

Energy Management Education

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What We Will Cover

- Intro to BCIT
- CESA and Factor Four
- EM role
- The future of EM Education

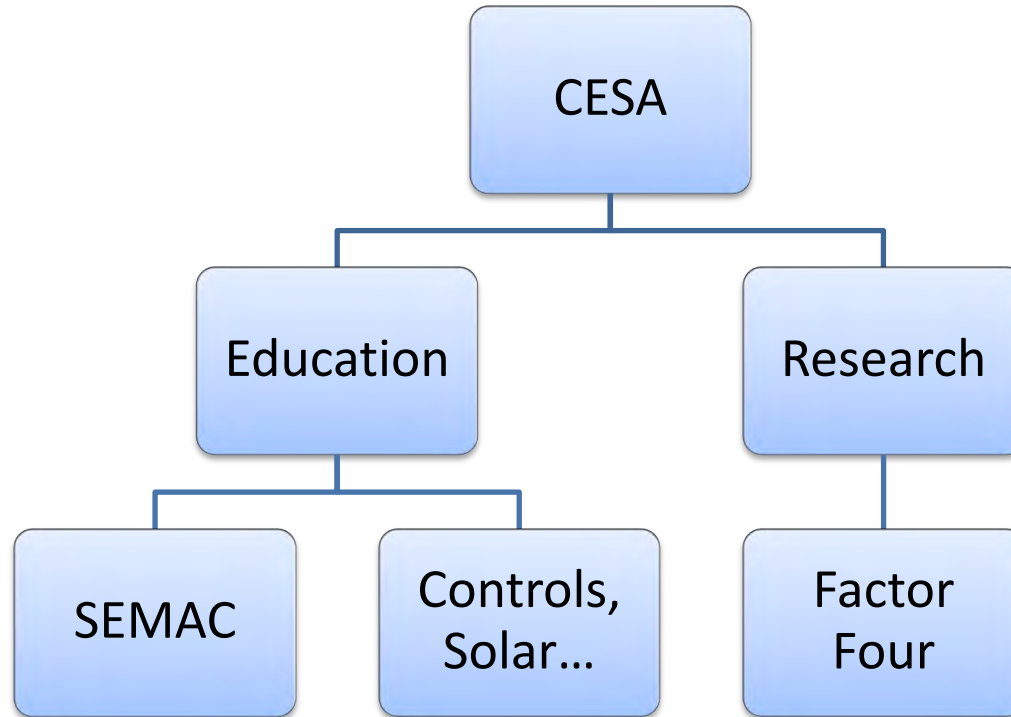
BCIT



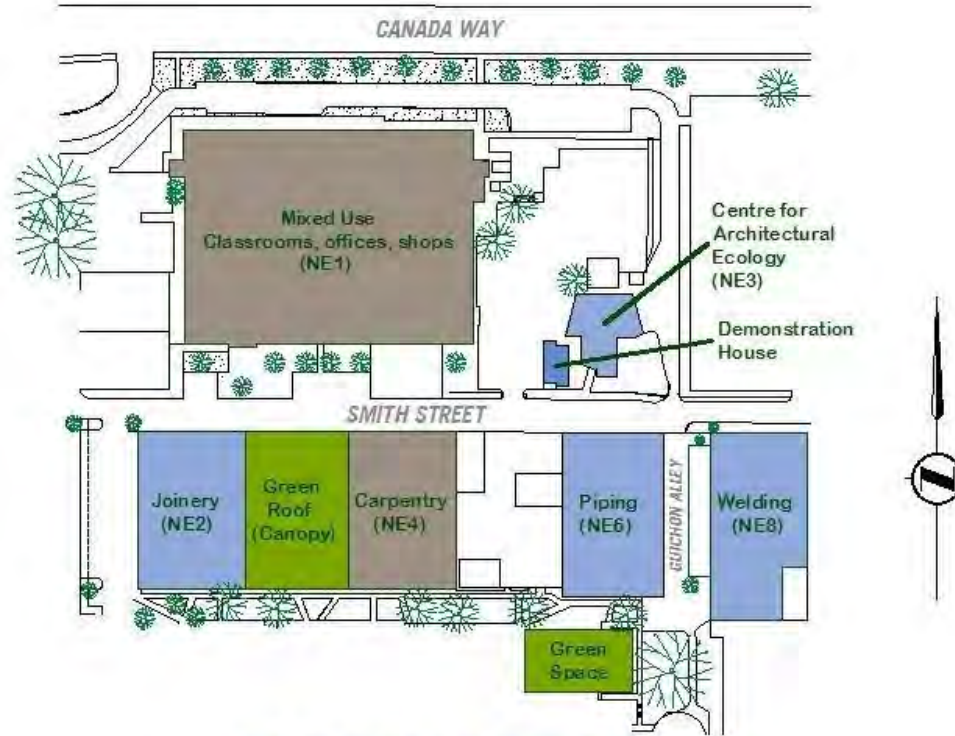
BCIT is one of British Columbia's largest post-secondary institutions with more than 48,000 students enrolled annually (16,600 full-time, 31,600 part-time).

