



# How to Save Water, Energy, and MONEY

September 29, 2018  
Victoria, BC

Jordan Fisher

FRESCO - [jfisher@frescoltd.com](mailto:jfisher@frescoltd.com)



# Presentation Overview

- Challenges/Opportunities
- Building systems and efficiency 101
- Business case for upgrades
- Group discussion on key issues
- Current programs/opportunities
- Questions/discussion



# Overview of Efficiency Opportunities

## *The Challenge*

- What challenges is your co-op facing?
- How do these relate to energy/water?
- How do they relate to required upgrades?
- Capital planning?
- Environmental goals?
- Other?



# Overview of Efficiency Opportunities

## *The Challenge*

- **Increasing costs**
  - Budget pressures
  - Taxes, utilities, maintenance/repairs
- Limits to revenue
  - Need to keep rents affordable



# Overview of Efficiency Opportunities

## *The Challenge*

- Repairs and replacements looming
- Lack of capacity
- Housing shortage – cost of real estate



# Overview of Efficiency Opportunities

## *The Opportunity*

- Utility costs are an area where you can control costs
- Investing in energy/water efficiency
- Asset renewal; protect affordability today and into the future
- Non-energy benefits





# Overview of Efficiency Opportunities

## *Efficiency 101*

- Utility prices
  - Difficult to predict
  - General upward trend
  - Not just energy; water a major expenditure



# Overview of Efficiency Opportunities

## *Utility Prices*

**BUSINESS**

BC Hydro rates rise as demand slows







# Overview of Efficiency Opportunities

## *Utility Prices*

### Fortis B.C. defends 80% hike in natural gas

Price of natural gas on commodity markets has only increased 26 per cent this year

By Adrian Macoczym, CBC News | Posted: Sep 13, 2016 5:52 PM PT | Last Updated: Sep 14, 2016 7:19 AM PT



FortisBC has received approval to increase natural gas rates by 80 per cent. (CBC)

*Misleading headlines; what are future costs?*



# Overview of Efficiency Opportunities

## *Utility Prices*

**Metro Vancouver water, sewer rates to increase**

KELLY SINOSKI, VANCOUVER SUN 30.04.2015 |





# Overview of Efficiency Opportunities

## *Efficiency 101*

- Energy Conservation Measures (ECMs)
  - Mechanical Equipment
  - Controls
  - Water fixtures
  - Lighting
  - Building envelope



# Mechanical Equipment Overview

- Systems common in multi-family properties
  - Boilers
  - Water Heaters
  - Air Handlers / Makeup Air Systems
  - Controls





# Overview of Efficiency Opportunities

## *Boiler Basics*



- Older boilers: Technology from ‘yesteryear’
- Lack of controls
- Around 60%-80% overall efficiency
- Easy to ruin if water temperature drops





# Overview of Efficiency Opportunities

## *Boiler Basics*



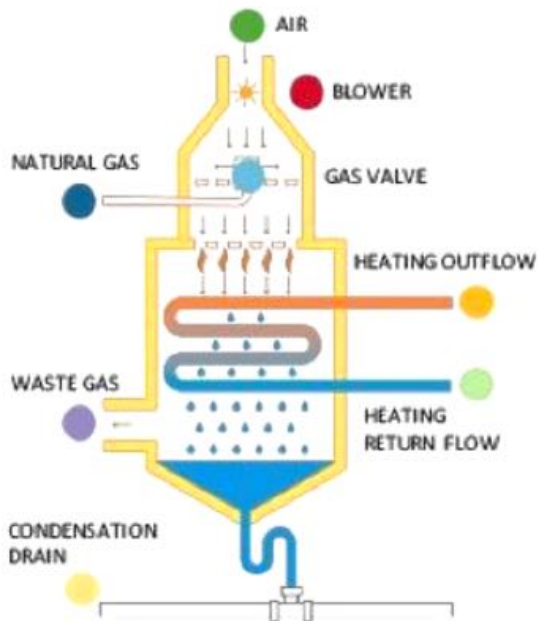
- Modern boilers: high-efficiency now common
- Proven technology
- Digital controls
- Around 90%-95% efficiency
- Designed for low water temperatures



# Overview of Efficiency Opportunities

## *Boiler Basics*

- High-Efficiency Boiler design:
  - “Condensing”
  - “Modulating”
  - “Mod-Con”





