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Bluenose Academy – Lunenburg, NS

Background
The Bluenose Academy in Lunenburg, Nova Scotia is the first government building in the province with a fully-integrated wood pellet-fired biomass heating system. It is also the first building in Canada featuring a biomass heating system to obtain LEED® Gold certification.

With the Old Town of Lunenburg - a UNESCO World Heritage Site – in close proximity, the Bluenose Academy design team, consisting of *Architecture49* and *Dumac Energy*, was tasked with designing a contemporary school building within a heritage context and achieving LEED® Gold certification.

Faced with rising and unpredictable fuel oil costs and with natural gas not available at the site, the team was charged with integrating innovative renewable energy technologies into the building design. The team ultimately settled on using wood pellets as a fuel source as a more economical and price stable option.

The Viessmann Solution
A Viessmann Pyrot KRT-540 wood-fired boiler (rated at 1843 MBH) was commissioned as the system's primary source of space and DHW heating. The fully-automatic Pyrot utilizes the industry's most advanced combustion technology, triple-pass heat exchanger and modulating output control to achieve an efficiency of up to 85% while keeping emissions to a minimum. Its state-of-the-art system monitoring and safety equipment ensure safe and reliable operation.

The heating system also includes a Vitorond 200, VD2-560 oil-fired boiler (rated at 1941 MBH) to provide backup and additional capacity during peak loads, as well as six Vitosol 200-F SV2 flat plate solar thermal collectors.

Wood pellets are stored in a 26-ton capacity steel silo and delivered to the boiler by the Pyrot's feed auger. When fuel gasification and combustion are complete, an automated deashing system extracts ashes from the combustion chamber and transfers them to an ash bin.

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Viessmann Pyrot KRT-540 wood pellet boiler (1843 MBH)

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The Results

- The integration of a biomass boiler and solar heating system into the mechanical and electrical system in addition to a good building envelope assisted in optimizing the overall energy performance in the Bluenose Academy. Based on MNECB 1997 designed energy costs we were able to obtain **65% savings** of which **46.7% of the buildings energy is provided by on-site renewable energy**.

- Annual CO_2 reductions: 550.5 tons*
(* Numbers based on MNECB 1997 designed energy costs and Environment Canada's GHG Inventory 1990-2002 Data with an adjustment factor to account for the line losses and upstream emissions)

- Bluenose Academy was the recipient of the **Canadian Solar Thermal Project of the Year** by the Canadian Solar Industries Association (CanSIA) in 2012.

The biomass system is part of an integrated system consisting of a biomass boiler, solar thermal, solar air, and solar photovoltaic technology

Project Details

Project Year	2012 (attained LEED® Gold certification in 2015)
Equipment	Pyrot KRT-540 Vitorond 200, VD2-560 6xVitosol 200-F SV2
Rated Output	1843 MBH (Pyrot) 1941 MBH (Vitorond)

Client:	**South Shore Regional School**
Architect:	**Architecture49**
LEED Consultant:	**Architecture49**
Mechanical Engineer:	**Dumac Energy**

Viessmann Pyrot

Virorond 200, VD2

Vitosol 200-F SV2

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