Center for Energy Systems Applications (CESA)

<http://commons.bcit.ca/energy/>

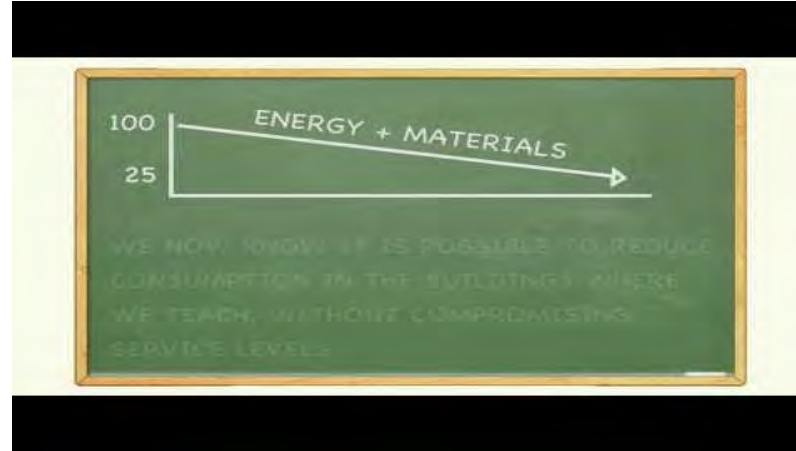


Research Partnership



FACTOR FOUR AREA

Factor Four



<https://youtu.be/5Em75vIHDdM>

Factor Four

REDUCING ENERGY AND MATERIALS USE FOUR-FOLD

FACTOR FOUR | REDUCING ENERGY AND MATERIAL FOUR FOLD

sustainability
at BCIT

PROPOSED

A new trades and technology building could be built following passive design principles. This landmark building will be known across Canada for its low energy consumption, low maintenance costs, high comfort levels and high durability.

PROPOSED FOR 50TH



In time for the 50th anniversary celebrations, a much needed paint refresh will be given to the Afresh home, BCIT's net zero energy home.

PROPOSED FOR 50TH



The concept behind the sustainable garden demonstration project is to introduce a template of sustainable landscape practices from which members of BCIT's community can benefit, while improving the landscape of the area.

COMPLETED



Students and staff breathe easier because of a dust extraction system operating on 10% of the pre-Factor Four energy.

PROPOSED FOR 50TH



Functioning as a living laboratory the wood-waste to energy facility will include an outdoor teaching space and technology viewing windows. The system will reuse 250,000 kg of waste while creating carbon neutral energy.

COMPLETED



The Center for Architectural Ecology, with its offices and research facilities at the heart of Factor Four, has installed a living wall as part of the development of an elevated lab.

COMPLETED

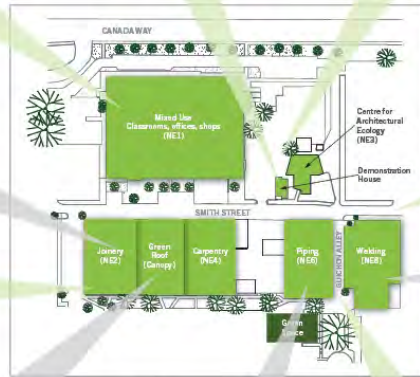


The Piping Department students installed a high efficiency condensing boiler system operating with efficiencies at up to 98%.

