

Energy and Society @ QU

➤ Parteq Innovations



➤ Innovation Park: <http://www.innovationpark.ca/>



▪ Anchor tenant is global technology centre Novelis (Alcan); houses about 20 organisations:

★ ELORIN, SWITCH, KEDCO, IRAP

★ HPCVL (www.hpcvl.org) - P³





Access the data

Building Systems

Green Features

Access the data

Contact, About

This page makes historical data available through a simple form. Simply select a data point range, and choose what kind of data you want: Interpolated data is given on the Interval while original data is what is stored directly in the database at Irregular Intervals - most use Interpolated data. Advanced statistical analysis is also available. There are 6000 data points so not all of them are available here; if you would like something included that isn't listed here. Alternately, you can download a more advanced graphing and analysis tool from the Queen's Campus only).

DOWNLOAD PROCESSBOOK

- ProcessBook.exe (90MB)
- Enthalpy_Wheel.PDI - an example file
- Installation Instructions and tutorial
- ProcessBook User's Manual
- ProcessBook Programmer's Reference
- DataLink for Excel (132MB with documentation)

GREEN TIPS

Evaluate your purchases and consider how they contribute to your household waste. Buy more durable goods and re-usable products. Ask for products with less packaging.

n/a

CHOOSE DATA POINT AND RANGE

Select an item

START DATE

07-Nov-10
dd-Mon-YY (08-Aug-06)

START TIME

9:16
24h format (19:00)

END DATE

07-Nov-10
dd-Mon-YY (09-Aug-06)

END TIME

11:16
24h format (23:00)

TIMING & STATISTICAL ANALYSIS

- Original Values
 Interpolated Values
 Average Std Dev

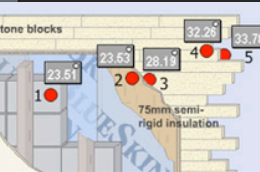
Period:

RESULTS

Table: Interpolated
Step interval: 5m
From: 07-Nov-10 9:16
To: 07-Nov-10 11:16

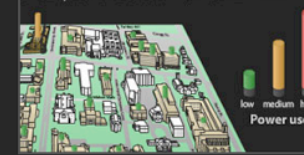
ILC.Power.Watts (Watts)

2010-11-07 09:16:00	93352.000
2010-11-07 09:21:00	92457.000
2010-11-07 09:26:00	91670.000
2010-11-07 09:31:00	92350.000
2010-11-07 09:36:00	93694.000
2010-11-07 09:41:00	92499.000
2010-11-07 09:46:00	91076.000
2010-11-07 09:51:00	93289.336
2010-11-07 09:56:00	94798.000
2010-11-07 10:01:00	98565.000
2010-11-07 10:06:00	103396.666
2010-11-07 10:11:00	108180.250
2010-11-07 10:16:00	110071.500
2010-11-07 10:21:00	111691.500
2010-11-07 10:26:00	113179.000
2010-11-07 10:31:00	114240.750
2010-11-07 10:36:00	111784.500
2010-11-07 10:41:00	116671.000
2010-11-07 10:46:00	109424.000
2010-11-07 10:51:00	109439.000
2010-11-07 10:56:00	108940.000
2010-11-07 11:01:00	108385.000
2010-11-07 11:06:00	109683.500
2010-11-07 11:11:00	110092.250
2010-11-07 11:16:00	111278.000



Insulation temperatures are monitored in real time.

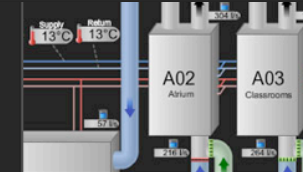
al Campus Power Use: 14,842,962 watts



Campus power, for over 90 buildings....



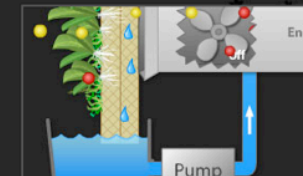
A 20kW solar array generates renewable power...



The air-handling system - see flows, temperatures...



