JULY 28, 2021

Save on Energy Channel Partner Session: Accelerating Energy Efficiency in Mid-Tier Commercial Real Estate

Presented by the IESO



Today's Presenters

Rob Edwards: Business Advisor, IESO

Jess Burgess: Consultant, Canadian Institute for Energy Training/Econoler

Stephen Dixon: Owner-President, KnowEnergy





Agenda

- 1. Save on Energy Program updates
- 2. Top 5 findings from the Mid-Tier CRE energy study
- 3. Targeted program support for the mid-tier sector
- 4. How to assist your mid-tier customers conduct an energy-efficiency walk-through
- 5. What's next and discussion



About the IESO



Reliably operate Ontario's Province-wide system 24/7



Plan for Ontario's future energy needs



Purposefully engage to enable informed decisions





Enable competition and create efficient electricity markets



Enable province-wide energy efficiency





Smart Metering Entity

Cybersecurity leadership





2021-2024 CDM Framework

- \$692M, four-year CDM Framework launched in January 2021
- Centrally delivered by the IESO under the Save on Energy brand
- Programs target commercial, institutional and industrial customers with opportunities for residential electricity consumers
- Renewed programming for income-eligible electricity consumers and on-reserve First Nation communities







Save on Energy Programs

- Ontario businesses, large and small, have access to incentives for retrofits and other energy-efficiency projects to lower energy costs
 - Retrofit Program
 - Energy Manager Program
 - Energy Performance Program
 - Recommissioning
 - Training





Retrofit Program – New for 2021

- Enhanced list of fixed measures, improved application process and reduced administrative burden for applicants
- Previous custom track replaced by three streams of measures to include those most-commonly applied in former custom measure track
 - Includes Lighting, HVAC and Manufacturing and other Equipment
- Opportunity to keep pace with changing marketplace needs over the four-year framework



Energy Manager Program

Since 2011, 150+ managers across Ontario have become part of highly skilled network of energy professionals

- Performance payment of \$300/kW of summer peak-demand reduction
- In 2023, program will evolve from embedded energy manager model to a strategic energy management model
- New model will provide enhanced technical support, resources to companies with dedicated energy managers





Energy Performance Program

- Holistic approach to energy savings: operational + behaviour + capital
- Savings are determined by comparing annual metered consumption to the baseline energy model (hourly interval meter data)
- Incentive of \$0.04/kWh paid each year for three years + \$50/kW adder for summer peak demand savings (June to August, weekdays)
- Save at least 5% energy savings over first two years (20% cap)
- Upfront incentive payments to support implementing capital improvements and energy management practices - Baseline Energy Consumption x \$0.04/kWh x 2.5%



Energy Performance Program (cont'd)

- 1,500,000 kWh minimum; can aggregate up to five building into a single facility baseline energy model
- Data normalized for weather and significant building operations
- Retrofit applications ineligible; Energy Manager program eligible
- Approval by December 31, 2024 for three-year contract
- Now includes industrial facilities
- COVID-19 Guidance Document NRE, NRA, baseline development
- IESO currently exploring aggregator model for EPP



Retro-commissioning Program Update

In 2022, the IESO will launch a program to help building owners hire a commissioning agent to tune up their buildings

- A building tune-up finds savings and improves occupant comfort by reprogramming and repairing energy-using systems
- Minor replacement of some equipment would be allowed, but most capital projects would be ineligible in this program
- All buildings "drift" away from how they should work, and some were never set up properly in the first place, so a building tune-up can help!



Training and Support

Professional certification, specialized and foundational training programs

All training programs are eligible for a Save on Energy 50% incentive (capped to a course maximum and subject to eligibility)

Partnership with Enbridge Gas provides a 75% incentive for Certified Energy Managers, Building Operator Certification and Dollars to \$ense training courses

(capped to a course maximum and subject to eligibility)



saveonenergy.ca/For-Contractors-and-Allies/ Training-and-Support





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Jess Burgess: Consultant, Canadian Institute for Energy Training/Econoler

Next Presenter







Mid-Tier Energy Study "Top 5" Findings





Top 5: Trusted Channel

How are energy projects identified?



