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TEACHING ENERGY EFFICIENCY POLICY AT UNIVERSITY LEVEL

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Challenge what is. Imagine what could be.

International Greening Education Event

Karlsruhe, Germany

October 29-31, 2014



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PRESENTATION OUTLINE

- Sustainability at York University
- Importance of Energy Conservation
- Summary of Workshop on Teaching Energy Conservation
- Highlights of York Course
- Questions & Answers

Sustainability @ York U

There are more than 500 courses related to sustainability at York University



Over 65% of York University's total waste is diverted from landfills



Over 80% of the York University community commutes using alternative transit



More than 25% energy reduction compared to 2007

327 metric tonnes of carbon sequestered by Keele campus' trees, annually



50% of Glendon campus is covered by forest



New Farmer's Market in 2013 - 2014

Phase out the sale of bottled water at York by September 2015



President's Sustainability Council (PSC)

The 2013 PSC Report contains 14 new recommendations, 85 in total.

67 Recommendations made by the PSC in the first three reports



> 10 from the 2011/2012 report
> 20 from the 2010/2011 report
> 37 from 2008/2009 report



23 - completed recommendations
28 - significant progress has been made
13 - work has been done
3 - not yet started

The PSC Consists Of



30
18
6
6

Committee Members
Staff
Faculty
Students

PSC Areas Of Focus

Administration & Organization Structure
Campus Operations & Development
Social Justice
Curriculum
Student Sub-committee

Awards and Accolades



2012 Smart Commute Regional Employer of the Year

2013 Minister's Award for Environmental Excellence, Ontario Ministry of the Environment



One of Canada's Greenest Employers 2013 & 2014

Ranked #2 in Corporate Knights 2014 Future 40 Responsible Corporate Leaders in Canada



DATA CURRENT AS OF SEPT. 2014



\$40 million project, 85 buildings, 2 campuses

Started with campus-wide energy audit and utility analysis

Phased implementation over 4 years

Demonstrated 25% savings (\$5 million/yr)





CONSERVATION

Five Types

- Behavioural Conservation (no change in technology)
- Energy Efficiency (technical improvements)
- Demand Response (time of use – electricity only)
- Fuel substitution (increases use of other fuel)
- On-site generation (solar, wind, wood, etc.)

BENEFITS OF CONSERVATION IN CANADA

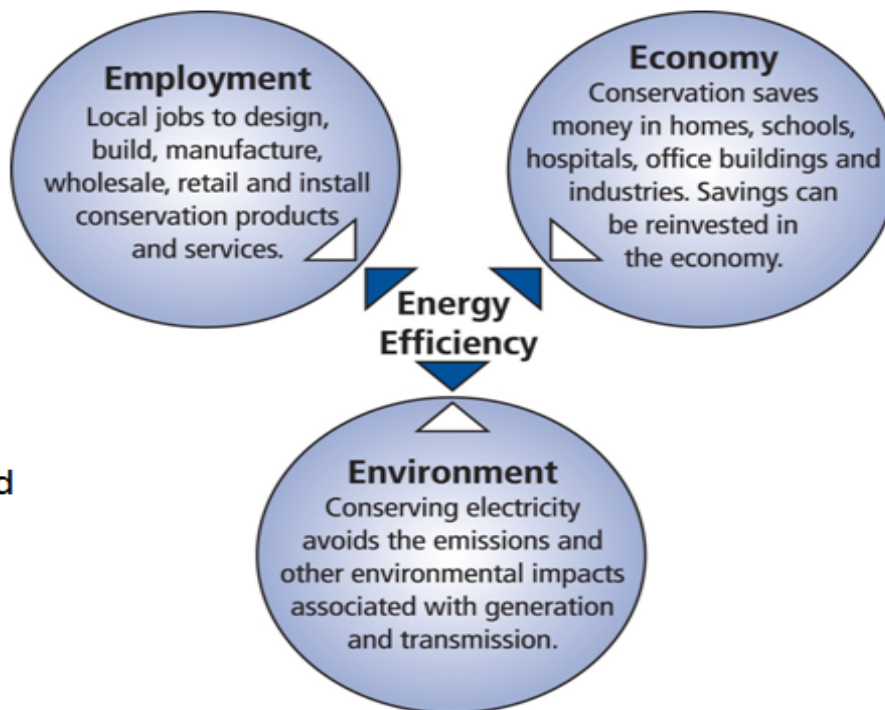


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Benefits of Conservation

The Three “Es”:

- **Employment** benefits: labour-intensive, local jobs
- **Economic** benefits: cost-effective for households and makes private sector more competitive
- **Environmental/health** benefits: reduced GHGs, acid rain, smog



