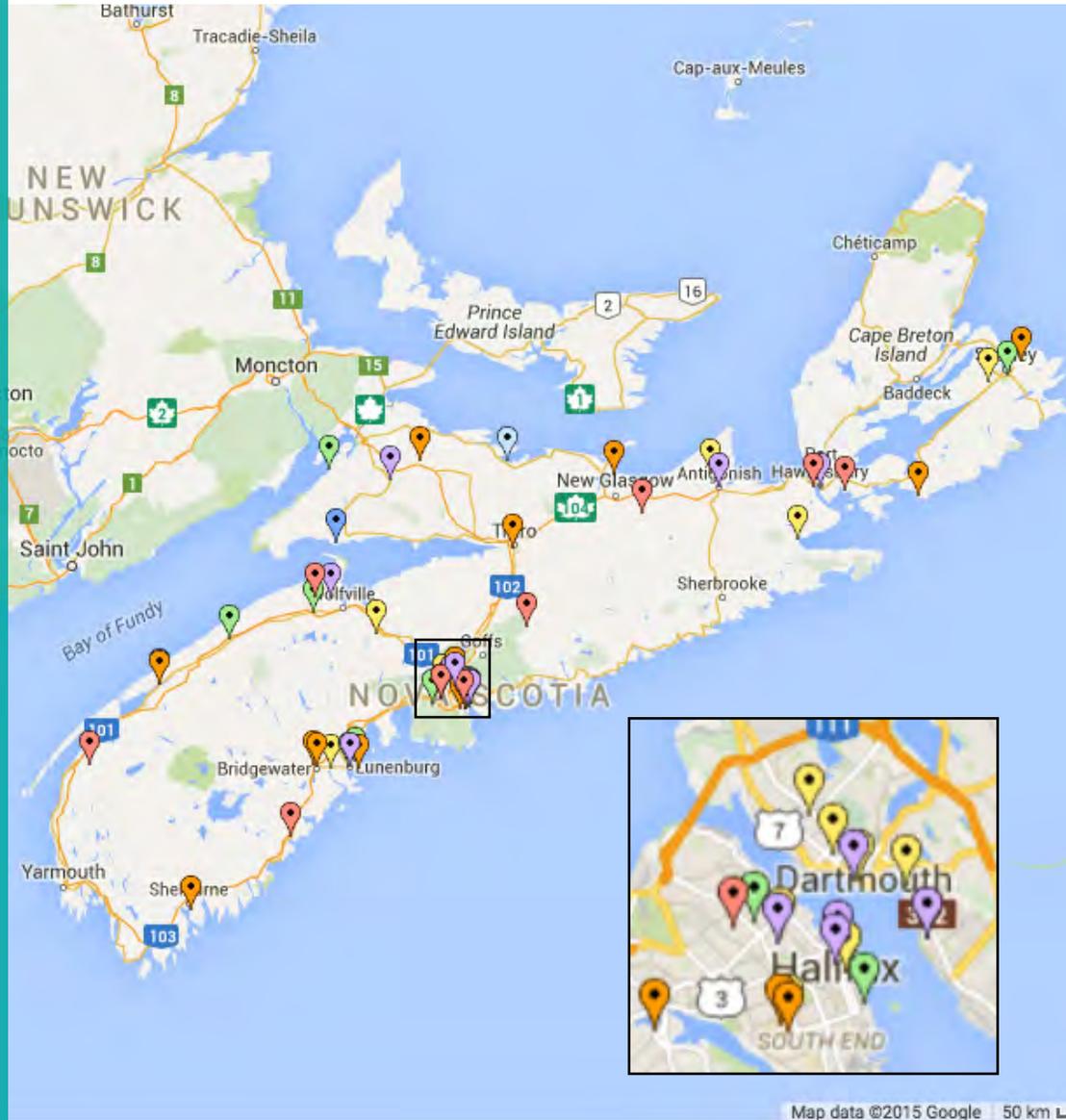


**HOMEGROWN SUCCESS:
NOVA SCOTIA'S
SMART ENERGY
INVENTORY**



Acknowledgements

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Layout

Claire Simmons, QUEST NS

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ADVANCING SMART ENERGY COMMUNITIES IN CANADA

QUEST is a non-profit organization that conducts research, engagement and advocacy to advance Smart Energy Communities in Canada. Smart Energy Communities improve energy efficiency, enhance reliability, cut costs, and reduce greenhouse gas emissions. With the help of 8 provincial and territorial Caucuses, QUEST brings together key stakeholders from government, utilities & energy providers, the real estate sector among others to transform Canada's 5400 communities into Smart Energy Communities.

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The QUEST NS Caucus provides an informal forum where participants interested in managing energy related issues consistent with QUEST's mission, vision and principles for Smart Energy Communities can meet, exchange information, communicate success stories, propose implementation strategies and develop partnerships.

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INTRODUCTION

Homegrown Success: Nova Scotia's Smart Energy Solutions Inventory

Introducing Nova Scotia's Smart Energy Solutions Inventory

Like its history, culture, and landscapes, Nova Scotia (NS) has much to celebrate as it builds Smart Energy Communities. By turning our communities into Smart Energy Communities, we can improve energy efficiency, cut costs, improve reliability, and reduce greenhouse gas emissions in Canada.

So what is a Smart Energy Community? First, Smart Energy Communities integrate conventional energy networks. That means that the electricity, natural gas, district energy, and transportation fuel networks in a community are better coordinated to match energy needs with the most efficient energy source. Second, Smart Energy Communities integrate land use, recognizing that poor land use decisions can equal a whole lot of energy waste. Third, Smart Energy Communities harness local energy opportunities.

This inventory is intended to capture as many examples as possible of the fuels and technologies that are advancing Smart Energy Communities in Nova Scotia so that their success can be identified, referenced, and considered for replication by others.

This is a living showcase of the development of Smart Energy Communities in Nova Scotia. Anyone who would like to have a project included in a future update of the Inventory is encouraged to contact the QUEST NS Coordinator at ns.caucus@questcanada.org.

Participate in the QUEST NS Caucus
questcanada.org/caucus/ns

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questcanada.org/subscriberservices

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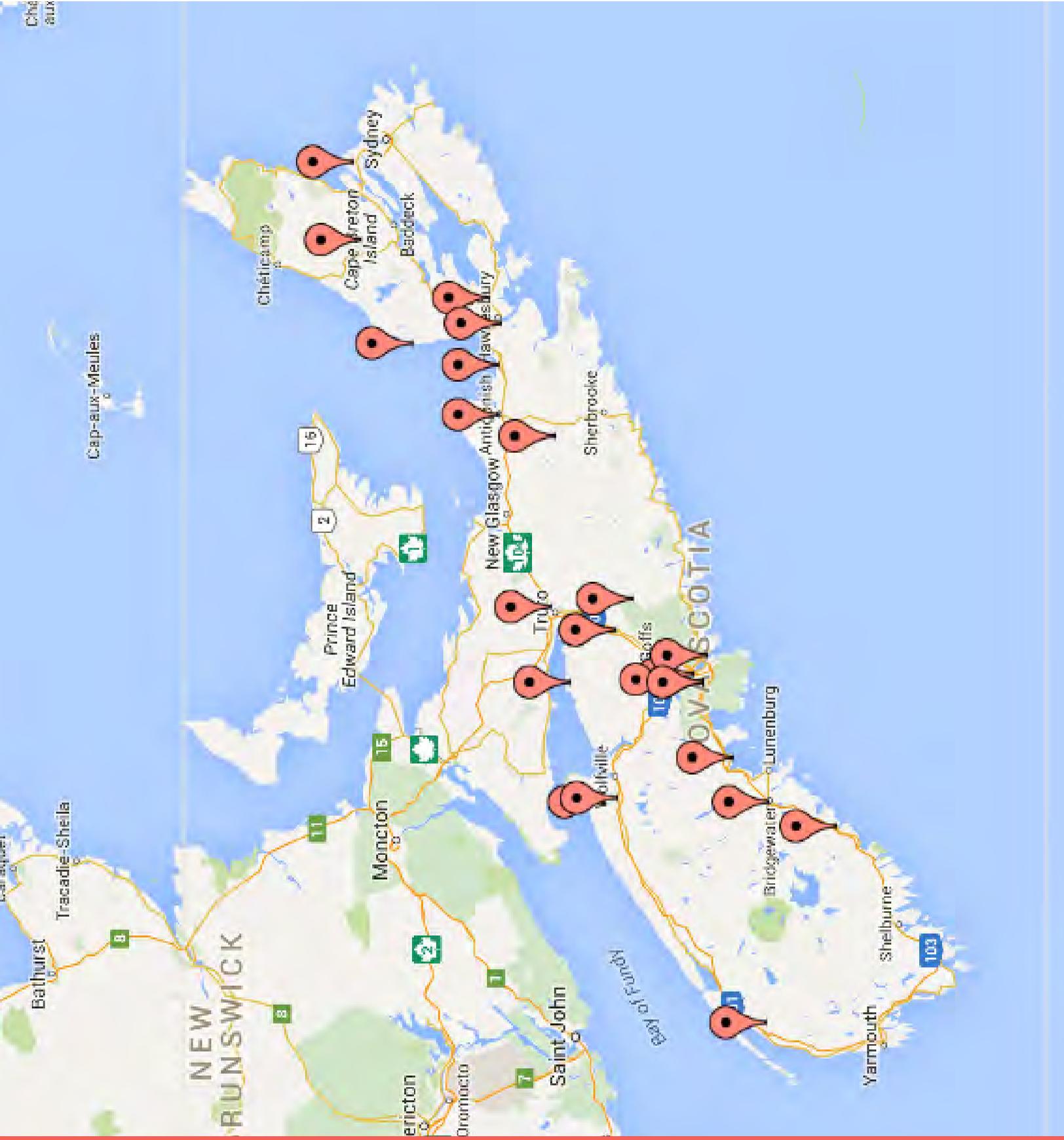
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2. Millbrook Wind Farm - Millbrook First Nation
3. Spiddle Hill Project - Colchester-Cumberland Wind Field Inc.
4. Wind COMFIT Projects

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2. Data Analytics: Applied Energy Research (AER) - Nova Scotia Community College
3. District Energy: MacAdams Project - Private Residence
4. Energy Storage: Electric Vehicle Chargers - Plugshare
5. Energy Storage: Tesla Destination Charging Stations
6. Geothermal: The People's Place - Antigonish Town and County Library
7. Geothermal: Municipal Geothermal Project
8. Geothermal: Alderney 5 Energy Project - Halifax Regional Municipality
9. Geothermal: Halifax Harbour Seawater Geothermal
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12. Geothermal: Port Hawkesbury Civic Centre - Town of Porthawkesbury
13. Geothermal: Geothermal Arenas
14. Geothermal: Geothermal Community Centres - Halifax Regional Municipality
15. Renewables: Orchard In-Line Energy Recovery Turbine - Bedford
16. Sewage Heat Capture: Q Lofts
17. Waste-to-Heat: Waste Heat Capture Arenas

BIOGAS/ BIOMASS



ANAEROBIC DIGESTER CENTREVILLE PILOT FACILITY

CENTREVILLE
KINGS COUNTY, NS

Built in 2009, an anaerobic digester using cow manure and food waste to produce biogas.



QUICK FACTS

- ▶ Energy Type: Biogas
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Energy
- ▶ Owner: Biogas Energy Inc.
- ▶ Completed: 2009

DESCRIPTION

Converts various and problematic organic matters into energy through the highly efficient and cost effective anaerobic digestion process. The plant processes dairy cow manure and food waste up to 3 tonnes/day and generates up to 140 cubic metres/day of biogas. The intent is to conduct R&D to demonstrate:

- Ability to operate efficiently and cost effectively in the cold climate,
- Suitable for small to medium scale operations,
- Modular design of all major components to enable economical dismantling and relocation,
- Ability to effectively resist corrosion problems, a challenge for similar systems.

Bio Energy Inc. is currently developing a second facility in Cumberland County.

MORE INFORMATION

www.biogasenergyinc.ca/

CONTACT

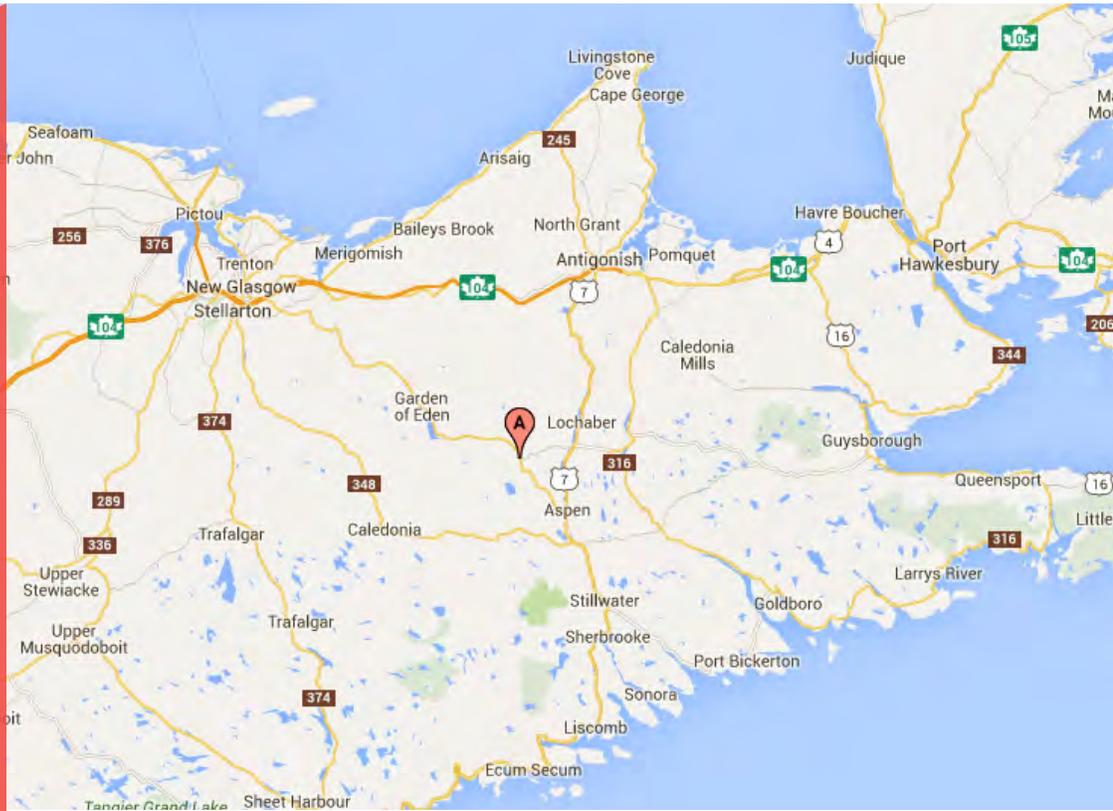
DAVID MILLER
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1.902.402.8164

BioGas Energy Inc. 

ARCHIBALD DAIRY FARM BIOGAS ENERGY PROJECT

NEWTOWN GUYSBOROUGH COUNTY, NS

Project using green technology to turn cow manure and biosolids to heat and electricity.



QUICK FACTS

- ▶ Cost: \$200,000 (funding)
- ▶ Funded by: NS Dept. of Environment, ecoNova Scotia
- ▶ Energy Type: Biogas
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Agriculture
- ▶ Owner/Operator: Archibald Dairy Farm
- ▶ Completed: 2010

DESCRIPTION

The 2010 project allows the capture of greenhouse gas emissions from farm waste and convert it into renewable energy.

MORE INFORMATION

novascotia.ca/news/release/?id=20100728002

CONTACT

Archibald Dairy Farm
1.902.833.2626



BIOFUEL WEISS BIODIESEL PRODUCTION FACILITY

**MOUNT UNIACKE
HANTS COUNTY, NS**

\$380,000 plant using cooking oil to produce biodiesel.



QUICK FACTS

- ▶ Cost: \$380,000
- ▶ Energy Type: Biogas
- ▶ Status: Development Phase
- ▶ Scale: Project
- ▶ Sector: Energy
- ▶ Owner: Biofuel Weiss

DESCRIPTION

Built in 2014, Biofuel Weiss Inc. is a modern, continuous flow biodiesel production facility in Mt. Uniacke, Nova Scotia. The facility uses cooking oil imported from across Canada as feedstock. The facility produces 7 million gallons per year, which is exported to the German market.

MORE INFORMATION

www.biofuelweiss.ca

CONTACT

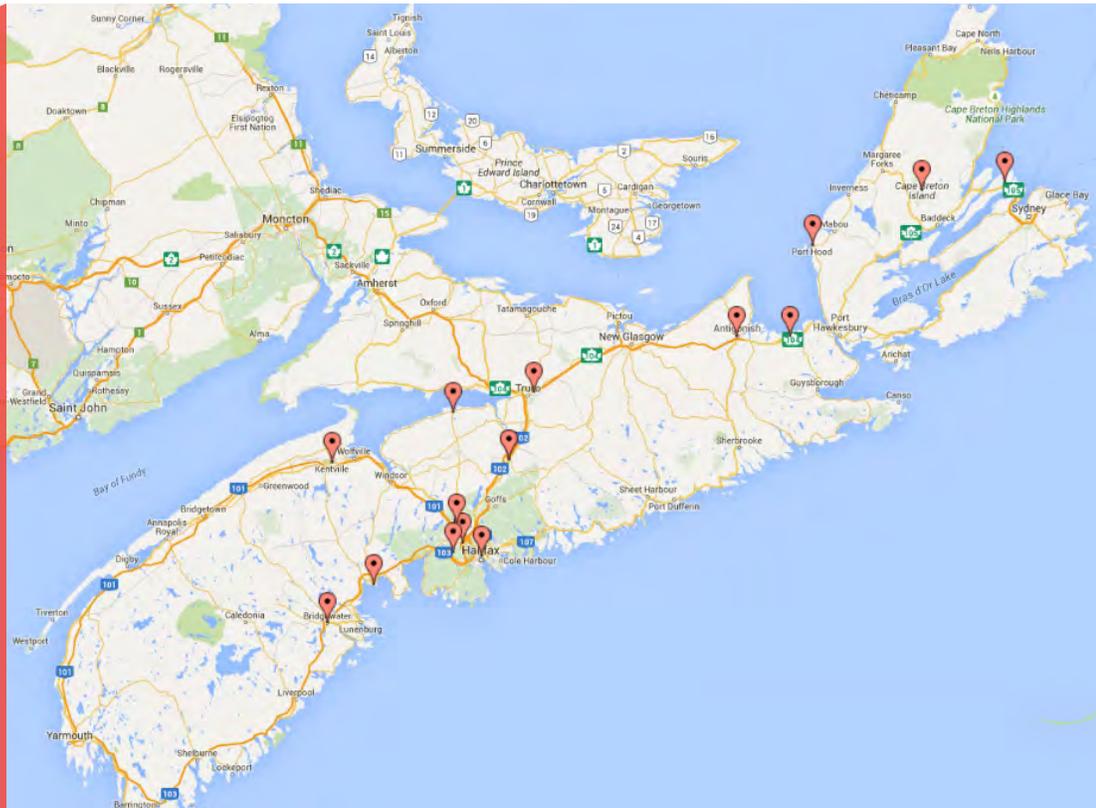
BIOFUEL WEISS
info@biofuelweiss.ca
1.902.266.4266



BIOMASS COMFIT PROJECTS

VARIOUS PROVINCE-WIDE, NS

16 biomass projects across the province supported through the COMFIT Program.



QUICK FACTS

- ▶ Generation: 23.75MW
- ▶ Project Range: 0.1MW - 6MW
- ▶ Energy Type: Biomass
- ▶ Status: Development Phase
- ▶ Scale: Project
- ▶ Sector: Multi-sector
- ▶ Owner/Operator: Various

DESCRIPTION

The Nova Scotia Community Feed-in Tariff (COMFIT) Program encourages community-based, local renewable energy projects by guaranteeing a rate per kilowatt-hour for the energy the project feeds into the province’s distribution electrical grid.

MORE INFORMATION

energy.novascotia.ca/renewables/programs-and-projects/comfit

batchgeo.com/map/NSCOMFITprojects

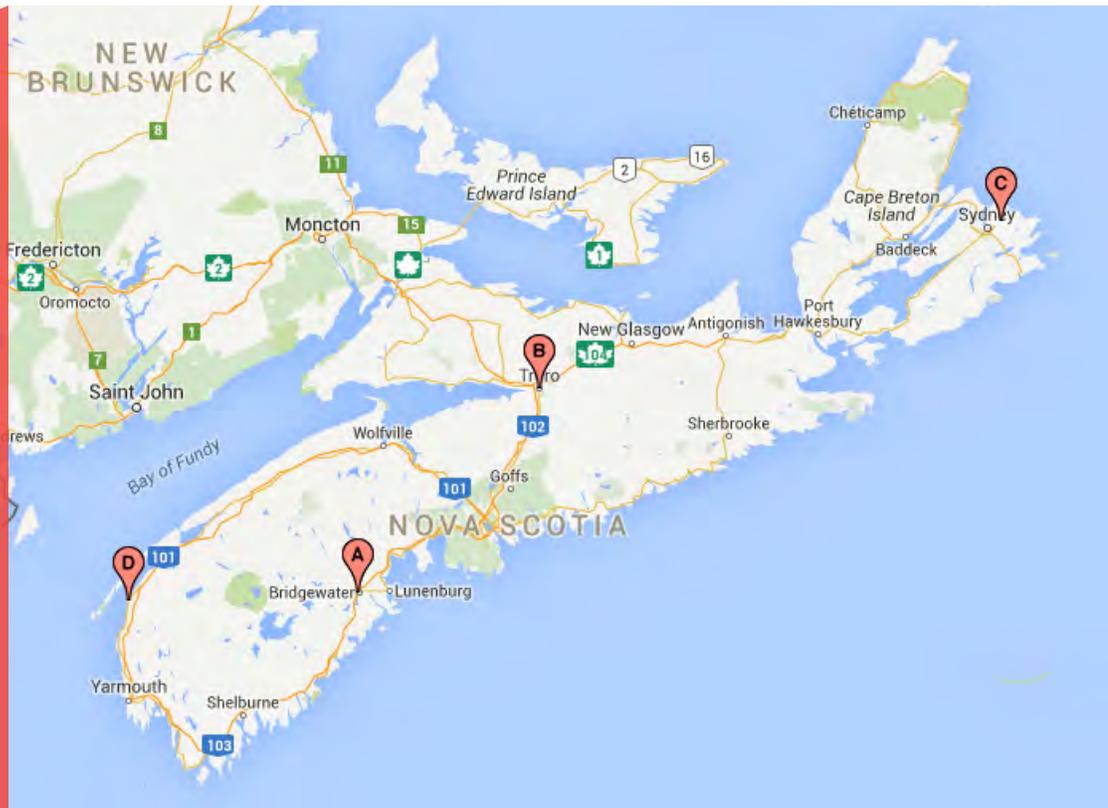
CONTACT

COMFIT ADMINISTRATOR
comfit@gov.ns.ca

CAMPUS BIOMASS PROJECTS

MULTIPLE CAMPUSES PROVINCE-WIDE, NS

At least 4 campuses in Nova Scotia have or are developing biomass facilities on site.



QUICK FACTS

- ▶ Funded by: COMFIT, private
- ▶ Energy Type: Biomass
- ▶ Status: Development Phase, Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional
- ▶ Owner: Multiple Universities

DESCRIPTION

The following educational institutions in Nova Scotia use biomass to support their energy demand:

- Dalhousie Agricultural Campus
- Université Sainte Anne
- Cape Breton University
- NSCC Bridgewater Campus

MORE INFORMATION

- ▶ www.biomasscenter.org/images/stories/agcollege.pdf
- ▶ www.greenenergyfutures.ca/blog/st-anne-university-story-nova-scotias-greenest-little-campus
- ▶ www.cbu.ca/sustainability/green-campus

CONTACT

DR. ALAIN JOSEPH
 alain.joseph@nsc.ca
 1.902.491.1714

CELLUFUEL BROOKLYN PROJECT

**BROOKLYN
QUEENS COUNTY, NS**

\$5 Million plant converting wood to biofuel.

QUICK FACTS

- ▶ Cost: \$5 Million
- ▶ Funded by: Private Equity, Provincial and Federal Funding
- ▶ Job Creation: 10
- ▶ Generation: 20M litres fuel/year
- ▶ Payback Period: 4 years
- ▶ Energy Type: Biogas
- ▶ Scale: Project
- ▶ Sector: Energy
- ▶ Status: Implemented
- ▶ Owner: Cellufuel Inc.
- ▶ Completed: April 9, 2015

CONTACT

CHRIS HOOPER
chris.hooper@cellufuel.com
1.800.893.2708



DESCRIPTION

CelluFuel Inc. plans to refine woody biomass into low-emission diesel fuel. Currently, the company is building a \$5M, 1.5 million litre biodiesel demonstration-scale plant at ReNova, the former Bowater Mersey Mill in Liverpool, Nova Scotia. With anticipated test-site success, CelluFuel plans to develop a \$35M commercial operation requiring 80,000 green tonnes of fibre annually and producing 20 million litres of fuel which is being exported for international markets.

MORE INFORMATION

www.cellufuel.com



HIGHLAND ENERGY SACKVILLE LANDFILL

**BEDFORD
HALIFAX COUNTY, NS**

Methane capture and power generation from a closed landfill.



QUICK FACTS

- ▶ Funded by: Private
- ▶ Generation: 2MW/year
- ▶ Energy Type: Biogas
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Municipal, Energy
- ▶ Owner/Operator: Highland Energy
- ▶ Completed: January 1, 2006

DESCRIPTION

Largest landfill gas capture and power generation system east of Montreal. Built in 2006, the collection system consists of 74 landfill gas wells and the collection system to bring the landfill gas to the power plant. Commercial operations began in 2006 and have run continuously, producing 2 MW of power annually. The environment and surrounding areas around the landfill have improved significantly - vegetation has flourished and odour issues and gas migration have been eliminated.