Mid-tiers count on vendors for

- Energy information
- Project identification
- Expertise



Top 5: Frontiers Beyond Lighting

Lighting has been very successful! Major opportunities remain in...

- HVAC equipment
 - Controls
- Retro-commissioning
- Operational improvements and behaviours

What types of energy-efficiency projects have you completed in the past 5 years?







Top 5: Operational Opportunity

What are the biggest challenges implementing energy projects?



Operational improvements overcome the financing barrier

- No capital investment
- No corporate approvals
- Low risk



Top 5: Alignment of Corporate Goals & Resources Is Rare



Tools for Alignment

On-site training and project development support:

- Dollars-to-\$ense workshops
- Energy treasure hunts



Benchmarking

Property managers believe their buildings perform above average, but very few are benchmarking

How does the performance of your mid-tier building compare against others in the sector?

What actions do you take with utility bills, beyond paying them?

Powering Tomorrow



Top 5: Support



Save on Energy Programs



Save on Energy representatives <u>retrofit@ieso.ca</u> 1-844-303-5542



Training and Support



Channel Partners



Targeted Support Strategy for Mid-Tier

- Focus on simple, high-return savings measures
 - Easy to access prescriptive Retrofit Program incentives
- Overcome capital barriers through operational actions
 - The energy-efficiency building walk-through
- Incentives for training and professional development







Energy Efficiency Measure Guides for Mid-Tier

- Common in mid-tier buildings
- Typically offer high return
- Retrofit incentives available
- Guides for:
 - Lighting controls
 - Variable frequency drives
 - ECMs (fan coils, refrigeration)
 - Chillers





Video Guide: How to Conduct an Energy-Efficiency Walk-through

- Short, how-to video guide for building operators, supervisors, property managers
- Recommendation to invite equipment vendors on the walk-through
 - Access technical expertise
 - Identify new energy-saving projects





Stephen Dixon: Owner-President, KnowEnergy





How to Support Your Customers and Increase Sales Through Energy-Efficiency Walk-throughs



Conducting an EE Walk-through in a Mid-Tier Building

- Engage with customer
- Set an objective such as finding low-cost savings opportunities
- Agree on scope building, systems
- Collect AND analyze some data before
- Set a time and conduct the walk-through
- Leave a list of ideas
- Follow-up with some savings (costs) numbers





Getting the Customer Interested

- Leverage quick savings without cost build the relationship
- Suggest that no-cost measures can support some of those other projects for which funding may be a challenge
- Remember, many mid-tiers may not have an energy manager or expertise
 become the energy resource





Energy Knowledge is Important

Utility Cost



Natural Gas Electricity

Energy Consumption



Natural Gas
 Electricity

Carbon Emissions



Natural Gas Electricity



Mid-Tier Case Study

- 3 floors, 48,000 ft² Energy reduced by 37% from 2014 to 2018
- Actions driven by asset renewal
- Measures include
 - 4 new rooftop HVAC units
 - VFDs on circulator pumps
 - building automation system
 - one of two boilers, DHW heater
 - exterior lighting
- \$165,000 saved over 5 years
- New interior LED this year 5% reduction!







What's A Good Time for a Walk-through?

- Demand profile is invaluable for asking questions
- Know your customer and their operations
- Whenever possible is a good time
- During normal operations
- During abnormal operations
- During quiet times less occupancy



Questions to Ask/Info to Collect Prior to Walk-through

- How much do you pay for energy?
 - Electricity, natural gas
- How many kWh and cubic metres of electricity and/or gas do you consume?
- Can I see a copy of your bills?
- Can we obtain some demand profile or interval data?
- Have you had an energy audit if so, what was done?
- Have you made any comparisons made to other buildings?