PROPOSED FOR 50TH



Students, inspired by Guichon Creek, designed a project that brings awareness to daylighting urban creeks while creating a gathering space.



PROPOSED FOR 50TH



Students proposed celebrating our industrial nature by transforming Smith Street to a more colourful Granville Island style atmosphere.

COMPLETED



BCIT's award-nominated, 2.7 million-dollar ventilation retrofit operates on 39% of the pre-Factor Four energy while experimenting with different technologies.

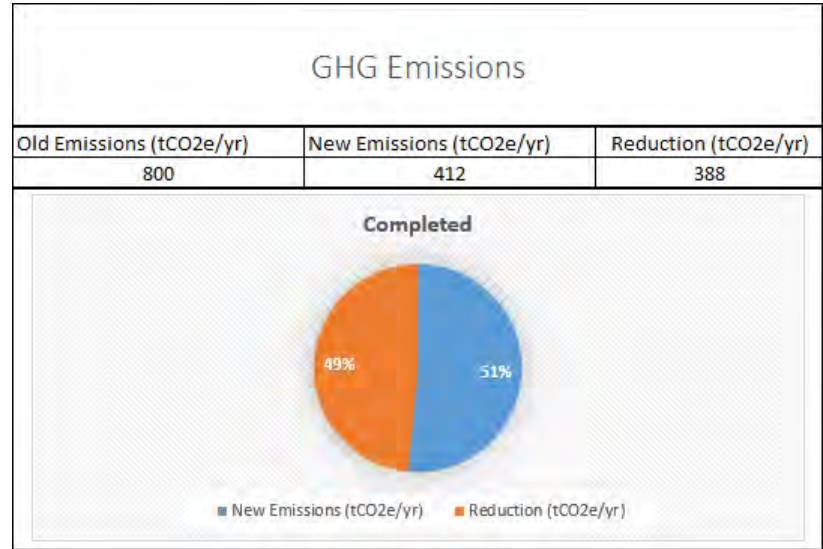
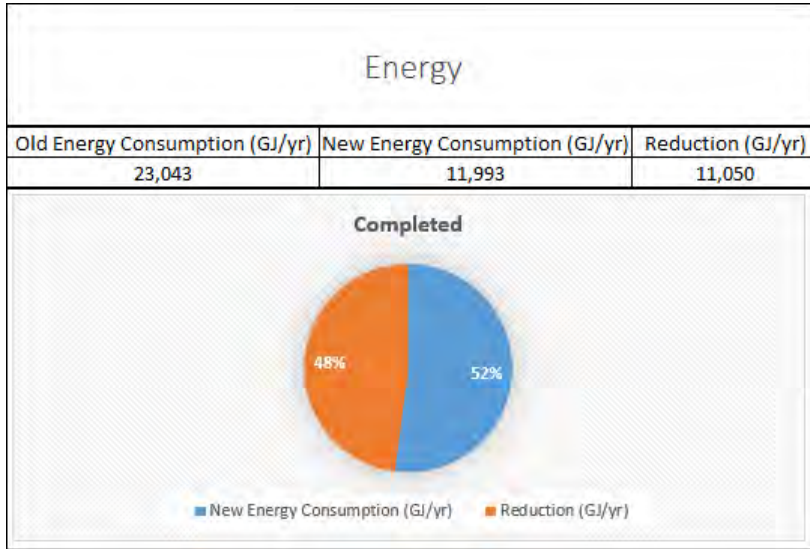
ADDITIONAL PROJECTS

- > Real time metering [COMPLETED]
- > Behavioural and operational change initiatives [COMPLETED]
- > LED outdoor lighting [COMPLETED]
- > Afresh home HVAC retrofit [COMPLETED]
- > Daylighting the carpentry canopy [PROPOSED]
- > Trades shops lighting redesign [PROPOSED]
- > Outdoor welding [PROPOSED]
- > Virtual welding [PROPOSED]
- > Center for Architectural Ecology Passivhaus retrofit [PROPOSED]
- > Pedestrianization of Smith Street [COMPLETED]
- > Educational signage [COMPLETED]
- > Daylighting Guichon Creek [PROPOSED]
- > Changing wood procurement and management practices in the joinery trades training program [COMPLETED]

SCHOOL OF CONSTRUCTION AND THE ENVIRONMENT – concerned with the natural environment, the built environment and the relationship between them. | AUGUST 2014

BCIT/AMG/2014_0017 2014

Our Success so Far



2008 base year

Data from 2016

Includes all of factor for but not NE01

Does not include Biomass.

