

## ■ Project Description

- Customer: University of Northern British Columbia
- Location: Prince George, B.C.
- Application: Biomass gasification plant to provide heat for campus
- Nexterra Scope of Work: Turnkey gasification system
- Capacity: 4.4 MWth/15 MMBtu/hr net useable heat (hot water)
- Fuel: Locally sourced wood residue
- Fuel Moisture Content: Up to 60%
- Fuel Source: Local mills and/or clean construction debris

## ■ System Highlights

- Displaces 85% of current natural gas consumption
- Reduces GHG emissions by 3,500 tonnes/year
- Helped UNBC win AASHE Award for top sustainability case study
- Integrates operations with research, curriculum and community development

## ■ Expected System Performance

Natural Gas Displacement	23 million kWt-hrs/yr
Annual Savings	£300,000 - £510,000/yr
Avoided CO <sub>2</sub> Emissions	3,500 tonnes/yr
Avoided CO <sub>2</sub> Emissions (Car Equivalent)	1,000 cars/yr
Avoided Carbon Liability (\$55/tonne)	\$192,500/yr
Wood Fuel Required	8,000 green tonnes/yr
Wood Fuel Trucks Required	280 trucks/yr

"We see the bioenergy program as an important component of UNBC's commitment to reduce greenhouse gas emissions and implement renewable energy technologies on the Prince George campus. It is one way that we're being responsive to a community and region that very much sees bioenergy as part of its future."

- Dr. George Iwama, President, UNBC

*In its first year of full operations Nexterra's system at UNBC has allowed UNBC to cut its consumption of fossil fuels for district heating by 89%. Emissions testing has also determined that the system produces particulate emissions at – or even below – the level of heating systems that burn natural gas.*





