Electrical Deregulation – Planning for Success in Texas Schools

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ABSTRACT

Beginning January 1, 2002, Texas' electric industry is opening to customer choice, giving consumers the power to choose the company that provides their electricity. Under electrical deregulation in Texas, there are three separate players. The Retail Electric Provider (REP) markets power to the consumer (public) and serves as the customer point of contact. The Power Generation Company generates the electricity and is already deregulated. The transmission and distribution utilities (wires) remain regulated by the Public Utility Commission of Texas (PUCT).

As of the writing of this abstract in October 2001, REP's indicate that only about 15% of Texas ISD's have taken any action.

Ready or not pricing and purchasing methods of electricity in Texas will change. This paper discusses major deregulation issues in Texas Schools (e.g. procurement process, contracts, workloads, uncertainty. etc.). The before and after scenarios of deregulation are compared. Texas Schools, to be prepared for success, need to understand their energy usage and patterns, district characteristics, deregulation options and pricing, and terms/conditions. This paper provides Texas Schools with specific homework, electrical deregulation options, procurement process, and RFP guidelines. Owning the fine print is as essential as terms and conditions and may be as important as the price. Examples will be included. The decision making process for all size school districts will be discussed.

The experience of the authors in assisting Texas school districts in this process will be shared. After deregulation, homework will also be addressed.

SENATE BILL 7

Senate Bill 7 (1999) which will bring competition in electric service to Texas was signed into law by Governor Bush. The Act became effective September 1, 1999 with customer choice implementation beginning January 1, 2002. It sets forth the intent and purpose of the legislature regarding the desire to not have a monopoly of electric production and sale.

Transition to the competitive retail electric market includes unbundling of the electric industry components. The law requires electric utility companies to separate their inter-business activity into units called a power generation company, retail electric provider, and transmission and distribution utility. Transmission and distribution services for investor owned utilities would remain regulated.

A freeze on existing retail base rate tariffs and the purchase power cost recovery factor went into effect on September 1, 1999.

Metering for residential customers will remain regulated until the later of January 1, 2005 or the date on which at least 40% of residential customers are taking service from unaffiliated retail electric providers. Metering for all other customer classifications will become competitive on January 1, 2004.

Price-to-beat rates are established for residential and small commercial customers. Small commercial is defined as less than 1,000 Kilowatt (KW) electrical load. Price-to-beat rate is six percent off the regulated base rate frozen as of January 1, 1999. Affiliated REP's must offer price-to-beat. Price-to-beat is only for Affiliated REP's. An Affiliated REP must offer price-to-beat until 2005 or until they lose 40% of their customers. It also is the maximum price until 2007.

Municipal and co-operative utilities may opt-in or opt-out of electrical deregulation.

The text of Senate Bill 7 may be reviewed at http://www.capitol.state.tx.us/.

MAJOR DEREGULATION ISSUES FOR TEXAS ISD'S

Ready or not, pricing and purchasing of electricity will change for Texas ISD's. Major deregulation issues for Texas ISD's include the following.

- Procurement process selection
- Terms and conditions, contracts
- Additional workload and budget (labor)

- Pricing unknowns and budget preparations
- Timing of procurement, commitment
- Uncertainty of natural gas pricing
- Politics and pressure on administration and school board
- Other

Before Senate Bill 7 electrical deregulation, very little time and attention was required for Texas ISD's to purchase electricity. Tariffs were regulated and there was a very limited choice of utility. Most Texas ISD's had no choice of utility. The investment was a minimum and pricing was relatively stable for budgeting and planning.

After deregulation pricing, contracts, terms and conditions will be negotiated. Texas ISD's can expect to pay more in wire investment to have an electrical supply brought to a site. The potential and risk for pricing instability is greatly increased. Texas ISD's will experience an increased preparation and procurement workload for issuing procurement documents and evaluating bids or proposals.

There are four electric reliability councils in Texas.

ERCOT-Electric Reliability Council of Texas
SPP- Southwest Power Pool
WSCC- Western System Coordinating Council
SERC- Southeast Electric Reliability Council

The majority of Texas is in ERCOT. ERCOT represents a bulk electric system located totally in Texas and serves about 85 percent of Texas' electrical demands. Maps showing the national and state reliability councils may be observed on the North American Electric Reliability Council website, http://www.nerc.com/regional/.

The lack of suitable, efficient grid interconnection between the reliability councils serving Texas has restricted implementations of deregulation in Texas except in ERCOT region. All but ERCOT are tied into grids serving other states.

HOMEWORK FOR SCHOOLS

Texas ISD's need to do their homework before purchasing electricity in the new competitive market. The following are steps recommended for Texas ISD's to begin their planning and action for deregulation.