The lights tell which rooms are in use!



The blowall, a green air filter.

structural systems are monitored in real-time and left open to view, to show how sustainable practices can be incorporated into building design.

Weather

Temperature:
4.2°C
Humidity:
73.00%



- Feels like: **4.17 °C**
- Wind speed: **3.22 km/h, SSE**
- Rain (today): **0 mm**
- Solar radiation: **137.00 W/m²**
- Rain rate: **0 mm/h**
- UV Index: **2.00**
- Pressure: **102.54 kPa (Steady)**



SBC – Vision and Mission

SBC VISION

A coordinated and inclusive community in which stakeholders work together to advance the environmental, economic and ethical use of biological resources.

SBC MISSION

To build the Bioeconomy Café®, a collaborative gathering of stakeholders by:

- C**reating the forum for stakeholders with biological, financial and/or academic capital to engage in the process of advancing the bioeconomy within the Great Lakes Region;
- A**ssessing the needs of stakeholders and analyzing opportunities for collaboration;
- F**acilitating strategic opportunities for linking community members with the goal of creating collaborative, multidisciplinary research projects;
- E**ducating stakeholders on the progress and results emerging as a result of community collaboration.

- Biology
- Business
- Chemistry
- Chemical Engineering
- Civil Engineering
- Geography
- Education
- Environmental Sciences
- Family Medicine
- Law
- Mechanical and Materials Engineering
- Policy Studies
- Political Studies
- Sociology
-

THE GREAT LAKES BIO-REGION:
MARKET OPPORTUNITIES
AND CARBON PRICING



[CONFERENCE PROGRAM]

3rd Annual
Conference
on Biomass for
Energy



Conference on Biomass and Energy for the Great Lakes Economy



Queen's
UNIVERSITY



SUSTAINABLE BIOECONOMY CENTRE

AT QUEEN'S UNIVERSITY



INSTITUTE FOR ENERGY &
ENVIRONMENTAL POLICY

◆ Works at the intersection of energy and environmental issues

◆ 27 Fellows in 12 institutions, including academia, government, industry

◆ Three main areas of focus:

◆ Renewable energy (the Eastern Ontario region)

◆ Arctic issues (Canada's arctic)

◆ Water issues (Great Lakes basin and beyond)



QUEEN'S UNIVERSITY INSTITUTE
for Energy and Environmental Policy

Home

About Us

Publications

Events

Learning

Contact Information

Research

Notable

The Future of Coal in Ontario:
Conference Summary Report

CANDU or no CANDU
by Bryne Purchase
Fraser Institute web site - March 2008

Energy Security Rapporteur's Report
Canada-U.K. Colloquia - Feb. 2007

What to do about Kyoto
by Alan Nymark
Ottawa Citizen - Feb. 2007

Coal isn't the demon; politicizing power policy is, says energy expert Bryne Purchase
The Globe and Mail - Jan. 2007

3rd Annual Conference on Biomass for Energy



The Great Lakes Bio-Region: Market Opportunities and Carbon Pricing

[Click the banner above to go to the Biomass Conference webpages.]

Current and Upcoming

(Last Updated October 14, 2010)

MNU MATARIKI NETWORK OF UNIVERSITIES
Partnering for a better world

QUEEN'S WORKSHOP
NOVEMBER 5-7

8th Biennial Short Rotation Woody Crops Operations Working Group Conference
Short Rotation Woody Crops in a Renewable Energy Future: Challenges and Opportunities

[Click here to see PDF]

October 17-19, 2010

2nd Annual Community Power Conference: *Power to the People*



» Find us on Facebook and Twitter

November 14-17, 2010
Metro Toronto Convention Centre
Information line: **1-866-573-6732**





Canadian Microelectronic Corporation



NFP with focus on industry-university design resources.

Enables pollution monitoring systems, natural resource management, process control etc.

