# Your Energy Audit

munihelps.org/rebates-incentives/holyoke-

## Home

TEST SITE
123 ABC St.
Holyoke, MA 01040
(123) 456-7890
guy@sesamest.org

## Audit Date

May 5, 2020
02:00 PM

## Audited By

**Jamie Overby**
jamie.overby@
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**Center for EcoTechnology**
320 Riverside Dr. 1-A
Northampton, MA 01062
8:30AM - 5:00PM Monday - Friday

**Phone Assistance:**
(888) 333-7525

HELPS
Home Energy Loss Prevention Services



Hello!

Thank you for showing me around your house the other day. I was able to identify some great energy savings opportunities to help save you money and increase the over all comfort in your home throughout the seasons. If you have any questions, don't hesitate to reach out to us at 1-888-333-7525.

Thanks!

## Inside Your Report

# Concerns

**We listened to you!**

As our client, we want to make sure we are addressing all of your concerns for your home. If we have missed any concerns in this report, please let us know right away.

## House feels drafty

Home feels drafty in the living room and the bedrooms. Homeowner believes the cause is the windows. After further inspection, there is no insulation in the walls and that is a bigger problem than the windows.

## Street is noisy

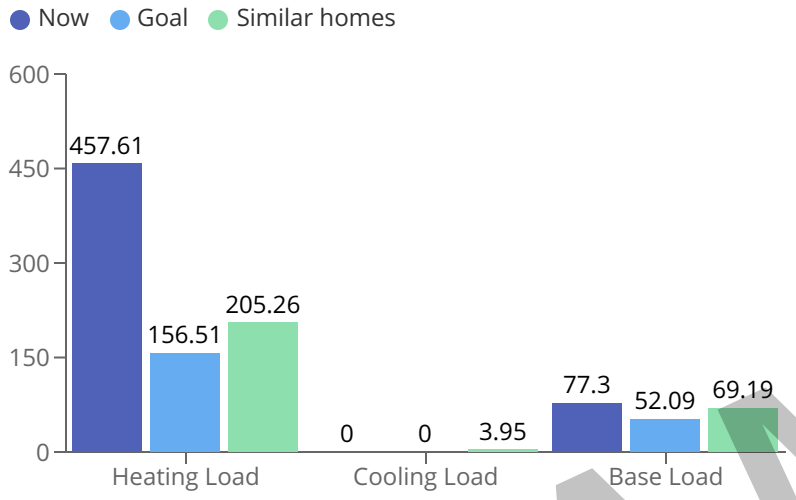
Homeowner can clearly hear the traffic noise from the busy highway outside. Some of the occupants use earplugs to sleep at night. Again, wall insulation will go a long way to alleviating this problem.

## Heating bills too high

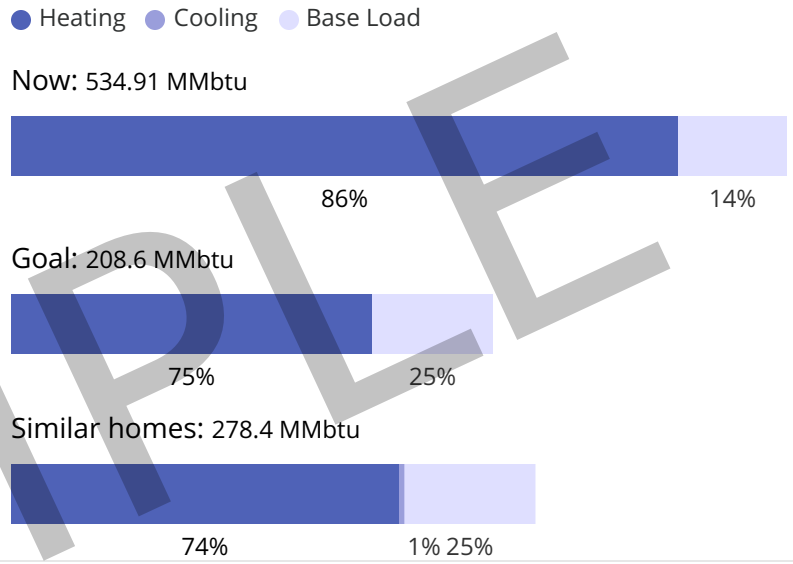
Homeowner feels that heating bills are much higher than their previous home and is concerned that they're much higher than they should be.

# Your Energy Use

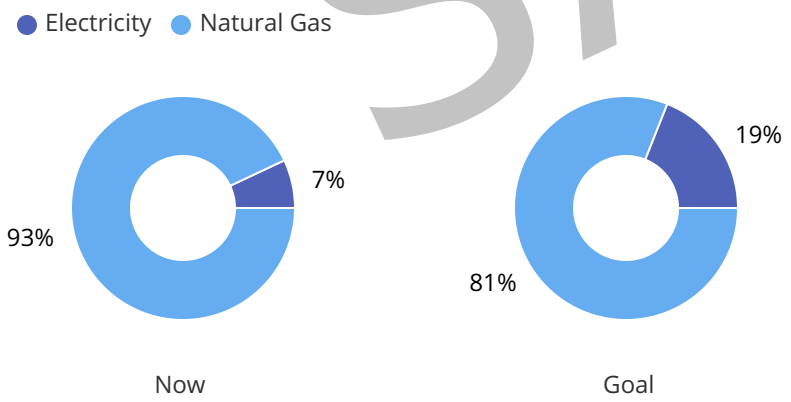
## Yearly Energy Consumption (MMBtu)



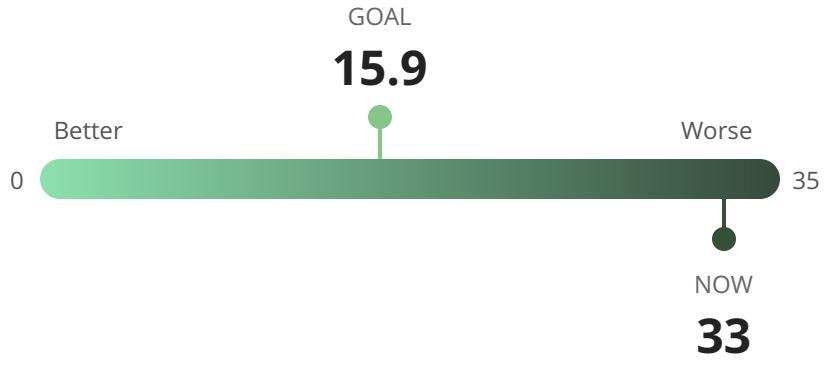

## Load Profile (MMBtu)




## Energy Mix by Fuel Type




## CO2 Footprint (tons)



CET CENTER FOR ECOTECHNOLOGY

# Solutions for Your Home

## Totals

### Approximate Cost

$ 49,400

This is a ballpark guess. Ask your contractor for a detailed bid.

