

Approved: 3/21/96  
Date

## MINUTES OF THE SENATE COMMITTEE ON TRANSPORTATION AND UTILITIES.

The meeting was called to order by Chairman Ben Vidricksen at 9:05 a.m. on March 18, 1996 in Room 254-E of the Capitol.

All members were present except:  
Senator Rock

Committee staff present: Hank Avila, Legislative Research Department  
Ben Barrett, Legislative Research Department  
Bruce Kinzie, Revisor of Statutes  
Martha Ozias, Committee Secretary

Conferees appearing before the committee:

Janet Stubbs - Kansas Building Industry Association  
National Association of Home Builders  
Robert Hogue - Kansas Building Industry Association  
Richard Hayter - Professional Engineer, Manhattan  
Kevin Kaberling - Schuller International, Inc., McPherson  
Jim Zalaznik - Plant Manager, Certain Teed Corporation, Kansas City  
Trudy Aron - Executive Director, American Institute of Architects  
Robert Doyle - North American Insulation Manufacturers Association  
Brian Dreiling - Kansas Home Energy Rater  
David Schlosser - North American Insulation Manufacturers Association

Others attending: See attached list

### **HB 2619 - RELATING TO CERTAIN SOLAR ENERGY SYSTEM TAX CREDITS**

This bill would repeal an obsolete statute which has not been applicable for several years. There were no conferees and no discussion. Senator Papay made a motion to move the bill out favorably. Senator Harrington seconded this. Motion carried.

### **HB 2707 - CONCERNING BUILDING ENERGY EFFICIENCY STANDARDS**

Janet Stubbs appeared in support of this bill which would prevent the State Corporation Commission from adopting or enforcing energy efficiency standards. She expressed concerns that additional costs would be added to each new structure without proven energy savings in return and thought this appeared to be self serving to a segment of the construction industry which has promoted the insulation requirements of this code. Their Associations recognize the undesirable effects that costly government regulations have on the ability of the consumer to qualify for loans and felt these requirements should be handled by local government officials who are in the position of developing, adopting and enforcing the energy codes for the residential buildings in their jurisdictions. (Attachment 1)

Robert Hogue explained that Kansas homebuilders have continued to improve the energy performance of their homes because of market driven initiatives without the benefit of a prescriptive code. The new Kansas energy code will not "fix" any existing problem but would make it increasingly difficult for young families and older retirees to move into newer, more energy efficient homes. It would also make it more difficult for those building new homes to select the best mix of energy saving tools. (Attachment 2)

Richard Hayter voiced personal opposition to this bill with specific reference to adoption of the Model Energy Code. He felt there was an obligation to support programs that will extend the availability of natural resources especially if these decisions are cost effective. Adoption of **HB 2707** would remove the specific authority given the KCC for setting standards as they have done through the public hearing process and it could erode the effectiveness of the Commission in meeting the responsibility to serve as stewards of energy conservation. He noted that if the homebuyer does not wish to consider the net cost benefit and wants only a low first cost

## CONTINUATION SHEET

MINUTES OF THE SENATE COMMITTEE ON TRANSPORTATION AND UTILITIES, Room 254-E  
Statehouse, at 9:05 a.m. on March 18, 1996.

the KCC allows them to opt out of the order. However, he felt that the average consumer cannot stay current in new building technology and would not have the knowledge necessary to request all the construction and equipment details necessary for quality, energy efficient construction. (Attachment 3)

Kevin Kaberline explained that even though the Model Energy Code would reduce the initial cost of a new home it would make home ownership less affordable and monthly bills would increase as more energy is required to give the same interior comfort. He felt the repeal of the MEC would allow fewer Kansans to secure mortgages and federally financed mortgage assistance programs would not be available. (Attachment 4)

James Zalaznik spoke on behalf of the North American Insulation Manufacturer's Association who is also opposed to **HB 2707** because it would make housing less affordable for home buyers in Kansas. The Model Energy Code was adopted to reduce the amount of energy used to heat and cool homes and as a result, homeowners will use less fuel which would amount to considerable savings. He felt that repeal of this Code would jeopardize low-income citizens' ability to qualify for a mortgage. (Attachment 5)

Trudy Aron spoke in support of this bill stating that as enforcement departments update their codes the provisions would fall under the enforcement of local officials. She felt that today's buildings are more energy efficient and adoption of proscriptive codes could actually delay the implementation of alternative energy sources. Energy standards may increase paperwork and restrict building designs and could make it difficult to recycle older buildings. (Attachment 6)

Opposition to this legislation was expressed by Robert Doyle who stated that the growing acceptance of the Model Energy Code as a guideline provides lenders with a national standard by which energy efficiency can be readily verified and factored into the mortgage underwriting process. He felt this bill would have an adverse impact on the affordability of new homes. (Attachment 7)

Brian Dreiling addressed the fact that energy codes promote complete system efficiency and safety and sometimes unsafe conditions occur if the codes are not followed completely. He cited problems with high levels of carbon monoxide, moisture problems and high energy costs and stated that before installing any energy efficient features consideration needed to be given to the effect on the entire system. He felt the Model Energy Code could be used as a guide to safe and effective energy efficiency and if enforced would assure efficient and safe housing. (Attachment 8)

David Schlosser pointed out that the energy standards adopted by the KCC were developed after public hearings and considerable input and he felt that recommendation of **HB 2707** would send the wrong message to regulators and derail good public policy. He urged its defeat. (Attachment 9)

The Chairman felt this issue needed more study and no action was taken.

A motion to approve the minutes of the March 13th meeting was made by Senator Papay and seconded by Senator Lawrence. Motion carried.

The meeting was adjourned at 10:04 a.m.

The next meeting is scheduled for March 19, 1996.

SENATE TRANSPORTATION AND UTILITIES  
COMMITTEE GUEST LIST

DATE: MARCH 18, 1996

NAME	REPRESENTING
DAVID B. SCHLOSSER	PETE Mc GILL & Assoc.
SAMUEL ZALAZNIK	NAIMA
Robert Doyle	NAZMA
KEVIN Kaberline	NAIMA
Bill Caven	KACC/Sevin
RICHARD HAYTER	SELF
Larry Holloway	KCC
Jim Ploger	KCC
John McGuire	NAIMA
Edwin Steffes	Senate
George Barber	K's consulting Engrs
Judy Iron	Am Inst of Architects
Walt Miles	KCC
Tom Young	AARP
Bob Stone	KBIA
Meon Dreda	Midwest Energy
Charles Reese	Midwest Energy
J.C. Long	Utili Corp United, Inc.
TOM DAY	KCC



TESTIMONY

SENATE TRANSPORTATION AND UTILITIES COMMITTEE  
HB 2707

March 18, 1996

MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE:

My name is Janet Stubbs appearing today on behalf of the Kansas Building Industry Association which includes approximately 1300 members of the residential construction industry throughout Kansas. The KBIA and the National Association of Home Builders support the contents of HB 2707.

Before I ask Robert Hogue, a Topeka residential contractor, to address the more technical aspects of MECH 93 and construction of residential structures using the code, I want to be certain there is no misunderstanding regarding either the background of this legislation or the procedures which would be required with MECH 93.

Currently, a builder must sign a form stating compliance with the current energy requirements at the office of most utilities prior to being given permanent power to a residential structure. The utility files this form and stores it away. Neither the utility or the KCC make an inspection to verify compliance with the thermal standard requirements in force today.

Under MECH 93, a residential builder will be required to sign a document stating either compliance or non-compliance with the code prior to connection of permanent power to the structure. Again, no inspection will be made by the utility or the KCC. As I understand it, permanent power will not be denied but the homeowner must sign a verification of non-compliance. Although the ability to sign a document admitting a structure does not meet MECH 93 is promoted as providing flexibility for the contractor, we see it as a liability issue for him.

The KCC order not only permits the builder to sign a document certifying compliance or non-compliance, it suggests utilization of the option of obtaining an Energy Rating by some of the individuals who have started business providing this service. This option would not be removed by passage of HB 2707. Any individual who has an interest in paying the \$300 or \$350 fee for this service and believes it will benefit him either by assisting in obtaining an "energy efficient loan" or dollars saved through energy savings may still do so without the KCC order requiring MECH 93 construction for

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residential structures. However, we believe the consumer should have the option of obtaining this study, at all times.