1. Establish one central District contact.
2. Determine the electric reliability region by campus and facility.
3. Determine the existing utility provider for each campus. Many districts have multiple utilities serving their campuses.
4. Review deregulation options available for each campus. Catalogue each campus and facility by the following.
   - Served by investor owned utility
   - Served by co-op or municipal utility
   - Campuses and facilities with greater than 1,000 KW electrical load
   - Campuses and facilities with less than 1,000KW electrical load.
5. Facility assessment by building
   - Number and location of meters (street address)
   - Account number
   - Current tariff/rate
   - Twelve month electric usage (KWH, KW) and cost.
   - Available time-of-use (TOU) profile
   - Consider obtaining TOU metering for large loads (e.g. high schools) and typical smaller loads (e.g. elementary schools).
6. Define district characteristics
   - Start/stop dates for school, holidays
   - Patterns and schedules of school occupancy (eg. full, partial, unoccupied)
   - Summer school schedules
   - Other characteristics affecting use (e.g. church use, community college, YMCA, etc.)
   - Identify with dates of new additions, renovations, new campuses planned
   - Review each campus for flexibility of use
7. Define all services provided by existing regulated utility (e.g. transformer maintenance, leased transformer, security lighting, etc.). These may not be provided in future and/or there will be a cost.
8. Other planning steps
   - Define tolerance to price fluctuation and risk
   - Understand options
   - Develop deregulation plan/strategy
   - Monitor deregulation legislation, rules, and interpretation of rules
   - Select procurement method

ELECTRICAL DEREGUALTION OPTIONS FOR TEXAS ISD'S

The following existing utility status by campus and facility determines the available options under Senate Bill 7 deregulation.

- District served by investor owned utility
- District served by municipal or co-op utility (single or dual service area) that opts-in
- District served by municipal or co-op utility (single service area) that opts-out
- District served by municipal or co-op (dual service area) that opts-out

District Served by Investor Owned Utility

Campuses and facilities with less than 1,000KW electrical load may take price-to-beat from the existing investor owned utility REP or they may purchase competitively from other REP's.

A school district may join an aggregator for group purchasing of electricity.

A school district may also self-aggregate all of its campuses and facilities if the total combined load is greater than 1,000KW. Under this option, a district may then competitively purchase electricity from the existing utility REP or other REP's.

The Texas Education Agency has ruled that school districts cannot simply take the price-to-beat option if the total cost is more than $25,000. They state districts must use a competitive procurement process to ensure that price-to-beat is the best offer.

Districts Served by Municipal or Co-Operative Electric Utility (Single Service Area) That Opts-In

The options available are the same as above for districts served by investor owned utilities.

District Served by Municipal or Co-Operative Utility (Single or Dual Service Area) That Opts-Out

Districts have no options under competitive procurement. They stay with existing utility and do not have a choice to negotiate rates.

Districts Served by Municipal or Co-Operative Electric Utility (Dual Service Area) That Opts-Out

Districts may use existing switchover rules to change to investor owned utility REP and then follow rules for customer choice. It is very likely that high disconnect fees will make this a poor economic option.

Districts That do not Affirmatively Choose a New Provider by January 1, 2002

Campuses and facilities with less than 1,000KW load will be placed on price-to-beat with the affiliated REP of the existing utility. Campuses with greater than 1,000KW load will be placed on a standard offer price with the Affiliated REP of the existing utility. The standard offer price will be based on generalized load factor categories and will be a higher rate than the District could expect to obtain by competitive procurement. For new accounts opened in 2002, Districts will want to select a REP, otherwise they will be placed with the provider-of-last-resort which will be a higher rate. Standard offer price and provider of last resort price are expected to be much higher than price-to-beat or negotiated pricing.

PROCUREMENT PROCESS FOR TEXAS ISD'S

Texas public school districts that competitively purchase electricity must follow the Education Code procurement laws, directives of the Texas Education Agency, and their own local polices and procedures. Request for Proposals (RFP), Request for Competitive Sealed Proposals (RCSP), and Request for Qualifications (RFQ) are the procurement processes used by many Texas ISD's for competitive purchase of electricity. These methods were used to select REP's or Aggregators.

School districts may expect to spend time developing and negotiating terms and conditions of contracts. The fine print may be more important than the price. The following are examples of issues that districts should address in their procurement and negotiations.

