



Stories From the Field

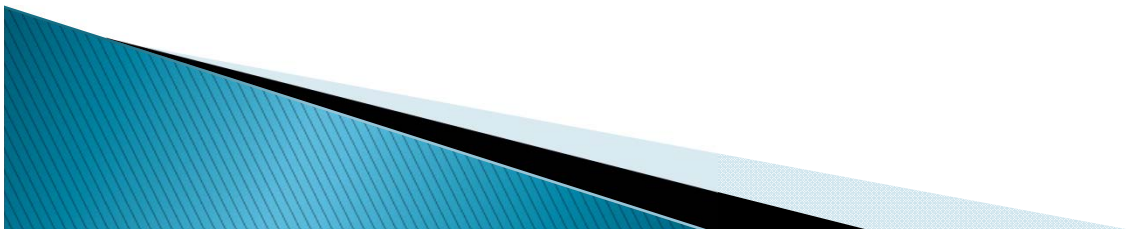


Building America

Culture eats strategy for breakfast!

Found on a wall in the Ford Motor Company

“Way Forward” strategy room



Deep Bench



Kat Benner



John Bobb



Erin Bordelon



James Brauer



Ross Britton



Jerold Davis



Aaron Gary



Paul Gay



Jason Helm



Brian Mount



Josh Newman



Casius Pealer



Anthony Pinero



Randy Plumlee



Steve Saunders



Greg Shaw



Kristin Shewfelt



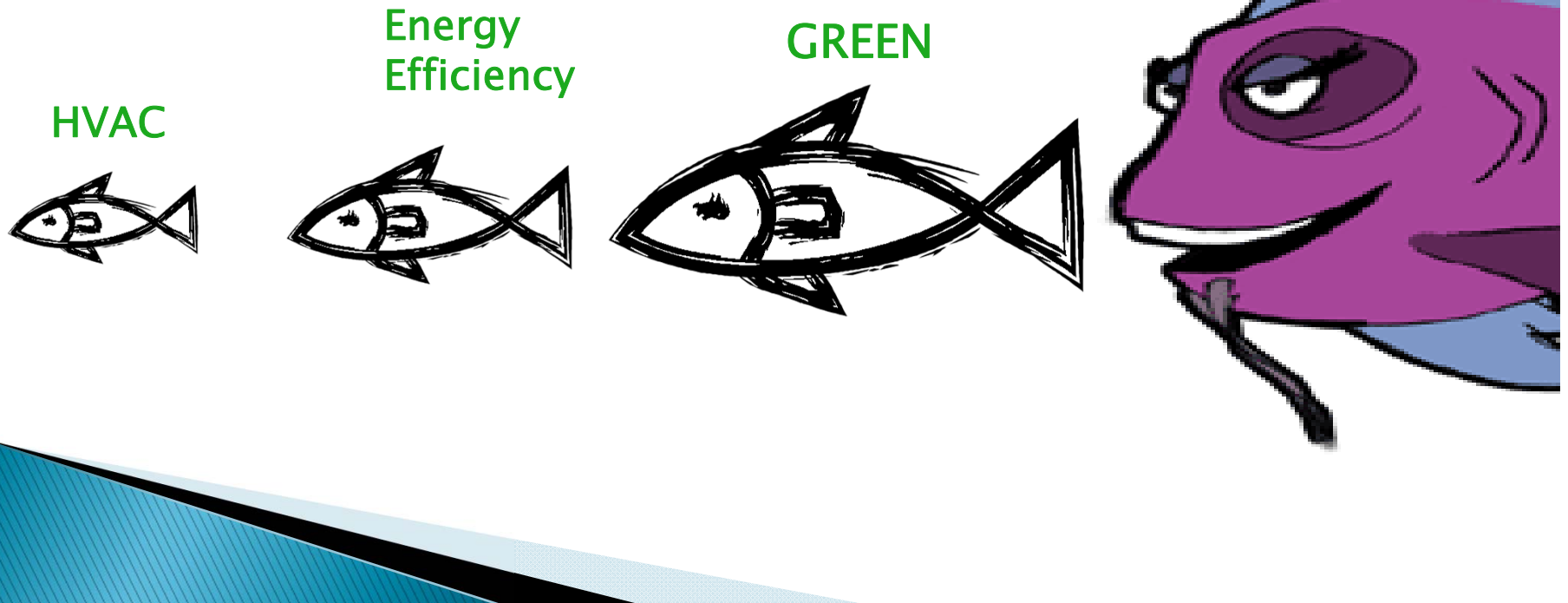
Jeff Slaugh

HERS Rater Certified	30
HERS Trainers	4
HERO Auditor	9
BPI Analyst	1
HERS QAD	4
LEED AP	9
LEED Green Rater	7
LEED QAD	7
LEED Faculty*	3
NAHB Green Verifier	3

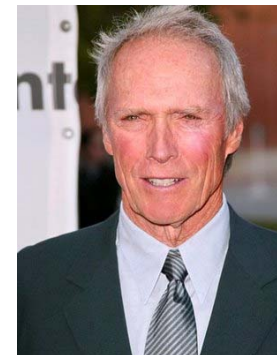
