

Larry Taylor
presents

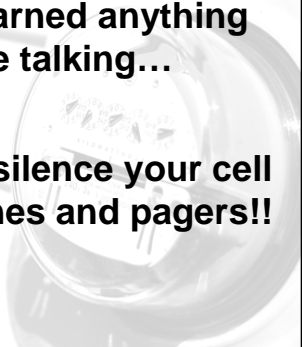
Cutting Through the Hype



AIRRITE
Indoor environmental solutions provided

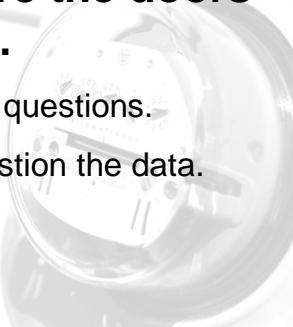
No one ever learned anything
while they were talking...

...please silence your cell
phones and pagers!!



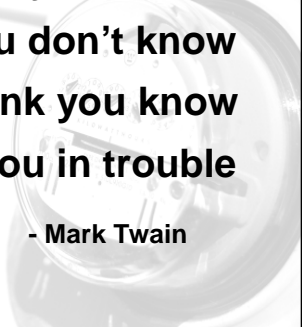
Questions are the doors to learning...

- Always ask questions.
- Always question the data.



It ain't what you know
It's what you don't know
That you think you know
That get's you in trouble


- Mark Twain



Is Going Green related to Energy Efficiency?

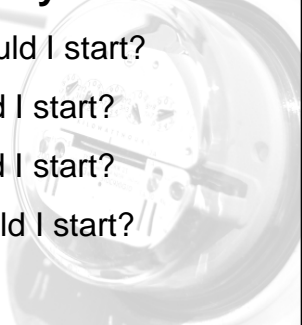
Which word do people have the most
positive feelings about?

- Conservation
- Going Green
- Energy Efficiency
- Sustainability



Questions always asked...

- **Where** should I start?
- **How** should I start?
- **Why** should I start?
- **When** should I start?



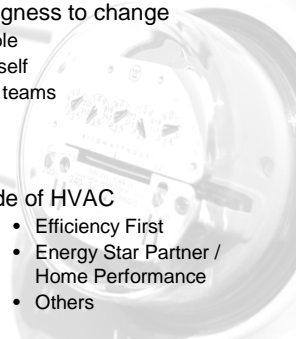
Where should I start?

- ACCA
- RESNET
- BPI
- ACI
- EEBA
- Energy Star
- Local Utility
- Building Science Knowledge



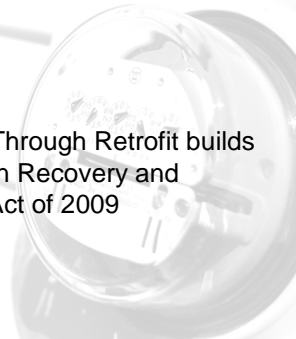
How should I start?

- Must be FULLY committed
- Must have a willingness to change
 - Get uncomfortable
 - Reinvest in yourself
 - Reinvest in your teams
 - Sales
 - Installation
 - Support
- Join groups outside of HVAC
 - RESNET
 - BPI
 - EEBA
 - ACI
 - Efficiency First
 - Energy Star Partner / Home Performance
 - Others



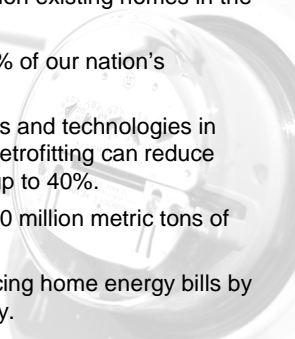
When should I start?

- Yesterday
- Today
- Tomorrow
- The Recovery Through Retrofit builds on the American Recovery and Reinvestment Act of 2009



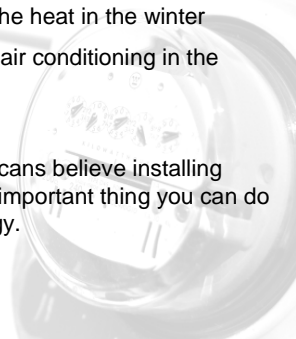
Is there a MARKET?

- There are 130 million existing homes in the United States.
- They generate 20% of our nation's emissions.
- Existing techniques and technologies in energy efficiency retrofitting can reduce energy usage by up to 40%.
- We can reduce 160 million metric tons of carbon by 2020.
- All this while reducing home energy bills by \$21 billion annually.



What Americans believe are the most effective methods for Conserving Energy...

- 75%...turn down the heat in the winter
- 63%...turn up the air conditioning in the summer
- 52%...air sealing
- Only 6% of Americans believe installing CFLs is the most important thing you can do to conserve energy.



