FAQ

BCIT Factor Four Wood Waste-to-Energy project

WHAT IS BIOMASS?

Biomass is biological material from living organisms. The term often refers to wood or plant-derived materials. Used as a renewable energy source, biomass can be converted to energy through thermal conversion, chemical conversion, or biochemical conversion.

HOW WILL BIOMASS BE USED ON THE BCIT BURNABY CAMPUS?

BCIT plans to use biomass that originates from trees, often referred to as "woody biomass," as part of a wood-waste-to-energy project. BCIT will use waste wood from our Carpentry and Joinery programs as fuel for a biomass energy system that will heat building NE1, greatly reducing our use of natural gas in that building.. The wood-waste-to-energy project is one of multiple Factor Four projects that have been included in BCIT's energy plan.

WHAT IS FACTOR FOUR?

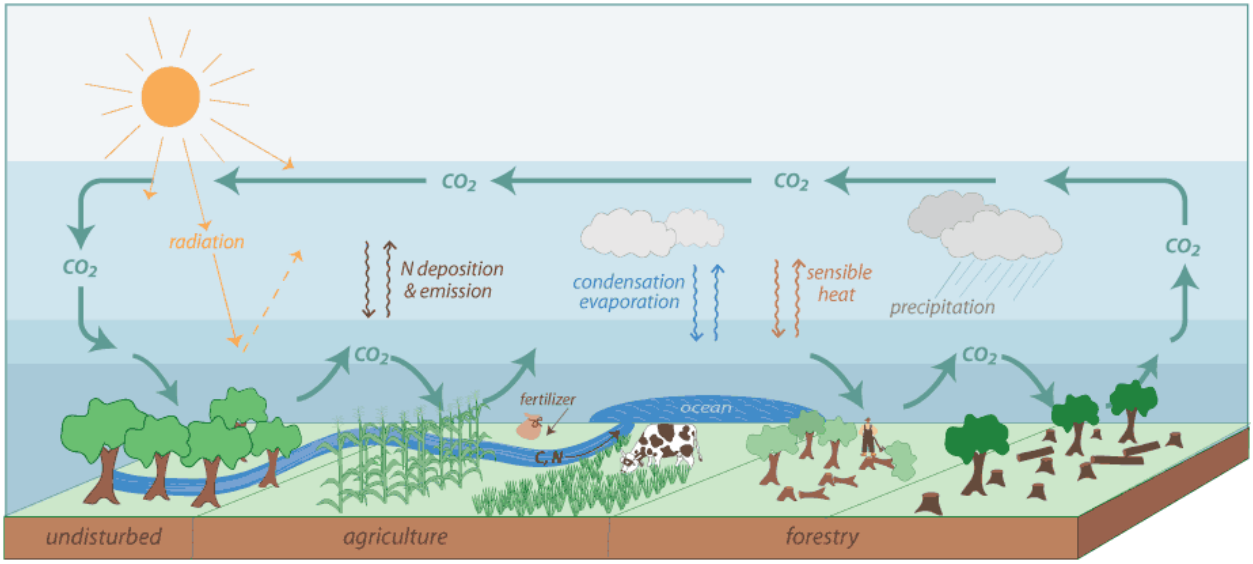
The School of Construction and the Environment is leading the Factor Four Initiative in the buildings it occupies (NE1 to NE8) at the BCIT Burnaby Campus: the "Factor Four Area." The purpose is to explore whether a fourfold (75%) reduction in materials and energy use can be achieved without compromising service levels (building occupant health and comfort and educational program delivery). The wood-waste-to-energy project is one example of our efforts to reduce energy use on our campuses.

WHAT IS BIOMASS ENERGY?

Humans first utilized biomass energy when they began burning wood for heat. Considered a renewable, sustainable, and clean form of energy, biomass can be used directly to produce heat or electricity. BCIT's Biomass Energy System will directly feed waste wood into a boiler, which will be used to heat water that will heat our building, displacing natural gas in the process.

HOW IS BIOMASS CARBON NEUTRAL?

Carbon is released and captured all the time as part of the normal carbon cycle.

