





Streamlining Energy Audits with TREAT (now approved for Energy Upgrade California)

Performance Systems Development Monday, February 16, 2015



The PSD Team

Software



✓ Field tools

ProgramManagementApplications

✓ M&V

Professional Services



- ✓ Technical Consulting
- ✓ Training
- ✓ Energy Engineering
- ✓ Rater Providership

Programs



- ✓ Design
- ✓ Implementation
- ✓ Marketing
- ✓ QA/QC

Performance Systems Contracting



TREAT Software Approved for Use in California

HP Contractors in California can now use one of the most accurate modeling tools in the country

— DOE Approved for ALL Residential Building Types —

in the Energy Upgrade California® Home Upgrade!!



You've asked...we've answered. We've now added more software modeling options in Advanced Home Upgrade.

Find out which is right for your business!

Key Features in TREAT 3.4

HPXML Data Export

- Standardized building data transfer, required in CA.
- New Building Wizard
 - Streamlined inputs help users generate models in as little as 30 minutes.
- Home Performance Report and Package Comparison Report
 - Designed to help you sell more jobs!
 - Show customers existing home conditions, usage, and proposed savings.
 - Generate reports as PDF or Word for even greater customization.
- Model Inspector
 - Provides feedback on model validity and helps the modeler perform "sanity checks".
- Daily Weather Data
 - Pull the most up to date weather data right into TREAT using our import tool.

Key Features cont'd.

- Renewable Energy inputs and improvements.
- TREAT "True-up" calibration process.
 - Use existing bills to calibrate model to real building usage
- Real-Time Model feedback with the "feedback panel"

Calculate Model	Electricity			Natural gas		0il #2		More Fuels	
Calculate Billing	Heating, kWh /vear	Cooling, kWh/vear	Base Load, kWh /vear	Heating, therms	Base Load, therms	Heating, gallons	Base Load, gallons	Heating Slope Btu/F-	Heating Reference
True Up Help	p			/year	/year	/year	/year	day / sq.ft.	F.
Building Model	0.0	2,011.0	6,434.8	1,816.4	360.0	0.0	0.0	15.57	61
Billing Data	0.0	1,889.1	6,732.7	1,888.7	531.8	NC	NC	15.65	61
Percent Difference	NA	6%	5%	4%	48 %	NA	NA	0.52 %	0%

Scenario Management

Create various savings packages to manage different investment scenarios.

Package Name	Cost \$	Annual Usage MMBtu	Annual Savings MMBtu	Annual Usage \$	Annual Savings \$	Payback Years	Cash Flow \$ / year	? SIR
All measure boiler option no window	13547.00	118.80	127.69	1654	1367	9.91	-279	2.37
All measures furnace option	19847.00	124.96	121.52	1756	1265	15.69	-1146	1.50
Boiler DHW tank + Insulation	12807.00	126.38	120.11	1769	1253	10.22	-303	2.38

New Building Wizard

 Streamlined Wizard assists in data entry portions of TREAT.

 Once all Wizard inputs have been made users can dive back into the model to include more detail as needed!

General		
		TMY2
Long Term	Weather State*	CA 👻 City* SAN DIEGO/MONTG 👻
Number of :	stories	3 •
Number of I	pedrooms	4
Number of (occupants	5
Wall Color		
Roof Color		Dark 🔻
Foundation		Vented crawlspace Depth Below Grade, Ft 5
Attic		
Air Leakag	e	
1	ACH	•
Shieldina C	ass 4 - Tunica	al suburban: buildings or trees within 30 ft, in most directions
Fuels		
Heating	Natural gas	★
Hot Water	Electricity	
FIOU W GLEF		

- Customizable preferences and surface libraries speed up the process even more!
- TREAT supports both calibrated and uncalibrated models with our billing analysis tools.

New Building Wizard (Cont.)

	nstruction
Conditioned	I space walls adjacent to
Exterior	
Conditioned Un-vented a	Dirt Floor Gyp Bd, 2x6 24'' OC, No Insulation, R-1 2x8 24'' OC, 0.5'' Wood, Shingles R-2 8'' Block, R-2
Conditioned Basement	Carpet w/Pad, 6" Concrete, R-3 Gyp Bd, 2x4 16" OC, 3.5" Air, 1" Wood, R-4 Gyp Bd, 2x6 16" OC, 1" Fiberglass, R-4 Carpet w/Pad, 0.75" Wood, 2x10 16" OC, No Insulation, R-5 Gyp Bd, 2x4 16" OC, 3.5" Fiberglass, 1" Wood, R-13
Foundation Exterior	2x8 24" OC, 5.5" Fiberglass, 0.5" Wood, Shingles, R-19 1.25" Wood, 2x10 16" OC, 6" Fiberglass, R-21 Gyp Bd, 2x6 16" OC, 2" Fiberglass, 10" Cellulose, R-39
Ground	<library></library>
oncondition	ned space floor adjacent to
Ground	ned space floor adjacent to
Ground Windows	ned space floor adjacent to
Ground Windows Glazing	ned space floor adjacent to
Ground Windows Glazing Frame	ned space floor adjacent to
Ground Windows Glazing Frame Size W'' x H	
Ground Windows Glazing Frame Size W'' x H	

PERFORMANCE SYSTEMS D E V E L O P M E N T

Brand Packages!

