

# 2011 Thirty Green Energy Savings Makeover



The Garcia Family received over 7000  
Viewer Votes to win this Years Energy Savings Makeover!



1650 SF Home Built in the late 50's





# 2011 Thirty Green Energy Saving Makeover



The Iudice Family ended up in Second Place.





# 2011 Thirty Green Energy Saving Makeover



The Baskett Family ended up in Third Place.



# Lead testing...

The Lead testing was performed on this home because of the age of the home (pre-1978) and all necessary rules were followed.

The Inspection was performed by Scott Von Gonten with ConserveIQ.





# The Energy Audit

The blower door test on the home produced the following results: 5,449 CFM (cubic feet per minute) at 50 Pascals difference. To put this into perspective, 1 CFM is roughly equivalent to the amount of air in a standard basketball. So, under the test conditions, the home was 'leaking' the equivalent of 5,449 basketballs of air per minute into your conditioned spaces.

The below translates the number into a meaningful value.

For the number of occupants in the home, the required ventilation could be achieved by having a 100 square inch hole. Based on the blower door test though, all of the separate holes in the house combine to make the equivalent of a 545 square inch hole. So, the simple explanation is that you have too much air leaking in than you actually need or want.



# The Energy Audit

How much?

4.45 Times too much air!

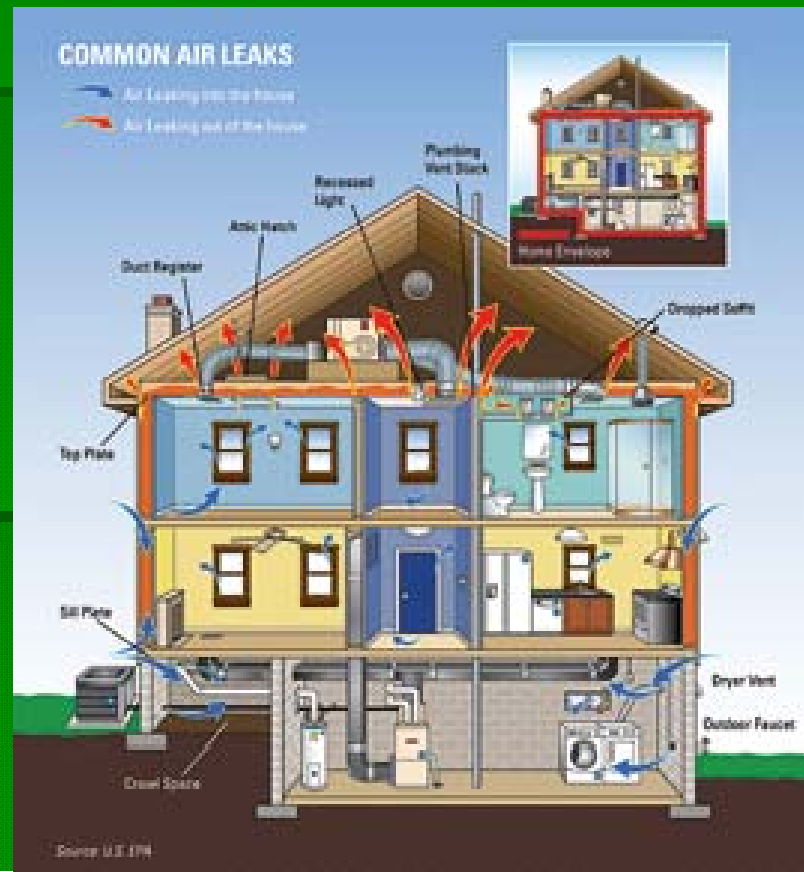


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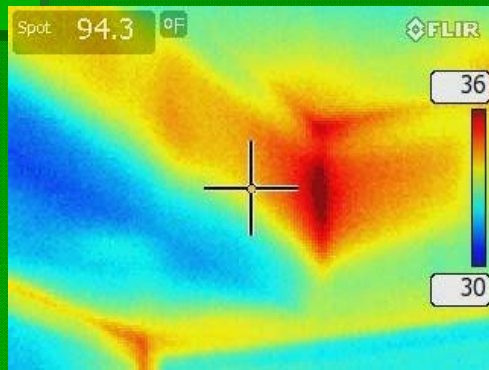
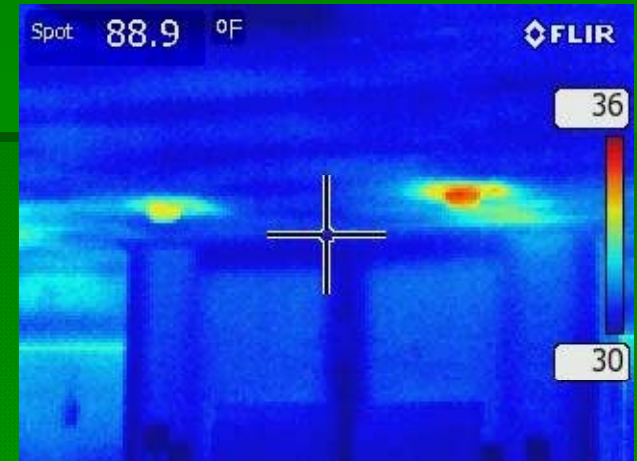
# The Energy Audit



