GREEN HOME RENOS 101

BURLINGTON SUSTAINABLE DEVELOPMENT COMMITTEE

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GREEN RENOS

- why go green?
- what is green housing?
- Jim’s home
- best bang
- 2 examples
- where to get help

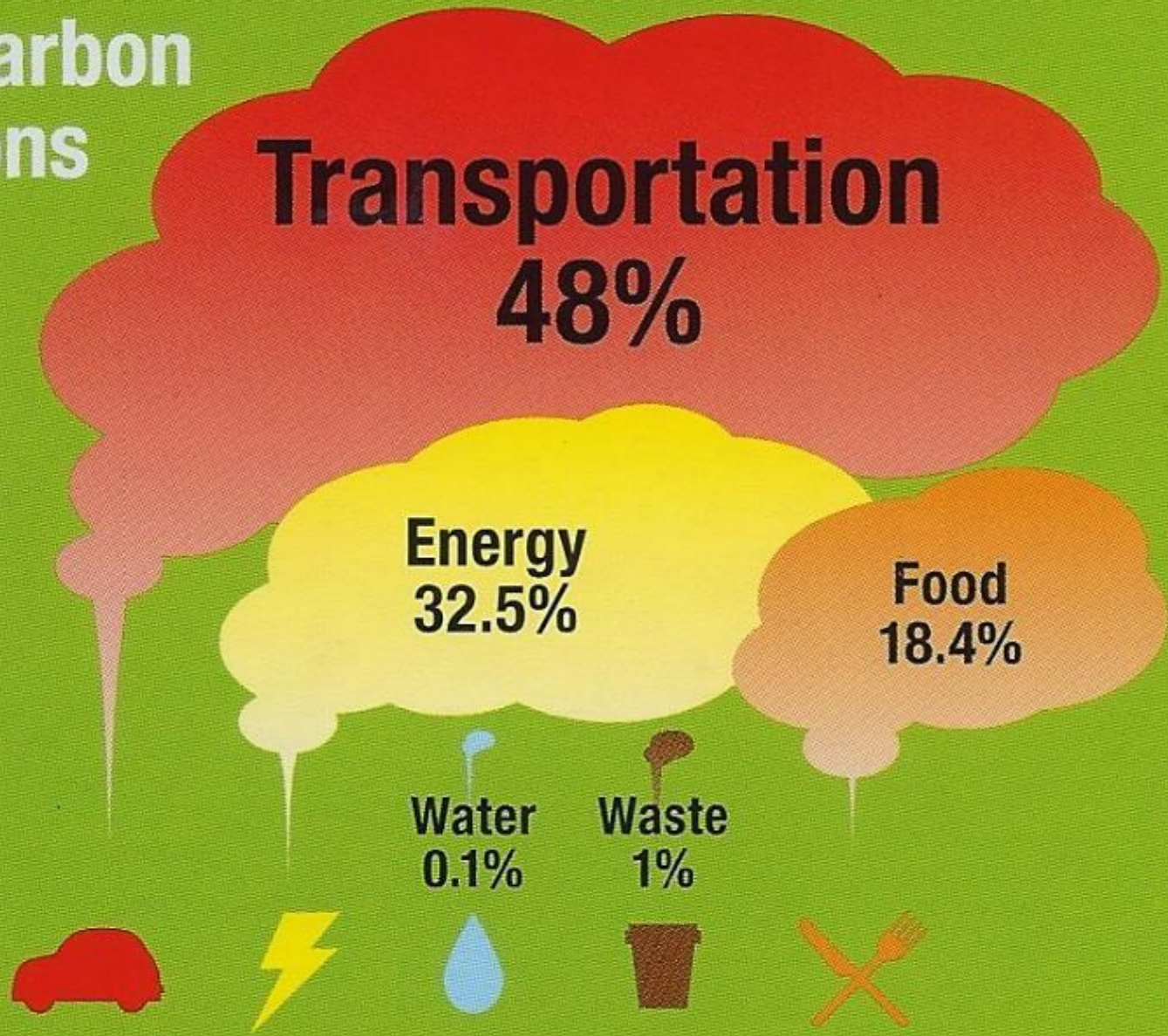
WHY GO GREEN?

- **Climate change impacts caused by fossil fuel extraction and combustion**
- **Canada is 2% of world population but 6th largest carbon producer**

Average total carbon dioxide emissions per household:

20.64 tonnes

These results are based on a survey of 400 single family detached households in Toronto in 2012.

