

## Introducing Sustainability into a Joinery Trades Training Program

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### BCIT OVERVIEW

- The British Columbia Institute of Technology (BCIT) is a public, post-secondary educational institute in British Columbia that offers trades and technology programs.
- The School of Construction and the Environment (SoCE) is the largest of six schools comprising BCIT.
- SoCE's Joinery program is the largest in Western Canada, producing 280 graduates per year.
- The Joinery department has explored ways to include sustainability in their training.

### INTRODUCTION

- The National Occupational Analysis (NOA) outlines curriculum requirements for all Canadian trades programs, but in Joinery it does not include the topic of sustainable materials and practices.
- We are addressing the absence of a sustainability competency by using sustainable materials and practices on our shop floor.

### WASTE DIVERSION

- We have implemented an aggressive recycling program which diverted approximately 345 cubic yards of waste from the landfill in 2013.

RECYCLING	GARBAGE
<ul style="list-style-type: none"> <li>Solid wood</li> <li>Laminated solid</li> <li>MDF</li> <li>Plywood</li> <li>Particleboard</li> <li>Melamine overlay (PVC edges removed)</li> <li>Hardboard</li> <li>Any of the above with screws, nails, staples</li> <li>Floor receptacles (wood only)</li> </ul> <p>Note: Wood products with applied finishing materials (oil, stain, paint, lacquer, etc.) are considered "Garbage".</p>	<ul style="list-style-type: none"> <li>Wood products with applied finishing materials</li> <li>Plastic laminates</li> <li>Sandpaper</li> <li>PVC edging</li> <li>Used paper products</li> <li>Used plastic containers</li> <li>Used glue brushes, rollers, etc.</li> <li>General floor sweepings</li> </ul>

#### OTHER RECYCLABLES:

<p>Corrugated cardboard</p>	<p>Plastic</p>	<p>Cans and bottles</p>	<p>All metals</p>
	<p>Mixed paper</p>		

### SOLID WOOD PROCUREMENT



- In a typical year our Joinery department trains:
  - 14 Apprenticeship classes (224 students)
  - 4 Foundation classes (64 students)
  - 6 Trades Discovery classes (120 students)
  - 4 Interior design classes (96 students)
- These 500 students all work on making practical projects.
- In 2013 we purchased 7,220 board measure of solid wood and 67% were Forest Stewardship Council (FSC) certified. (Note: 1 board measure = 1 square foot of 1" thick material)

### PANEL PRODUCT PROCUREMENT



- We also purchased 840 sheets of panel product and 78% of these had no-added-urea-formaldehyde (NAUF).