- **Design** Design software and CAD tools, design methodologies, intellectual property including libraries, computer systems, and manufacturing technology environments.
- **Make** Prove your design concepts: get access to the best foundries in the world for the manufacture of prototypes. Also includes packaging and assembly services to integrate multiple technologies on a single device.
- **Test** Best-in-class equipment, products, and services to test and verify the functionality of microsystems, components or systems, and to demonstrate proofs-of-concept.





@ Innovation Park

GreenCentre Canada, a national Centre of Excellence for Commercialization and Research, is a unique collaboration between industry and academia. Our not-for-profit centre fills a significant unmet need by providing the expertise and assuming the financial risks associated with developing promising early-stage innovations in Green Chemistry that meet the specific needs of industry.

Our aim is to transform Green Chemistry research breakthroughs into clean, sustainable products and processes that will benefit Canada and the world. GreenCentre's strategic advantages include:

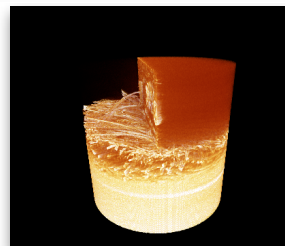
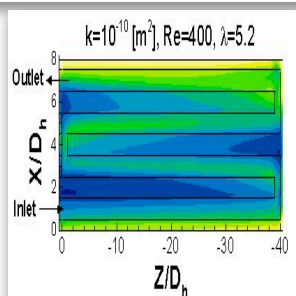
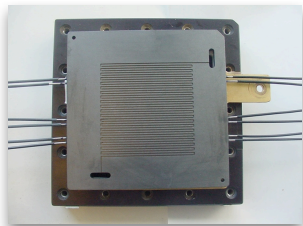
- 1 An innovation pipeline fed by university researchers from across Canada
- 2 Active participation by industry members from across the chemical value chain
- 3 A full suite of commercialization services, from assessment, scale-up and testing to intellectual property protection, business management, financial resources and communications
- 4 A technical staff dedicated to commercialization and focused on product and application development and scale-up synthesis; and
- 5 A commercialization team with industry expertise leading the development and commercialization of our technologies





About the Fuel Cell Research Centre

QUEEN'S-RMC FCRC Fuel Cell Research Centre

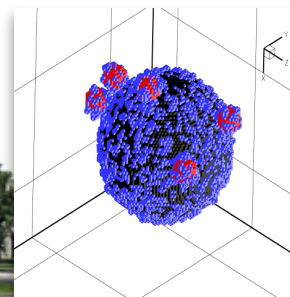
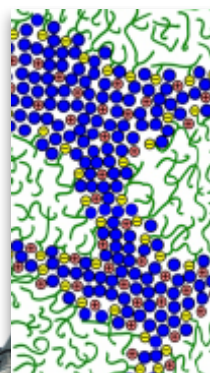
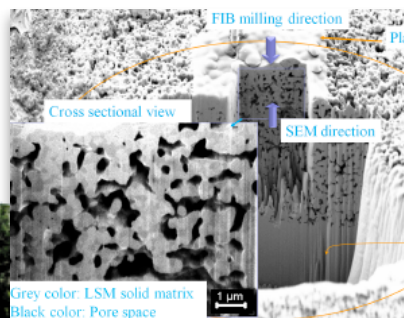


- 10 faculty members – 4 core FC + 6 others
- 30 graduate students, 7 pdfs, 3 techs, 3 staff + 4-10 undergrad students
- 10,000 sq.ft. lab and office space
 - Seven 320 sq. ft. labs dedicated to fuel cell research

Over 25 years of H₂ & fuel cell R&D history



Brant Peppley with Ballard Power Ser. No. 002 (1986)