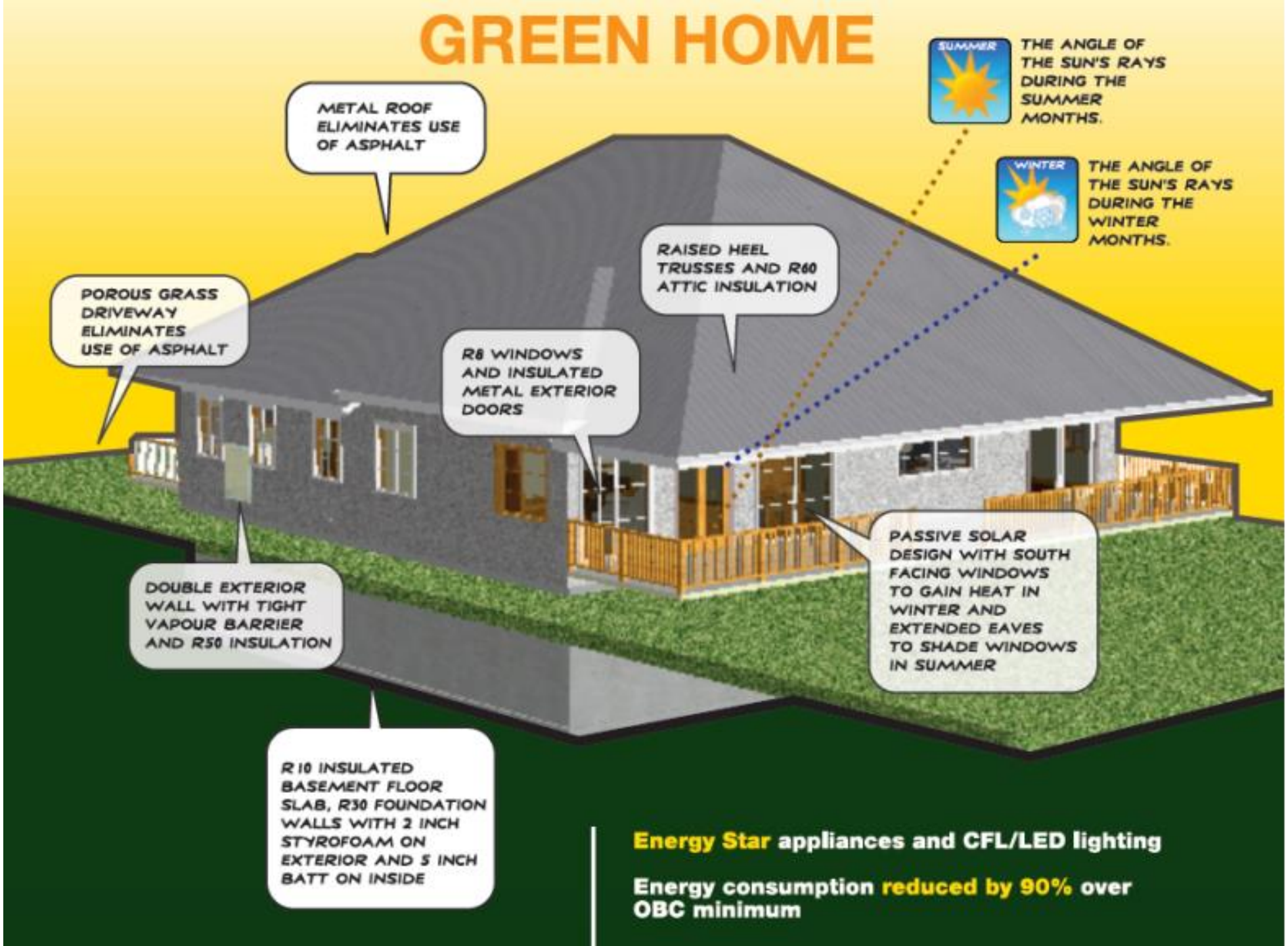


WHAT IS GREEN HOUSING?

- **Comfortable draft free environment with even temperature, proper humidity and fresh air**
- **Healthy environment with low toxins from building materials and household chemicals**
- **Reduced carbon emissions from building envelope, heating systems, appliances, tools and renewable generation**
- **Low water consumption and proper storm water control**

