ENERGY PERFORMANCE SCORE

Energy Performance Score Pilot for Existing Homes

Conservatin Advisory Council

January 12, 2011

EnergyTrust of Oregon

The Energy Performance Score

- An asset-based performance metric
- A Miles-per-gallon (MPG) for homes
- tool for strategic engagement of customers and markets
  - but only if it can be a reliable
  - accepted
  - effective tool in the field
- used as a resource to give visibility and awareness to consumers on the performance of their home's shell and mechanical systems under standard operating conditions

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The Energy Performance Score is not

- a certification
- a program
- a guarantee
- a cash incentive
- an alternative to Home Performance with ENERGY STAR®

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Advantages of the EPS

- Helps homeowners compare their energy usage with homes of a similar size to theirs
- Provides a target score that homeowners can achieve with recommended upgrades
- Shows energy use on a scale

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How is EPS Calculated?

Data Inputs

- Home size
- Insulation levels
- Air leakage
- Duct leakage
- Heating and cooling systems
- Several other factors

** Energy modeling assumes average operating conditions. Actual use may vary on number of occupants and behaviors.*

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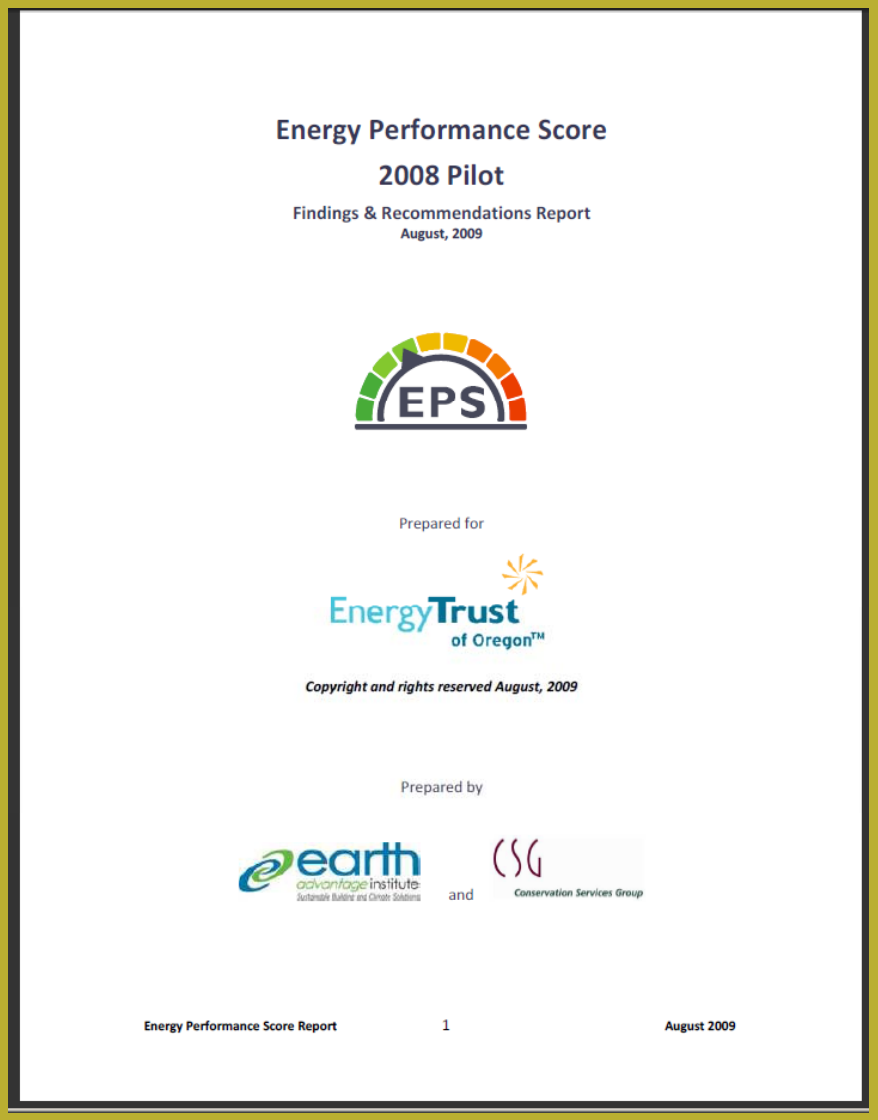
LA2

