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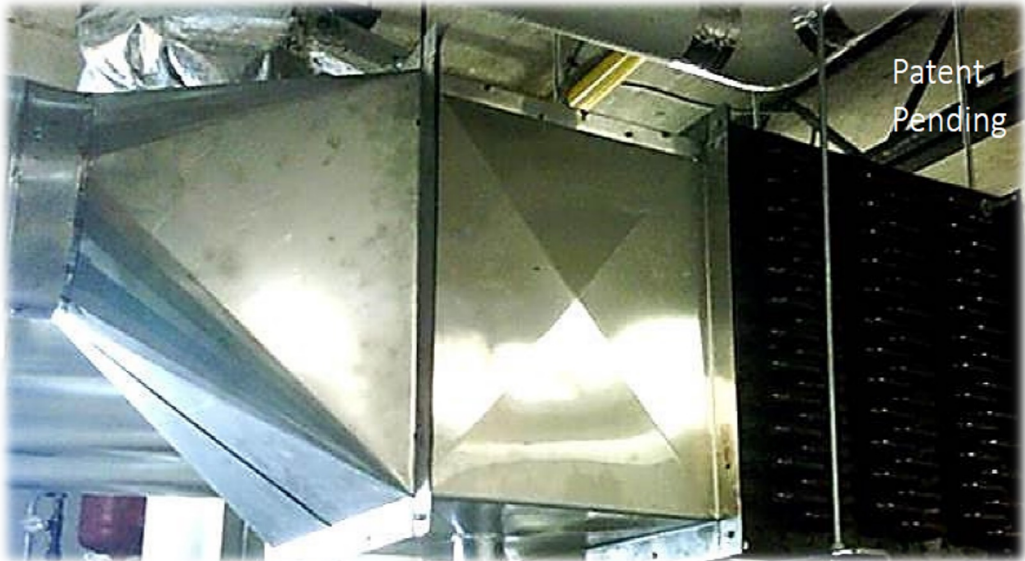
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ONTARIO POWER GENERATION



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6 – 36-month payback

HFG ENERGY OPTIMIZATION SYSTEMS

Boiler Energy Optimization | Preheat Ventilation | Domestic Hot Water Heating
Refrigeration/Air Conditioning Cost Reduction | Increased Building Valuation | CO2 Reduction

FROM ONE SYSTEM

The 4EL Energy HFG is a breakthrough in energy systems for cities. 15%-25% annual savings combined heating and cooling. Proven with nearly 20 years of installations. Customer payback periods between 9 and 36 months. Installs in one to two days. High rise, commercial, institutional, government, and industrial are all of your customers.



GLOBAL MARKET

Daily - 365 Savings



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Increased Asset Valuation

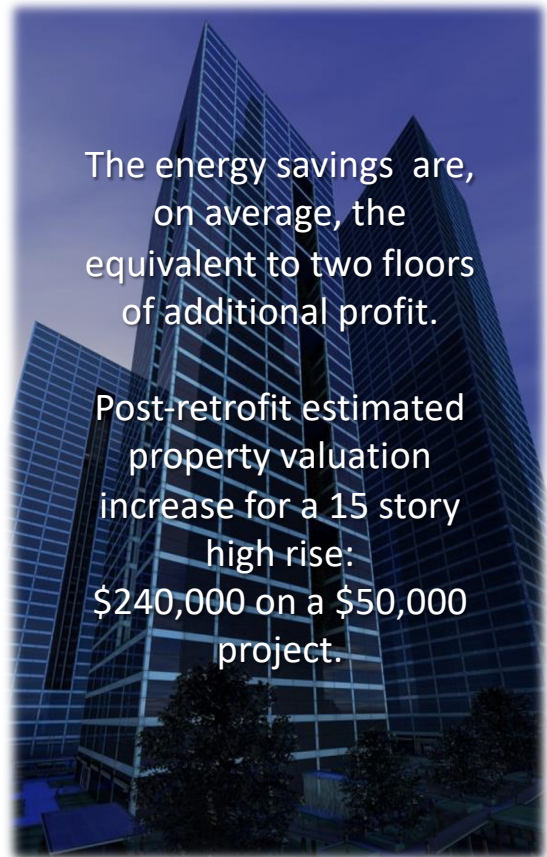
As investors and occupants become more knowledgeable about and concerned with the environmental and social impacts of the built environment, buildings with better sustainability credentials enjoy increased marketability.