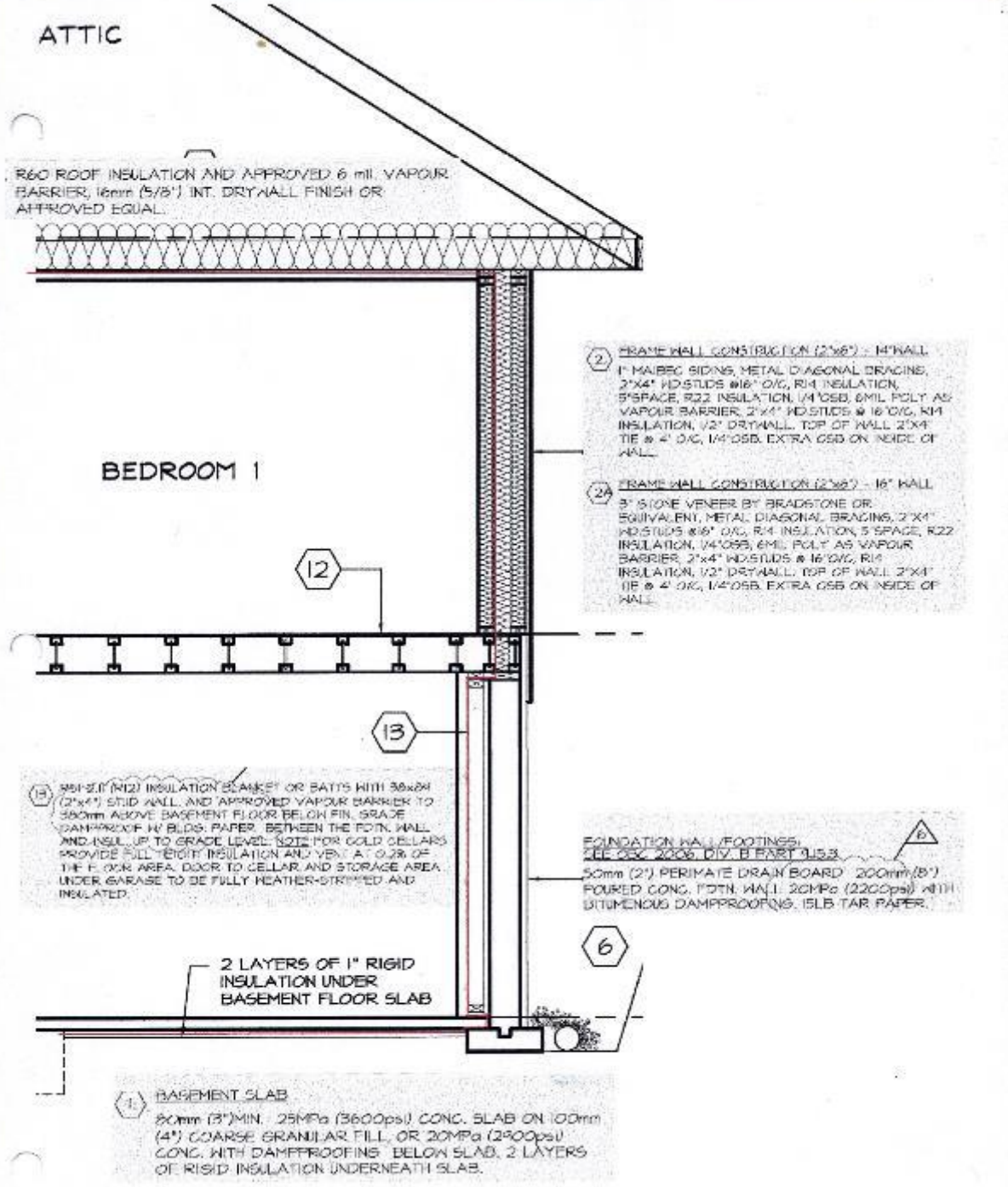
Less energy use means $$ savings

GREEN HOME



Energy Star appliances and CFL/LED lighting

Energy consumption **reduced by 90%** over OBC minimum


ATTIC
R60 ROOF INSULATION AND APPROVED 6 mil. VAPOUR BARRIER, 16mm (5/8") INT. DRYWALL FINISH OR APPROVED EQUAL.
BEDROOM 1
12
13
2 LAYERS OF 1" RIGID INSULATION UNDER BASEMENT FLOOR SLAB
6
2 FRAME WALL CONSTRUCTION (2"x6") - 14" WALL
1" MAIBEC SIDING, METAL DIAGONAL BRACING, 2"X4" WD.STUDS @16" O/C, R14 INSULATION, 5"SPACE, R22 INSULATION, 1/4"OSB, 6MIL POLY AS VAPOUR BARRIER, 2"x4" WD.STUDS @ 16"O/C, R14 INSULATION, 1/2" DRYWALL. TOP OF WALL 2"X4" TIE @ 4' O/C, 1/4"OSB. EXTRA OSB ON INSIDE OF WALL.
2A FRAME WALL CONSTRUCTION (2"x6") - 16" WALL
3" STONE VENEER BY BRADSTONE OR EQUIVALENT, METAL DIAGONAL BRACING, 2"X4" WD.STUDS @16" O/C, R14 INSULATION, 5"SPACE, R22 INSULATION, 1/4"OSB, 6MIL POLY AS VAPOUR BARRIER, 2"x4" WD.STUDS @ 16"O/C, R14 INSULATION, 1/2" DRYWALL. TOP OF WALL 2"X4" TIE @ 4' O/C, 1/4"OSB. EXTRA OSB ON INSIDE OF WALL.
13 R20 2.11 (RI2) INSULATION BLANKET OR BATTS WITH 38x89 (2"x4") STUD WALL AND APPROVED VAPOUR BARRIER TO 350mm ABOVE BASEMENT FLOOR BELOW FIN. GRADE DAMPPROOF W/ BLDG. PAPER. BETWEEN THE FDTN. WALL AND INSUL. UP TO GRADE LEVEL. NOTE: FOR COLD CELLARS PROVIDE FULL HEIGHT INSULATION AND VENT AT 0.2% OF THE FLOOR AREA. DOOR TO CELLAR AND STORAGE AREA UNDER GARAGE TO BE FULLY WEATHER-STRIPPED AND INSULATED.
6 FOUNDATION WALL (FOOTINGS) SEE OBC 2006 DIV. B PART 9.15.3.
50mm (2") PERIMATE DRAIN BOARD 200mm(8") POURED CONC. FDTN. WALL 20MPa (2200psi) with BITUMENOUS DAMPPROOFING. 15LB TAR PAPER.
1 BASEMENT SLAB
80mm (3")MIN. 25MPa (3600psi) CONC. SLAB ON 100mm (4") COARSE GRANULAR FILL, OR 20MPa (2900psi) CONC. WITH DAMPPROOFING BELOW SLAB, 2 LAYERS OF RISID INSULATION UNDERNEATH SLAB.


ENERGYGUIDE

Capital Costs	My Green Home	Standard Home
Insulation	$15,000	$0
Windows, doors	$5,000	$0
High Eff. Gas furnace, 25 kW	$0	$10,000
ZUBA heat pump, 9 kW	$15,000	0
Electric air conditioner	Incl. w. heat pump	$2,000
Ductwork	$0	$1,000
Heat Recovery Ventilator	$3,000	$1,000
H.E. Gas water heater	$0	$1,000
Instant water heater	$3,000	$0
Drain heat recovery	$500	$0
CFL Light bulbs	$200	$0
Gas fireplace	$0	$0
Grey water unit	$2,000	$0
Energy Star appliances	$1,000	$0
Total	**$44,700**	**$15,000**
	Difference	**$29,700**

Annual Operating Costs	My Green Home	Standard Home
Space Heating 2012/2013	$316	$2,700
Water heating 2012	$330	$457
Cooling 2013	$132	$250
Water/sewer 2012	$632	$800
Lighting	$55	$220
Appliances	$400	$660
Addl. $30k Financing at 2%, 30 yrs.	$1272	$0
Total	**$3,137**	**$5,087**
	Difference	**-$1,950**

Mortgage of $30,000 at 2%, 30 yrs. = $106 per month,

Energy savings = $269 per month.