# Overview of Efficiency Opportunities

## *Heat Pumps*





# Overview of Efficiency Opportunities

## *Heat Pumps*

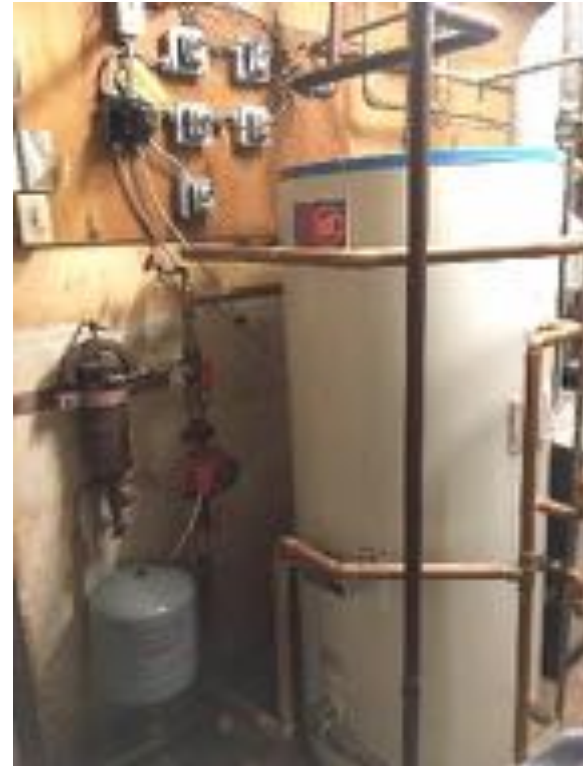
- Ducted-heat pumps
- Ductless heat pumps
- Mini-ducted heat pumps





# Overview of Efficiency Opportunities

## *Water Heaters*



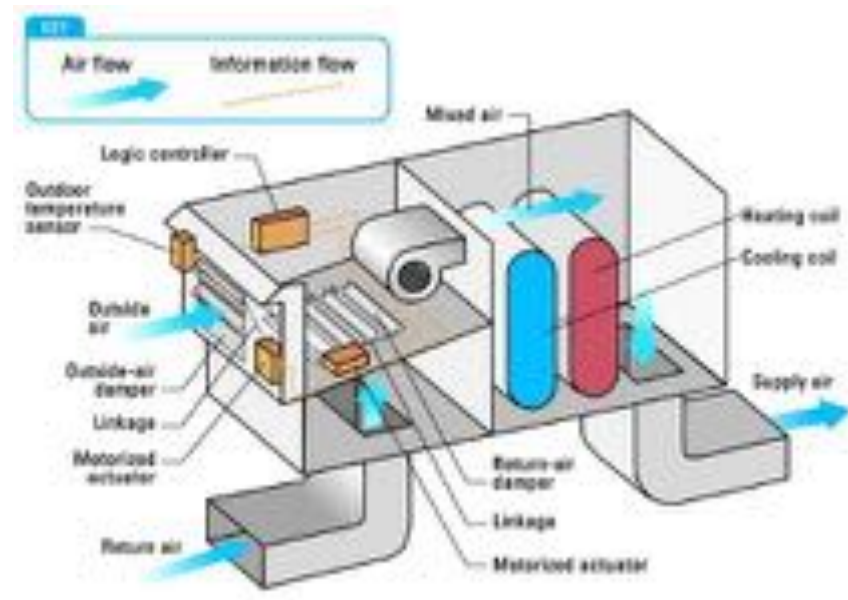




# Overview of Efficiency Opportunities

## *Air Handling Systems*

- Improvements:
  - Modulating fans
  - Digital controls
  - Condensing
  - Heat pump
  - Exhaust heat recovery





# Overview of Efficiency Opportunities

## *Control Upgrades*

FURNACE 150 SUMMER  
100 FALL  
190 WINTER

PRESSURE 25  
(NO LOWER THAN 15)