Studies around the world show that **green buildings more easily attract tenants and command higher rents and sale prices.**

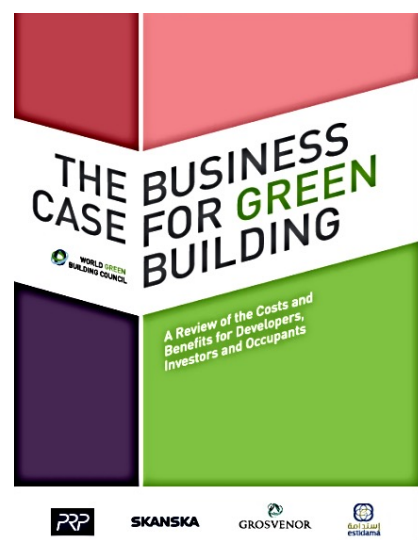
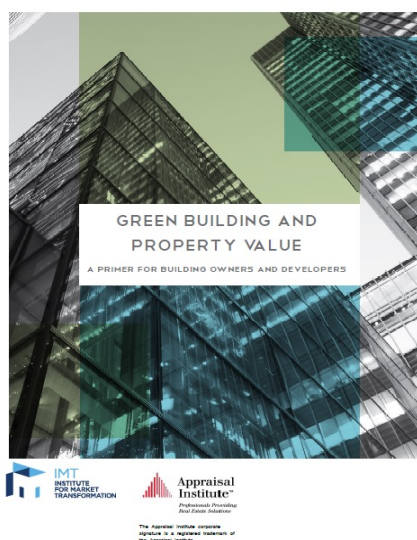
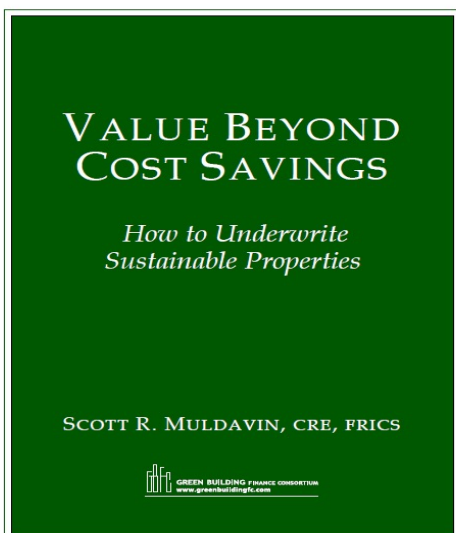
In markets where green has become more mainstream, there are indications of emerging 'brown discounts' where buildings that are not green may rent or sell for less.

- **WORLD GREEN BUILDING COUNCIL**
- **US Green Building Council**
- **Canada Green Building Council**
- **Leadership in Energy and Environmental Design (LEED)**

Moving beyond the value that accrues to owners from rents, operational savings, and market recognition at sale, these guides help building owners and developers understand the appraisal process and how green, high performance characteristics and data can be used by appraisers to help fully **maximize increased property valuation due to energy optimization systems.**



Property Valuation Increase Due To Energy Improvements



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Campbell Company of Canada HFG Case Study - 2007

- *"Campbell has been a welcome guest in Canadian kitchens for over 80 years. Our values not only support how we operate in our workplace, but also how we conduct ourselves with our peers and in our community. "*
- Energy optimization system installed on boilers and process hot water systems.
- 120psi Steam boiler flue gas temperatures reduced **from 450F to 56F**.
- Exhaust boiler conditions: 450F.
- Inlet combustion air temperature: 80F.
- Boiler Exhaust temperature: 56F.
- 99% combustion efficiency after installation.
- \$202,000 per year in savings.
- \$127,000 installation cost prior to incentives.
- **6-month payback period.**

ENERGY RECOVERY CASE STUDY



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Energy Retrofit Incentive Project



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Metal Koting (Continuous Colour Coat Limited) HFG Case Study - 2006

- *“As an industry-leading producer of high quality, custom coil-coated metal products for more than 45 years, METAL KOTING (Continuous Colour Coat Limited) focuses on developing and producing specialty coating systems for flat rolled metal substrates, including carbon steel, stainless steel, and aluminum.”*
- HFG High temperature energy optimization system.
- 1,600 degrees Fahrenheit (871 degrees C).
- 3.75 million Btu/hr.
- Installed cost: \$132,000 prior to incentives.
- Savings: \$156,000 per year.
- **Payback period: 9 months.**

ENERGY RECOVERY CASE STUDY



Energy Retrofit Incentive Project



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University of Waterloo Energy Recovery Case Study - 2005

- *“In the heart of Waterloo Region, at the forefront of innovation, the University of Waterloo is home to world-changing research and inspired teaching. At the hub of a growing network of global partnerships, Waterloo will shape the future by building bridges with industry and between disciplines, institutions and communities.”*
- HFG energy optimization system installed in main power plant.
- \$750,00 per year in savings.
- \$1.5 million installation cost prior to incentives
- **Two-year payback.**



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ENERGY RECOVERY CASE STUDY

OPSEU Pension Trust (OPTrust) High Rise Case Study

- OPTrust's Real Estate Group has grown the fund's real estate portfolio to \$2.2 billion at year-end 2013.
- HFG energy optimization system installed on boilers, ventilation and domestic hot water systems.
- \$15,000 per year in savings.
- 24-month payback period after incentives.
- Estimated valuation increase: \$240,000.
- Actual ROI – immediate.