Positive cash flow = $163 per month

CO_2 Emissions per Year	**My Green Home**	**Standard Home**
Electricity	1.2 tonnes from appliances, lighting heating, cooling	1 tonne from appliances, lighting, cooling
Natural gas	1.6 tonnes from hot water, cooking and fireplace	8 tonnes from heating and hot water
Total	**2.8 TONNES**	**9 TONNES**

Feilders' Solar PV Tracker

2.4 kW Dual Axis Solar Tracker located in Selwyn, near Peterborough

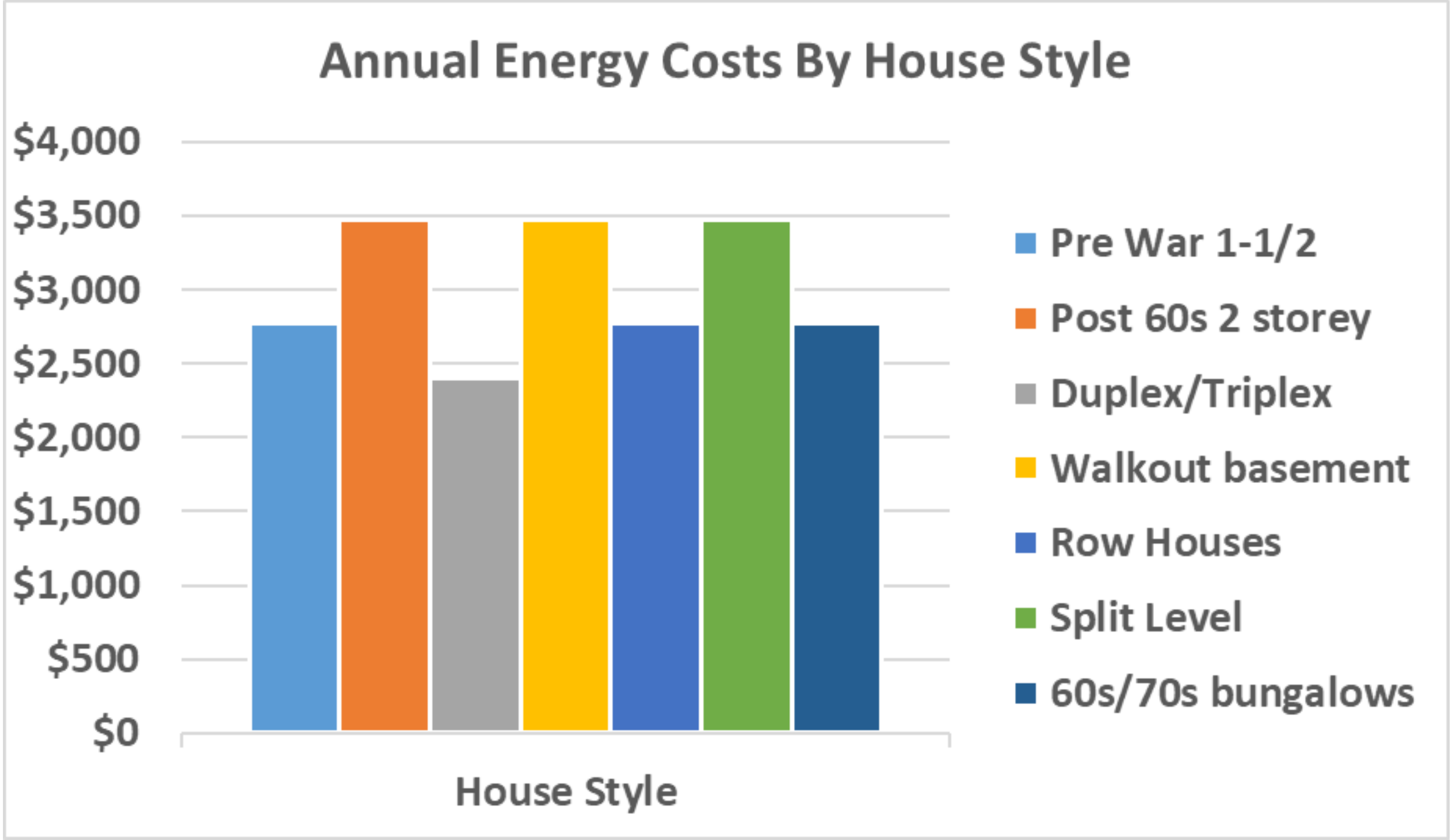
$3500 per year at $0.802/kWh from Ontario microFIT program