* May 1, 2012

HVAC is the Core

But there are bigger fish out there!

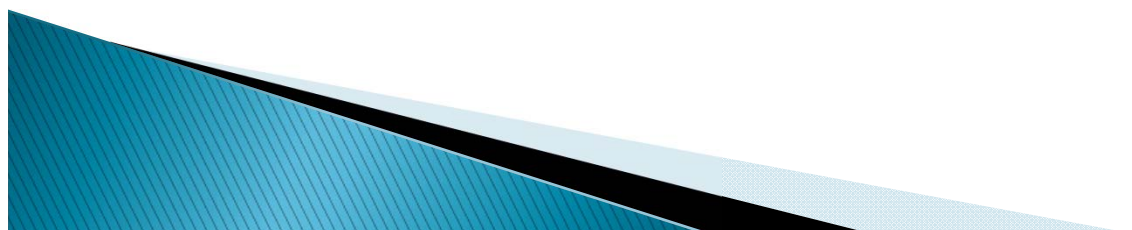


At Half-Time in America:

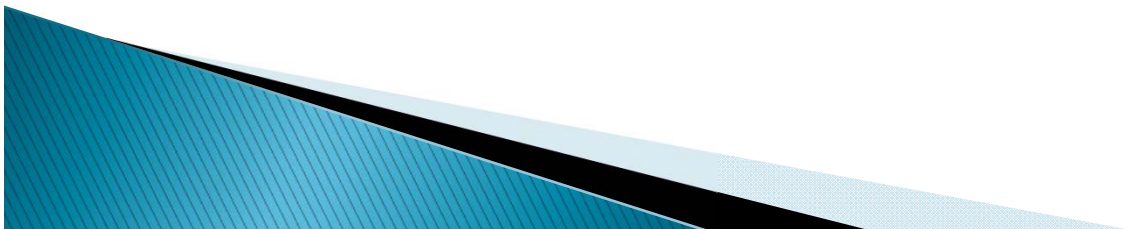


The Score for Home Performance:

- ▶ Almighty Dollar – 100
- ▶ Environment – 0



Are Audits Valuable? (not always – but....)



Are Audits Valuable? (not always – but....)

When “new wife” is paramount – White
Dallas

Audit	\$ 500
Performance	<u>\$103,000</u>
Total	\$103,500

Project complete and paid.



Are Audits Valuable? (not always – but....)

When “green” is paramount
New York State

Audit	\$ 12,500
Renovation	<u>\$250,000</u>
Total	\$262,500

Audit complete and paid.
Planning for renovation.



Are Audits Valuable? (not always – but....)