### Estimated Savings

$3,935 per year

This is an estimate of how much you could save starting in Year 1. Savings will only increase as energy prices rise over the years.

### Savings to Investment Ratio*

For Package: 1.4

### Impact of upgrades

| | |
|---|---|
| Energy Reduction | 61% |
| Carbon (CO2) Savings | 17 tons |
| Equivalent cars removed from the road | 3.5/yr |

**Call us today at (888) 333-7525 to ask a question or discuss the next step!**

| DETAILS | APPROXIMATE INSTALLED COST | APPROXIMATE ANNUAL SAVINGS | SIR * |
|---|---|---|---|
| Upgrade Lighting | $ 0 | $ 50 | 100 |
| Lower Hot Water Temp | $ 0 | $ 141 | 100 |
| Upgrade Clotheswasher | $ 500 | $ 114 | 3.4 |
| Thermostat Set Points | $ 0 | $ 673 | 100 |
| Upgrade Heating System | $ 3,700 | $ 1,189 | 4.9 |
| Insulate Walls | $ 7,500 | $ 716 | 1.9 |
| Upgrade Pool Pump | $ 1,700 | $ 204 | 1.8 |
| Insulate Attic | $ 3,000 | $ 253 | 1.7 |
| Seal Air Leaks | $ 1,600 | $ 310 | 3 |
| Replace Freezer | $ 500 | $ 22 | 0.7 |
| Upgrade Windows | $ 20,800 | $ 437 | 0.4 |
| Insulate Frame Floor | $ 400 | $ 15 | 0.8 |



* SIR is the Savings to Investment Ratio. Simply put, if the SIR is 1 or greater, then the energy savings from the item will pay for itself before it needs to be replaced again. This metric is used to help prioritize the recommendations by financial merit.

# Solutions for Your Home

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| DETAILS | APPROXIMATE INSTALLED COST | APPROXIMATE ANNUAL SAVINGS | SIR * |
|---|---|---|---|
| Replace Refrigerator | $ 1,000 | $ 52 | 0.8 |
| Upgrade Dishwasher | $ 500 | $ 45 | 1.5 |
| Replace Doors or Add Storm Doors | $ 800 | $ 34 | 1 |
| Seal & Insulate Duct work | $ 5,000 | $ 242 | 0.7 |
| Upgrade Water Heater | $ 2,400 | $ -562 | 0 |

* SIR is the Savings to Investment Ratio. Simply put, if the SIR is 1 or greater, then the energy savings from the item will pay for itself before it needs to be replaced again. This metric is used to help prioritize the recommendations by financial merit.

# Upgrade Lighting

LIGHTING

**Approximate installed cost**

$0

**Annual Energy Savings**

Approx. $50

**Savings to Investment Ratio**

100

**Why it matters**

Light Emitting Diode (LED) bulbs use 12% of the energy of regular incandescent light bulbs and last up to 50 times as long. Replacing incandescent bulbs with LEDs will save significant energy and replacement costs over time.

Replace incandescent light bulbs that are used more than an hour per day with LEDs can save you money!

## Now & Goal

| DETAILS | NOW | GOAL |
|---|---|---|
| **Lighting** | | |
| # of CFLs | | |
| # of LEDs | 38 | |
| # of Incandescents | 62 | 62 |

# Lower Hot Water Temp

HOT WATER TEMPERATURE

**Approximate installed cost**

$0

**Annual Energy Savings**

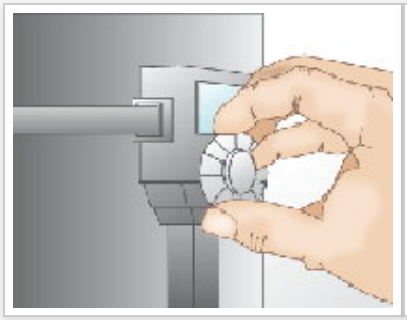
Approx. $141

**Savings to Investment Ratio**

100

**Why it matters**

Set water heater to deliver at 122 F (use a cooking thermometer to test the temperature at the faucet) or the lowest practical setting for your preferences. A good measure is if you can take a shower using only hot water (not adding cold water), but still above 122 F. This will reduce standby energy loss and risk of scalding.




Savings resulting from turning down your water heater temperature are based on two components: reduced standby losses, and consumption (from water demand or use in your home). Set too high, or at 140ºF, your water heater can waste anywhere from $36 to $61 annually in standby heat losses and more than $400 in demand losses.

## Now & Goal

| DETAILS | NOW | GOAL |
|---|---|---|
| **Hot Water Temperature** | | |
| **Water Heater 1** | | |
| Temp | 155 °F | 120 °F |

# Upgrade Clotheswasher

CLOTHESWASHER

**Approximate installed cost**

$500

**Annual Energy Savings**

Approx. $114

**Savings to Investment Ratio**

3.4

**Why it matters**

Old clothes washers can be energy and water hogs. When your current clothes washer breaks or otherwise needs to be replaced, be sure to choose a front loading ENERGY STAR model with the highest Modified Energy Factor (MEF) that's within your budget.


When it is time to upgrade your clothes washer, consider replacing it with an Energy Star refrigerator which will run more efficiently and save you money!

## Now & Goal

| DETAILS | NOW | GOAL |
|---|---|---|
| **Clotheswasher** | | |
| Type | Top Load | Top Load |
| ENERGY STAR | No | Yes |
| Integrated Modified Energy Factor | 0.64 IMEF | 1.03 IMEF |
| Model Year | | 2020 |

# Thermostat Set Points

THERMOSTAT

**Approximate installed cost**

$0

**Annual Energy Savings**

Approx. $673

**Savings to Investment Ratio**

100

**Why it matters**

Installing a programmable thermostat (or correctly setting the one you currently have) will help you to use less energy when you're not at home or when you're sleeping.


Replace your manual thermostat with a programmable one like this one or if you already have a programmable thermostat, be sure it is programmed correctly.

## Now & Goal

| DETAILS | NOW | GOAL |
|---|---|---|
| **Thermostat** | | |
| Heating Setpoint High | 74 °F | 68 °F |
| Heating Setpoint Low | 62 °F | 62 °F |
| Cooling Setpoint High | | 85 °F |
| Cooling Setpoint Low | | 80 °F |

# Upgrade Heating System

HEATING SYSTEM

**Approximate installed cost**

$3,700

**Annual Energy Savings**

Approx. $1,189

**Savings to Investment Ratio**

4.9

**Why it matters**

Install a more efficient furnace, boiler or heat pump. Depending on the age of the unit, substantial savings may be gained by replacing it with an ENERGY STAR rated appliance. If you're heating with gas, look for a sealed combustion unit. They're much safer since the exhaust pathway from the unit is sealed and goes directly outside. If it doesn't quite make sense to replace your heating system now, be prepared to replace it with a high efficiency ENERGY STAR unit when it finally wears out.