Phase 1 Report

http://energytrust.org/library/reports/EPS_2008_Pilot_Report.pdf



Energy Performance Score

2008 Pilot

Findings & Recommendations Report

August, 2009

EPS

Prepared for

EnergyTrust of Oregon™

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Prepared by

earth advantage institute — Sustainable Building and Climate Solutions

and

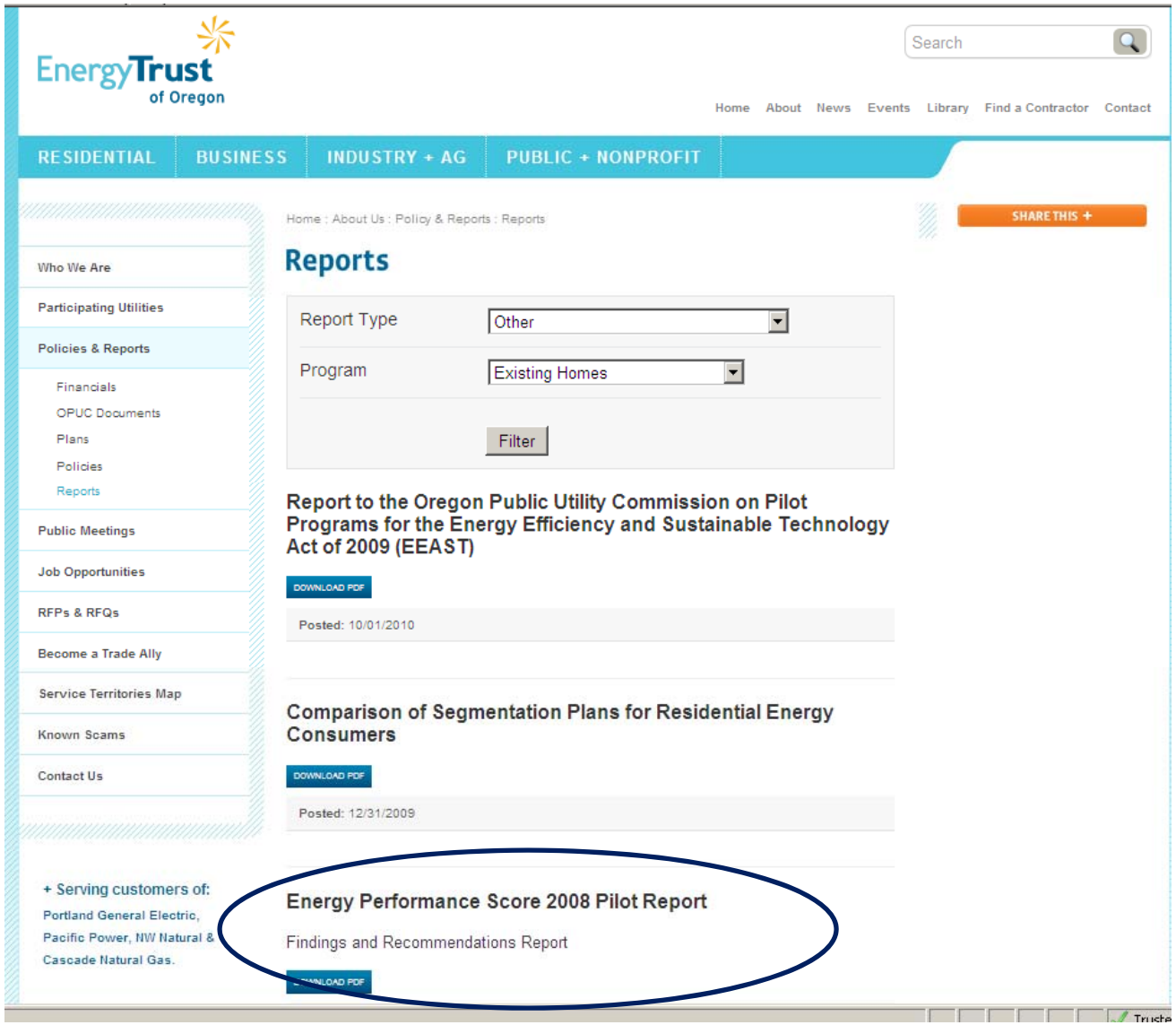
CSG Conservation Services Group

Energy Performance Score Report 1 August 2009

Slide 6

LA2 Remove this section?
Lynda Arakelian, 11/15/2010

Library/Reports – Search by Existing Homes



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Findings from Initial EPS Research

1. Complicated models were no better at forecasting energy savings than less complex models.
2. The best performing non-complex model had an apparent error band of plus or minus 30%.
3. Comparisons to billing data are not the accurate test of a model's forecasting efficacy, due to homeowner behavior.
4. A set of enhancements to the less-complex energy models might improve accuracy.
5. More tests of improved models in comparison to a standardized baseline (non-bill) should be conducted.

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Next Phase EPS with DOE’s HES

Goals of the EPS Pilot

- Does an EPS motivate a customer to act, in terms of sooner, deeper or both?
  - Which information is most useful
    - Score or no score, energy usage & savings representation
    - How do consumers relate carbon footprint information
  - What are the customers' visual preferences
- Does an EPS have efficacy in:
  - Directing customers to do the right sorts of things
  - Assigning a comparative ranking without diagnostic testing
  - Predicting energy saved without diagnostic testing
  - Which of three models perform better (HES, SIMPLE and RHA2)
- What is ease of use in the field for the three models

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EPS Next Steps

- Continued vetting of visual score for consumer preferences on look, feel & content
- Further analytic review of alternative approaches
  - SIMPLE 2.0
  - RealHomeAnalyzer2 (RHA2)
  - DOE's Home Energy Score (HES)
- Impact of home performance scores on influencing home improvement follow through rates

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Pilot Overview

- 400 gas homes in total will get an assessment with a score
  - 200 Homes provided DOE's HES (Score & Recommendations)
  - 200 with RealHomeAnalyzer 2.0 EPS (Score & Recommendations)
  - All homes will be modeled with SIMPLE as well
  - Standard HERs will be used as benchmark for follow through rates
- Feb launch, March-April analysis (consumer surveys 1 week & 6 months)
- BPI certified technicians as Energy Advisors (5 dedicated)
  - For this effort Advisors are from the PMC*
- Training (HES, RHA, Call Center, Contractors)
- Homes will be randomly assigned from the requests for a Home Energy Review (free checklist audit)

*PMC: Program Management Contractor
Conservation Services Group

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Overview (Continued)

- Home energy score provided to homeowner on site
  - –Recommendations sheet
  - –Packet of materials
    1. List of Trade Allies
    2. List of Incentives
    3. Measure fact sheets based on recommended measures
    4. Energy Advisor business cards
  - –Follow-up with 2 surveys (1 week & 6 months)
- Not doing a blower door test

  Leakage will be assigned based on advisors assessment of multiple characteristics of home including visual inspection (values are based on multiple historic leakage rates, home size, foundation, age, number of stories)