Seven Steps to Finding Savings in a Walk-through



1. Help the Customer to Understand Consumption, Price and Cost

- January 2005
 250,000 kWh ... \$19,670
- February 2005
 250,015 kWh ... \$20,032
- Energy up 0.01%
- Cost up 1.8% ???
- >\$24 per kWh





2. Do Some Comparisons – Use Energy Star[®] PortfolioManager[®]

- Compare a building to others
 - Energy intensity (GJ/m²)
 - Energy Star Score (1-100)
 - Accounts for weather and other use factors
- Determine potential for savings
- Ontario's Reporting of Energy Consumption and Water Use Regulation utilizes Portfolio Manager
 - by July 1, 2013 50,000 ft^2

ENERGY STAR [®] Statement of Energy Performance									
_		Building 3							
5	6	Primary Property Fu Gross Floor Area (m [:] Built: 1955	nction: Office '): 1,423						
ENERGY STAR® Date Generated: April 21, 2014									
1. The ENERGY STA climate and busines Property & Col	R score is a 1-100 ass s activity. ntact Information	essment of a building's ener	gy efficiency as compared with similar buildings nation	wide, adjusting for					
Property Addres Building 3	is	Property Owner	Primary Contact						
1000 Carling Ottawa, Ontario I	(1Y 4E4	()							
Property ID: 394 bldg 3: 1	8895								
Energy Consu	mption and Energ	y Use Intensity (EUI)							
Site EUI	Annual Energy b	y Fuel	National Median Comparison						
0.99 GJ/m ²	Natural Gas (GJ)	1 (65%)	National Median Site EUI (GJ/m ²)	1.04					
	Electric - Grid (G	(J)	% Diff from National Median Source EUI (GJ/m ²) 1.43						
Source EUI			Annual Emissions						
1.37 GJ/m ²			Greenhouse Gas Emissions (MtCO2e/year)	62					

Get started at https://portfoliomanager.energystar.gov/pm/login.html





3. Look for Savings in a Demand Profile







4. Try to Understand Where Energy is Used– Focus on Largest Usage Areas



Natural Gas Use in Commercial Buildings





Make Sure You Understand the Need

- Heat/cool
- Air power
- Fluid flow
- Ventilation
- Illumination





Look for a Current Facility Requirement (CFR)



5. Eliminate Energy Waste

- Turn it off
 - Lights, fans, pumps
 - Leaky building envelope
 - Phantom loads
- Turn it down
 - Temperature
 - Water
 - Air flow
- Control it
 - Exhaust/ventilation
 - Lighting time and levels













6. Maximize Efficiency

- Maintenance
 - Filters and lubrication
 - · Clean heat exchangers, pipes, ducts and coils
 - Regular tune-ups
 - New controls
- Optimize pumps, fans and cooling systems
 - Sequence multiple devices
 - Operate at most efficient point
 - Variable speed drives
- Install more efficient equipment
 - Lighting
 - Chillers
 - Fans and pumps











Waste and Efficiency







7. Consider Supply Options Longer Term

- Cogeneration
- Combined heat and power
- Heat recovery
- Heat pumps
- Photovoltaic
- Solar air, hot water







Four Questions to Ask

- Can you shut if off?
- Can you tune it up?
- Can you make it routine?
- Can you make an investment in it?
 - A lot of incentives are available



A Handy Walk-through Form

Questions	Opportunity to Save	Can I make it routine?	
Can I shut it off? Are there systems or equipment operating	1	Are there items that maybe small or large but tend to get forgotten in the everyday rush of keeping other things operating properly. Can	
during times when they are not <u>required</u> and you could shut them down? <i>Example: electric sidewalk heater in late</i>		l add them to a checklist or procedure? Example: cleaning/changing of an air intake filter on a boiler or compressor.	
spring		Can invest in it and use a rebate?	
Can it be tuned up?		Is there older equipment that needs replacing or is far less efficient than newer equipment.	
regular check-ups or adjustments to ensure better <u>efficiency.</u>		Is there a rebate from <u>SaveOnEnergy</u> or Enbridge?	
Example: small gas fired DHW heater.		areas.	