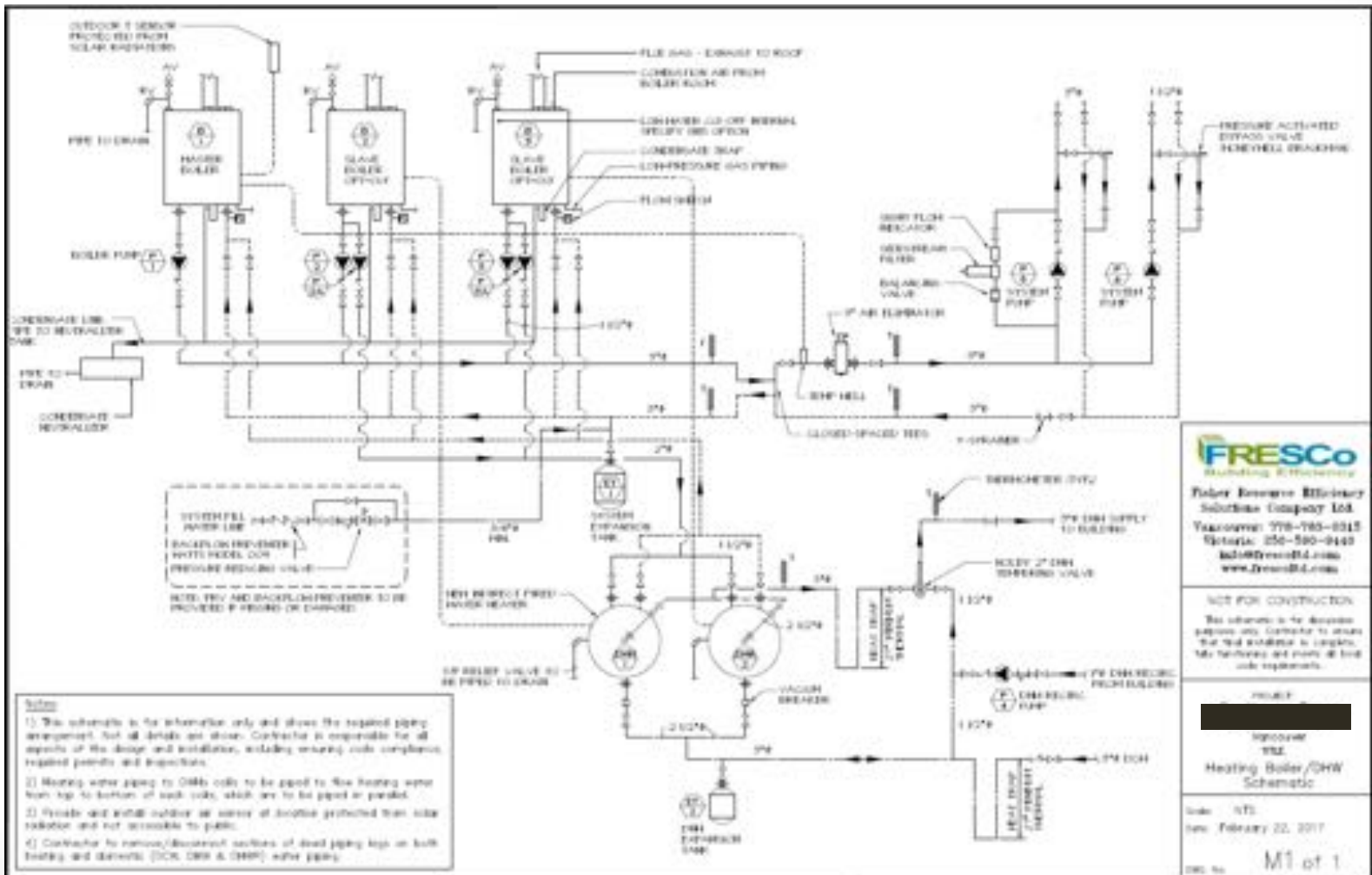
- ADJUST REAR WHITE  
HANDLE WHEN LOW

(OPEN VALVE TO BOTH  
BOILERS WHEN  
REALLY COLD.)