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Energy Performance Score

ENERGY PERFORMANCE SCORE

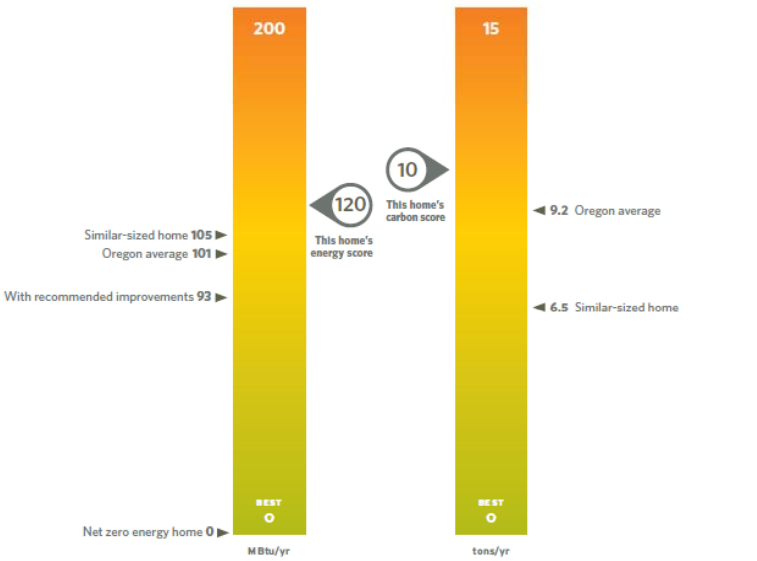
INDEPENDENT ASSESSMENT OF THIS HOME'S ENERGY CONSUMPTION, COSTS AND CARBON EMISSIONS

ENERGY CONSUMPTION

Measured in million Btu per year (MBtu/yr).
One million Btu = 293 kWh or 10 therms.

CARBON EMISSIONS

Measured in tons of carbon dioxide per year (tons/yr).
One ton = 2,000 miles driven by one car (typical 21 mpg car).



REPORT FOR: 12345 Example Road, Portland, OR 97217

PREPARED BY: John Sweet, Energy Trust of Oregon

ISSUE DATE: 02-01-2010

YEAR BUILT: 1975

SQUARE FOOTAGE USED FOR ENERGY CALCULATIONS: 2,000

ESTIMATED ANNUAL ENERGY USAGE:
Electric (kWh): 5,558
Natural gas (therms): 1,028

IDENTIFICATION #: 123456

TYPE: Single Family

ESTIMATED AVERAGE ANNUAL ENERGY COSTS*:
$1,674
monthly average: **$139**
*Actual energy costs will vary.

PGE · NW Natural · EnergyTrust of Oregon

EPS

Energy Performance Score, or EPS, is a tool to assess a home's energy consumption, costs and carbon emissions.

The Easy Way To Compare Energy Use

Energy efficiency, utility costs and environmental impact are important factors to consider when buying or building a home. They can affect the real and perceived value of a home, but aren't always easy to quantify.

EPS compares a home's energy consumption, costs and carbon emissions with those of similar sized homes in Oregon.

Measuring Energy Use and Costs

EPS calculation is based on several factors: square footage, air leakage and ventilation, insulation, windows, heating and cooling systems, water heating, lighting, major appliances and standard operating conditions.

Actual energy use will vary with occupant behavior and weather. Fuel costs are based on retail prices of each gas and/or electric utility at the time EPS is issued.

Only professionals certified by Building Performance Institute can offer EPS from Energy Trust, ensuring an accurate estimate of a home's existing conditions. For more focused measurements, a Home Performance with ENERGY STAR® evaluation conducted by a Home Performance contractor can provide additional diagnostic testing.

Carbon Emissions

A home's energy consumption affects carbon emissions and impacts the environment. The EPS estimates these emissions from the electric production and natural gas consumption of the home to create a carbon score. You can change your carbon footprint by purchasing renewable energy options from your utility or other carbon offset programs.

Brought To You By Energy Trust of Oregon

Energy Trust is an independent nonprofit organization dedicated to help residents use less energy and manage costs. Energy Trust developed EPS to educate Oregonians about energy efficiency and provide a tool to make informed home-improvement decisions.

Provide this EPS to an agent or appraiser during the process of selling or renting out a home. It can help showcase the home's energy efficiency, costs, market value and improvements.

For more information about EPS, contact Energy Trust at **1.866.368.7878** or visit **www.energytrust.org/eps.**

USEFUL TERMINOLOGY

Energy Calculation
The Energy Performance Score is displayed in millions of Btu (MBtu) per year.

A Btu or British Thermal Unit is a measurement of the heat content of fuel. One Btu = the energy produced by a single wooden match.

$$\frac{\text{Annual kWh}}{293} + \frac{\text{Annual therms}}{10} = \text{annual MBtu}$$

Oregon Average Energy Score
The average annual energy consumption of electricity, natural gas, and other fuels from typical homes.

Oregon Average Carbon Score
The annual carbon dioxide from electricity production and gas use for typical homes, built to typical pre-2008 Oregon building practices.

Similar-Sized Home
The energy consumption and carbon emissions of a similar-sized home built to typical pre-2008 building practices.

Carbon Emissions
Carbon dioxide is displayed in tons per year. The carbon score is calculated from the electric and natural gas consumption of the home. 1 ton = 2000 pounds of carbon.

For electricity: The carbon score is based on emissions from producing electricity. 1 ton of carbon = 2,217 kWh

For natural gas: The carbon score is based on emissions from burning natural gas. 1 ton of carbon = 171 therms

Energy Trust of Oregon 851 SW Sixth Avenue, #1200, Portland, Oregon 97204 1.866.368.7878 503.546.6862 fax **energytrust.org**

Energy Trust of Oregon is an independent nonprofit organization dedicated to helping utility customers benefit from saving energy and tapping renewable resources. Our services, cash incentives and energy solutions have helped participating customers of Portland General Electric, Pacific Power, NW Natural and Cascade Natural Gas save on energy costs. Our work helps keep energy costs as low as possible, creates jobs and builds a sustainable energy future. **Printed with vegetable-based inks on paper that contains 100% post-consumer waste. 12/10**

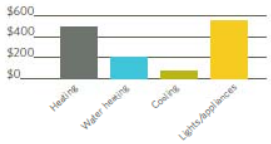
Recommendations Report

CUSTOM HOME ENERGY REPORT

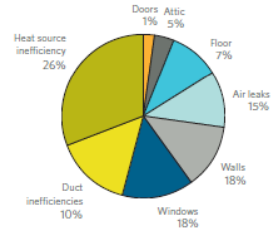
ENERGY-EFFICIENCY RECOMMENDATIONS FOR YOUR HOME

Report for: 12345 Example Road, Portland, OR 97217
Issue date: 02-01-2010
Year built: 1975
Prepared by: John Sweet, Energy Trust of Oregon