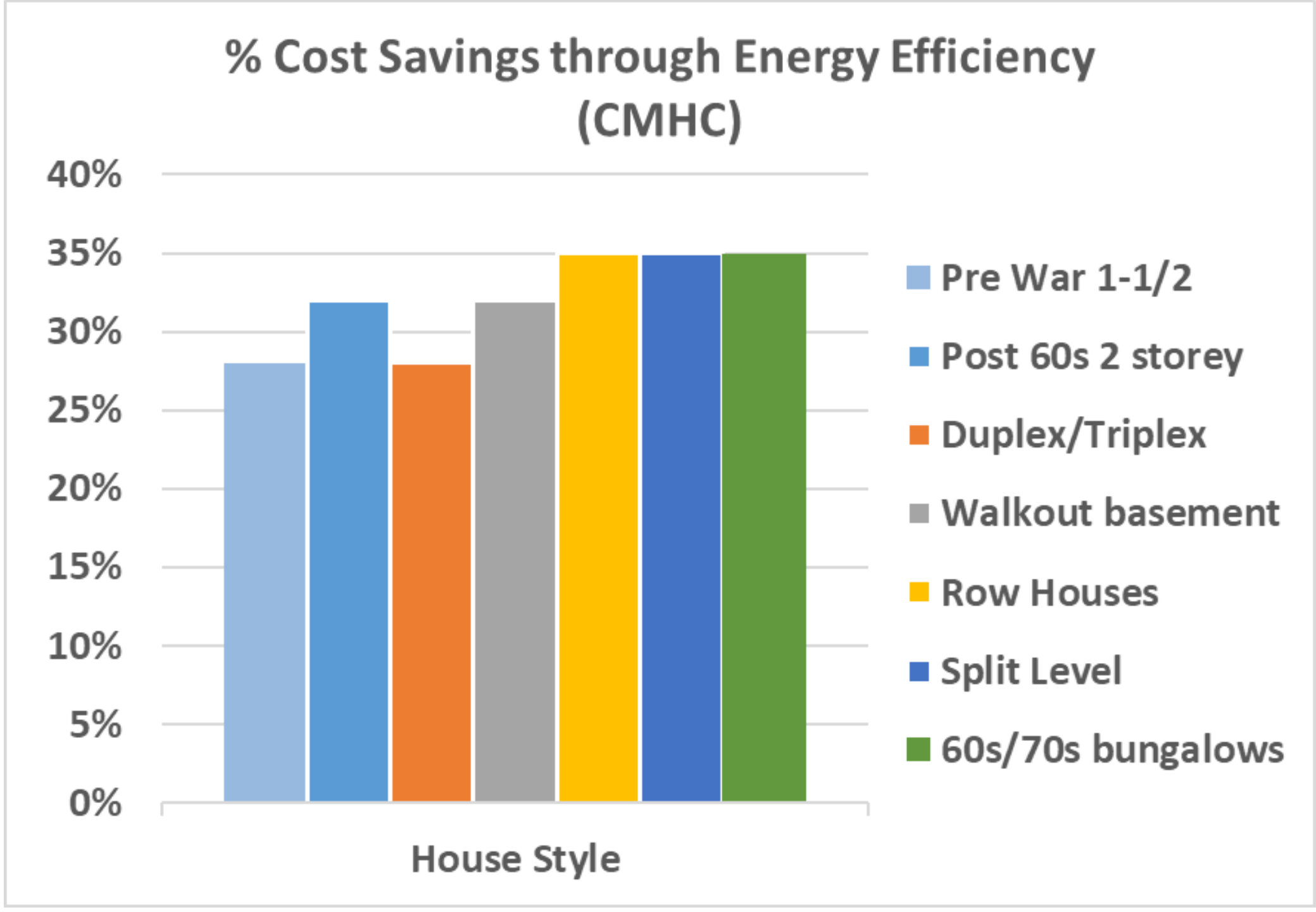
Cost $35,000 results in payback of 10 years.

Carbon Offset = 0.38 tonnes

THE BEST BANG FOR YOUR BUCK AND THE PLANET

1. Insulate attic and basement or crawl space
2. Replace your gas furnace and electric A/C with a heat pump


Annual Energy Costs By House Style
$4,000
$3,500
$3,000
$2,500
$2,000
$1,500
$1,000
$500
$0
House Style
Pre War 1-1/2
Post 60s 2 storey
Duplex/Triplex
Walkout basement
Row Houses
Split Level
60s/70s bungalows


