



Savings Analysis for Eco-GFX or ThermoDrain application in a Multi-residential application

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Cost Benefit Analysis

Eco-GFX or ThermoDrain unit installation in multi-residential buildings

1. Objective

- 1.1 The objective of this analysis is to provide a cost-benefit comparison for two proposed Eco-GFX or ThermoDrain products.

2. Method

- 2.1 Operating parameters are entered into the calculator.
- 2.2 With the hypotheses mentioned in section 3 efficiencies and savings have been calculated with recognized thermal engineering methods.
- 2.3 Eco-GFX and ThermoDrain data used was obtained in EcoInnovation's research and development laboratories using our standard test protocol.

3. Hypotheses

- 3.1 The following values were used in the calculations:

- 3.1.1 There is a total of 1 apartments at an occupancy rate of 100%
- 3.1.2 Hot water heater configuration is 1 apartment per water heater
- 3.1.3 Each shower is used for a total of 10 minutes per day, 4 times a day.
- 3.1.4 Total annual shower time is 244.55 hours
- 3.1.5 Configuration is in Equal flow 100% of units maximum efficiency
- 3.1.6 Each shower has a flow rate of 9.5 lpm (2.5 gpm)
- 3.1.7 Average cold water temperature is -9.1 F°
- 3.1.9 Average drain temperature is 3.2 F°
- 3.1.10 Delta T is 12.3 F°
- 3.1.11 Total annual wasted energy is 2558 kWh
- 3.1.12 Energy used to heat water is Natural Gas at a cost of \$0.5 per m³
- 3.1.13 Efficiency of hot water heater is 78%

4. Scenario comparisons

4.1 Cost and savings scenario 1

- Average ratio of 1 shower(s) per ThermoDrain TD-340
- Number of ThermoDrain TD-340 units required is 1
- The ThermoDrain TD-340 is \$550 per unit, for a total cost of \$550
- Installation cost of \$50 per unit for a total installation cost of \$50
- The potential efficiency of the ThermoDrain TD-340 is 51% in this configuration
- The maximum hypothetical design flow rate for the ThermoDrain TD-340 is 2.5 gpm
- This unit will be hypothetically operating at a maximum flow rate of 2.5 gpm
- Total recovered energy is 125.5 m³ per year of operation
- **Total savings per year using a quantity of 1 ThermoDrain TD-340 units is \$62.75**
- **Total Payback period is 9.6 years**
- Total payback after 20 years with energy inflation at 2% per year is \$1524.66
- Rate of return with energy inflation at 2% per year is 10.3%



4.2 Cost and savings scenario 2

- Average ratio of 3 shower(s) per ECO-GFX 2360
- Number of ECO-GFX 2360 units required is 1
- The ECO-GFX 2360 is \$800 per unit, for a total cost of \$800
- Installation cost of \$100 per unit for a total installation cost of \$100
- The potential efficiency of the ECO-GFX 2360 is 57% in this configuration
- The maximum hypothetical design flow rate for the ECO-GFX 2360 is 7 gpm
- This unit will be hypothetically operating at a maximum flow rate of 2.5 gpm
- Total recovered energy is 1458.06 kWh per year of operation
- **Total savings per year using a quantity of 1 ECO-GFX 2360 units is \$70.14**
- **Total Payback period is 12.8 years**
- Total payback after 20 years with energy inflation at 2% per year is \$1704.22
- Rate of return after 20 years with energy inflation at 2% per year is 6.5%

5. Installation configuration

- 5.1 Based on the information provided, the following installation diagrams shall be used as a guide as to how the DWHR unit will be configured

5.1.1 Cold water configuration drawing

The DWHR units will be placed in Equal flow 100% configuration.
Refer to configuration equal flow drawing

5.1.2 Eco-GFX or ThermoDrain installation drawing

Scenario 1*

Use configuration Type 5 or 6

Scenario 2*

Use installation drawing Type 3

*NOTE: For cases where there is 1 water heater for 1 shower such as in a single family home, condo or triplex, use section 5.1.1 for both cold water and drain configuration installations.

*Disclaimer: All **energy savings** listed on this page are by their nature, theoretical. The calculations performed are an estimate of the potential savings under the given circumstances and should be considered as such. EcoInnovation or its associates cannot be held accountable for