Our Association has opposed MECH 93 because of the additional cost added to each new structure without proven energy savings in return. The Directors of both the National and State Associations do not oppose the adoption of MECH 93 because they are unconcerned about the environment, energy savings or the best interests of the consumer. To the contrary, Mr. Chairman, we view the requirements of this code as adding to the cost of construction, and is viewed by the experts at NAHB to provide questionable benefits for that cost. The additional cost appears self serving to a segment of the construction industry which has promoted the insulation requirements of this code.

There is a great deal more to be considered in obtaining energy savings than just insulation on unfinished basement walls or piling more insulation in some sections of the attic because you cannot achieve the desired insulation depth in other areas due to construction techniques. I was shocked to learn that the latter is one of the many "trade offs" permitted by the MECH 93 code.

Construction techniques in framing and installation of heating and air conditioning systems, which provide maximum prevention of air infiltration and loss, are of major importance in building an energy efficient house. People considering buying or building a new home are aware and concerned about energy costs. The marketplace is demanding energy efficiency now.

Affordability of housing continues to be a concern of the leadership of this organization at National, State and Local levels. We recognize the undesirable effects that costly government regulations have on the ability of the consumer to qualify for loans. We continue to believe that local government officials who understand the building code requirements for their area should be in the position of developing, adopting and enforcing the energy codes for the residential buildings in their jurisdictions. Most localities in Kansas adopt either the UBC or CABO building codes. (The CABO code has been dropped in favor of the UBC in Wichita.) MECH 93 is a in the appendix of those codes and may be adopted in part or total by the local officials who can then inspect when making the other inspections during construction.

Opponents may attempt to infer that passage of HB 2707 will prevent federally insured mortgages in Kansas. NAHB assures me this is not correct. Builders constructing in that price range and focused on this market understand the requirements for those loans. They also know that FHA has their own inspections and requirements throughout the construction process.

Members of the Committee, we urge passage of HB 2707 as passed by the House Committee of the Whole on a vote of 114-10.

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House Bill 2707  
Kansas Building Industry Association  
Robert R. Hogue

	1980	1996
Federal Gov't Mandate	Imposition of BEPS Nationwide	States required to consider MEC 92/93 as a statewide code
Energy Rates	Climbing rapidly 20-50% inflation	Stable
Energy Supplies	U.S. held hostage by energy producing nations.	Stable Supply
Energy Innovation	None occurring	Many innovations since 1980

Our association supports HB 2707 because the recent KCC order initiating a Statewide Energy Code was not generated in response to any compelling problem. Kansas has a new residential energy code because the Federal Government ordered us to consider adopting one and the KCC did. Problems were not identified, solutions and goals were not derived, but an action plan was implemented.

Kansas homebuilders have continued to improve the energy performance of their homes because of market driven initiatives without the benefit of a prescriptive code. The new Kansas energy code will not "fix" any existing problem but it will make it increasingly difficult for young families and older retirees to move into newer, more energy efficient homes and will make it more difficult for those building new homes to select the appropriate best mix of energy saving tools in today's builder tool box.

Under this order, builders in each of the state's five climatic regions would have three prescriptive options, or in three of the climatic zones, various building components could be traded off for other prescriptive solutions. Like BEPS in 1980, more complicated computer driven solutions would be available, but they will be shunned by the industry as needlessly complex. While none of these prescriptive methods have been published by the Corporation Commission, it is highly probable that they will share the common pitfall of MEC 93 or any other prescriptive solution--- they lack economic validity. While the KCC ignored our concerns about costs, benefits and affordability for Kansas consumers, I hope you will not. Let me show you what our industry has been doing to increase energy efficiency while the KCC derived additional statewide regulations.

I have included below an excerpt from the testimony I gave in 1980 at the Federal BEPS hearings

**FIGURE A-1**

YEAR	R-VALUES		NO. OF GLASS PANELS IN FENESTRATIONS	VOLUME OF AIR CHANGES PER HOUR
	CEILING	WALL		
1974	10.1	7.68	2	1
1975	10.1	11.5	2	1
1976	18.6	11.5	2	1
1977	22.9	11.5	2	1
1978	22.9	11.5	2	.6
1979	32	11.5	2	.6
1980*	32	11.5	3	.6
1996	32	14.7	2 LoE-ARGON	.3
BEPS	38	27	3	.6

\* PROBABLE MID-YEAR CONSTRUCTION

This chart lists the major elements of the thermal envelope for a standard practice home in Topeka in the years leading up to BEPS plus the data for a standard practice Topeka home in 1996. The energy lost from these thermal envelope elements in a typical 1144SF Topeka ranch home is calculated and shown in Figure A-2 on the next page. As you can see, a standard practice home in Topeka has steadily improved and currently exceeds the performance that would have been mandated by BEPS. This was achieved by the same market driven industry initiatives that are in place today.

As is readily seen in Figure A-2, as furnace efficiencies have increased, and rate of increase in energy costs is not as great as the increase in the cost of construction, there is a diminishing return for brute force prescriptive methods.

The benefit derived by the consumer must be greater than the cost to the consumer. As illustrated in Figure C-1, also updated from my 1980-BEPS testimony, there is a point of diminishing returns for each increasingly efficient change in any element of the thermal envelope. While this graph is for a wall section, the principle would be equally valid for any part of the thermal envelope. Mandating prescriptive improvements in any given section of the thermal envelope will save energy, but the resultant savings will be a continued drain on Kansan's economic well being in the form of higher initial home costs, higher mortgage payments, higher property taxes, and higher insurance rates. If these increased costs are not offset by the savings of reduced energy consumption, it is a net loss to Kansas homeowners. Of greater importance and economic impact are the second order effects of non-market driven prescriptive energy codes.

The most dramatic impact will be on young families and older Kansan's of limited economic means, especially in the rural areas and smaller cities and towns where incomes have not kept pace with increased construction costs. Many of these individuals only