- Take title to electricity on district's side of meter at each campus or facility.
- 24 hours a day, 365 days a year, firm, non-interruptible reliable rate and service
- Separate contracts for electricity from other services (e.g. performance contracting)
- Understand pricing and everything included or excluded
- Define any time limitations to correct billing errors
- Watch for price adjustment clauses and pass through charges
- Automatic renewal of Contract and pricing
- Impact of adding electrical loads (e.g. additions, computers, etc.)
- Effect of equipment shut down for maintenance
- Impact of building occupancy schedule changes (e.g. holiday shifts, summer school, etc.) on pricing and billing
- Contract quantities and/or minimum-maximum usage requirements and penalties
- New campuses
- Sell a building or change function/use
- Add, delete, or relocate portable buildings

REQUEST FOR PROPSALS OR COMPETITIVE SEALED PROPOSALS

The following is an outline of a RFP or RCSP for schools to use as a guide in preparing procurement documents.

Notice to Offers
Offer Form
Instructions for Proposers and Proposals
General Conditions
District Overview
Qualification Requirements
Selection Process
Evaluation Criteria
Pricing
Pricing Format
Proposal Format Requirements

OBSERVATION OF COMPETITIVE PROCUREMENT

School districts used several methods and approaches for competitive procurement. Numerous districts issued RFP's or RCSP's prepared in-house or by consultants. Some of the districts simply issued sample RFP's provided by REP's. Unfortunately, feedback from REP's and districts indicate many have taken no procurement action. The Texas Association of School Boards issued an RFP and selected a REP (TXU Energy Services) so that Districts could sign separate contracts. Region 4 Education Service Center aggregated districts and selected an out-of-state entity.

The following are observations of the authors based on assisting several Texas ISD's and two colleges in the competitive procurements of electricity.

- Request for proposals or competitive sealed proposals were issued to Retail Electric Providers.
- Significant time researching and planning the proposals was spent by the district's staff and consultant.
- None of the REP's had researched school procurement nor did they understand school requirements.
- Only three REP's responded to proposal requests although others stated intent to respond.
- REP's only provided "indicative" pricing with their proposals.
- Final pricing was only provided after a REP was selected and terms and conditions negotiated.
- Proposal format requirements were followed relatively close by two of the three REP's.
- REP's paid very little attention to requirements of the District's RFP's or RCSP's in making their final offer (terms and conditions).
- REP's initially tried to persuade the consultant and Districts that the REP's terms and conditions were non-negotiable.
- The District's staff, consultant, and attorney were involved in the final negotiations.
- Consumers were at a disadvantage in the negotiations because of fixed terms and conditions attitude of REP's and lack of qualified REP's involved in the competition. In addition, the large number of agreements to be processed or negotiated by the REP's restricted their willingness and ability to be more open and compromising.
- Initially REP's would not provide pricing with-out a swing or bandwidth on usage (KWH) based on the past 12 months. The bandwidth was based on a plus or minus percent usage (e.g. plus or minus 10 percent) deviation from the previous usage history either on a monthly or annual basis depending upon the REP. Pricing above band was spot-market and below band was take or pay. Eventually pricing was provided for some customers with unlimited bandwidth or swing.
- There was no apparent automatic feedback between the same company REP's personnel once terms and conditions were negotiated for a District. Each individual person for a REP seemed to start from baseline zero with the Districts and Colleges.
- Pricing received by districts and colleges fluctuated daily based on the price of natural gas.
- Pricing provided by the REP's was based on future changes in the regulated transmission and distribution charge being a pass-through charge except for short term contracts.
- Time-of-use rates offered were not selected nor did they indicate worthwhile savings.

CONCLUSIONS AND RECOMMENDATIONS

- Texas School Districts and Colleges will save money based on Fall 2001 pricing received under deregulation. This is largely due to significant decrease in natural gas pricing in late 2001.
- Actual savings will depend on regulated charge for transmission and distribution. The PUCT could wipeout the savings if significant increases in transmission and distribution cost are allowed or regulated.
- Texas School Districts and Colleges spent significant time in the procurement process and in negotiations.
- Significant future savings in the cost of procurement would be achieved for Texas schools and colleges if the PUCT or legislature would

require or develop standard mutually acceptable uniform terms and conditions.

- More real competition is needed from more qualified REP's.
- The log-jam of contracts being processed by the REP's near the end of 2001 impeded competition, both in number of offers to schools and willingness of REP's to deviate from their company's standard terms and conditions.
- Conduct a statewide survey of Texas educational institutions to obtain responses on their actions, if any, and market shift that occurred.
- School Districts and Colleges should monitor electrical prices and if the economy, September 11, 2001 terrorist impact, or other factors result in significant decreases in electrical pricing, then re-negotiate contracts for blended pricing.
- Billing accuracy should be monitored for every account each month. The change in rates and providers for every account creates opportunities for billing errors.
- Improve energy efficiency and manage energy use effectively.
- Conduct building systems master plan for every campus.
- Manage the electrical load.

