



FLORIDA SOLAR ENERGY CENTER

A Research Institute of the University of Central Florida

*Qualifying for the
New Home Tax Credit*

Examples in 9 U.S. Cities

International Builder's Show

January 11, 2006

Philip Fairey



Introduction

- ❖ Simulations and calculations performed using EnergyGauge® USA 2.5 software – qualified through software tests required by RESNET Pub 005-01
- ❖ Only one of many possible solution provided for each climate (best orientation)
- ❖ No mechanical ventilation – all homes with natural infiltration at 0.35 ach
- ❖ All insulation is installation Grade I
- ❖ Results indicate that many new homes, in all parts of the country, may ultimately qualify for federal tax credits.



Home Characteristics

City	Area	Home Description
Miami	2,000	1-story, block, slab-on-grade
Houston	2,000	1-story, frame, slab-on-grade
Dallas	2,400	2-story, frame, slab-on-grade
Atlanta	2,400	2-story, frame, on crawl space
Las Vegas	2,000	1-story, frame, slab-on-grade
Long Beach*	2,400	2-story, frame, slab-on-grade
Sacramento*	2,400	2-story, frame, slab-on-grade
Baltimore	2,000	1-story, frame, on crawl space
Burlington	2,400	2-story, frame, w/cond. basement

* Very similar to Micropas examples



Envelope Characteristics

City	Floor	Roof	Ceiling	Walls
Miami	R-0	Tile*, RBS	R-30	R-7.6
Houston	R-0	Comp, RBS	R-32	R-13
Dallas	R-0	Comp, RBS	R-38	R-13
Atlanta	R-30	Comp, RBS	R-38	R-11+3
Las Vegas	R-0	Comp, RBS	R-32	R-13
Long Beach	R-0	Comp, RBS	R-30	R-13
Sacramento	R-0	Comp, RBS	R-30	R-13
Baltimore	R-30	Comp	R-48	R-13+5
Burlington	R-0	Comp	R-48	R-15, 13+5

* Light in color



Window Characteristics

City	Type	Frame	WFA%	U-Fact	SHGC
Miami	Low-e	Metal	18	0.57	0.28
Houston	Low-e	Metal	18	0.57	0.28
Dallas	Low-e	Vinyl	18	0.47	0.40
Atlanta	Low-e	Vinyl	18	0.47	0.40
Las Vegas	Low-e	Vinyl	18	0.47	0.40
Long Beach	Low-e	Vinyl	16.5 *	0.47	0.40
Sacramento	Low-e	Vinyl	16.5 *	0.47	0.45
Baltimore	Low-e	Vinyl	18	0.47	0.55
Burlington	Low-e	Vinyl	18	0.33	0.55

* per Micropas example



Lighting & Appliances

City	Fl_lights*	Frig	dWash	cFans
Miami	22/32	eStar	eStar	eStar
Houston	20/32	eStar	eStar	---
Dallas	20/32	eStar	eStar	---
Atlanta	20/32	eStar	eStar	---
Las Vegas	20/32	eStar	eStar	---
Long Beach	std	std	std	---
Sacramento	std	std	std	---
Baltimore	std	std	std	---
Burlington	std	std	std	---

* high-efficiency fixtures / qualifying fixture locations



HVAC Equipment

City	Ducts	Heating	Cooling
Miami	R-8 attic, tight*	COP 1	SEER 15
Houston	Interior, tight*	HSPF 7.8	SEER 14
Dallas	Interior, tight*	HSPF 7.8	SEER 14
Atlanta	Interior, tight*	HSPF 8.0	SEER 14
Las Vegas	Interior, tight*	HSPF 7.8	SEER 14.5
Long Beach	R-6 attic, tight*	AFUE 80	SEER 13
Sacramento	R-6 attic, tight*	AFUE 92	SEER 13
Baltimore	Interior, tight*	AFUE 94	SEER 13
Burlington	Interior, tight*	AFUE 94	SEER 13

* tight = tested to 3 cfm_{25,out} per 100 ft² conditioned area



Conclusions

- ❖ Qualification not difficult in very mild climates
- ❖ Window selection is important, with changes in SHGC making a significant difference, even in northern climates
- ❖ Efficient lighting and appliances provide significant benefit in cooling dominated climates
- ❖ Relatively “standard” envelope features can make the goal with only “moderate” increases in HVAC efficiencies if ducts are good
- ❖ Tight ducts located in conditioned space provide significant benefit for both heating and cooling.