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Energy Retrofit Incentive Project

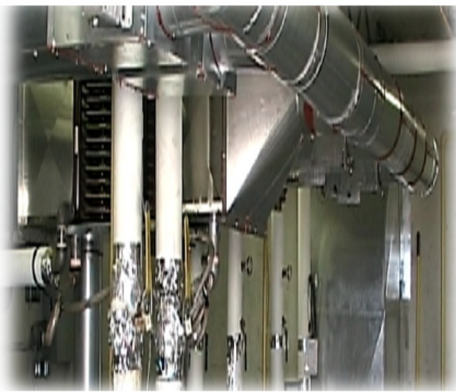


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OPSEU Pension Trust (OPTrust) Performance Validation Report

- OPTrust’s Real Estate Group - Energy recovery system installed on boilers, ventilation and domestic hot water systems.
- 24-month payback period.
- Temperature measurements were taken at the following points:
- Boiler stack exhaust where it exits the boiler 327F.
- HFG Eliminator exhaust vent 84.6F.
- Boiler room temperature 84.2F.



“Over 99% of the flue gas energy is recovered through the HFG Eliminator.”

Andrew Lanesmith – 3rd party validation

Energy Systems Specialist.

PEng. University of Waterloo.

**15 Story Condominium: Four atmospheric boilers operating at 78.5% efficiency.
99% efficiency after installation.**

- Guaranteed 90% energy optimization.
- Meets all safety and code requirements..
- Flue gas temperatures up to 600F
- Complete systems up to 10MMBH



Modular – all components easily transported in an elevator and through a standard door.

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Validation Report - Date of Measurements: September 28, 2016

Location of Installation: Cambridge, Ontario. Canada

Measurements Taken By: Andrew Lanesmith, PEng. - Energy Systems Specialist.
Master of Divinity.

The HFG energy optimization system was installed at the OPSEU condominium complex located in Cambridge, Ontario Canada. The HFG Eliminator was installed to recover energy from the heating and hot water boiler's flue gas exhaust. The recovered energy is used to preheat cold water make-up to the building's hot water supply, and to preheat air supplied to the building during colder months of the year.

The HFG was tested in September, 2016. Temperature measurements were completed by Andrew Lanesmith, PEng. - Energy System Specialist – to validate that the HFG system operates as designed.

One hot water boiler was operating when temperature measurements were taken. The hot water boiler stack vents outside through the side wall when there is no demand for energy recovery. When there is a demand to recover energy from the boiler stack flue gas, an actuator opens a damper, allowing the hot flue gas to be drawn through the HFG. Energy from the flue gas is transferred via a heat exchanger to a glycol loop which conveys the heat to a second heat exchanger. The second heat exchanger preheats the cold, City water which is required as make-up water for the domestic hot water supply.



Ambient temperature coming from the boiler flue gas. Those in attendance put their hands in the 84.6F flue gas exhaust while the boilers were operating.



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Validation Report - Date of Measurements: September 28, 2016

DESCRIPTION OF BUILDING SYSTEMS

The building is equipped with:

- A domestic hot water loop for hot water consumption.
- A hydronic hot water loop for building heating.
- A make-up air unit to provide fresh air to each floor of the building.

The hot water loops include four hot water storage tanks. The water in the storage tanks is maintained at the design hot water temperature by circulating the stored water through two hot water boilers. When the hot water temperature in the storage tanks drops below the low temperature set point, the hot water boilers turn on to raise the temperature of the hot water to the high temperature set point. City water make-up is supplied to the hot water storage tanks based on the demand for domestic hot water.

The make-up air unit is designed to heat cold, make-up air during the heating season. The make-up air heating system consists of an indirect fired natural gas burner.

DESCRIPTION OF ENERGY RECOVERY SYSTEM

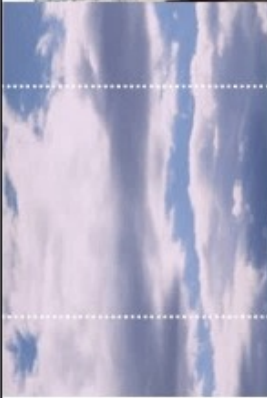
At this site, four hot water boilers maintain the design temperatures of the two hot water loops – domestic hot water and heating. Each boiler has an exhaust stack that vents to a 6 inch energy recovery plenum.

Demand for energy optimization is created when:

- The domestic hot water supply calls for city water make-up, and/or
- The outside air temperature drops below a set point, creating a demand to preheat building make-up air

Ducting from each boiler exhaust stack tees into a main header. The main header is ducted to the HFG optimization system.

During the validation measurements, the side wall vents for each of the boilers were monitored by a digital thermometer as well as physically determined by holding a hand in the exhaust vents. The temperature recorded and felt was similar to the outside ambient air temperature. This observation indicated that the actuator controlled dampers were operating properly.



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Engineers, Consultants, Stakeholders, Business Owners - On Site To Confirm Validation