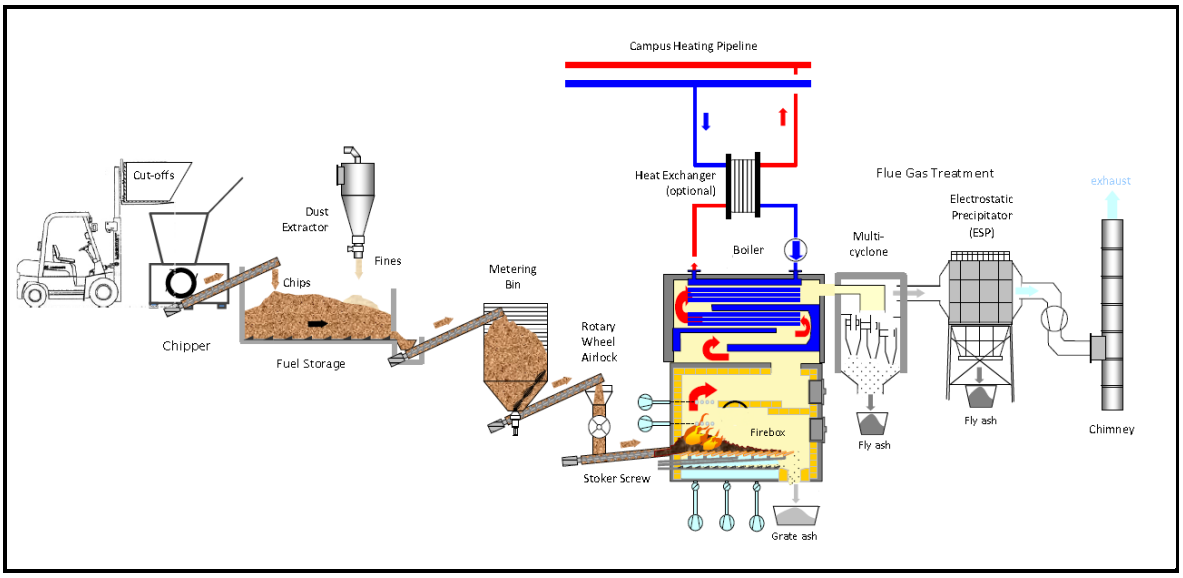


Biomass is considered carbon neutral because using biomass as an energy source does not emit more CO_2 than what can be recycled naturally. Using biomass as a heat source in place of fossil fuels (e.g., natural gas) reduces greenhouse gas emissions.

WHAT ARE THE FIVE MAJOR COMPONENTS OF A WOOD-WASTE-TO-ENERGY SYSTEM?

The main components include:

1. Fuel preparation (chipper) and handling
2. Fuel storage
3. Biomass boiler
4. Air emissions filtration
5. Connection to BCIT's existing district energy line



WHAT IS THE DIFFERENCE BETWEEN A WOOD STOVE AND BCIT'S PROPOSED SYSTEM?

There are major differences between a wood stove and BCIT's wood-waste-to-energy system. The proposed system is not a wood stove or incinerator. Differences include:

- **Advanced combustion controls.** A wood stove does not allow much control over the combustion process other than the manual opening and closing of an air intake. In contrast, the proposed system will include controls to allow:
    - the control of the combustion temperature;
    - the amount of oxygen supplied and the way this oxygen mixes with the wood gases;
    - the time wood gases remain in the combustion chamber;
    - the velocity of the air supplied.
- **An air filtration system**. The proposed system will be equipped with an advanced filtration system (an electrostatic precipitator) that will remove particulate matters to a level substantially lower than what is stated in the strict Metro Vancouver bylaws. It will remove particulate matters from the system before they exit the chimney (a regular wood stove does not have any technological means of removing particulate matter).

Furthermore, the ANNUAL emissions of BCIT's biomass boiler will be less than one tenth of the emissions from a fireplace per HOUR (approximately 0.1 kg per year for the boiler, versus 0.96 kg per hour for a fireplace). This very small amount of emissions is far less than the allowable amount by the Metro Vancouver Air Quality Management Bylaws. BCIT is not only meeting these strict air quality guidelines, but doing even more than required.

WHAT WILL I SEE COMING OUT OF THE CHIMNEY?

The proposed system has practically no visual smoke or odor. However, in cold weather the chimney may show a plume of condensed water vapor similar to natural gas boilers.