# Efficiency Opportunities

## *Design/Specifications*







# Overview of Efficiency Opportunities

## *Heat Loss/Pipe Insulation*





# Overview of Efficiency Opportunities

## *Efficiency 101*







# Overview of Efficiency Opportunities

## *Efficiency 101*





# Overview of Efficiency Opportunities

## *Efficiency 101*





# Overview of Efficiency Opportunities

## *Efficiency 101*





# Overview of Efficiency Opportunities

## *Efficiency 101*







# Overview of Efficiency Opportunities

## *Efficiency 101*





# Overview of Efficiency Opportunities

## *Efficiency 101*





# The Business Case

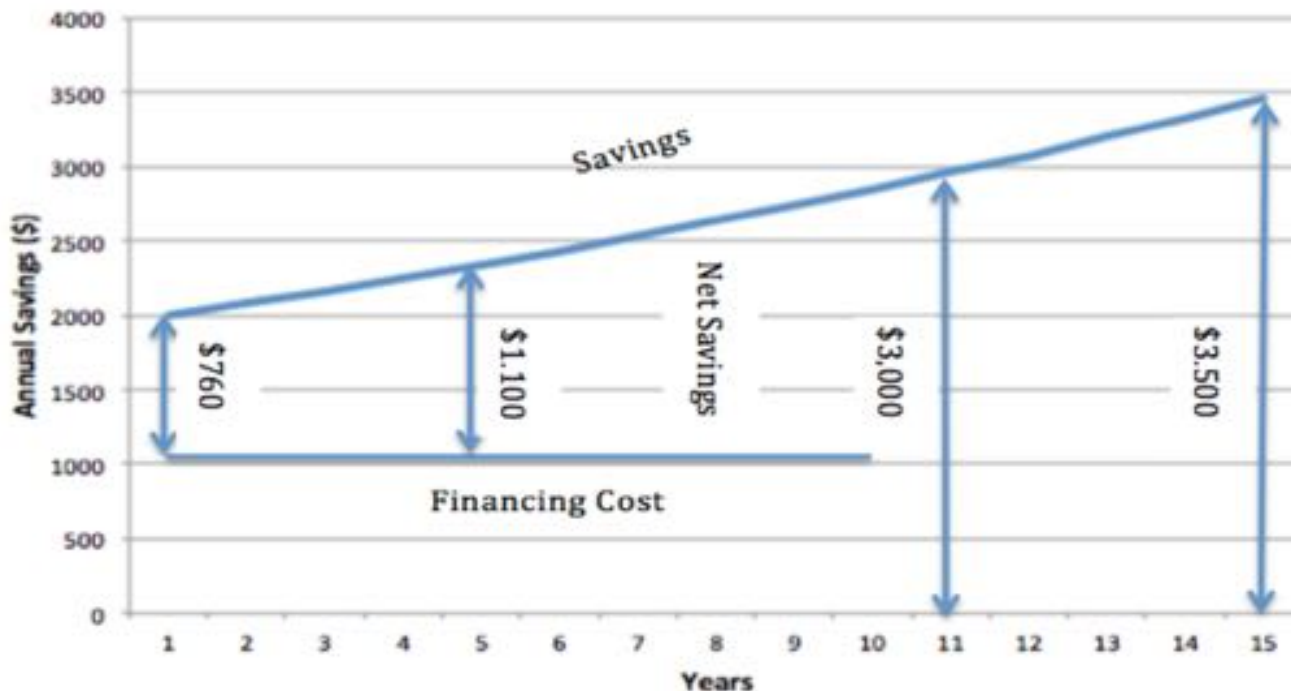
*Is it a good use of funds?*

- Impact on **rents**
- ROI
- IRR
- NPV
- NOI v. Financing Cost



# Financing

Assumptions: 10k investment; 20% ROI; 4.5% interest, fixed 10-yr; 4% escalation







# Managing Risk

- Lower risk than other investments w/ comparable returns
- Protect against failure of building components
- Utility rates?



# Managing Risk

- The right measures
- Good design
- The right products
- The right contractors
- Avoid complexity
- Roles/responsibilities



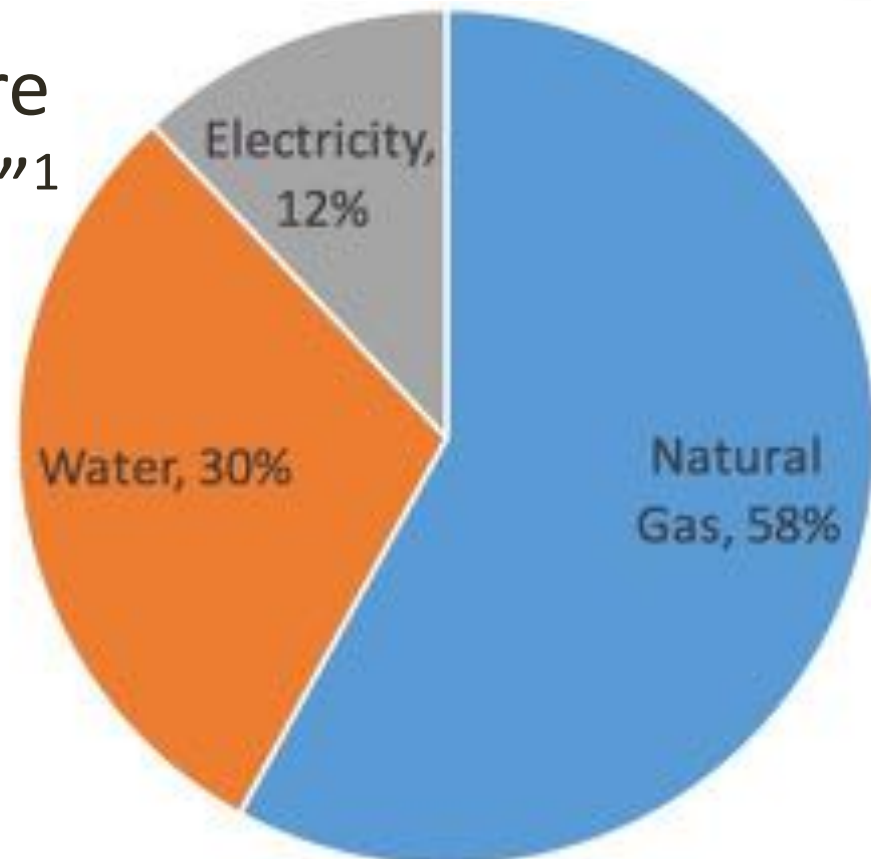
# Utility Costs





# Utility Costs

- 3/4 of utility cost are paid by the “owner”<sup>1</sup>
- Gas and water are most significant