Consider upgrading your heating system to a high efficiency unit.

## Now & Goal

| DETAILS | NOW | GOAL |
|---|---|---|
| **Heating System** | | |
| **Hvac System 1** | | |
| System Name | Hvac System 1 | |
| Equipment Type | Furnace with standalone ducts | |
| Upgrade action | Replace with a newer model | |
| % of Total Heating Load | 100% | 100% |
| Heating Energy Source | Natural Gas | Natural Gas |
| Heating Capacity | 100000 BTU/h | 100000 BTU/h |
| Heating System Efficiency | 72 AFUE | 95 AFUE |
| Heating System Model Year | 1985 | 2020 |

# Insulate Walls

WALLS

**Approximate installed cost**

$7,500

**Annual Energy Savings**

Approx. $716

**Savings to Investment Ratio**

1.9

**Why it matters**

Insulating your walls can lead to a significant reduction in utility bills. The is done by drilling small holes in the wall cavities either from the inside or outside and filling the space with cellulose, fiberglass, or even foam insulation. If it's time to replace your exterior siding, then be sure to ask your contractor about adding a layer of rigid foam underneath the new sheathing of 1" or more.

By “dense packing” cellulose insulation in your wall cavities, air leaks and drafts will be dramatically reduced. To install the insulation, contractors will lightly pry up a few rows of siding of on your house and temporarily remove it. They will then drill a 2” hole in the sheathing for every wall cavity. A blower pushes cellulose insulation at high speed through a hose into the holes, filling the wall cavity. Great care is taken to ensure the cellulose fills into every part of the wall.

## Now & Goal

| DETAILS | NOW | GOAL |
|---|---|---|
| **Walls** | | |
| **Wall 1** | | |
| Modeled Area | 3400 ft² | 3400 ft² |
| Siding | Other | |
| Construction | 2x4 Frame | |
| Cavity Insulation | | 13 R Value |
| Continuous Insulation | | |

# Upgrade Pool Pump

POOL PUMPS

**Approximate installed cost**

$1,700

**Annual Energy Savings**

Approx. $204

**Savings to Investment Ratio**

1.8

**Why it matters**

Single-speed pool pumps can often equate to half of an entire home's electricity demand. Substantial energy savings can be achieved by replacing it with a variable speed pool pump. An ENERGY STAR certified pool pump can run at different speeds and be programmed to match the pool operation with its appropriate pool pump speed. The energy saved is considerable; reducing pump speed by one-half allows the pump to use just one-eighth as much energy.


Replace single-speed pool pump with a variable-speed pool pump for greater energy savings.

## Now & Goal

| DETAILS | NOW | GOAL |
|---|---|---|
| **Pool Pumps** | | |
| Pump Type | Single Speed | Variable Speed |
| Size | 18000 Gallons | |
| Pump Horsepower | 0.5 | 1.5 |
| Pump Annual Frequency | 365 Days/Year | 365 Days/Year |
| Pump Daily Frequency | 4.6 Hours/Day | 8 Hours/Day |
| Variable Speed Turnover | 1 | 1 |
| Pump Model | | 2020 |

# Insulate Attic

ATTIC

**Approximate installed cost**

$3,000

**Annual Energy Savings**

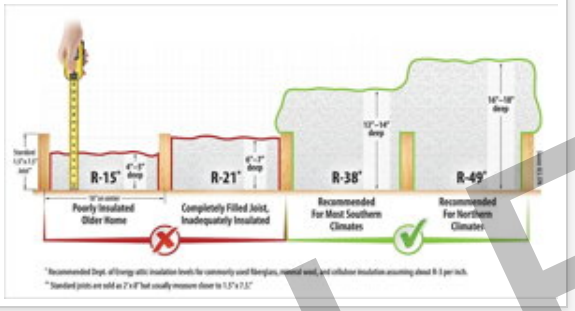
Approx. $253

**Savings to Investment Ratio**

1.7

**Why it matters**

Adding insulation to your attic can lead to a significant reduction in your utility bills. This process is often combined with careful air sealing of the ceiling from the attic side to ensure the new insulation performs at its maximum level.




Having the correct amount of attic insulation can help you maintain a comfortable temperature throughout your home and help save money on your energy bills, plus, prevent major issues like ice dams in the winter.

## Now & Goal

| DETAILS | NOW | GOAL |
|---|---|---|
| **Attic** | | |
| **Attic 1** | | |
| Modeled Area | 1850 ft² | 1850 ft² |
| Insulation | 12.5 R Value | 49 R Value |
| Radiant Barrier? | No | No |
| Has Knee Wall? | Yes | No |
| Knee Wall Area | 600 ft² | |
| Knee Wall Cavity Insulation | 7 R Value | |
| Cool Roof? | No | No |

# Seal Air Leaks

AIR LEAKAGE

### Approximate installed cost

$1,600

### Annual Energy Savings

Approx. $310

### Savings to Investment Ratio

3

### Why it matters

Air sealing is typically the most cost effective improvement you can make to your home. To properly seal out air leaks, a large fan called a blower door is used to depressurize your house. This makes air leaks easy to find, so corrective measures can be taken. A good air sealing job will dramatically increase the comfort of your home and help you save significant energy.


Good air-sealing and a continuous air barrier between the attic and the home's conditioned (living) space are important, not only to save energy and reduce fuel bills, but also to prevent moisture problems in the attic.

## Now & Goal

| DETAILS | NOW | GOAL |
|---|---|---|
| **Air Leakage** | | |
| Blower Door Test Performed | Estimate | Estimate |
| Blower Door Reading | 13680 CFM50 | 10260 CFM50 |
| Conditioned Air Volume | 31450 ft³ | |
| Wind Zone | 2 | |
| N-Factor | 14.99 | |
| Equivalent NACH | 1.74 NACH | 1.31 NACH |
| Effective Leakage Area | 768.53 in² | 576.4 in² |
| Equivalent ACH50 | 26.1 ACH50 | 19.57 ACH50 |
| Kitchen Fan | | |
| Bathroom Fan 1 | | |
| ASHRAE 62.2 Required mechanical ventilation rate | N/A CFM | N/A CFM |
| Minimum CFM50 | | 3708 CFM50 |
| Mechanical Ventilation Type | None | None |

# Replace Freezer

FREEZER

**Approximate installed cost**

$500

**Annual Energy Savings**

Approx. $22

**Savings to Investment Ratio**

0.7

**Why it matters**

Old freezers can easily cost twice as much to operate as a new freezers. Replace your old freezer with a new ENERGY STAR model and be sure to recycle the old one (keeping it running in your garage or basement will use even more energy).

