

WELCOME to the

CECA
UoFT



BEP Workshop

The image is a collage of four distinct photographs. The top-left photo shows a large white teepee with a person in a plaid shirt standing near its base. The top-right photo is a close-up of a woven basket with a geometric pattern. The bottom-left photo shows a person in traditional Indigenous regalia performing a dance. The bottom-right photo shows a hand with a circular logo that reads "MYKKROTO LAND ACKNOWLEDGEMENT" and "#TKARO FOR ALL".

LAND ACKNOWLEDGEMENT

"We wish to acknowledge this land on which the University of Toronto operates. For thousands of years it has been the traditional land of the Huron-Wendat, the Seneca, and most recently, the Mississaugas of the Credit River. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land."

OUTLINE



- 1. The Energy Audit**
- 2. Assessment**
- 3. Retrofit**
- 4. Evaluation of Proposal**

Why is BEP important?

- Energy efficiency in buildings is essential to address climate change
- Buildings are a large contributor to energy consumption and greenhouse gas emission
- For context in the GEC and Case Comp
 - vital for a net zero or more sustainable retrofit

Conducting an Audit

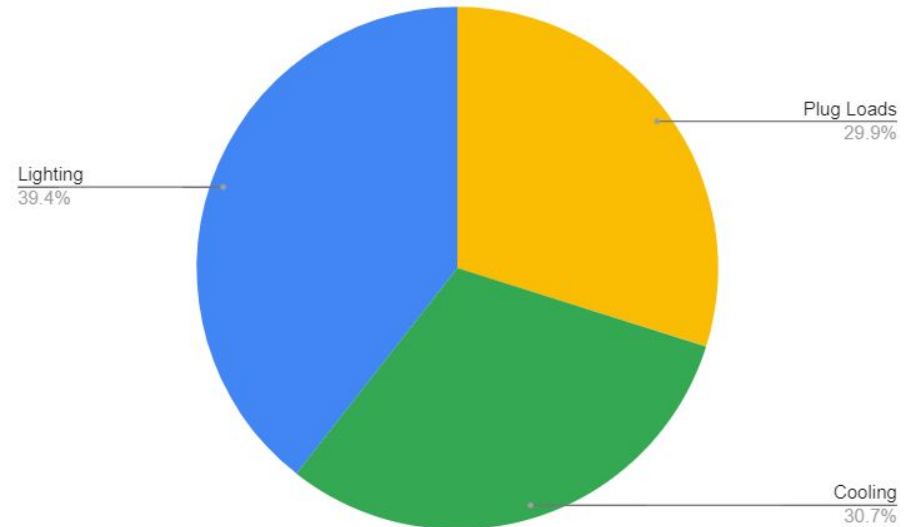
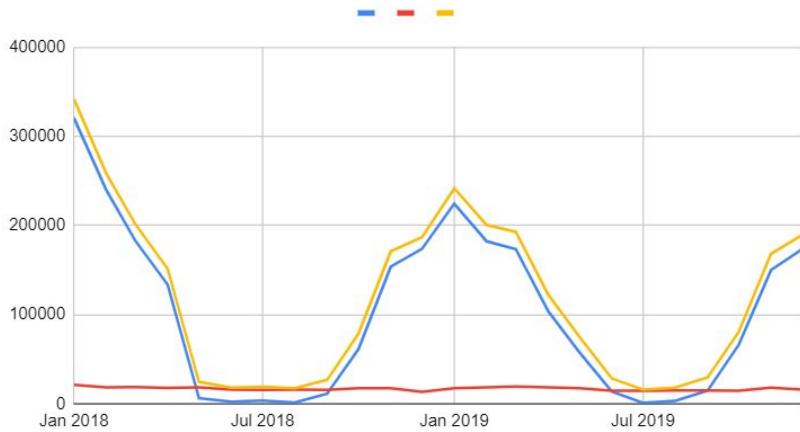
- **Data**
 - average annual total energy consumption
 - percentage consumed by electricity
 - natural gas or other energy use (ex. gasoline or wood)
- **Analysis**
 - variances, or room for error
 - further break down components
 - interpret, what do these numbers and figures mean?

Components of Electricity Use



Audit contd..