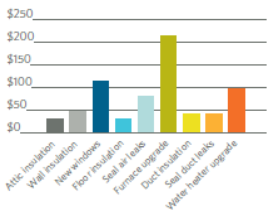
Current Annual Estimated Energy Costs



Where Your Home Loses Heat



Annual Estimated Energy Cost Savings



EXISTING CONDITIONS

Attic insulation	R-5
Wall insulation	R-4
Windows	single pane
Floor insulation	R-11
Air leakage	very leaky
Heating system	gas furnace, age, model #
Cooling system	type, age, model #
Duct insulation	R-3
Duct leakage	very leaky
Water heater	age, size in gallons, model #

RECOMMENDED IMPROVEMENTS

	Cost Range	Annual Savings	Energy Trust Incentive
Seal air leaks	$	$	$
Attic insulation	$	$	$
Water heater upgrade	$	$	$

Keep up the momentum! Making the recommended improvements listed above could be your greatest opportunity to improve comfort and energy costs in your home.

OTHER OPPORTUNITIES

	Energy Trust Incentive
Solar water heater	$
Solar pool heating	$
Solar electric	$
Recycle old refrigerator/freezer	$
ENERGY STAR* refrigerator	$
ENERGY STAR freezer	$
ENERGY STAR clothes washer	$
ENERGY STAR dishwasher	$

*Actual savings and payback results may vary and are dependent on many factors such as occupant behavior and weather. Savings estimates will vary slightly with diagnostic testing. Current Annual Estimated Energy Costs and Annual Estimated Energy Cost Savings are based on the most recent 12 months of energy use at this location. If the occupancy of the home changed during this period, results may vary significantly.

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US Department of Energy's

Home Energy Score (HES)

U.S. DEPARTMENT OF ENERGY

Energy Trust is One of Ten Home Energy Score (HES) Pilots under DOE

1. Allegheny County Pensylvania, Efficiency PA
2. Cape Cod and Martha's Vineyard, Cape Light Compact
3. Colorado Mountain Region, Energy Smart Program
4. Greater Charlottesville area, Virginia, Local Energy Alliance Program
5. Indiana, Hoosier Energy
6. Minnesota, Center for Energy & Environment
7. Omaha and Lincoln Nebraska, Cities of Omaha and Lincoln
8. Portland Oregon, Energy Trust of Oregon
9. South Carolina, Electric Cooperatives of South Carolina
10. Texas, United Cooperative Services

www.homeenergyscore.gov

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Home Energy Score (HES)

- An asset-based performance metric is produced with US DOE's Home Energy Saver (HES) Pro
- Scale from 1 to 10, with current score and score after upgrades, along with estimated annual savings
- Comparison home score is from national RECs data
- Includes total source energy use (MBTUs/year) and home size
- Includes *Tips to Save Energy at Home*, *Home Upgrade Recommendations*, and *Summary Page of Inputs*
- Pilots to provide recommendations reports to DOE by June 2011

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Updated Pilot Initiative Timeline

January

Technical Training

- Finalize Online Training Module
- Provide list of certified assessors
- Provide training access codes to certified assessors

Pilot Program Materials

- Draft marketing materials
- Draft quality assurance documents
- Draft survey questions and identify protocols for gathering data
- Provide feedback on materials

Launch Online Test Module

Assessors take test

Qualify Assessors

(provide ID & password to access scoring tool)

February

Launch Pilots

Conduct Qualified Assessor Orientation

March through June

Conduct Home Assessments

- Use the scoring tool & marketing materials
- Conduct research and gather data

Provide Research Data

Text in red = actions by Pilot Participants

HOME ENERGY SCORE

Address **555 Park Lane**
Pittsburgh, PA 99999

Total Energy **190 MBTUs / year**
Home Size **1,500 square feet**
Air Conditioning **Yes**

Climate Zone

Score with Upgrades **8**

Estimated Annual Savings **$520**

Current Score **6**

Uses More Energy	1	2	3	4	5	6	7	8	9	10	Uses Less Energy

Top 20% of similarly sized homes score here or better

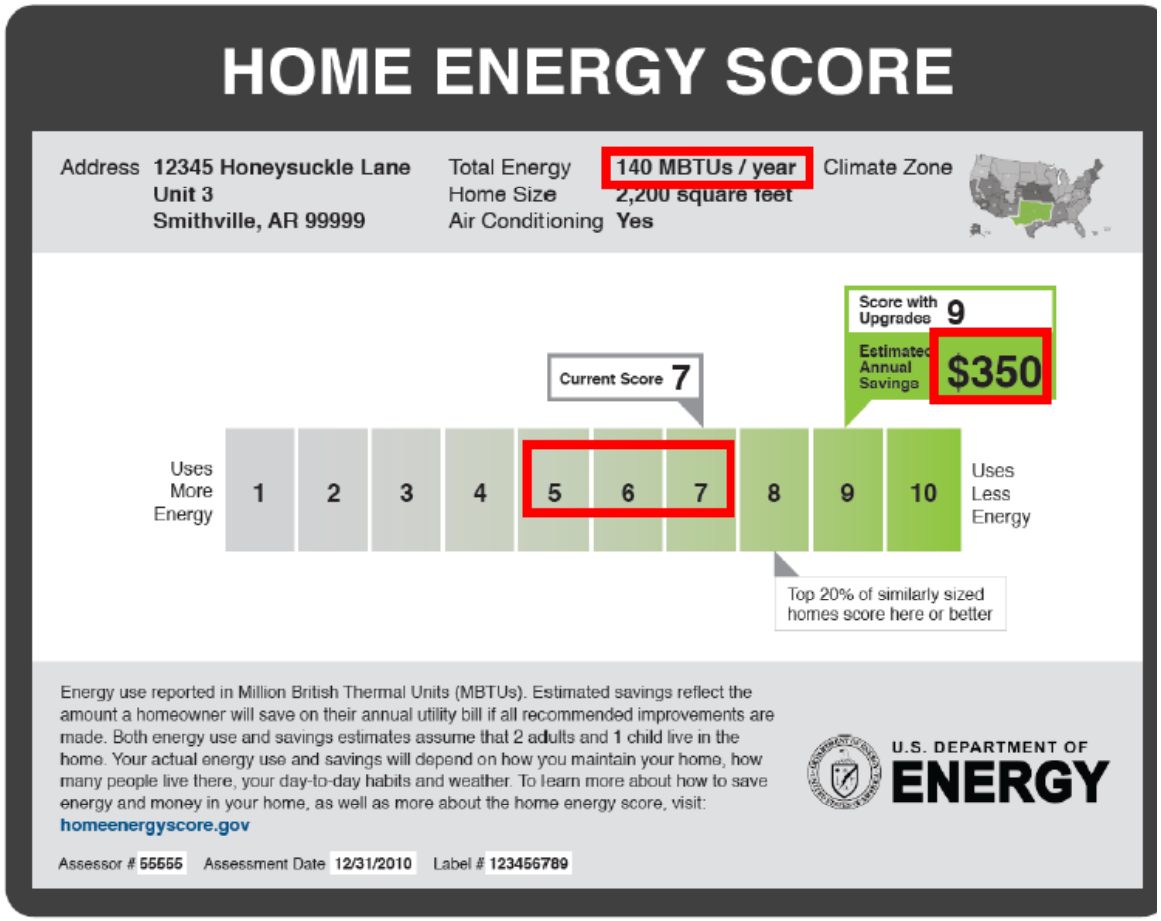
Energy use reported in Million British Thermal Units (MBTUs). Estimated savings reflect the amount a homeowner will save on their annual utility bill if all recommended improvements are made. Both energy use and savings estimates assume that 2 adults and 1 child live in the home. Your actual energy use and savings will depend on how you maintain your home, how many people live there, your day-to-day habits and weather. To learn more about how to save energy and money in your home, as well as more about the home energy score, visit: **homeenergyscore.gov**