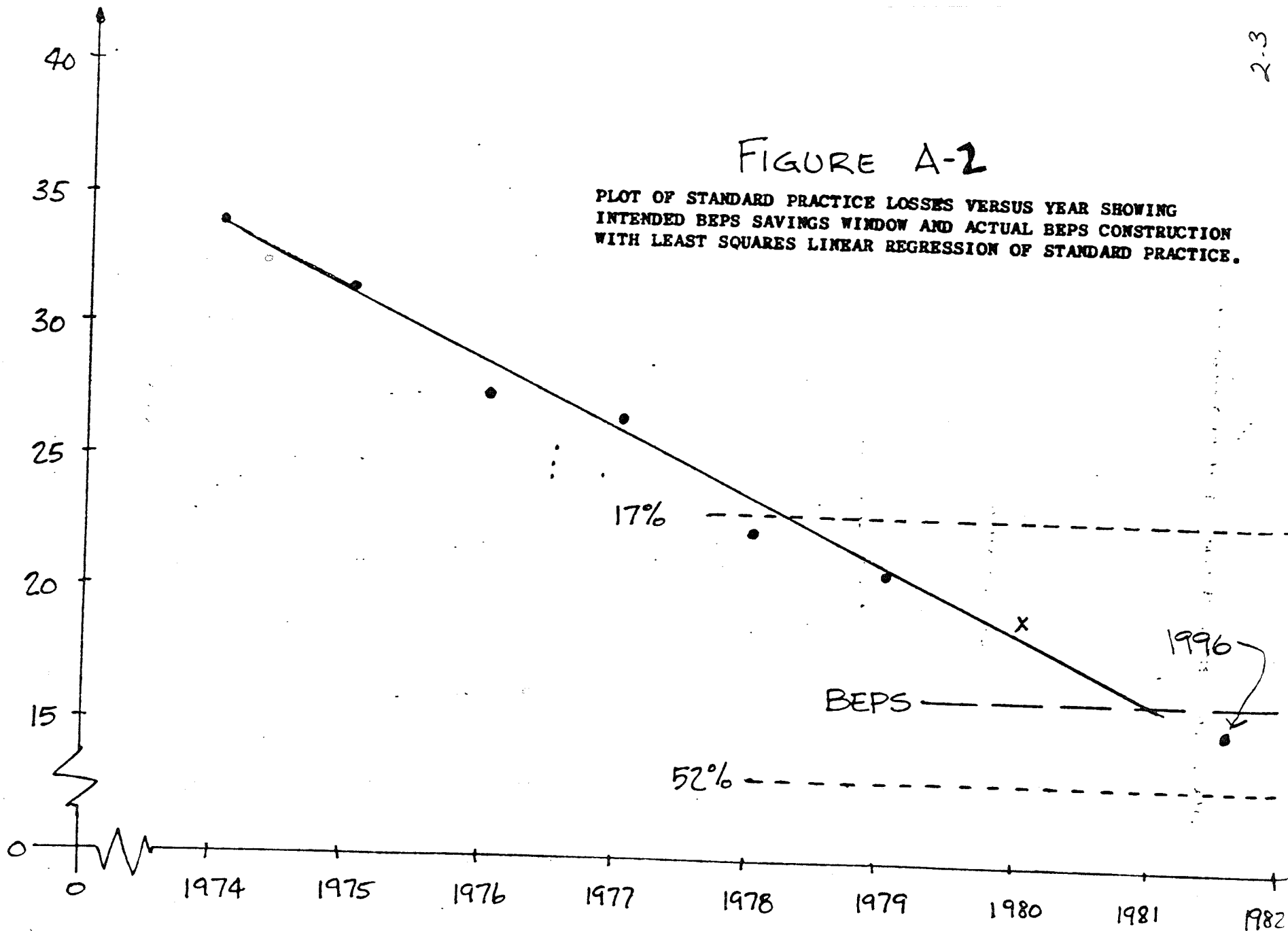


$\text{BTUH/FT}^2 @ 80^\circ\text{F } \Delta T \times 10^3$

2-3

### FIGURE A-2

PLOT OF STANDARD PRACTICE LOSSES VERSUS YEAR SHOWING INTENDED BEPS SAVINGS WINDOW AND ACTUAL BEPS CONSTRUCTION WITH LEAST SQUARES LINEAR REGRESSION OF STANDARD PRACTICE.



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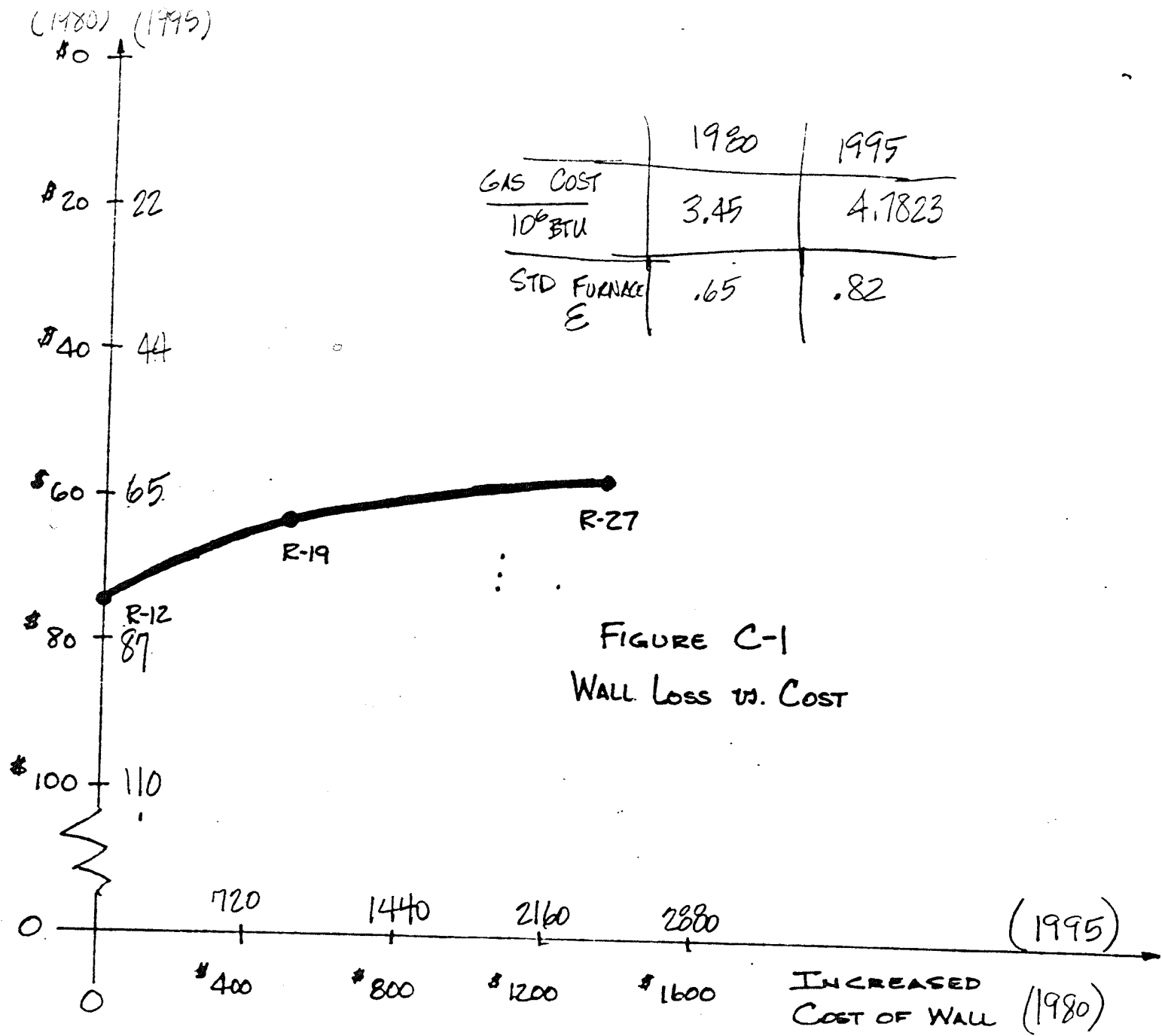


FIGURE C-1  
WALL LOSS vs. COST

marginally qualify for new home loans because of the additive effects of step function changes in the cost of new construction from new regulations like this energy code. Some of these families will stay in, or be relegated to older, less energy efficient homes than the new homes they would be able to buy if this code did not exist.

Another second order affect, which has ramifications for long term energy improvements, is that private initiatives will be stymied. The easiest route to compliance for most homes built in Kansas will be the minimum prescriptive solution which will become the defacto standard practice. As an example of the type of private initiatives the building industry supports, my firm is currently engaged in a study with the National Association of Homebuilders Research Center. Information about this program is included as Appendix 1 along with the results of a random test conducted on two of my standard practice homes early in the program. As part of this program, I have built four homes in Topeka that are being tested in a group of 30 homes nationally. We are looking for more efficient ways to distribute energy in the home and to gain real world data on cost/benefit ratios. If these methods can stand the test of market value, they will begin to appear in our homes. Other market driven initiatives by the industry have resulted in improved glazing U-Values (as of January 1, 1996 my window supplier only stocks low E argon filled glass), higher furnace efficiencies, reduced infiltration techniques (not quantifiable for prescriptive codes), and linear performing insulation products (Foam and cellulose in lieu of non-linear fiberglass). All these innovations are in place because they made economic sense as opposed to an attempt to reach some arbitrarily chosen theoretical performance figure.

Finally, local units of government have the ability to impose energy codes that make sense for their community. What makes sense in a rapidly growing, affluent 5200 heating degree day community on Kansas's east end, may not make any sense in an economically depressed rural region in the same climatic zone. These types of prescriptive codes will only add to the economic distress of many families and do not address the real energy consumers in Kansas ---older less well constructed homes.

Once again, we hope you will allow communities to retain control of their own values and support House Bill 2707. Thank you for your time.

## Appendix I

### THERMAL DISTRIBUTION EFFICIENCY PROGRAM

The NAHB Research Center is conducting a project to promote the adoption of cost-effective and performance enhancing construction practices for duct systems that will result in higher levels of energy efficiency and thermal comfort. An improved approach to HVAC systems will include practical recommendations on duct layout, installation/sealing techniques, air balancing, and accurate equipment sizing guidelines.