Home Performance Report

 We Suggest Performance Systems
 Gold Package
 for Best Value

 Show overall package
 Show overall package
 Image: Stress of the second second

- Each page of the report details specific use categories in the home.
 - Appliances, Air Infiltration, Domestic Hot Water Consumption, Lighting, and more!
- Run in conjunction with our Package Comparison Report to quickly compare up to 3 Improvement packages



Package Comparison Report

HOME ENERGY ANALYSIS REPORT

Audit Date: 11/12/2003

Package Comparison

PERFORMANCE SYSTEMS DEVELOPMENT

Package Savings Summary							
	Boiler DHW tank + Insulation	All measure boiler option no windows	Insulation & Air Sealing Only				
Total Installed Cost	\$12,807	\$13,547	\$4,807				
Annual Energy Cost Savings	\$1,253	\$1,367	\$905				
Monthly Cash Flow	(\$25)/month	(\$23)/month	\$27/month				
Simple annual payback, years	10	10	5				
Savings to Investment Ratio	2.4	2.4	4.1				
Annual kWh Savings, kWh	2260	2260	2260				
Total Energy Savings, MMBtu	120.1	127.7	86.6				

Package Savings by Improvement

Improvement	Non Energy Benefits	Boiler DHW tank + Insulation	All measure boiler option no windows	Insulation & Air Sealing Only			
Blow 10" of cellulose in attic	Improve comfort, increase value of building.	\$76	\$76	\$88			
Dense pack walls	Improve comfort, increase value of building.	\$606	\$605	\$707			
Energy Star Refrigerator	Increase value of building, reduce environmental risk due to old ozone-depleting refrigerants.		\$66				
Indirect tank off boiler	Increase value of building.	\$61	\$50				
Low Flow Device Installation 1	Reduce water use.		\$60				
Replace cold water valve	Improve indoor air quality and comfort.		\$0				
Air sealing with foam + benefits of dense pack in	Reduce drafts.	593	\$93	\$110			
Install Condensing boiler 93% eff	Increased equity. Custo	mizable Non-E	nergy				
	Benefits help sell jobs!						

Model Calibration with TREAT "True-up" Ensures Program Accuracy

- Recent Study by PSD identified key issues to be addressed by residential energy efficiency programs
- Study focus: "Identified the underlying causes of an energy savings prediction shortfall in the NYSERDA Home Performance with ENERGY STAR program for the years of 2007 to 2011 and assessed the potential impact on savings predication accuracy of applying the ANSI/BPI-2400 standard for baseline energy model calibration to actual energy usage."

 "The most significant variable contributing to the relative accuracy of the savings predictions was the degree to which the baseline simulation was calibrated to match the actual energy bills in the home."

PERFORMANCE SYSTEMS

DEVELOPMENT

 "Energy modeling tools complying with the RESNET simulation tests for existing residential buildings should produce similar results to the TREAT software used in the NYSERDA program when used in conjunction with the application of the ANSI/ BPI-2400 standard."



Baseline and Post-Retrofit Usage and Model Weather Normalized

Figure 1. Predictions without Calibration



Figure 2. Predictions with Calibration

Study Findings

"Model Calibration addressed most of the error."

PERFORMANCE SYSTEMS

DEVELOPMENT

 "Accredited software models should produce similar accurate percentage predications. The Energy simulation software used by the program (TREAT) was shown to produce predicted savings percentages, accurate within one to two percentage points of the actual savings percentages"

Pre-retrofit, Baseline Usage Post-retrofit Usage Post-Retrofit Energy Prediction Uncalibrated Baseline Pre-Retrofit Model

Figure 1. Predictions without Calibration



Figure 2. Predictions with Calibration

Baseline and Post-Retrofit Usage and Model Weather Normalized

Impact of Uncalibrated Model on Realization Rates

Baseline and Post-Retrofit Usage and Model Weather Normalized

PERFORMANCE SYSTEMS





Impact of Calibrated Model on Realization Rates

Baseline and Post-Retrofit Usage and Model Weather Normalized



ANSI / BPI-2400 Process Flow



Additional Information

Learn more at: http://psdconsulting.com/software/treat/treat-3-4/

From there you can also download a free 30-day trial of TREAT

Learn more about using TREAT in California: http://psdconsulting.com/california

Accreditations

- DOE Certified WAP tool for ALL residential buildings types
- RESNET Accredited Existing Homes Tax Credit Compliance Tool
- DOE BESTEST
- ANSI/BPI 2400 Standard