1 Buildings with central heating





# Overview of Efficiency Opportunities

## *Labelling and Benchmarking*



**ENERGUIDE** Ask your dealer for the FUEL CONSUMPTION GUIDE or call 1-800-387-2000.

Regular gasoline  
Essence ordinaire

<b>CITY / VILLE</b> <b>7.9 / 36</b> L/100 km    ml/gal	<b>Highway / ROUTE</b> <b>5.9 / 48</b> L/100 km    ml/gal
--	---

These estimates are based on the Government of Canada's approved criteria and testing methods. The actual fuel consumption of this vehicle may vary. Refer to the Fuel Consumption Guide.

Consommes estimées selon les critères et méthodes approuvés par le Gouvernement du Canada. Les consommations réelles de carburant de ce véhicule peuvent varier. Consultez le Guide de consommation de carburant.

**Canadi**

**Demandez le GUIDE DE CONSOMMATION DE CARBURANT à votre concessionnaire ou composez le 1-800-387-2000.**



**Canadi**

**ENERGUIDE**

Energy consumption / Consommation énergétique

**416 kWh**  
per year / par année

300 kWh      300 kWh

Uses least energy / Consomme le moins d'énergie

**Type 3**  
16.1 - 18.4

Uses most energy / Consomme le plus d'énergie

Similar models compared relative to 6.75 volume in gal / Modèles similaires comparés

Model number: AC 00000

Revised 01/05/04. For more information, visit www.enrguide.ca or 1-800-387-2000. © 2004 EnerGuide Inc.



**Nutrition Facts**

Per 1 burger (130 g)

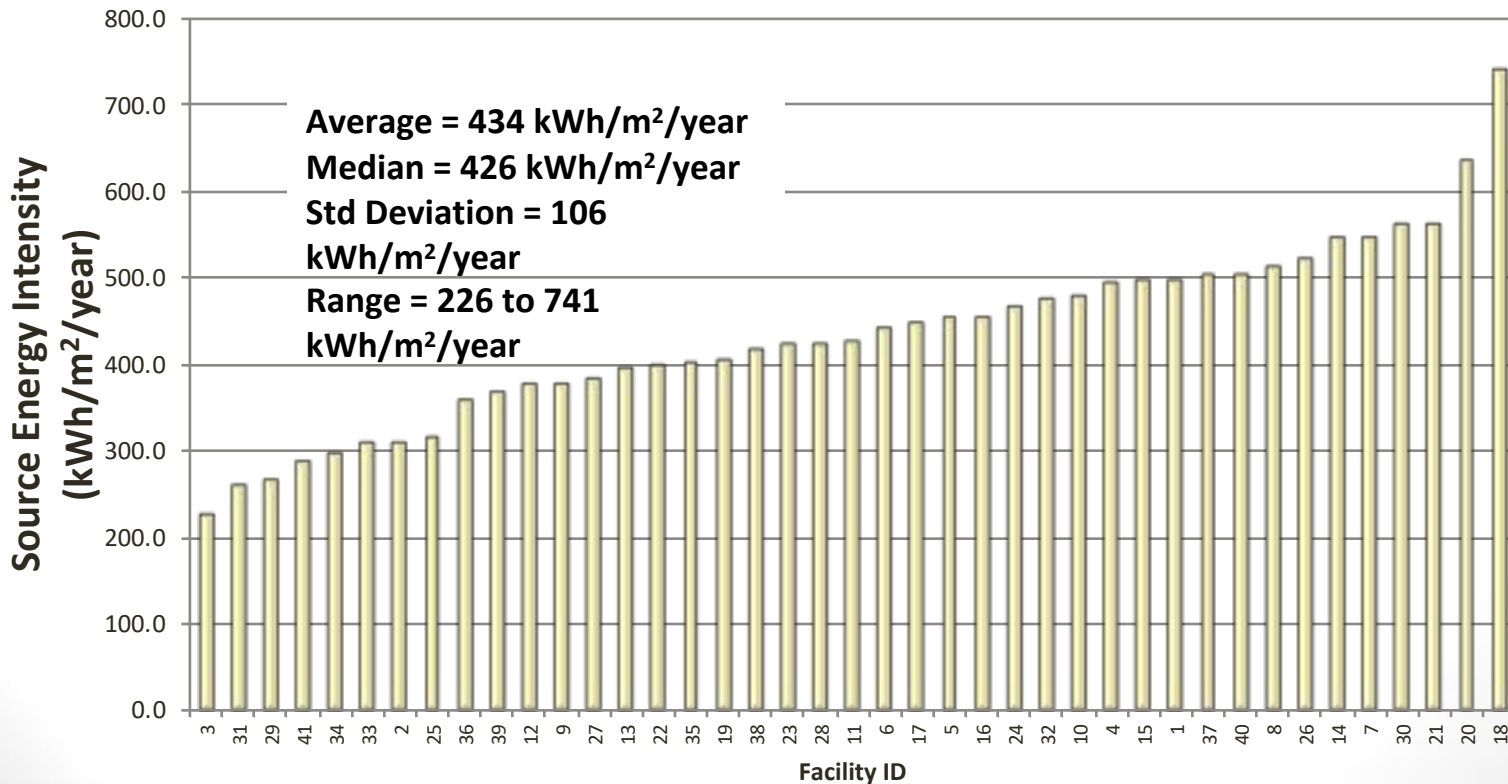
Amount	% Daily Value
<b>Calories 200</b>	
<b>Fat 9 g</b>	<b>14 %</b>
Saturated Fat 2 g + Trans Fat 1 g	15 %
<b>Cholesterol 70 mg</b>	
<b>Sodium 800 mg</b>	<b>33 %</b>
<b>Carbohydrate 4 g</b>	<b>1 %</b>
Fibre 0 g	0 %
Sugars 0 g	
<b>Protein 25 g</b>	
Vitamin A 0 %	Vitamin C 0 %
Calcium 4 %	Iron 2 %