When its time to upgrade your freezer, consider replacing it with and Energy Star freezer which will run more efficiently and save you money!

## Now & Goal

| DETAILS | NOW | GOAL |
|---|---|---|
| **Freezer** | | |
| **Freezer 1** | | |
| Name | Freezer 1 | |
| ENERGY STAR | No | Yes |
| Usage | 483.51 kWh/yr | 354 kWh/yr |
| Model Year | | 2020 |

# Upgrade Windows

WINDOWS

**Approximate installed cost**

$20,800

**Annual Energy Savings**

Approx. $437

**Savings to Investment Ratio**

0.4

**Why it matters**

Adding storm windows, or replacing your current windows can save energy and help reduce drafts or solar gain.


Consider replacing old single pane windows with new energy efficient Energy Star.

## Now & Goal

| DETAILS | NOW | GOAL |
|---|---|---|
| **Windows** | | |
| **Window 1** | | |
| ENERGY STAR | No | Yes |
| U-Value | 0.89 U Value | 0.39 U Value |
| Solar Heat Gain Coefficient | 0.64 SHGC | 0.52 SHGC |
| Window Area: NE (Right) | 102 ft² | 102 ft² |
| Window Area: SE (Front) | 340 ft² | 340 ft² |
| Window Area: SW (Left) | | |
| Window Area: NW (Back) | 272 ft² | 272 ft² |
| Exterior Treatment: NE (Right) | No Treatment | No Improvement |
| Exterior Treatment: SE (Front) | No Treatment | No Improvement |
| Exterior Treatment: SW (Left) | No Treatment | No Improvement |
| Exterior Treatment: NW (Back) | No Treatment | No Improvement |

# Insulate Frame Floor

FRAME FLOOR

**Approximate installed cost**

$400

**Annual Energy Savings**

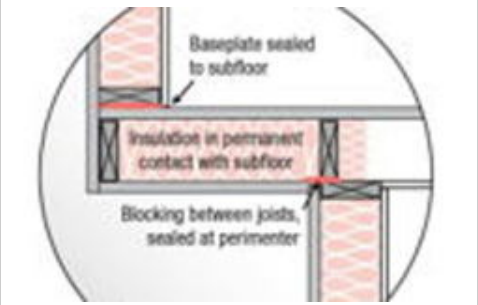
Approx. $15

**Savings to Investment Ratio**

0.8

**Why it matters**

Insulating floors above the garage and cantilevers can dramatically increase the comfort of bedrooms and other living spaces. This is done by drilling holes in the ceiling of the garage or floor of the cantilever and then filling the cavity between the floor joists with blown-in insulation.




A cantilevered floor is a floor that sticks out past the foundation or supporting wall below. It may be a first- or second-story bump-out, a bay window, or a room over an open porch. Floor joist bays that extend from the house out under the cantilevered floor are sometimes left unsealed and uninsulated by the builder, allowing outside air to flow through the home and conditioned air to escape.

Insulate floor above the garage:
Insulation between the garage and the living space as important as any insulation in an exterior wall. Most contractors will "drill and fill" the space between the garage and the living space above with cellulose.

## Now & Goal

| DETAILS | NOW | GOAL |
|---|---|---|
| **Frame Floor** | | |
| Floor Cavity Insulation | 7 R Value | 19 R Value |
| Floor Continuous Insulation | | |
| Modeled Floor Area | 500 ft² | |

# Replace Refrigerator

REFRIGERATOR

**Approximate installed cost**

$1,000

**Annual Energy Savings**

Approx. $52

**Savings to Investment Ratio**

0.8

**Why it matters**

Old refrigerators can often cost twice as much to operate as a new refrigerator. Replace your old refrigerator with a new ENERGY STAR model and be sure to recycle the old one (keeping it running in your garage or basement will use even more energy).


When it is time to upgrade your refrigerator, consider replacing it with an Energy Star refrigerator which will run more efficiently and save you money!

## Now & Goal

| DETAILS | NOW | GOAL |
|---|---|---|
| **Refrigerator** | | |
| **Refrigerator 1** | | |
| Name | Refrigerator 1 | |
| ENERGY STAR | No | Yes |
| Usage | 670.52 kWh/yr | 348 kWh/yr |
| Model Year | | 2020 |

# Upgrade Dishwasher

DISHWASHER

**Approximate installed cost**

$500

**Annual Energy Savings**

Approx. $45

**Savings to Investment Ratio**

1.5

**Why it matters**

Old dishwashers can be energy and water hogs. If your dishwasher was made before 1994, or when your current dishwasher breaks or otherwise needs to be replaced, be sure to choose an ENERGY STAR model with the highest Energy Factor (EF) that's within your budget.


When it is time to upgrade your dishwasher, consider replacing it with an Energy Star refrigerator which will run more efficiently and save you money!

## Now & Goal

| DETAILS | NOW | GOAL |
|---|---|---|
| **Dishwasher** | | |
| Dishwasher Installed? | Yes | Yes |
| ENERGY STAR | No | Yes |
| Energy Factor | 0.43 EF | 0.77 EF |
| Model Year | | 2020 |

# Replace Doors or Add Storm Doors

DOORS

**Approximate installed cost**

$800

**Annual Energy Savings**

Approx. $34

**Savings to Investment Ratio**

1

**Why it matters**

Adding storm door(s) or replacing your current exterior door(s) with insulated ones will help save energy and help reduce drafts.

Your home's exterior doors can contribute significantly to air leakage, and can also waste energy through conduction, especially if it's old, uninsulated, improperly installed, and/or improperly air sealed. Weatherstripping can reduce the energy losses due to air leakage.

Upgrade to energy efficient insulated doors: When selecting doors for energy efficiency, it's important to first consider their energy performance ratings in relation to the local climate and your home's design

Adding a storm door can be a good investment if your existing door is old but still in good condition. However, adding a storm door to a newer, insulated door is not generally worth the expense, because you won't save much more energy. Never add a glass storm door if the exterior door gets more than a few hours of direct sun each day. The glass will trap heat against the entry door and could damage it.