This project is intended to:

- gain recognition among builders, HVAC contractors, and consumers of the importance that thermal distribution systems have on overall energy usage;
- inform builders of the issues, possible solutions and the associated benefits and costs;
- give builders the tools to ensure that their customers are getting the greatest value possible for their dollars invested in a home's HVAC system, particularly the ductwork;
- develop specifications and guidelines from the builder's perspective to assure quality installations;
- promote mutually beneficial relationships with HVAC subcontractors who have varying degrees of technical capability; and
- quantify operational benefits for presentation to buyers if additional first costs are incurred.

The Research Center is looking for volunteer builders to participate in the development of this program. A practical study will be arranged to implement various recommendations on improving duct efficiency on a home(s) under construction. The Research Center will provide HVAC design assistance, coordination with HVAC subcontractors, and financial compensation for direct costs associated with this study. Performance data on these homes will be collected with follow-up testing over a two-day period after the house is complete.

## FIELD STUDIES DESCRIPTION

The NAHB Research Center will be performing field studies with cooperating builders to document changes in duct efficiency and costs associated with various modifications to existing HVAC duct practice. Actual changes incorporated in field testing will be dependent on the typical practices already in place. Additional costs incurred due to research modifications will be financially compensated by the Research Center.

The following is a list of possible issues the field testing will focus on:

- location of duct systems with regard to unconditioned or conditioned space
- using multiple return outlets as opposed to central return grilles;
- sealing/insulating duct systems to various degrees;
- use of Variable Air Volume (VAV) controls to increase comfort and efficiency;
- use of different duct materials with regard to cost, installation, and performance.

In order to determine which modifications are most appropriate for a specific application, we will need to obtain the bid package you provide to your HVAC contractor, including a complete set of drawings. We will work in close association with your HVAC subcontractor and keep you informed of all activities. Performance testing of the home's HVAC system and ductwork will be conducted after the home is substantially finished.

Ideally, the testing will be performed in the fall or winter. The testing can be done over a weekend, requiring two to three days. All testing work will be done by the NAHB Research Center. All equipment will be removed after testing is completed.

The benefits of this study will include a detailed energy analysis of the actual performance of the house. This data will include:

- a blower door test to determine overall air infiltration;
- a duct blaster test to determine the tightness of your HVAC ductwork;
- a coheat test to evaluate the overall thermal performance of the building envelope; and
- an evaluation of the system efficiency of your complete HVAC system.

# NAHB RESEARCH CENTER

400 Prince George's Boulevard • Upper Marlboro, MD 20772-8731 • (301) 249-4000 • FAX 249-0305

Appendix 2

November 1, 1995

Bob Hogue  
RHCI  
3400 South Topeka Blvd.  
Topeka, KS 66611

Dear Bob,

Listed below are the results of the blower door tests we performed last week at your two model homes. The ducts were in full communication with the house during the tests, meaning that the grilles were open and not sealed.

Site : 3421 SW Glendale Dr.  
Topeka, Kansas

ACH50 = 5.2

$$\frac{5.2}{20} = .26 \text{ ACH}_{\text{ASHRAE}}$$

Site : 3301 SW Westport Dr.  
Topeka, Kansas

ACH50 = 5.9

$$\frac{5.9}{20} = .295 \text{ ACH}_{\text{ASHRAE}}$$

I hope you find these helpful. A full battery of air leakage tests, which we will perform on the baseline, central return, and "gasket" houses, evaluates total duct leakage, duct leakage to unconditioned spaces, and room pressurization.

Also, I would like to keep up to date with the schedules for the central return house and the gasket duct house. Please let me know if any major schedule changes occur. My current understanding has the central return model finishing in early December and the gasket model house finishing in mid January.

Please call me if you have any questions regarding the results or our future testing.

Sincerely,

James M. Lyons

**Testimony Before the Senate Committee on Transportation and Utilities**  
**by**  
**Richard B. Hayter, Ph.D., P.E.**  
**on**  
**H.B. 2707**  
**March 18, 1996**

Good morning.

I am Richard Hayter; a professional engineer licensed to practice in the State of Kansas. I reside in Manhattan.

Before I present my comments, I must make two disclaimers. As some of you know, I am an associate dean of engineering at Kansas State University. My comments are my own and do not reflect any position of the university.

Secondly, a few of you may know that this year I am president of an engineering society known as ASHRAE. The American Society of Heating, Refrigerating and Air-Conditioning Engineers is an international organization with 50,000 members in 119 countries. One of the functions of ASHRAE is to develop consensus standards for our industry; one of which deals with energy efficient design of new buildings except low rise residential. Referred to as ASHRAE/IESNA Standard 90.1-1989, this standard is specified both in the 1992 U.S. Energy Policy Act and the Kansas Corporation Commission order.

As I interpret H.B. 2707, it will not impact the adoption of standards comparable to the ASHRAE standard for commercial structures in Kansas. As a result, it is not necessary that I speak on behalf of ASHRAE.

Therefore, today I am speaking as a citizen of Kansas and am voicing my personal opposition to H.B. 2707 with specific reference to adoption of the Model Energy Code.

Like the ASHRAE standard development process which requires an extensive, formal process to achieve consensus before a standard is released, the Model Energy Code has also undergone extensive review and discussion by the Council of American Building Officials and others who prepared the model code.

I will divide my testimony into two parts. I will first provide somewhat altruistic reasons for rejecting H.B. 2707 and will follow that with more tangible reasons.

First, two altruistic reasons. Like you, I have served as an elected official but at the local level. As a city commissioner and mayor of Manhattan, I felt as some of you do that the best public policy is the least public policy as long as the citizens rights and needs are protected. However, as many of you do, I also realized that, at times, it was necessary to make decisions that would have long term benefits to our community that went beyond the immediate situation. The conservation of energy is such an issue. I feel that we have an obligation to support programs that will extend the availability of natural resources; particularly if such decisions can be proven to be cost effective as will adoption of the Model Energy Code which I will show later in my testimony.

Secondly, as some of you recall, I was the last director of the Kansas Energy Office. In the late 1970's and early 80's Kansas was a leader among states in programs dealing with energy conservation and renewable energy. In the middle 80's the legislature transferred the responsibilities of the Kansas Energy Office to the Kansas Corporation Commission.

Ever since that time, the KCC has given leadership to a Kansas ethic of the need to conserve resources. Given the rather limited fiscal resources available to the Commission, I applaud them for the commitment they have had in accepting these responsibilities and the work they have done.

As you will hear from others, adoption of H.B. 2707 not only removes the specific authority given the commission for setting standards as they have done through an extensive public hearing process, it may have much further ramifications in eroding the effectiveness of the Commission in meeting the responsibilities given them by the legislature in serving as stewards of our state's commitment to energy conservation.

The second part of my testimony deals with two tangible reasons for defeat of H.B. 2707.

Testimony in support of the bill has indicated that the cost of housing will increase under the model energy code because of an increased requirement of time on the part of the builder as well as cost of material. I am not here today to refute or support that position. However, to arrive at the true fiscal impact on the homeowner, you must consider not only first cost but operating cost as well.

The Pacific Northwest National Laboratory is charged with the responsibility of providing technical design guides, training and analysis for the energy codes specified in the 1992 U.S. Energy Policy Act. As a result of H.B. 2707, they were asked to develop data specifically for Kansas on the impact of the Model Energy Code. Extensive analysis is available as a result of their calculations which we can make available to your staff. Allow me to merely read a portion of their cover letter to the Kansas Corporation Commission.



I quote

"Home owners should realize a net savings (accounting for all costs including the down payment) in about 4 years (for a 20% down payment). The first-cost increase is about \$1300 for a typical single-family home. Annual energy cost savings for single-family homes are \$156 and \$164 for Wichita and Topeka, respectively."

It's important to note that if the homebuyer does not wish to consider the net cost benefit and wants only a low first cost, the KCC allows homeowners to opt out of the order altogether where it states that:

"The utility may provide permanent service to a non-complying residential building only if the residence owner provides the utility with written verification of non-compliance."

