

• VISIBILITY

Nergica publishes scientific articles to consolidate its leadership in applied research in the field of renewables. In this context, our paper on offshore wind power and our associated media presence were particularly helpful in enhancing our visibility.

• SUPPORTING THE NEXT GENERATION

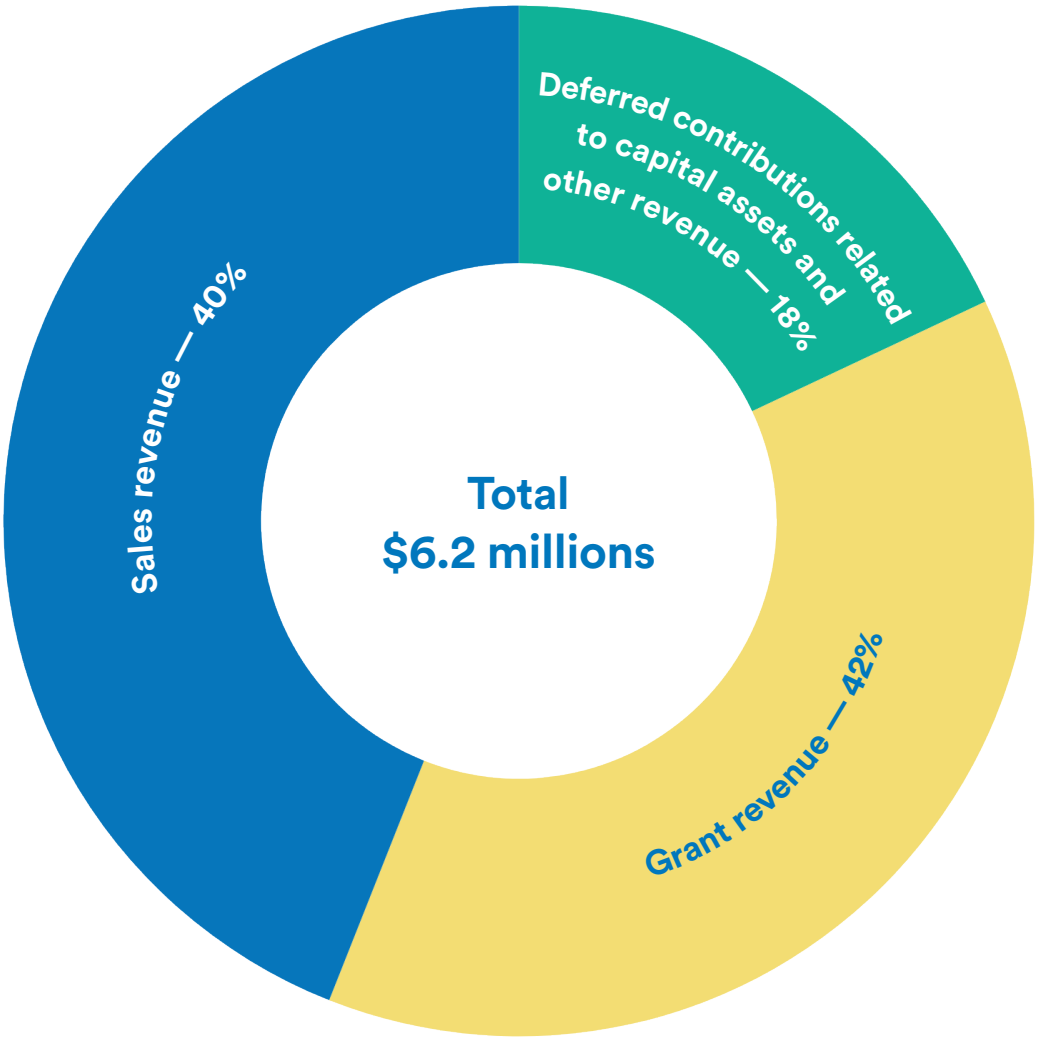
Nergica continues to play an active role in training tomorrow's researchers and developing the labour force. This past year, we provided 12 college and university interns an opportunity to collaborate on concrete research projects. Moreover, we awarded one of these interns a grant to acknowledge the quality of his work, thereby underscoring our desire to maximize the benefits of our expertise on education.