MORE INFORMATION

www.highland-energy.com/case_studies.html

CONTACT

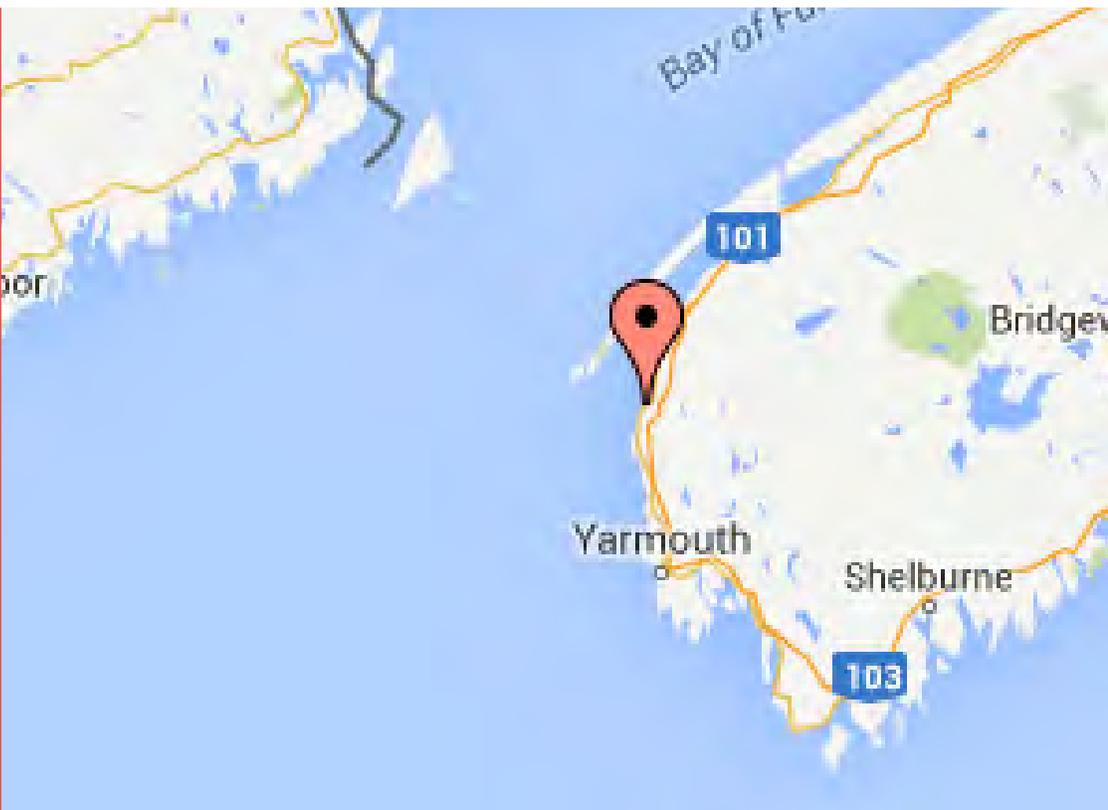
David MacLennan
dbm@highland-energy.com
1.902.864.1567



**MUNICIPAL GENERATOR
PROJECT USING
MINK WASTE**

**WEAVER SETTLEMENT
DIGBY COUNTY, NS**

An anaerobic digester project partnership between local mink ranchers and the Municipality of Digby to help the mink industry deal with waste management.



QUICK FACTS

- ▶ Cost: \$850,000
- ▶ Funded by: Gas Tax
- ▶ Job Creation: 3
- ▶ Generation: 4M kwh/year
- ▶ Payback Period: 4 years
- ▶ Energy Savings:
GHG Reductions
- ▶ Energy Type: Biogas
- ▶ Status: Implemented
- ▶ Scale: Community-wide
- ▶ Sector: Municipal
- ▶ Owner: Digby Municipality
- ▶ Operator: Southwest Eco-Energy
- ▶ Completed: May 5, 2015

DESCRIPTION

The Municipality of Digby obtained a COMFIT award for 600 kW of power. The municipality chose Martin Machinery, Latham Missouri, to build a containerized unit to house the synchronous generator (Stamford), which works synchronously with the grid. The engine is a Guascor lean burn biogas design (Spanish manufacturer) and using filters can burn biogas (methane) - similar to natural gas. Designed to return heat to the digester to bring the temperature up to 50°C. The emissions meet standards set by Environment Canada and US EPA. Once operational the unit can produce 4,000,000 kwh per year, enough to power approximately 450 homes. Total cost of generator and connection to the grid - \$850,000.

MORE INFORMATION

- www.digbydistrict.ca/anaerobic-digester.html
- www.southwestecoenergy.ca

PROJECT PARTNERS

- NS Department of Energy
- NS Department of Environment
- NS Department of Labour
- CAS

CONTACT

TERRY THIBODEAU
tthibodeau@municipality.digby.ns.ca



OCEAN NUTRITION BIOFUEL PLANT

**MULGRAVE
GUYSBOROUGH COUNTY, NS**

Biofuel production system using marine microorganism with a high concentration of oil.

QUICK FACTS

- ▶ Funded by: STDC, NRCan, Lockheed Martin
- ▶ Energy Type: Biofuel
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Manufacturing
- ▶ Owner: Ocean Nutrition

CONTACT

IAN LUCAS
ilucas@ocean-nutrition.com
1.902.480.3216



DESCRIPTION

Scientists discovered a heterotrophic algae that is 60 times more productive at making oils than other types of algae that rely on sunlight and CO₂. Heterotrophs, like humans, grow by eating carbon-based materials. Ocean Nutrition Canada, which has patented the unique organism — called ONC T18 B — was approached by members of the biofuel industry and encouraged to lead a project consortium funded by Sustainable Development Technology Canada and which includes the National Research Council and Lockheed Martin. They plan to demonstrate they can grow the algae on a large scale using a waste stream feedstock. Project partner Honeywell UOP will convert the algae oil into jet fuel.

MORE INFORMATION

meg-3.com/

www.cleanbreak.ca/tag/ocean-nutrition-canada/

PROJECT PARTNERS

SDTC
NRCan
Lockheed Martin



POWER STRENGTH & ENERGY SOLUTIONS HEATING SYSTEM

CLEVELAND
RICHMOND COUNTY, NS

Power Strength & Energy Solutions Ltd. installs high-efficient hydronic wood stoves with a high-efficient solar thermal system and uses the harvested energy to heat water for space heating and domestic hot water.



QUICK FACTS

- ▶ Cost: \$10,000 - \$25,000
- ▶ Payback Period: 4-8 years
- ▶ Cost Savings: \$3000/year
- ▶ Energy Savings: up to 45,000 kWh/year
- ▶ Energy Type: Biomass, Solar Thermal
- ▶ Status: Implemented
- ▶ Scale: Project, Technology
- ▶ Sector: Residential, Energy
- ▶ Owner: Roland Bathen

DESCRIPTION

The PSES Heating System is simple with minimal technical parts. Comprised of a high-efficient hydronic wood stove and solar thermal system, it uses harvested energy to heat water for space heating and domestic hot water. A solar controller directs the backup heat source which can be any hydronic heating system or an electric heat element.

MORE INFORMATION

www.pses.ca

www.walltherm.ca

PROJECT PARTNERS

aBetter Connection Halifax
Landry Broth Louisdale

CONTACT

ROLAND BATHEN
info@pses.ca
1.902.625.3612



SCOTIA ATLANTIC BIOMASS

MUSQUODOBOIT
HALIFAX COUNTY, NS

Viridis Energy produces 120,000 tonnes of industrial wood pellets annually. The facility is located in central Nova Scotia.

SCOTIA ATLANTIC BIOMASS

QUICK FACTS

- ▶ Generation: 120,000 tonnes
- ▶ Energy Type: Biomass
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Energy
- ▶ Owner: Viridis Energy Inc.

DESCRIPTION

Scotia Atlantic Biomass Ltd., a subsidiary of Viridis Energy, produces up to 120,000 tonnes industrial wood pellets per year. Halifax Grain Elevator Ltd. provides storage for over 50,000 tonnes of pellets before shipping them to Europe. The dedicated storage facility allows Scotia Atlantic Biomass to consolidate volume before exporting, resulting in significant savings on shipping and maximizing the opportunities presented by the Canada and EU Comprehensive Economic and Trade Agreement (CETA). The plant resides on a 157-acre property, inhabiting 20 operating buildings with an additional 22-acre wood lot. Using five pellet presses, the plant has a 120,000 to 150,000 metric ton production capacity annually. As one of the largest plants in Eastern Canada, Scotia Atlantic is ideally located to service the growing demand for industrial pellets in Europe.

MORE INFORMATION

www.viridisenergy.ca/products/scotia_atlantic/

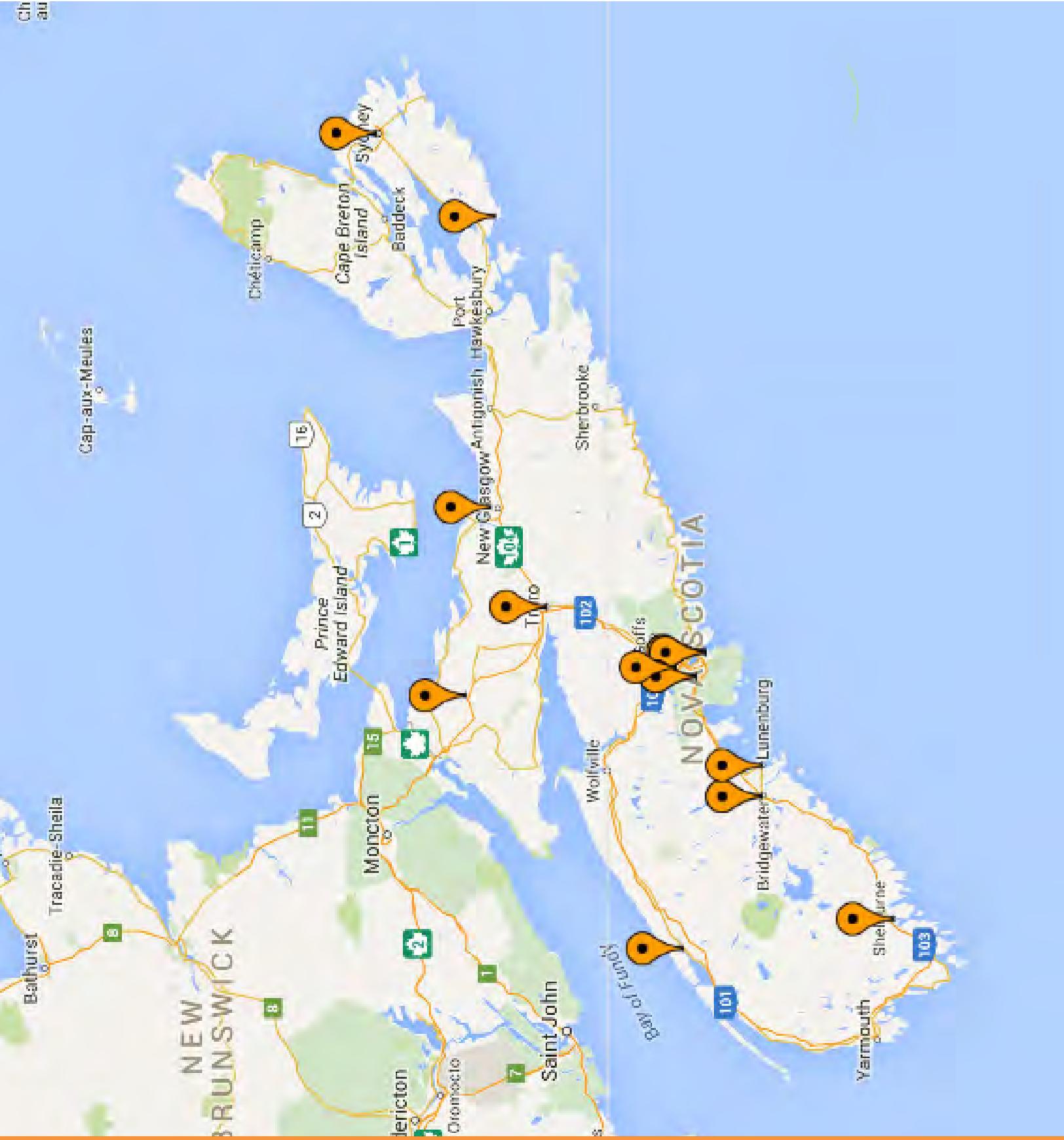
CONTACT

JULIE MILLINGTON
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VIRIDIS ENERGY INC.

ENERGY EFFICIENCY



ANNAPOLIS ROYAL LED STREETLIGHTS

ANNAPOLIS ROYAL ANNAPOLIS COUNTY, NS

In 2009, funding by Conserve NS and ecoNova Scotia made it possible for 1,100 energy-efficient LED streetlights to be installed in the province. Annapolis Royal was the only town to be completely refitted with the lights. The Nova Scotia government has legislated that all towns adopt LED streetlights.

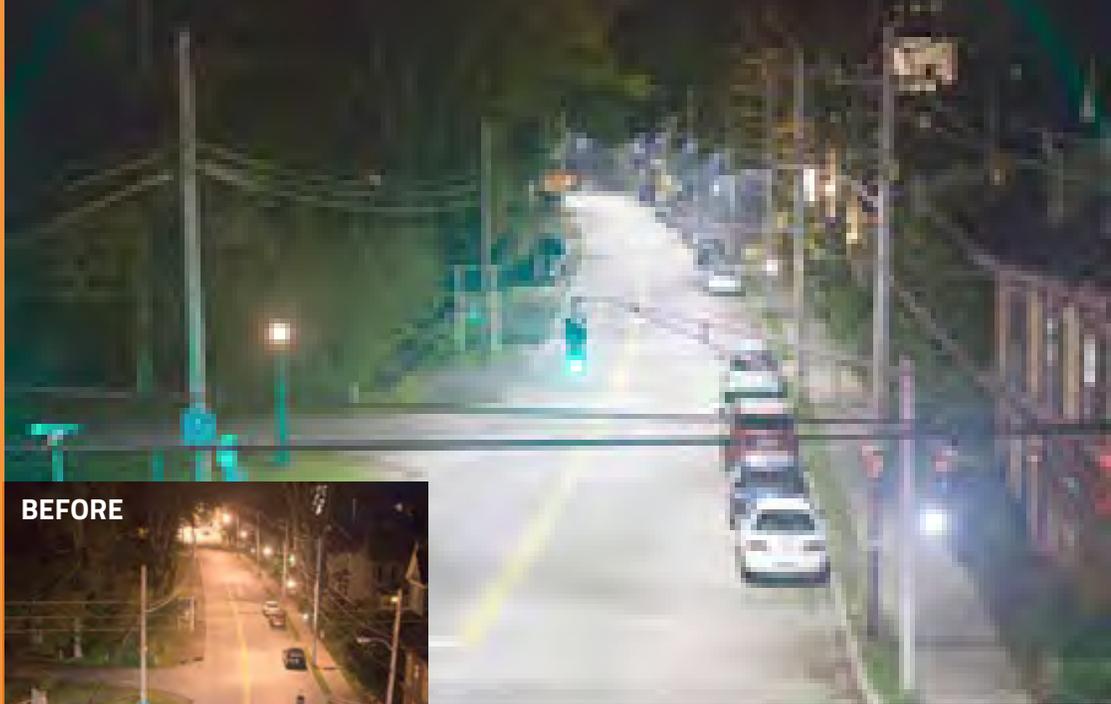
QUICK FACTS

- ▶ Funded by: Conserve NS, ecoNova Scotia
- ▶ Energy Type: Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Community-wide
- ▶ Sector: Municipal
- ▶ Owner: Town of Annapolis Royal
- ▶ Completed: 2009

CONTACT

SANDI MILLETT-CAMPBELL
phmc@annapolisroyal.com

AFTER



BEFORE



DESCRIPTION

Annapolis Royal was the first town in Canada to be completely refitted with energy-efficient LED street lights for a total of 131 LED lights. The Satellite Series LED streetlights manufactured by LED Roadway Lighting in Amherst, Nova Scotia offer a significant reduction in power consumption over High-Pressure Sodium (HPS) and Metal Halide (MH) systems. The LED street lights meet International Dark Sky Association requirements with no up-light or light pollution. The LED streetlights also boast a significant reduction in the cost of fixture maintenance with a 20 year total system design life and reduction in greenhouse gas emission, and no mercury or lead is contained in the fixture.

MORE INFORMATION

annapolisroyal.com/town-hall/streetlights

www.ledroadwaylighting.com

energy.novascotia.ca/energy-efficiency/efficiency-and-conservation/buildings-and-appliances/led-street-lighting

PROJECT PARTNERS

LED Roadway Lighting



BRIDGEWATER MEMORIAL ARENA LIGHTING RETROFIT

**BRIDGEWATER
LUNENBURG COUNTY, NS**

Comprehensive retrofit of all lighting in the Bridgewater Memorial Arena to high efficiency T8 fluorescent lighting.



QUICK FACTS

- ▶ Cost: \$20,000 (actual, rounded)
- ▶ Funded by: Town of Bridgewater, ecoNova Scotia, Efficiency Nova Scotia
- ▶ Cost Savings: \$8,900 (estimate), \$8,200 (actual)
- ▶ Payback Period: 2.2 years
- ▶ Energy Savings: 48,300 kWh (estimate), 54,600 kWh (actual)
- ▶ Energy Type: Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Municipal
- ▶ Owner: Town of Bridgewater
- ▶ Completed: November 30, 2010

CONTACT

LEON DEVREEDE
ldevreede@bridgewater.ca
1.902.541.4390

DESCRIPTION

Replacement of 49 HID high bay lights of the ice surface with new fixtures containing 6 x 8T fluorescent tubes, and approximately 100 other antiquated fixtures (mostly T12) with 8T fixtures and tubes throughout the rest of the building. An ice surface lighting study was conducted by the installer before the lighting was installed to ensure that the new lighting would provide suitable light quality, and detailed energy calculations were performed as part of two major project grants obtained from Efficiency One and the Province of Nova Scotia before any lighting was installed. The upgrade was estimated to result in a 44% reduction in lighting energy consumption. Other benefits of the project included the ability to turn ice lighting on and off quickly, eliminating the need for long warm-up times, and a significant overall improvement in lighting quality throughout the building.

MORE INFORMATION

www.sustainability-unsm.ca/bridgewater-path-to-sustainability.html

youtu.be/YlprFje2SjY

PROJECT PARTNERS

ecoNova Scotia
Efficiency Nova Scotia



CAPITAL HEALTH ENERGY EFFICIENCY UPGRADES

HALIFAX
HALIFAX COUNTY, NS

Capital Health has made a commitment to reduce its 2014 energy usage by 15% by 2016.



QUICK FACTS

- ▶ Funded by: Capital Health, Efficiency Nova Scotia
- ▶ Cost Savings: ~ \$1 Million
- ▶ Energy Savings: 5.6 GWh (2014)
- ▶ Energy Type: Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional
- ▶ Owner/Operator: Capital Health
- ▶ Implemented: 2014

DESCRIPTION

Capital Health worked with staff and an energy advisor to identify opportunities from lighting to air handling unit changes.

MORE INFORMATION

[www.youtube.com/
watch?v=CHwozBoeNT0](http://www.youtube.com/watch?v=CHwozBoeNT0)

[www.youtube.com/
watch?v=g9Rd0d5G7E0](http://www.youtube.com/watch?v=g9Rd0d5G7E0)

PROJECT PARTNERS

Efficiency Nova Scotia

CONTACT

Amelia Warren
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1.877.999.6035



CULTURE OF EFFICIENCY NON-PROFIT ENERGY EFFICIENCY UPGRADES

VARIOUS NON-PROFITS PROVINCE-WIDE, NS

The EAC has worked with 15+ non-profits to improve the sustainability of their core operations by reducing their energy costs and greenhouse gas emissions.



QUICK FACTS

- ▶ Funded by: Efficiency Nova Scotia
- ▶ Energy Type: Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Community-wide
- ▶ Sector: Institutional
- ▶ Owner/Operator: Various
- ▶ Completed: August 1, 2014

DESCRIPTION

The Ecology Action Centre challenged non-profit organizations across the province to reduce their energy consumption in a variety of ways:

- Improving the building envelope
- Reducing consumption in appliances
- Decreasing lighting load
- Lowering water usage
- Participating in Efficiency Nova Scotia programs
- Monitoring electricity usage

The hope is that the *Culture of Efficiency* project can encourage not-for-profit organizations to find ways to save energy in their own buildings.

MORE INFORMATION

www.ecologyaction.ca/files/images-documents/file/Energy/EnergyEfficiencyStories_Aug2014.pdf

PROJECT PARTICIPANTS

- Autism Nova Scotia
- Beacon United Church
- The Deanery Project
- Halifax Music Co-op
- Hillside Pines
- L'Atelier de Clare
- Metro Community Housing Association
- New Boundaries
- Queens Association for Supported Living
- Spring House
- St. Paul's Family Resource Institute
- Yarmouth Life Skills for Disabled Adults
- The Youth Project
- YMCAs of Cape Breton

CONTACT

EMMA NORTON
efficiency@ecologyaction.ca
1.902.429.2202



DALHOUSIE UNIVERSITY COMPRESSED AIR AUDIT

HALIFAX
HALIFAX COUNTY, NS

Conducted a 4 month compressed Air Audit on Dalhousie's Halifax campuses. Included all compressed air lines, air compressors and air dryers.



QUICK FACTS

- ▶ Funded by: Dalhousie University, Efficiency Nova Scotia
- ▶ Cost Savings: \$75,063/year
- ▶ Payback: 2 years
- ▶ Energy Savings: 500,420 kWh
- ▶ Energy Type: Energy Efficiency
- ▶ Status: Development Phase
- ▶ Scale: Project
- ▶ Sector: Institutional
- ▶ Owner: Dalhousie University

DESCRIPTION

The compressed air audit identified, labelled and logged air leaks in compressed air lines throughout the campus. This process made the air leaks easy to locate and fix. Leaky air lines can cause compressors to run over time and consume unnecessary electricity. The audit also identified redundant equipment.

PROJECT PARTNERS

Efficiency Nova Scotia

CONTACT

Glen MacDougall
gmacdougall@dal.ca
1.902.802.9845



DALHOUSIE UNIVERSITY RE-COMMISSIONING OF MARION MCCAIN BUILDING

HALIFAX
HALIFAX COUNTY, NS

Dalhousie hired a consultant to recommission the 14 year old Marion McCain Arts and Social Sciences Building to ensure it was running optimally.



QUICK FACTS

- ▶ Funded by: Dalhousie University, Efficiency Nova Scotia
- ▶ Cost Savings: ~ \$40,000/year
- ▶ Payback Period: 2 years
- ▶ Energy Savings: 300,000 kWh
- ▶ Energy Type: Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional
- ▶ Owner: Dalhousie University

DESCRIPTION

The 2-3 month recommissioning process investigated the operation of all building systems, including HVAC systems, draft repairs, and building automation. These systems were then tweaked, repaired or replaced to provide optimal running conditions that consider both energy efficiency and occupant comfort. The project focus was to optimize building performance as related to occupancy comfort. The recommissioning process identified some preventative maintenance opportunities on specific building systems.

PROJECT PARTNERS

Efficiency Nova Scotia

CONTACT

Glen MacDougall
gmacdougall@dal.ca
1.902.802.9845



ENERGY EFFICIENT NEW SOBEYS STORES

NEW SOBEYS LOCATIONS PROVINCE-WIDE, NS

Sobeys implemented a company-wide energy efficiency strategy to reduce corporate energy consumption.



QUICK FACTS

- ▶ Funded by: Sobeys, Efficiency Nova Scotia
- ▶ Cost Savings: \$5,000/month per store, company-wide savings of \$500,000/year
- ▶ Payback Period: 1.4 years
- ▶ Energy Savings: 4.9 GWh/year, 3,700 tonnes / CO₂
- ▶ Energy Type: Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Retail
- ▶ Owner: Sobeys
- ▶ Completed: 2012

DESCRIPTION

To date, energy usage has been reduced by over 4.9 GWh, saving \$500,000 in annual electricity costs and reducing 3,700 tonnes of CO₂ emissions. All new stores in Atlantic Canada will incorporate energy efficient technologies including: energy efficient motors and LED lighting in the cases, night curtains, high efficiency T5 lighting, variable speed drives on HVAC systems, natural lighting, exterior LED signs. The average electricity bill per store was approximately \$20,000/month. New stores that have installed energy efficient technology are spending approximately \$15,000/month.

MORE INFORMATION

www.youtube.com/watch?v=9mT11tVOSYA

PROJECT PARTNERS

Efficiency Nova Scotia

CONTACT

AMELIA WARREN
awarren@efficiencyns.ca
1.877.999.6035



GROWING FORWARD & GROWING FORWARD 2

VARIOUS LOCATIONS PROVINCE-WIDE, NS

Funding support was available to farmers to make energy efficiency, energy conservation and renewable energy upgrades on-farm.



QUICK FACTS

- ▶ Funded by: Agriculture and Agri-Food Canada, NS Department of Agriculture, Efficiency Nova Scotia
- ▶ Energy Type: Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Community-wide
- ▶ Sector: Agriculture
- ▶ Owner/Operator: Various

DESCRIPTION

Through Growing Forward, farmers had resource support from a Farm Energy Specialist and financial support for Beneficial Management Practices (BMPs) and Energy Pilot Projects.

Examples of farmers who have made energy improvements:

- Lighting Retrofit: Cox Brothers, Poultry Farm, Maitland, NS
- Ground Source Heat Pumps: Round Hill and Brookside Poultry Farm, Round Hill, NS
- Solar Powered Cold Storage / Food Dehydrator: Waxwing Farm, Windemere, NS
- Energy Efficient Cold Storage/ Evaporator Controllers: Stirling Fruit Farm, Greenwich, NS
- Barn Retrofit Plate Cooler/Heat Reclaimer: Lindenright Holsteins, Antigonish, NS
- Broiler Barn Solar Wall & Ventilation: Cornwallis Farm Ltd., Port Williams

MORE INFORMATION

novascotia.ca/agri/programs-and-services/financial-funding/growing-forward2/

novascotia.ca/thinkfarm/documents/fsheets/09-farm-energy.pdf

nsfa-fane.ca/programs-projects/farm-energy-improvements/

www.nsac.ca/fens/

www.youtube.com/watch?v=K7q4NFxIYhA

www.youtube.com/watch?v=TdZzPgPqwmM

PROJECT PARTNERS

Efficiency Nova Scotia
 Nova Scotia Federation of Agriculture
 Think Farm
 FENS

CONTACT

JULIE BAILEY
 baileyja@gov.ns.ca
 1.902.896.4473



ICE RINK ENERGY PROJECT

VARIOUS LOCATIONS PROVINCE-WIDE, NS

As of 2011, 63 of the provinces' 84 arenas were retrofitted as part of the Ice Rink Energy Project. Energy efficiency retrofits included heat recapture, lighting retrofits, and low-e ceiling ice surfaces.