Site Overview



Gasifier & Oxidizer



Oxidizer & ESP



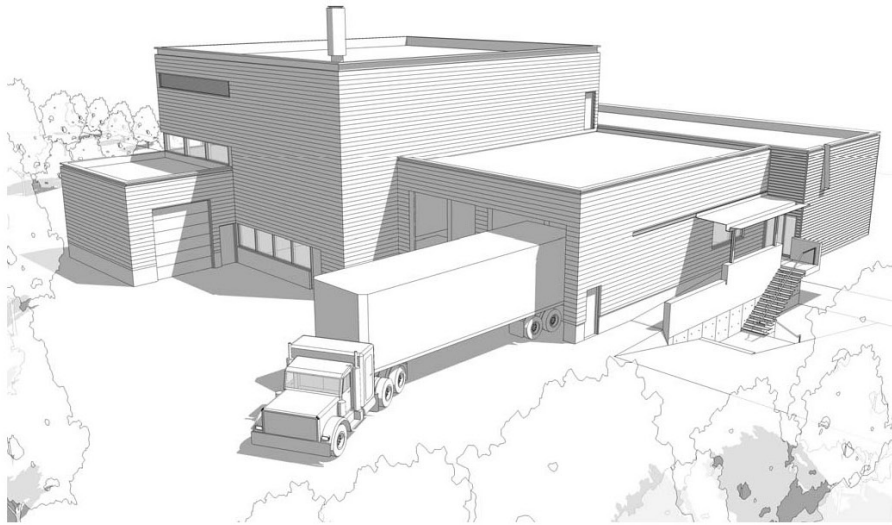
Building Under Construction



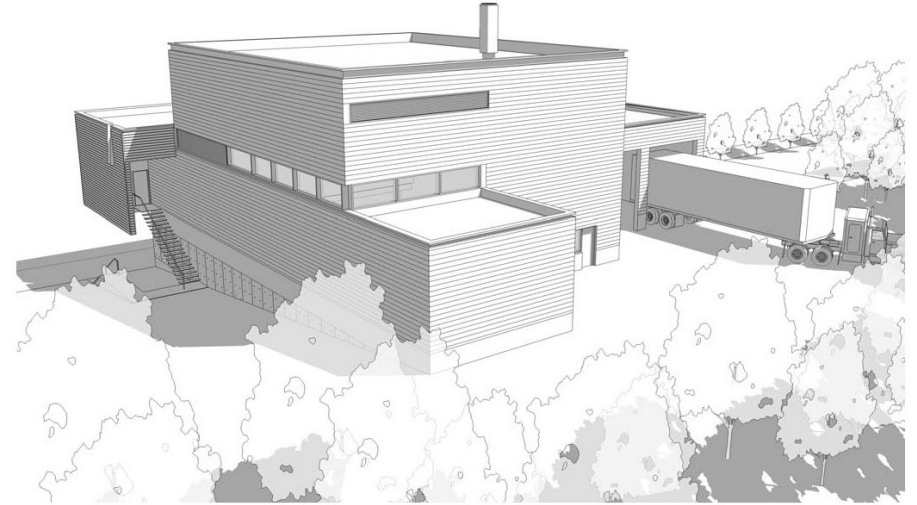
Rear of Building (Completed)



Anchored by Nexterra's biomass gasification system, UNBC's bioenergy program will reduce greenhouse gas emissions and fossil fuel consumption on the Prince George campus. The program will help the University meet its current and future energy needs, reduce or eliminate their greenhouse gas footprint, and reduce energy costs while contributing to R&D, training, student and public education and the development of bioenergy projects and demonstration opportunities for northern communities.