To reach 75% reduction biomass at maximum capacity.

Benefits of Partnership

- Access to current data and project analysis
- A “home base” for a otherwise relatively abstract program, because of its online nature
- A chance to be part of a bigger question and to bring this into your career

<http://commons.bcit.ca/factorfour/soce/>

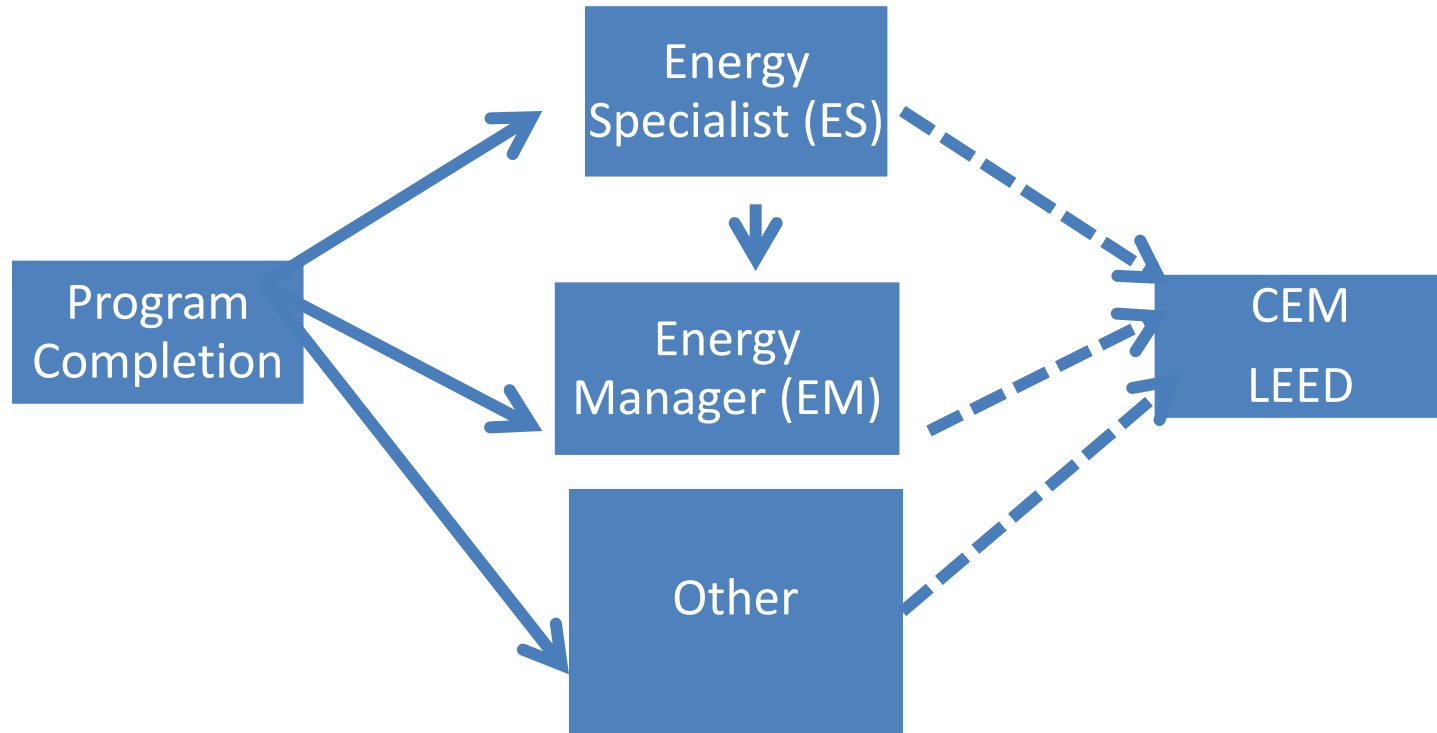
Role of an EM

Requires technical knowledge

But mostly the ability to work with people.