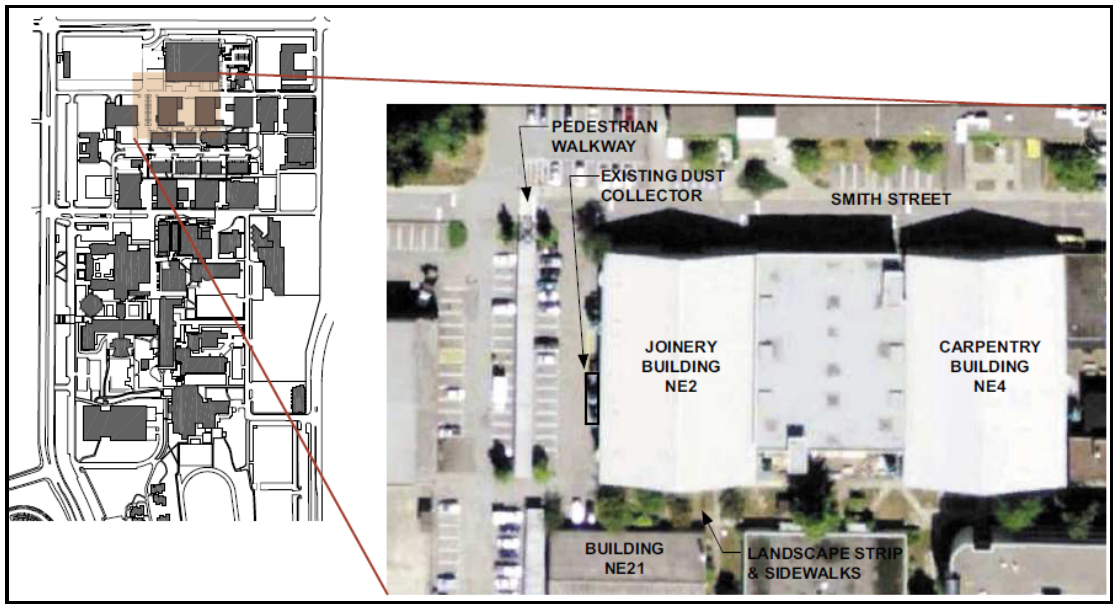
WHAT MAKES UP BCIT'S BIOMASS FUEL?

BCIT will only use wood waste generated on campus from Joinery and Carpentry training. Treated wood is not used in either the Carpentry or Joinery training programs. When the biomass energy system is operational, its fuel source will be located in a controlled and secure location so that "weekend visitors" cannot dump their personal wood waste in BCIT's stream.

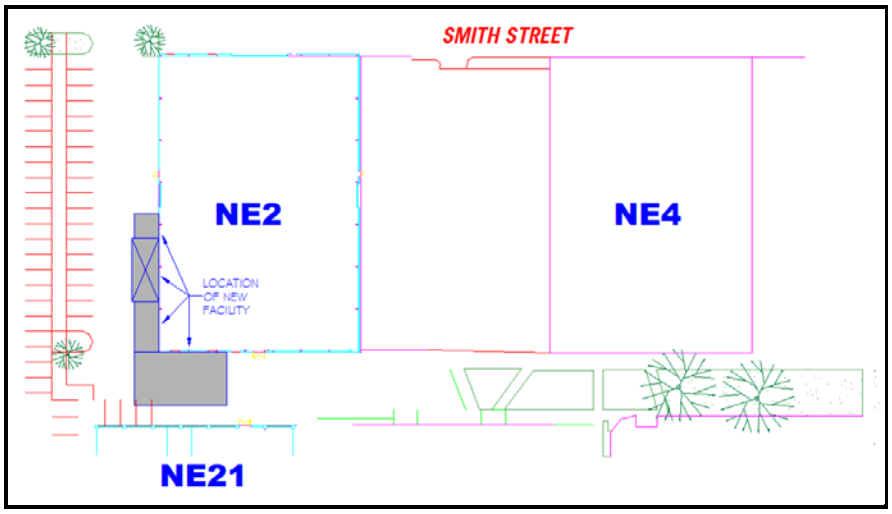
WHAT IS THE DIFFERENCE BETWEEN BIOMASS BOILERS AND NATURAL GAS BOILERS?

The BCIT biomass facility is similar to a natural gas boiler in that they both burn a fuel to release energy and transfer the energy to water. They both require a smoke stack exhaust to release the by-product of the combustion into the atmosphere. The main difference between a biomass and natural gas boiler is in the fuel handling and storage component.

WHERE WILL THE NEW BIOMASS ENERGY SYSTEM BE LOCATED?



BCIT's Burnaby campus with detail of Joinery building (NE2) and nearby features.



Location of New Biomass Facility

WILL THERE BE ANY NOISE LEVEL INCREASE?

The project team completed a sound map of the area to document current noise levels (prior to installation of the proposed system). Most components of the system are quiet by design and will not contribute to a site noise level increase. The only component of concern from a sound perspective is the chipper. The chipper will be located in a sound-proof enclosure. The design requirements provided to the lead architects will be to keep noise levels at or under what measured prior to the system installation.

WHAT ARE THE REGULATIONS AND BYLAWS?

Under provincial legislation, Metro Vancouver is responsible for monitoring air quality and controlling emissions in the region. For air quality management, the location of BCIT's Burnaby campus requires compliance with Metro Vancouver Air Quality Management Bylaws.
The BCIT biomass facility will operate well below the Metro Vancouver permitted emissions standards.

WHAT ABOUT OTHER IMPACTS ON THE NEIGHBOURHOOD?

Truck traffic will decrease, because we will no longer have to remove wood waste from campus for disposal. In average, one or more truck per week will be removed from the roads. Due to its state-of-the-art air emissions filtering system and advanced combustion and emissions monitoring system, the system will have no health impacts for the community.

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