QUICK FACTS

- ▶ Funded by: Efficiency Nova Scotia, NS Dept. of Health Promotion and Protection
- ▶ Energy Type: Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional
- ▶ Owner/Operator: Various

DESCRIPTION

As part of a wider initiative to improve efficiency across a number of ice rinks in Nova Scotia, Kentville Centennial Arena made significant energy savings. The facility installed lighting upgrades, including a low-e ceiling over their ice surface, added heat recovery and improved their water treatment. Their measures saved 171,645 kWh each year resulting in over \$14,000 of annual savings.

63 arenas have been retrofitted and include:

- (A) Kentville Centennial Arena
- (B) Dr. Bernie MacLean Cultural and Recreation Centre
- (C) Antigonish Arena
- (D) Canso Arena
- (E) New Glasgow Arena
- (F) Eleanor Pew Morris Memorial Arena
- (G) Bayplex
- (H) Springhill Arena
- (I) Parrsboro Lions Recreation

MORE INFORMATION

www.unsm.ca/green-toolbox-funding-opportunities-and-announcements-may-june-2013.html

www.cumberlandnewsnow.com/News/Local/2011-10-04/article-2766589/Arena-receives-efficiency-upgrades/1

batchgeo.com/map/NSenergyefficientarenas

PROJECT PARTNERS

Efficiency Nova Scotia
NS Dept. of Health Promotion and Protection



CONTACT

CATHERINE KERSTEN
rfans@sportnovascotia.ca
1.902.425.5450 ext. 330



INTERTAPE POLYMER STRATEGIC ENERGY MANAGEMENT

TRURO
COLCHESTER COUNTY, NS

Intertape Polymer converts plastic pellets into woven products. They are a world class facility in Nova Scotia.



QUICK FACTS

- ▶ Funded by: Intertape Polymer, Efficiency Nova Scotia
- ▶ Cost Savings: ~20-30%
- ▶ Energy Savings: 5.6 GWh (2014)
- ▶ Energy Type: Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Manufacturing
- ▶ Owner/Operator: Intertape Polymer
- ▶ Implemented: 2014

DESCRIPTION

Intertape Polymer's latest partnership with Efficiency Nova Scotia has led to the establishment of a successful Strategic Energy Management Program. The company formed a multi-disciplinary team and a key exercise of the team was to perform an energy scan of the plant for a day and a half. The scan looked at the processes that used energy and where energy could be saved. This exercise helped employees realize how much energy was being used and the cost associated with it. Through the Strategic Energy Management Program Intertape Polymer was able to model their past energy usage and compare it against current usage. As a result the company has cut costs by 20-30%.

MORE INFORMATION

youtu.be/2LviRQYnkFE

PROJECT PARTNERS

Efficiency Nova Scotia - Strategic Energy Management Program

CONTACT

Amelia Warren
awarren@efficiencyns.ca
1.877.999.6035



LOBSTERS 'R' US SEAFOOD

BRIDGEWATER
LUNenburg COUNTY, NS

Lobsters 'R' Us Seafood grades and stores lobsters and snow crab. With the help of Efficiency NS incentives and rebates the company built an energy-efficient life storage system allowing Lobsters 'R' Us to lower operating costs and compete in higher margin markets overseas.



QUICK FACTS

- ▶ COST: \$1.5 Million storage facility
- ▶ Funded by: Lobsters 'R' Us Seafood, Efficiency Nova Scotia
- ▶ Cost Savings: \$90,000 projected annually
- ▶ Payback Period: 1.4 years
- ▶ Energy Savings: ~1 GWh projected annually; saves \$0.25-\$0.35 per pound of lobster
- ▶ Energy Type: Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Retail
- ▶ Owner: Blaire Martell
- ▶ Completed: 2012

CONTACT

BLAIRE MARTELL, OWNER
blaire.martell@ns.sympatico.ca
1.902.587.2202

DESCRIPTION

In 2012, Lobsters 'R' Us Seafood built an energy-efficient 3-room, \$1.5 million live storage facility holding up to 450,000 pounds of live lobster and snow crab for as long as 150 days. It is expected to save over 1 GWh or \$90,000 annually in electrical costs compared to a standard trickle system. The system includes an electrically powered water pumping and cooling system and a sophisticated biofiltering system for ammonia that will be computer monitored.

MORE INFORMATION

www.youtube.com/watch?v=CGexYegNlts

www.energycyns.ca/wp-content/uploads/2013/12/Lobsters-R-Us-Seafood-Case-Study_VF.pdf

lobstersrus.ca/

PROJECT PARTNERS

Efficiency Nova Scotia



LUNENBURG SMART METER PILOT PROGRAM

LUNENBURG
LUNENBURG COUNTY, NS

18 Residential Unit and 6 Commercial
Unit Smart Meter Project



QUICK FACTS

- ▶ Energy Type: Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Multi-Sector
- ▶ Owner: Town of Lunenburg
- ▶ Completed: 2013

DESCRIPTION

The Smart Meter Pilot Program is a component of Lunenburg Community Network with support from Lunenburg Electric Utility. The program has run a small pilot of 18 residential meter participants and 6 commercial participants. Installed in 2013, the Town WIFI system is used to capture meter data. There is a potential opportunity for infrastructure leverage for gas meters and water meters.

MORE INFORMATION

www.cbc.ca/news/canada/nova-scotia/lunenburg-launches-smart-meter-project-1.1349499

PROJECT PARTNERS

Lunenburg Community Network
Lunenburg Electric Utility

CONTACT

JULIAN BOYLE
jboyle@explorelunenburg.ca



MI'KMAQ SUSTAINABLE HOUSING

13 MI'KMAQ COMMUNITIES PROVINCE-WIDE, NS

In this pilot project, nearly 1,900 homes in 13 First Nation communities developed skills while saving energy and money as part of an innovative pilot project to promote energy efficiency.



QUICK FACTS

- ▶ Cost: \$1 Million
- ▶ Funded by: Efficiency Nova Scotia, Province of Nova Scotia, Kwilmu'kw Maw-klusuaqn Negotiation Office / Mi'kmaq Rights Initiative
- ▶ Energy Savings: \$180/year (per residence), \$330,000/year (total), 1,800 tonnes / CO₂
- ▶ Energy Type: Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Community-wide
- ▶ Sector: Residential
- ▶ Completed: 2014

DESCRIPTION

Thirty-six First Nations community members completed training to install energy efficient lighting, electric hot water tank and pipe wrap, low-flow showerheads and other upgrades in First Nations homes. The installers also provided residents with information and advice to help them save. The pilot will prevent more than 1,800 tonnes of carbon dioxide from entering the atmosphere each year, which is equivalent to taking around 350 cars off the road.

MORE INFORMATION

thechronicleherald.ca/novascotia/1133850-ns-funds-1m-energy-program-for-mi-kmaq-communities

www efficiencyns.ca/mikmaq-communities-develop-skills-save-energy-lower-costs-efficiency/

www.sustainablehousing.ca/

PROJECT PARTNERS

Efficiency Nova Scotia
Kwilmu'kw Maw-klusuaqn Negotiation Office / Mi'kmaq Rights Initiative
Sustainable Housing



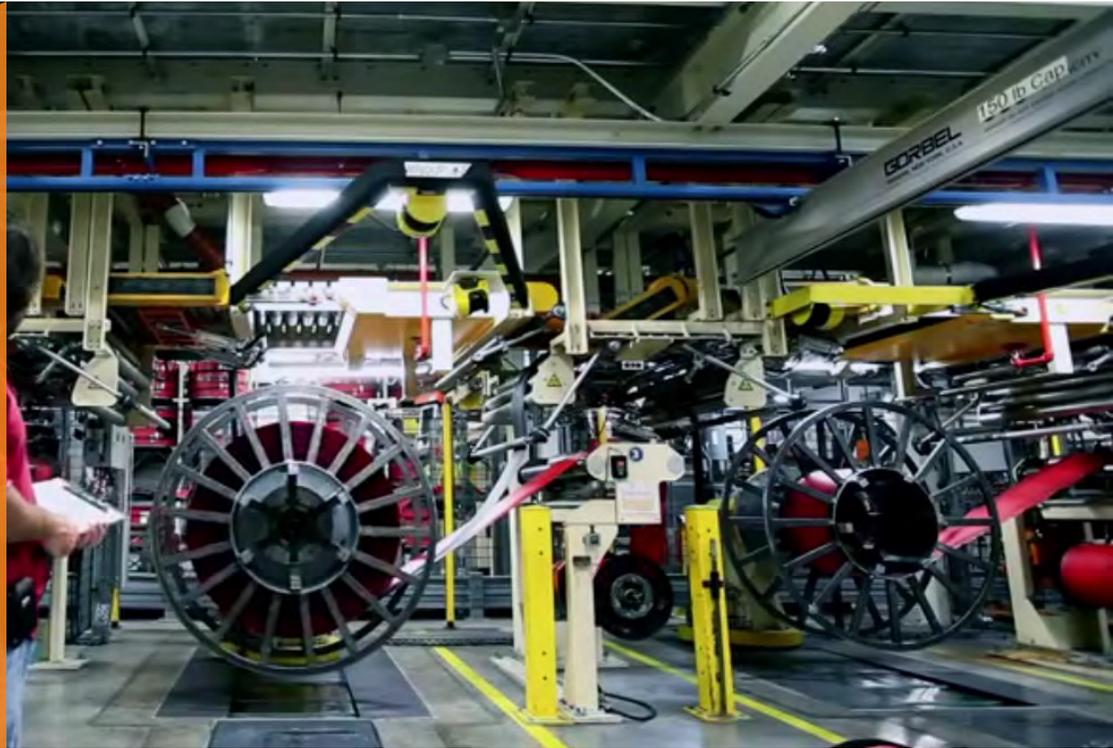
CONTACT

AMELIA WARREN
awarren@efficiencyns.ca
1.877.999.6035

MICHELIN ENERGY EFFICIENCY EMPLOYEE ENGAGEMENT

**BRIDGEWATER
LUNENBURG COUNTY, NS**

Michelin encouraged all of its plants to improve energy efficiency by 20 percent over the next five years. To be successful every Michelin employee needs to get involved.



QUICK FACTS

- ▶ Funded by: Michelin, Efficiency Nova Scotia
- ▶ Energy Type: Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Manufacturing
- ▶ Owner/Operator: Michelin
- ▶ Implemented: 2012

DESCRIPTION

Michelin's Bridgewater Plant launched the Energy Olympics to get employees to think about the energy changes that could be made. The Plant hopes to influence other Michelin Plants to do the same thing. The ideas generated can be implemented at the local plants and other Michelin plants worldwide.

MORE INFORMATION

www.youtube.com/watch?v=e2UqrCm4l18

PROJECT PARTNERS

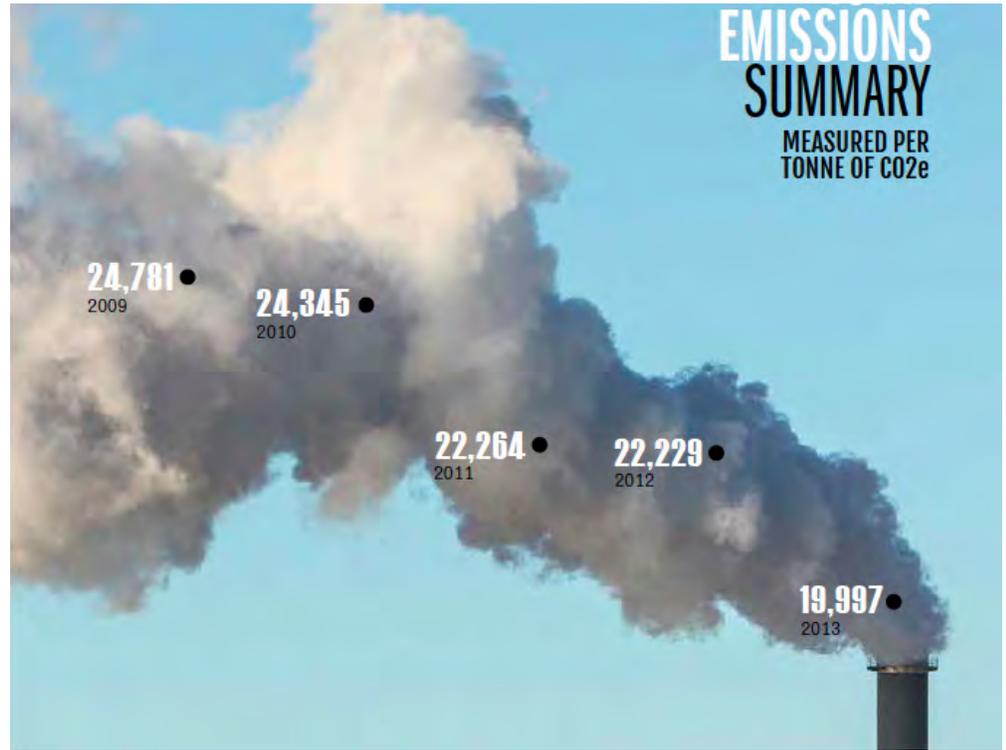
Efficiency Nova Scotia

CONTACT

AMELIA WARREN
awarren@efficiencyns.ca
1.877.999.6035



**EMISSIONS
SUMMARY**
MEASURED PER
TONNE OF CO₂e



NSLC ENERGY EFFICIENCY RETROFITS

26 NSLC LOCATIONS PROVINCE-WIDE, NS

Nova Scotia Liquor Corporation operates 106 stores and a 150,000 ft² warehouse. The company initiated 50 energy efficiency projects in 26 locations.

QUICK FACTS

- ▶ Funded by: NSLC, Efficiency Nova Scotia
- ▶ Cost Savings: \$480,000/year
- ▶ Payback Period: 1.4 years
- ▶ Energy Savings: 4 Million kWh/year, 3,000 tonnes / CO₂
- ▶ Energy Type: Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Retail
- ▶ Owner: NSLC
- ▶ Implemented: 2009-2013

DESCRIPTION

Identified energy efficiency opportunities, including pre-cooling air, reclaiming heat, ECM motors in the coolers, sensor lighting, and induction lighting in the warehouse.

- Upgraded lighting to new, more energy-efficient fixtures including LED and CFL lighting
- Installed Cool Zone fan control and door heat controls
- Installed LED lighting upgrades in refrigeration units
- Installed outside air economizers for free cooling in winter and during cool weather
- Converted to induction lighting in Distribution Centre

MORE INFORMATION

www.youtube.com/watch?v=Pwscflxxtwg

PROJECT PARTNERS

Efficiency Nova Scotia

CONTACT

AMELIA WARREN
awarren@efficiencyns.ca
1.877.999.6035



OXFORD FROZEN FOODS FREEZER TUNNEL UPGRADE

**OXFORD
CUMBERLAND COUNTY, NS**

To freeze 4 million pounds of blueberries to -20 °F, Oxford Frozen Foods built an innovative freezer tunnel that is longer and at a warmer temperature thereby using less refrigerant and saving energy.



QUICK FACTS

- ▶ Funded by: Oxford Frozen Foods, Efficiency Nova Scotia
- ▶ Cost Savings: \$500,000/year (projected)
- ▶ Energy Savings: 3.7 GWh/year (projected)
- ▶ Energy Type: Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Manufacturing
- ▶ Owner/Operator: Oxford Frozen Foods
- ▶ Completed: 2013

DESCRIPTION

Oxford Frozen Foods is the world's largest supplier of wild blueberries, exporting blueberries to China, South Korea, Japan, India and other parts of the world. The harvested blueberries need to be frozen the same day and therefore electricity is one of the highest costs to the business. The company has to freeze 4 million pounds of blueberries to -20°F.

MORE INFORMATION

- oxfordfrozenfoods.com/news/view/19
- www.youtube.com/watch?v=W2qDb_FY4f4

PROJECT PARTNERS

Efficiency Nova Scotia

CONTACT

AMELIA WARREN
awarren@efficiencyns.ca
1.877.999.6035



powerWHYS ENERGY EFFICIENCY APP

VIRTUAL APPLICATION
PROVINCE-WIDE, NS

Residential construction companies become a building renovation affiliate with powerWHYS and get paid to save clients money. Using the technology, contractors earn profits by using the tool and showing clients how renovations can pay for themselves.

QUICK FACTS

- ▶ Energy Type: Energy Efficiency
- ▶ Status: Development Phase
- ▶ Scale: Project
- ▶ Sector: Residential, Service, Energy, Technology
- ▶ Owner: Megan McCarthy

CONTACT

MEGAN MCCARTHY
megan@powerWHYS.com



DESCRIPTION

Independent certified PowerWHYS contractors are able to gather customized building data to connect to products based on their client's specific renovation needs.

Using the powerWHYS tool, contractors audit a building by inputting findings as they go. The audit pairs with energy billing data and real-time data from on-site sockets that are connected to a device in the electrical panel.

Based on data collected, the tool provides recommendations geared toward saving money. The display indicates when an upgrade will pay for itself, allowing users to increase the scale of projects with their customers. Contractors earn commission for every project run through the free tool.

MORE INFORMATION

www.powerWHYS.com



RESIDENTIAL BLUELINE ENERGY MONITORING

THREE RESERVE COMMUNITIES PROVINCE-WIDE, NS

30 Blueline energy monitoring systems have been installed in 3 reserves in Nova Scotia (10 each) to allow residents & Band Council to review energy usage and to pinpoint where improvements can be made.



QUICK FACTS

- ▶ Cost: \$6,000 (\$200/unit)
- ▶ Funded by: Confederacy of Mainland Mi'kmaq
- ▶ Energy Savings: ~ 9% - 17% electrical savings per residence
- ▶ Energy Type: Energy Efficiency
- ▶ Status: Development Phase
- ▶ Scale: Neighbourhood/Development
- ▶ Sector: Residential
- ▶ Owner: Confederacy of Mainland Mi'kmaq
- ▶ Completed: September 2015

DESCRIPTION

The Blueline products are mounted to the residential meters and are connected, through WIFI, to an online interface for viewing. The online interface (Plotwatt) will break down each item (fridge, dryer, heating etc) so that the end user is able to record where they are using most of their energy and even compare it with people in their area or other plotwatt users who have similar sized homes.

MORE INFORMATION

www.bluelineinnovations.com/

PROJECT PARTNERS

Rexel (Nedco)
 Confederacy of Mainland Mi'kmaq
 Blueline Innovations

CONTACT

JEREMY SIMMONS
 jeremy.simmons@nedco.ca
 1.902.450.2115



SANDY POINT SEWAGE TREATMENT PLANT

SHELBURNE
SHELBURNE COUNTY, NS

District of Shelburne has invested in wastewater treatment infrastructure to improve environmental performance, reduce greenhouse gas emissions, and create additional capacity to encourage industrial and high density residential development.



QUICK FACTS

- ▶ Cost: \$2.5 Million
- ▶ Funded by: Federal, Provincial, Municipal Infrastructure Funding
- ▶ Energy Type: Energy Efficiency, Innovative Planning
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Municipal
- ▶ Owner/Operator: Municipality of the District of Shelburne
- ▶ Completed: 2012-2014

CONTACT

EMILY TIPTON

etiption@municipalityofshelburne.ca
1.902.875.3489

DESCRIPTION

Over the past five years, the District of Shelburne has made significant capital investment in wastewater treatment infrastructure to improve environmental performance, reduce greenhouse gas emissions, and create additional capacity to encourage industrial and high density residential development in an appropriate area.

This included design and construction of a new wastewater treatment plant (completed in 2012), the addition of a septage receiving station (completed in 2013) and the cleaning, inspection and repair of the wastewater collection system (completed in 2014).

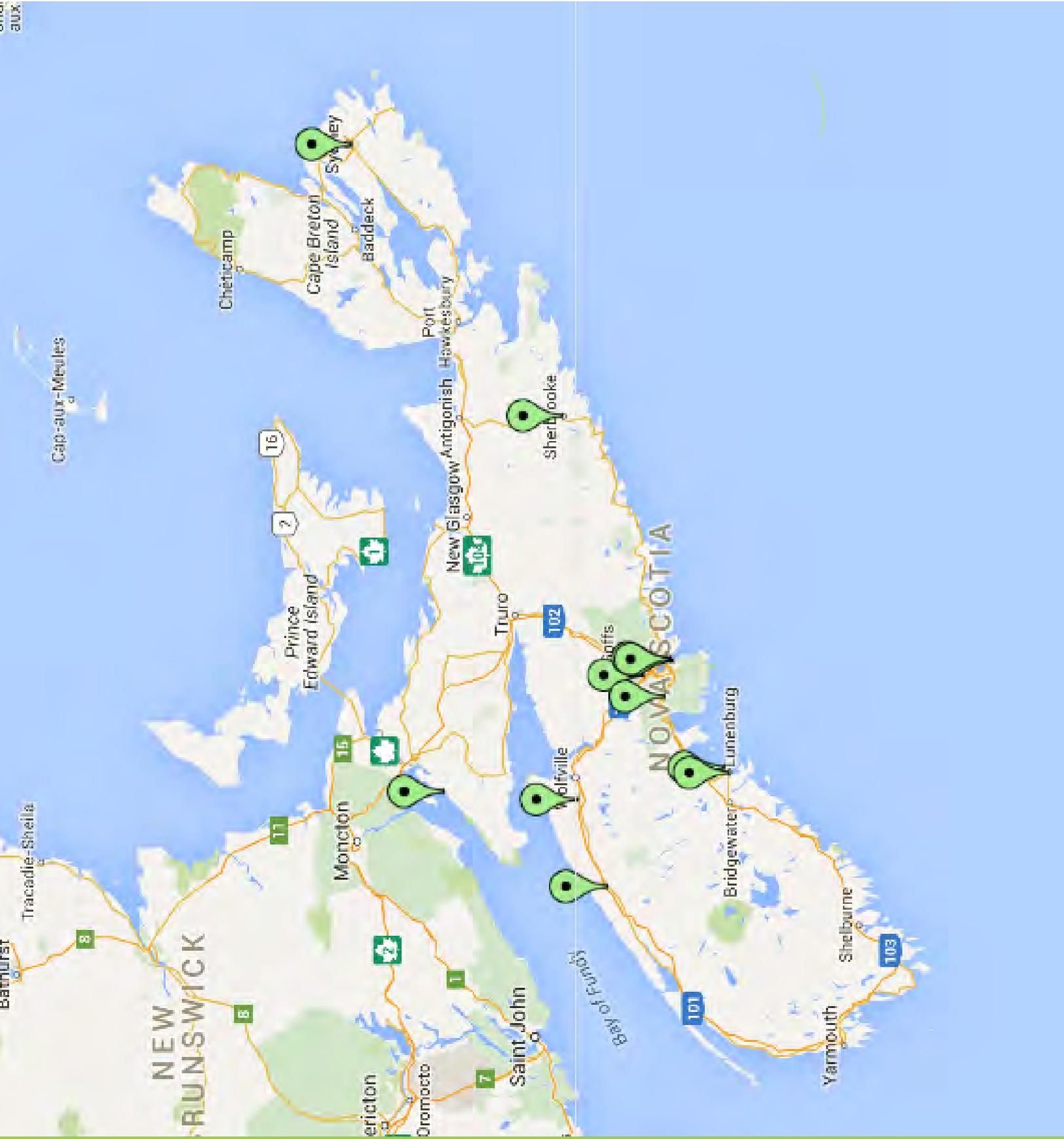
The entire development was part of the implementation of the Integrated Community Sustainability Plan, adopted by Council in 2010, and the project was a case study for the application of a Climate Change Vulnerability Assessment tool developed by Engineers Canada to ensure the infrastructure was appropriately sited and designed to incorporate climate change considerations.

MORE INFORMATION

www.municipalityofshelburne.ca/public-works.html



GREEN BUILDING





BLUENOSE ACADEMY

LUNENBURG
LUNENBURG COUNTY, NS

Built in 2012, the Bluenose Academy was designed to replace four existing schools in the area including the historic Lunenburg Academy. The redesign provided an opportunity to take advantage of green building technology.

QUICK FACTS

- ▶ Renewables: 48.6% energy usage
- ▶ Energy Savings: 56.5% more efficient than comparable building
- ▶ Energy Type: Green Building, Biomass, Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional
- ▶ Owner/Operator: South Shore Regional School Board
- ▶ Completed: 2012

CONTACT

BLUENOSE ACADEMY
ba@ssrsb.ca
1.902.634.2210

DESCRIPTION

The building shares its library, cafeteria, music room, drama room, tech-space and gymnasium with the local community eliminating the need for a separate community centre. The school has a digital display board that tracks energy use and the performance of other environmental systems in the building. The primary heating system in Bluenose Academy is a boiler fueled by wood pellets, the first for a school in Nova Scotia. The wood pellets are from local wood waste from sustainability harvested timber. The building has solar air, solar thermal and solar PV. The building has a daylight strategy and high efficiency lamps and occupancy sensors. The fan units are sized and operated independently. A solar wall is used to pre-heat the air for air handling unit 4 which serves the gym and support areas. The school has a green roof to reduce heating and cooling costs.

MORE INFORMATION

www.sabmagazine.com/blog/2014/03/24/bluenose-academy/

www.ba.ednet.ns.ca/sites/default/files/BA%20GREEN%20SCHOOL.pdf

PROJECT PARTNERS

WHW Architects Inc. (Architecture49)

ARCHITECTURE | 49



ECOLOGY ACTION CENTRE GREEN RENOVATION SHOWCASE

HALIFAX
HALIFAX COUNTY, NS

In 2014-2015, the Ecology Action Centre undertook a major renovation and expansion project, showcasing green renovation techniques for old homes, typical in the Halifax area. Every effort was made to make the project as low-impact as possible and a considerable amount of the project was focused on energy efficiency upgrades.



QUICK FACTS

- ▶ Energy Savings: The kWh/ft² usage will decrease by 30%, despite increasing overall square footage by 50%.
- ▶ Energy Type: Green Building, Energy Efficiency, Solar, Solar Thermal
- ▶ Status: Development Phase
- ▶ Scale: Project
- ▶ Sector: Energy, Commercial, Residential
- ▶ Owner: Ecology Action Centre
- ▶ Completed by: October 2015

CONTACT

EMMA NORTON
efficiency@ecologyaction.ca
1.902.429.2202

DESCRIPTION

In September 2014, the Ecology Action Centre began working on their schematic design for the Fern Lane renovation. Their goals: increase energy efficiency, space, and accessibility to the public. The Ecology Action Centre is a well-respected environmental charity in Nova Scotia and hoped to use this status to promote affordable green renovation techniques to other Nova Scotian individuals and institutions. To increase the energy efficiency of their space they:

- added continuous insulation around the building,
- insulated their unfinished basement,
- built a better insulated roof, and
- invested in energy efficient windows and doors.

The office also features excellent use of day lighting, efficient lighting, and solar thermal panels that are used for in floor radiant heating.