• COMMUNITY ENGAGEMENT

Nergica welcomes Hydro-Québec's wind development strategy, especially with regard to its emphasis on the importance of local expertise and partnerships with municipalities and First Nations, which are essential for reaching our renewable energy targets.

In summary, Nergica continues to play a prominent role in the evolution of the renewables industry by leveraging innovation, knowledge sharing and community engagement to build a sustainable energy future.

Revenue


Deferred contributions related to capital assets and other revenue — 18%
Sales revenue — 40%
Grant revenue — 42%
Total
$6.2 millions

Clientele

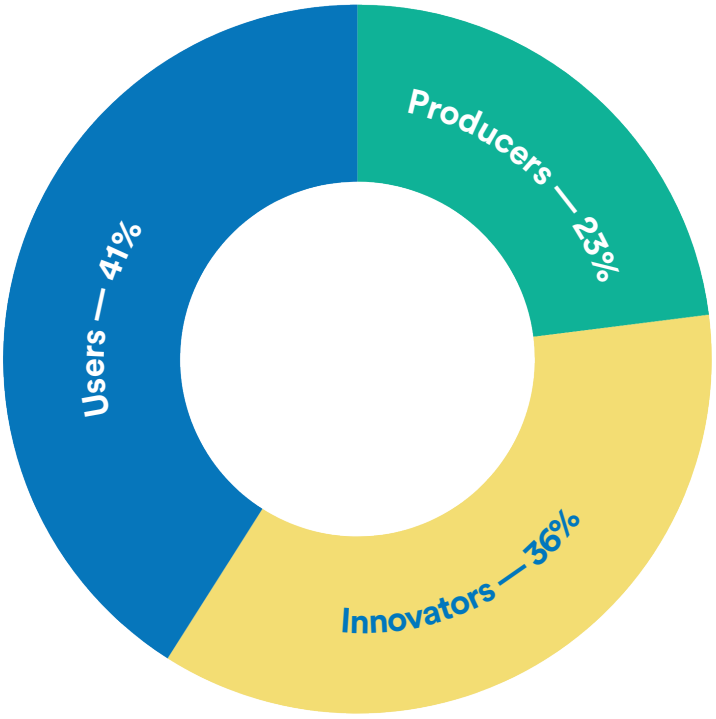
Nergica's clientele can be divided into three main categories: producers, innovators and users. Producers, who represent 23% of our clientele, are mainly generators of renewable energy, notably wind and solar. Innovators, who account for 36% of our clientele, are companies that have developed new products or services to optimize renewable energy performance. Lastly, users, who represent 41% of our clientele, include municipalities, communities and large companies with renewable energy consumption needs.

These categories comprise a wide array of companies such as technology developers, manufacturers of wind turbines and their components, and wind farm operators. Nergica's clientele also includes communities, public and parapublic organizations as well as utilities.

Rapidly Expanding Sector

Nergica's clientele includes players from the wind and solar sectors across Canada. Quebec's wind sector comprises over 150 businesses while the province's solar industry is currently enjoying rapid growth.

A number of recent announcements warrant mention, especially Hydro-Québec's 2035 Action Plan. Indeed, solar PV paired with hydroelectricity and wind power could help Quebec reach its energy transition objectives while at the same time making the province a North American leader in renewable energy.