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# The Energy Audit





# The Energy Audit



The Duct Blaster test on the home's ductwork system produced the following results: 612 CFM (cubic feet per minute) at 25 Pascals leakage. To put this into perspective, your system was designed to deliver approximately 1200 CFM. So, under the test conditions, your duct system was **"leaking"** 51% of the air needed to heat and cool your home into unconditioned spaces.



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# The Energy Audit

Duct leakage should be  
no more than 4 CFM @  
25 Pa per 100 SF.



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# The Energy Audit

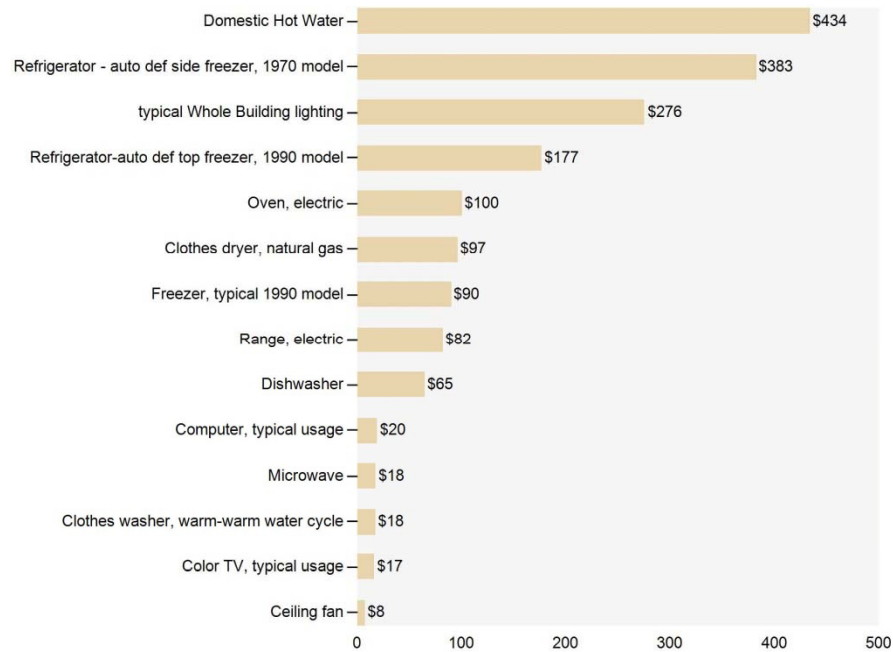


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# The Home's Base Load Requirements...

Base Load Use and Cost Breakdown





# Projected savings will Change the Garcia's lives

Energy Savings Projected  
to be @ 63.6%



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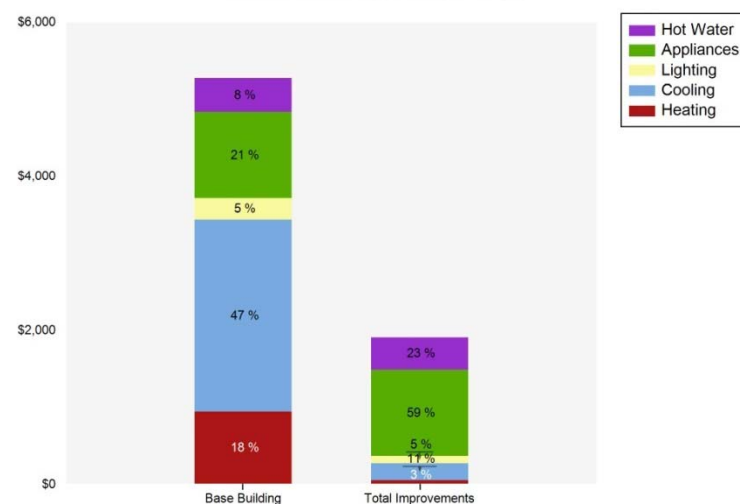
# The Energy Audit Projections based on improvements to be made