% Cost Savings through Energy Efficiency (CMHC)
40%
35%
30%
25%
20%
15%
10%
5%
0%
House Style
Pre War 1-1/2
Post 60s 2 storey
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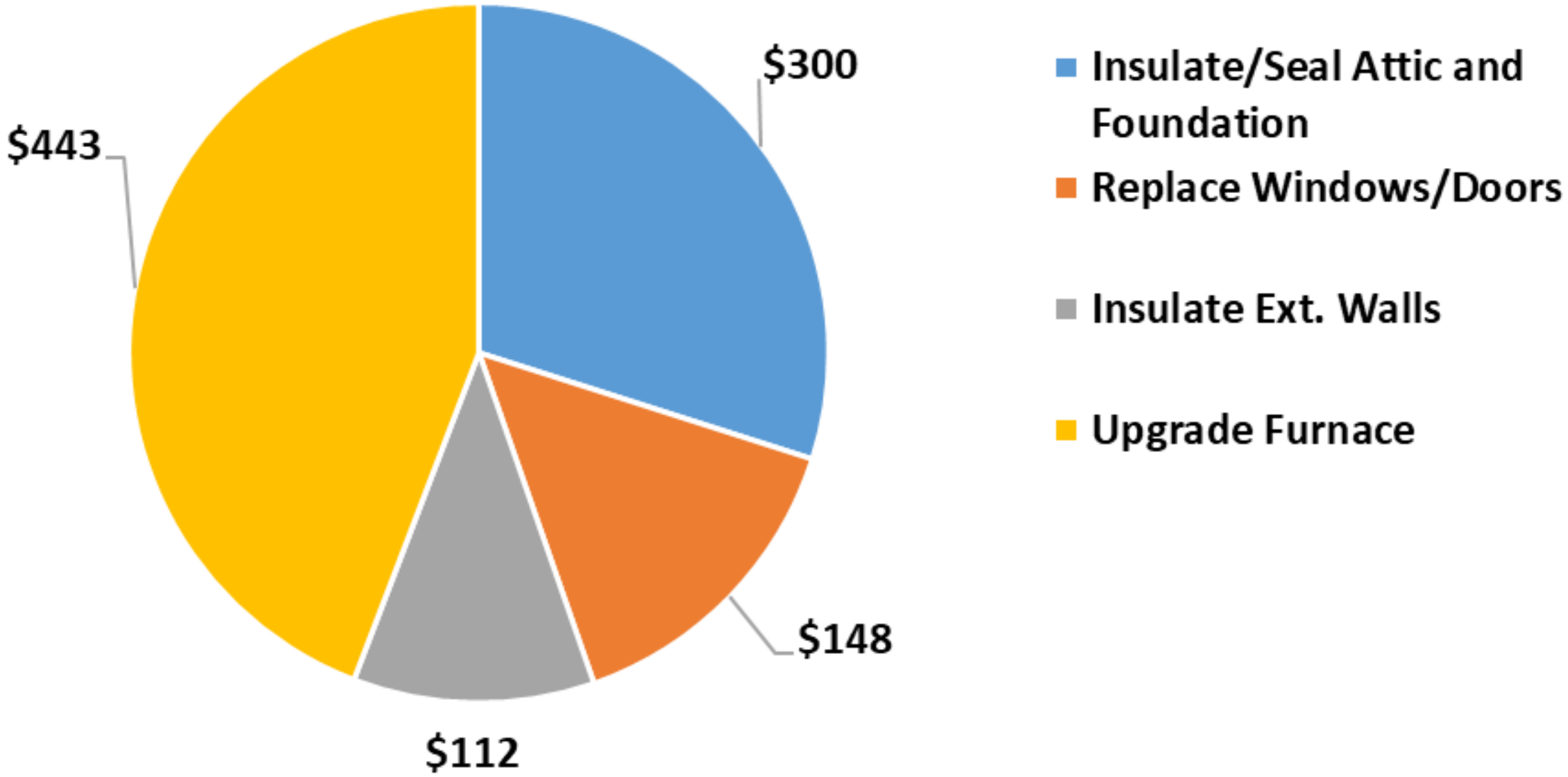