Homes produced with airtight duct systems (around 15% savings in Htg and Cooling Energy)

Palm Harbor Homes	22,000
Southern Energy Homes	8,000
Cavalier Homes	1,000
	= = =
Subtotal	31,000

Technical measures incorporated in BAIHP homes include some or many of the following features - better insulated envelopes (including Structural Insulated Panels and Insulated Concrete Forms), unvented attics, “cool” roofs, advanced air distribution systems, interior duct systems, fan integrated positive pressure dehumidified air ventilation in hot humid climates, quiet exhaust fan ventilation in cool climates, solar water heaters, heat pump water heaters, high efficiency right sized heating/cooling equipment, and gas fired combo space/water heating systems.

HOMES BY THE FLORIDA HOME ENERGY AND RESOURCES ORGANIZATION (FL.H.E.R.O.)

Over 400 single and multifamily homes have been constructed in the Gainesville, FL area with technical assistance from FL H.E.R.O. These homes were constructed by over a dozen different builders. In this paper data from 310 of these homes is presented. These homes have featured better envelopes and windows, interior and/or duct systems with adequate returns, fan integrated positive pressure dehumidified air ventilation, high efficiency right sized heating/cooling equipment, and gas fired combo space/water heating systems. The innovative outside air (OA) system is described below.

The OA duct is located in the back porch (Figure 1) or in the soffit (Figure 2). The OA is filtered through a 12"x12" filter (which is readily available) located in a grill (Figure 3) which is attached to the OA duct box. The flex OA duct size varies depending on the system size - 4" for up to 2.5 tons, 5" for 3 to 4 ton and 6" for a 5 ton system. The OA duct terminates in the return air plenum after a manually adjustable butterfly damper (Figure 4).

Figure 1 OA Intake Duct in Back Porch

Figure 2 OA Intake Duct in Soffit

Figure 3 Filter Backed Grill Covering the OA Intake

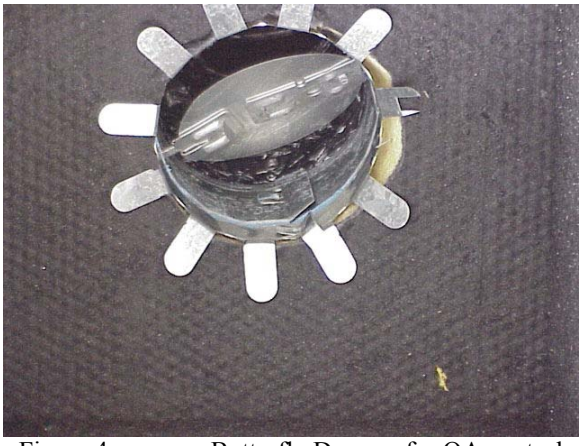


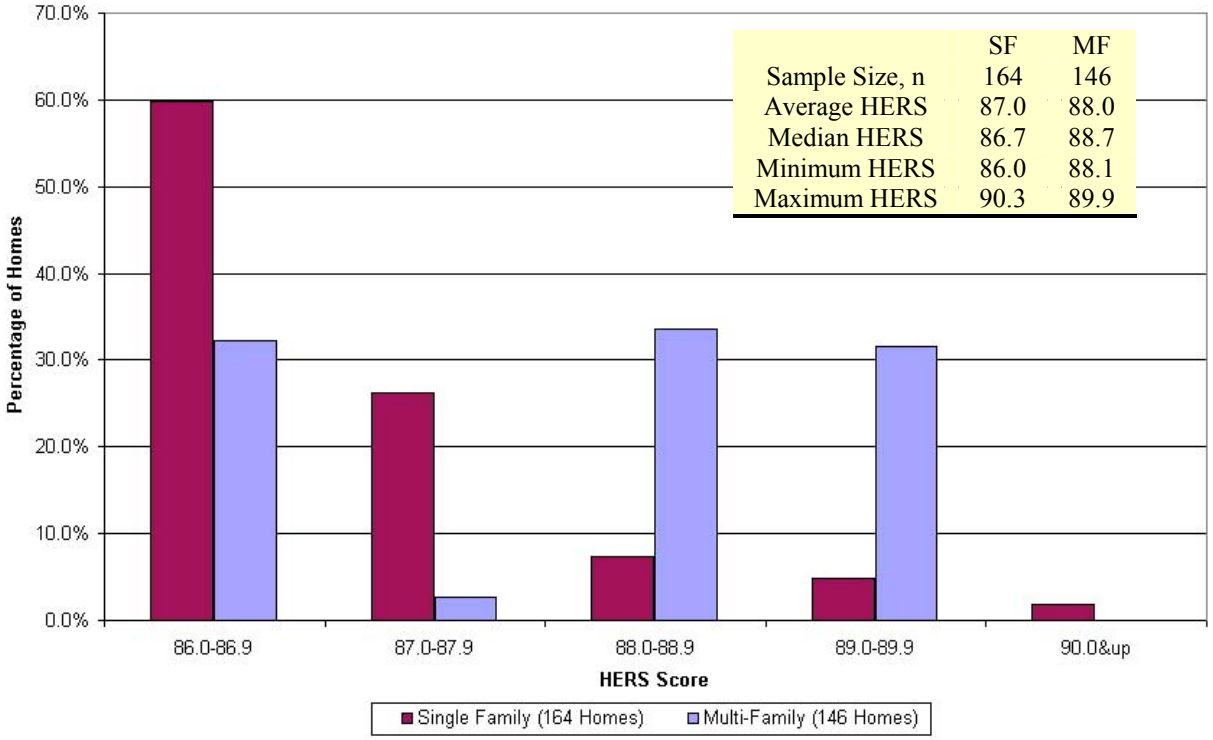
Figure 4 Butterfly Damper for OA control