Obviously this option would be available for both custom built and speculative housing.

The last tangible reason I will give for rejecting H.B. 2707 deals with consumer protection. Technology in housing is a sophisticated science. Opportunities for energy conservation go well beyond simply adding more insulation in the attic, double glazing and an efficient furnace.

Fortunately, most home builders in Kansas stay abreast of these new technologies and some adopt these technologies in the homes they build. The Model Energy Code or the other alternatives allowed in the KCC order is technologically sophisticated just as are our home builders. However, the average consumer cannot stay current in new building technology. He or she typically will not have the knowledge necessary to request all the construction and equipment details necessary for quality, energy efficient construction. Yet these details are necessary to qualify for federally backed loans as well as save money during their ownership of the home. The KCC order provides that protection.

Numerous design tools, guides and training opportunities are available to assist the home builders conform to the code. As a result, considerable flexibility exists in building homes which meet the code.

For the reasons that I have mentioned and for those presented by others here today, I urge you to support the KCC and their order and to reject H.B. 2707.

Testimony of Kevin Kaberline  
on behalf of Schuller International, Inc. -- McPherson, Kansas  
Regarding HB 2707  
Senate Transportation and Utilities Committee  
March 18, 1996

HB 2707, a bill that would repeal the Model Energy Code in Kansas, just passed the State House of Representatives. On behalf of the 300 McPherson based Schuller International employees, I wish to register our opposition to HB 2707.

Although it is true repealing the Model energy code would reduce the initial cost of a new home, it will make home ownership less affordable. Home owners' monthly bills will increase as more energy is required to give the same interior comfort. The proponents of the MEC repeal argue that the MEC adds \$1300 to the cost of a new home in Kansas. This adds about \$8-10 per month or \$96-120 per year over the life of the mortgage. This is only part of the story. The MEC homes require less energy. Energy savings in the first year alone are approximately \$174 which more than offsets the added annual cost of the investment. Less energy used also conserves resources and reduces pollution.

Secondly, the repeal of the MEC may allow fewer Kansans to secure mortgages. Low-income citizens may not qualify for a mortgage on a non-MEC home due to higher energy bills used in determining mortgage qualifications. Furthermore, federally financed mortgage assistance programs, such as VA and FHA loans, will no longer be available to Kansans, since federal law makes such loans contingent on homes complying with the MEC. In 1993 over 20% of the homes purchased in Kansas were financed with federally insured and guaranteed mortgages.

We urge you to protect home ownership in Kansas by keeping the MEC and rejecting HB 2707.

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DATE: 3/18/96  
ATTACHMENT: 4

# NAIMA

NORTH AMERICAN INSULATION  
MANUFACTURERS ASSOCIATION

March 18, 1996

Mr. Chairman, and honorable members of the Transportation and Utilities Committee:

My name is James E. Zalaznik. I am Plant Manager of the CertainTeed Corporation , Insulation Plant in Kansas City.

Today, I'm speaking on behalf of the North American Insulation Manufacturer's Association (NAIMA), and all of its members. NAIMA members represent over 1,200 employees in the State of Kansas. NAIMA is opposed to House Bill 2707, because this Bill will make housing less affordable for home buyers in Kansas.

The Model Energy Code (MEC), developed by the Council of American Building Officials (CABO) is referenced in the 1992 Energy Policy Act. This consensus standard promulgated by building code officials, home builders, designers, manufacturers and government representatives was voluntarily adopted earlier this year by Kansas. The intent of the code is to reduce the amount of energy used to heat and cool homes.

If HB 2707 is enacted and as a result the Model Energy Code abandoned, consumers, businesses, and the environment will all suffer.

- Homeowners' monthly utility bills will increase as more energy will be required to yield the same interior comfort level. While proponents of Model Energy Code repeal argue that the Code adds substantially to the first-cost of a new home, the facts are striking. A 1992 study by the Alliance to Save Energy estimates that the Model Energy Code adds about \$1,300 to the cost of a new home in Kansas. This adds about \$8-10 to a monthly mortgage, or between \$96-120 per year over the life of the loan. But this is only half the story. As a result of the Model Energy Code, homeowners will use less fuel; energy savings in the first year alone approximate \$174, which more than offsets the added annual cost related to this investment.

# NAIMA

NORTH AMERICAN INSULATION  
MANUFACTURERS ASSOCIATION

- Without the Model Energy Code, energy consumption in the state will increase, potentially requiring substantial investment in new power-generating capacity, which will hurt Kansans in the form of higher rates for the power they consume, as well as additional environmental degradation associated with the burning of more fossil fuels. Compliance with the Model Energy Code saves Kansans approximately 68 billion BTUs of energy per year, and allows Kansans to avoid over 3,200 tons of pollutants.
- Repeal of the Model Energy Code will make it more difficult for first time home buyers to purchase a home. The increased energy costs associated with the non-Model Energy Code home may jeopardize low-income citizens' ability to qualify for a mortgage. Further, federally-financed mortgage assistance programs, such as VA, FHA, and FMHA loans will no longer be available to Kansans, since federal law makes such loans contingent on certification that the dwelling complies with the Model Energy Code. In 1993, over 21 percent of the homes purchased in Kansas were financed with federally insured and guaranteed mortgages.

The benefits of the MEC are too great to abandon. We strongly urge you to reject HB 2707.

# AIA Kansas

A Chapter of The American Institute of Architects

75th Anniversary

1921-1996

March 18, 1996



**TO:** Senator Vidricksen and Members of the Senate Transportation and Utilities Committee

**FROM:** Trudy Aron, Executive Director

**RE:** Support for HB 2707

I am Trudy Aron, Executive Director of the American Institute of Architects in Kansas (AIA Kansas). Thank you for allowing me to testify in support of HB 2707. Last October our association testified before the joint interim energy and natural resources committee on this issue. We testified that we had no serious problems with the Energy Policy Act of 1992 (EPACT) requirement that states adopt ASHRAE 90.1-89 as the building energy standard for commercial buildings. However, we had serious concerns over the enforcement provisions for this standard. Since that time we have testified before the Kansas Corporation Commission and have come to the conclusion that the provisions in HB 2707 presents the easiest solution to a complex problem.

HB 2707 gives enforcement responsibilities to the local code officials in cities, counties, or other municipalities that have adopted building codes which include energy standards that meet EPACT. The latest version of the Uniform Building Code (UBC), used by most Kansas cities and counties, already include a model energy code. As enforcement departments update their codes, the provisions in EPACT will naturally fall under the enforcement of these local building departments.

In areas without local code enforcement or where the local entity has not adopted energy standards which meet EPACT, the owner, architect/engineer and builder/contractor would be required to state, to the local utility, that, to the best of their knowledge, the building complies with this energy standard prior to utility hook-up.

The following is presented as background on this issue:

**Will the adoption of a statewide energy code result in decreased energy consumption by commercial buildings?**

Maybe yes, maybe no. Today's buildings, without mandatory energy codes, are much more energy efficient than those built in the past. Clients are demanding more energy efficient buildings. The market place has greatly increased the efficiency of buildings -- residential and commercial over the past twenty-five years. The energy efficiency of building components -- electrical and mechanical systems; appliances; window/door, building skin and roofing materials -- are constantly upgraded to decrease energy use in buildings. We believe this trend will continue into the future. Further more, the adoption of proscriptive codes could actual undermine and/or delay the implementation of alternative energy sources such as solar, wind and geo-thermal.

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F. Lynn Walker, AIA

*President Elect*  
Vincent Mancini, AIA

*Secretary*  
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*Executive Director*  
Trudy Aron, Hon. AIA, CAE

700 SW Jackson, Suite 209  
Topeka, Kansas 66603-3757  
Telephone: 913-357-5308  
800-444-9853  
Facsimile: 913-357-6450

SENATE TRANSPORTATION  
DATE: 3/18/96  
ATTACHMENT: 4

**What impact will the adoption of an energy standard for commercial buildings have on the architectural profession?**

The adoption of energy standards for commercial buildings may increase design and documentation time - while designing a building to a proscriptive code is less desirable than one which is flexible; the greater the flexibility, the longer it may take to evaluate the various components within the design which will impact the overall energy use of the building and, hence, documentation of the selected scenario would take longer. Energy standards may increase paperwork - anyone involved in the design of a major project can attest to the weightiness of the paperwork involved. The documentation involved in proving that the design meets an energy code could substantially increase this paperwork. And, energy standards may increase design costs - the longer it takes to design a project, the more that design will cost. As nearly all commercial buildings are a one-of-a-kind custom design, it will take more time to evaluate, design, and document energy efficiency.