MORE INFORMATION

www.ecologyaction.ca/expansion2014

www.ecologyaction.ca/files/images-documents/EAC%20DD%20Presentation%20-%20FINAL%20-%20FEB%2023%202015.compressed.pdf

PROJECT PARTNERS

Solterre Design
Tekton Design + Build
Sherwood Enterprises
Equilibrium Engineering
Roxul
Kohler
Halifax C&D
Amos Wood
RONA



**Ecology
Action
Centre**

Solterre Design

ENERGY-EFFICIENT ADMINISTRATION BUILDING

**SHERBROOKE
GUYSBOROUGH COUNTY, NS**

The 2013 administration building has achieved a level four Green Globe designation, which shows leadership in energy and environmental design, including practices such as energy efficiency, water conservation and choice of materials with lower environmental impact.



QUICK FACTS

- ▶ Cost: \$1,806,645
- ▶ Funded by: Gas Tax Fund
- ▶ Energy Type: Green Building, Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Municipal
- ▶ Owner/Operator: District of St. Mary's
- ▶ Completed: November 2013

CONTACT

CHRISTA WEBBER
christa.webber@saint-marys.ca
1.902.522.2432

DESCRIPTION

Building features include:

- Ground source heat exchanger
- LED lighting systems
- Highly insulated structure
- Open floor plan
- Integrated design process
- High performance glazing
- Use of local and natural materials
- Daylighting and occupancy sensor lighting controls
- Commissioning plan implemented
- Minimized disruption to the site
- Shading of impervious surfaces
- Exterior light trespass minimized
- Building orientation optimized
- Passive ventilation features
- Energy efficient motors
- Water conservation features
- Local and natural vegetation used in landscaping

MORE INFORMATION

www.infrastructure.gc.ca/media/news-nouvelles/2013/20131116sherbrooke-eng.html

unsm.ca/doc_download/1156-st-mary-s-new-administration-building-case-study.html

PROJECT PARTNERS

Archibald & Fraser Architects



HAWKINS HOUSE: PASSIVE HOUSE E-DESIGN

HUBLEY
HALIFAX COUNTY, NS

Hawkins House has received both Passive House certification and LEED® Canada for Homes Gold certification.

QUICK FACTS

- ▶ Funded by: Private
- ▶ Cost Savings: Heating costs are estimated at \$200/year
- ▶ Energy Type: Green Building
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Residential
- ▶ Completed: 2011

CONTACT

Natalie Leonard
info@passivedesign.ca
1.902.475.1060

DESCRIPTION

Hawkins House is a single-family dwelling built with slab on grade and wood frame construction. The heating costs are \$200/year thus achieving the German Passive House standard by conserving energy, rather than generating energy with renewable technologies. This approach makes the home's construction affordable by eliminating the need for a furnace and central heating system. First year monitoring data shows the home's energy use is on target. This project is certified by the Canada Green Building Council with LEED for Homes Gold certification.

MORE INFORMATION

passivedesign.ca/projects.html

hawkinshouse.ca/

www.atlanticgreenbuilding.ca/index.php?option=com_content&view=article&id=58:hawkins-house&catid=57:individual-case-studies&Itemid=131

PROJECT SUPPLIERS

- Efficiency Nova Scotia
- Accurate Dorwin Fiberglass Windows and Doors
- Continental Plastic Industrial Flooring
- Creative Solar
- Passive House E-Design
- The Roofing Connection
- ThermalWise
- ThermoHomes
- TrueFoam Solutions

**Passive House
E-Design**

JOGGINS FOSSIL CENTRE

JOGGINS
CUMBERLAND COUNTY, NS

The Joggins Fossil Centre is LEED Gold Certified, reducing energy consumption by 64.5% and over 50% of energy demand produced on site.



QUICK FACTS

- ▶ Energy Type: Green Building, Wind, Solar, Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Tourism
- ▶ Completed: 2007

CONTACT

JENNA BOON
director@jogginsfossilcliff.net
1.888.932.9766

DESCRIPTION

Joggins Fossil Centre has many innovative features, including:

- 50 kilowatt wind turbine generator
- Solar heating system to preheat hot water
- Passive solar heat and light collection by special glazing units.
- Green roof, which minimizes heat loss, improved insulation and assists with water collection. The water from the roof run-off is used to flush toilets and water the plants.
- Electronic self-closing faucets and waterless urinals which reduce water consumption by approximately 30% along with the use of dual flush valve water closets
- Chemical free and minimal invasive landscaping policy
- Priority parking for more environmentally friendly vehicles

MORE INFORMATION

- jogginsfossilcliffs.net/centre/green/
- www.vollickmckee.com/files/the_joggins_fossil_centre.pdf

PROJECT PARTNERS

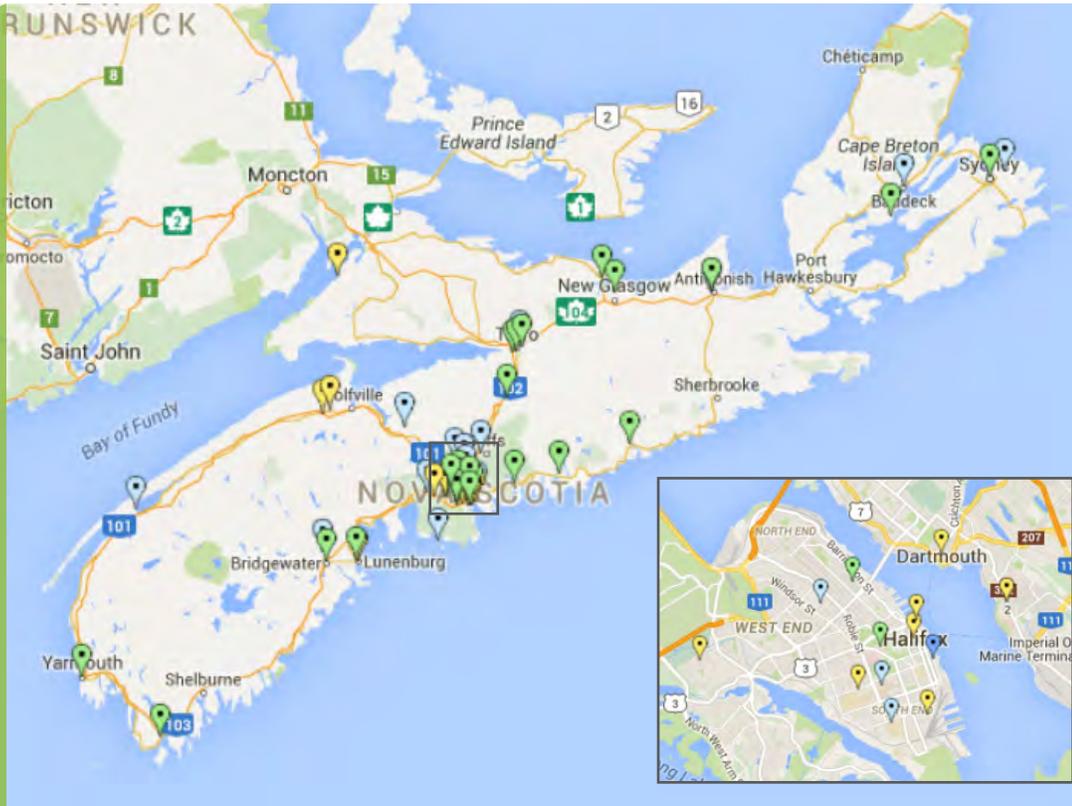
WHW Architects Inc. (Architecture49)



LEED BUILDINGS: CBGC

VARIOUS LOCATIONS PROVINCE-WIDE, NS

LEED Certification is an increasingly common feature for buildings in Nova Scotia.



QUICK FACTS

- ▶ Energy Type: Green Building
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Multi-Sector
- ▶ Owner/Operator: Various

DESCRIPTION

There are 75 LEED buildings in the province. 3 LEED Platinum, 17 LEED Gold, 30 LEED Silver and 25 LEED Certified.

See LEED Buildings tab for break-down.

LEED Platinum buildings include:

- 1H Emera Headquarters, 1223 Lower Water St., Halifax
- Efficiency Nova Scotia, 230 Brownlow Ave., Burnside (LEED for Commercial Interiors)
- Solterre Concept House, Second Peninsula, Lunenburg

MORE INFORMATION

leed.cagbc.org/LEED/projectprofile_EN.aspx

batchgeo.com/map/NSLEEDBuildings

PROJECT PARTNERS

Canada Green Building Council
US Green Building Council

CONTACT

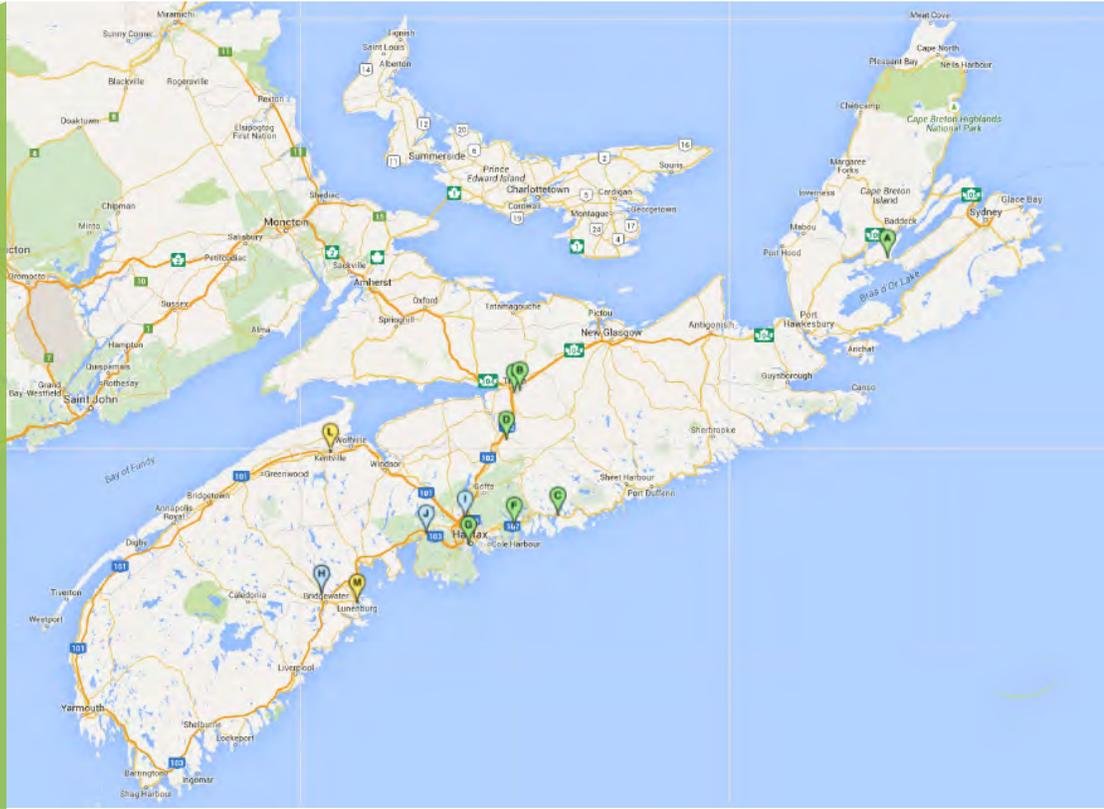
LARA RYAN
lryan@atl.cagbc.org
1.902.229.1580



LEED SCHOOLS: CGBC

VARIOUS LOCATIONS PROVINCE-WIDE, NS

LEED Certification is an increasingly common feature of new school builds in Nova Scotia.



QUICK FACTS

- ▶ Energy Type: Green Building
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional
- ▶ Owner/Operator: Various

DESCRIPTION

14 schools in the province have received certification of LEED Canada for New Construction and Major Renovations. 2 LEED Gold, 4 LEED Silver and 8 LEED Certified.

Schools include:

- (A) Rankin School of the Narrows
- (B) Harmony Heights Elementary School
- (C) Oyster Pond Academy
- (D) Winding River Elementary
- (E) Truro Elementary School
- (F) Porters Lake Elementary School
- (G) Citadel High School
- (H) Centre scolaire de la Rive-Sud
- (I) Waverley Memorial Elementary School
- (J) Sir John A Macdonald High School
- (K) Centre scolaire de la Rive-Sud
- (L) Kings County Academy
- (M) Bluenose Academy
- Charles P. Allen (registered only)

MORE INFORMATION

leed.cagbc.org/LEED/projectprofile_EN.aspx

batchgeo.com/map/NSLEEDSchools

PROJECT PARTNERS

Canada Green Building Council
US Green Building Council

CONTACT

LARA RYAN
lryan@atl.cagbc.org
1.902.229.1580



**MAUPELTUEWEY
KINA'MATNO'KUOM
MEMBERTOU SCHOOL**

**MEMBERTOU
CAPE BRETON COUNTY, NS**

The Membertou School is among the most energy efficient schools in Nova Scotia.



QUICK FACTS

- ▶ Energy Type: Green Building, Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional
- ▶ Owner/Operator: Membertou First Nation
- ▶ Completed: 2014

DESCRIPTION

Membertou School is among the most energy efficient in the Province complete with low-flow water faucets, automatic light sensors, solar panels, geothermal heat pumps, and energy efficient insulation allowing the school to obtain an energy rebate from Nova Scotia Power annually. Green from the start, the planning phase of the school emphasized Traditional Ecological Knowledge on environmental stewardship.

MORE INFORMATION

www.membertou.ca/sites/default/files/pdfs/march%2027th,%202015.pdf

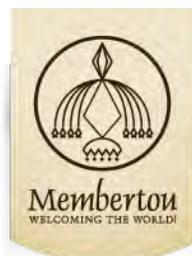
www.membertouschool.ca/

PROJECT PARTNERS

WICO Construction Management

CONTACT

CHIEF TERRY PAUL
terrypaul@membertou.ca
1.800.617.6466 ext. 2500



NSCC WATERFRONT & CENTRE FOR THE BUILT ENVIRONMENT (CBE)

NSCC WATERFRONT CAMPUS HALIFAX COUNTY, NS

The Waterfront Campus is equipped with alternative energy technologies and built-in interpretive/diagnostic features. It's a "living lab" for students, faculty and industry.



QUICK FACTS

- ▶ Funded by: Nova Scotia Power/ Emera, Province of Nova Scotia, Clean Energy Fund
- ▶ Energy Type: Green Building, Geothermal, Renewables, Energy Efficiency, Energy Storage, Solar, Wind, Solar Thermal
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional, Energy
- ▶ Owner/Operator: NSCC

DESCRIPTION

At 120,000 sq. ft. CBE includes an outdoor construction pavilion, large operable doors creating flexible workspace and allowing various trades to work together. Designed as a living test lab - the CBE evolves as new technologies are developed, tested and proven. A geothermal system meets the building cooling needs and provides ~ 50 per cent of heating requirements. The building is designed with the capacity for rooftop photovoltaic panels. Shop facilities and public spaces use natural ventilation. Solar wall cladding naturally preheats ventilation air. Interior living walls, planted from floor-to-ceiling with plants act as natural air filters. A green roof reduces heating and cooling costs, and storm water runoff, as well as increasing roof life. CBE helps the Nova Scotia construction industry develop leading-edge environmental knowledge and sustainable practices that are in growing demand worldwide.

MORE INFORMATION

www.nsc.ca/explorensc/cbe/

www.nsc.ca/explorensc/cbe/cbe_interpretivebrochure.pdf

PROJECT PARTNERS

Nova Scotia Power/Emera
WHW Architects Inc. (Architecture49)

ARCHITECTURE | 49



CONTACT

DR. ALAIN JOSEPH
alain.joseph@nsc.ca
1.902.491.1714



NSPI HEADQUARTERS LEED PLATINUM BUILDING 1H

HALIFAX,
HALIFAX COUNTY, NS

Nova Scotia Power's Headquarters in downtown Halifax was the first LEED Platinum Building certified by the Canada Green Building Council in Atlantic Canada.



QUICK FACTS

- ▶ Cost: \$53.4 Million
- ▶ Size: 14,600m² gross
- ▶ Energy Type(s): Green Building, Geothermal - Seawater Cooling and Heating
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Commercial
- ▶ Owner/Operator: NSPI
- ▶ Completed: Fall 2011

DESCRIPTION

The building was transformed from a former generating facility to a modern office building. The building includes a number of environmentally friendly features:

- rainwater collection
- white roof for cooling
- atriums for natural light
- seawater heating & cooling
- water efficient washrooms
- energy efficient facade
- energy recovery on HVAC
- variable speed drives
- tight building envelope
- daylight & occupancy sensors for lighting

The geothermal heating & cooling system ["chilled beam" technology] has reduced costs by ~ half that of an equivalent sized building.

First building in Atlantic Canada to receive LEED Platinum Certification.

MORE INFORMATION

www.nspower.ca/en/home/community/lower-water-st-office-1h/

www.wzmh.com/projects/nova-scotia-power-corporate-office-facility

www.youtube.com/watch?v=dWFmO-mzok

PROJECT PARTNERS

WZMH Architects



CONTACT

SHARON SCATTOLON
sharon.scattolon@nspower.ca
1.902.428.6720



PILIKAN HOUSE: NSCC

NSCC MIDDLETON CAMPUS ANNAPOLIS COUNTY, NS

Pilikan house is a demonstration site where the next generation of residential construction professionals can learn how to incorporate sustainability into affordable and practical homes.

QUICK FACTS

- ▶ Energy Type: Green Building, Geothermal, Renewables, Energy Efficiency, Energy Storage, Solar, Solar Thermal
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional, Energy
- ▶ Owner/Operator: NSCC
- ▶ Completed: 2012

CONTACT

SCOTT HENDERSON
scott.henderson@nsc.ca
1.902.825.5200



DESCRIPTION

Pilikan house is a hands-on learning tool for students in NSCC's Energy Sustainability Engineering Technology (ESET) program. It's a research tool with 30 monitoring and control points to track energy consumption. The house was over-engineered with energy efficient features to study their advantages and disadvantages in the Nova Scotia context. A certified R-2000 house, Pilikan achieved an EnerGuide rating of 91. The blower-door test on Pilikan House resulted in a reading of 0.6 ACH (Air Changes/Hour). A frost protective slab prevents frost from penetrating the soil underneath the house, the walls are double-studded and the entire house is insulated well beyond building code requirements. Equipped with solar hot water panels, Pilikan has a heat recovery ventilator (HRV); triple glazed windows and solar photovoltaic (PV) power. Pilikan House was built facing south which increases the home's ability to capture and store thermal energy in the form of heat.

MORE INFORMATION

www.nsc.ca/explorensc/cbe/pilikan-house.asp

PROJECT PARTNERS

Solterre Design

Solterre Design

nsc

SOLTERRE DESIGN CONCEPT HOUSE

SECOND PENINSULA
LUNENBURG COUNTY, NS

The Solterre Concept House brings together LEED for Homes Platinum Certification, the German based Passive House (Passivhaus) energy standard and the self-sufficiency of off-grid living.



QUICK FACTS

- ▶ Energy Savings: Uses 70-90% less energy than a typical home of the same size
- ▶ Energy Type: Green Building, Energy Efficiency, Solar, Solar Thermal
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Residential
- ▶ Owner/Operator: Solterre Design
- ▶ Completed: 2013

CONTACT

KEITH ROBERTSON
keith@solterre.com
1.902.492.1215

DESCRIPTION

The Concept House provides a demonstration site for environmentally-sensitive architecture and green building products. It has LEED for Homes Platinum Certification, Passive House Certification and has received a Lieutenant Governor Award of Merit for architectural design.

- Solar thermal panels from Nova Scotia manufacturer
- Solar electric panels supplying all of the house's electrical needs
- Passive solar design with Canadian-made high performance fiberglass windows
- Thermal break insulation details
- Insulation Values R-30 sub slab, R55 wall, R100 roof
- High-efficiency appliances (DC and Energy Star)
- High-efficiency ERV system (energy recovery ventilation)
- LED lighting
- Low emission and high performance, EPA certified, wood stove
- Insulated thermal mass with slab-on-grade foundation

MORE INFORMATION

www.solterre.com/concept-cottage/

www.welserver.com/WEL0634/

PROJECT PARTNERS

Passive House E-Design
Canada Green Building Council



Passive House E-Design

Solterre Design



VALLEY WASTE RESOURCE MANAGEMENT ADMIN BUILDING

KENTVILLE
KING'S COUNTY, NS

The Valley Resource Management Administrative Building is one of the first Administrative Buildings in Canada to be accredited with LEED and passive solar house certification.

QUICK FACTS

- ▶ Cost Savings: Combined heating and cooling cost of \$700/year
- ▶ Energy Savings: uses 1/3 the energy and 1/4 the water compared to an average building
- ▶ Energy Type: Green Building
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Municipal
- ▶ Owner/Operator: Valley Waste Resource Management
- ▶ Completed: 2014

CONTACT

Amelia Warren
awarren@efficiencyns.ca
1.877.999.6035

DESCRIPTION

This innovative administrative building includes features such as occupancy sensors, high efficiency lighting, insulation, and reclaimed materials. The building is an excellent example of how passive solar design can be applied to office spaces.

A \$550,000 wind turbine is contracted to be installed in Summer 2015.

Valley Waste has one of the highest rates of recycling and waste diversion in the province of Nova Scotia and aspires to become a zero waste region. This building is yet another way the region is showing its commitment to the environment. The mechanical heating and cooling infrastructure was able to be downsized because of the reduced heating and cooling loads - saving capital dollars.

MORE INFORMATION

www.youtube.com/watch?v=IVail_prZzQ

www.vwrm.com/

PROJECT PARTNERS

Efficiency Nova Scotia
Passive House E-Design



Passive House E-Design



VERSCHUREN CENTRE CAPE BRETON UNIVERSITY

SYDNEY
CAPE BRETON COUNTY, NS

The Verschuren Centre is one of Canada's most sustainable university labs, with an estimated 50 per cent decrease in energy consumption compared to similar buildings. That efficiency was built into every aspect of the Centre's design.



QUICK FACTS

- ▶ Energy Type: Green Building, Energy Efficiency, Geothermal, Solar, Wind
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional
- ▶ Owner/Operator: Cape Breton University

DESCRIPTION

Geothermal Heating and Cooling
20% more efficient than a conventional source with 39 vertical wells on a closed loop.

Solar
With an estimated output of 64kW, the panels power domestic hot water, with excess capacity directed to the heat pump or in-slab radiant heating systems.

Wind
Five vertical-axis wind turbines deliver up to 1.2 MW to offset electricity demand. The annual energy production from each turbine is estimated at 2000 kWh/year.

Advanced Lighting
Lighting is tied to daylight and occupancy sensors. All exterior lighting is LED.

- Other systems at the Centre include:
- Displacement ventilation
 - Natural ventilation
 - Greywater system
 - Storm water system

MORE INFORMATION

verschurencentre.ca/?page_id=18

PROJECT PARTNERS

Barrie & Langille (Halifax)
Moriyama & Teshima (Toronto)

CONTACT

DR. ANDREW SWANSON
andrew_swanson@cbu.ca
1.902.563.1182

Cape
Breton
University

VERSCHUREN
CENTRE



VIMIGA PROFESSIONAL CENTRE

LOWER SACKVILLE
HALIFAX COUNTY, NS

Carbon neutral building that utilizes technologies such as solar chimneys and collectors, in-floor radiant heat and high performance window glazing.



QUICK FACTS

- ▶ Payback: 7 years
- ▶ Energy Type: Green Building, Geothermal, Solar, Energy Efficiency
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Commercial
- ▶ Completed: 2013

CONTACT

Amelia Warren
awarren@efficiencyns.ca
1.877.999.6035

DESCRIPTION

Technologies installed include a geothermal heat pump for heating and cooling, evacuated solar tubes for domestic hot water, solar chimneys and collectors, lighting shelves, in-floor radiant heat, and high performance window glazing.

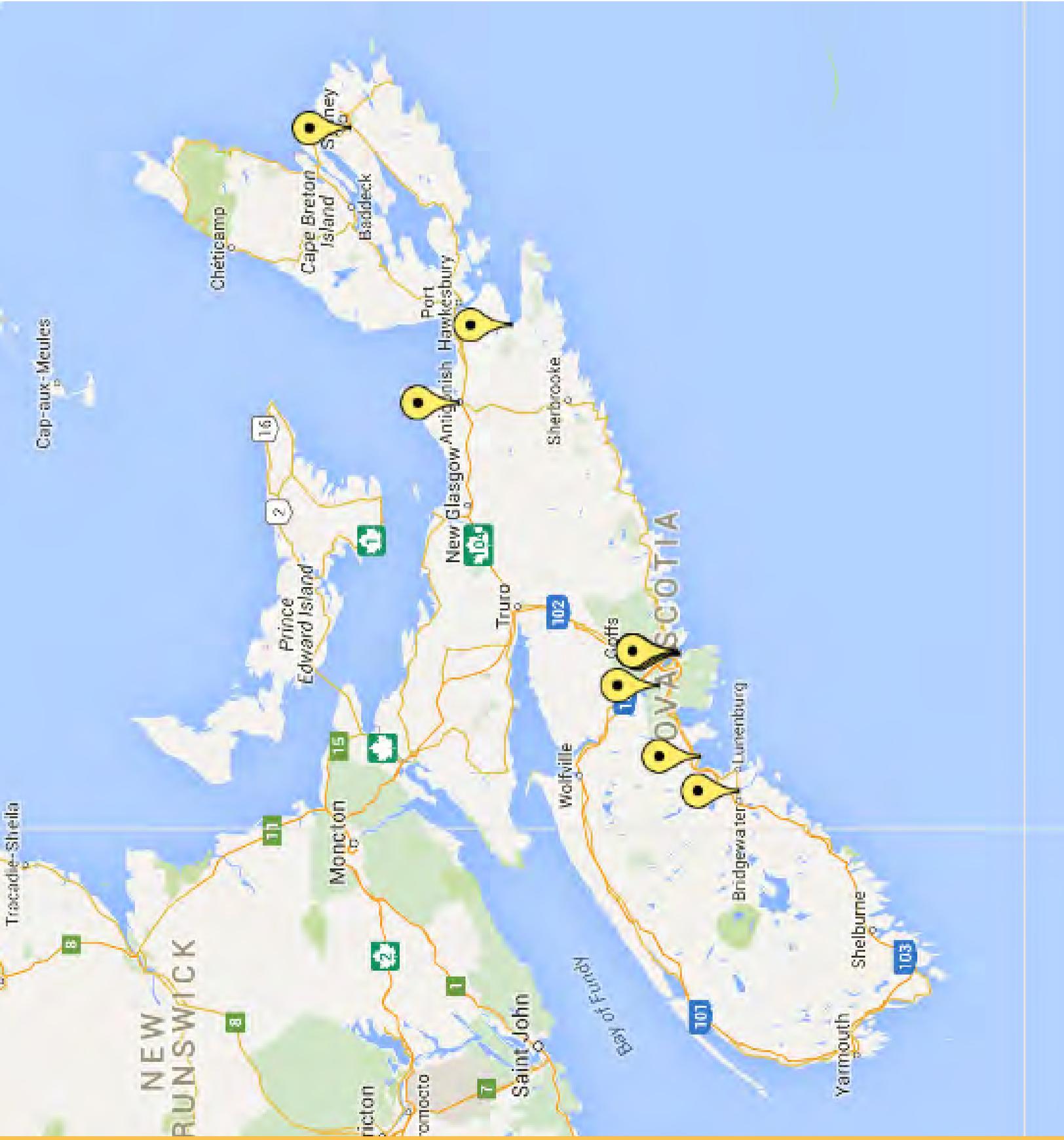
MORE INFORMATION

www.youtube.com/watch?v=e5JhTlcFOzY

PROJECT PARTNERS

Efficiency Nova Scotia

SOLAR



7.74KW GRID-TIED PV HOME

ANTIGONISH
ANTIGONISH COUNTY, NS

7.74kW grid-tied home with 36 solar PV panels and one solar hot water panel.