U.S. DEPARTMENT OF ENERGY

Assessor # **85317** Assessment Date **11/05/2010** Label # **000062465**

Home Energy Score: Score Calculations

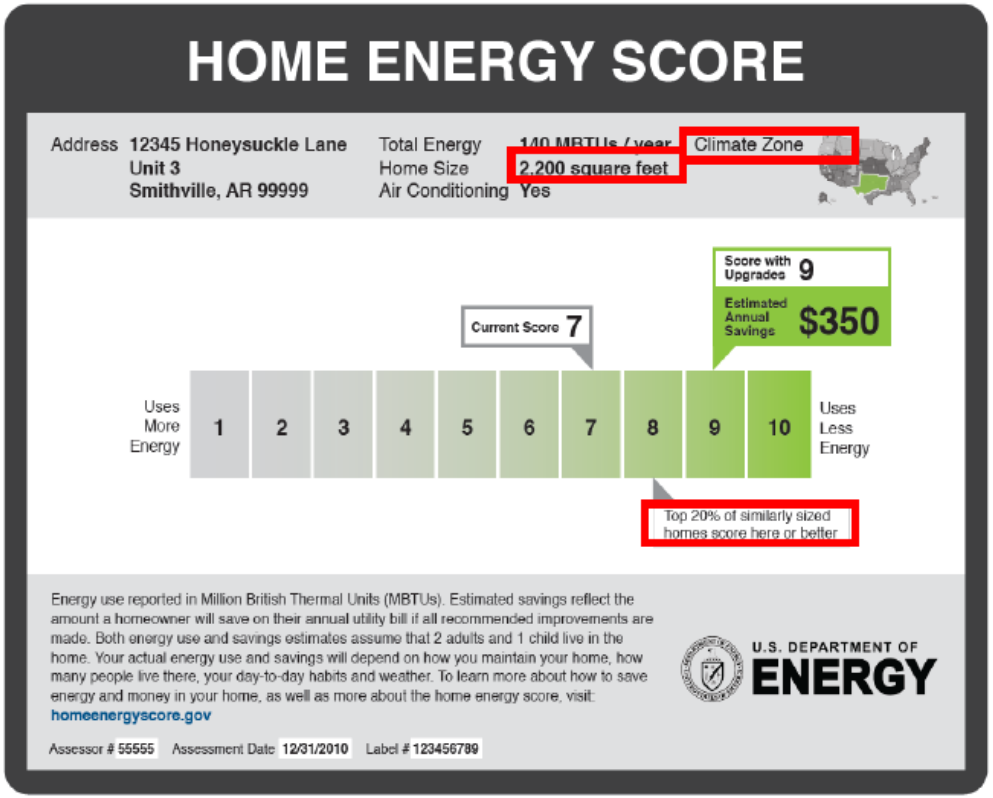
- Based on your inputs, the tool estimates total energy (**source energy** MBTUs) for the home, assuming certain standard conditions, such as 3 occupants.
- The tool then translates the total source energy into a score ranging from 1 to 10 where 10 is the best.
- The score is considered an "**asset**" score since it does NOT account for the behavior of the specific individuals currently living in the home.
- The dollar savings estimate represents that amount of money a typical homeowner in this home would save on their annual utility bills by making all of the upgrades recommended by the tool. Actual savings may be lower or higher depending upon a number of factors including occupant behavior.



Source energy is the amount of energy needed at the house plus any additional energy needed to deliver and/or produce it. Electricity has a much higher source factor than natural gas or oil.