The damper can be set during commissioning and closed by the homeowner in case the OA quality is poor (e.g. forest fire). This system introduces filtered and conditioned ventilation air only when the cooling or heating system is operational. The ventilation air also positively pressurizes the house. Data on the amount of ventilation air or positive pressurization is not available from a large sample of homes. A few measurements indicate that about 25 to 45 cfm of ventilation air is provided which pressurizes the house in the range of +0.2 to +0.4 pascals.

Measured Home Energy Ratings (HERS) and airtightness on these FL. H.E.R.O. homes is presented next in figures 5 through 8. Data is presented for both single family detached (SF) and multifamily homes (MF). See Table 2 below.

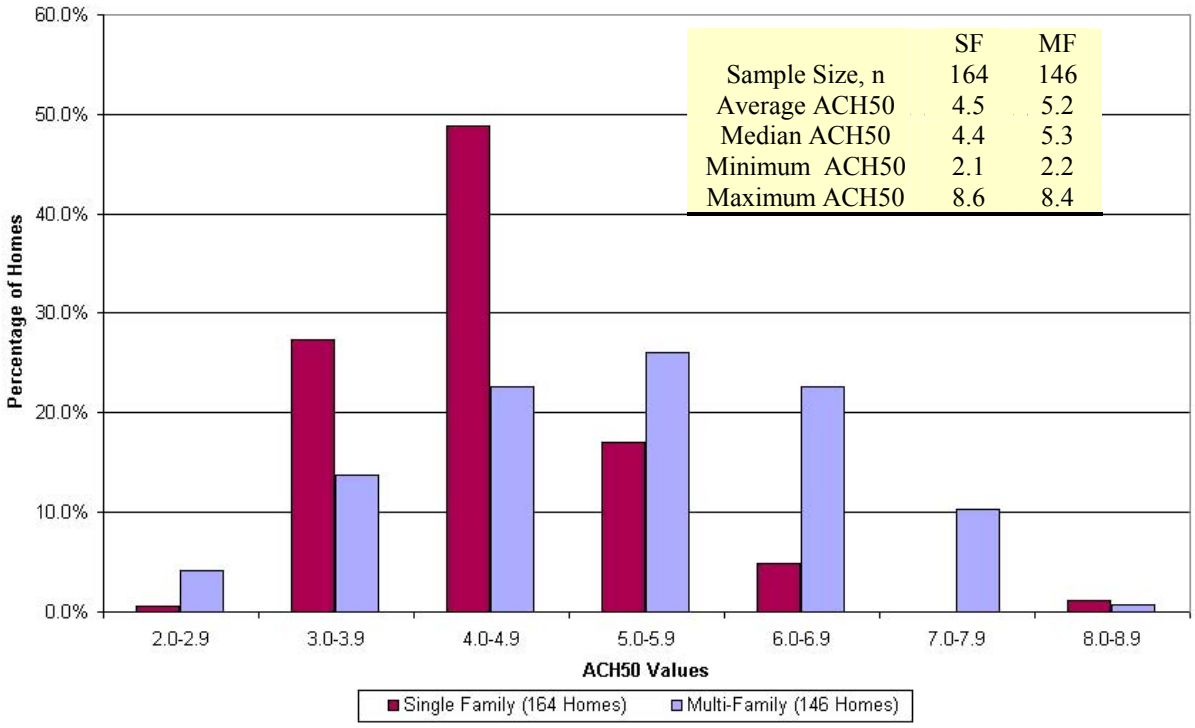
Table 2. Summary statistics on FL.H.E.R.O. Homes
n = sample size