QUICK FACTS

- ▶ Cost: ~\$45,000 (in 2011)
- ▶ Job Creation: Supported one local small business
- ▶ Cost Savings: \$2,500/year (2015)
- ▶ Payback Period: 15 years
- ▶ Energy Savings: 9,600kWh/year (solar PV); 500kWh/year (hot water)
- ▶ Energy Type: Solar, Energy Storage, Solar Thermal
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Residential
- ▶ Owner: Peter & Julia Ritchie
- ▶ Completed: September 2011

CONTACT

PETER RITCHIE
pritchie42@gmail.com
902.867.2828

DESCRIPTION

This grid-tied residence has the following solar and energy efficiency features:

- 7.74kW PV system
- 36 (230W) PV panels coupled with micro-inverters (215W)
- 1 solar hot water panel with a small PV panel to run pump
- Non-standard net metering set-up with two meters one buy and one sell
- Electric hot water boiler (primary heat source)
- Pellet stove (secondary heat source)
- Passive solar

MORE INFORMATION

www.youtube.com/watch?v=nEBa0V5b19g

www.appleseedenergy.com

PROJECT PARTNERS

Appleseed Energy



36 PANEL PV ARRAY - PRIVATE RESIDENCE

BLUES MILLS
INVERNESS COUNTY, NS

Grid-tied 36 panel PV array with
monitoring system.



QUICK FACTS

- ▶ Cost: \$32,000
- ▶ Payback Period: 12 years
- ▶ Energy Type: Solar
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Residential
- ▶ Owner: Private
- ▶ Completed: Spring 2014

DESCRIPTION

A 36 PV panel grid-tied family home with monitoring and bilateral metering.

MORE INFORMATION

thechronicleherald.ca/novascotia/1204301-energy-challenge-will-put-green-in-inverness-pockets

www.appleseedenergy.com

PROJECT PARTNERS

Appleseed Energy

CONTACT

BRIAN ROSE
brian@appleseedenergy.com
1.902.227.8220



68 PANEL PV ARRAY - PRIVATE RESIDENCE

**CHESTER
LUNENBURG COUNTY, NS**

In 2014 Solar Global Solutions installed a 17 kW net-metered solar PV system at a residence in Chester.



QUICK FACTS

- ▶ Energy Type: Solar
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Residential
- ▶ Owner: Private
- ▶ Completed: November 2014

DESCRIPTION

The system is built from sixty eight 250 W PV panels with microinverters installed on ballasted racking, yielding a capacity of 17 kWp.

MORE INFORMATION

www.solarglobalsolutions.com

CONTACT

SEAN FLEMING
sfleming@solarglobalsolutions.com
1.902.876.2834



85 PANEL PV ARRAY - PRIVATE RESIDENCE

COXHEATH
CAPE BRETON COUNTY, NS

An 85 solar panel electric system on
a private home.



QUICK FACTS

- ▶ Generation: 23,000 kWh/year
- ▶ Funded by: Private
- ▶ Payback: 11.5 years
- ▶ Energy Type: Solar PV
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Residential
- ▶ Owner: Private
- ▶ Completed: May 2013

DESCRIPTION

In May 2013, Appleseed Energy installed the province's largest solar electric system on a luxury house near Sydney, Cape Breton.

The home, which includes an indoor swimming pool and guest quarters, has 85 solar panels. It is rare to find a house that can accommodate such a large system.

The system will generate an estimated 23,000 kWh of electricity annually, enough to supply almost all of the home's energy needs.

Any excess power is sent back to the grid, earning the homeowners a credit on their Nova Scotia Power bill.

MORE INFORMATION

www.appleseedenergy.com

thechronicleherald.ca/business/1143270-cb-home-sets-record-with-huge-solar-system

CONTACT

BRIAN ROSE
brian@appleseedenergy.com
1.902.227.8220



ALDERNEY GATE PUBLIC LIBRARY

**DARTMOUTH
HALIFAX COUNTY, NS**

Solar Global Solutions installed a 12.2 kWp solar system on the roof of the library. The system was completed January 2015.



QUICK FACTS

- ▶ Energy Type: Solar
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Commercial, Municipal
- ▶ Owner: Halifax Regional Municipality
- ▶ Completed: January, 2015

DESCRIPTION

The system was installed via a 12.2 kWp string inverter. The panels were flush-mounted to an existing slanted south-facing roof structure on the roof of the library.

MORE INFORMATION

www.solarglobalsolutions.com

CONTACT

SEAN FLEMING
sfleming@solarglobalsolutions.com
1.902.876.2834



HALIFAX

BEDFORD INSTITUTE OF OCEANOGRAPHY SOLAR THERMAL ARRAY

**DARTMOUTH
HALIFAX COUNTY, NS**

Thermal array providing preheated water to the primary hot water boiler that supplies the cafeteria.



QUICK FACTS

- ▶ Cost Savings: \$2,059/year
- ▶ Payback Period: 13 years
- ▶ Energy Savings: 1,810L of oil/year
- ▶ Energy Type: Renewables, Solar Thermal, Energy Storage
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional
- ▶ Owner: Bedford Institute of Oceanography (BIO) - Government of Canada
- ▶ Completed: March 2012

CONTACT

BABAK FARSI
info@doctorsolar.ca
1.902.468.3132

DESCRIPTION

This solar thermal project was installed on the Holland Building of the Bedford Institute of Oceanography (BIO) in March, 2012. The objectives of this project were to reduce the long term costs associated with heating the domestic hot water used by the BIO cafeteria, and to act as a pilot project tool for BIO to assess the viability of additional solar thermal projects.

The solar thermal array consists of 10 Thermo Dynamics® commercial hot water heating panels that are mounted to a custom steel racking structure manufactured by Doctor Solar. The array tilt angle of 45° is optimized for year-round efficiency, facing 45° west of true south. The project includes a monitoring system that allows both Doctor Solar and the building caretakers to view real-time and historical data about the system's operation.

MORE INFORMATION

doctorsolar.ca/projects/commercial-hot-water/bedford-institute-oceanography



CHEDABUCTO PLACE GREEN ENERGY PROJECT

**GUYSBOROUGH
GUYSBOROUGH COUNTY, NS**

Solar panels for pool water heating,
domestic hot water and air heating.



QUICK FACTS

- ▶ Payback Period: 5 years
- ▶ Cost Savings: \$8,800/year
- ▶ Energy Type: Solar
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional
- ▶ Owner: Municipality of the District of Guysborough
- ▶ Completed: Sept. 30, 2015

DESCRIPTION

To cut the \$10,000 annual cost of heating the community pool, solar panels for pool water heating, domestic hot water and air heating for Chedabucto Place, which houses the local P-12 school and the pool were installed. The project incorporated ongoing learning opportunities by putting the solar panels in a visible place and setting up an interactive computer system to allow students to see how the temperature of the air and water are controlled. Solar panels are also going to be installed on the municipal building. It is hoped that the municipality will save about \$8,800 a year on propane alone and the project will pay for itself shortly after five years.

MORE INFORMATION

www.sustainability-unsm.ca/municipal-success-stories.html

CONTACT

DEBBIE NIELSEN
dnielsen@unsm.ca
1.902.423.8312



CORNERSTONE WESLEYAN CHURCH SOLAR PV ARRAY

HAMMONDS PLAINS
HALIFAX COUNTY, NS

A grid-tied 44 panel solar PV system installed at Cornerstone Wesleyan Church.



QUICK FACTS

- ▶ Cost: \$80,000
- ▶ Funded by: Private
- ▶ Cost Savings: \$2,500/year (PV); \$5,000/year (heat pumps)
- ▶ Payback: 10 years
- ▶ Energy Type: Solar PV, Heat Pumps
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional
- ▶ Owner: Cornerstone Wesleyan Church
- ▶ Completed: Summer 2015

DESCRIPTION

A grid-tied 44 panel solar PV system installed at Cornerstone Wesleyan Church. The church plans to sell excess energy to Nova Scotia Power.

MORE INFORMATION

atlantic.ctvnews.ca/church-goes-green-sells-unused-energy-to-nova-scotia-power-1.2481338

PROJECT PARTNERS

Shines Solar Renewable Energy

CONTACT

PASTOR DENN GUPTILL
info@cornerstonewesleyan.ca
1.902.832.2222

CORNERSTONE
WESLEYAN CHURCH



DALHOUSIE UNIVERSITY LIFE SCIENCES CENTRE SOLAR/VENT PV

HALIFAX
HALIFAX COUNTY, NS

Largest Solar/Vent PV install in Canada, and first in Atlantic Canada. Used in combination with new Air Handling unit for pre-heating.



QUICK FACTS

- ▶ Funded by: Efficiency Nova Scotia, Dalhousie University
- ▶ Cost Savings: \$16,000/year
- ▶ Payback: ~15 years
- ▶ Energy Savings: 117,000 kWh/year
- ▶ Energy Type: Solar PV
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional
- ▶ Owner: Dalhousie University
- ▶ Completed: Summer 2014

DESCRIPTION

This install takes advantage of both solar electric systems and solar heating systems. A 20kW system comprised of 80 PV panels was installed on the vents and provide power to the building. The waste heat from the PV panels is then fed into the solar vents that deliver air to the air handler that services the building.

PROJECT PARTNERS

Efficiency Nova Scotia

CONTACT

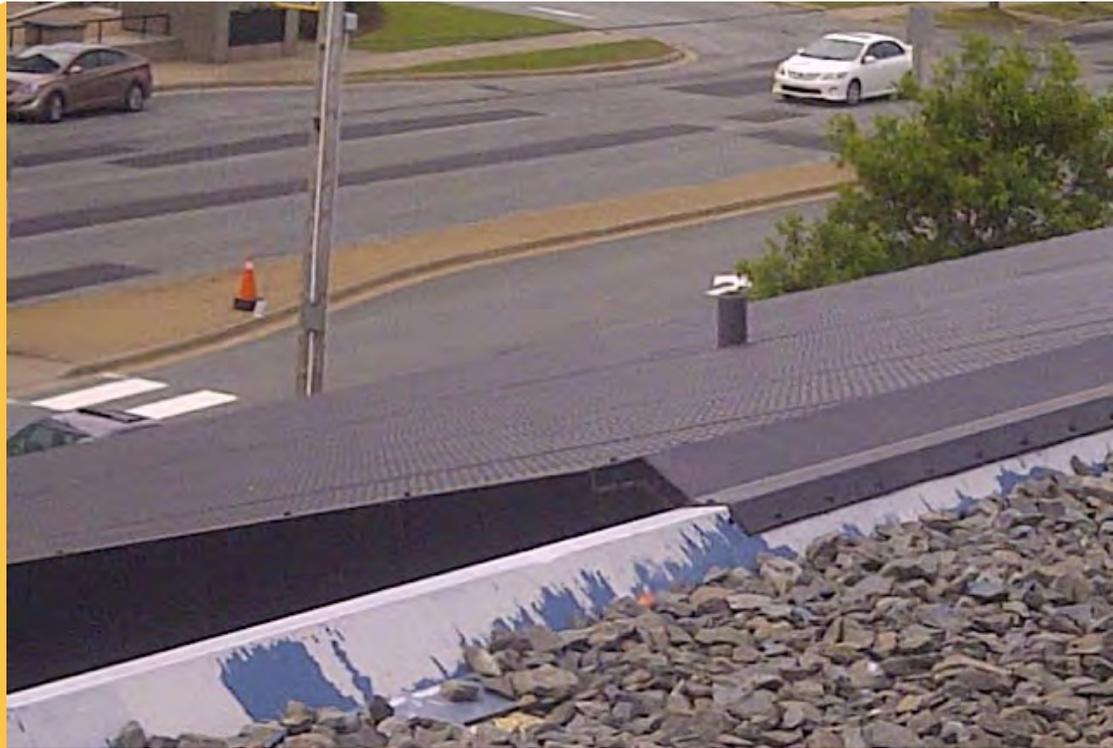
GLEN MACDOUGALL
gmacdougall@dal.ca
1.902.802.9845



DARTMOUTH SPORTSPLEX SOLAR WALL

DARTMOUTH HALIFAX COUNTY, NS

In 2015, HRM installed a solar wall for hot air at the Dartmouth Sportsplex.



QUICK FACTS

- ▶ Cost: \$120,000
- ▶ Funded by: FCM Green Municipal Fund
- ▶ Cost Savings: \$10,000/year
- ▶ Energy Type: Solar Hot Air
- ▶ Status: Development Phase
- ▶ Scale: Project
- ▶ Sector: Municipal
- ▶ Owner: Halifax Regional Municipality
- ▶ Completed: 2015

DESCRIPTION

A 4,000 sq. ft. solar wall installation with modelling estimating \$10k in annual savings.

MORE INFORMATION

www.cbc.ca/news/canada/nova-scotia/sportsplex-s-defective-roof-opens-door-for-green-technology-1.2715968

solarwall.com/en/products/solarwall-air-heating/how-solar-wall-works.php

PROJECT PARTNERS

Markland Associates Ltd.
MyGeneration
SolarWall Canada
Efficiency Nova Scotia
City of Halifax

CONTACT

JIM BROWN
brownji@halifax.ca
1.902.430.6267

HALIFAX

DAYSPRING VOLUNTEER FIRE DEPARTMENT

DAYSPRING LUNENBURG COUNTY, NS

The fire department installed two solar heating systems, upgraded its insulation and installed higher efficiency lighting and a new furnace.



QUICK FACTS

- ▶ Cost: \$17,000
- ▶ Funded by: ecoNova Scotia, Conserve Nova Scotia, Dayspring & District Volunteer Fire Department, Municipality of the District of Lunenburg
- ▶ Cost Savings: \$3,400/year
- ▶ Payback Period: Under 10 years
- ▶ Energy Savings: 30% less electricity and 35% less oil
- ▶ Energy Type: Solar Thermal
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Municipal

DESCRIPTION

\$17,000 of energy management initiatives save the Dayspring Volunteer Fire Department in the Municipality of Lunenburg \$3,400/year.

The fire department installed two solar heating systems, upgraded its insulation, installed higher efficiency lighting, and a new furnace. This resulted in a 30% reduction in electricity use and a 35% reduction in furnace oil costs, far beyond the original savings estimates.

MORE INFORMATION

www.sustainability-unsm.ca/municipal-success-stories.html

CONTACT

CHIEF STANLEY SLAUENWHITE
stanleys@eastlink.ca
1.902.543.6030

NORTHBROOK POLICE TRAINING CENTRE PV ARRAY

**DARTMOUTH
HALIFAX COUNTY, NS**

Large commercial photovoltaic array installed in Fall 2014 on the roof of the Northbrook Police Training Centre in Dartmouth, Nova Scotia.



QUICK FACTS

- ▶ Cost: \$54,000
- ▶ Funded by: Halifax Regional Municipality Solar City Program
- ▶ Cost Savings: \$2877/year
- ▶ Payback Period: 19 years
- ▶ Energy Savings: 19,246 MWh
- ▶ Energy Type: Solar, Renewables
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional
- ▶ Owner: Halifax Regional Municipality
- ▶ Completed: May 2015

CONTACT

BABAK FARSI
info@doctorsolar.ca
1.902.468.3132

DESCRIPTION

The Northbrook Police Training Centre project is the largest solar photovoltaic (PV) array designed and installed by Doctor Solar as of summer 2015. The 14.64 kW PV system supplies a portion of the facility's electric power requirements, and also feeds excess power to the surrounding electric grid under Nova Scotia Power's Enhanced Net Metering program. The PV array is comprised of 48 individual 305 Watt solar PV modules. The array is a mounted, ballasted, flat roof racking system. Because the array is weight ballasted instead of being fastened to the roof, there are no roof penetration points. The array is divided into four separate strings of twelve panels each, which feed into a DC combiner box and disconnect switch mounted on the building's roof. The system features a 12kW Plus string inverter that transforms the DC output of the array to three phase.

MORE INFORMATION

doctorsolar.ca/projects/commercial-pv/northbrook-police-training-centre



PARKER STREET APARTMENTS SOLAR THERMAL ARRAY

DARTMOUTH
HALIFAX COUNTY, NS

Large solar thermal array providing preheated water to a large apartment building.



QUICK FACTS

- ▶ Cost: \$286,000
- ▶ Funded by: Private, Conserve NS Solar Water Heating Rebate
- ▶ Cost Savings: \$27,446/year
- ▶ Payback Period: 20 years
- ▶ Energy Savings: 159 MWh
- ▶ Energy Type: Solar, Renewables, Energy Storage, Solar Thermal
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Residential
- ▶ Owner: Killam Properties
- ▶ Completed: June 2012

CONTACT

BABAK FARSI
info@doctorsolar.ca
1.902.468.3132

DESCRIPTION

The Parker Street Apartments project is the largest solar thermal array that Doctor Solar has installed as of summer 2015. The objective of this project was to reduce the costs associated with heating the domestic hot water supply that services more than 200 units of this eight floor apartment building. The 100 Thermo Dynamics commercial solar thermal panels used in this project are divided into two arrays of 50. The two array banks are mounted to the east and west sections of the roof on tilted double-tiered steel support structures manufactured by Doctor Solar. Each thermal array provides heated glycol to a dedicated bank of heat exchangers that are located in the rooftop mechanical room. The system circulates water between twenty 200 gallon storage tanks located in the basement and the heat exchangers on the roof. It features a comprehensive monitoring system that allows Doctor Solar and the building caretakers to track the system status and performance both in real-time and historically.

MORE INFORMATION

doctorsolar.ca/projects/commercial-hot-water/parker-st-apartments

PROJECT PARTNERS

Conserve Nova Scotia
Killam Properties
Thermo Dynamics





SOLAR CITY 2.0

VARIOUS LOCATIONS HALIFAX COUNTY, NS

Through Solar City 2.0, homeowners in Halifax can finance solar water heating systems through a new solar collector account with the City of Halifax.

QUICK FACTS

- ▶ Cost: \$8.3 million (pilot) \$13 million (Solar City 2.0)
- ▶ Funded by: Halifax Regional Municipality, Collector Account
- ▶ Payback Period: 10-15 years
- ▶ Cost Savings: \$200,000/year
- ▶ Energy Savings: 1.3 million kWh/year
- ▶ Energy Type: Solar, Solar Thermal
- ▶ Status: Implemented
- ▶ Scale: Community-wide
- ▶ Sector: Residential
- ▶ Owner: Halifax Regional Municipality
- ▶ Completion: 2018

CONTACT

SOLAR CITY OFFICE
solarcity@halifax.ca
1.902.240.8208

DESCRIPTION

Solar City 2.0 offers homeowners in Halifax innovative solar energy options, which can be financed through a solar collector account with the HRM. Halifax Regional Council approved the continuation of the Solar City Program on March 31, 2015 for another three years.

The program aims to:

- Complete 450 installations of a variety of solar technologies annually;
- Increase the opportunities for residents and businesses to save money and reduce their environmental footprint;
- Continue to administer the program on a cost neutral basis for the municipality.

It offers property owners the three solar technology options: Solar Photovoltaic, Solar Air and Solar Thermal (Hot Water).

MORE INFORMATION

www.halifax.ca/solarcity/

[batchgeo.com/
map/49a2297a59f938ecbb97a1cc8a2dc926](http://batchgeo.com/map/49a2297a59f938ecbb97a1cc8a2dc926)

[www.youtube.com/
watch?v=ibb1guSmQHY](http://www.youtube.com/watch?v=ibb1guSmQHY)

PROJECT PARTNERS

Thermo Dynamics
Scotian Renewables
Dr. Solar
Dalhousie University
Nova Scotia Community College
Green Power Labs
NS Dept. of Energy
Federation of Canadian Municipalities



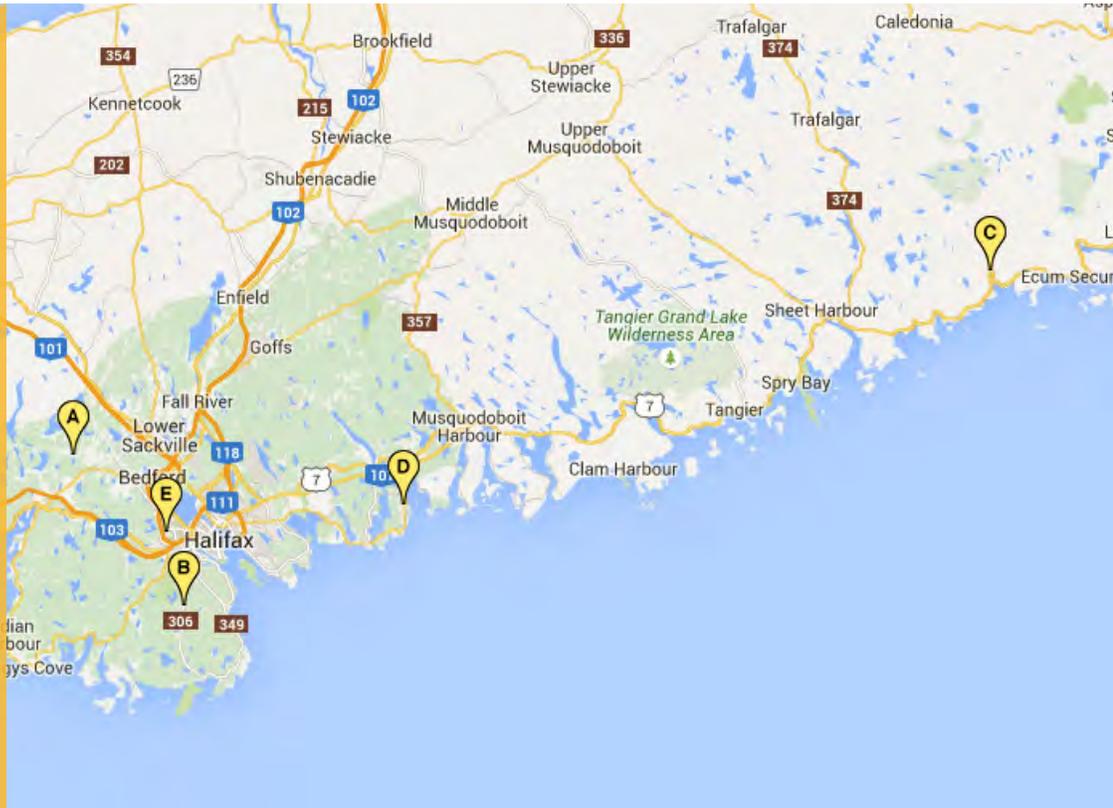
HALIFAX

**DOCTOR
SOLAR**

SOLAR HOT AIR COMMUNITY CENTRES (HRM)

5 LOCATIONS HALIFAX COUNTY, NS

HRM installed solar hot air systems in 5 community centres to supplement room heating.



QUICK FACTS

- ▶ Energy Type: Solar Hot Air
- ▶ Status: Implemented
- ▶ Scale: Community-wide
- ▶ Sector: Municipal
- ▶ Owner: Halifax Regional Municipality

DESCRIPTION

HRM installed solar hot air panels in 5 community centres. Air is drawn through the unit, heated and pushed back into the room without electrical assistance. The unit is self-powered.

The intent of the project is to reduce the operating costs of the facilities for the community groups and to increase community knowledge of renewable energy solutions.

Solar hot air panels were installed in the following community centres:

- (A) Upper Hammonds Plains Com. Centre
- (B) Harrietsfield/Williamstown Community Centre
- (C) Moser River Community Centre
- (D) Ste. Therese Community Centre
- (E) Canada Games Centre - which has one of the largest solar hot water installations in Canada.

MORE INFORMATION

- www.halifax.ca/energy-environment/environment/SolarHotAir.php
- batchgeo.com/map/solarhotairhrm

CONTACT

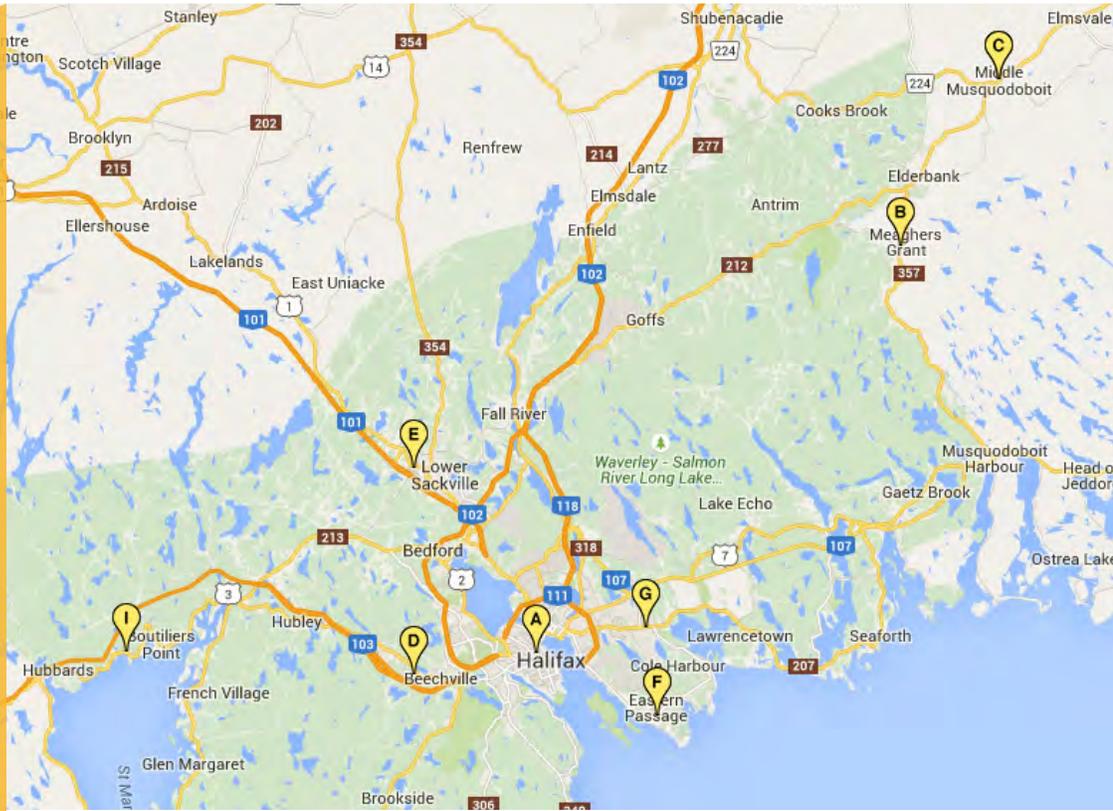
JIM BROWN
brownji@halifax.ca
1.902.430.6267



SOLAR THERMAL FIRE HALLS (HRM)

8 LOCATIONS PROVINCE-WIDE, NS

HRM installed solar panels for hot water in 8 fire stations. Three types of solar hot water technology were used to test the range of available technologies and help promote adoption of solar energy in HRM.