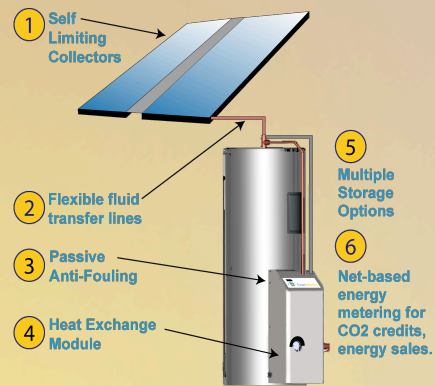


Alternative and Renewable Energy Solar Calorimetry Laboratory

Solar Systems Development

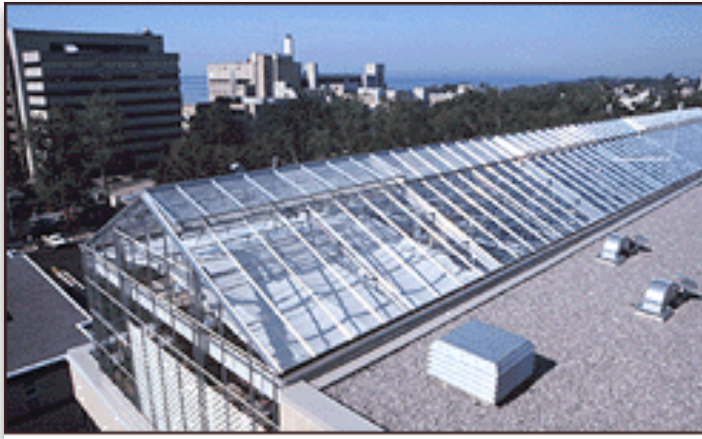
Solar Thermal and PV Technologies

- Solar heating and cooling
- Solar assisted heat pumps
- Combined PV-Thermal
- System modeling



www.enerworks.ca

Biosciences Complex



- ✓ Plant Sciences - “Our Biology Department is a centre of excellence”



Phytotron , a \$2.5 million facility for plant growth including six research-quality greenhouses and 25 plant growth chambers.



Hybrid poplars: Using a combination of genetic, genomic and biochemical approaches, we are investigating the regulation of a wide range of developmental processes that could impact the quality or the quantity of biomass produced from fast-growing trees such as poplar. Our ultimate goal is to identify genes that control superior traits related to biomass and bioenergy and transfer this knowledge to tree breeders for incorporation into their tree-breeding strategies.



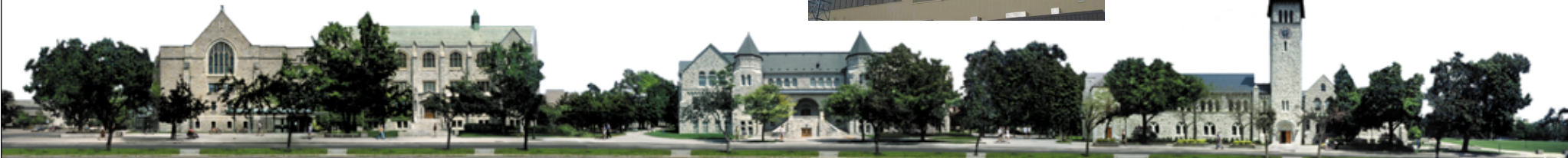
Biomass Characterisation Laboratory



- Biomass evaluation
- Biomass densification technologies
- Mixed biomass characteristics
- Bio-char
- Physical and analytical tests



- Torrefaction
- Gasification



Photovoltaic Characterisation Laboratory

Queen's Applied Sustainability Group




- Dirk: InGaN PV
- Mike: a-Si PV/T
- Amir: PV+CCHP
- Rob: PV+Snow
- Nabeil: PV + concentration
- Ha: GIS+PV+LIDAR
- Brittney: Solar water
- Kadra: PV+\$
- Nicole: RE+Nunavut/Ivana: OSAT
- Christine/Kristen: PV+RepRap

Materials
Devices
Systems
Resources
Economics
Development
Policy

E. M. Pearce and J. M. Pearce, "Life Cycle Considerations in Energy Conservation for Design of Low Income Housing" Chapter 10, in Utrick, Joseph B. editor, Energy and Buildings: Efficiency, Air Quality and Conservation Nova Science Publishers: New York, pp. 257-278, 2009.