	SF	MF
Median cond area	1,909	970
% constructed with 2x4 frame or frame and block	94%	100%
Avg. Conditioned Area, ft^2	1,993 (n=164)	1,184 (n=146)
Avg. HERS score	87.0 (n=164)	88.0 (n=146)
Avg. ACH50	4.5 (n=164)	5.2 (n=146)
Avg. Qtot (CFM25 as %of floor area)	6.9% (n=25)	5.0% (n=72)
Avg. Qout (CFM25 as %of floor area)	3.0% (n=15)	1.4% (n=4)



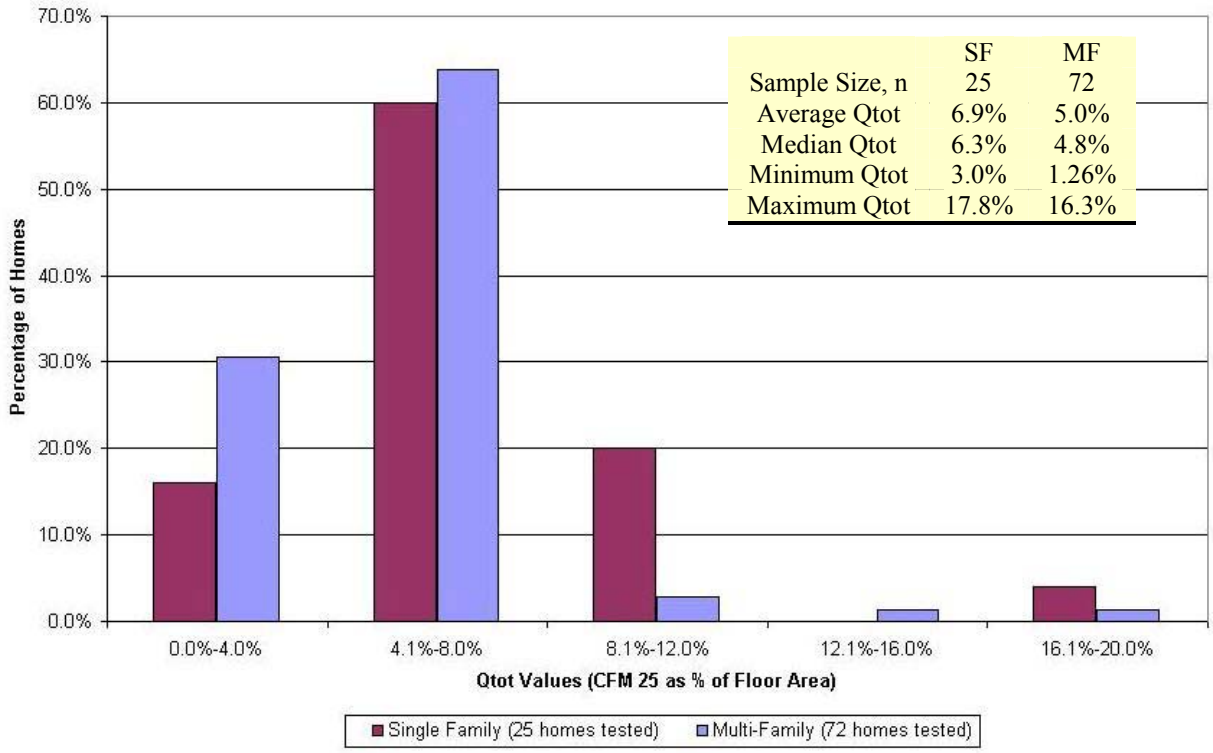
	SF	MF
Sample Size, n	164	146
Average HERS	87.0	88.0
Median HERS	86.7	88.7
Minimum HERS	86.0	88.1
Maximum HERS	90.3	89.9

Figure 5 HERS Scores for FL H.E.R.O. Homes



	SF	MF
Sample Size, n	164	146
Average ACH50	4.5	5.2
Median ACH50	4.4	5.3
Minimum ACH50	2.1	2.2
Maximum ACH50	8.6	8.4

Figure 6 ACH50 Values for FL H.E.R.O. Homes



	SF	MF
Sample Size, n	25	72
Average Qtot	6.9%	5.0%
Median Qtot	6.3%	4.8%
Minimum Qtot	3.0%	1.26%
Maximum Qtot	17.8%	16.3%