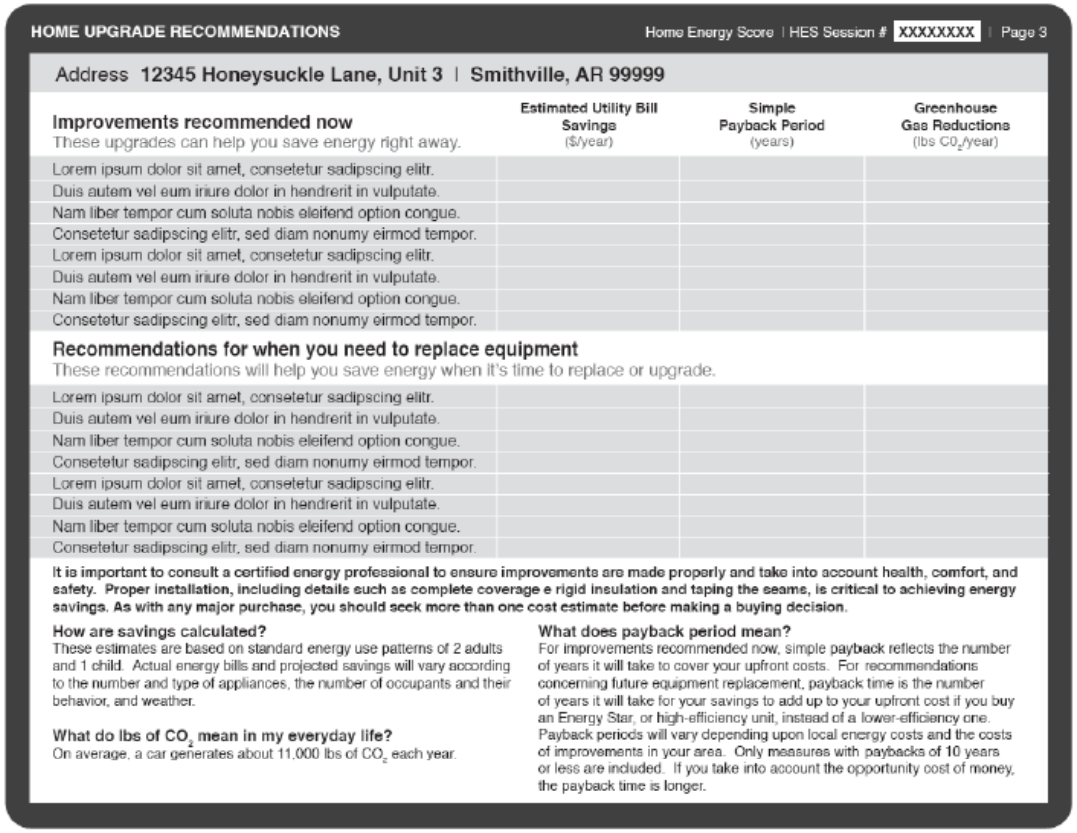
House Size & Climate

- The tool does <u>not</u> factor house size into the score.
- However, the scale notes where the top 20% of similarly sized homes rank as a reference point.
- If the home is less than 2200 square feet, it is considered smaller; if it is more than 2200 square feet, it is considered larger.
- Typically, the top 20% of smaller homes score 9 or better; and the top 20% of larger homes score 8 or better.
- The score <u>does</u> take into account the climate.
  - For example, a home that scores an 8 in Minneapolis uses more energy than a home that scores an 8 in San Diego, given the climatic differences of those locations.



Recommendations

- The customized recommendations are divided into two types:
  - Those to be done now.
  - Those to be done when it is time to replace.
- The recommendations are prioritized by payback in years.
- For the replacement recommendations, the payback is based on how long it would take to recover the incremental cost of buying an efficient model rather than an inefficient model.
- Utility bill savings are calculated using average state utility rates.



HOME UPGRADE RECOMMENDATIONS Home Energy Score | HES Session # XXXXXXXX | Page 3

Address 12345 Honeysuckle Lane, Unit 3 | Smithville, AR 99999

Improvements recommended now These upgrades can help you save energy right away.	Estimated Utility Bill Savings ($/year)	Simple Payback Period (years)	Greenhouse Gas Reductions (lbs CO_2/year)
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Recommendations for when you need to replace equipment These recommendations will help you save energy when it's time to replace or upgrade.			
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It is important to consult a certified energy professional to ensure improvements are made properly and take into account health, comfort, and safety. Proper installation, including details such as complete coverage e rigid insulation and taping the seams, is critical to achieving energy savings. As with any major purchase, you should seek more than one cost estimate before making a buying decision.

How are savings calculated?
These estimates are based on standard energy use patterns of 2 adults and 1 child. Actual energy bills and projected savings will vary according to the number and type of appliances, the number of occupants and their behavior, and weather.

What do lbs of CO_2 mean in my everyday life?
On average, a car generates about 11,000 lbs of CO_2 each year.

What does payback period mean?
For improvements recommended now, simple payback reflects the number of years it will take to cover your upfront costs. For recommendations concerning future equipment replacement, payback time is the number of years it will take for your savings to add up to your upfront cost if you buy an Energy Star, or high-efficiency unit, instead of a lower-efficiency one. Payback periods will vary depending upon local energy costs and the costs of improvements in your area. Only measures with paybacks of 10 years or less are included. If you take into account the opportunity cost of money, the payback time is longer.

Tips

TIPS TO SAVE ENERGY AT HOME

Home Energy Score | HES Session # XXXXXXXX | Page 2

Most home owners can reduce their energy bills and increase the comfort and safety of their home by changing some basic habits and doing more routine maintenance. Here are some easy ways to save energy and money. Savings from these measures are not included in the Home Energy Score.

Refrigerator/Freezer

- If your extra refrigerator is only used once in a while, unplug it and prop the door open when it's empty.
- If your extra refrigerator doesn't have much in it, consider replacing it with a smaller Energy Star model.

Laundry

- Use cold water to wash your clothes. Most detergents clean just as effectively and clothes don't fade as fast.
- Hang your clothes on a line to dry, when appropriate.
- If you use a clothes dryer, set the timer to Autodry so the dryer stops when your clothes are dry. This saves energy and is better for your clothes.
- Clean the dryer lint trap before each use. Clean the dryer vent hose every 6 months, more if you dry a lot of clothes. Be sure your vent hose is free of kinks.