### ADHESIVE SELECTION

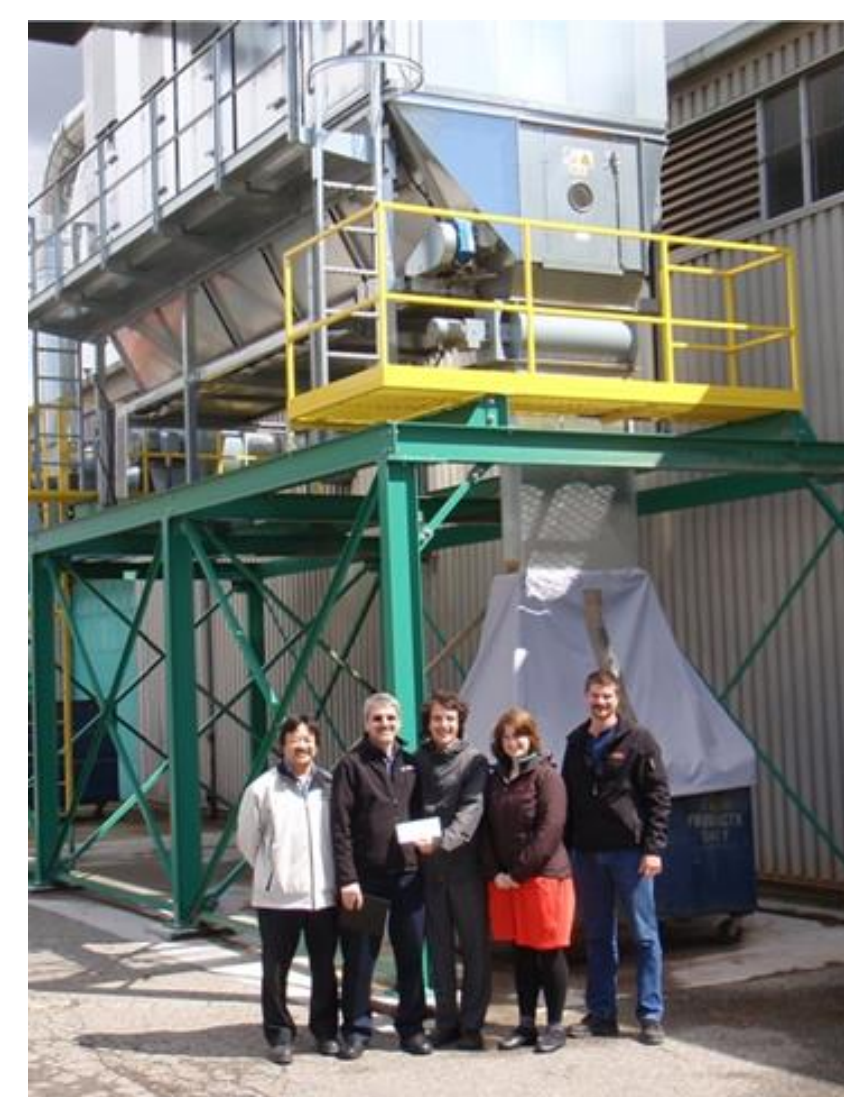


- Our department has discontinued the use of solvent-base contact cement and switched to a water-base product.



- The other adhesive we use extensively is polyvinyl acetate (PVA), which is also a water-base product.

### DUST EXTRACTOR UPGRADE



- During the summer of 2010, BCIT replaced a dated dust extraction system in the Joinery and Carpentry shops. The old system consisted of six constant-volume extractors. These were replaced with two variable frequency drive motors, on one solid-state central control panel. The new system uses 85% less electricity than an equivalent constant-volume system available in the marketplace. BCIT received a \$45,800 grant from the BC Hydro Power Smart program to support this energy efficient project.

Additional benefits include:

- Lower heating costs (less warm air expelled from the shop).
- Reduced noise levels
- Design-ready for wood waste-to-biomass energy system

### ELECTRICAL SAVINGS (ANNUAL TOTAL)

- The Joinery department has reduced its total electrical consumption by 51% (Light saver program combined with the savings from our variable frequency drive dust extractor).



### DONATIONS OF TIME AND PRODUCTS

- The Joinery department regularly supports social groups by donating instructor and student time to build projects. Projects and tools that are no longer required by our department are also donated to charitable organizations.



Canfor Playhouse Challenge 2012



Lions Gate Hospital 2013

Other organizations we have supported include:

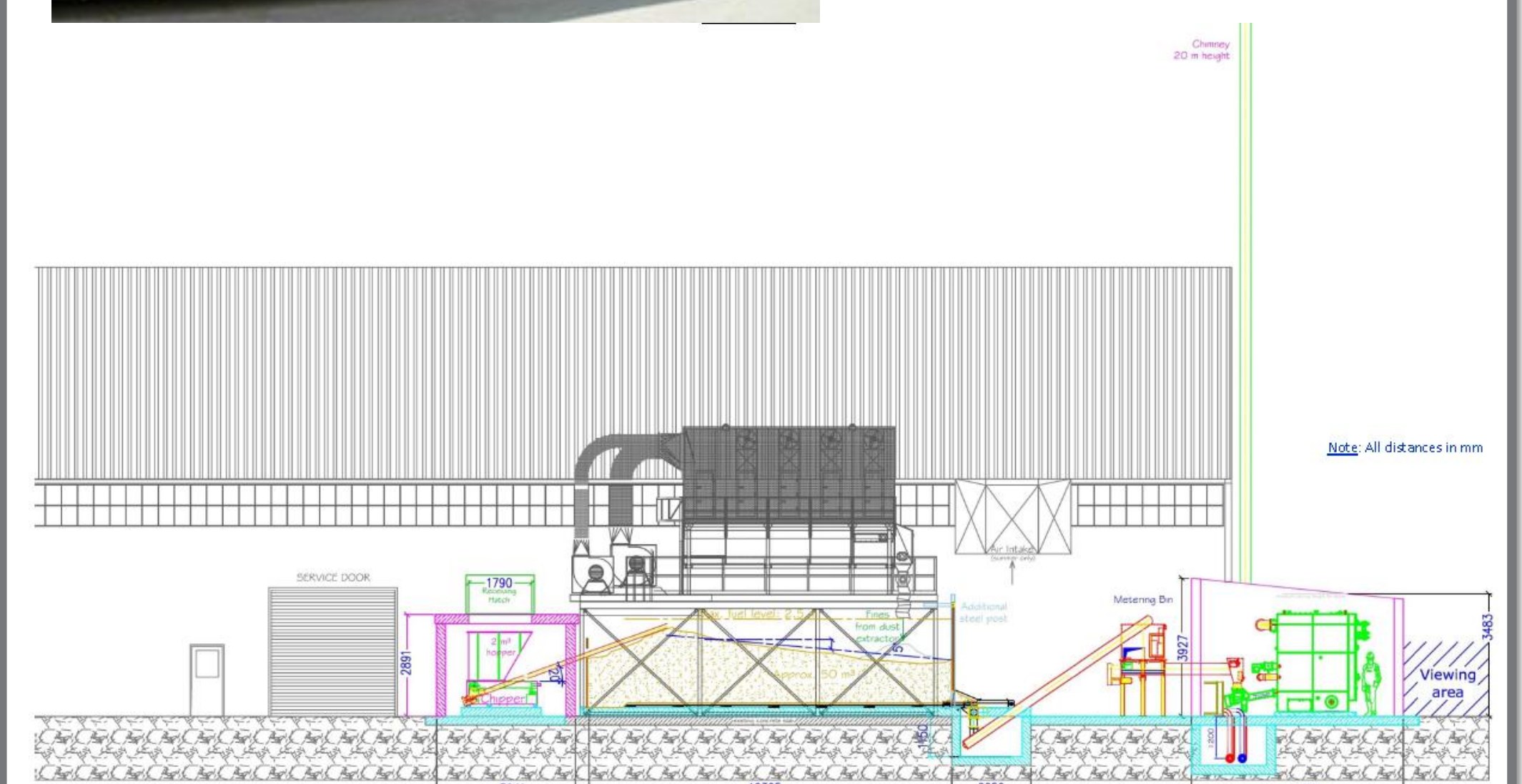
- Habitat for Humanity
- Balding for Dollars (kids with cancer)
- Big Brothers
- Francis House

### WOOD WASTE-TO-BIOMASS ENERGY

- Collectively, the Joinery and Carpentry departments generate approximately 250,000 kg of wood waste annually.
- By purchasing a 200 kW waste-to-energy biomass boiler this waste could be converted into 4000 GJ of energy to supply hot water to our campus district heating line and to reduce our carbon emissions by 200 tonnes (Project approved by BCIT's Board of Governors and listed in our five-year capital plan. Feasibility study, fuel study, ash report and schematic design report are complete).
- Potential annual cost savings include:
  - \$20,000 in disposal fees
  - \$37,000 in natural gas savings, carbon tax and carbon offsets