Energy Efficiency Walk-through Scenarios



What We Found: Similar Facility, Different Baseload



Building automation system (BAS) schedule overrides

> \$20,000/year





What We Found: Parallel Pumps

- Two pumps in parallel
- Both with VFDs
 - One at 20% and the other at 87%
 - One was a backup
 - "deep" override on
- Shut down slower pump
- Savings of \$2,900/year
- No cost







Daylight Sensors Improperly Located

- Daylight sensors for dimming fixtures were found installed in locations where they were not able to read the light levels properly
 - Over dark floor tiles
 - Too far from windows to detect outside light
- Solution: in both cases, it was a matter of moving the sensor over a desk area to within 3 to 6 feet of the window





Daylight Dimming

- Electricity savings
- One large room with 4 kW of lighting
- Dimming could reduce load by 2 kW for 1,500 hours per year
- ~ \$400 per year for relocation of a sensor





Drive Installed – Not Used Properly

- Ventilation air quantity was calculated on almost twice the actual occupancy "just in case"
- 100% outdoor air air-handlers had VFDs but were not controlled by the BAS and operated at 100% rather than varied based on requirement
- Solution: VFD reduced to 65% speed, which was close to 100% of occupancy required flow
 - Owners did not want to incur the expense of connecting the VFDs to the BAS and adding the pressure sensors required





Possible Savings by 35% Speed Reduction

- Electricity and gas savings
 - Moving and heating outside air
- Assume a 5,000 cfm airflow (full)
 - Use of a VFD reduces air flow 1,750 cfm and demand by 5 kW
- Total cost avoidance:
 - Electricity cost avoidance ~ \$6,000
 - Gas cost avoidance ~ \$2,000





Triple Duty Valve Used to Modulate Pump Rather Than VFD

- This is a very common one.
- A modulating hydronic system is installed with a triple duty valve and a VFD. The balancer found that the full flow needed to be trimmed by 10%.
- Rather than limit the VFD speed to 90% maximum, the balancer closed down the flow using the triple duty valve which added unnecessary pressure drop to the system
- This wasted pump energy throughout the full operating range





Cost of 10% Throttle versus Variable Speed Drive

- Electricity
- Assume a 25 HP circulator
- Load with 10% throttling: 19 kW
- Load with 10% speed reduction: 15 kW
- Operating 4,000 hours per year
- Avoidable cost of throttling ~ \$2,200





Beyond the Walk-through – An Effective Proposal



Reframe the Situation

- You will end up paying the cost of the VSD project in one year, whether you commit to the project or not
 - A VSD project with one-year simple payback
- Prepay part of your electricity bill for the next two years and get a free lighting retrofit
 - Two-year simple payback
- Eliminate two pump seal replacement next year and get \$2,500 extra in your expense budget
 - A VSD project that saves \$2,500 in energy costs and increases pump reliability.





Create a Effective (One-Page) Proposal

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LEISC	Lertin	at University of YourTown	
in a use tilation fume	control needs	of onition demands	e.
Addressing ventility of fa	n system to me	et peak fume-evacuation	
TARGET: Modify laboratory ventuation to	an and student	5	
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to of YourTown is globally	tecognized as a		
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The limitations of the furne to providing	a healthy and s	uring the day, leading to a build-u	ransfers
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Implementing a variable speed one	waste during n	on-peak united	
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with minimal disruption to rest	alon leaders to	discuss how this system will	
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concerns.			
		Net Present Value	\$130,373
FINANCOAL.	\$145,000	simple Payback Period	31%
Total project costs	\$2,500	Return on Investment	31%
Annual Maintenance cones	\$7,000	Internal Rate of Return	19%
Non-utility Savings	\$31,000	Modified INN	2.1
projected Administral Rebate	\$31,000	Savings to Investment Nacio	
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The strategic steps of your one-page proposal

Follows a logical process of thought:

- Title and subtitle –what's to come
- Target and secondary targets goals
- Rationale background, WHY, the pitch
- Financial \$\$\$
- Status what's happening
- Action what do you want?