**What impacts will the adoption of an energy standard for commercial buildings have on the buildings themselves?**

Energy standards may restrict building designs - when a code is very proscriptive, the less flexibility the architect has to meet the clients' unique needs. The adoption of building standards may effect indoor air quality - many buildings designed during the '70s and '80s greatly reduced energy consumption but, because, in part, of the poor air exchange, many occupants of the building suffered illnesses. The "sick building syndrome" has become a well known problem. We need to make sure that reducing our energy costs is not done at the expense of the health of the occupants of the building. The adoption of energy standards will, most likely, increase construction costs - since the adoption of an energy code effects the economics of a project, not its life safety, the cost for construction just like the cost of design will likely increase. The more proscriptive the adopted code would be, the more likely the cost would increase. With more voluntary or out-come based regulations, the more flexibility the architects and engineers would have in designing a building that meets the energy efficiency standards as well as the project budget. We have numerous concerns about how these standards will affect older and historic buildings. The renovation and reuse of older buildings are a major portion of the work done by the design and construction industry. The adoption of a proscriptive code could make it difficult, if not impossible, to recycle our older building stock.

Thank you for allowing us this opportunity to provide you with information on our support for HB 2707. I'll be happy to respond to any questions you may have.

# NAIMA

NORTH AMERICAN INSULATION  
MANUFACTURERS ASSOCIATION

Mr. Chairman, and honorable members of the Transportation and Utilities Committee:

I am Robert Doyle, of Owens Corning. I am speaking today on behalf of the North American Insulation Manufacturers Association (NAIMA), and all of its members. NAIMA members represent over 1,200 employees in the State of Kansas. NAIMA is opposed to HB 2707, because this Bill will make housing less affordable for home buyers in Kansas.

Whenever the issue of affordability of new homes arises, rarely does anyone mention Energy-Efficient Mortgages (EEM's). EEM's are mortgages that are underwritten to reflect the energy and consequent dollar savings realized by purchases of energy-efficient homes. EEM programs allow current mortgage underwriting guidelines to be adjusted for the economic benefit of home energy savings by increasing the debt to-income ratios used in evaluating the borrower's ability to repay the mortgage loan.


While these mortgages have been around for some time, only a small percentage of homes are currently purchased with an EEM. This is most likely due to the lack of uniform standards to qualify a home for an EEM. As a result, it has been difficult to document home energy efficiency, or factor its effects into the mortgage underwriting process.

The growing acceptance of the Model Energy Code (MEC) as the guideline, provides lenders with a national standard by which energy efficiency can be readily verified and factored into the mortgage underwriting process.

The Federal National Mortgage Association (Fannie Mae) and other mortgage purchasers and lenders have agreed to provide an automatic 2 percent adjustment on their underwriting ratios for new homes built to standards that meet or exceed the Model Energy Code. The Department of Housing and Urban Development also allows for an automatic 2 percent adjustment.

For an example of this increased buying power, if a family has a gross annual income of \$50,000, the "stretched" debt-to-income ratio of 30 percent (as opposed to the normal 28 percent debt-to-income ratio allowed by most lenders), would enable a borrower to qualify for an energy-efficient home costing \$10,000 more than the non-efficient home.

It is clear from this example that EEM's, in combination with the Model Energy Code, make housing more affordable. In light of this, we ask you to reject HB 2707 which would repeal the Model Energy Code and have an adverse impact on affordability of new homes.



Robert Doyle  
300 Sunshine Road  
Kansas city, KS 66115-1393

## TESTIMONY SUBMITTED REGARDING HOUSE BILL # 2707

By Brian Dreiling  
Midwest Energy Inc.

3/18/96

Energy costs are commonly the third largest monthly expenditure a household faces. Energy efficiency lowers utility expenses and raises disposable income. Home buyers want these features built into their new homes at a reasonable cost. Home builders, on the other hand, may only include upgrades that are visible and the cheapest. Most importantly, installing only certain energy upgrades can cause unsafe conditions.

Energy codes promote complete system efficiency and safety. Sometimes unsafe conditions occur if the codes are not followed completely. For example, the City of Hays has implemented a mandatory ventilation, combustion air, and energy check be performed on all new homes built in the city limits. Blower doors, combustion air measurements and an energy rating system are used to evaluate these homes. Personnel performing evaluations are trained and certified Energy Raters. Testing has found some unsafe conditions, which were fixed before harm could occur. Some of the problems found, deal with high levels of carbon monoxide, moisture problems and high energy costs. A home works as a system, therefore, needs to be treated as a system when upgrading efficiency. The way wall insulation is installed can effect the operation of the furnace in the basement. If ventilation fans are used, wood burning stoves may back draft. The home is a system and needs to work as a system. Before installing any energy efficient features consideration needs to be given to the effects on the entire system. The Model Energy Code can be used as a guide to safe and effective



energy efficiency. Every new home buyer should be assured, the house they are about to buy, is energy efficient and safe.

The City or Hays' program is working well , although many people are excluded who live in rural areas. If the Model Energy Code were enforced state wide all areas could be assured of efficient and safe housing.

If you have any questions be call Brian Dreiling at 1-800-222-3121.

Thank You



Brian Dreiling

Kansas Home Energy Rater  
Level 1 Thermographer  
C/I Energy Use Specialist

**TESTIMONY PRESENTED**  
**TO THE**  
**SENATE**  
**TRANSPORTATION AND UTILITIES**  
**COMMITTEE**

**BY**  
**DAVID SCHLOSSER**  
**OF**  
**PETE MCGILL & ASSOCIATES**

**ON BEHALF OF**  
**THE NORTH AMERICAN INSULATION**  
**MANUFACTURERS ASSOCIATION**

**ON**  
**HB 2707**

---

**MARCH 18, 1996**

Good morning, Mr. Chairman and members of the committee. Thank you for the opportunity to appear before you on HB 2707. My name is David Schlosser, and I work with Pete McGill and Associates to represent the interests of the North American Insulation Manufacturers Association, or NAIMA, in Kansas.

NAIMA opposes HB 2707 for a variety of reasons. You will hear from several other conferees who oppose 2707 because energy efficiency building codes are good public policy. I am speaking today for three reasons:

First, I want to introduce you to the people who will persuade you that energy efficiency building codes are examples of good regulations -- regulations that provide more value than they cost to implement. In addition to the people who will testify today, you will find attached to my testimony a considerable sheaf of papers that will describe the benefits of reasonable energy efficiency regulations.

Second, I want to acquaint you with the process that produced the Model Energy Code for residential energy efficiency, and its adoption in Kansas.

Third, I want to convince you that process is an example of developing regulations that should be respected and copied.

The Council of American Building Officials (CABO) developed the Model Energy Code (MEC) through a *voluntary private initiative* that brought together parties interested in construction and energy efficiency. Through *negotiation and consensus*, the MEC 93 was voluntarily developed by private industry -- not government bureaucrats.

For almost 20 years, Kansas statutes have given the Kansas Corporation Commission (KCC), an independent regulatory body, the authority to restrict connection to utility service of newly constructed buildings that do not meet minimum energy efficiency standards. The KCC adopted the MEC 93 standards in 1995 after public hearings in which all interested parties had ample opportunity to offer input and ask for considerations.

The KCC's order responded to concerns expressed by the proponents of HB 2707 by explicitly providing six different methods for meeting the model energy standards *and* an opt-out clause for contractors who do not wish to comply with those standards. The opt-out requires only that builders notify the home buyer that their new home does not meet energy efficiency requirements. NAIMA believes that all the KCC's alternatives adequately address the concerns of HB 2707's proponents.

Other conferees will directly refute the proponents' reasons for supporting 2707. I am here to suggest that you should not overturn an independent regulatory body's decision that was arrived at through an excellent example of voluntary, private-sector initiative and public input.