Figure 7 Qtot Values for FL H.E.R.O. Homes

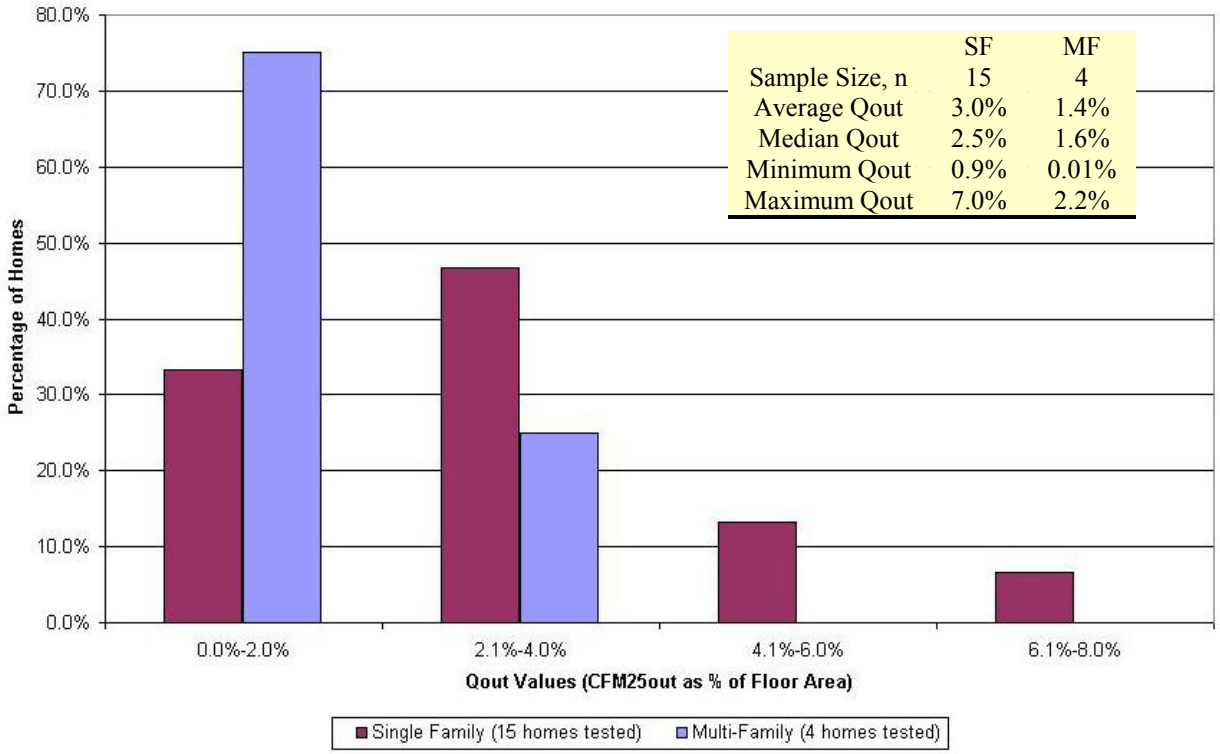


Figure 8 Qout Values for FL H.E.R.O. Homes

Data is available for other typical non BAIHP, new Florida homes (FPL , 1995 and Cummings et al, 2001). The FPL study had a sample size of over 300 single family homes and the median Qout was 7.5% , three times that of the FL. H.E.R.O. homes. In the Cummings study of 11 homes the measured average values were : ACH50= 5.7, Qtot=9.4% and Qout=4.7%. Although the sample sizes are small the FL. H.E.R.O. homes appear to have significantly more airtight duct systems than typical homes.

The remainder of the paper presents status of other tasks of the BAIHP project.

OTHER BAIHP TASKS

Moisture Problems in HUD code homes

The BAIHP team expends considerable effort working to solve moisture problems in existing manufactured homes in the hot, humid Southeast.

Some manufactured homes in Florida and the Gulfcoast have experienced soft walls, buckled floors, mold, water in light fixtures and related problems. According to the Manufactured Housing Research Alliance (MHRA), who we collaborate with, moisture problems are the highest priority research project for the industry.

The BAIHP team has conducted diagnostic tests (blower door, duct blaster, pressure mapping, moisture meter readings) on about 40 such problem homes from five manufacturers in the past two years and shared the results with MHRA. These homes were newly built (generally less than 3 years old) and in some cases just a few months old when the problems appeared. The most frequent causes were:

- Leaky supply ducts and/or inadequate return air pathways resulting in long term negative pressures.
- Inadequate moisture removal from oversized a/c systems and/or clogged condensate drain, and/or continuous running of the air handler fan.
- Presence of vinyl covered wallboard or flooring on which moist air condenses creating mold, buckling, soft walls etc.
- Low cooling thermostat set point (68-75F), below the ambient dew point.
- Tears in the belly board and/or poor site drainage and/or poor crawlspace ventilation creating high rates of moisture diffusion to the floor.

Note that these homes typically experience very high

cooling bills as the homeowners try to compensate for the moisture problems by lowering the thermostat setpoints. These findings have been reported in a peer reviewed paper presented at the ASHRAE IAQ 2001. conference (Moyer et al)

The Good News:

As a result of our recommendations and hands-on training, BAIHP partner Palm Harbor Homes (PHH) has transformed duct design and construction practices in all of its 15 factories nationwide producing about 11,000 homes/yr. All Palm Harbor Home duct systems are now constructed with mastic to nearly eliminate air leakage and produced with return air pathways for a total cost of <$10/home!! The PHH factory in AL which had a high number of homes with moisture problems has not had a single problem home the past year!