Solar Photovoltaic Materials and Solar Cells

- Amorphous Silicon Materials and PV
- Indium Gallium Nitride for Photovoltaics

Photovoltaic Thermal Hybrids

- Amorphous Silicon PV/T
- InGaN PV/T

PV Manufacturing

- Green Manufacturing of Solar Photovoltaics
- Environmentally responsible manufacturing and industrial symbiosis

PV Systems

- Snow Cover and Hydrophobic Thin Film Coatings for Canadian Solar Photovoltaic Applications
- Photovoltaic system design

Policy

- Government photovoltaic manufacturing in Canada
- Banking for solar
- Banking for solar – P2P
- Solar map of renewable energy region

Applied Sustainability

- Desalination
- Green IT/S
- Applied Sustainability in Northern Communities
- Open-source appropriate technologies (OSAT)



Green IT @ QU

Green IT Research @ Queen's

Home

Papers & Conference
Presentations
Tools Created
We need your help!
Sitemap

Home

Research on Green Information Technologies and Systems at Queen's University, Canada, is supported by a SSHRC grant.

Researchers include:

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Tracy Jenkin, School of Business, tjenkin@business.queensu.ca

Joshua Pearce, Mechanical and Materials Engineering, pearce@me.queensu.ca

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Jim McKeen, School of Business, jmckeem@business.queensu.ca

Jane Webster, School of Business, jwebster@business.queensu.ca



ePOWER

QUEEN'S CENTRE FOR ENERGY & POWER ELECTRONICS RESEARCH



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Welcome to ePOWER

The Queen's Centre for Energy and Power Electronics Research (ePOWER) fosters collaboration among academic and industrial researchers to advance fundamental energy and power electronics research, to develop a broad range of commercially competitive and environmentally friendly technologies, and to train the next generation of innovators.

ePOWER has the following goals:

- To establish Queen's University as a world leader in fundamental and applied energy and power electronics research.
- To foster academic and industrial collaboration on energy and power electronics research with a focus on commercialization.
- To train highly-educated individuals by providing advanced energy and power electronics research opportunities in state-of-the-art facilities.

SPOTLIGHT



Kingston students get hands-on experience in green technology thanks to ePOWER's Youth Outreach program

[> Read more](#)

NEWS

>Quick updates.....ePOWER spin-off company [SPARQ Systems](#)' made-in-Ontario solar photovoltaic technology generated buzz at San Francisco solar conference.....The IEEE has announced that ePOWER Director Praveen Jain will be the 2011 recipient of the William E. Newell Power Electronics Award.....ePOWER is pleased to welcome new graduate students Ting Hao, Marko Krstic and Sepide Rafiel.....Newly-minted PhD grad John Lam is continuing his work at ePOWER as a MITACS Industrial Fellow.

[> More News...](#)

EVENTS



Energy and Society

- ★ Biological Station – 2000 hectares of terrestrial and aquatic habitats. Each year it hosts myriad researchers from national and international universities, and field courses including such diverse themes as herpetology, limnology, botany, ornithology, aquatic biodiversity assessment, applied ecology and fisheries.
- ★ PEARL – Paleocological Environmental Assessment and Research Laboratory – Paleolimnology (The Great Climate Debate, Monday Nov. 7.....)
- ★ Bioeconomy – Systems, Law and Policy, Biological carbon sinks, biomass production technologies, biomass conversion technologies and use.