# Replace Doors or Add Storm Doors

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### Approximate installed cost

$800

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### Savings to Investment Ratio

1

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| DETAILS | NOW | GOAL |
|---|---|---|
| **Doors** | | |
| **Door 1** | | |
| Area | 21 ft² | 21 ft² |
| ENERGY STAR | No | Yes |
| U Value | 0.46 U Value | 0.21 U Value |
| **Door 2** | | |
| Area | 21 ft² | 21 ft² |
| ENERGY STAR | No | Yes |
| U Value | 0.46 U Value | 0.21 U Value |
| **Door 3** | | |
| Area | 21 ft² | 21 ft² |
| ENERGY STAR | No | Yes |
| U Value | 0.46 U Value | 0.21 U Value |

# Seal & Insulate Duct work

DUCTS

**Approximate installed cost**

$5,000

**Annual Energy Savings**

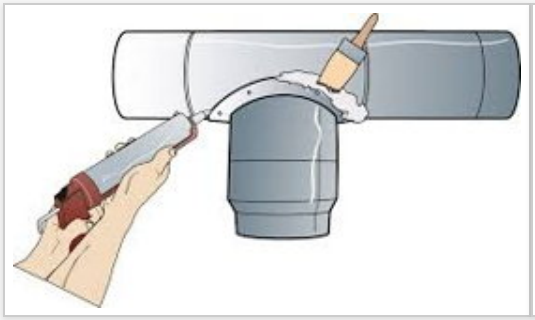
Approx. $242

**Savings to Investment Ratio**

0.7

**Why it matters**

If you have a forced air system for heating or cooling, sealing the connections and penetrations with mastic will ensure that all of the air makes it to where it was designed to go. This increases the efficiency of your heating and cooling system and improves comfort.



If ducts are located in an unconditioned space, such as a vented attic or vented crawlspace, they should be sealed and insulated to prevent heat loss due to air leaks and conduction and to provide some protection against harsh conditions.

## Now & Goal

| DETAILS | NOW | GOAL |
|---|---|---|
| **Ducts** | | |
| **Hvac System 1** | | |
| Duct Location | Basement (unconditioned) | Basement (unconditioned) |
| Duct Insulation | No Insulation | R-8 Duct Insulation |
| Duct Leakage | 30% - Very leaky | Seal to 6% Leakage |
| Duct Efficiency | 83.18% | 92.07% |

# Upgrade Water Heater

WATER HEATER

**Approximate installed cost**

$2,400

**Annual Energy Savings**

Approx. $-562

**Savings to Investment Ratio**

0

**Why it matters**

Replace your water heater with a tankless model or a heat pump water heater to save energy and reduce the ability for dangerous Carbon Monoxide to leak into your home.

Upgrade your water heater to a high efficiency unit. These can include tank-less on demand units or heat pump water heaters.

## Now & Goal

| DETAILS | NOW | GOAL |
|---|---|---|
| **Water Heater** | | |
| **Water Heater 1** | | |
| Fuel | Natural Gas | Electricity |
| Type | Tank Water Heater | Heat Pump |
| ENERGY STAR | | Yes |
| Energy Factor | 56 EF | 100 EF |
| Model Year | | 2020 |

# Health & Safety

### What's This?

These tests are recommended by the Building Performance Institute (BPI). They can help identify potential health and safety concerns in your home.

# Your Massachusetts Home Scorecard

This scorecard compares home energy use and carbon footprint to an average home in MA, and shows improvements based on recommended technology.

HOME ENERGY USE
**535**

## ABOUT

Address
**123 ABC St. , Holyoke, MA 01040**

Year Built
**1900**

Sq. Footage
**3700**

# of Bedrooms
**4**

Primary Heating Fuel
**Natural Gas**

Assessment Date
**05/05/2020**

Energy Specialist
**Jamie Overby**

## YEARLY ENERGY USE

Electricity
**10,897 kWh**

Natural Gas
**4,977 therms**

## YEARLY COSTS & SAVINGS*

**$ 8,181**
Pre-upgrade Energy cost per yr

**$ 4,246**
Post-upgrade Energy Cost per yr

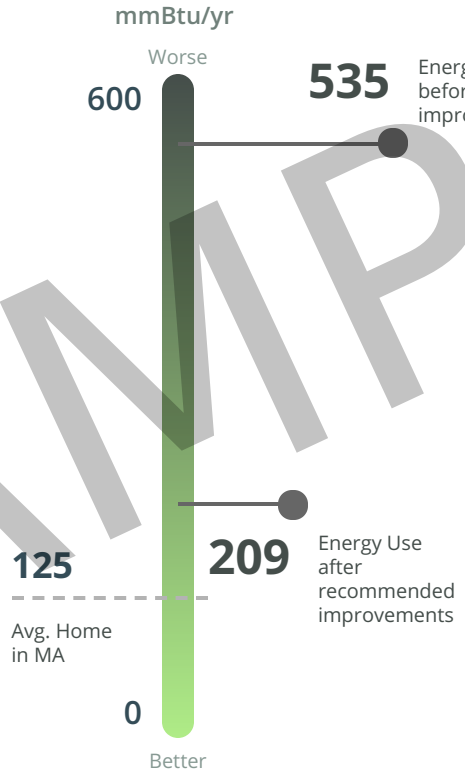
SAVE **$ 3,935**
Estimated Energy Savings per yr

Before After

Electricity: $ 0.19/kWh, Natural Gas: $ 1.23/therm.

## HOME ENERGY USE

This shows the estimated total energy use (electricity and heating fuel) of your home for one year. The lower the energy use, the better!

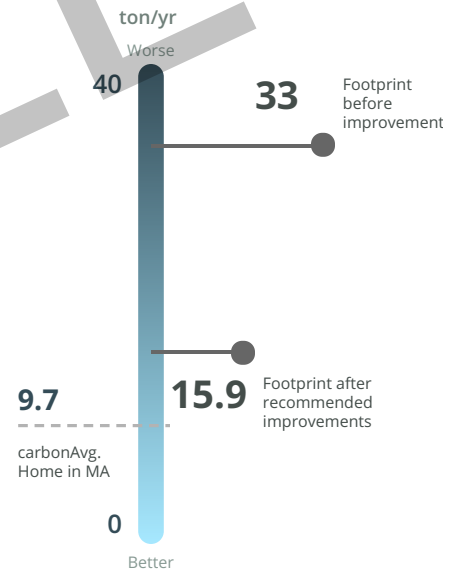



Estimated percentage of energy use by fuel type:

**93%** Natural Gas **7%** Electricity

## HOME CARBON FOOTPRINT

This score shows the estimated carbon emissions based on the annual amounts, types, and sources of fuels used in your home. The lower the score, the less carbon is released into the atmosphere to power your home.




Estimated average carbon footprint (tons/yr):

**87%** Natural Gas **13%** Electricity



* Estimated costs and savings. Actual energy costs may vary and are based on many factors such as occupant behavior, weather and utility rates. Please see next page for more on the EPS calculation Projections for score improvements and energy savings are estimates based on implementing all of the recommended energy efficiency improvements. Ref# 164544.