The legislature should *always* have the authority to question whether any regulatory agency has conducted itself adequately and thoroughly, and overrule any regulatory authority adopted by a questionable process.

However, this is not such an instance. The energy standards adopted by the KCC were developed through voluntary, private sector initiative and consensus. They were adopted by the KCC after public hearings with solicitation of considerable input. At every stage in the development of the MEC and its adoption by Kansas, the proponents of HB 2707 have had an opportunity to voice their concerns. In response, the KCC included in its order a variety of options for builders, *including not complying with the Model Energy Code.*

Favorable recommendation of 2707 sends the wrong message to regulators -- that when, after public hearing and input, they adopt good standards, developed through voluntary private-sector consensus, with creative alternatives for compliance and even an option for non-compliance, the legislature will allow participants in that very process to derail good public policy.

Passage of HB 2707 is not good public policy, and I urge you to defeat it.

Chair  
Senator ...ngaman  
Co-Chair  
Senator ... M. Jeffords  
Representative Edward J. Markey  
Representative John Edward Porter

Founding Chair  
Charles H. Percy

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American Gas Association

Michael R. Bonsignore  
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Honeywell Inc.

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Executive Director  
Consumer Federation of America

Joseph A. Califano Jr.  
Chairman & President  
Center on Addiction and Substance  
Abuse at Columbia University

Richard H. Cowart  
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Vermont Public Service Board

Carson D. Culbreth  
Director of the Energy Division  
North Carolina Department of Commerce

John C. Fox  
Executive Vice President  
Ontario Hydro

Robert A. Hehner III  
Chairman  
The GHK Company

James A. Johnson  
Chairman & Chief Executive Officer  
Fannie Mae

Richard A. Kashnow  
President  
Schuller International Inc.

Thomas R. Kuhn  
President  
Edison Electric Institute

Shirley Wiseman Lach  
Past President  
National Association of Home Builders

Dean T. Langford  
President  
OSRAM PENNSYLVANIA INC.

Jonathan Lash  
President  
World Resources Institute

Susan A. Maxman  
Past President  
American Institute of Architects

Frank H. Pearl  
Chairman  
Rappahannock Investment Company

John W. Rowe  
President & Chief Executive Officer  
New England Electric System

Philip R. Sharp  
Director, Institute of Politics  
Harvard University

The  
**ALLIANCE**  
To Save Energy



March 12, 1996

Senator Ben Vidricksen  
Chairman  
Transportation and Utilities Committee  
State Senate of Kansas

Dear Senator Vidricksen:

I urge you to defer action on HB 2707, which would roll back progress in building energy codes by twenty years. I ask instead that this bill be referred for further study and discussion before substantive decisions are made.

The issues surrounding building energy codes are complex and often controversial. We believe the people of Kansas would be better served by a more deliberate process that weighs the full benefits and costs of modern energy codes.

The Alliance to Save Energy has been working for the last six years to help states modernize their building energy codes. Many states around the country, including Arkansas, Georgia, Indiana, Iowa, Kentucky, Minnesota, New Mexico, North Dakota, Tennessee, Utah, and Wyoming have improved their codes recently. They have decided to do this for several reasons:

- **Modern energy codes save more than they cost.** Homeowners' energy bills go down, more than offsetting slight mortgage payment increases. This reduces the overall cost of homeownership.
- **They make housing more affordable.** Federal mortgage programs such as FHA and VA require compliance with the Model Energy Code (MEC) of the Council of American Building Officials. Many first-time homebuyers depend on these programs to buy their first homes. Since more than 20% of Kansas home purchases were financed through FHA and VA last year, it is vital that the state maintain its commitment to the Model Energy Code.
- **Better Building Codes Reduce Pollution.** By reducing energy used in residential buildings, modern codes such as the MEC avoid the emission of large amounts of atmospheric pollution.

It would be very unfortunate for Kansas to lose these benefits by taking a major step backwards in building energy codes. The Alliance is a coalition of business, government, consumers and others that works for consensus solutions on energy efficiency issues. We are willing to work with you and others in Kansas to make sound decisions on energy codes. Through our sponsorship of the Building Codes Assistance Project and other resources, we can provide technical assistance to help work through the important issues.

Please feel free to contact me if you would like more information or assistance.

Sincerely,

William R. Prindle  
Senior Program Manager

SENATE TRANSPORTATION  
DATE: 3/18/96  
ATTACHMENT: 9-4



**BOARD OF PUBLIC UTILITIES**  
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LAWRENCE R. DUNNISON, CPA, PACTY COMPTROLLER

March  
11  
1996

Senator Don Steffes  
Room 460E  
State Capitol  
Topeka, Kansas 66612

Dear Don:

Our office was notified by Randy Burnison, plant manager of Schuller International's McPherson facility that HB 2707, a bill reducing if not repealing federal requirements for insulation in new structures, had cleared the Kansas House of Representatives.

While not being a natural gas supplier, the McPherson Board of Public Utilities remains concerned with energy-saving requirements. Not being familiar with the details of the bill, we would ask that you review it carefully prior to its coming to the floor of the Kansas Senate. If it does, indeed, have the aforementioned effect, we would ask your opposition to it. I am sure you need not be reminded that energy costs are a constant concern to customers, and that strict, but reasonable insulation codes can help reduce those costs.

Thank you in advance for your prompt attention to this matter. We are certain you will give it the proper consideration. Not only is Schuller our utility's second largest customer, they are McPherson's third largest employer.

Sincerely,

BOARD OF PUBLIC UTILITIES

  
R.N. Anderson, General Manager

RNA/cp

cc: Marvin Peters  
Tim Maier

SENATE TRANSPORTATION  
DATE: 3/18/96  
ATTACHMENT: 9-5

**Pacific Northwest National Laboratory**

Operated by Battelle for the U.S. Department of Energy

March 13, 1996

Mr. Jim Ploger  
Kansas Corporation Commission  
1500 S.W. Arrowhead Road  
Topeka, KS 66604-3349

Dear Mr. Ploger:

As you requested, enclosed is a cost/benefit analysis that gives the impacts of changing from the typical current construction practice to the levels needed to comply with the 1993 Model Energy Code (MEC). The costs and benefits for typical single-family and multifamily dwellings in Wichita and Topeka are examined in our analysis.

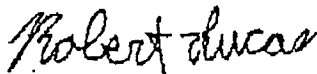
According to this analysis, complying with the MEC should save consumers money, though not immediately. Home buyers should realize a net savings (accounting for all costs including the down payment) in about 4 years (for a 20% down payment). The first-cost increase is about \$1300 for a typical single-family home. Annual energy cost savings for single-family homes are \$156 and \$164 for Wichita and Topeka, respectively. There will be little or no cost increase for a typical multifamily unit as current practice complies with the MEC's requirements (the MEC has less stringent requirements for multifamily buildings than for single-family buildings).

Attachment A provides more detailed cost impact information. Attachment B provides information on the assumptions and methodology used in the analysis to determine the cost impacts.

The adoption of an energy code in Kansas, including the specifics of that code, is a decision to be made in Kansas. This letter is not meant to imply that the Energy Policy Act of 1992, PNNL, the U.S. Department of Energy, or I can or should dictate Kansas's decision on a building energy code.

Please feel free to call me if you have any questions.

Sincerely,



Robert Lucas  
Building Energy Standards Program

cc: Joe King, DynCorp  
Ron Majette, DOE  
Steve Turchen, DOE  
Craig Conner, PNNL  
File/LB

Battelle Boulevard ■ P.O. Box 999 ■ Richland, WA 99352

SENATE TRANSPORTATION  
DATE: 3/18/96  
ATTACHMENT: 2-4

**ATTACHMENT A**  
**ECONOMIC IMPACTS OF 1993 MODEL ENERGY CODE IN KANSAS**

**MARCH 13, 1996**

The following shows the economic impacts of the 1993 Model Energy Code (MEC) in terms of mortgage cost impacts, energy cost impacts, net annual impacts, and the years to cumulative positive cash flow. First costs (i.e., construction costs) are shown at the end. These are the incremental impacts of complying with the MEC instead of common current practice. The cities of Wichita and Topeka are examined. The analysis was done for two different scenarios: a "move-up" home buyer purchasing a single-family house and a "first-time" financially limited home buyer purchasing a small multifamily unit. For multifamily buildings, current practice in Kansas complies with the 1993 MEC and, therefore, there are little or no economic impacts. Information on the input parameters for the analysis is given in Attachment B.