When “multiple bidders” give conflicting information–

Ft. Worth

Audit	\$ 1,000
Performance	\$ <u>91,000</u>
Total	\$ 92,000

Project complete on March 2012



Are Audits Valuable? (not always – but....)

When “Comfort” is the key –
North Dallas

Audit	\$25,000
Energy Renovation	<u>\$390,000</u>
Total	\$421,000

Project complete and paid 100%



Lies

Damn Lies

Comprehensive
Audits

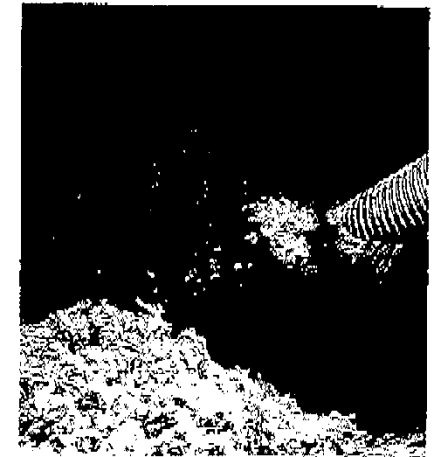
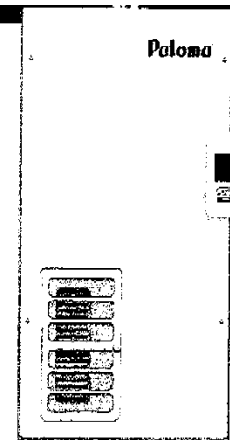


Over-Promise / Under-Deliver



**WINDOWS INSTALLATION
CUT ENERGY COSTS
BY UP TO 15%**

**TANKLESS WATER HEATER INSTALLATION
CUT ENERGY COSTS BY UP TO
33% & NEVER RUN OUT OF
HOT WATER AGAIN**



**INSTALLED INSULATION
CUT ENERGY COSTS
BY UP TO 10%**



Save up to 59% a year
on Utility Bills with a
Trane High Efficiency
Comfort System.

Call for a Free In-Home
Comfort Consultation.

117% "BACK TO THE GRID"

PROMISES / PROMISES

- ▶ Super efficient windows save 50%*
- ▶ Super high SEER A/C super saver 43%
- ▶ Programmable thermostat saving 30%
- ▶ Award winning radiant barrier savings 30%
- ▶ CFL lights save 14% per light x 50 fixtures 22%
- ▶ Duct sealing saves 10%
- ▶ Tankless water heater savings 20%
- ▶ R-50 ceiling insulation savings 19%
- ▶ Our super solar puts power back to the grid

Total Savings 224%

*"saves up to"



PROMISES / PROMISES (continued)