# Overview of Efficiency Opportunities

## *Labelling and Benchmarking*





# Group Discussion

- Issues/projects you are facing?
- Who manages utility spending? Goals?
- What types of upgrades?
- Successes?
- Challenges?
- What would you like to see?



# Programs/Opportunities

- Why do utilities run energy efficiency programs?
- Why would a business want to incentivize you to buy *less* of what they sell?





# Programs/Opportunities

## *Social Housing Retrofit Support Program*



**Co-Ops Are Eligible**



# Programs/Opportunities

## *Social Housing Retrofit Support Program*

- Energy Study Funding (optional) – up to \$5,000
- Implementation Support Funding (optional) – up to \$7,000



# Programs/Opportunities

## *Social Housing Retrofit Support Program*

- Rebates - Natural Gas
  - Boilers
  - Commercial kitchen
  - Water heaters
  - Mechanical systems/controls
  - Windows/insulation



# Programs/Opportunities

## *Social Housing Retrofit Support Program*

- Rebates - Electric
  - Commercial kitchen
  - Commercial refrigeration
  - Heat pumps/electric water heaters
  - LED lighting/controls
  - Variable speed drives





# Programs/Opportunities

## *Energy Conservation Assistance Program*



How can we help?

Sign Up

Log In

[Accounts](#) [Energy savings](#) [News](#) [Projects & operations](#) [Community](#) [Work with us](#) [Outages & safety](#)

[Residential](#) [Business](#) [Local government](#) [Electric vehicles in B.C.](#)

[Home](#) [Energy savings](#) [Residential](#) [Savings & rebates](#) [Savings based on income](#) [Free product install and advice](#)

### Free product install and advice



Improve your home's comfort and efficiency

#### SAVINGS BASED ON INCOME

[Free energy saving kit](#)

[Free product install and advice](#)

[Non-profit and Aboriginal housing upgrades](#)

#### See also

- [Everyday electricity-saving tips](#)
- [Do-it-yourself projects to help improve your](#)



# Programs/Opportunities

## *Energy Conservation Assistance Program*



Accounts **Energy savings** News Projects & operations

Residential • Business • Local government Electric vehicles in I

Home • Energy savings • Residential • Savings & rebates • Savings based on income • Free

### Free product install and advice



- All units: *Free* shower heads, aerators, light bulbs, weather strip
- Townhome: *may* qualify for: fridge, furnace, insulation



# Programs/Opportunities

## *Energy Conservation Assistance Program*



Accounts **Energy savings** News Projects & operations

Residential • Business • Local government Electric vehicles in

Home • Energy savings • Residential • Savings & rebates • Savings based on income • Free

### Free product install and advice



- Tips for residents
- In-suite only; excludes major equipment (boilers, ventilation, water heaters)



# Free energy-saving upgrades for co-ops

Help your co-op save money and increase the comfort of your homes.