Achievements

I. Major projects covering the period July 1, 2023 to June 30, 2024 (even partially)

Project title	Client / Partner	Summary
Enhancing renewable energy integration in off-grid networks	Tarquti, Hydro-Québec	The proposed research project aims to develop an approach to improving renewables integration with a methodology that optimizes solutions for the specific needs of Nunavik's remote communities. With this project, the partners wish to: • Assess the social, technical and economic constraints associated with integrating renewables into stand-alone grids in Nunavik; • Develop climate models to characterize extreme weather events in Nunavik (low temperatures, icing, blizzards); • Develop a methodological approach for sizing renewable generation systems while taking into account the technical, economic and climate constraints of Nunavik; • Exchange and share know-how acquired through partners, Nunavik communities and any other stakeholders.
Development of a nowcasting algorithm for wind power production in Nunavik	IREQ	The Hydro-Québec Research Institute (IREQ) is collaborating with Nergica to develop a nowcasting model that can be applied and deployed in Nunavik to provide very short-term wind and minimum wind power forecasts. Defined as a very short-range, high temporal resolution prediction of meteorological and energy conditions, nowcasting is a promising solution to safely optimize wind energy integration in Nunavik's off-grid networks.

Achievements

I. Major projects covering the period July 1, 2023 to June 30, 2024 (even partially)

Project title	Client / Partner	Summary
Mi'gmaq community of Gesgapegiag: **Microgrid-based autonomy and First Nations leadership in clean energy**	Mi'gmaq community of Gesgapegiag	The community of Gesgapegiag is undertaking a capacity-building project with the aim of achieving energy self-sufficiency and leadership in renewables. Nergica's support in this project enables the Mi'gmaq community to receive technical assistance to operate its stand-alone microgrid. Nergica is also offering technical support to community members responsible for the microgrid by providing a training program based on learning experiences, O&M manuals, troubleshooting guides and training videos. Other action items planned under this project include knowledge transfer and public dissemination of content to other Indigenous communities.
Management of CITEQ (Catalyseur d'innovation pour la transition énergétique au Québec)	CITEQ Members: Nergica and CIRADD (Cégep de la Gaspésie et des Îles), InnovLOG (Cégep André-Laurendeau), CPA-Centre TERRE (Cégep de Jonquière), SEREX (Cégep de Rimouski), IVI Solutions (Cégep de Saint-Jérôme), ITMI (Cégep de Sept-Îles), CNET (Cégep de Shawinigan), Innofibre (Cégep de Trois-Rivières), CÉPROCQ (Collège de Maisonneuve), Jacobb (Collège de Rosemont), IMAR (Collège de Bois-de-Boulogne), Université du Québec à Trois-Rivières (UQTR), Université du Québec à Chicoutimi (UQAC), Université du Québec en Abitibi-Témiscamingue (UQAT), BC Énergies, Carboniq Inc., DigiHub and Prodeval Inc.	Under this project, a college- and university-level research network was established with the goal of offering appropriate support to members of practice settings who wish to deploy energy transition solutions (technologies). Founded in 2021, CITEQ endeavours to accelerate the adoption and adaptation of clean technologies in practice settings in order to ensure a successful energy transition in Quebec. CITEQ's objectives are to: 1) Develop a holistic service offering to meet the complex and multidisciplinary needs of practice settings; 2) Create a favourable environment for the exchange of know-how and experiences between members of Quebec society dedicated to the energy transition; 3) Train tomorrow's workforce (college and university levels) to support the the energy transition.

Achievements

I. Major projects covering the period July 1, 2023 to June 30, 2024 (even partially)

Project title	Client / Partner	Summary
Training and capacity building for members of the Kuujjuaarapik-Whapmagoostui community	Kuujjuaraapik-Whapmagoostui Renewable Energy Corporation (KWREC)	The project aims to reduce fossil fuel consumption for energy generation by adding wind to the diesel generators that currently power the communities of Whapmagoostui and Kuujjuaraapik. The installation and operation of the new wind array will create jobs at the local level. KWREC mandated Nergica to develop a wind energy training plan to promote the integration and retention of selected workers. This plan aims to allow Indigenous workers to acquire the new knowledge, skills and capabilities to carry our their new functions.
Optimization of renewable energy integration to microgrids	OPAL-RT Technologies Inc.	The project consists of developing a library of digital twin models of decentralized energy production systems as well as a controller for the optimization of power/energy flow management in microgrids. These developments will help enhance renewable energy integration.
Development of fact sheets on wind technology for the purpose of presenting them to the general public	Union des municipalités du Québec	In its mission to support its members, UMQ was interested in producing informative material on the subject of wind energy. In this context, Nergica produced easy-to-understand content on various relevant aspects of wind energy and its impacts. More specifically, these outreach tools focused on 4 main themes: 1) Presentation of wind energy technology; 2) Wind power and its impact on the environment (fauna, flora, noise); 3) Wind energy laws and regulations in Quebec; 4) Wind farm development in farmland.