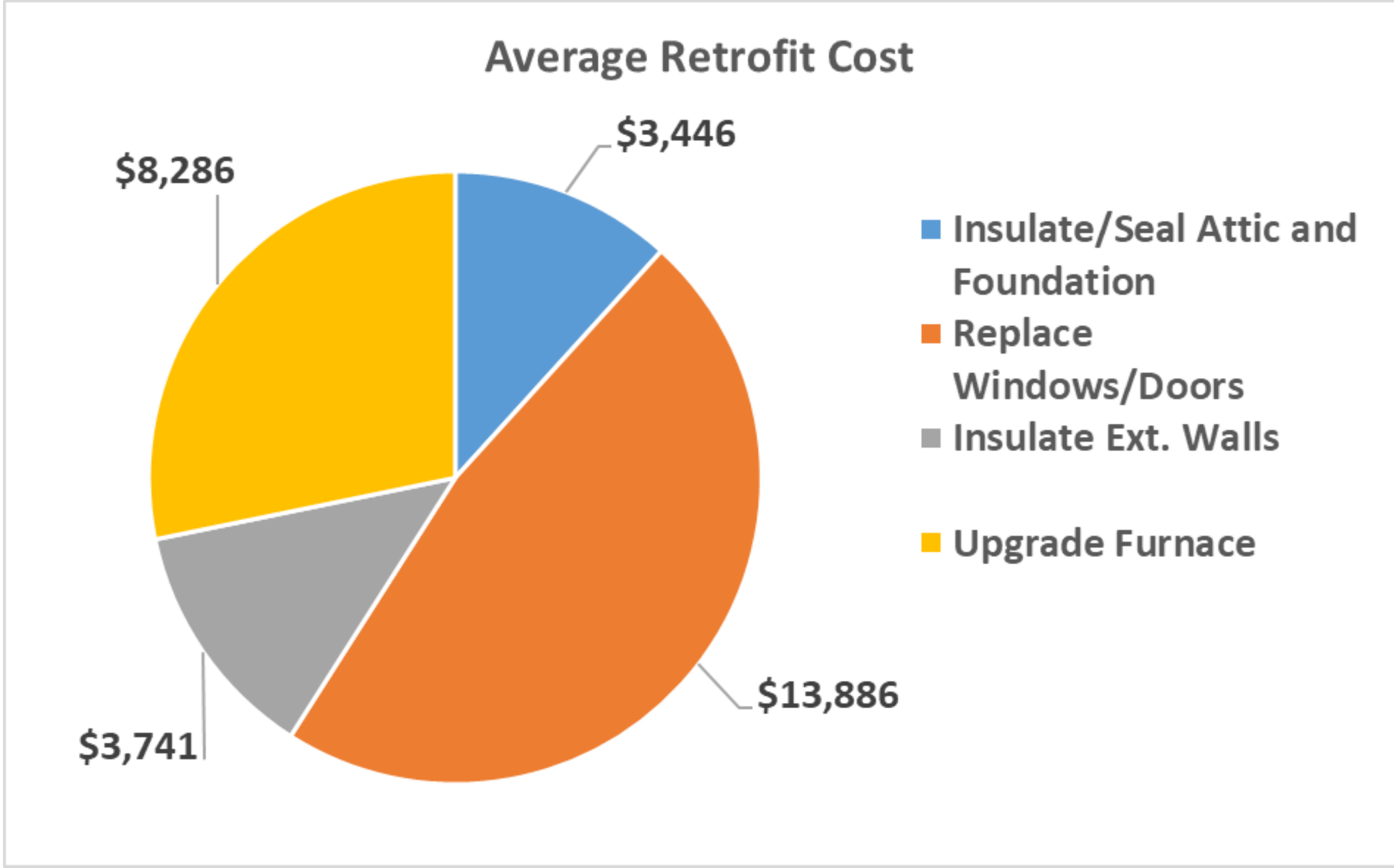
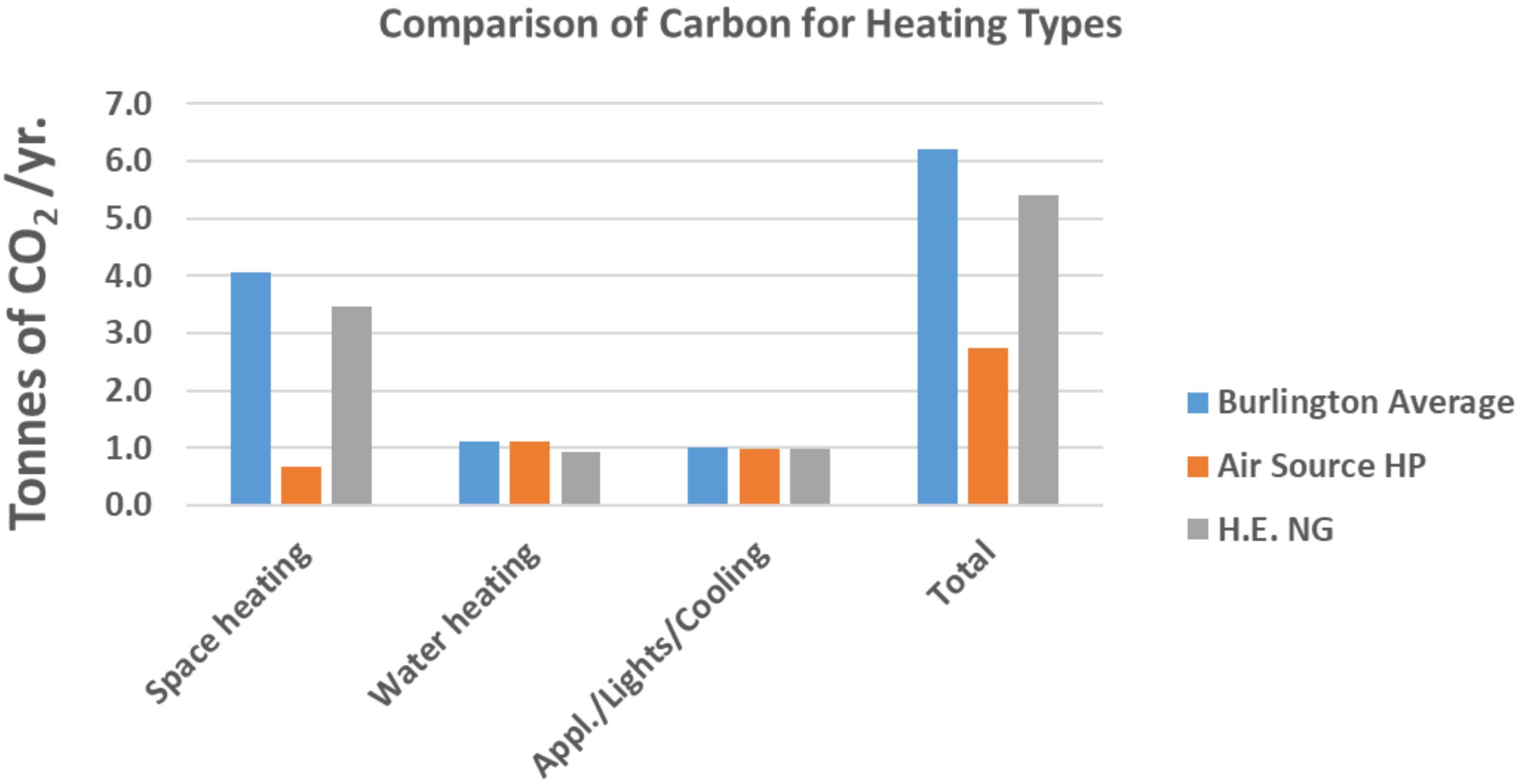
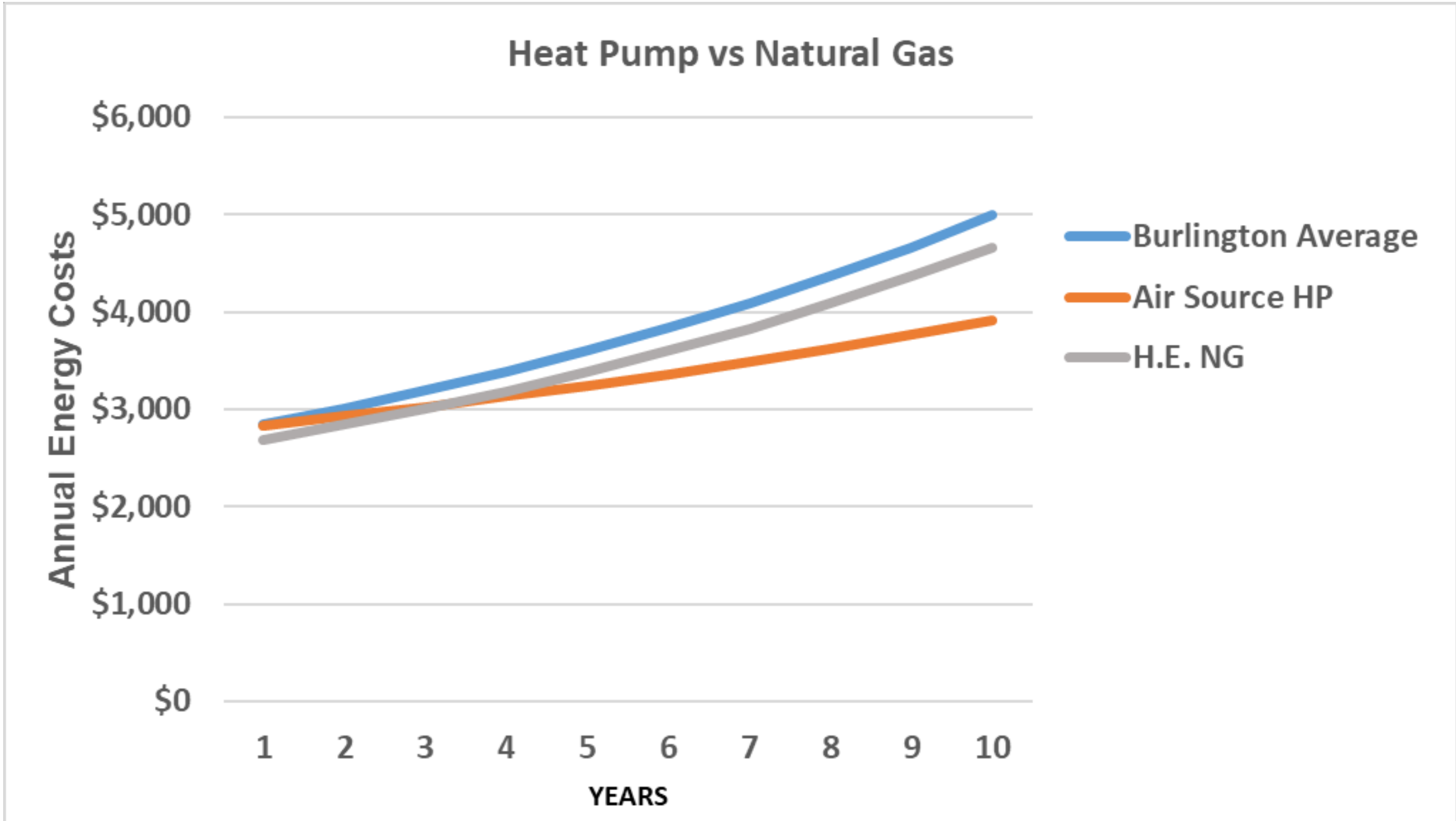
Average Annual Energy Retrofit Cost Savings