## SOLUTIONS:

- E. Properly sealed ducts
- F. Registers and grills tightly sealed to ducts
- G. Sealed furnace and filter slot
- H. Well-insulated ducts in unfinished areas
- I. Straightened flexible ducts with improved airflow

Total Annual Energy Bill by Category



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Heating	\$942	\$55	\$887
Cooling	\$2,495	\$213	\$2,282
Lighting	\$276	\$92	\$184
Appliances	\$1,121	\$1,121	\$0
Hot Water	\$434	\$434	\$0
Total	\$5,268	\$1,914	\$3,353





# Monitoring the Energy Usage...



## Energy, Inc. introduces **TED 5000 Series.**

**Proven to help you reduce electricity usage by an average of 12.6%.**

- Sensitive to one watt of electricity.
- Accurate to within 2%.
- Project monthly bills.
- Optional wireless display.
- Stores up to 10 years of data.
- Measures voltage and kW/hr.
- View data remotely.
- Charting, graphing, trending.



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# What Improvements were made?



**recraft**   
Construction Services  
& Green Remodeling

**thirty**  **green**



# What Improvements were made?

HVAC System...Carrier GreenSpeed™ Heat Pump with Dual Fuel Gas Back-Up, Infinity Control, Re-Designed R-8 Flex Duct Work System, Night and Day Zone Control System, Carrier Attic Mounted Air Filtration System to include UVC Lamps.

Installed By: Davis A/C and Heating, Inc.



# What Improvements were made?





# What Improvements were made?

Attic Ventilation and Radiant Barrier...Improved intake by adding Gable Vents and installing a Solar Attic Fan (by Attic Breeze). PolyCore™ Perforated Radiant Barrier with 2 layers of highly reflective metalized film to the underside of the Roof Rafters.

Installed By: Heat Blockers



# What Improvements were made?

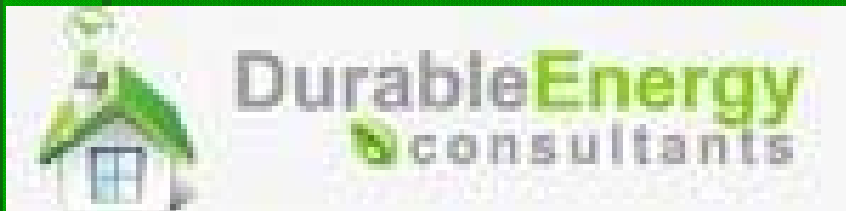




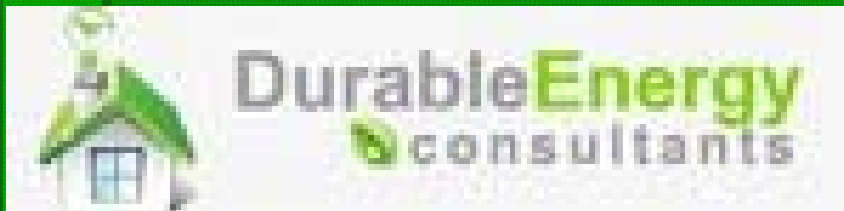
# What Improvements were made?

Insulation and Air Sealing...Removed all of the old insulation (to improve Indoor Air Quality), air sealing at the ceiling level with Owens Corning “Energy Complete” and installed R-38 Blown-in Owens Corning Insulation.

Installed By: Durable Energy Consultants



# What Improvements were made?





# What Improvements were made?

Windows...Home Craftsman Double Pane Low-E Cardinal 366 glass with a SHGC of .22 in Vinyl Frames with tilt in for ease of cleaning.

Installed By: Wonderful Windows



# What Improvements were made?





# What Improvements were made?

Exterior Wall Insulation...**Homesulate**™ Foam Insulation was specifically designed and formulated as a highly efficient thermal and acoustical cavity fill insulation. For 36 years, it has been specified and installed in more than 390 million square feet of new and existing commercial and residential construction.

Installed By: HomeSulate



# What Improvements were made?





# Investment for Total Improvements...

\$36,306.00

## R.O.I.

Cost 36,306

Annual savings MBTU 129.2

Annual Savings \$3,310

% of Savings 60 + %

Payback Years 11

Cash Flow \$/Year \$114

SIR 2.10



# Re-testing after Improvements were Completed...

Reduced air Infiltration from 4.45  
times too much to 1.9.

Reduced Duct Leakage from 51% to 4%



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# In the Words of the Garcia's

"First of all, the entire experience was fantastic. Tim and I learned so much and I could never have predicted the impact both the knowledge and the improvements would have on us. Not to mention the blessing of getting to know all of the amazing people involved with the project and the friendships that developed throughout the process. I can't say enough about the human element of the project... everyone was just fantastic and so giving and fun to work with."