Why an Energy Audit?

“It wasn’t raining when Noah built the ark.”

- Howard Duff



Why an Energy Audit?

- 84% of homeowners have never had an energy audit of their home.
- A DOE study shows \$4.50 out of every \$10 spent on energy is spent heating and cooling the home.
- \$1.40 out of every \$10 spent on energy is spent on heating water for the home.
- Lighting and appliances make up the balance of energy costs in a home.
- An EPA study shows over 50% of all HVAC systems are not operating at their "labeled" efficiency.

Barriers

- Consumers' access to straight-forward and reliable information
 - Access to **Financing**
 - Access to a **Skilled Workforce**

Movement to Overcome Barriers

- Developing an Energy Performance Label for Homes
- Developing a National Home Energy Performance Measure
- Development of support for Municipal Energy Financing
- Improvement of Energy Efficient Mortgages
- Expansion of State Revolving Loan Funds
- Establishment of National Workforce Certification and Training Standards

Competitive Local Barriers

- FREE audits
- FREE services / add-on offers
- Lack of competitor's knowledge
- Local market leader is often the LOW PRICE market leader
- Lack of Municipal Inspector's knowledge
- Co-ops...some offer help...some don't

What's all the Hype?!

FREE audits / evaluations

- It's NOT REAL...only performed by those with minimal knowledge, with training only on the product they sell.
- Audit used mainly to sell their product or service.

My product will save ___% energy.

- Check the fine print...most will state the amount saved or energy consumed by their product ONLY.
- BUT the wording creates the perception of TOTAL UTILITY energy savings.

My house is AIR TIGHT because I have ___ inches of insulation.

- Most types of loose-fill insulation do not stop air transfer or infiltration.
- Most insulations only have ratings for R-values related to heat transfer.

A Radiant Barrier will lower my energy cost by ___%.

- While radiant barriers may assist in lowering energy cost, there may be more effective uses of limited funds.
- The determination and sequence of other energy measures can only be identified and prioritized through a Whole-house Professional Audit by a trained rater.
- These raters can model the house and proposed energy measures using a nationally accepted modeling software that presents a full report of findings, including the sequence of measures to perform and estimated energy savings.

Sealing the duct system will reduce energy cost.

- While sealing the duct system is a good thing to do and may save energy, it may also create an increase in operation cost.
- If the duct system is too small to begin with (60% - 80% are), then the increase in static pressure on the system may also increase the operating cost, while lowering comfort conditions.
- Before sealing, always measure and test air flow; run and MJ8 room-by-room; and compare to existing ducts.
- You may find that replacing the duct system is a much better overall energy and comfort solution.

New windows will save ___% energy.

- While new high energy efficient windows may provide energy savings, they don't always measure up to their promises.
- If the existing windows are double-pane, the energy savings of installing newer windows will end up toward the bottom of energy measures (as defined by testing and modeling).
- In addition, new windows may cause other problems in the home, such as combustion safety issues, increased humidification problems and/or IAQ problems.
- A Professional Audit is required for verification.

A new high efficiency HVAC unit will save ____%.

- Oftentimes, removing a 10-SEER and installing a 13-SEER or higher may actually increase operating cost, lower comfort levels, and increase humidity levels, which could create mold growth conditions and IAQ problems that could potentially lead to liability issues for the installing contractor.
- Testing using National Audit Standards and following ACCA QI/QC and QI/vp programs will help to minimize this exposure.

Converting my attic to a non-vented attic will save energy.

- While there is a lot of discussion on this issue, the short answer is MAYBE.
- If you just insulate the roof deck and don't pay very close attention to the infiltration issues in the attic, then you may do more long-term harm than good in addition to wasting a lot of time and money.
- Always lowering the attic temperature properly will result in lower energy consumption related to the temperature of the attic...it just may not convert to Whole-house Savings.

Adding insulation to my attic is good for energy savings.

- Most of the time additional insulation in the attic space will result in lower energy consumption.
- However, it may increase IAQ problems if proper air infiltration sealing is not performed prior to the additional insulation.
- Most of us have seen the by-products of rodents in attic spaces and throughout the insulation. The by-products of these rodents can create a virus named HUNAN.
- Rodent-borne diseases are spread directly to humans through bite wounds; consuming food or water that is contaminated with rodent feces; coming in contact with surface water contaminated with rodent urine; or through breathing in germs that may be present in rodent urine or droppings that have been stirred into the air (a process known as "aerosolization").

Using a stand-alone dehumidifier will solve my humidity problems.

- While stand-alone dehumidifiers will remove large amounts of moisture during non-HVAC demand periods, you may not solve the high humidity issue.
- Dehumidifiers may be sized based on air changes (ACH) per hour @25 pa. Verify unit's capacity before installing.
- This ACH can only be obtained by whole-house infiltration and duct leakage testing.
- Any other process is just GUESSING!