QUICK FACTS

- ▶ Energy Type: Solar Thermal
- ▶ Status: Implemented
- ▶ Scale: Community-wide
- ▶ Sector: Municipal
- ▶ Owner: Halifax Regional Municipality

DESCRIPTION

HRM Flat Panel Installations were installed at the following locations:

- (A) Central Fire Department (#3)
- (B) Meaghers Grant Fire Station (#36)
- (C) Middle Musquodoboit Volunteer Fire Station (#38)
- (D) Lakeside Volunteer Fire Station (#58)

HRM Evacuated Tube Panel Installations were installed at the following locations:

- (E) Sackville Fire Station (#10)
- (F) Eastern Passage Fire Station (#16)
- (G) Cole Harbour Fire Station (#17)
- (I) Black Point Volunteer Fire Station (#56)

The SolarBeam is located at the Mainland North Fire Station (#7).

MORE INFORMATION

www.halifax.ca/energy-environment/environment/SolarHotWater.php

batchgeo.com/map/solarthermal-firestationshrm

CONTACT

JIM BROWN
brownji@halifax.ca
1.902.430.6267

HALIFAX

SOLAR WELL PUMPING

NSCC WATERFRONT CAMPUS HALIFAX COUNTY, NS

An NSCC project that involves drilling a well and using a solar powered pump to provide a water feature to be used at NSCC to learn about solar pumping and water resources.



QUICK FACTS

- ▶ Cost: \$25,000
- ▶ Funded by: Internal
- ▶ Payback Period: 15 years
- ▶ Cost Savings: \$250,000/year
- ▶ Energy Type: District Energy, Geothermal, Renewables, Water Source Cooling, Energy Storage
- ▶ Status: Development Phase
- ▶ Scale: Project, Technology
- ▶ Sector: Multi-sector
- ▶ Owner: NSCC
- ▶ Completed: Sept. 30, 2015

DESCRIPTION

A solar technology project that explores the capacity for a solar pumping system using solar data, designed for a variety of applications. Students were engaged in the design, monitoring and maintenance of the solar well pumping system and participated in a trip to rural-Africa to install a similar off-grid system. Topics studied and data examined include: power availability, electrical sizing of wire, voltage drop, ampacity, Canadian Electrical Code compliance, pump curve applications, remote monitoring for aquifers, water consumption, solar efficiency, daily, monthly and yearly solar resources in Halifax. Business opportunities for agriculture and other water pumping applications can be studied.

MORE INFORMATION

international.nsc.ca/sunny-days-ahead-working-together-to-create-a-sustainable-water-supply/

CONTACT

GORD WILKIE
gordon.wilkie@nsc.ca
1.902.491.4569



WEST STREET FIRE STATION SOLAR PV

HALIFAX
HALIFAX COUNTY, NS

Solar Global Solutions installed a 13.4 kWp string-inverted solar photovoltaic system on the West Street Fire Station in Halifax in November 2014.



QUICK FACTS

- ▶ Energy Type: Solar
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Commercial, Municipal
- ▶ Owner: Halifax Regional Municipality
- ▶ Completed: November 2014

DESCRIPTION

The system integrates 40 ballasted 335W monocrystalline solar PV panels using a three-phase string inverter yielding a net capacity of 13.4 kW.

MORE INFORMATION

www.solarglobalsolutions.com

CONTACT

SEAN FLEMING
sfleming@solarglobalsolutions.com
1.902.876.2834



HALIFAX

YARMOUTH YMCA SOLAR THERMAL POOL

YARMOUTH
YARMOUTH COUNTY, NS

40 panel solar thermal pool heating
system to offset the cost of fuel oil



QUICK FACTS

- ▶ Energy Type: Solar Thermal
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional
- ▶ Owner: YMCA
- ▶ Completed: July 2004

DESCRIPTION

Solar collectors are mounted on a flat roof located directly above the swimming pool. The orientation of the solar collectors is due south with an angle of 45° to the horizontal. There are a total of 40 Thermo Dynamics G32 solar collectors (119 m² gross collector area; 127 m² aperture area). The solar collectors are the liquid-flat-plate type, with low-iron tempered glass glazing and Sunstrip absorber plate. The solar collectors are arranged in two arrays of 20 solar collectors. There is a front array of 20 solar collectors and a rear array of 20 collectors. Within each array, there are two sub-arrays of 10 solar collectors in parallel with each other. Each sub-array of 10 solar collectors has 5 solar collectors plumbed in series with another 5. The arrays are plumbed independently, and valved, to allow servicing of one array without shutting down the entire system.

MORE INFORMATION

www.thermo-dynamics.com/projects/ymca_yarmouth.html

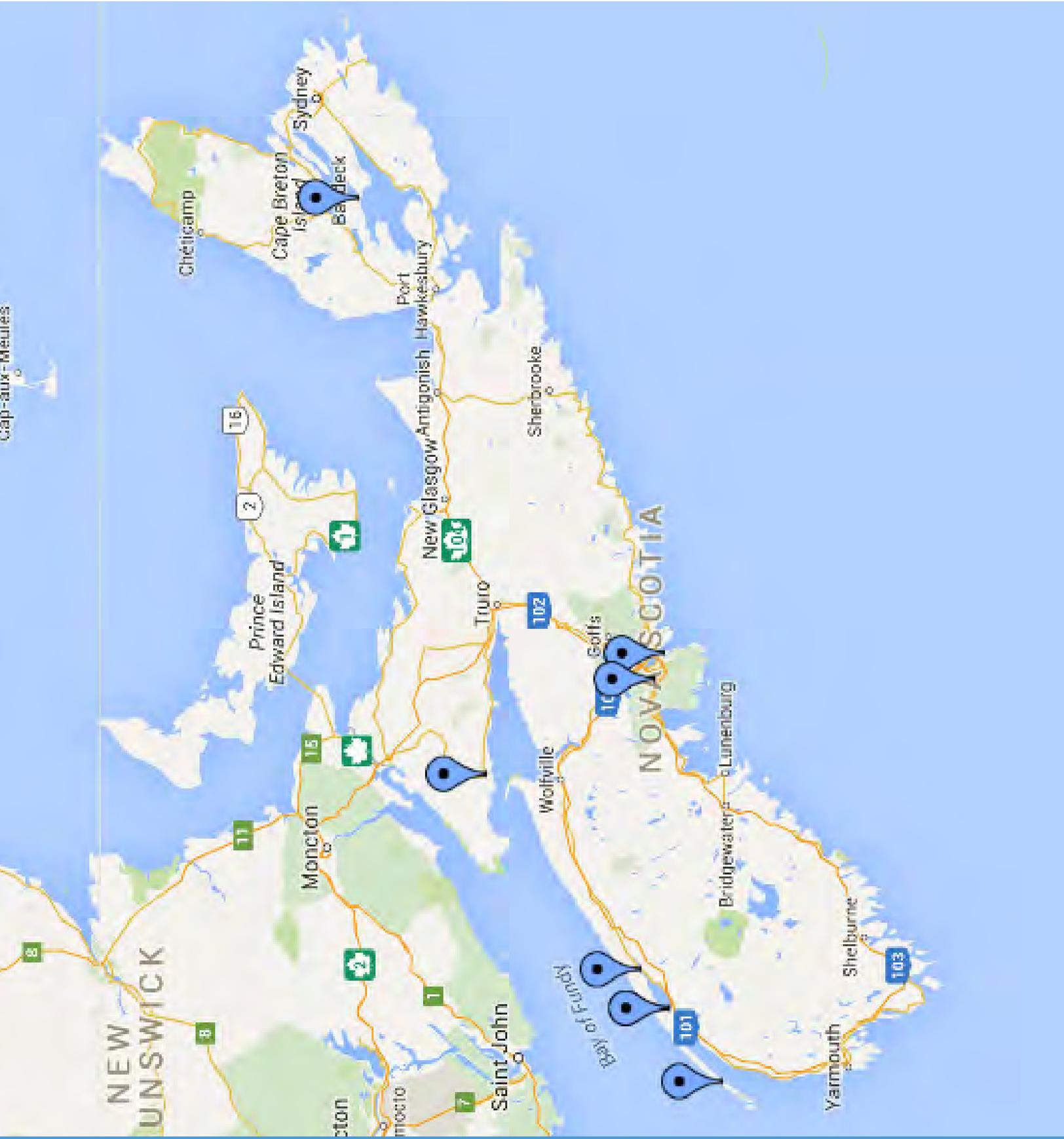
ymcayarmouth.net/

CONTACT

PETER ALLEN
solarinfo@thermo-dynamics.com
1.902.468.1001



TIDAL



ANNAPOLIS TIDAL STATION

**ANNAPOLIS ROYAL
ANNAPOLIS COUNTY, NS**

Annapolis Tidal Power Plant is owned and operated by Nova Scotia Power. It is one of the few tidal plants in the world and the only tidal plant in North America.



QUICK FACTS

- ▶ Generation: 20 MW (enough energy to power 4500 homes)
- ▶ Energy Type: Tidal
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Energy
- ▶ Owner/Operator: Nova Scotia Power
- ▶ Completed: 1984

DESCRIPTION

The 20MW Power Plant came online in 1984 and has a daily output of roughly 80-100 megawatt hours, depending on the tides. The plant produces energy twice a day for approximately six hours at a time.

MORE INFORMATION

www.youtube.com/watch?v=pxCPLv--U4

www.nspower.ca/en/home/about-us/how-we-make-electricity/renewable-electricity/annapolis-tidal-station.aspx

CONTACT

ANNAPOLIS TIDAL STATION
INTERPRETIVE CENTRE
1.902.532.0502



FUNDY OCEAN RESEARCH CENTRE FOR ENERGY (FORCE)

PARRSBORO
CUMBERLAND COUNTY, NS

The Fundy Ocean Research Center for Energy (FORCE) is Canada's leading research centre for in-stream tidal energy, acting as a host to technology developers and providing the electrical infrastructure to deliver power to the grid; it also provides independently reviewed environmental monitoring.

QUICK FACTS

- ▶ Cost: \$86.7 Million
- ▶ Funding: ACOA, Encana Corp, Province of Nova Scotia, Berth Fees
- ▶ Job Creation: 6+
- ▶ Generation: 64MW
- ▶ Energy Type: Tidal
- ▶ Status: Development Phase
- ▶ Scale: Project
- ▶ Sector: Energy
- ▶ Owner/Operator: FORCE
- ▶ Implemented: October 2014

CONTACT

TONY WRIGHT
tony.wright@fundyforce.ca



DESCRIPTION

Development of fully grid connected 4 MW tidal array in the Bay of Fundy. Tidal energy comes from the Earth's rotation and the gravitational pull of the Moon and Sun on the world's oceans forcing the water back and forth. The movement of the tide is a source of clean, renewable energy that can be turned into electricity. Tidal power is also far more predictable than wind and solar power. In 2009, FORCE began using new technology to test the potential of tidal energy in the Bay of Fundy. FORCE has 17.5MW of feed-in tariff approved at its site but has a capacity through its subsea cables of 64MW.

MORE INFORMATION

- www.fundyforce.ca
- www.nrcan.gc.ca/energy/funding/current-funding-programs/cef/4955

PROJECT PARTNERS

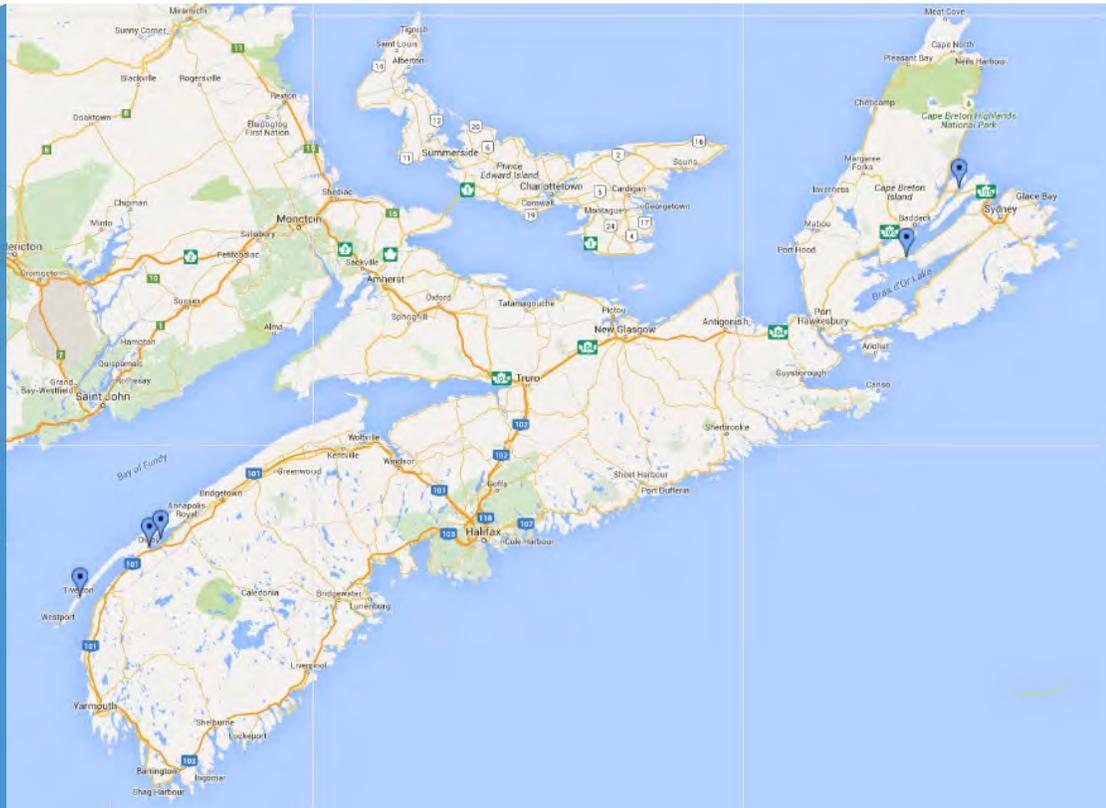
- Minas Energy with Marine Current Turbines and Bluewater Energy Services
- Black Rock Tidal Power
- Atlantis Operations Canada with Lockheed Martin and Irving Shipbuilding
- Cape Sharp Tidal Venture (OpenHydro and Emera)



TIDAL COMFIT PROJECTS

DIGBY GUT, GRAND PASSAGE, PETIT PASSAGE, BARRA STRAIT, AND GREAT BRAS D'OR CHANNEL PROVINCE-WIDE, NS

5 tidal projects currently supported by the COMFIT program.



QUICK FACTS

- ▶ Generation: 3.1MW
- ▶ Project Range: 0.1MW to 1.5MW
- ▶ Energy Type: Tidal
- ▶ Status: Development Phase
- ▶ Scale: Project
- ▶ Sector: Energy
- ▶ Owner/Operator: Fundy Tidal Inc.
- ▶ Completion: Dec. 2016-July 2017

DESCRIPTION

The Nova Scotia Community Feed-in Tariff (COMFIT) Program encourages community-based, local renewable energy projects by guaranteeing a rate per kilowatt-hour for the energy the project feeds into the province's distribution electrical grid.

MORE INFORMATION

energy.novascotia.ca/renewables/programs-and-projects/comfit

www.fundytidal.com/projects

www.youtube.com/watch?v=BnZkKh-d7Qg&list=PLwLZ9YtgHtLDf2bxy8qgBvHUIK9KPI5D5&index=6

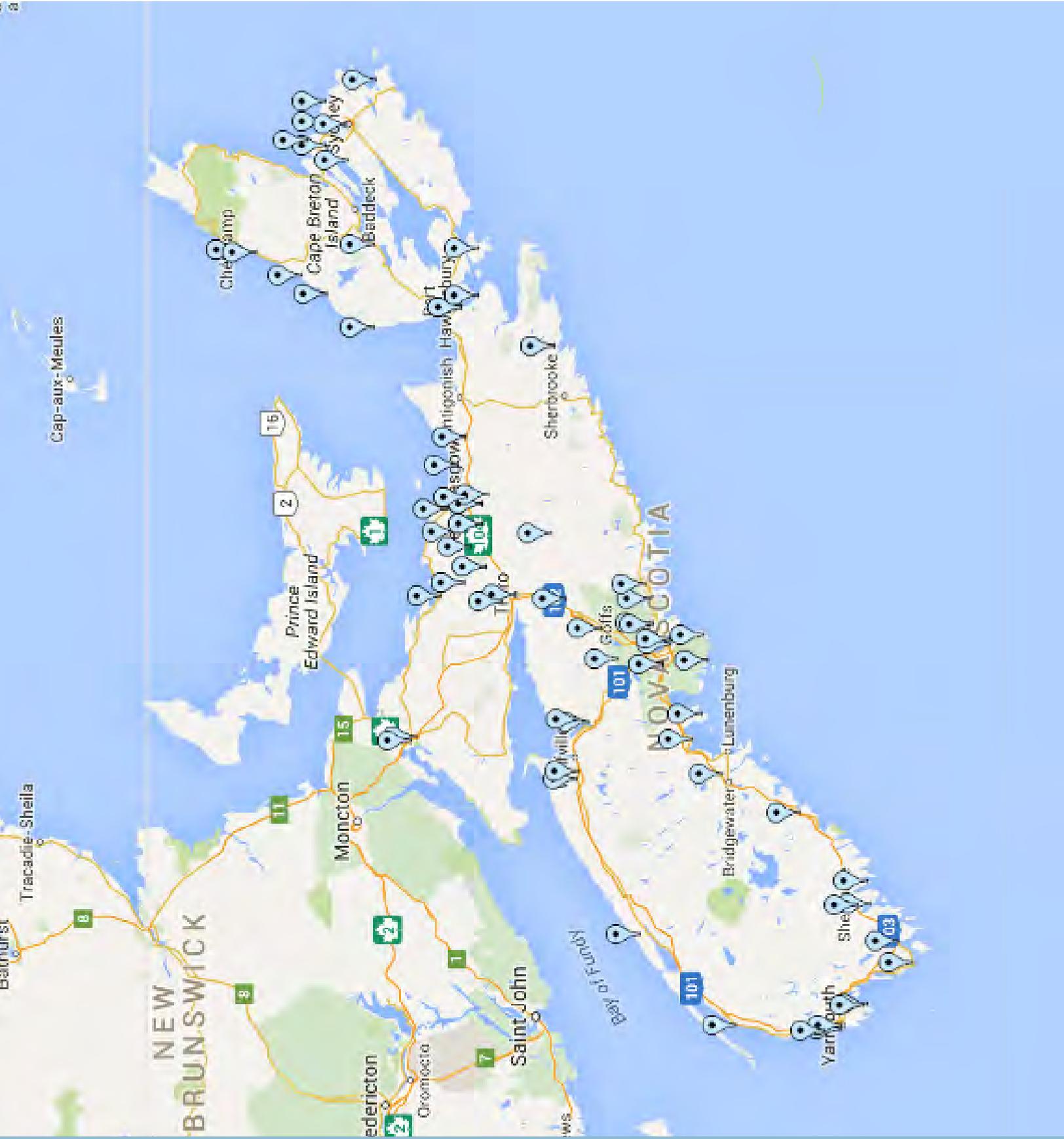
batchgeo.com/map/NSCOMFITprojects

CONTACT

DANA MORRIN
dana@fundytidal.com



WIND



1kW HUGH PIGGOTT WIND TURBINE

TATAMAGOUCHE
COLCHESTER COUNTY, NS

A small-scale handbuilt 1kW Hugh Piggott style wind turbine at private residence.



QUICK FACTS

- ▶ Cost: \$2,500
- ▶ Generation: 1kW
- ▶ Energy Type: Wind
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Residential
- ▶ Owner/Operator: Lil MacPherson
- ▶ Completed: 2012

DESCRIPTION

In April 2012, a 50 ft. Hugh Piggott style wind turbine was constructed and erected at a private residence in Tatamagouche.

The idea was conceived by a Dalhousie University engineering student and the turbine was built by *If You Build It*, a community organization based in Halifax.

It was built by 30 people for \$2,500.

MORE INFORMATION

www.youtube.com/watch?v=9III_FBcBaE

www.facebook.com/IfYouBuildItEnergy

PROJECT PARTNERS

If You Build It

CONTACT

LIL MACPHERSON
lillymac41@hotmail.com
1.902.221.2338



MILLBROOK COMMUNITY WIND PROJECT

MILLBROOK FIRST NATION COLCHESTER COUNTY, NS

The Millbrook First Nation is the first Mi'kmaq band to have a wind energy project approved under the province's COMFIT program.



QUICK FACTS

- ▶ Job Creation: prioritize local and Mi'kmaq contractors
- ▶ Generation: 10MW
- ▶ Energy Type: Wind
- ▶ Status: Development Phase
- ▶ Scale: Community-wide
- ▶ Sector: Energy
- ▶ Owner/Operator: Millbrook First Nation (51%) juwi Wind Canada (49%)
- ▶ Completed: 2015

CONTACT

CHIEF BOB GLOADE
bgloade@msn.com
1.800.693.3112 ext: 127

DESCRIPTION

Once constructed, Millbrook Community Wind consists of three wind turbines. The project is co-located with another proposed two turbine wind project Truro Heights Community Wind, which is to be majority owned by Eskasoni First Nation. Combined the five turbines will generate 10 megawatts. Over the course of the year these two projects should produce enough energy to power more than 3,300 Nova Scotia homes with stable, local, and clean renewable energy.

See Wind COMFIT page for more info.

This project is part of a larger 24MW wind portfolio of 4 communities:

- Chebucto Pockwock Lake Wind Field Limited (CEDIF)
- Millbrook First Nation
- Eskasoni First Nation
- Whynotts Mi'kmaq Wind Co.

MORE INFORMATION

www.millbrookwindfarm.ca/

PROJECT PARTNERS

Firelight Infrastructure Partners
Community Wind Farms
juwi Wind Canada



SPIDDLE HILL WIND PROJECT

TATAMAGOUCHE COLCHESTER-CUMBERLAND, NS

The Colchester-Cumberland Wind Field Inc. (CCWF) is a Nova Scotia corporation operating in Colchester and Cumberland Counties. It is the first registered CEDIF in Nova Scotia contracted to generate electricity for Nova Scotia Power Inc.



QUICK FACTS

- ▶ Cost: \$5.3 Million
- ▶ Funding: Share Capital and Loan (approx. 60/40)
- ▶ Job Creation: Local contractors and tradespeople have been employed as much as possible
- ▶ Energy Savings: 4,000 tonnes/year of GHG emissions
- ▶ Energy Type: Wind
- ▶ Status: Implemented
- ▶ Scale: Community-wide
- ▶ Sector: Energy
- ▶ Owner: Colchester-Cumberland Wind Field Inc. (CCWF)
- ▶ Complete: 2016

CONTACT

DAVID STEVENSON
david.r.stevenson@ns.sympatico.ca
1.902.657.1064

DESCRIPTION

CCWF owns and operates two Enercon E-53 (800kW) and two AOC 15/50 wind turbines in 2015. A third 50kW turbine is planned for installation in 2016. In phase one, the first E-53 was commissioned in 2011. Phase two, under the NS COMFIT program, began with the installation of two AOC turbines in 2012 and the second E-53 in 2013. The third 50kW wind turbine is to be added in 2016. The CCWF wind field is located within the distribution area of the Tatamagouche sub-station. When the NSPI Nuttby Mtn. turbines operate, the area is completely on wind energy electricity. All electricity produced flows to the NSPI grid under 20-year Power Purchase Agreements. Shareholders are to receive their first dividend in 2016. With many shareholders living in the area served by the wind field, benefits flow to them in two ways.

See Wind COMFIT page for more info.