Energy Consumption Annually in kwh 2018-20



Assessment

- Specific break down of existing electrical systems: existing lighting fixtures, lighting controls, and HVAC motor controls
- What are operating hours?
 - all day everyday, what are the needs of the occupants
 - ex. School Building vs Workplace
- Are there thermostats, timers?
 - what is needed based on the season
 - for example if cooling load small window unit air conditioners

Assessment cont'd

Location	Light type	Total Wattage (W)	Daily Operating Hours	Total Weekly Operating Hours	Weekly Energy Use (kWh)
Stairwells and Hallways	CFL	195.0	10.0	70.0	13.7
	T12	5240.0	10.0	70.0	366.8
Classrooms	T12	21195.0	8.0	52.0	1102.1
Offices	T12	3720.0	8.0	52.0	193.4
Washrooms	CFL	26.0	12.0	84.0	2.2
	T12	1600.0	12.0	84.0	134.4
Child Care Rooms	T12	3920.0	8.0	56.0	219.5
Kitchen and Lunchrooms	T12	800.0	4.0	26.0	20.8
Library	T12	4800	10.0	84.0	403.2
Damaged Light	T12	6600.0	N/A (Varies)	61.0	402.6
	CFL	104.0	N/A (Varies)	80.0	8.3
Weekly Energy Usage (kWh)					2045.2
ANNUAL ENERGY USAGE (kWh)					79761.8

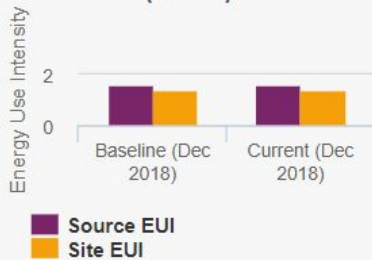
Energy Use/ Benchmark

- **Tool called Energy Star Portfolio Manager®**
 - used to measure and track energy and water consumption as well as greenhouse gas emissions
 - can also use to set energy use target
 - see how building design will compare to similar existing buildings



Energy Star Portfolio Manager®

Energy Performance (GJ/m²)



Generate & Download Performance Documents for this Property

[Statement of Energy Performance](#)

Metrics Comparison for Your Property & Your Target [Change Time Period](#)

Metric	Dec 31 2018 (Energy Baseline)	Dec 31 2018 (Energy Current)	Target*	Median Property*
ENERGY STAR score(1-100)	10	10	Not Set	50
Source EUI(GJ/m ²)	1.57	1.57	Not Set	1.11
Site EUI(GJ/m ²)	1.38	1.38	Not Set	0.98
Source Energy Use(GJ)	6271.2	6271.2	Not Set	4423.3
Site Energy Use(GJ)	5512.3	5512.3	Not Set	3888.0
Energy Cost(\$)	Not Available	Not Available	Not Set	Not Available
Total GHG Emissions(Metric Tons CO ₂ e)	244.1	244.1	Not Set	172.1

* To compute the metrics at the target and median levels of performance, we will use the fuel mix associated with your property's current energy use.

DOE Building Asset Score Tool

- **DOE Building Asset Score Tool**
 - Made by the U.S Department of Energy
 - used to assess the physical and structural energy efficiency of buildings
 - the tool generates a energy efficiency rating that enables comparison with other buildings
 - evaluates envelope (roof, walls, windows) and major systems and equipment (mechanical, electrical, service hot water)

DOE Building Asset Score Tool



Recommendation

- **Short Term**

- implemented now
 - budget
 - material availability
 - labour availability
 - requirements for occupancy

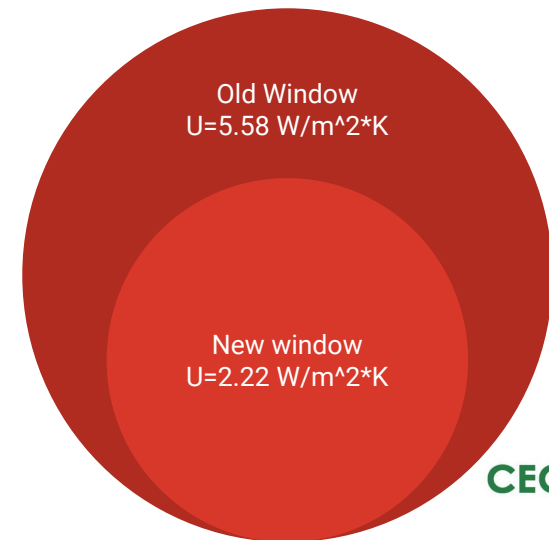
- **Long Term**

- ideas for the future
 - need money
 - requires vacancy
 - more complicated to design and implement



Retrofits

- **Energy Efficiency**
 - better windows
 - better wall insulation
 - better heating system (natural gas boiler vs electric boiler)
 - thermal curtains
 - newer systems
- **Justification**
 - Why is it worthwhile?



Questions?



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THANK YOU

for Coming to our Workshop!

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