SOUTHWEST CORNER

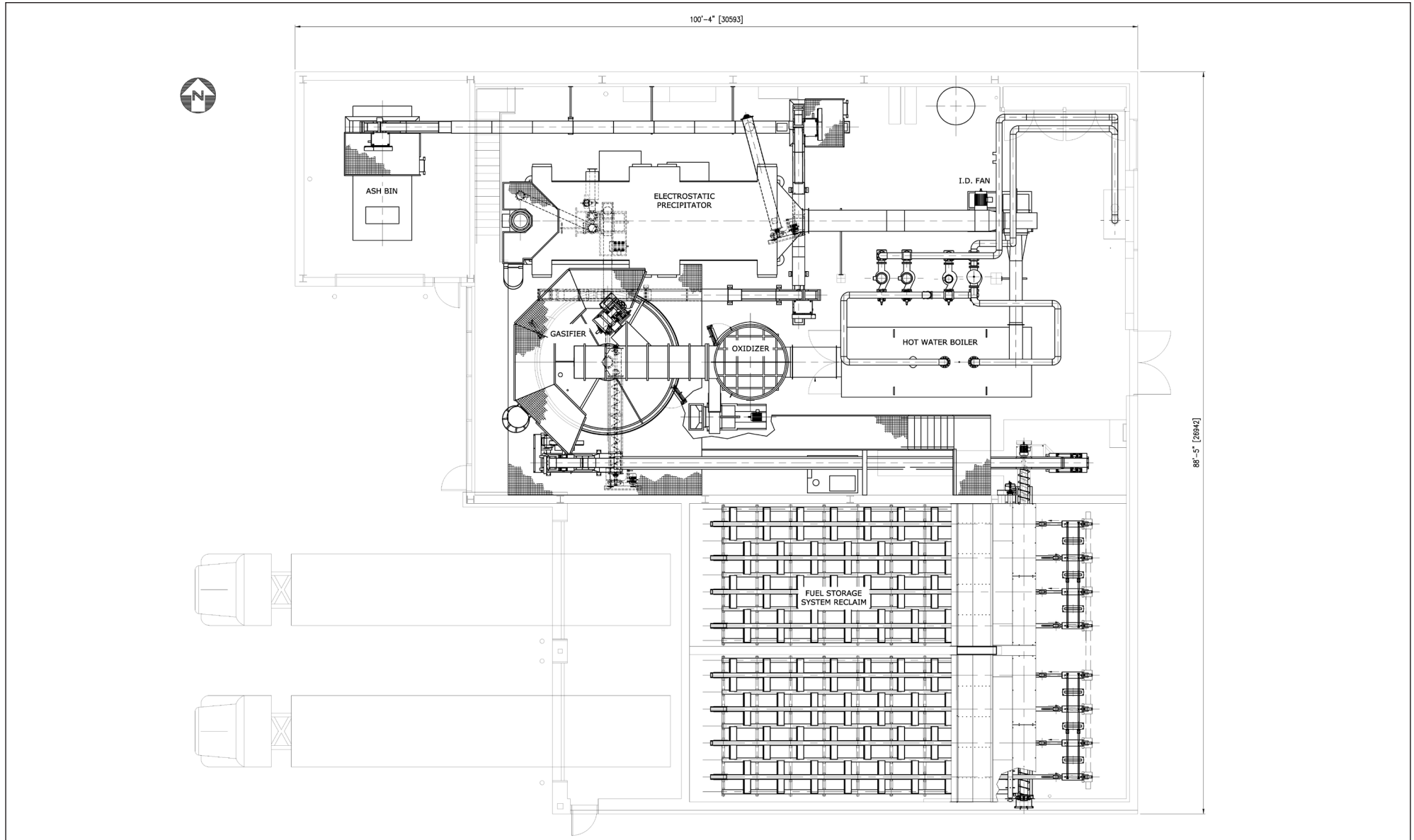


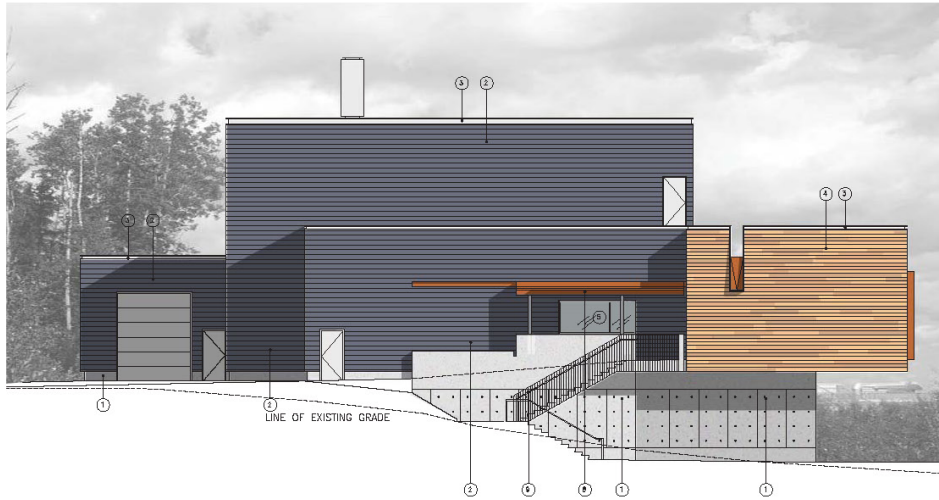
NORTHWEST CORNER



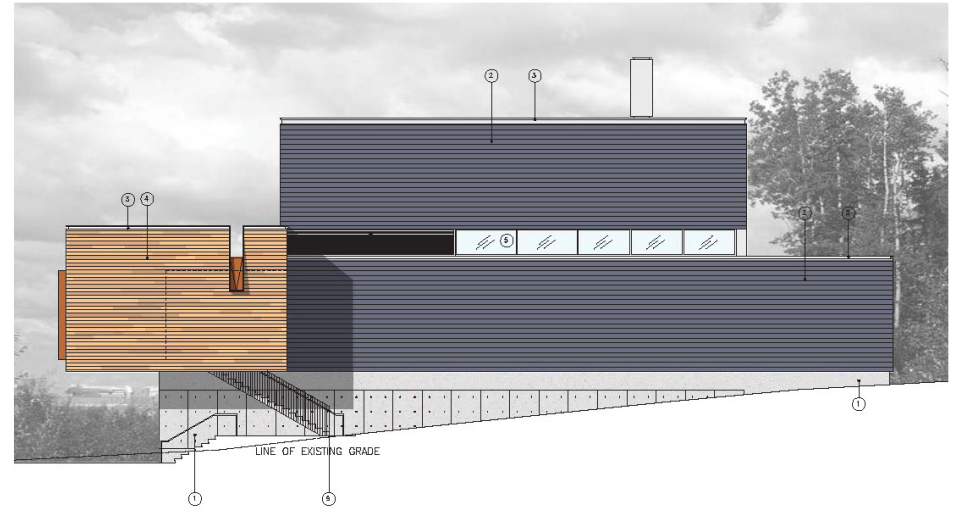
NORTHEAST CORNER

HCM Architects





SOUTH ELEVATION



NORTH ELEVATION



WEST ELEVATION



EAST ELEVATION

- |                              |                      |                             |                              |
|------------------------------|----------------------|-----------------------------|------------------------------|
| ① C.I.P. Concrete            | ④ Wood Cladding      | ⑦ LEED Educational Panels   | ⑩ Galvanized Metal Guardrail |
| ② Metal Cladding/Panel       | ⑤ Storefront Glazing | ⑧ Folded Steel Plate Canopy |                              |
| ③ Prefinished Metal Flashing | ⑥ Mechanical Louvre  | ⑨ Tempered Glass Canopy     |                              |

HCM Architects



UNBC's Prince George campus is uniquely positioned to become an innovation "hub" for bioenergy.

### TEACHING

UNBC has a diverse range of environmental degree programs and offers undergraduate and graduate courses covering bioenergy systems, biomass characteristics, and the application of material and energy balances to bioenergy systems.

### RESEARCH

Locally conducted research is seen to be a vital ingredient for making Northern British Columbia a national leader in a technologically advanced, forest-based bioenergy industry. UNBC researchers are already engaged with bioenergy and existing infrastructure includes two research forests and the I.K. Barber Enhanced Forestry Laboratory.

### CAMPUS

UNBC's Prince George campus is a showpiece for wood and bioenergy. A utility corridor links the main campus buildings to a central power plant and provides the distribution system necessary for UNBC to make the transition to renewable energy sources.

### LIVING IT

Students, staff, faculty, and alumni are passionate about the environment and the transition to renewable energy sources. For example, UNBC is a founding partner in the International Bioenergy Conference and Exhibition, one of the largest bioenergy conferences in the world.