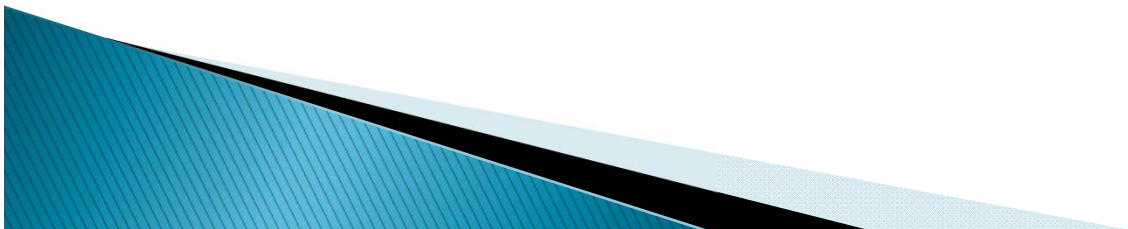
Total Savings 224%

Deductible 50% for hype 112%

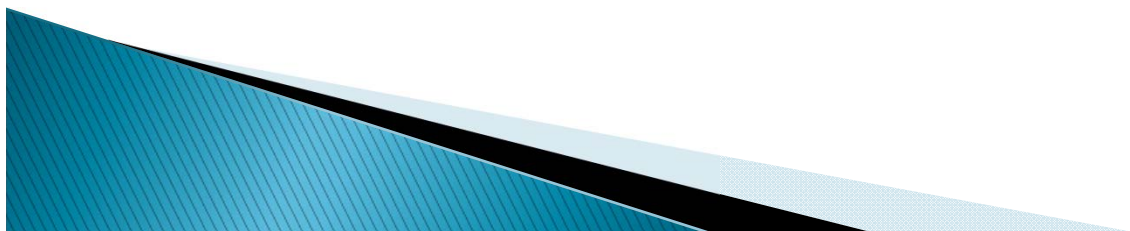
Send 12% back to the grid

We feel sooooo superior!

*"saves up to"



OOPS!



OOPS!

# of Houses	Average Base HERS	Average Projected HERS After Improvement	Projected/ Base HERS Δ 17 Deep Energy Retrofit	Average Original Electric Utility Bill kWh x Rate = \$	Average of 2011 Post Improvement Electric Utility Bill kWh x Rate = \$
17	162	97	64	\$4,711.74	\$4,293.52

Average Savings Per Home	\$418
Average Cost of Improvements	\$20,295
Average Year to Return Investment	48 years



Two Thoughts –

1. Oh No!

quickly followed by

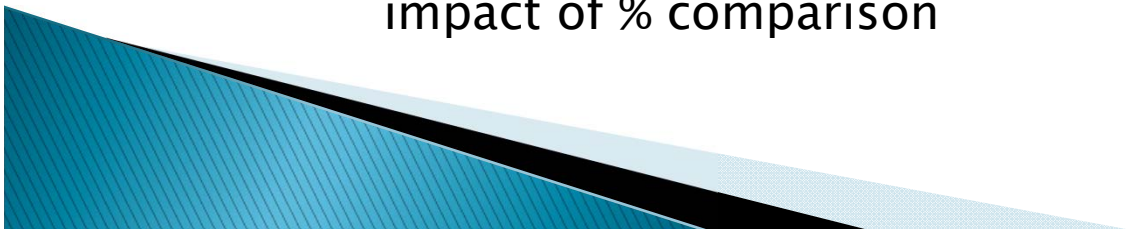
2. How come I'm still alive?



Suggestions for Ongoing Research

Improve Predictability of Energy Audit forecast

1. “Calibration” of Pre Home Performance Utility Bills
 - Disaggregation
 - Weather Normalization
2. Inspection and Testing (Time reduction for physical audit)
 - Speed time of Test –Validation of Delta Q
 - Field Automation Tools
 - Input data simplification (fewer data points, align data discovery for both Load Calc and Energy Model
 - Automation of input (remote data entry – tablet “ap”)
3. Off Site – Analysis of Audit Data
 - Contractor DB f – can we control “over shoot”
 - HERS Index Validity – confidence on > than 130 HERS and impact of % comparison



Suggestions for Ongoing Research

3. Off Site – cont'd

- Impact of changes in base load, HERS and energy use prediction and actual
- What is potential impact of Time of Use and Demand Response
- Utility Bill escalation Clause (create an intelligent / reasonable standard) – reduce wild west of forecast
- Software auto create analysis of “measure bundles”



Suggestions for Ongoing Research

Additional Research Questions

1. Energy Model not tied to a current code (more accurate?)
2. Analog vs. Digital Meter (Cawthon “outlier”)
3. Digital Data for QA (i.e. use changes from interval meter data to validate measure vs. 2nd test from oversight org)
4. Energy improvement quantification from implemented measures
5. Impact of year over year actual (normalized) and of HVAC maintenance (no effective studies exist)
6. Many other things that could be done with (reported) results of digital information
7. Study with Urban Living Laboratory (instrumented MF data)
8. On Bill finance for efficiency (potential impact in both Regulated and Deregulated states)



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