# More Information

## MORE INFORMATION

## ABOUT THE MASSACHUSETTS HOME SCORECARD

The Massachusetts Home Energy Scorecard (MA Scorecard) is a tool to assess a home's expected energy use, cost, and carbon footprint. A lower energy use generally means that a home has a smaller carbon footprint and lower energy costs. The MA Scorecard also allows for comparisons of one home's energy use and carbon footprint. This is because the energy use and carbon footprint are calculated without the influence of occupant behavior, which can vary depending on things like whether there are teenagers in the house who take long hot showers and often leave lights on when they are not in a room.

### Home Energy Use

The Home Energy Use (HEU) calculation is based on a home's size, design, insulation levels, air leakage, heating and cooling systems, major appliances, lighting, hot water heating, and any electricity produced onsite by solar PV. The HEU number is "normalized" in the sense that occupant behavior, which can vary, is taken out of the calculation. A home's actual energy use will vary with number of occupants, occupant behavior, weather, and changes to the home.

***For additional details on the recommended energy improvements and savings estimates for your home, please refer to your Home Energy Assessment Report.***

## USEFUL TERMINOLOGY

### Btu

A Btu, or British Thermal Unit, is a measurement of the heat/energy content of fuel. mmBtu stands for one million Btus. One Btu ~ the energy produced by a single wooden match. One million Bts ~ the energy produced by 7 gallons of gasoline used in a typical car.

### Carbon Footprint

The greenhouse gas emissions associated with a home's energy use impact the environment. The Carbon Footprint calculation is based on the carbon emissions for the annual amounts, types, and sources of fuels used in your home. Measurement is in tons of carbon dioxide per year (tons/year). One ton = 2000 miles driven by one car (typical 21 mpg car.)

For electricity, carbon emissions are based on electricity consumed onsite and the mix of fuel sources used in the region to generate that electricity at the time of this report.

For fossil fuel used in heating and hot water, carbon emissions are based on the therms of natural gas or gallons of oil or propane used in the home.

### Average Home in Your Area

The "Average Home in Your Area" refers to the average energy use or carbon footprint of all the homes in Massachusetts before implementation of any energy improvements. The average may vary slightly over time as homes become more efficient due to improvements.

# Rebates & Incentives

munihelps.org/rebates-incentives/holyoke-

| HG&E 2021 Rebates* | |
|---|---|
| **Item** | **Rebates Amounts & Requirements** |
| Dishwasher | $25 - Energy Star® or CEE Tier 1 or Higher |
| Room Air Conditioner | $25 - Energy Star® |
| Dehumidifier | $30 - Energy Star® |
| Air Purifier | $40 - Energy Star® |
| Clothes Washer | $50 - Energy Star® or CEE Tier 1 or Higher |
| Refrigerator | $50 - Energy Star®/CEE Tier 1 or 2<br>$75 - ES Most Efficient/CEE Advanced Tier |
| Electric Clothes Dryer | $50 - Energy Star®<br>$250 - Energy Star®, Replacing Gas Dryer<br>$350 - Energy Star® Heat Pump, Replacing Gas Dryer |
| Electric Storage Tank or Solar Hot Water Heater | $150 - Replacing Gas Water Heater<br>$300 - Replacing Oil or Propane Water Heater |
| Heat Pump Hot Water Heater (Electric Only) | $300 - Energy Star®<br>$600 - Energy Star®, Replacing Gas Water Heater $750 - Energy Star®, Replacing Oil or Propane |
| Central Air Conditioners | $100/ton up to $500 – SEER ≥ 16, EER ≥ 13 Previous ducted system required |
| Air Source Heat Pumps | $250/ton up to $1,000 – SEER ≥ 18, EER ≥ 12.5 and HSPF ≥ 9 |
| Blower Door Test & Air Sealing | 50%, up to $500 |
| Duct Sealing | 50%, up to $500 |
| Insulation | 50%, up to $2,000 - Attic, Wall, Floor, Basements & Pipe Insulation |
| Programmable Thermostat | 50% up to $50 - 7-Day Programmable Thermostat |
| Wi-Fi Smart Thermostat | 50% up to $125. Must be Enrolled in HG&E Connected Homes Program |

| HG&E 2021 Connected Homes Program* | |
|---|---|
| **Item** | **Incentive Amount & Requirements** |
| Electric Hot Water Heaters | $5/month - Qualifying Wi-Fi-enabled GE or Rheem models |
| HVAC Seasonal Controls | $5/month in winter, $8/month in summer, Qualifying models only |
| Wi-Fi Smart Thermostat | $5/month in winter, $8/month in summer, Qualifying models only |
| Electric Vehicle Chargers | $10/month plus a free Level 2 charger or a $450 bill credit. |

| HG&E 2021 Residential Energy Conservation Program* | |
|---|---|
| **Item** | **Requirements** |
| Gas Furnace | AFUE Rating ≥ 95% |
| Gas Steam Boiler | AFUE Rating ≥ 82% |
| Gas Hot Water Boilers | AFUE ≥ 90%, Outdoor Reset Control Required |
| Gas Combi Boiler/Water Heater | AFUE ≥ 95% |
| Gas Storage Water Heaters | Energy Star® |
| Indirect Water Heater | Attached to gas boiler with AFUE ≥ 90% |
| Electric Hot Water Heaters | Must be converting from gas, oil or propane |
| Solar Hot Water Heaters | SRCC Certified |
| Heat Pump Hot Water Heaters | Energy Star® |
| Replacement Windows | Energy Star® Certified for Northern Climate Zone. Windows being replaced must be single-pane windows |
| Replacement Doors | Energy Star® Certified for Northern Climate Zone |
| Central Air Conditioners | SEER ≥ 16, EER ≥ 13, Previous ducted system required |
| Air Source Heat Pumps | SEER ≥ 18, EER ≥ 12.5, HSPF ≥ 9 |
| Electric Vehicle Charging Infrastructure | Must enroll in Connected Homes program. Costs covered: Service upgrades, equipment costs and installation costs |
| Blower Door Test & Air Sealing | |
| Duct Sealing | |
| Insulation | Attic, Wall, Floor, Basements & Pipe Insulation |
| Thermostat | 7-Day Programmable Thermostat |
| Wi-Fi Smart Thermostat | Must be Enrolled in HG&E Connected Homes Program |

***Please Note: Additional requirements apply for each incentive type listed above depending on equipment and program. Please visit www.hged.com/savehome for a complete list of eligibility requirements.**

**Connected Homes Program:** Provides ongoing monthly incentives for qualifying Wi- Fi enabled smart devices

**Residential Energy Conservation Program:** Financial assistance at 0% interest offered for qualifying energy efficiency improvement projects