Average Retrofit Cost
$3,446
$8,286
$13,886
$3,741
Insulate/Seal Attic and Foundation
Replace Windows/Doors
Insulate Ext. Walls
Upgrade Furnace


Comparison of Carbon for Heating Types
Tonnes of CO_2 /yr.
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Space heating
Water heating
Appl./Lights/Cooling
Total
Burlington Average
Air Source HP
H.E. NG


Heat Pump vs Natural Gas
$6,000
$5,000
$4,000
$3,000
$2,000
$1,000
$0
Annual Energy Costs
1
2
3
4
5
6
7
8
9
10
YEARS
Burlington Average
Air Source HP
H.E. NG

Example 1
Insulate/Seal Attic and Foundation

Cost: $2000 to $4000
Rebates: up to $1500
Annual Savings: up to $300
Mortgage or LOC Annual Payments: $80 for $1500
Net Annual Savings: $220
Carbon savings: 10% (0.7 tonnes)

Example 2

Air Source Heat Pump Retrofit: When your A/C dies but your furnace is good. Furnace provides backup and lasts longer.

Cost: $9000

Rebates: $500 (gas) to $5000 (baseboard heating)

Annual Savings: $500 (old natural gas) to $1500 (electric)

Mortgage or LOC Annual Payments: $457 (gas) to $215 (electric)

Net Annual Savings: $33 (gas) to $1,285 (electric)

Carbon Savings: 84% (gas) to 61% (electric)

MIDEA HEAT PUMP

A low cost solution to provide low carbon heating and cooling with reduced operating costs using an existing gas furnace

Control and Thermostat

Replacement Coil

Outdoor Unit

Mr. Slim MSZ-FD09/12NA

Highly Efficient, Extremely Quiet

MITSUBISHI ELECTRIC
HVAC Advanced Products Division

Mr.SLIM.

INVERTER

R410A

Up to 25 SEER!

General Features:

- Highly energy-efficient system with quiet operation
- Updated sleek, compact indoor unit design
- Integrated i-see™ sensor automatically detects room air temperature differences and adjusts for better comfort
- Includes Standard, Platinum Deodorizing, and Anti-allergy Enzyme Filters for a complete triple air purifying system
- "Powerful Mode" function permits system to temporarily run at a lower/higher temperature with an increased fan speed, which quickly brings the room to the optimum comfort level
- Auto changeover for cooling and heating
- Wireless remote controller

Where Can I Get Help?

- City of Burlington, Take Action
- Burlington Hydro
- Union Gas
- Green Ontario Fund
- BurlingtonGreen, “Make The Switch”
- Region of Halton

THANK YOU

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