"The Energy Audit was a big WOW for us. Some of the fixes might be big ones, but honestly, most of them are the little fixes that you might not have thought of or hadn't gotten around to."



# In the Words of the Garcia's

"Wall foam stuff! I had no idea the impact this part of the project would make on our home and myself, individually. Usually the wall next to my side of the bed is warm to the touch and it can get hot on my side. I immediately noticed that the wall was cool and so was my 'spot' in the bed. That was when it hit me... this product was a really good thing."

"The impact the new windows made, both cosmetically and efficiency-wise is dramatic!"

"Wow' and 'Cool' reaction we get when people go in the attic. The ductwork and reconfiguration of the attic is a site to see. Everyone commented that they had never seen an attic like ours. All that fuss over an attic... who knew?"





# August Electric Bill...

Here is a re-cap of the Energy bill analysis for the 2011 Energy Saving Makeover.

August 2010 (7/28/10-8/27/10) (31 day cycle)

\$503.40 Actual amount of bill

\$118.30 Amount added to allow for Extreme August 2011 Weather conditions; Hotter Summer, Higher Air Conditioning Loads and Higher Summer Utility Bills. The Weather Normalization calculation process and procedures that we followed were suggested and reviewed by James Sweeney from The Energy System Lab at Texas A & M University.

\$621.70 Adjusted total for August 2010

August 2011 (7/29/11-8/29/11) (32 day cycle)

\$284.68 Actual amount of bill

<\$9.37> Adjustment to allow for a 31 day billing cycle

\$275.31 Adjusted Total for August 2011

A total savings of \$346.39 were indentified resulting in a 55.7% percentage saving by comparing August 2010 to August 2011 as described above.



# September Electric Bill...

The Garcia family is very excited. They just received their September 2011 electric bill. It was for a thirty day billing cycle, which resulted in a total of 2032 KWh usage and a total amount of \$252.48.

In September of 2010, their bill was for a 31 day billing cycle with 7937 KWh usage that resulted in a total bill of 987.23.

Savings of \$734.75 and a 74.4% reduction in electrical consumption.

In September 2011, we were still having record temperatures compared to 2010, so the even greater news is that once we adjust for weather and correct for the one day in the billing cycle, the September reduction will be even greater than the above.

Just a reminder that the Energy Audit predicted an energy savings of 63.6%, based on the improvement package for a twelve month period.

We are tracking, after two months, over 65% savings and I believe we are well on our way to the 63.6% predicted.





# Plumbing Improvements to Reduce Water Consumption...

Reduction of water Consumption has been estimated to be 60% or greater, after Improvements.



# Green Certification...

National Association Home Builders Research Center, “National Green Building Standard for Remodeling”.

Under the Green Remodel Standard for homes built prior to 12/31/1979, the following conditions must be met for a NAHB RC Green Certification:

The Green Remodel Path compliance method follows the same format of a mandatory baseline and four performance levels (Bronze, Silver, Gold, Emerald). The mandatory provisions focus only on the minimum expectations for indoor environmental quality and include a total of five mandatory practices from the standard. The performance levels address water and energy efficiency and are based on a degree of improvement relative to the existing performance.





# Green Certification...

Reductions in both energy and water consumption must be implemented, with the overall rating for the home based on the lowest performance level achieved. Energy consumption must include heating, cooling and water heating. Water consumption must include all water uses including indoor and outdoor.

**Energy and Water Reduction % Thresholds:** Bronze (20%), Silver (34%), Gold (43%), Emerald (50%). A third party Energy audit before and after remodeling efforts must be accomplished to validate the energy reductions received. A water usage analysis must also be completed before and after the remodeling efforts to verify the water reductions.



# Green Certification...

This year's Thirty Green Energy Savings Makeover has been submitted to the NAHB RC for consideration to be Certified as a Performance Level "Emerald" Remodel!

The NAHB RC has responded back with Great News... They are predicting an overall Energy Reduction for the home to be in the 80% range.





# Thirty Steps to Saving Thirty Percent...

Twenty-three of the Thirty Steps were used on this years 2011 Thirty Green Energy Savings Makeover Home to Reduce the Garcia Family's Energy cost while improving the home's comfort and health, while increasing the value of the home.



# Then the Tree Fell...



How do I account for this type of infiltration?





# Special Thanks To...

Five-Two-One Compressor Saver



James Sweeney  
Riverside Energy Efficiency Laboratory

Curtis Goodson  
American Plumbing Co.