Achievements

I. Major projects covering the period July 1, 2023 to June 30, 2024 (even partially)

Project title	Client / Partner	Summary
Support for instrument deployment (arctic power supply (APS), lidar and meteorological masts) in Nunavik	Tarquti Energy Inc.	Every step of the way, Nergica is supporting Tarquti Energy Inc. in deploying instrumentation in Nunavik by participating in community engagement, capacity building, training and technical support activities.
Icing assessment in Newfoundland	World Energy GH2	World Energy GH2 is interested in acquiring a better understanding of the icing phenomenon at its future wind farm on Newfoundland's Port au Port Peninsula. The client would also like to quantify the impact of icing on wind power production as well as recover potential energy by means of an ice protection system (IPS). In this context, Nergica proposes to conduct, as a first phase, an analysis of the icing climate at the client's site of interest. Nergica will then evaluate the icing-induced energy losses and the energy recovered by the selected IPS solution.

Achievements

II. Ongoing projects as of June 30, 2024

Project title	Client / Partner
Canadian representative in international expert groups of the International Energy Agency (Task 41, Task 50, Task 52, Task 54), 2024-2025	NRCan (Natural Resources Canada)
FeatherEdge Pilot Testing	Biome Renewables
Support for the development of icephobic coatings	UQAC
Icing alerts and control	Capstone
Microgrid installation support	CanmetENERGY
Design of a solar generating system for a bulk freighter	Innovation Maritime
Evaluation of wind energy integration for a greenhouse complex	Biopterre Cégep de La Pocatière
Supervision of an internship for 4 students from Groupe Collégia in a real work setting at Nergica's research site	Boralex Collégia Apuiat

Achievements

III. Projects completed as of June 30, 2024

Project title	Client / Partner
Evaluation of renewable energy integration potential	Aluminerie Alouette
Support to municipality for the establishment of a niche market dedicated to decarbonizing its vessel fleet	Municipality of Îles-de-la-Madeleine
Prefeasibility study of a hybrid system	Charles J Andrew Youth and Family Treatment Centre
Prefeasibility analysis of deployment	Centre communautaire Griffon
Rusutsu Wind Icing Assessment	Invenergy Wind Development Japan GK
Icing assessment (Quebec)	Invenergy
Financial assistance program to support Canadian SMEs	Icetek / Fibecycle / Sentrex / SysNergie / TECHÉOL / Instrumar
Virtual/augmented reality wind training	Boralex CIMMI
Wind turbine performance analysis during periods of icing	EDF Renewables Nicolas-Riou Wind Farm
Solar and wind potential analysis	Machinerie Dubois
Confidential project	Indigenous community
Market study to support the Carnaval de Québec in its decarbonization plan	Carnaval de Québec
Optimal control of a wind turbine with de-icing system through ice forecasting and observations	Saint-Philémon Wind Farm S.E.C., Glen Dhu Wind Energy LP, NSERC
Research and preparation of fact sheets	Ecotech Québec
Evaluation of ice accretion in Nova Scotia	ABO Energy Canada
Technical review of off-grid PV systems for telecommunications towers	YRH
Tech-Access Canada	LxNGen
Confidential project	Indigenous community
Answers to wind power questions for a non-technical audience	Nicolet-Yamaska RCM
Bibliographic study of solar power in cold climates	Éolectric
Support for instrumentation validation	Cégep de Jonquière – TERRE Chair
Feasibility study for implementing a microgrid at Éole Cap-Chat site	Éole Cap-Chat

Communication and Events

Once again, Nergica managed to further its branding efforts and boost the organization's visibility through a number of networking and knowledge-sharing events. These events brought together key players from the research sector, the renewables industry and the energy transition. Participating in the organized events were numerous small, mid-sized and large companies working in the fields of production, innovation or goods and services, as well as various communities and associations.