MORE INFORMATION

www.youtube.com/watch?v=Fq-AXDqSgRM&list=PLwLZ9YtgHtLDf2bxy8qqBvHUIK9KPISD5&index=5

www.ccwf.ca/

PROJECT PARTNERS

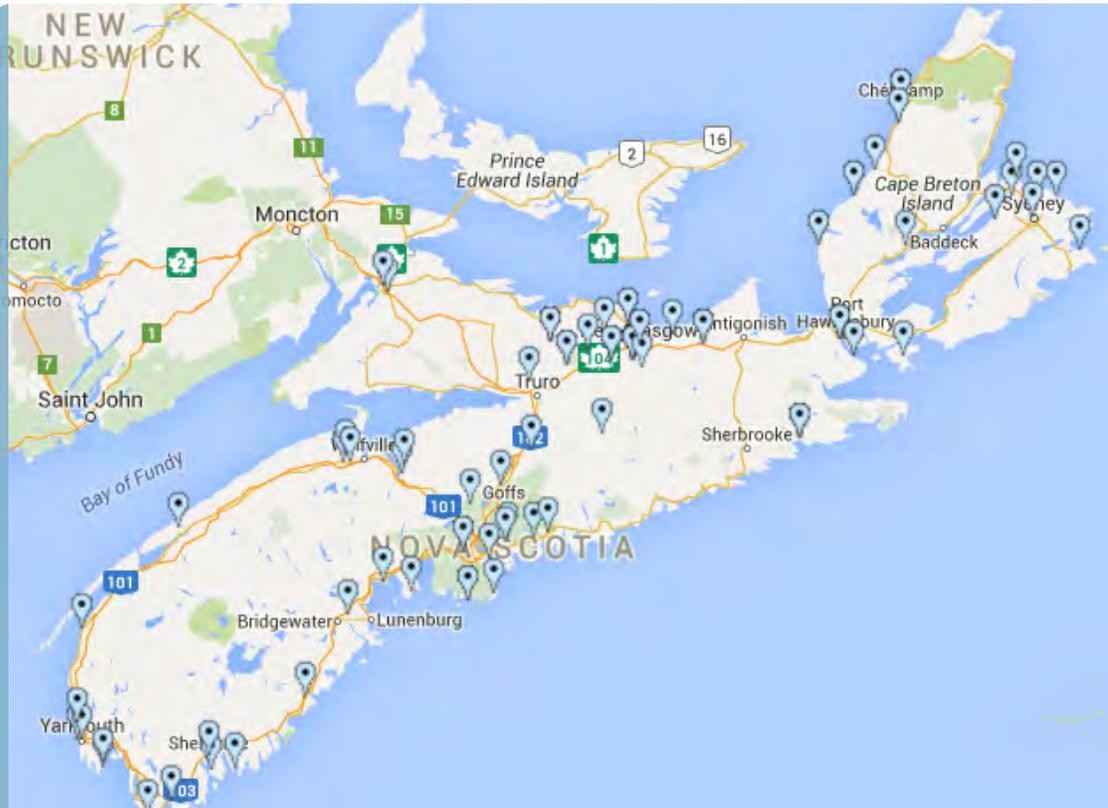
Seaforth Energy
Nova Scotia Department of Energy
NSPI



WIND COMFIT PROJECTS

VARIOUS PROVINCE-WIDE, NS

96 wind projects generating 185MW of wind exist across the province through COMFIT.



QUICK FACTS

- ▶ Generation: 185.57MW
- ▶ Project Range: 0.035MW - 11.5MW
- ▶ Energy Type: Wind
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Multi-sector
- ▶ Owner/Operator: Various

DESCRIPTION

The Nova Scotia Community Feed-in Tariff (COMFIT) Program encourages community-based, local renewable energy projects by guaranteeing a rate per kilowatt-hour for the energy the project feeds into the province’s distribution electrical grid.

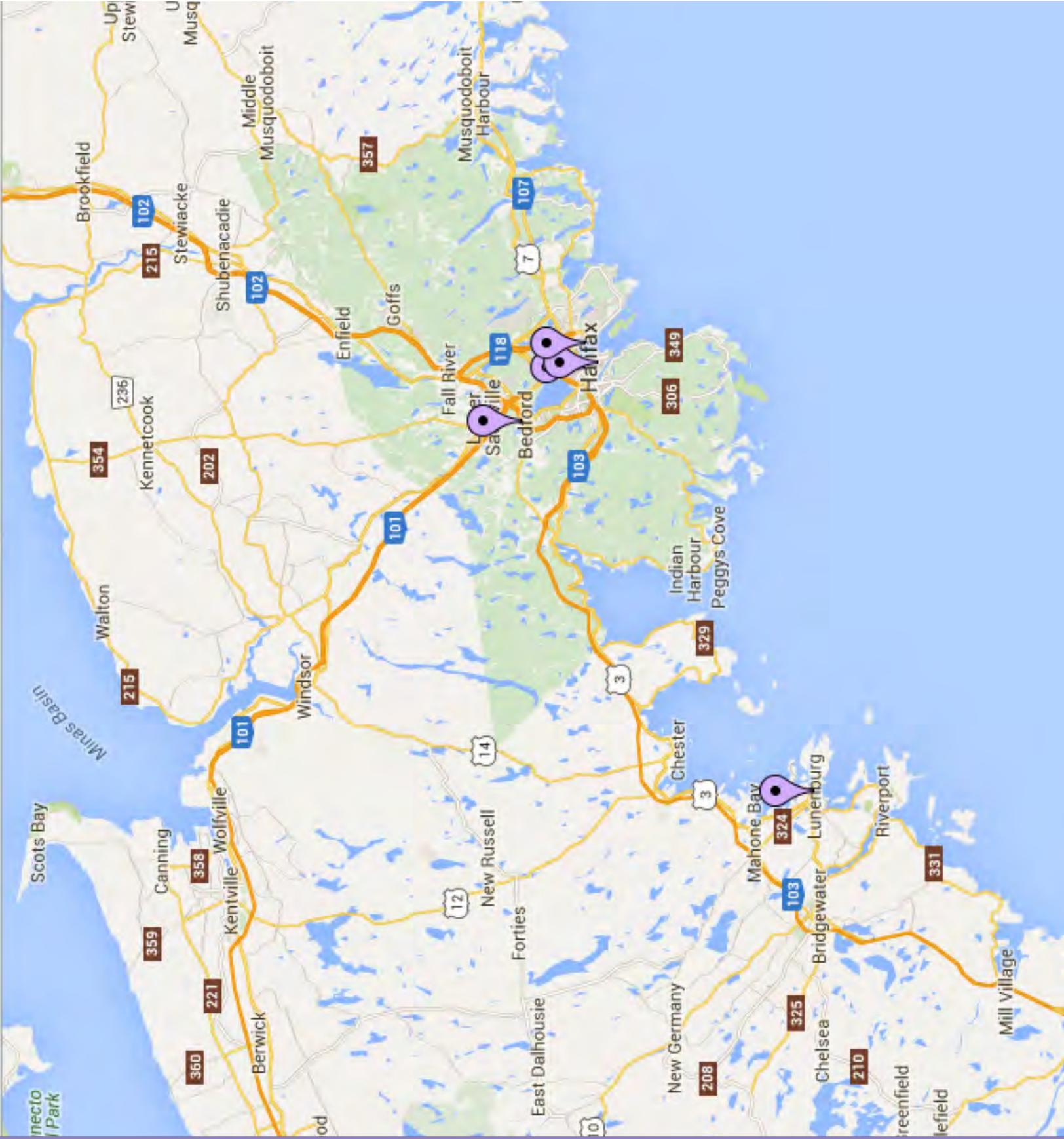
MORE INFORMATION

energy.novascotia.ca/renewables/programs-and-projects/comfit

batchgeo.com/map/NSCOMFITprojects

CONTACT

COMFIT ADMINISTRATOR
comfit@gov.ns.ca



OTHER ENERGIES

- CHP
- DATA ANALYTICS
- DISTRICT ENERGY
- ENERGY STORAGE
- IN-LINE RECOVERY TURBINE
- SEWAGE HEAT RECOVERY
- WASTE HEAT CAPTURE

COMBINED HEAT AND POWER SMUGGLER'S COVE INN

LUNENBURG
LUNENBURG COUNTY, NS

High-efficiency (96%) propane fueled
CHP unit for heat and hot water.



QUICK FACTS

- ▶ Cost: \$45,000
- ▶ Funded by: Private
- ▶ Job Creation: 2 jobs for 3 months
- ▶ Generation: 12 kW/h (heat) and 4.8 kWh (power)
- ▶ Payback Period: 6 years
- ▶ Cost Savings: \$8,000/year
- ▶ Energy Type: Combined Heat and Power
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Tourism, Commercial
- ▶ Owner: Juergen Ziegler
- ▶ Completed: May 17, 2013

DESCRIPTION

Located in downtown Lunenburg, the 20 unit Smuggler's Cove Inn and Scuttlebutt Restaurant use a high efficient (96%) CHP system driven by propane. It creates 12 kW/h which is used for hot water radiant system and domestic hot water. At the same time, it produces 4.8 kWh of electric energy used in the building.

MORE INFORMATION

www.smugglerscoveinn.ca

www.marathonengine.com

CONTACT

JUERGEN ZIEGLER
sshg@bellaliant.com



NSCC APPLIED ENERGY RESEARCH (AER)

NSCC WATERFRONT CAMPUS HALIFAX COUNTY, NS

AER researches methods of improving the use of sustainable energy technologies using NSCC's solar, wind, energy monitoring and microgrid equipment. EnergyDATA further develops AER's 'smart' energy initiatives with a greater emphasis on big data.



QUICK FACTS

- ▶ Cost: \$17,000
- ▶ Funded by: NSERC - \$2.3 million
In-kind - \$2 million
- ▶ Job Creation: Five full time, 25+ part time
- ▶ Energy Type: Data Analytics, Geothermal, Green Building, Renewables, Energy Efficiency,
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional, Energy
- ▶ Owner/Operator: NSCC
- ▶ Completed by: April 30, 2019

CONTACT

DR. ALAIN JOSEPH
alain.joseph@nsc.ca
1.902.491.1714

DESCRIPTION

EnergyDATA develops and tests energy management technologies and analytical tools to improve energy management infrastructure. Using various smart devices, electrical loads, and data communications equipment, the program's research helps partners make energy products and services more commercially successful. NSCC's unique facilities offer a controlled research and testing environment ideally suited to testing concepts such as, prototype 'smart' water heaters, metering equipment and other grid-interactive devices that are in development or evaluation in the NS grid context. With input from up to 20 industry partners over five years, EnergyDATA works to improve the intelligence of new and existing energy infrastructure through better use of communications technology and data analytics. As one of Atlantic Canada's first microgrid R&D sites, the program looks forward to contributing to the development of affordable and reliable renewable energy technologies in our region and beyond.

MORE INFORMATION

www.nsc.ca

PROJECT PARTNERS

The National Science and Engineering Council of Canada (NSERC)

nsc
Applied Research

MACADAMS PROJECT

**SOUTH STREET , HALIFAX
HALIFAX COUNTY, NS**

Small 4 building multi-unit residential complex with a pellet heat source, a geothermal heat source and natural gas.



QUICK FACTS

- ▶ Energy Savings: Replaces 100,000 litres of oil/year
- ▶ Energy Types: Geothermal, Biomass, Natural Gas, Solar Thermal
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Residential
- ▶ Completed: 2010 - 2015

DESCRIPTION

A small DE system heating 4 multi-unit residential buildings, replacing 100,000 litres of oil. It currently has 3 fuel options: a pellet boiler with an automatic 3000 kg feed system, a geothermal system consisting of ten 90' deep 4" diameter boreholes combined with a 5T heat pump, and natural gas backup. The system has a German made fuel source controller that draws from the lowest price fuel source as needed. The system will be supplemented in 2015 with an evacuated tube solar thermal system.

CONTACT

DUNCAN MACADAMS
duncanmacadams@me.com

ELECTRIC VEHICLE CHARGING STATIONS

VARIOUS LOCATIONS PROVINCE-WIDE, NS

63 Electric Vehicle Chargers are located in NS.



QUICK FACTS

- ▶ Energy Type: Energy Storage
- ▶ Status: Implemented
- ▶ Scale: Community-wide
- ▶ Sector: Energy
- ▶ Owner/Operator: Various

DESCRIPTION

63 Electric Vehicle Chargers are located in Nova Scotia. There are only two fast-charging stations in Nova Scotia, one at Glooscap Annex in Truro and one at the Atlantic Superstore on Barrington Street in Halifax. In Bridgewater, at the Lunenburg Co. Lifestyle Centre there are 7 chargers with two ports that can charge 14 vehicles at once. There are 5 chargers at Charles P. Allen High School in Bedford, 3 at the Halifax Central Library, 2 in Scotia Square and 2 at an office building in Dartmouth. Some municipalities have chosen to connect EV chargers to their Town Hall.

MORE INFORMATION

www.plugshare.com

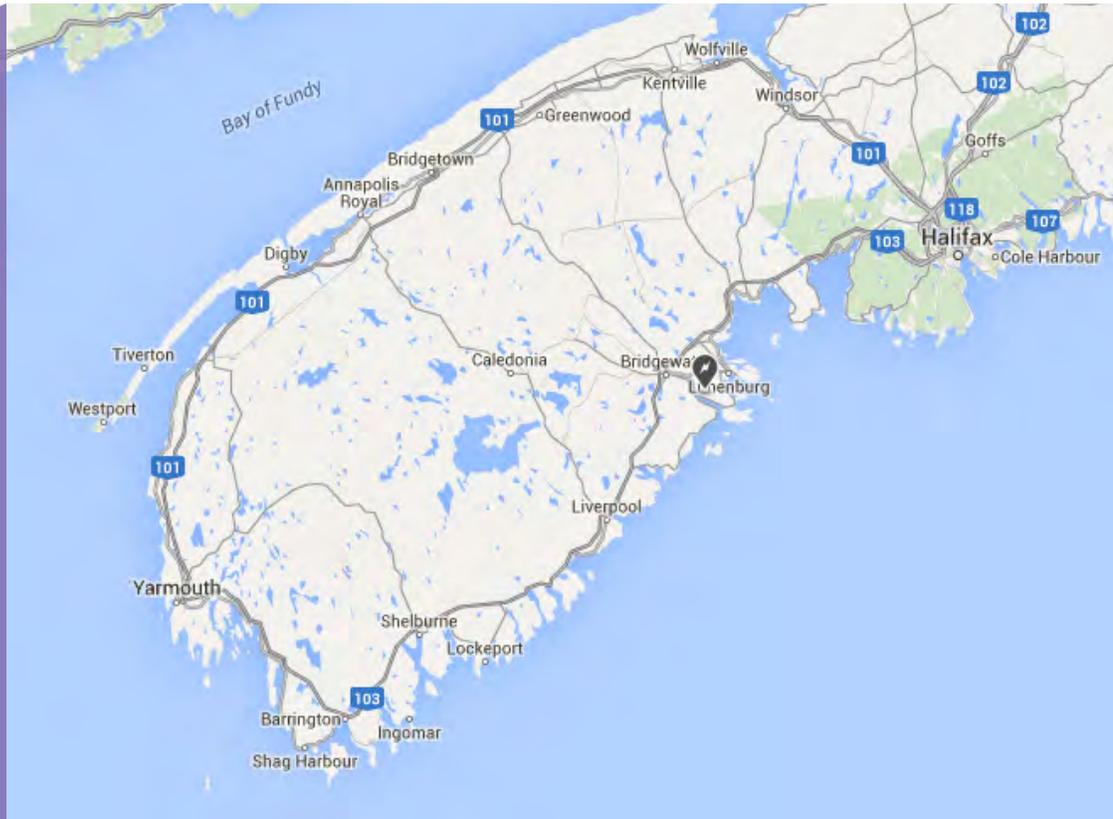
PROJECT PARTNERS

Nova Scotia Moves
 NS Electric Vehicle Highway Services
 Charging Network

TESLA DESTINATION CHARGING STATION

MIDDLE LAHAVE
LUNENBURG COUNTY, NS

There is one Tesla Destination Charging Station in NS.



QUICK FACTS

- ▶ Energy Type: Energy Storage
- ▶ Status: Implemented
- ▶ Scale: Community-wide
- ▶ Sector: Energy
- ▶ Owner/Operator: Tesla

DESCRIPTION

There is a Tesla Destination Charging Station at St. Mark's Place on the Lighthouse Route in Middle LaHave.

The station has 2 Tesla Connectors, up to 80A. It is available to the public. and is a self park station.

MORE INFORMATION

www.teslamotors.com/en_CA/fin-dus#/bounds/70,-50,42,-142,d?-search=supercharger,destination%20charger,&name=Canada

PROJECT PARTNERS

Tesla Motors
St. Mark's Place

CONTACT

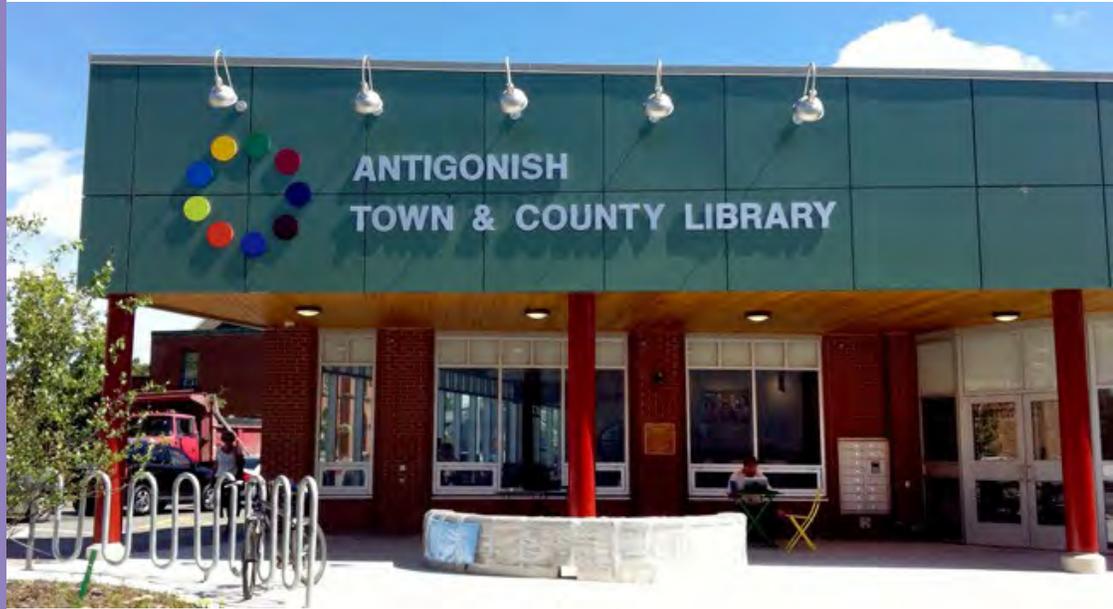
ST. MARK'S PLACE
info@stmarksplace.net
1.902.298.1292



THE PEOPLE'S PLACE ANTIGONISH TOWN AND COUNTY LIBRARY

ANTIGONISH
ANTIGONISH COUNTY, NS

The People's Place, Antigonish Town and County Library installed a geothermal heating and cooling system and energy efficient Solara windows.



QUICK FACTS

- ▶ Funded by: EcoNova Scotia
- ▶ Energy Type: Geothermal
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional
- ▶ Completed: June 2011

DESCRIPTION

The People's Place, a new library complex in Antigonish, is a model for sustainable energy practices. Funding from EcoNova Scotia allowed the project to put in a geothermal heating and cooling system, add energy efficient Solara windows to reduce glare saving cooling and heating costs, and install self-venting skylights and controls. These measures reduce the operating costs. Throughout the project's evolution there has been a great deal of citizen engagement – and energy efficiency was identified as a top priority. Displays and a walking tour demonstrate all the sustainable elements of the new building.

MORE INFORMATION

www.sustainability-unsm.ca/municipal-success-stories.html

www.youtube.com/watch?v=9DSt6xCnzss

PROJECT PARTNERS

Efficiency One

CONTACT

DEBBIE NIELSEN
dnielsen@unsm.ca
1.902.423.8312



Pictou-Antigonish
Regional Library



MUNICIPAL GEOTHERMAL PROJECT

SPRINGHILL
CUMBERLAND COUNTY, NS

Historic underground coal mines in Springhill contain about 49 billion litres of water, the equivalent of about 19,600 Olympic-sized swimming pools. The water is heated by geothermal energy from the Earth.

QUICK FACTS

- ▶ Energy Type: Geothermal
- ▶ Status: Planning Phase
- ▶ Scale: Community-wide
- ▶ Sector: Multi-sector
- ▶ Owner/Operator: Town of Springhill (4) and private operators (9)

CONTACT

REG RIDGLEY
rridgley@townofspringhill.ns.ca



DESCRIPTION

The mines' depths make underground water as much as 11°C higher than normal groundwater temperatures. The water can be used to heat buildings, then returned underground to be reheated by natural processes. As of February 2015, about 30 geothermal wells had been drilled, of which 13 are currently used by businesses/facilities for heating, cooling and production purposes.

- Community Centre (2 Municipal Wells)
- Ropak Northeastern Limited (2 Private Wells)
- Surrette Battery Inc. (3 Private Wells)
- Fitness Centre (2 Private Wells)
- Community College (2 Private Wells)
- Springhill Loop Supply (2 Municipal Wells)
- GOVRC Workshop
- Eel Farm

MORE INFORMATION

novascotia.ca/news/release/?id=20140123003

www.town.springhill.ns.ca/index.php?option=com_docman&task=doc_download&gid=162&Itemid=114

PROJECT PARTNERS

Department of Natural Resources



ALDERNEY 5 ENERGY PROJECT

**DARTMOUTH
HALIFAX COUNTY, NS**

Project consists of an underground thermal energy storage (UTES) system that harvests winter cold energy from seawater and stores underground to air condition 250,000 ft² of municipal buildings in summertime.

QUICK FACTS

- ▶ Cost: \$3 Million
- ▶ Funded by: NRCan, Halifax Regional Municipality
- ▶ Payback Period: 15 years
- ▶ Cost Savings: \$250,000/year
- ▶ Energy Type: District Energy, Geothermal, Renewables, Water Source Cooling, Energy Storage
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Commercial, Municipal
- ▶ Owner: Halifax Regional Municipality
- ▶ Completed: Feb. 1, 2009

CONTACT

JIM BROWN
brownji@halifax.ca
1.902.430.6267



DESCRIPTION

Project consists of an underground thermal energy storage (UTES) system with 80 boreholes, 500 feet deep, a seawater intake and titanium heat exchanger system that harvests cold energy from seawater in winter and stores underground to air condition 250,000 ft² of municipal buildings. This is one of the first applications of UTES to air condition buildings without the use of heat pumps.

MORE INFORMATION

www.halifax.ca/facilities/Alderney5.php

www.questcanada.org/quest-publications

www.youtube.com/watch?v=xXM228e6SFO

PROJECT PARTNERS

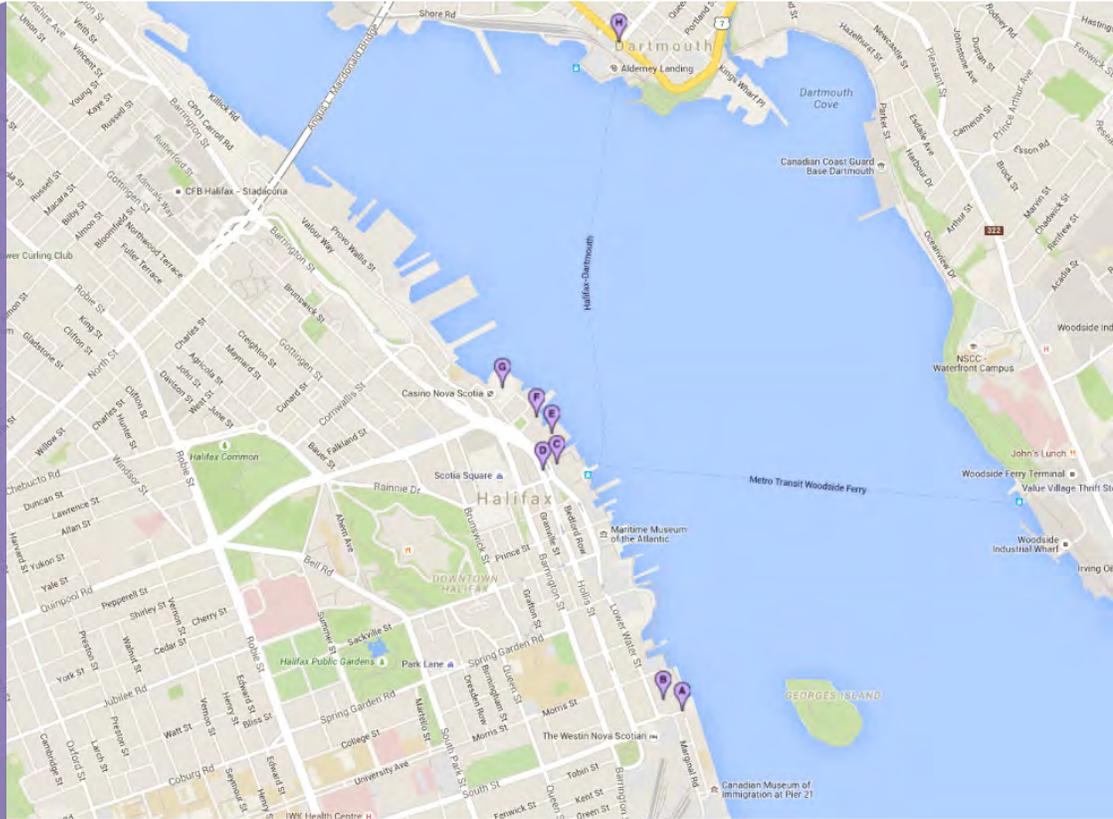
Government of Canada - TEAM Program

HALIFAX

HALIFAX HARBOUR GEOTHERMAL SYSTEMS

HALIFAX WATERFRONT HALIFAX COUNTY, NS

9 buildings on the Halifax Waterfront use seawater heating and cooling.



QUICK FACTS

- ▶ Energy Type: Geothermal
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Commercial
- ▶ Owner/Operator: Various

DESCRIPTION

Properties that use geothermal seawater heating and cooling from Halifax Harbour include:

- (A) Seaport Market
- (B) 1H Emera Headquarters
- (C) Historic Properties
- (D) RBC Waterside
- (E) Marriott Hotel
- (F) Purdy's Wharf
- (G) Casino Nova Scotia
- (H) Alderney 5
- (I) Bedford Institute of Oceanography (not on map)

MORE INFORMATION

purdyswharf.com/

www.youtube.com/watch?v=hQuv7k-GhHE

batchgeo.com/map/halifaxseawatergeothermal

CONTACT

MARY ELLEN DONOVAN
mellendonovan@gmail.ca

4 SINGLE FAMILY DWELLINGS HEATED WITH GEOTHERMAL

CANARD
KINGS COUNTY, NS

4 close neighbours in rural Nova Scotia elected to install individual vertical geothermal residential heating systems.



QUICK FACTS

- ▶ Cost: \$25,000/
- ▶ Energy Savings: Estimated at half the cost of an oil furnace
- ▶ Energy Type: Geothermal
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Residential
- ▶ Owner/Operator: 4Homeowners

DESCRIPTION

In an area with plentiful ground water, one property owner uses a regular well to pump water out of the ground, run it through his heat pump and then dispose of it into a drainage ditch. Another property owner uses a two well system which is 180 feet deep and cost about \$20,000. The heat pump cost about \$4000, and another \$1000 to install, bringing the overall cost to an estimated \$25,000. It has the option of returning the water to the ground using the first well, or the outflow can be run into a drainage ditch. A third owner has a single well and a drainage ditch because that is the cheapest option. Savings are estimated at half the cost of an oil furnace.