High efficiency air cleaners will solve my IAQ issues.

- We have found many installed air cleaners actually cleaning the air going through them to the specification of the product, while the occupant is still complaining of dusty conditions, allergy issues, odors, and other IAQ problems.
- We have found in these cases that the contractor failed to **stop the source** and **only tried to treat the symptom**.
- By not identifying the source through infiltration / duct leakage testing, thermal envelope testing, and VOC checks, they most likely provided the wrong prescription.

We are making homes too tight.

- Actually, we can't make a house too tight...but we can **LEAVE** it too tight!!
- You should always build a seal as tight as possible and then control the amount, quality, and quantity of outdoor air entering the inside of the thermal envelope of the structure.
- As professionals, we should provide solutions...not problems!!

I use ___ product to remove odors and VOCs from homes.

- Research shows that the only pure way to rid any area of these products is through air dilution by air intake and exhaust systems.
- **All other means are only masking the problems while providing the occupant with a false sense of IAQ.**
- If you have an A/C or heating capacity problem using air dilution, then explore using an ERV or HRC unit for outside air intake to offset your capacity losses.

Roof turbine vents will save energy.

- While these may lower the attic space temperature, they may actually increase energy cost.
- Installing these without knowing if the house is in a positive or negative pressure, you may be lowering the attic temperature by pulling cold air out of the house.
- Most installers of turbine vents will not increase attic air make-up to keep balanced pressure in the attic space.

Installing Powered Attic Ventilators (PAVs) will save money.

- While these may lower the attic space temperature, they may actually increase energy cost.
- A PAV will move a much higher volume of air than a turbine, causing a greater negative pressure situation in the attic space.
- This air must be made up from some location, which is typically from the interior of the house due to duct leakage, recessed can lights, other thermal bypasses, or thermal envelope leaks.
- When this leakage happens, the HVAC system will have to work harder to provide comfort conditions inside the home, increasing runtime and operating cost.

Replacing my incandescent bulbs will lower energy cost.

- With new energy efficient lamps, consumers are running the lights longer, which may result in additional energy usage above the estimated savings.
- With the increased runtime, the thermal temperature of the recessed fixture may cause an increase in the stack effect, which causes larger losses of inside air.
- The loss of inside air increases the need of make-up air and additional HVAC runtime.
- Oftentimes this condition creates additional comfort issues as well as IAQ issues.

How do I handle the HYPE?

- Get past your **EGO** of not having all the answers.
- Fall back on Building Science training and knowledge.
- TEST...TEST...TEST and then verify.
- Don't jump to conclusions without all the **DATA**
- Don't be driven by customer urgency, which will lead you into traps. Remember, this is not like down equipment...the problem has been going on for some time.
- Don't allow it to become your problem.

How do I protect my company?

- TEST...TEST...TEST...gather all the data.
- Analyze the data and facts.
- Report factual, proven, and verified information...NOT opinions and or preceptions.
- Provide a **FULL WRITTEN REPORT** on any and all recommendations and scope of work with clear expectations of results.
- Don't allow the customer to rush you...there is much more exposure in this type of work compared to the normal HVAC jobs (repairs / replacements).
- Have the customer **sign off** on receipts of recommendations; scope of work; and sequence of improvements. Otherwise, as other trades become involved and changes are made, they don't reflect back on you.

How do I price the work?

- Remember...this is not a commodities product like HVAC equipment.
- It's **labor intensive** with **low materials cost**.
- Overhead percentages must be adjusted accordingly.
- It requires an advanced level of knowledge and training.
- There's a large investment in testing equipment.
 - Infiltrometers
 - Duct Blasters
 - Infrared Cameras
 - Computers and Specialized Software

Resources

- Home Energy Magazine
- Efficiency First Organization
- Comfort Institute
- ACCA
- Energy Star...HPwES, Energy Star Weatherization Programs
- RESNET
- Affordable Comfort Institute (ACI)
- Building Performance Institute (BPI)
- ASHRAE
- Utilities

Opinion

- The HVAC industry has been a leader in our country's progress of producing health, safety, and comfort to its citizens.
- But it has also been one of its least effective guardians of energy due to less-than-desirable installation and service practices.
- Today and tomorrow we have the opportunity and obligation to correct our past mistakes by using the knowledge and skills we have toward helping our customers improve their energy consumption.

**The future lies in
offering a clear
alternative that
has value.**

Closing thoughts!

**We live in a moment of history
where change is so speeded up
that we begin to see the present
only when it is already
disappearing.** R. D. Laing (1927-89)

**The "Doors of Opportunity"
are marked...**

**PUSH or PULL
You choose!!**