UBC CAMPUS ENERGY CENTRE

LOCATION
Vancouver, British Columbia

SIZE
2,000 m²

COMPLETION
2016

ARCHITECT
DIALOG

STRUCTURAL ENGINEER
Fast + Epp

GENERAL CONTRACTOR
Ledcor Construction

ENGINEERED WOOD FABRICATOR
Structurlam

OWNER
UBC

Project Overview

As long-term owner/operators of large building portfolios, and stewards of public funds, universities play an important role in sustainable construction.

The University of British Columbia (UBC) was an early adopter of lower carbon mass timber construction and has gained an international reputation for its innovative approach to building design. This includes UBC's ongoing efforts to reduce the operating and embodied energy of its buildings and their associated greenhouse gas emissions.

The Campus Energy Centre (CEC) is a synthesis of these two approaches; It is a hybrid structure that includes a significant amount of wood, and at the same time it reduces the university's greenhouse gas emissions by 33% by optimizing the energy supply to 133 campus buildings. The CEC is an integral part of the university's reduction program with the new high efficiency water heating plant and district hot-water distribution loop replacing the pre-existing steam boiler plant constructed in 1925. The gas-fired boilers produce 45 megawatts of thermal energy, enough to meet the university's current needs with the ability to accommodate future expansion.

Architecturally, the CEC has a range of elements, from administrative areas to high bay equipment spaces, all of which are unified by wrapping the building in a continuous perforated zinc cladding system. At ground level, large windows reveal the inner workings of the CEC to passers-by, an informal educational opportunity that is complemented by interpretative signage and organized tours of the facility.

Photo credit: Ema Peter Photography

"This is the second time we have used CLT in an industrial building on the UBC campus - the first being the Bioenergy Research & Demonstration Facility. Based on our positive experience with that project, it was a natural choice for the Campus Energy Centre. We have found CLT to be durable and cost competitive with steel."

***Paul Holt**, Director, Energy and Utilities, University of British Columbia*

Wood Use

UBC has several landmark mass timber buildings on its Vancouver campus, including the Centre for Interactive Research on Sustainability, the Bio-energy Research and Demonstration Centre; the Earth Sciences Building and the Brock Commons Tallwood House - a student residence that is the tallest contemporary wood hybrid structure in the world. The use of wood in a large scale industrial facility such as the CEC therefore comes as no surprise.

In this project, the choice of a wood structure for the boiler bays was made on the basis of its strength, durability, appearance and multiple sustainable attributes.

The primary structure of the boiler process area is a Douglas fir glue-laminated timber (glulam) post and beam frame, with enclosing walls of seven ply (245mm thick) cross-laminated timber (CLT) panels and sloping CLT roof panels. The 20-metre high CLT panels create a unified enclosure around the mechanical equipment, giving the vast space a sense of warmth, unusual in an industrial building.

Compared with the kind of all steel structure most commonly associated with buildings of this type, the hybrid wood system reduces the overall construction carbon (the sum of the greenhouse gas emissions associated with the extraction, processing, fabrication, transportation and installation of all building components) by 88.3 (CO2 equivalent) tonnes.

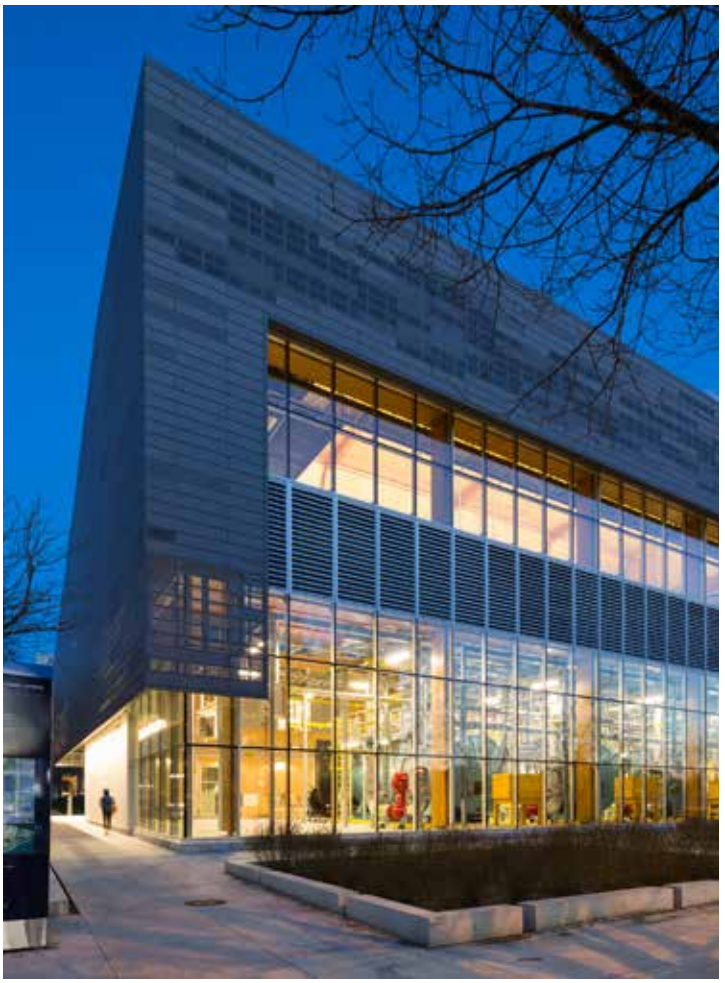

Photo courtesy of Ema Peter Photography

ESTIMATED ENVIRONMENTAL IMPACT OF WOOD USE

- Volume of wood products used: **836 cubic meters**
- U.S. and Canadian forests grow this much wood in: **2 minutes**
- Carbon stored in the wood: **653 metric tons of CO_2**
- Avoided greenhouse gas emissions: **253 metric tons of CO_2**
- Total potential carbon benefit: **906 metric tons of CO_2**

GHG EMISSIONS ARE EQUIVALENT TO:

- **192** cars off the road for a year
- Energy to operate **96** homes for a year

**Estimated by the Wood Carbon Calculator for Buildings, cwc.ca/carboncalculator.*

**CO2 refers to CO2 equivalent.*

FOR MORE INFORMATION

This profile is published by Forestry Innovation Investment, the Government of British Columbia's market development agency for forest products.

For more examples of innovative wood building projects throughout British Columbia, visit:

naturallywood.com

The wood grain featured in this profile is lodgepole pine.