## The Energy Conservation Assistance Program (ECAP)

provides members of qualified non-profit housing co-operatives with **FREE** home energy assessments and installations of energy-saving products, which may include:



I was extremely impressed with BC Hydro and FortisBC's ECAP. From the very first contact with the program, I felt that they cared and wanted to help our housing co-op.

Lisa  
Friendship Co-op

Townhome co-ops may even qualify for:



Related programs may help apartment co-ops benefit from high-efficiency boilers.





# Programs/Opportunities

## *FortisBC RAP Program*



[fortisbc.com/apartment](http://fortisbc.com/apartment)  
[fortisbc.com/apartmentsavings](http://fortisbc.com/apartmentsavings)

1-877-327-6137  
[apartmentrebates@fortisbc.com](mailto:apartmentrebates@fortisbc.com)

*Energy at work*



**FORTIS BC**

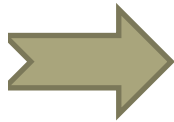


# Programs/Opportunities

## *FortisBC RAP Program*

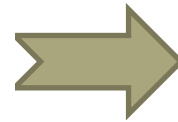


Application  
Package

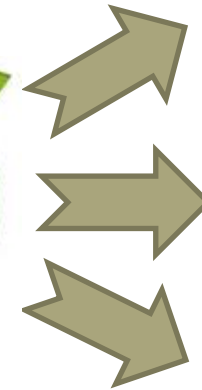


Building Owner/  
Property  
Management  
Company

Approval



Notice,  
Tenant  
Brochure,  
Common  
Area Posters





# Programs/Opportunities

## *FortisBC RAP Program*

### Eligibility Requirements

- ✓ Purpose-built rental containing a minimum of nine units
- ✓ Receive natural gas from FortisBC
- ✓ Have central natural gas water heating
- ✓ Not have water-efficient showerheads / aerators previously installed
- ✓ Not be slated for demolition



# Energy Assessments

## Summary

The upgrades identified for this building are expected to result in the following incentives, costs, savings and return on investment (ROI):

Total Incentives	Net Cost after incentive	Annual cost savings	ROI*
\$12,300	\$60,400	\$16,300	24%

The upgrades include the following items:

Upgrade	Incentive	Net Cost after incentive	Annual cost savings	ROI*
Efficient Water Fixtures	\$2,900	No Cost	\$3,300	-
Lighting Upgrades - Apartments**	\$4,759	No Cost	\$329	-
Lighting Upgrades - Common	\$1,731	\$5,221	\$4,108	84%
DHW heater upgrade	\$2,900	\$25,000	\$4,500	20%
Roof Insulation	-	\$29,200	\$3,800	16%
Weather stripping for doors	-	\$700	\$200	25%
Pipe Insulation	-	\$230	\$50	19%

The costs, savings and associated ROIs shown above are **estimates**. The RAP Program can provide free professional support through the implementation process for those upgrades that you choose to proceed with.

**Contact us right away to discuss your options and learn how to reduce your operating costs and maximize your return on investment. Call John Foster at 604 652-1774**





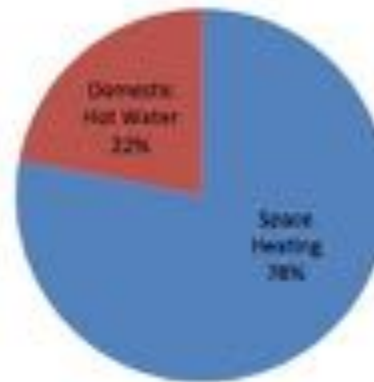
# Energy Assessments

## Appendix E: Review of Energy Consumption

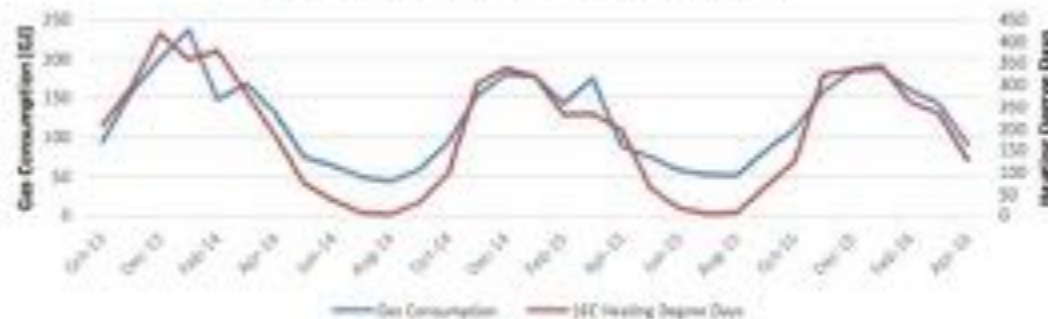
### Natural Gas Usage Breakdown

	Total	Space Heating	Domestic Hot Water
Annual Gjs	1,325	1,034	291
Annual Cost	\$8,669	\$6,766	\$1,904
Percent	100%	79%	22%

The values above are estimated.