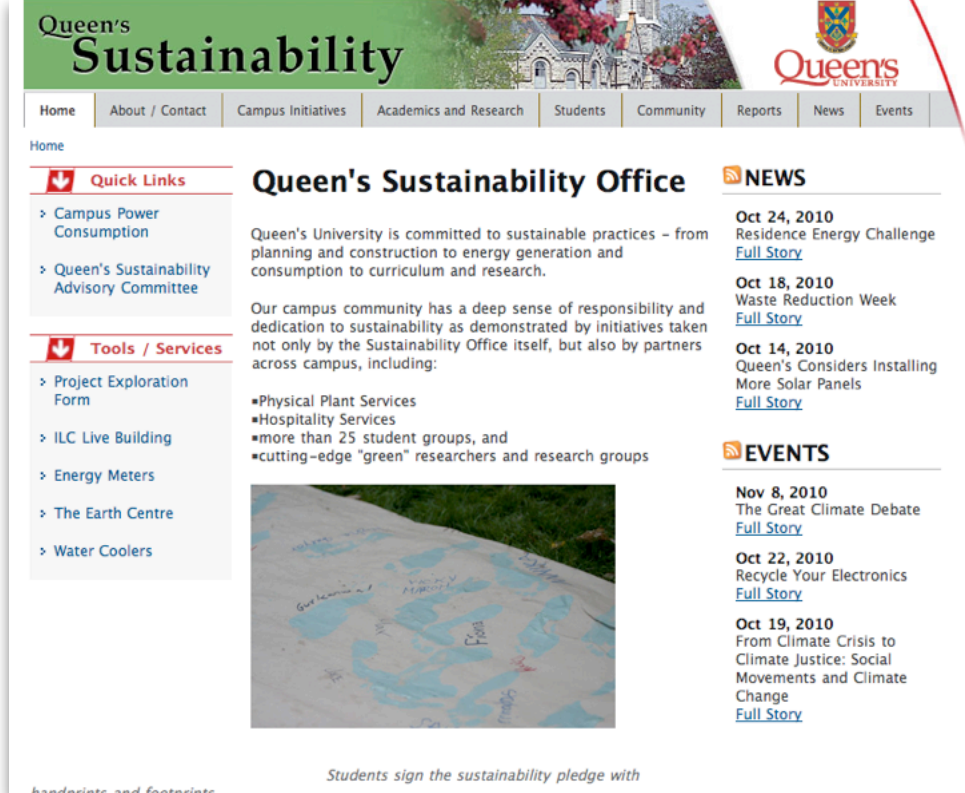
Energy and Society

- ▶ Monieson Centre - The Monieson Centre is a locus for excellence in the study of knowledge in organizations and communities. The Centre works closely with Queen's School of Business and other university faculty and students. It employs a collaborative, multi- disciplinary research model that upholds the standards of academic rigour. The Monieson Centre coordinates research projects and actively shares new knowledge through academic, industry, government, and community channels.
- ▶ Centre of Corporate Social Responsibility -
 - Integrity: Ethics, respect, transparency, authenticity and courage.
 - Innovation: Social innovation and social entrepreneurship.
 - Impact: Sustainability, community leadership, and outreach.



Energy and Society

- Sustainability is common thread throughout the University
- Office of Sustainability (campus operations)
- Evaluating through FIT programme mounting of solar PV on some of University buildings
- Many student groups
 - **EcoART and Trash to Art Collaboration** SGPS Sustainability Committee and Masters of Environmental Studies students.
- Pedagogic: MSc collaborative programme in Applied Sustainability; MSc in Environmental Science/Sustainability - ALL multi/inter disciplinary



The screenshot shows the Queen's Sustainability website. The header features the Queen's University logo and the text "Queen's Sustainability". A navigation menu includes links for Home, About / Contact, Campus Initiatives, Academics and Research, Students, Community, Reports, News, and Events. The main content area is titled "Queen's Sustainability Office" and includes a "NEWS" section with three articles: "Residence Energy Challenge" (Oct 24, 2010), "Waste Reduction Week" (Oct 18, 2010), and "Queen's Considers Installing More Solar Panels" (Oct 14, 2010). There is also an "EVENTS" section with three items: "The Great Climate Debate" (Nov 8, 2010), "Recycle Your Electronics" (Oct 22, 2010), and "From Climate Crisis to Climate Justice: Social Movements and Climate Change" (Oct 19, 2010). A "Tools / Services" sidebar lists links for Project Exploration Form, ILC Live Building, Energy Meters, The Earth Centre, and Water Coolers. A photo shows students signing a sustainability pledge on a large sheet of paper.