Undoubtedly, these gatherings helped drive innovation in the fields of solar and wind power, micro-grids, energy storage as well as renewable energy integration across the country.

Communications and Events

Événements Nergica

15th edition

Quebec Renewable Energy Conference and Renewables Gala

June 11 to 13, 2024

220 participants

1st Renewables Gala with 230 participants

19 nominations

44 guest speakers

76 businesses

25 sponsors

11 exhibitors

110 (registered) business meetings organized

Best performance in the past 15 editions

Communications and Events

Quebec Renewable Energy Conference and Renewables Gala

The 15th Quebec Renewable Energy Conference in Carleton-sur-Mer was highly appreciated by its 230 participants. The three-day conference (June 11 to 13) included panels, networking, a taste of the Gaspé, and a gala. This year's conference was interactive, dynamic, energizing and conducive to dialogue between the representatives of different companies. Attendees also had the chance to participate in many original "extra-curricular" activities to discover local businesses and sites related to renewables.

The event aimed to bring together key industry players to educate them about topics of current interest and promote progress in the sector, notably by addressing the most important issues and fostering B2B engagement. This year's conference addressed current topics of interest for the renewable energy industry, in addition to offering a broad range of activities such as workshops, expert panels, business meetings, an exhibitors' hall, presentations, a gala and networking periods. The gala was a chance to highlight the work of certain key players and showcase initiatives that can inspire and propel the rest of the industry.

With 110 recorded business meetings, networking with the B2B2GO platform was once again a major success. Without a doubt, this complementary private business meeting service offered to companies across the industry is an exceptional opportunity to develop winning business partnerships.

Communications and Events

Webinar | Maximizing Your Wind Assets in Cold Climates

December 13, 2023

Icetek's Ice Condition Monitoring System is a revolutionary performance-enhancing instrument for wind turbines prone to icing. This nacelle-mounted instrument detects and quantifies icing events as well as a large number of meteorological parameters. Adopted by wind farm operators and technology suppliers across Canada, Icetek's system has proved its effectiveness.

In a webinar put together by Icetek and organized by Nergica, cold climate experts and users of the atmospheric ice detection system discussed the use of Icetek's device and the benefits of this new technology. Panelists included Olivier Fortin-Moreau (CTO and head of engineering, Icetek), Daniela Roeper (VP, Borealiswind), John Kirby (senior manager of wind operations, Liberty Power) and Charles Godreau (project manager for research and innovation, Nergica).

Braindate – Energy Transition | Virtual Networking Event

November 16, 2023

A Braindate was organized on the energy transition in the tourism sector. Offered by Escouade Énergie (a consortium of CCTTs) and the Conseil régional de l'environnement de la Gaspésie, this virtual event was a unique opportunity for professionals to discuss self-generation, certificates, grants, innovation and many other relevant topics for buildings in the tourism sector. Participants discussed their know-how and experience in small groups or one-on-one in order to ensure a constructive and diversified exchange.

Goal of event:

The main objective of this event was to promote the energy transition at tourist facilities by enabling dialogue between professionals. By offering a virtual platform to discuss key topics and share best practices, the event aimed to stimulate the adoption of innovative and sustainable solutions to improve energy efficiency in tourism-related infrastructure.

Communications and Events

Webinar | Diesel Savings Through Energy Storage

September 13, 2023

In collaboration with OPAL-RT, Nergica used this webinar to present its efforts to validate how an energy storage system has helped lower diesel consumption in a microgrid by using the OPAL-RT real-time simulation platform. Topics covered included the benefits of microgrids, integrating renewables to offset diesel consumption and reduce GHG emissions, as well as energy self-sufficiency and reliability. Scenarios based on operational data from Nergica's research site were also presented. Webinar moderators were Charles-Olivier Jacques, research and innovation analyst at Nergica, and Martin Bélanger, director of sales for North America at OPAL-RT Technologies.