Heating and Cooling

- Install a programmable thermostat.
- During the winter, lower the thermostat setting at night and when the house is empty.
- During the summer, raise the thermostat setting at night and when the house is empty.
- Avoid the desire to turn the thermostat temperature way up or way down to make the house warmer or colder. It doesn't heat or cool the house any faster but it uses more energy.
- Use ceiling fans alone or with air conditioning. Remember to turn them off when you leave.
- Change your furnace filter every two months (during summer too, if you have central air conditioning). Do it more frequently if you have pets or see that the filters are more than a little dirty.
- Bleed the air out of the radiators within a month of turning the boiler on each winter. Don't block vents and radiators with furniture.
- Install reflectors behind the radiators on outside walls.
- Keep about 2 feet of space cleared around your outside air conditioner/heat pump compressor.

Curtains and Blinds

- On summer days, close window shades and curtains on the south and west side of the house. On winter days, open them.
- On winter nights, close all window shades and curtains.

Lights

- When you leave a room, turn lights off.
- Replace incandescent bulbs with compact florescent lights (CFLs).

Computers and Other Electronics

- Use the energy saver settings on computers and other electronics so they go to sleep when you are not using them.
- Plug groups of electronics together into one power strip. Turn off the whole powerstrip off when they are not in use.

Water

- Fix leaky faucets and running toilets right away.
- Install low-flow showerheads and faucet aerators.

Buying and Replacing Appliances, Windows and Other Equipment

When you buy or replace appliances, windows or other equipment, be sure to pick ones that have an ENERGY STAR label. If there are no ENERGY STAR choices, compare the products' energy use specifications and pick one that is more energy efficient.

Whole House upgrades save energy and money and can make your home more healthy, comfortable and safe to live in.
For even bigger savings, ask a certified energy professional about "whole house" energy upgrades. Qualified professionals can help you pick the right kind and size of equipment and make sure it is installed correctly. They also help you understand the health, comfort and safety considerations of your decisions when planning improvements.

- The tool also provides one page of general tips for reducing home energy use.

Summary Page

- The tool provides a summary page of the inputs so that the homeowner can have a record of the values the assessor used to generate the score.
- The Score is valid for three years if no energy upgrades (that relate to the data fields required by the tool) are made to the house.
- If you have trouble while using the Tool, click on Help, then "Let us Know" at the bottom of the page.
  - Complete the form, the help desk will respond by email.

New or More Information

- If any energy-related characteristics of the house change (e.g. after retrofit) or you realize that an entry was incorrect, you will need to start over and re-enter the full set of data to get an updated or corrected Score.
  - The most recent dated score documents are regarded as the governing score for that property address
- The Home Energy Scoring Tool is linked to two other software tools created by Lawrence Berkeley National Laboratory: Home Energy Saver and Homer Energy Saver Pro (HES and HES Pro).
- If the homeowner would like additional recommendations that reflect their particular behavior, the HES or HES Pro websites allow the assessor or homeowner to model additional details about the home and homeowner operation. The inputs from the scoring tool assessment will automatically be uploaded into HES or HES Pro by entering the scoring session i.d. number. That number is located in the header of the Scoring Recommendations page.

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy
eere.energy.gov

Why We Doing an HES Pilot Also

- Comparing multiple modeling tools, of which DOE's HES is one
- Comparing consumer response to different visual representations
- Opportunity to provide recommendations to DOE to improve HES

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Process for Pilot Rollout

Pilot timeline

- Launch in February 2011
- All homes scored by early April
- Preliminary evaluation in early summer 2011
- Contractor roll-out late 2011/early 2012
  - contractor engagement starts in January
  - depends on results of tool comparison
  - and preliminary follow through rates

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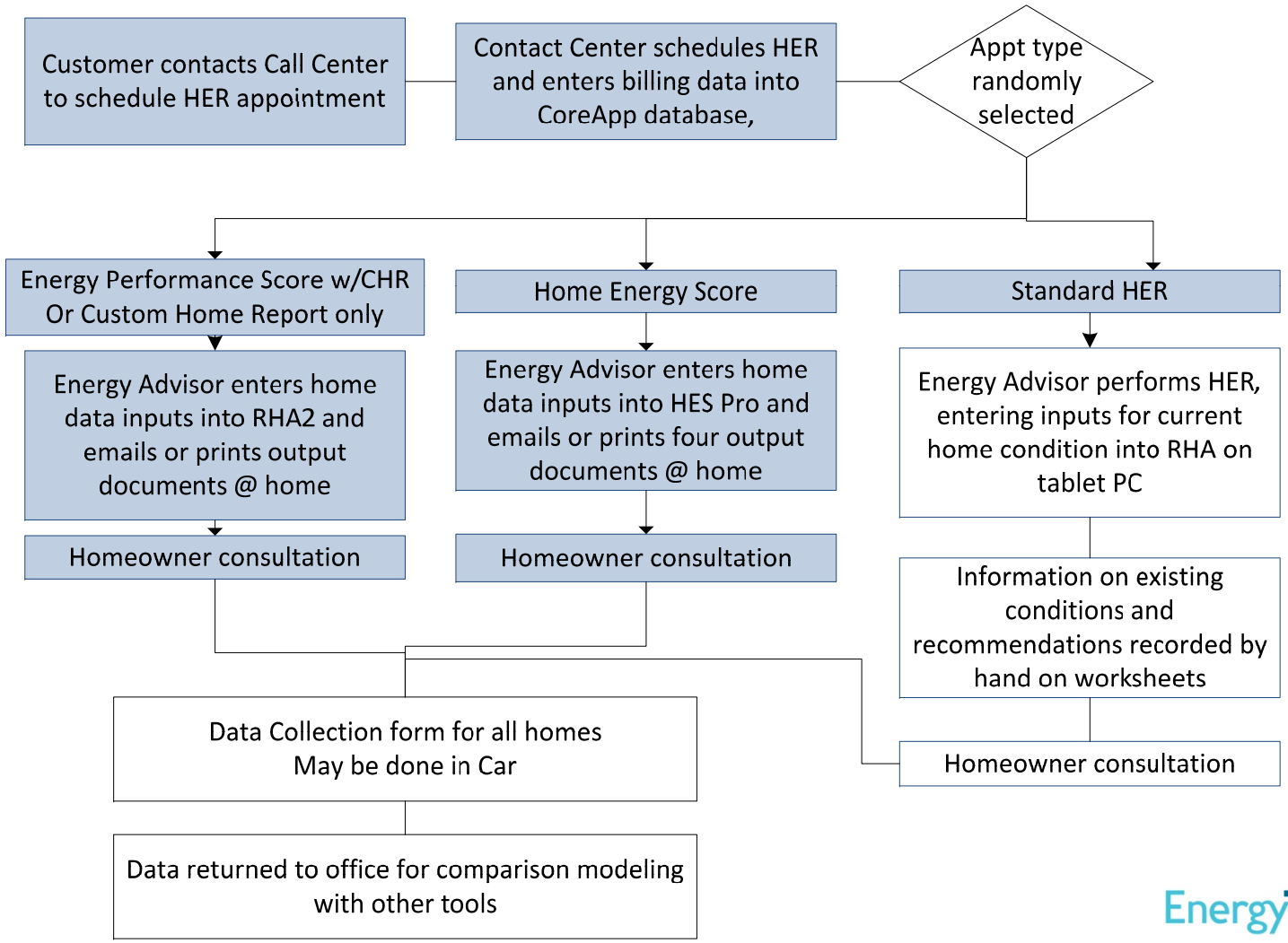
Pilot process