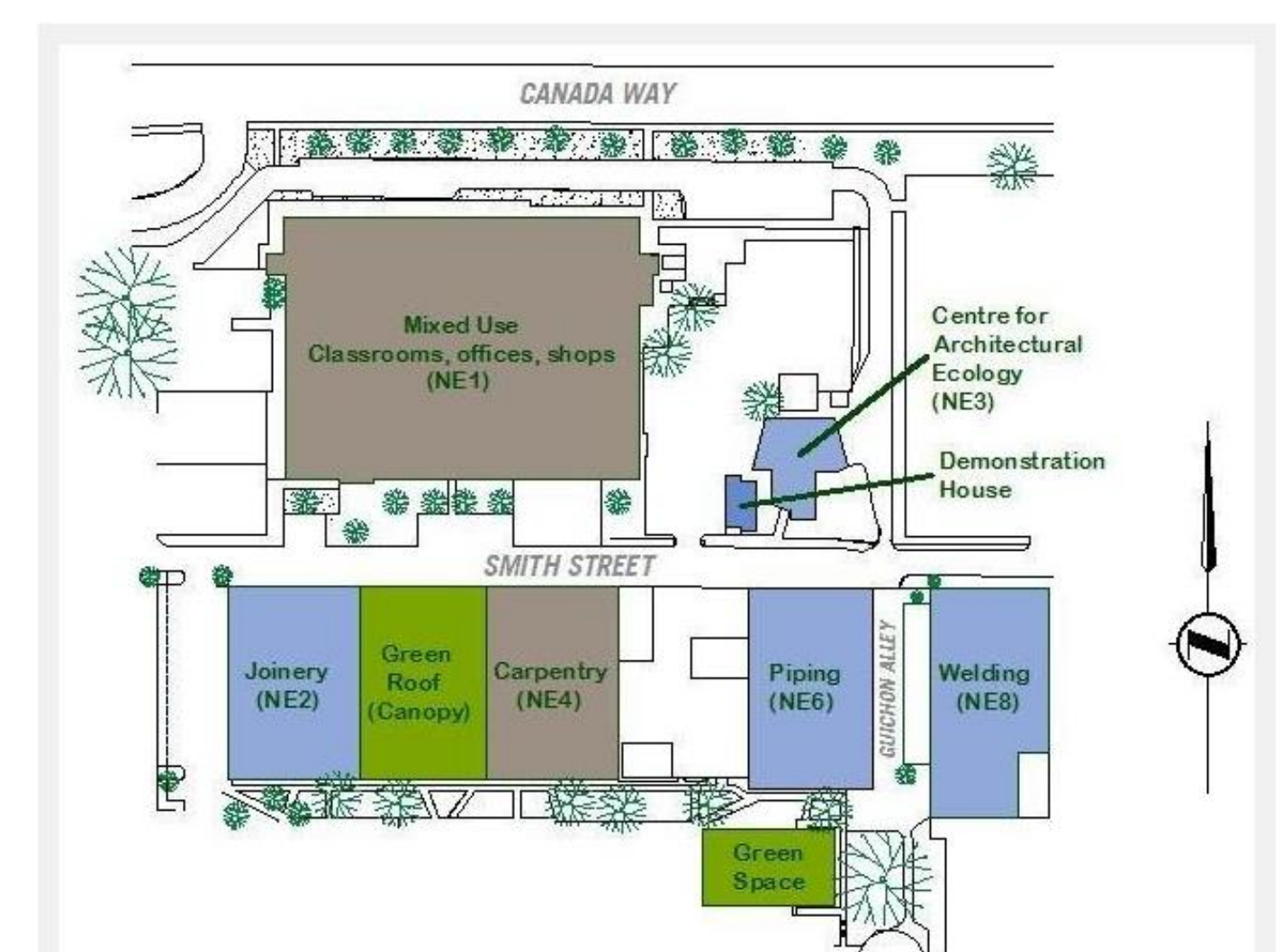


Once a week we fill a 40 cubic yard container with wood waste.



West elevation of biomass-to-energy facility

### FACTOR FOUR CONCEPT



#### FACTOR FOUR AREA

This area has been selected for a number of reasons: the buildings are all part of the School of Construction and the Environment, they are intense energy and material users, and they represent the entire range of buildings, from industrial, to commercial, to residential. In addition, by working in a concentrated area changes have a greater impact.

- The SoCE is leading the Factor Four Initiative in the buildings it occupies at BCIT's Burnaby campus: the "Factor Four Area".
- The purpose is to explore whether a fourfold improvement in energy and materials-related resource productivity can be achieved without compromising service levels (building occupant health and comfort and educational delivery).
- The Joinery department is a major participant in the Factor Four initiative.

### SUMMARY

- By taking a pragmatic approach, the Joinery department has successfully exposed students to sustainable materials and practices.

### ACKNOWLEDGMENTS

The team supporting this initiative includes:

- BCIT SoCE Dean's Office
- BCIT Campus Planning
- BCIT Facilities Department
- BCIT Joinery and Carpentry Departments