

### Introduction

Taylor Lumber Co. Ltd. of Middle Musquodoboit, Nova Scotia is a major employer in the area, producing kiln-dried and heat-treated lumber. Beginning as a mill in 1946, the company decided to focus on kiln-dried lumber in the 1990s. During its expansion, Taylor Lumber installed a wood-fired combined heat and power (CHP) plant. This plant supplies steam to the kiln and produces power for the operation. Excess energy is sold to Nova Scotia Power for use on the local distribution grid. Using sawdust, shavings and wood waste up to 6" long, capacity of the CHP plant is 1.15 MW.



Picture 1 CHP Facility, Taylor Lumber, NS  
Courtesy of KMW Energy Inc.

### Vision

When the CHP plant was constructed by Taylor Lumber in 1995, it was only partially due to energy costs. The company was concerned about sending their waste biomass to a landfill. They were concerned about this as an environmental issue; however, they also saw their need for power and steam increasing with their planned expansion to a kiln drying facility. Co-generation seemed like a perfect fit. Indeed as energy prices have risen over the last decade, the CHP plant has been a benefit to the finances of the company by creating an energy resource from the waste biomass.

*"It's always hard to see to the future in this business, but we estimated our power consumption based on plans at the time, and it looked like we'd need more power. Altogether, the investment in co-gen looked like a good one."*  
Robert Taylor,  
Taylor Lumber President

### Ownership Structure

Taylor Lumber is a private company in Middle Musquodoboit that employs close to 100 people. It is a family owned and operated business that produces spruce, pine and fir lumber products. Mill operations include the saw mill, chipping plant, dry-kiln and planner mill. The saw mill and planner mill operations produce roughly 10-12 million board feet per year of kiln-dried softwood lumber, while the chipping plant produces 40-50 thousand cubic metres per year of softwood chips. The CHP plant produces 100% of the heat and power needs of the mill and excess is sold to the distribution grid.

### Planning Process

Bark and sawdust are about 40% of feedstock each, whereas shavings are 20%. Taylor Lumber commissioned a turnkey boiler from KMW Energy Systems of London, ON, for its ability to handle a variety of feedstock, e.g., size and moisture content, to match the biomass produced at the mill. Beyond the boiler, other aspects of the facility include conveyors, diverter gates, and water sprays. The CHP plant operates 24 hours a day, 7 days a week; during which a stationary engineer is required to be onsite to monitor and control the process from an operator's booth.

### **Project Financing**

The project was financed by Taylor Lumber as part of an expansion of operations. The fuel, electricity and landfill fee savings since 1995 have proven the merits of the investment.

### **Benefits and Barriers**

As the first independent sawmill operator to start selling energy from biomass to Nova Scotia Power, Taylor Lumber benefitted from their CHP plant in terms of reduced energy costs, additional income from the sale of excess electricity to Nova Scotia Power, and dealing with their waste biomass. Indeed Taylor Lumber turned their waste into a resource via the CHP plant. The financial savings over a decade later have added to the success of the company.

The main challenge in 1995 was to obtain financing for the installation of a technology which was unfamiliar to many lenders at the time. Obtaining financing for projects of this kind continues to be a challenge today.

### **Lessons Learned**

There are three specific lessons that can be learned for all community renewable energy projects from this private sector owned CHP plant:

- Financial benefits of renewable energy projects are most noticeable in the long term; and
- Benefits of a renewable energy project can be outside of energy and its costs, such as creating a resource from a waste with a biomass CHP facility; and
- Using turn key technology, many aspects of the project can be customized to the site by in-house resources

### **Further Information**

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### **Project Development**

#### **Resource Assessment**

The biomass is sourced primarily from the mill, i.e., excess shavings, bark and sawdust.

#### **Technical Design**

The boiler was a turnkey installation but conveyors, etc. were designed in-house.

#### **Environmental Assessment**

The project in 1995 did not require an environmental assessment.

#### **Grid Connection/Energy Use**

Heat and initial electricity use is within the mill; excess electricity is distributed to Nova Scotia Power's distribution grid and energy is used within the local community.

#### **Project Financing**

The project capital costs were funded entirely by the company.

#### **Land Ownership and Access**

Biomass is from existing operations and the site of the CHP plant is within facility.

#### **Community Engagement**

The staff were made aware of expansion including the CHP facility in 1995.

#### **Aboriginal Consultation**

Not completed as part of this project in 1995.

#### **Permits and Approvals**

No permits or approvals were required for this CHP in 1995.