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Energy Scoring Data Collection Sheet

CoreApp Project ID:_____ Appointment Type: ☐ Std HER ☐ EPS ☐HES ☐ CHR

For all projects: collect the following	
House information	CFA: _____ ft^2 # Bedrooms:_____ Year built:_____ HPwES recommended? ☐
House type	☐ 1 story ☐1 ½ ☐ 2 story ☐ tri-level other: _____ Stories Above Grade
Window Frame	☐ Wood ☐ Vinyl or New wood ☐ Metal
Window Glass	☐Single ☐ Double-pane ☐ Triple pane
Window Tint	☐ Clear ☐ Tinted
Window: Other	☐ U-0.30+ ☐Solar control low-E ☐ insulating low-E ☐ Argon gas filled
Insulation	Floor R-value _____ Wall R-value _____ Ceiling insulation _____
Duct insulation	☐ none ☐ n/a ☐unknown ☐R3 ☐R8+
Duct location (25% increments)	_____% Conditioned space _____% Attic _____% Vented Crawl _____% Unvented crawl _____% Garage _____% Basement ☐NA
Foundation type (pick one)	**Crawl**: ☐conditioned ☐unconditioned ☐vented ☐unvented **Basement**: ☐conditioned ☐unconditioned ☐**Slab-on-Grade**
Air leakage est.	☐air sealed ☐not air sealed ☐air sealed unknown **AND** ☐Tight ☐average ☐very leaky
Duct leakage est.	Sealed: ☐yes ☐no **AND** ☐Average ☐leaky ☐very leaky
Heating type, efficiency & location	Year installed:_____ **AND** ☐ Gas furnace 70% ☐ Gas furnace 80% ☐Gas furn 92% ☐Room/thru-the-wall gas furnace ☐ Gas boiler ☐ Heat pump/gas backup ☐ Heat pump 6.8 HSPF ☐ Heat pump 8.5 HSPF ☐ Electric resistance ducted ☐ Electric Resistance non-ducted ☐ Propane furnace ☐ Oil furnace ☐Oil boiler

Energy Scoring Data Collection Sheet

CoreApp Project ID:_____ **Appointment Type:** ☐ Std HER ☐ EPS ☐HES ☐ CHR

Air conditioning	☐None ☐central ☐room ☐heat pump + SEER or install yr: _____
DHW type & efficiency	Year installed: _____ ☐ Gas tank EF: _____ ☐Electric tank EF:_____ ☐Gas tankless EF: _____ ☐Fuel oil ☐Propane ☐Boiler is used for heating and DHW
Window area (~sq.ft)	☐Low: 10% win:CFA ☐Avg: 15% win:CFA ☐High: 20% win:CFA

For Appointment type: Std HER, EPS or CHR		
Frame type	☐ aluminum ☐ alum. w/thermal break ☐wood ☐ vinyl	
Wall frame type	☐ wood ☐wood w/ insulated headers ☐wood w/ EPS ☐ wood w/insulated headers and EPS ☐ structural brick ☐concrete block ☐straw bale	
Exterior finish	☐wood ☐stucco ☐vinyl siding ☐ alum. siding ☐brick veneer	
Front door facing	☐North ☐South ☐East ☐ West	
Skylights	Glazing type: _____ frame type:_____ size:_____	Roof absorptance (0-1): _____
Roof insulation/type	Rvalue _____ ☐ fibrous ☐ radiant barrier ☐ expanded polystyrene	
Roof construction	☐composition shingle ☐wood shake ☐clay tile ☐concrete tile ☐tar & gravel	
Attic type	☐unconditioned ☐conditioned ☐cathedral ceiling	
Foundation wall insulation	☐None ☐R-5 ☐R-11 ☐R-19 ☐NA	
Slab floor insulation	☐None, ☐R-5, ☐NA	

Questions to be Analyzed

Questions

- Customer follow-through rates on measure installation
  - Pull project data from our efficiency project database at the following intervals (1 month, 3 months, 6 months & 1 year)
  - Compare to standard Home Energy Review follow-through rates
- Data analysis & metric comparisons
  - Relative accuracy of HES, SIMPLE and RHA2
  - Comparison to each other and other models (SIMPLE)
  - Use of billing data
  - Actual blower door comparisons on sub sample
  - Look at different benchmarks (SEEM data) vs (RECs)

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Questions (Continued)

- Customer feedback surveys (multiple questions)
  - Participants will be surveyed electronically (1 week & 6 months)
  - Actions taken (behavioral change, small measures (CFLs))
  - Satisfaction & value of Energy Advisor in the process
  - Visual score inquiry (scale, energy data representation)
- Program delivery efficiencies & customer information
  - Tablets and printers on site
  - Scripted conversations for message consistency
  - Automatic randomized site selection and advisor assignment
  - Timing of activities (audit time, scheduling, printing etc)
  - Demographics (more detail on occupants)

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