**Questions?** Contact Sophie Theroux, HG&E Energy Efficiency Coordinator. Email: stheroux@hged.com. Phone: (413) 265-8292

# Tech Specs

## Property Details

| | |
|---|---|
| Year Built: | 1900 |
| Conditioned Area: | 3700 ft² |
| Area Includes Basement: | No |
| Average Wall Height: | 8 ft |
| House Length: | 40 ft |
| House Width: | 60 ft |
| Floors Above Grade: | 2 |
| Number of Occupants: | 3 |
| Number of Bedrooms: | 4 |
| Type of Home: | Single Family Detached |
| Front of Building Orientation: | South East |
| Shielding: | Normal |
| Tuck Under Garage: | Yes |
| Garage Size: | 2-car |

## Thermostat

| | |
|---|---|
| Programmable Thermostat Installed: | No |
| Heating Setpoint High: | 74 °F |
| Heating Setpoint Low: | 62 °F |

## Heating & Cooling

| | |
|---|---|
| Heating Design Load: | 152796 Btu/hr |
| **Hvac: 1** | |
| System Name: | Hvac System 1 |
| Equipment Type: | Furnace with standalone ducts |
| Upgrade action: | Replace with a newer model |
| Heating Energy Source: | Natural Gas |
| % of Total Heating Load: | 100% |
| Heating Capacity: | 100000 BTU/h |
| Heating System Efficiency: | 72 AFUE |
| Heating System Model Year: | 1985 |
| Duct Location: | Basement (unconditioned) |
| Duct Insulation: | No Insulation |
| Duct Leakage: | 30% - Very leaky |
| Duct Efficiency: | 83.18% |

## Appliances

| | |
|---|---|
| **Range: 1** | |
| Range Fuel Type: | Natural Gas |
| **Oven: 1** | |
| Oven Fuel Type: | Electricity |
| **Clothes Dryer: 1** | |
| Dryer Fuel Type: | Natural Gas |

## Clothes Washer

| | |
|---|---|
| Type: | Top Load |
| Integrated Modified Energy Factor: | 0.64 IMEF |
| ENERGY STAR: | No |

## Dishwasher

| | |
|---|---|
| Dishwasher Installed?: | Yes |
| Energy Factor: | 0.43 EF |
| ENERGY STAR: | No |

## Freezers

| | |
|---|---|
| **Freezer: 1** | |
| Name: | Freezer 1 |
| Usage: | 483.51 kWh/yr |
| ENERGY STAR: | No |

## Refrigerators

| | |
|---|---|
| **Refrigerator: 1** | |
| Name: | Refrigerator 1 |
| Refrigerator Age: | 22-24 |
| Refrigerator Size: | 16-18 |
| ENERGY STAR: | No |
| Usage: | 670.52 kWh/yr |

## Lighting

| | |
|---|---|
| % CFLs or LEDs: | 26-50% |
| Total # of Light Bulbs: | 100 |
| # of CFLs: | 0 |
| # of LEDs: | 38 |
| # of Incandescents: | 62 |

## Doors

| | |
|---|---|
| **Door: 1** | |
| Type: | Wood |
| Area: | 21 ft² |
| ENERGY STAR: | No |
| U Value: | 0.46 U Value |
| **Door: 2** | |
| Type: | Wood |
| Area: | 21 ft² |
| ENERGY STAR: | No |
| U Value: | 0.46 U Value |
| **Door: 3** | |
| Type: | Wood |
| Area: | 21 ft² |
| ENERGY STAR: | No |
| U Value: | 0.46 U Value |

## Exterior Walls

| | |
|---|---|
| **Wall: 1** | |
| Modeled Area: | 3400 ft² |
| Insulated?: | No |
| Siding: | Other |

# Tech Specs

| | |
|---|---|
| Construction: | 2x4 Frame |
| Cavity Insulation: | 0 R Value |
| Continuous Insulation: | 0 R Value |

## Attic & Vaulted Ceiling

**Attic: 1**

| | |
|---|---|
| Modeled Area: | 1850 ft² |
| Insulation Depth: | 4-6 |
| Insulation Type: | Fiberglass or Rockwool (batts or blown) |
| Insulation: | 12.5 R Value |
| Radiant Barrier?: | No |
| Has Knee Wall?: | Yes |
| Knee Wall Area: | 600 ft² |
| Knee Wall Cavity Insulation: | 7 R Value |
| Knee Wall Insulation Type: | Fiberglass or Rockwool Batt |
| Knee Wall Continuous Insulation: | 0 R Value |
| Cool Roof?: | No |

## Foundation - General

| | |
|---|---|
| Foundation: Basement: | 100% |
| Foundation Above Grade Height: | 1.5 ft |

## Foundation - Basement

| | |
|---|---|
| Modeled Basement Floor Area: | 1350 ft² |
| Basement Wall Insulation: | None or Bare Walls |
| Basement Heating: | None or Undesired Incidental |
| Basement Cooling: | None or Undesired Incidental |
| Basement Ceiling Cavity Insulation: | 0 R Value |
| Basement Ceiling Cavity Insulation Type: | Fiberglass or Rockwool Batt |
| Basement Ceiling Continuous Insulation: | 0 R Value |

## Frame Floors

| | |
|---|---|
| Modeled Floor Area: | 500 ft² |
| Floor Cavity Insulation: | 7 R Value |
| Floor Cavity Insulation Type: | Fiberglass or Rockwool Batt |
| Floor Continuous Insulation: | 0 R Value |

## Windows

**Window: 1**

| | |
|---|---|
| Window Area: NE (Right): | 102 ft² |
| Window Area: SE (Front): | 340 ft² |
| Window Area: SW (Left): | 0 ft² |
| Window Area: NW (Back): | 272 ft² |
| Type: | Single pane |
| Frame: | Wood or metal clad |
| ENERGY STAR: | No |
| U-Value: | 0.89 U Value |
| Solar Heat Gain Coefficient: | 0.64 SHGC |
| Exterior Treatment: NE (Right): | No Treatment |
| Exterior Treatment: SE (Front): | No Treatment |
| Exterior Treatment: SW (Left): | No Treatment |
| Exterior Treatment: NW (Back): | No Treatment |

## Air Leakage

| | |
|---|---|
| Blower Door Test Performed: | Estimate |
| Blower Door Reading: | 13680 CFM50 |
| Conditioned Air Volume: | 31450 ft³ |
| Wind Zone: | 2 |
| N-Factor: | 14.99 |
| Equivalent NACH: | 1.74 NACH |
| Effective Leakage Area: | 768.53 in² |
| Equivalent ACH50: | 26.1 ACH50 |
| Kitchen Fan: | 0 CFM |
| Bathroom Fan 1: | 0 CFM |
| ASHRAE 62.2 Required mechanical ventilation rate: | N/A CFM |
| Mechanical Ventilation Type: | None |