Field Monitoring

Several houses and portable classrooms are being monitored and the data displayed on the web. (Visit http://www.infomonitors.com/). Of special interest is the side-by-side monitoring of two manufactured homes on the campus of the North Carolina A & T U. where the advanced home is saving about 70% in heating energy and nearly 40% in cooling energy, proving that the Building America goal can be met in manufactured housing. Other monitored sites include the Washington State U. Energy House in Olympia, WA; the Hoak residence in Orlando, FL; two portable classrooms in Marysville, WA; a classroom each in Boise, ID and Portland, OR. See other papers being presented at this symposium for details on two recently completed projects giving results from duct repairs in manufactured homes (Withers et al) and side by side monitoring of insulated concrete form and base case homes (Chasar et al).

"Cool" Roofs and Unvented Attics

Seven side-by-side Habitat homes in Ft. Myers, FL. were tested under unoccupied conditions to examine the effects of alternative roofing strategies. After normalizing the data to account for occupancy and minor differences in thermostat set points and equipment efficiencies, the sealed attic saved 9% and the white roofs saved about 20% cooling energy compared to the base case house with a dark shingle roof for the summer season in South Florida. Visit http://www.fsec.ucf.edu/%7Ebdac/pubs/coolroof/exsum.htm for more information.

Habitat for Humanity

Habitat for Humanity affiliates work in the local community to raise capital and recruit volunteers. The volunteers build affordable housing for and with buyers who can't qualify for conventional loans but do meet certain income guidelines. For some affiliates, reducing utility costs has become part of the affordability definition.

To help affiliates make decisions about what will be cost effective for their climate, BAIHP researchers have developed examples of Energy Star homes for more than a dozen different locations. These are available on the web at http://www.fsec.ucf.edu/bldg/baihp/casestud/hfh_estar/index.htm . The characteristics of the homes were developed in conjunction with Habitat for Humanity International (HFHI), as well as Executive Directors and Construction Managers from many affiliates. Work is continuing with HFHI to respond to affiliates requesting a home energy rating through an Energy and Environmental Practices Survey. 36 affiliates have been contacted and home energy ratings are being arranged using combinations of local raters, Building America staff, and HFHI staff.

HFHI has posted the examples of Energy Star Habitat homes on the internal web site PartnerNet which is available to affiliates nationwide.

"Green" Housing

A point based standard for constructing green homes in Florida has been developed and may be viewed at http://www.floridagreenbuildings.org/. The first community of 270 homes incorporating these principles is now under construction in Gainesville, FL. The first home constructed and certified according to these standards has won an NAHB energy award.

BAIHP researchers are participating as building science - sustainable products advisor to the HUD Hope VI project in Miami, redeveloping an inner city area with over 500 units of new affordable and energy efficient housing.

Healthy Housing

BAIHP researchers are participating in the development of national technical and program standards for healthy housing being developed by the American Lung Association.

A 50-year-old house in Orlando is being remodeled to include energy efficient and healthy features as a demonstration project.

EnergyGauge USA®

This FSEC developed software uses the hourly DOE 2.1E engine with FSEC enhancements and a user-friendly front end to accurately calculate home

energy ratings and energy performance. This software is now available. Please visit http://energygauge.com/ for more information.

Industrial Engineering Applications

The UCF Industrial Engineering (UCFIE) team supported the development and ongoing research of the Quality Modular Building Task Force organized by the Hickory consortium, which includes thirteen of the nation's largest modular homebuilders. UCFIE led in research efforts involving factory design, quality systems and set & finish processes. UCFIE used research findings to assist in the analysis and design of two new modular housing factories – Excel homes, Liverpool, PA and Cardinal Homes - Wyliesburg, VA.

CONCLUSIONS

The entire BAIHP team of over 20 researchers and students are involved in a wide variety of activities to enhance the energy efficiency, indoor air quality and durability of new housing and portable classrooms.

In addition to energy efficiency, durability, health, comfort and safety BAIHP builders typically consider resource and water efficiency. For example, in Gainesville, FL BAIHP builders have incorporated the following features in developments:

- Better planned communities
- More attention given to preserving the natural environment
- Use of reclaimed sewage water for landscaping
- Use of native plants that require less water
- Storm water percolating basins to recharge the ground water
- Designated recreational areas
- Better designed and built infrastructure
- Energy efficient direct vented gas fireplaces (not smoke producing wood)

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