

LEED-ing the way in Energy Efficiency

at Algonquin College

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Implementing an energy service contract

to transform the Woodroffe Campus

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Algonquin College partners up with Siemens Canada to introduce energy efficiency measures touching all areas of the Woodroffe campus within several areas of improvement. By reducing energy costs, the College is investing in student success.

"This project really fits well with our overall sustainability and resiliency goals at the College. Once the whole project is complete, we expect up to a 12 percent reduction in our carbon footprint. With the co-gen plant, we now have the ability to meet our base load of electricity needs and operate the entire campus."

*– Todd Schonewille, Director,
Physical Resources, Algonquin College*

\$51 million

**\$51 million
investment
over 20 years**

\$3.7 million

**\$3.7 million in annual
operating cost savings**

1 INTRODUCTION

Algonquin College of Applied Arts and Technology is a publicly funded college located in Ottawa, Ontario. It is the largest college in Eastern Ontario with 19,000 full-time and 37,000 part-time students that are registered in over 266 programs^[2].

The College was established in 1967 with the formation of Ontario's college system^[2]. It is named after the Algonquin First Nations Peoples who were the original inhabitants of the area. Today, the College owns three active Ontario locations at Woodroffe, Perth and Pembroke.

Algonquin College has been a long time champion of environmental protection, demonstrating their dedication by becoming the first Canadian college to sign the Talloires Declaration, which commits post-secondary institutions to being leaders in sustainability^[3].

However, budget constraints resulting in a growing deferred maintenance backlog negatively affect the campus' energy performance. Moreover, taking into consideration that 33% of the buildings on campus were built pre-1970 and another 38% are pre-1990s construction, it becomes apparent that there is a lot of room for improvement in terms of energy efficiency^[3].

In 2014, the College released a detailed Conservation and Demand Management plan that aims to address these issues and reduce the electricity usage by 61% over 5 years^[3]. The plan is guided by the institution's Sustainable Algonquin Framework which identifies a balanced approach to sustainability where social, economic, and environmental (S-E-E) aspects are considered in institutional decision-making with equal weighting^[4]. Efforts to address areas relating to energy conservation are directly related to goals within the framework such as "Reduce our Ecological Footprint", "Enhance Student Success", and "Pursue Economic Strength", as examples.



Figure 1: The S-E-E Model of Sustainability^[4]

2 PROJECT DETAILS

Fulfilling its ambitious targets requires collaboration and Algonquin College recognized the need for assistance from the private sector. This prompted the College to issue a formal Request for Proposal (RFP) to a select group of companies. After assessing the options, the College entered into a 20 year partnership with Siemens Canada to deliver a comprehensive Energy Service Contract (ESCO₂) that is financed through energy savings.

The contract allows the College to benefit from a project with a guaranteed predetermined level of savings. The College would keep its energy budget whole until the project is finalized, after which the savings become available to the College.

In 2013, work began on the first phase of the project and saw the implementation of energy efficiency renovations that spanned several areas including water efficiency improvements, HVAC retrofits, the replacement of cooling towers, chiller plant optimization, interior and exterior LED lighting retrofits, as well as building automation controls and intelligent lighting controls^[5].

The project was also responsible for introducing a 4 megawatt cogeneration (cogen) plant^[5].

The Cogen Plant would supply the College with electricity and use the waste heat from the power generator to heat its buildings in the winter. In the summer, this heat would be used to power a chemical process through an absorption chiller to cool the buildings.

3 RESULTS

Energy results: The first phase of the project is expected to save over \$1.1 million per year in operating costs, as well as cut down deferred maintenance costs by \$13 million^[6]. The next phase aims to double operating cost savings to \$2.2 million annually with the introduction of electricity co-gen. By the end of the 20 year contract, the College will reduce its electricity consumption by over 18,000,000 kWh and benefit from \$3.7 million in savings per year^[6].

GHG reduction: From the 2010/2011 baseline year, the project in its totality will reduce the College's carbon footprint by 12%.



Figure 2: The Cogen Engine^[5]

4 CONCLUSIONS & REFLECTIONS

Algonquin College's perseverance to reducing its ecological footprint has shown many reasons to celebrate regarding the positive steps it is taking to conserve energy, innovate, and invest in a clean energy future.

The ESCO₂ strategic partnership between Algonquin College and Siemens Canada showcases a new approach to energy that looks at conservation, demand management, energy resiliency and new technologies aligned with decentralized electricity production and management. Algonquin College continues to have a strong long-term sustainability vision and has articulated a direction toward carbon neutrality in its 2017-2022 Strategic Plan. This plan also identifies the institution's aspirations to be "...serving as a leader in the education, research and exchange of environmentally sustainable practices." Key components to deliver on these goals will be strong partnerships and support to research, test and implement a broad spectrum of clean energy approaches, such as renewable power generation, renewable natural gas, as well as advanced building and infrastructure technologies and approaches. Continued collaboration with internal and external stakeholders will also be vital for success.

\$1.1 million

The first phase of the project is expected to save over \$1.1 million per year in operating costs

2042

The College plans to achieve net zero emissions by their 75th anniversary in 2042

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