TITLE and subtitle

- TITLE (ALL IN UPPER CASE) labels and defines the entire proposal
 - TITLE condenses the details into a single, captivating phrase if nothing else gets read, this will
- Subtitle (in upper and lower case below the main title) gives more detail, builds interest, adds "punch"
 - Subtitle provides a second chance to "hook" your reader

LET'S CLEAR THE AIR

Addressing ventilation fume control needs at University of YourTown



Target

- This is the main goal of your proposal
- Could also be called the "intention"
- Answers your reader's question, "What exactly will happen if I accept this proposal and it goes forward?"

TARGET: Modify laboratory ventilation fan system to meet peak fume-evacuation demands



Secondary targets (not titled)

- Almost all proposals have more than one target/objective
- Alone, each may not be able to justify the proposal, but together they add weight and purpose to the main objective
- Secondary targets highlight additional perceived benefits
- In your reader's mind, your idea goes from "this is an interesting idea" to "this
 - a great idea" Improve working conditions for staff and students
 - Extend the useful life of fan motor
 - Defer capital investment
 - Reduce energy expenses by \$31,000 annually
 - Attract an up-front incentive equal to the first year of savings.





Rationale (not titled)

- The longest section, this is the all-important step where you "sell" your idea
- Better still, if this section is well crafted your proposal will sell itself
- In two or three concise paragraphs, it convincingly presents all the reasons
 WHY your proposal should be accepted (think benefits!)
- Back up your objectives by showing you've done your homework discuss needs and present key features, advantages and benefits
- Here's your chance to show you are prepared, and to impart your passion to the reader!



Rationale

The University of YourTown is globally recognized as a research powerhouse and leader in research-intensive education.

The limitations of the fume hood exhaust system in the Science Building threatens the University's commitment to providing a healthy and safe workplace. The current fan system does not meet peak fume-evacuation requirements during the day, leading to a build-up of harmful fumes. Researchers and support staff in the department have been asking for transfers out at a higher rate than other buildings.

Implementing a variable speed drive technology on the ventilation will improve the exhaust performance while reducing energy waste during non-peak times. The system can be upgraded with minimal disruption to research productivity over a weekend.

We would be happy to speak with staff to discuss how this system will address their concerns.



Financial

- This is where you clarify the financial commitments required and benefits that will result
- Even though the first reader may not be a financial investor, it is still important to explain the money issue, as another reader may be a financial expert!

FINANCIAL:

Project first cost is estimated at \$114,000 after a SaveOnEnergy incentive of \$31,000. A 10 year analysis yields a net present value of \$130,373 with a savings-to-investment ratio over 2.

Simple Payback	3.2 years	Net Present Value	\$130,373
Return on Investment	31%	Savings to Investment Ratio	2.1
nternal Rate of Return	31%	Modified Internal Rate of Return	19%



Status

- Here's where you answer some key questions:
 - What is the current situation?
 - What has been accomplished already and/or what preparations are under way?
 - Who have you talked to and are there any agreements/related deals already in place?

STATUS:

A pre-qualified \$31,000 incentive to implement this project is available from the local electricity distributor.



ACTION

- Your action statement is in response to your reader's implied question
 - "What exactly do you want me to do?
- Remember if you don't ask for something, it's not a proposal

ACTION:

U of Y to authorize purchase agreement with Vendor to upgrade the lab ventilation system to variable speed drive technology to improve the laboratory fume exhaust.

Adapted from http://www.slideshare.net/uvic/the-one-page-proposal-presentation



Dollars to \$ense Training

- 1. Unlocking savings
- 2. Existing building commissioning
- 3. Making the case for energy efficiency
- 4. Revealing the results



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What's Coming Up?





The IESO will share the following tools to advance energy efficiency in the mid-tier sector:

- Mid-tier energy study backgrounder
- Energy-efficiency measure guides for mid-tier buildings
- Video guide on how to conduct an energy-efficiency walk-through
- Accessing and analyzing your interval energy data
 - Guide and information session



Discussion

What would enable you as a product or service company to drive more energy-efficiency activity in mid-tier buildings?



Questions

Submit questions using the chat feature



Thank you

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saveonenergy@ieso.ca



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facebook.com/SaveOnEnergyOntario



linkedin.com/showcase/ SaveOnEnergy-Ontario