MORE INFORMATION

youtu.be/i86tiTNw6_Q

CONTACT

MARY ELLEN DONOVAN
mellendonovan@gmail.com

PICTOU LANDING HEALTH CENTRE

PICTOU LANDING PICTOU COUNTY, NS

Designed as the community centre and main community health facility for the Mi'kmaq community of Pictou Landing. Containing clinics for doctors, dentists, and community health workers, as well as a community meeting space and public health education room.



QUICK FACTS

- ▶ Energy Savings: uses 43% less energy than a conventional heating and cooling system
- ▶ Energy Type: Geothermal
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Multi-sector
- ▶ Owner/Operator: Pictou Landing First Nation

DESCRIPTION

The Health Centre is heated and cooled using geothermal energy from a decommissioned municipal well, using 43% less energy than a conventional building of comparable size and forms a protective south facing space around a medicine garden and medicine wheel, the physical centre of the community. It was constructed by members of the community using local trees.

MORE INFORMATION

www.plfn.ca/

www.richardkroekerdesign.com/

PROJECT PARTNERS

Pictou Landing First Nation
Richard Kroeker Design
Brian Lilley and Peter Henry Architects

CONTACT

RICHARD KROEKER DESIGN
richard.kroeker@dal.ca
1.902.494.3277



Pictou Landing
First Nation



PORT HAWKESBURY CIVIC CENTRE

PORT HAWKESBURY RICHMOND COUNTY, NS

The facility has been highly regarded worldwide for its sustainable design, including a designation as one of the world's 10 greenest buildings by the US magazine Business Week.

QUICK FACTS

- ▶ Cost: \$ 17.3 million (total)
\$197,400 (earth loop)
- ▶ Funded by: FCM GMF
- ▶ Energy Savings: uses 40-45% less energy than a conventional heating and cooling system; GHG reduction of 73%
- ▶ Energy Type: Geothermal
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional
- ▶ Owner/Operator: Town of Port Hawkesbury
- ▶ Completed: 2004

CONTACT

GORDIE SNOOK
1.902.625.7037

DESCRIPTION

The arena is equipped with the Ice Kube System, an energy efficient geothermal chiller that has cold storage in the rink slab. The heating system works in reverse. Rather than cooling down the ice; it is removing heat from it.

The heat generated during the ice-making process is recovered and used throughout the facility as radiant heating.

Warm water is circulated through a heat exchanger to create hot water for showers, melt snow shavings removed from the ice and melt snow on the sidewalk around the buildings.

Excess heat is stored in a horizontal earth loop under the parking lot. Forced-air heat pumps provide heating and air conditioning by drawing or rejecting the heat to the earth loop. Excess heat is shared with the high school next door to heat the swimming pool.

MORE INFORMATION

www.phcivic.com/index.php

PROJECT PARTNERS

FCM Green Municipal Fund

GEOHERMAL ARENAS

5 LOCATIONS PROVINCE-WIDE, NS

It is becoming more common for arenas in Nova Scotia to draw upon geothermal energy.



QUICK FACTS

- ▶ Energy Type: Geothermal
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Municipal
- ▶ Owner/Operator: Various

DESCRIPTION

Arenas using geothermal energy to manage their heating and cooling include:

- (A) Port Hawkesbury Civic Centre
- (B) Membertou Arena
- (C) Bayplex (Glace Bay)
- (D) Springhill Arena
- (E) North Side Civic Centre (North Sydney)

MORE INFORMATION

batchgeo.com/map/NSgeothermalarenas

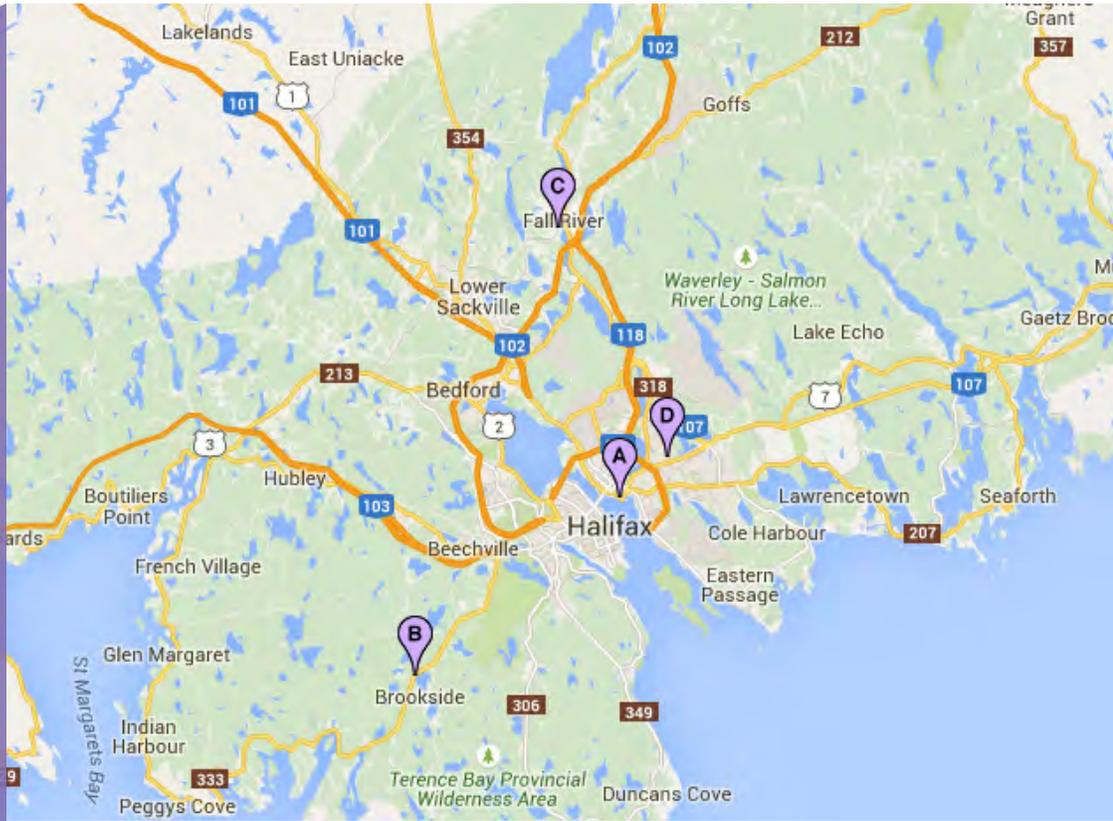
PROJECT PARTNERS

Thrive!
Enterprise Cape Breton Corp.
KUBE Solutions

GEOTHERMAL COMMUNITY CENTRES (HRM)

4 LOCATIONS HALIFAX COUNTY, NS

At least 4 community centres in HRM have geothermal systems installed.



QUICK FACTS

- ▶ Energy Type: Geothermal
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Municipal
- ▶ Owner/Operator: Various

DESCRIPTION

Since 2008, HRM has built and is operating more geothermal buildings than anyone else in Atlantic Canada using over 180 boreholes in at least 4 facilities, including:

- (A) Alderney 5
- (B) Prospect Community Centre
- (C) East Dartmouth Community Centre
- (D) Gordon R. Snow Community Centre

MORE INFORMATION

www.halifax.ca/energy-environment/environment/GeothermalEnergy.php

batchgeo.com/map/HRMgeothermal

CONTACT

JIM BROWN
brownji@halifax.ca
1.902.430.6267

HALIFAX

ORCHARD IN-LINE ENERGY RECOVERY TURBINE

**BEDFORD
HALIFAX COUNTY, NS**

Excess pressure in water pipelines is dissipated generally through pressure reduction valves before being delivered to consumers. Energy, which would otherwise be wasted, is captured by an in-line turbine to generate electrical energy to be used by homeowners and businesses connected to the local electrical distribution system.



QUICK FACTS

- ▶ Cost: \$450,000
- ▶ Funded by: Halifax Water, Water Research Foundation, NS Dept. of Environment
- ▶ COMFIT rate: 14.0¢ per kWh
- ▶ Cost Savings: \$35,000/yr
- ▶ Payback Period: 8.8 years (HW contribution only)
- ▶ Energy Savings: 225,000 kWh/yr
- ▶ Energy Type: Renewables
- ▶ Status: Implemented
- ▶ Scale: Community-wide
- ▶ Sector: Multi-sector
- ▶ Owner/Operator: Halifax Water
- ▶ Completed: October 7, 2014

DESCRIPTION

This project involved the installation of an in-line turbine/generator within the Orchard PRV Chamber. The system is comprised of supply and discharge piping, manual isolation valves, automated control and pressure relief valves, the energy recovery turbine (a.k.a. reverse pump), a 40 kW induction generator, and the associated control systems. The system has a net power capacity of 33.5 kW, and is expected to generate 225,000 kWh/yr – an amount equivalent to that used by approximately 25 NS households. The technical challenges involved integrating the system into an existing, operating and semi-closed water supply system, and understanding and mitigating any effects due to flow and/or pressure transients on the water supply system.

PROJECT PARTNERS

Rentricity Inc.
NS Power
NS Dept. of Energy (COMFIT)
Water Research Foundation

CONTACT

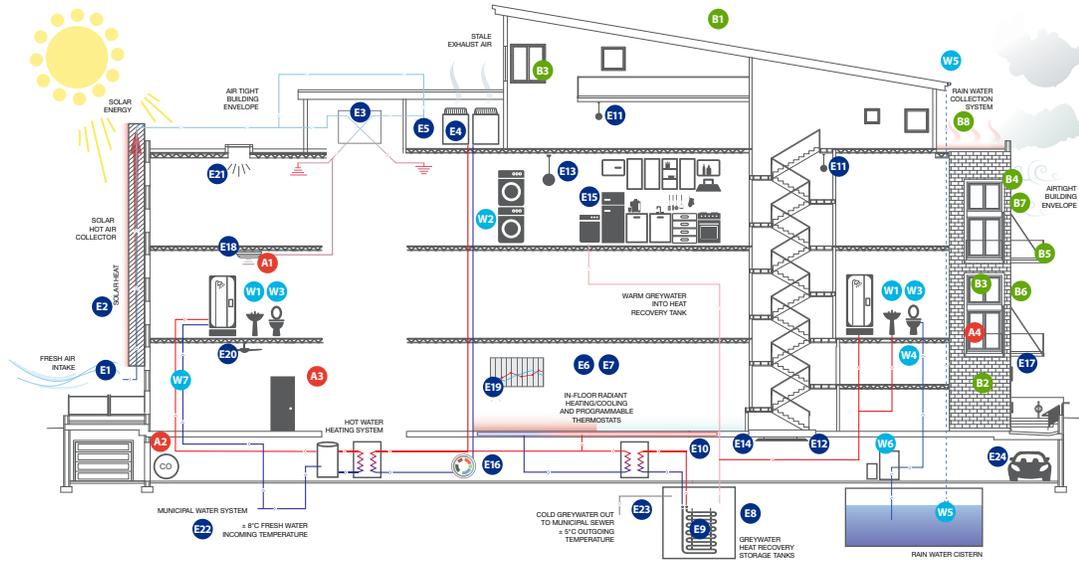
JEFF KNAPP
jeffreyk@halifaxwater.ca
1.902.490.5736



Q LOFTS SEWAGE HEAT RECOVERY

HALIFAX
HALIFAX COUNTY, NS

Internal Sewage Heat Capture in
72-unit residential building.



QUICK FACTS

- ▶ Energy Savings: uses less than 50% of the energy consumed by a building constructed to the requirements of the *Model National Energy Code*
- ▶ Energy Type: Sewage Heat Recovery
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Residential
- ▶ Owner/Operator: Polycorp Properties
- ▶ Completed: 2015

DESCRIPTION

Used hot water from showers, kitchens and laundries is collected and stored in two 9,000-litre insulated tanks buried under the the parking garage floor. An integrated heat exchanger in the greywater heat recovery storage tank extracts heat from the captured warm greywater and supplies it to the heat pump system. In-floor radiant heating, central geothermal heating, triple-glazed windows, solar thermal walls and extra insulation inside the perimeter walls are also being planned for the building.

MORE INFORMATION

qlofts.ca/wp-content/uploads/2013/09/Energy_schematic.pdf

qlofts.ca/

CONTACT

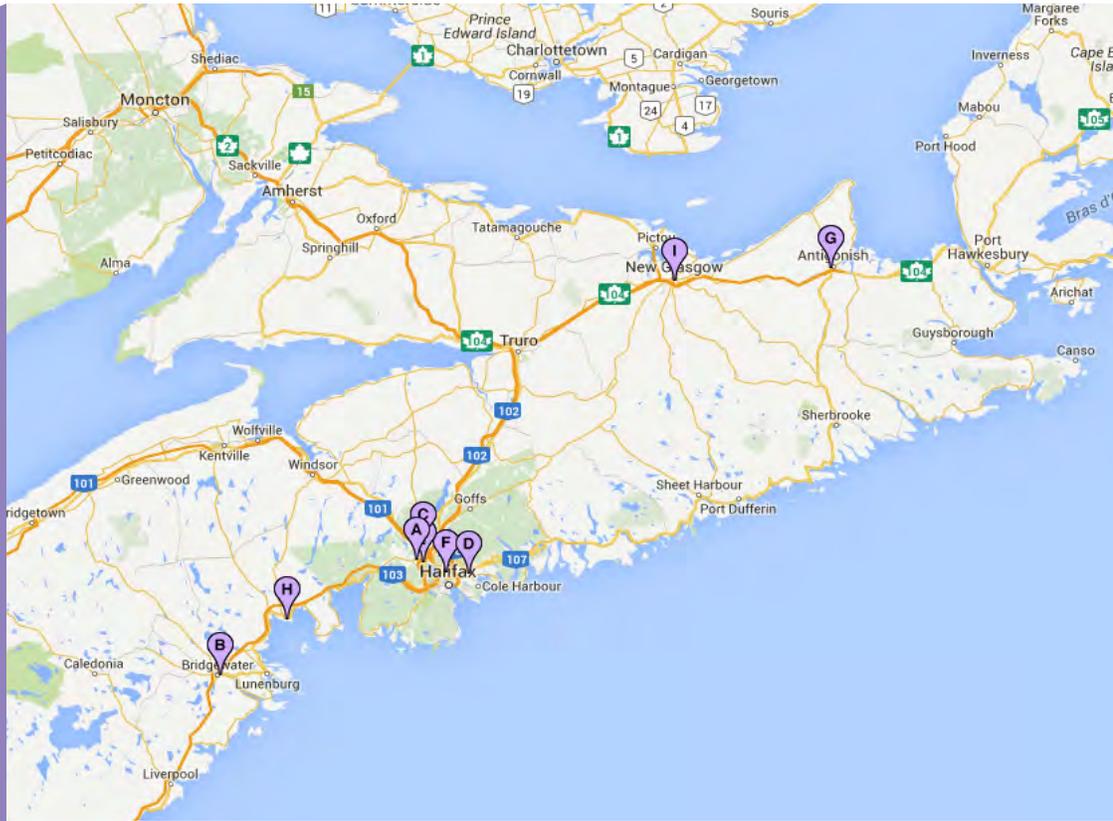
PETER POLLEY
1.902.431.9919



WASTE HEAT CAPTURE ARENAS

VARIOUS PROVINCE-WIDE, NS

Ice making facilities offer lots of opportunities to capture heat before it is lost.



QUICK FACTS

- ▶ Energy Type: Waste-to-Heat
- ▶ Status: Implemented
- ▶ Scale: Project
- ▶ Sector: Institutional

DESCRIPTION

The (A) BMO Centre 4-pad in Bedford is the most energy efficient arena in Canada. Waste heat from the refrigeration system is used to heat shower water, in-floor heating in the locker rooms, provide heating for the facility, as well as provide heat in bleacher seating areas. There is still excess heat that can't be used in this facility.

The new (B) Clearwater Seafoods Arena (Lunenburg County Lifestyle Centre) has incorporated waste heat capture.

The technology has been implemented in older existing rinks, including the Sackville Sports Stadium, Cole Harbour Place, LeBrun Centre, Gray Arena, Antigonish Arena, Eleanor Pew Morris Memorial Arena.

- (C) Sackville Sports Stadium
- (D) Cole Harbour Centre
- (E) LeBrun Centre
- (F) Gray Arena
- (G) Antigonish Arena
- (H) Eleanor Pew Morris Memorial Arena
- (I) John Brother MacDonald Arena

MORE INFORMATION

- www.mreng.ca/portfolio/bmo-centre;
- www.halifax.ca/energy-environment/environment/HeatRecovery.php
- www.thecasket.ca/archives/1555
- www.the-park.ca/images/ParkTalk0808.pdf
- www.lydonlynch.ca/sustainable-projects.php

PROJECT PARTNERS

- Efficiency Nova Scotia
- Federation of Canadian Municipalities -
- Green Municipal Fund

CONTACT

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 1902.425.5450 ext. 330



RESOURCES

Here is a list of resources that have been useful in the development of the *Homegrown Success: Nova Scotia Smart Energy Inventory*. Visit these sites to continue the story:

QUEST Atlas

www.questcanada.org/theatlas

QUEST Smart Energy Communities Video

www.questcanada.org/thesolution

Getting to Implementation: Community Energy Planning in Canada

gettingtoimplementation.ca/

Department of Energy COMFIT

energy.novascotia.ca/renewables/programs-and-projects/comfit

Efficiency Nova Scotia

www.energycns.ca/

Union of Nova Scotia Municipalities

www.unsm.ca/

BatchGeo Maps

NS Energy Atlas Map: batchgeo.com/map/homegrownsuccessenergyinventory

NS COMFIT Map: batchgeo.com/map/NSCOMFITProjects

NS LEED Buildings Map: batchgeo.com/map/NSLEEDBuildings

HRM Solar Monitoring Map: batchgeo.com/map/49a2297a59f938ecbb97a1c-c8a2dc926

Youtube Channels

QUEST: www.youtube.com/c/QUESTQualityUrbanEnergySystemsofTomorrowQUEST

Efficiency Nova Scotia: www.youtube.com/user/energycns

Nova Scotia Government: www.youtube.com/user/nsgov

Nova Scotia Agriculture: www.youtube.com/user/NSAgriculture/feed

Plugshare EV Charging Stations

www.plugshare.com/

Web Energy Logger

welserver.com/

Nova Scotia Power Wind Farm Map

www.nspower.ca/en/home/about-us/how-we-make-electricity/renewable-electricity/wind-farm-map.aspx

PROJECT PARTNERS & SUPPLIERS

- aBetter Connection Halifax
- Accurate Dorwin Fiberglass Windows and Doors
- Appleseed Energy
- Atlantis Resources
- Autism Nova Scotia
- Barrie & Langille (Halifax)
- Beacon United Church
- Black Rock Tidal Power
- Blueline Innovations
- Brian Lilley and Peter Henry Architects
- Community Wind Farms
- Confederacy of Mainland Mi'kmaq
- Continental Plastic Industrial Flooring
- Creative Solar
- Dalhousie University
- Dr. Solar
- ecoNovaScotia
- Efficiency Nova Scotia
- Farm Energy Nova Scotia
- Firelight Infrastructure Partners
- Green Power Labs
- Growing Forward
- Growing Forward 2
- Halifax Music Coop
- Hillside Pines
- If You Build It
- juwi Wind Canada
- KUBE Solutions
- Kwilmu'kw Maw-klusuaqn Negotiation Office
- L'Atelier de Clare
- Landry Broth Louisdale
- LED Roadway Lighting
- Lunenburg Community Network
- Lunenburg Electric Utility
- Lydon Lynch
- Metro Community Housing Association
- Mi'kmaq Rights Initiative
- Minas Energy
- Moriyama & Teshima (Toronto)
- New Boundaries
- Queens Association for Supported Living
- Nova Scotia Community College
- Nova Scotia Department of Energy
- Nova Scotia Department of Environment
- Nova Scotia Department of Health Promotion & Protection
- Nova Scotia Department of Labour
- Nova Scotia Federation of Agriculture
- Nova Scotia Power Inc.
- Openhydro
- Passive House E-Design
- Pictou Landing First Nation
- Rentricity Inc.
- Rexel (Nedco)
- Richard Kroeker Design
- Scotian Renewables
- Seaforth Energy
- Sherwood Entreprises
- Solterre Design
- Spring House
- St. Paul's Family Resource Institute
- Sustainable Housing
- Tekton Design + Build
- The Deanery Project
- The Roofing Connection
- The Youth Project
- ThermalWise
- Thermo Dynamics
- ThermoHomes
- Think Farm
- Tom Thompson Electrical
- TrueFoam Solutions
- WHW Architects - now Architecture49
- Yarmouth Life Skills for Disabled Adults
- YMCAs of Cape Breton

PROJECTS BY COUNTY

Annapolis County

- Energy Efficiency: LED Streetlights - Town of Annapolis Royal
- Green Building: Pilikan House – Nova Scotia Community College
- Tidal: Annapolis Tidal Station - NSPI/Emera

Antigonish County

- Geothermal: The People's Place - Antigonish Town and County Library
- Solar: 7.74kW Grid-Tied PV Home - Private Residence

Cape Breton County

- Green Building: Verschuren Centre - Cape Breton University
- Green Building: Maupeltuewey Kina'matno'kuom School - Membertou First Nation
- Solar: 85 Panel PV Array - Private Residence

Colchester County

- Energy Efficiency: Strategic Energy Management - Intertape Polymer
- Wind: 1kW Hugh Piggott Wind Turbine - Private Residence
- Wind: Spiddle Hill Project - Colchester-Cumberland Wind Field Inc.
- Wind: Millbrook Wind Farm - Millbrook First Nation

Cumberland County

- Energy Efficiency: Freezer Tunnel Upgrade - Oxford Frozen Foods
- Geothermal: Municipal Geothermal Project - Town of Springhill
- Green Building: Joggins Fossil Centre
- Tidal: Fundy Ocean Research Centre For Energy (FORCE)

Digby County

- Biomass: Municipal Generator Project Using Mink Waste - Town of Digby

Guysborough County

- Biomass: Ocean Nutrition Biofuel Plant - Ocean Nutrition
- Biomass: Archibald Dairy Farm
- Green Building: Energy-Efficient Administration Building - District of St. Mary's
- Solar: Green Energy Project - Chedabucto Place

Halifax County

- Biogas: Sackville Landfill - Highland Energy
- Biomass: Scotia Atlantic Biomass
- Data Analytics: Applied Energy Research (AER) – Nova Scotia Community College
- District Energy: MacAdams Project - Private Residence
- Energy Efficiency: Capital Health - Capital Health District Authority
- Energy Efficiency: Compressed Air Audit - Dalhousie University Halifax
- Energy Efficiency: Re-Commissioning of FASS Building - Dalhousie University
- Energy Efficiency: powerWHYS Energy Efficiency App
- Geothermal: Alderney 5 Energy Project - Halifax Regional Municipality
- Geothermal: Halifax Harbour Seawater Heating and Cooling
- Geothermal: Geothermal Community Centres - Halifax Regional Municipality
- Green Building: 1H NSPI Headquarters
- Green Building: Waterfront Campus and Centre for the Built Environment – NSCC
- Green Building: Fern Lane New Design - Ecology Action Centre
- Green Building: Hawkins House - Passive House E-Design
- Green Building: Vimiga Professional Centre
- Renewables: Orchard In-Line Energy Recovery Turbine – Halifax Water
- Sewage Heat Capture: Q Lofts
- Solar: Cornerstone Wesleyan Church Solar PV Array
- Solar: Parker St Apartments Solar Thermal Array - Killam Properties
- Solar: Northbrook Police Training Centre PV Array - Halifax Regional Municipality
- Solar: Solar Well Pumping - Nova Scotia Community College
- Solar: Solar City 2.0 - Halifax Regional Municipality
- Solar: Alderney Gate Public Library - Halifax Regional Municipality
- Solar: West Street Fire Station (Solar PV) - Halifax Regional Municipality
- Solar: Dartmouth Sportsplex Solar Wall - Halifax Regional Municipality
- Solar: Solar Vent/PV Install - Dalhousie University
- Solar Thermal: Solar Thermal Array - Bedford Institute of Oceanography
- Solar Thermal: Solar Hot Air Community Centres - Halifax Regional Municipality
- Solar Thermal: HRM Solar Thermal Fire Halls - Halifax Regional Municipality

PROJECTS BY COUNTY

Hants County

- Biomass: Biofuel Weiss

Inverness County

- Solar: 36 Panel PV Array - Private Residence

King's County

- Biomass: Anaerobic Digester: Centreville Pilot Facility - BioGas Energy Inc.
- Geothermal: 4 Single Family Dwellings - Private Residences
- Green Building: Valley Waste Resource Management Administrative Building

Lunenburg County

- Combined Heating Power: Smuggler's Cove Inn
- Energy Efficiency: Smart Meter Pilot Program - Town of Lunenburg
- Energy Efficiency: Bridgewater Memorial Arena Lighting Retrofit - Town of Bridgewater
- Energy Efficiency: Energy Efficiency Employee Engagement - Michelin
- Green Building: Bluenose Academy
- Green Building: Concept Cottage - Solterre Design
- Solar: 68 Panel PV Array - Private Residence
- Solar Thermal: Energy Efficient Fire Hall - Municipality of Lunenburg

Pictou County

- Geothermal: Pictou Landing Health Centre

Queens County

- Biomass: Cellufuel Brooklyn Project

Richmond County

- Biomass: PSES Heating System - PSES Heating System
- Energy Efficiency: Energy Efficiency Upgrades - Lobsters 'R' Us Seafood
- Geothermal: Port Hawkesbury Civic Centre - Town of Port Hawkesbury

Shelburne County

- Energy Efficiency: Sandy Point Sewage Treatment Plant - District of Shelburne

Victoria County

Yarmouth County

- Solar: Yarmouth YMCA Solar Thermal Pool

Province-wide

- Biomass: COMFIT Biomass Projects
- Biomass: Campus Biomass Projects
- Energy Efficiency: Energy Efficient New Sobeys Stores - Sobeys
- Energy Efficiency: Residential Blueline Energy Monitoring - 3 Reserve Communities
- Energy Efficiency: Mi'kmaq Sustainable Housing - Residential Direct Install
- Energy Efficiency: Growing Forward 1 & 2 - Nova Scotia Dept. of Agriculture
- Energy Efficiency: Culture of Efficiency - Ecology Action Centre
- Energy Efficiency: NSLC Retrofits
- Energy Efficiency: Energy Efficiency Arena Upgrades
- Energy Storage: Electric Vehicle Chargers - Plugshare
- Geothermal: Geothermal Arenas
- Green Buildings: LEED Buildings Canada Green Building Council
- Green Buildings: LEED Schools Canada Green Building Council
- Tidal: COMFIT Tidal Projects
- Waste-to-Heat: Waste Heat Capture Arenas
- Wind: COMFIT Wind Projects