Career Pathways



Careers

- There are many different types of positions beyond the energy manager and specialist positions that our program was originally designed for.
- Positions are all over BC, and growing across Canada depending on who applies and receives funding (EM /ES)
- The more willing you are to move to a position, the quicker you will get hired

Why create a program dealing with Energy Management?

- B.C.'s energy demand could increase by up to 40 per cent
- The provincial government has set a goal of fulfilling two thirds of the new energy demand through conservation by 2020 (BC Hydro say 77%)
- Legislated to be a carbon-neutral public sector as of 2010

The SEMAC & BCEM Program

- 9 courses forming an Advanced Certificate
 - 356 hours in length
- Taught online in a part time studies format
 - 1.5 or 2.5 years- one night a week of webinar classes
- One cohort intake per year
- 4.5 “technical” courses
- 4.5 “business” courses

Courses

BCEM		Credits
CESA 5100	Energy Basics	2.5
CESA 5320	Energy Systems & Controls	4.0
CESA 5420	Building System Integration and Analytics	3.0
CESA 5500	Codes and Standards	1.0
CESA 5620	Commissioning and Optimization	4.0
CESA 5700	Decision Making	2.5
CESA 5800	Change Management	2.5
CESA 5820	Controls and Operations Management	2.5
CESA 5920	Controls Project	2.0
Total Credits:		24.0

SEMAC		Credits
CESA 5100	Energy Basics	2.5
CESA 5300	Energy Systems	4.0
CESA 5400	Operations Management	4.0
CESA 5500	Codes and Standards	1.0
CESA 5600	Energy Audit	2.5
CESA 5700	Decision Making	2.5
CESA 5800	Change Management	2.5
CESA 5850	Strategic Planning for Energy Management	2.5
CESA 5900	Project Development	2.5
Total Credits:		24.0

Program Structure – 1.5 year

Fall
(Sept –Dec)

Winter
(Jan-April)

Spring
(April- June)

Year 1

CESA 5100
(10 weeks)

CESA 5320
(15 weeks)

CESA 5800
(10 weeks)

CESA
5500/5620
(5+10
Weeks)

CESA 5420
(15 weeks)

CESA 5700
(10 weeks)

Year 2

CESA 5820
(10 weeks)

CESA 5920
(10 weeks)

Employers

The following organizations are examples of where students have found work:

- Institutions
- Consulting Firms
- Health Care
- Industrial Manufacturing
- Non-Profit Associations
- Municipalities
- Hospitality Industry
- Private Consulting Business

How Do I Apply?



Community

- Community Energy Association
- 6 courses
- Online

Prepare for Tomorrow

Community Energy Management



Are you a city planner, engineer, operations manager, transportation coordinator, or financial director? If so, community energy management should be incorporated into your strategic plans.

Gain the knowledge and resources you need to conserve energy, decrease emissions, and reduce energy costs in your community.

BCIT is offering part-time, online courses developed in partnership with the Community Energy Association.

Register now.
bcit.ca/cesa5110

BCIT High Performance Building Lab

CESA 1500 – Passive House Tradesperson Training



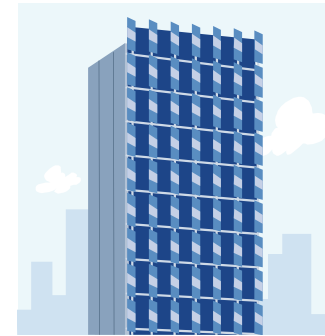
Figure 1 Practice wall Panels (Trees)



Figure 2 Assembly of House for Testing

Other Energy Curriculum

- **CESA 7100**
 - Energy Modeling for Building Professionals
- **CESA 0158/1059**
 - Introduction to Solar Electricity
 - Solar Electric Design
- **CESA 0178/0179**
 - Introduction to Solar Water Heating
 - Solar Water Heating Design



Other Energy Curriculum

- Our goal is to develop a series of professional development courses to enable graduates to keep current in the field

Thank You



bcit.ca/bcem
bcit.ca/semac

<https://commons.bcit.ca/energy/research/high-performance-building-lab/>

School of Construction and the Environment

BCITTM

School of Construction and the Environment