## Water Heating

**Water Heating: 1**

| | |
|---|---|
| Fuel: | Natural Gas |
| Type: | Tank Water Heater |
| Age: | 16-20 |
| Location: | Garage or Unconditioned Space |
| Temperature Settings: | Very High (150+ F) |
| Energy Factor: | 56 EF |

## Pool & Hot Tub

| | |
|---|---|
| Pool: | Yes |
| Pump Type: | Single Speed |
| Pump Horsepower: | 0.5 |
| Pump Annual Frequency: | 365 Days/Year |
| Pump Daily Frequency: | 4.6 Hours/Day |
| Variable Speed Turnover: | 1 |
| Hot Tub: | No |

## PV

**Pv: 1**

| | |
|---|---|
| Has PV?: | No |

## Utility Bills

### Electric

| | |
|---|---|
| Electric Utility Provider Name | Holyoke Gas & Electric |
| Electric Account Number | 12345678910 |

### Fuel

| | |
|---|---|
| Fuel Utility Provider Name | Holyoke Gas & Electric |
| Fuel Account Number | 01987654321 |

## Contact Information

Jamie Overby

# Tech Specs

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**About This Report**

Report Date: October 28, 2021
Job ID: 164544
Holyoke Gas & Electric HELPS Energy Audits

Report & modeling software: Snugg Pro™ 5.0

# Glossary

**Annual Fuel Utilization Efficiency (AFUE)** The measure of seasonal or annual efficiency of a residential heating furnace or boiler. It takes into account the cyclic on/off operation and associated energy losses of the heating unit as it responds to changes in the load, which in turn is affected by changes in weather and occupant controls.

**Annualized Return** The return an investment provides over a period of time, expressed as a time-weighted annual percentage. This is the equivalent annual interest rate you would get if you put the same amount of money spent on the energy upgrade into a savings account.

**Asbestos** Asbestos is a mineral fiber that has been used commonly in a variety of building construction materials for insulation and as a fire-retardant, but is no longer used in homes. When asbestos-containing materials are damaged or disturbed by repair, remodeling or demolition activities, microscopic fibers become airborne and can be inhaled into the lungs, where they can cause significant health problems.

**British Thermal Unit (Btu)** The amount of heat required to raise the temperature of one pound of water one degree Fahrenheit; equal to 252 calories.

**Carbon Monoxide (CO)** A colorless, odorless but poisonous combustible gas with the formula CO. Carbon monoxide is produced in the incomplete combustion of carbon and carbon compounds such as fossil fuels (i.e. coal, petroleum) and their products (e.g. liquefied petroleum gas, gasoline), and biomass.

**Cashflow** When financing energy efficiency improvements, cashflow is the difference between the average monthly energy savings and the monthly loan payment.

**Combustion Appliance Zone (CAZ)** A contiguous air volume within a building that contains a combustion appliance such as furnaces, boilers, and water heaters; the zone may include, but is not limited to, a mechanical closet, mechanical room, or the main body of a house, as applicable.

**Compact Fluorescent Light bulb (CFL)** A smaller version of standard fluorescent lamps which can directly replace standard incandescent lights. These highly efficient lights consist of a gas filled tube, and a magnetic or electronic ballast.

**Cubic Feet per Minute (CFM)** A measurement of airflow that indicates how many cubic feet of air pass by a stationary point in one minute.

**Carbon Dioxide (CO2)** A colorless, odorless noncombustible gas that is present in the atmosphere. It is formed by the combustion of carbon and carbon compounds (such as fossil fuels and biomass). It acts as a greenhouse gas which plays a major role in global warming and climate change.

**Energy Efficiency Ratio (EER)** The measure of the energy efficiency of room air conditioners: cooling capacity in Btu/hr divided by the watts consumed at a specific outdoor temperature.

**Energy Factor (EF)** The measure of efficiency for a variety of appliances. For water heaters, the energy factor is based on three factors: 1) the recovery efficiency, or how efficiently the heat from the energy source is transferred to the water; 2) stand-by losses, or the percentage of heat lost per hour from the stored water compared to the content of the water: and 3) cycling losses. For dishwashers, the energy factor is the number of cycles per kWh of input power. For clothes washers, the energy factor is the cubic foot capacity per kWh of input power per cycle. For clothes dryers, the energy factor is the number of pounds of clothes dried per kWh of power consumed.

**Heating Seasonal Performance Factor (HSPF)** The measure of seasonal efficiency of a heat pump operating in the heating mode. It takes into account the variations in temperature that can occur within a season and is the average number of Btu of heat delivered for every watt-hour of electricity used.

**Heat Recovery Ventilator (HRV) / Energy Recovery Ventilator (ERV)** A device that captures the heat or energy from the exhaust air from a building and transfers it to the supply/fresh air entering the building to preheat the air and increase overall heating efficiency while providing consistent fresh air.

**Light Emitting Diode (LED) Lighting** An extremely efficient semiconductor light source. LEDs present many advantages over incandescent light sources including lower energy consumption, longer lifetime, improved physical robustness, and smaller size.

**Modified Internal Rate of Return (MIRR)** This is your return on investment. Roughly speaking, if you invested the same amount of money for this project (listed on this report as the total cost) into a bank account, your equivalent interest rate from all of the energy savings would be the MIRR.

**N-Factor** A factor of how susceptible your house is to wind, influenced by weather patterns, location, and the number of floors in the home. Used in the calculation of NACH.

**Natural Air Changes per Hour (NACH)** The number of times in one hour the entire volume of air inside the building leaks to the outside naturally.

**Payback Period** The amount of time required before the savings resulting from your system equal the system cost.

**R-Value** A measure of the capacity of a material to resist heat transfer. The R-Value is the reciprocal of the conductivity of a material (U-Value). The larger the R-Value of a material, the greater its insulating properties.

**Radon** A naturally occurring radioactive gas found in the U.S. in nearly all types of soil, rock, and water. It can migrate into most buildings. Studies have linked high concentrations of radon to lung cancer.

**Rim Joist** In the framing of a deck or building, a rim joist is the final joist that caps the end of the row of joists that support a floor or ceiling. A rim joist makes up the end of the box that comprises the floor system.

**Seasonal Energy Efficiency Ratio (SEER)** A measure of seasonal or annual efficiency of a central air conditioner or air conditioning heat pump. It takes into account the variations in temperature that can occur within a season and is the average number of Btu of cooling delivered for every watt-hour of electricity used by the heat pump over a cooling season.

**Savings to Investment Ratio (SIR)** A ratio used to determine whether a project that aims to save money in the future is worth doing. The ratio compares the investment that is put in now with the amount of savings from the project.