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OPA
Ontario Power Authority

FOURTH BENEFIT IN REST OF THE WORLD

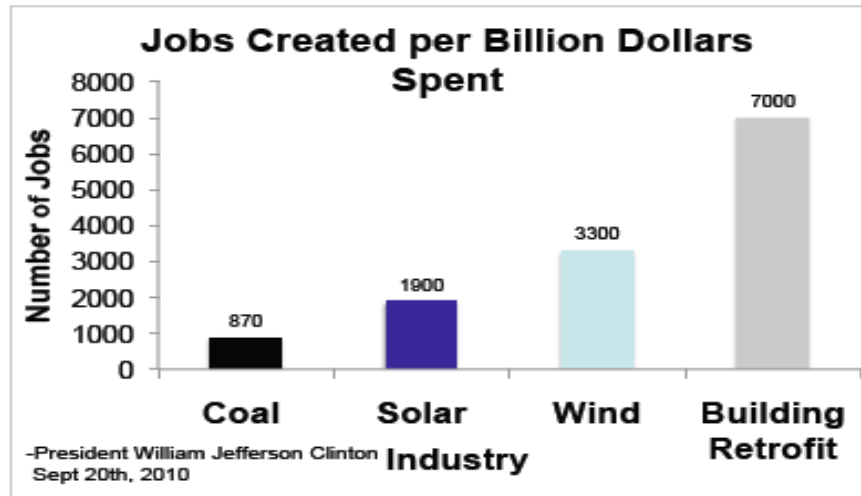


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Security of Supply
Russian gas pipeline!



EMPLOYMENT BENEFITS



Empire State Building Retrofit:

- 8 month design phase, 60 ideas considered, 8 projects (financial and environmental ROI).
- 3.1 year payback
- Initial \$20 million, 38% energy reduction, \$4.4 million savings annually.
- Creation of hundreds of jobs

- www.esbnyc.com

WORKSHOP ON TEACHING ENERGY CONSERVATION AT UNIVERSITY LEVEL



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- 1 ½ day workshop July 16/17 at York
- 23 professors/energy professionals
- 13 professors summarized their courses
- 6 government/utility/industry presentations
- Summary report available on line at
 - <http://sei.info.yorku.ca/seminar-presentations/>

MAJOR THEMES FROM WORKSHOP



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- Teaching energy efficiency lends itself well to a cross-disciplinary approach
- Need to have courses that teach engineers about policy, social considerations & communication
- Need to have courses that teach policy students how to get tech info from tech resources
- No one ideal department that should have sole responsibility for teaching energy efficiency
- May need to sneak in course on energy efficiency if one not yet offered

MAJOR THEMES FROM WORKSHOP (2)



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- Use homes energy efficiency as portal onto broader understanding of energy efficiency
- Importance of using case studies
- Would be interesting to consider having a mandatory course in energy efficiency as part of civic duty
- Rather than referring to courses in energy efficiency or energy issues, perhaps refer to energy systems change
- Should be funding for curriculum development

MAJOR THEMES FROM WORKSHOP (3)



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- Possibility of research projects using data submitted by public agencies as required by Regulation 397
- A common library of resources would be helpful
- Consider holding an annual workshop including profs from across Canada, perhaps alternating between a US and Canadian location
- York's Faculty of Environmental Studies offered to post presentations with summary report on their website



OVERVIEW OF APPROACH

- Most classes have guest speaker
- Modules focus on policy aspects
- Two group project – Briefing Note and York building assessment
- Term Paper 40%
- 25-35 4th year & MES students



GUEST SPEAKERS

- Typically reps from utilities, government, ENGO's & companies (Judith, Raegan, Paul, Alan by Skype)
- Includes both senior reps as well as recent employees
- All are potential employers
 - Senior reps asked to comment on what they look for when hiring
 - Younger reps asked to comment on strategies on getting job



MODULES

- Background on Energy, Power & Energy Services
- RETScreen Assessment Tool (for group project)
- Demand Response
- Drivers, Barriers & Policy Tools
- Economics of Energy Efficiency
- Transportation
- Energy Efficiency in Electricity System Planning
- Evaluating Energy Efficiency Programs
- Case Studies (Vermont, BC, California & Ontario)



GROUP PROJECTS

- RETScreen Assessment of York Building
 - Must include 1 behavioural, 1 EE & 1 DR measure
 - Results in a report (10%) with presentation (10%)
- Briefing Note
 - Students given recent Ontario government template
 - One of the guest speakers former/current political staff
 - Summarized in report and presentation (10%)



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TERM PAPER

- Submit outline for approval after 2 weeks
- **STRONGLY** encourage someone else to proofread
- Encouraged to focus on issue/country of interest to them
- 40% final mark



IN-CLASS QUIZ

- Define 5 terms (out of 8-9)
- Short answer to 3 questions (out of 5-6)
- Energy, Power & Cost Savings from EE Measure
 - Mandatory
 - Cost savings require use of TOU rates
- 20%



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READINGS

- 20-30 pages/week
- No text – use Alan Meier’s class notes, recent reports, websites
- Submit 10 weekly summaries (10%)



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DISCUSSION

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