Goal of event:

The chief objective of this webinar was to demonstrate the effectiveness of an energy storage system to lower reliance on diesel in microgrids while emphasizing the environmental and operational benefits of integrating renewable energy solutions. Through case studies and practical scenarios, the event aimed to promote innovative solutions to improve microgrid autonomy and reliability.

Braindate | February 7, 2024

Green Hydrogen: Production, Storage, Distribution and Use

Escouade Énergie (CCTT cluster dedicated to the energy transition) and the Réseau québécois sur l'énergie intelligente (RQEI) presented a virtual event made possible through the financial support of the Government of Quebec in its 2030 Plan for a Green Economy. Various experts joined a virtual conversation on the production, storage, distribution and use of green hydrogen.

Communications and Events

Our HR Initiatives

Earth Day presentation with Yves-Marie Abraham of HEC Montréal

In commemoration of Earth Day, Nergica had the privilege to welcome HEC Montréal professor Yves-Marie Abraham, who came to discuss the concept of degrowth with us.

Mr. Abraham lectures on economic sociology and conducts research on the topic of degrowth.

Participants listened to the talk while enjoying pizza in a relaxed atmosphere.

Nergica's Communications

Media benefits for Nergica

Press releases and media coverage

Nergica was widely covered in the media for its initiatives and projects, notably with regard to the role offshore wind might play in Canada's effort to become carbon neutral by 2050.

92 articles in regional and national media, which represents a 68% increase over last year.

- 31+ articles published by various media outlets on the relevance of offshore wind power in Canada
- 9+ articles on Nergica's Quebec Renewable Energy Conference
- 21+ articles in reaction to the presentation of a bill on energy governance from the Minister of Economy, Innovation and Energy
- 10+ articles on Nergica's new building
- 7+ articles on CED funding renewal

5 press releases:

- Nergica and Cégep de la Gaspésie et des Îles receive $1M grant;
- Nergica welcomes introduction of energy bill;
- Cégep de la Gaspésie et des Îles and Nergica building to become one of Quebec's first energy-plus buildings;
- Government of Canada supports two projects at college centre for technology transfer Nergica;
- Nergica, an applied research centre specializing in renewables, and Marine Renewables Canada forge strategic partnership to foster the development of the marine renewables industry.

2 press conferences

LinkedIn | 4,597 subscribers

(up 1,152 in one year!) Given that most of our target audience is present here, we are very excited about this 25% surge.

Facebook | 1,456 subscribers

Up 40 over last year.

Newsletter | 2,450 subscribers to French version and 707 subscribers to English version

The year was marked by major achievements for Nergica, both in terms of financing and partnerships as well as media visibility. These efforts consolidated Nergica's position as a leader in the field of renewables and emphasized the importance of offshore wind for the future of Canada's energy supply.

Dissemination of Findings

Participation in Conferences (in-person and virtual)

As part of its growth and development, Nergica's team strives to ensure a greater presence at important or major industry events. These opportunities are essential for professional development, increasing the organization's visibility and establishing strategic connections with key industry players. By actively taking part in these events, Nergica is not only actively engaged in advocacy efforts, but also succeeds in staying abreast of the most recent trends and innovations in the field of renewables.

A few statistics...

19 events in Quebec

4 elsewhere in Canada

4 abroad

Dissemination of Findings

Chantier sur la recherche au collégial organized by the Ministry of Education and Higher Education and the Ministry of the Economy, Innovation and Energy
October 3 and 4, 2023 | Lévis

General managers meeting – CCTT Network event
October 5, 2023 | Quebec City

Electricity Transformation Canada
October 23-24, 2023 | Calgary

Synchronex expert workshop
November 8-9, 2023 | Quebec City

Colloque de l'Escouade
November 13 and 14, 2023 | Thetford Mines

Futurocéan – Le Forum de l'innovation bleue au Québec
November 15-16, 2023 | Rimouski

Québec Mines + Énergies
November 20-23, 2023 | Quebec City

European Hydrogen Week
November 20-24, 2023 | Brussels, Belgium

Table de recherche et d'innovation, Centre-du-Québec
February 1, 2024 | Drummondville