### Monthly Gas Consumption and Weather





# Energy Assessments

## Appendix F: Photos



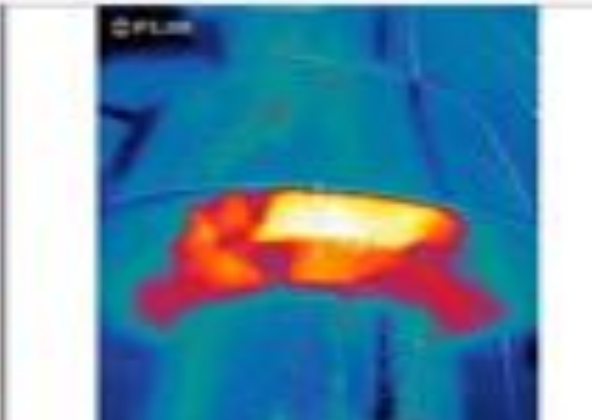
Steam heating system



Thermosyphon hot water system



CHP system thermal image, heat loss from boiler which is off



CHP boiler shut down, heat loss up the from boiler which is off



# Implementation Support

- Develop specifications
- Tendering process
- Review quotes
- Develop business case and discuss with owner/manager





# Implementation Support

- Fill out required application forms
- Oversee the implementation of measures
- Review installations





# Project Results



~\$1million saved



110,000 GJ saved



116 million liters/year water



6200 tCO<sub>2</sub> reduced

Small changes  
can add up to  
big savings





# Programs/Opportunities

## *BC Housing – Energy Efficiency Retrofit Program*



**Housing Assistance**

**Partner Services**

**Licensing & Consumer**

[Home](#) / [Partner Services](#) / [Asset Management & Redevelopment](#) / [Energy Efficiency Retrofit Program](#)

## Energy Efficiency Retrofit Program

The Energy Efficiency Retrofit Program provides funds for non-profit housing providers to make electric and gas energy upgrades.



# Programs/Opportunities

## *FortisBC Efficient Boiler Program*

**NATURAL GAS** >

**ELECTRICITY** >

Ask your question here.



[Account Login](#) >

### Rebates & savings

Rebates & offers

Natural gas boilers

Eligible Commercial Boiler List

Saving energy



**Natural gas boiler rebates**





# Programs/Opportunities

## *FortisBC Efficient Water Heater Program*

**NATURAL GAS** >

**ELECTRICITY** >

Ask your question here.



[Account Login](#) >

### Rebates & savings

#### Rebates & offers

#### Natural gas water heaters

Eligible Commercial Water Heater List

#### Saving energy







# Programs/Opportunities

## *FortisBC Efficient Custom Retrofit Program*



When saving energy requires a customized approach, our Commercial Custom Design Program for existing buildings can help. The program provides funding for natural gas energy-efficiency projects tailored to your specific building or facility.

### Eligibility requirements\*

1. You must be a FortisBC commercial rate class natural gas customer.
2. You must be a customer with medium to large commercial, institutional, multi-unit residential or light industrial buildings or facilities.
3. Your project must have the potential to save a minimum 1,200 gigajoules of natural gas annually.





# Programs/Opportunities

*FortisBC Custom energy-efficiency projects for new buildings*





# Programs/Opportunities

## *NEW PROGRAMS*

- ???
- Stay tuned...



# Programs/Opportunities

*Has your coop participated in any programs?*

- Which programs have you participated in?
- What worked?
- What challenges did you have?
- What needs do coops have that aren't being met?
- What would you like to see in future programs?





# Presentation Summary

- Challenges/Opportunities
- Building systems and efficiency 101
- Business case for upgrades
- Group discussion on key issues
- Current programs/opportunities



# Questions?

# Thank You!

Jordan Fisher [www.frescoltd.com](http://www.frescoltd.com)

Vancouver: 778-783-031

Victoria: 250-590-9440

Email: [jfisher@frescoltd.com](mailto:jfisher@frescoltd.com)