**bioenergy**



## About University of Northern British Columbia Prince George, British Columbia

The University of Northern British Columbia is one of Canada's best small universities. With a core campus in Prince George and regional campuses throughout northern BC, UNBC recognizes the importance of quality teaching, personal attention, ground-breaking research, and being relevant to the North.

UNBC selected Nexterra to supply and install 15-million BTU fixed-bed biomass gasification system to heat its Prince George campus and anchor its new Northern Bioenergy Innovation Centre. Nexterra's system is part of a \$14.8 million bioenergy program that includes upgraded road and utility infrastructure, a new building and a "living laboratory" for bioenergy research and development. The project, which was jointly funded by the federal and provincial governments, started up in late 2010.

**For more information:**  
[www.unbc.ca](http://www.unbc.ca)



### Partners:

Canada



## About Nexterra Systems Corp. Vancouver, British Columbia

Nexterra is a leading developer and supplier of advanced biomass gasification solutions that enable customers to self-generate heat and/or power inside-the-fence at institutional and industrial facilities using low cost biomass fuels. Nexterra's strategic relationships include GE Energy, Johnson Controls and Fortis BC.

### Projects include:

- U.S. Department of Veterans Affairs (DVA), Medical Center, Battle Creek, MI
- University of British Columbia, Vancouver BC
- U.S. Department of Energy (DOE), Oak Ridge National Laboratory, Oak Ridge, TN
- University of Northern British Columbia, Prince George, BC
- Dockside Green Development, Victoria, BC
- Kruger Products Limited, New Westminster, BC
- Tolko Industries Ltd., Heffley Creek Division, Kamloops, BC
- Nexterra Product Development Centre (PDC), Kamloops, BC



**For more information:**  
[www.nexterra.ca](http://www.nexterra.ca)