Rencontre Nuvéo
February 6, 2024 | Gaspésie

AQPER Congress
February 19-21, 2024 | Quebec City

Rematek Énergie 2024 virtual conference
March 13-14, 2024

Rendez-vous de l'innovation de l'Est du Québec
March 20 and 21, 2024 | Gaspé

Time World
April 2-4, 2024| Trois-Rivières

Hydro-Québec consultations, Gaspésie region
April 9, 2024 | Carleton-sur-Mer

CanREA Operations Summit
April 10-11, 2024 | Calgary

General managers meeting
May 1-2, 2024 | Quebec City

Applied Research Day – Battery Sector
May 14-16, 2024 | Shawinigan

International Hybrid Power Plant and System Workshop
May 14-15, 2024 | Azores, Portugal

Assises 2024 de l'UMQ
May 22-24, 2024 | Montréal

Energy NL Conference
June 4-6, 2024 | St. John's

Northeast Grid Planning Forum mission
June 3-5, 2024 | Ottawa

20th International Workshop on Atmospheric Icing of Structures (IWAIS)
June 18-21, 2024) | Narvik, Norway

Quebec Renewable Energy Conference by Nergica
June 11-13, 2024 | Carleton-sur-Mer

Diffusion des résultats

White Papers, Reports and Studies

Brief submitted as part of public consultations on the framework and development of clean energy in Quebec

Our brief was submitted in the context of government consultations and complements the responses provided in the questionnaire and at the consultation workshop with experts. It focuses on the recommendations and measures needed to accelerate the development of renewables with a view to meeting the ambitious targets set out by the provincial government with regard to greenhouse gas (GHG) emissions, decarbonization and the fight against climate change.

Offshore Wind Power in Canada: Challenges and Opportunities

Authors: Marc Defossez, PhD, Alexandra Gellé, PhD, Denis Lapalme, PhD, Amjad Maadeni, CEP, Ferial Slim, MSc

Given Canada's objective of achieving net-zero emissions by 2050, it is important to carefully explore all clean energy generation options in order meet the country's corresponding energy needs. Indeed, in order to become carbon neutral, Canada would need to install 150 GW of wind power capacity, as compared to the current figure of just 14.3 GW. To rise to this challenge, it is therefore important to explore various options such as offshore wind, which has been adopted by a large number of countries around the globe.

At the present time, Canada does not operate any offshore wind projects, despite having substantial wind regimes along its Atlantic and Pacific coasts, not to mention the Great Lakes. Canada's Atlantic seaboard in particular has one of the best wind potentials in the world. Additionally, Canada already boasts a robust wind industry as well as associations and an experienced labour force capable of developing offshore wind power projects.

In this paper prepared by Nergica, experts address the various aspects of offshore wind: technical, technological, regulatory, etc. They also provide a general overview of the situation in Canada.

Partner Consultations and Collaboration

At Nergica, our partnerships are the very core of our mission to advance renewables. By collaborating with businesses, educational institutions and governments, we apply our combined strengths to innovate and promote an inclusive energy transition. This section presents the key initiatives undertaken through these collaborations as well as their impact on our projects and the industry at large. An exhaustive list of our partners is presented below.

Cégep de la Gaspésie et des Îles;

NRCan Workshops for Technical Expert Interest Group – Remote Microgrids;

Institut nordique du Québec;

Tech-Access Canada;

2 Degrés (environmental and cleantech business incubator);

Énergie Solaire Québec;

Fonds Écoleader;

Hydro-Québec;

NSERC;

QUEST;

GÎMXPORT;

Gaspésie–Îles-de-la-Madeleine Regional Environmental Council (CREGÎM);

Consortium for Research and Innovation in Aerospace in Quebec (CRIAQ);

Innovation en énergie électrique (InnovÉÉ);

National Electricity Roundtable (NER);

Réseau québécois sur l'énergie intelligente (RQEI);

Southern Alberta Institute of Technology (SAIT);

Building Energy Innovators Council (BEIC);

Chamber of Commerce and Tourism of Gaspé;

Gaspé SADC;

OSISoft;

IGE + XAO Group;

Canadian Renewable Energy Association (CanREA);

Catalyseur d'innovation pour la transition énergétique du Québec (CITEQ-FRQNT);

Marine Renewables;

Acadia Center.

Nergica is a member of the following boards:

Escouade Énergie (consortium of CCTTs);

Association québécoise de la production d'énergie renouvelable (AQPER);

Nuvéo – Créneau d'excellence en énergie renouvelable;

Synchronex CCTT Network.

Partner Consultations and Collaboration

International Energy Agency working group

These activities represent an international platform for the exchange of experiences related to research activities, performance projects, identification of future research, development and standardization needs, as well as for a synthesis of skills and best practices.

International Energy Agency, involvement in working group on wind energy in cold climates ("IEA Wind TCP Task 19"). Nergica's participation in the activities of Task 54 in 2023-2024 revolved around the following points:

- Active role in the sub-group "**Performance Envelopes for Blade De-icing Systems**"; main task completed;
- Organization of general meeting in Calgary in October 2023;
- Nergica also invited Canadian innovators and researchers to join the performance envelope sub-group. Joining and actively contributing to this sub-group were **Daniela Roeper**, CEO of Borealis Wind (a developer of hot-air blade de-icing systems) as well as **André Bégin-Drolet**, professor at Université Laval, and **Patrice Roberge**, senior data scientist at Icetek, both of whom are experts in the performance of blade de-icing systems;

International Energy Agency, involvement in working group on wind in hybrid power plants ("IEA Wind TCP Task 50");

International Energy Agency, involvement in working group on the use of lidar for wind energy ("IEA Wind TCP Task 52");

International Energy Agency, involvement in working group on distributed wind ("IEA Wind TCP Task 41").

Governmental and Para-governmental Partners

- Canada Economic Development for Quebec Regions (CED)
- Natural Resources Canada (NRCan)
- Natural Sciences and Engineering Research Council of Canada (NSERC)
- Quebec Ministry of Education and Higher Education (MEES)
- Quebec Ministry of the Economy, Innovation and Energy (MEIE)
- National Research Council Canada – Industrial Research Assistance Program (NRC-IRAP)
- Fonds de recherche du Québec – Nature et technologies (FRQ – NT)
- Quebec Ministry of Employment and Social Solidarity

Benefits for Education

Expertise Pooling and Benefits for College-level Training

For a sixth consecutive year, Nergica received a financial contribution from Quebec's Ministry of Education and Higher Education. This Government of Quebec initiative aims to support members of the CCTT consortium in their mission. Thanks to this invaluable financial assistance, Nergica's team was able to carry out various trainings and initiatives such as collaborating and pooling expertise with other CCTTs or research centres. In addition to helping to strengthen Nergica's collective skill set, these efforts also spurred innovation and excellence in education and applied research.

Nergica also continued to maximize benefits for college-level education by hiring both students and professors. This year, Nergica welcomed 12 interns and released one Cégep professor, all of whom were involved in various research projects.

Benefits for Education

This year, Nergica hosted:

- **12 college interns**
  - 1 university intern
  - 1 teacher (0.2 FTE)

Breakdown of college-level internships:

- **5 in computer technology:**
  - Programming of management dashboards;
  - Programming of microgrid management dashboards;
  - Programming of artificial intelligence algorithms and initiation to machine learning;
- **1 in accounting and management**
- **1 in natural sciences:**
  - Development of a technical and economic analysis tool for various solar power components;
- **2 in 3D animation and image synthesis;**
- **2 in maintenance technology:**
  - On-site work;
- **1 in electrical engineering technology.**

University internship:

1 in mechanical engineering.

Teacher:

1 for the preparation of a customized training program (KWREC).

Research-Study" option (ORÉ):

3 interns in ORÉ.

Like the Cégep de la Gaspésie et des Îles (CGÎ) and its CCTTs, Nergica continued its participation in the "Research-Study" option. This program offered three students the chance to contribute to concrete research work with the team that oversees our research centre.

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