**Mortgages: Down Payment, Monthly Payment, and Tax Deductions**

Because most houses are financed, the financial impacts of the 1993 MEC on mortgages will likely be of significant interest to the consumer. In this analysis, a fixed-rate mortgage is assumed, and the interest portion of the payments is assumed to be deducted from income taxes.

Table 1 shows how mortgage-related costs will be impacted for a 30-year fixed-rate mortgage with a 20% down payment for the single-family house. The up-front costs include the down payment, points, and loan fees. The savings from income tax deductions of the mortgage interest will slowly decrease over time, and the values shown in Table 1 are for the first year. Table 1 also shows increases in annual property taxes because of the assumed increases in assessed property value.

**Table 1. Impacts on Mortgage Costs for a Single-Family Home Buyer**

	Cost Change Per Housing Unit	
	Wichita	Topeka
Annual mortgage payment increase	\$93	\$96
Up front cost increase	\$268	\$275
First year tax deduction savings	\$25	\$26
Property tax increase	\$13	\$14

**Energy Cost Savings**

The 1993 MEC will result in a reduction in the energy costs (i.e., the homeowner's utility bill for heating and cooling) as it requires higher levels of energy efficiency than is typically used in current



practice in Kansas. The MEC has requirements that are intended to keep energy use (and thereby energy costs) to a reasonably low level.

Table 2 shows the estimated energy cost savings from the increased level of energy efficiency required by the MEC. Natural gas heating and electric central air conditioning are assumed. If electric heating is used, energy cost savings will be much higher.

It should be noted that the annual energy cost savings in Table 2 are for the initial fuel price rates. The energy costs are expected to increase in the future. Most of the energy cost savings are from heating season energy savings.

Table 2. Annual Energy Cost Savings for a Single-Family Home Buyer

Cost Savings Per Housing Unit	
Wichita	Topeka
\$156	\$164

**Net Annual Savings**

Table 3 shows the net annual savings, including energy costs, mortgage payments, mortgage tax deduction, and property taxes, but does not include the up-front costs.

Table 3. Net Annual Cost Savings for a Single-Family Home Buyer

Cost Savings Per Housing Unit	
Wichita	Topeka
\$75	\$79

**Time to Cumulative Positive Cash Flow**

Most consumers want to know when they will start saving money (accounting for all costs and benefits). The energy cost savings resulting from increased energy efficiency start as soon as the dwelling is occupied. Of more interest may be the time when the consumer has saved more money than he or she has paid out (including the down payment). This is referred to as the time to cumulative positive cash flow. Beyond this time, the net cost savings can be expected to continue to grow; thus, the shorter the length of time to positive cash flow, the more attractive the investment in increased energy efficiency becomes.

Table 4 shows the number of years until the homeowner realizes a net cost savings from the increased levels of energy efficiency (i.e., the cumulative savings exceeds the cumulative expenditures). This length of time was derived from the calculation of the up-front costs, mortgage payments, energy costs, property tax, and mortgage interest tax deductions. During the fourth year of ownership, a

single-family homeowner in the Wichita or Topeka area would have saved more money than was expended, and the savings would continue to grow after that time. If the down payment was only 10% for the single-family home, cumulative positive cash flow would be reached during the 3rd year in Wichita and the 2nd year in Topeka.

Table 4. Years to Positive Cash Flow

Wichita	Topeka
4	4

**First Costs**

The first cost is the incremental retail cost to purchase and install energy features in the house; for example, the cost to buy and install more insulation. This cost includes the builder's profit. This is the cost that would be paid if the dwelling were paid for in cash.

Table 5 compares the increase in first costs from the construction changes needed for compliance with the 1993 MEC for the single-family home buyer. Most of the first cost increase is from the addition of basement wall insulation. Again, see Attachment B for details on the assumed combinations of energy-efficiency measures, cost data sources, and other assumptions.

Table 5. First Cost Increase Per Single-Family Housing Unit

	First Cost Increase
Wichita	\$1270
Topeka	\$1304

**ATTACHMENT B**

**ASSUMPTIONS USED IN ANALYSIS OF THE MODEL ENERGY CODE IN KANSAS**

**MARCH 13, 1996**

**Financial and Economic Assumptions**

The financial and economic parameters required for input to this analysis are summarized below. These parameters are used to calculate the costs and benefits from the homeowner's perspective.

- new home mortgage parameters
  - 8.0% mortgage interest rate (fixed-rate)
  - points and loan fees equal to 1.6% of the mortgage amount
  - 30-year loan term
  - down payment of 20% for single-family home, 10% for multifamily home
- other rates and economic parameters
  - marginal federal income tax of 28% for single-family, 15% for multifamily plus state income tax of 2.5%
  - property tax of 1.5%
  - 3.4% inflation

**Fuel Prices**

Gas and electricity prices used in the analysis are shown in Table 1. These energy prices were obtained by calling Western Resources, the primary utility serving each of the two cities. Electricity prices are for the cooling season. Fuel prices for future years are assumed to increase at the general inflation rate of 3.4%.

**Table 1. Fuel Prices by City<sup>(a)</sup>**

City	Natural Gas (\$/therm)	Electricity (\$/kWh)
Wichita	0.481	0.107
Topeka	0.481	0.0648
(a) These are marginal fuel prices.		

### Complying Measures for Current Practice and the 1993 MEC

This economic analysis considers the cost effectiveness of thermal-envelope requirements and heating and cooling equipment. The envelope components considered in the analysis are ceilings, above-grade opaque walls, windows, doors, and basements with wall insulation. Table 2 shows insulation levels and window types corresponding to the assumed current practice (the baseline) and the 1993 MEC compliance for the single-family and multifamily dwellings. The complying measures for the MEC shown in Table 2 were selected utilizing software known as "MECcheck™" (Version 2), which notifies the user if a set of insulation levels, window measures, and heating and cooling efficiencies complies with the MEC and allows tradeoffs across all building components. Note that other methods of compliance can be chosen, e.g., a high efficiency furnace may not be needed if more insulation is used. The assumed current practice essentially meets the 1993 MEC requirements for the multifamily building examined here—a slight improvement in window U-values relative to typical aluminum-frame double-paned windows might be required. For cooling equipment, central air conditioners with the minimum efficiency allowed by federal law are assumed in all cases.

Table 2. Energy-Efficiency Measures for Current Practice and 1993 MEC

	Ceiling Insulation	Wall Insulation	Window Type	Basement or Slab Insulation	Furnace Efficiency
<b>Current Practice</b>					
Single family	R-30	R-11	Double wood (U-0.50)	R-0 (basement)	78%
Multifamily	R-30	R-11	Double aluminum	R-0 (slab)	78%
<b>1993 MEC</b>					
Wichita Single family	R-30	R-11 batt	Double wood + low-E (U-0.38)	R-5, 4 ft. deep	90%
Multifamily	R-30	R-11 batt	Double vinyl or aluminum (U-0.60)	R-0 (slab)	78%
Topeka Single family	R-30	R-13 batt	Double wood + low-E (U-0.38)	R-5, 4 ft. deep	90%
Multifamily	R-30	R-11 batt	Double vinyl or aluminum (U-0.60)	R-0 (slab)	78%

### Cost Data

The analysis to determine the cost effectiveness of the MEC in Kansas requires information on the incremental costs of insulation, windows, and HVAC equipment needed to improve from current practice to the levels needed for compliance with the 1993 MEC. Cost data were obtained from 1995 Means Residential Cost Data (1994) and 1995 National Construction Estimator (1994), except for

windows and gas furnaces. The cost of low-E coatings on double-paned windows was estimated to be \$1/ft<sup>2</sup>. The 90% efficient gas furnace was assumed to cost \$400 more than the 78% efficient furnace for the single-family dwelling (Hanford et al. 1994). These cost impacts account for the benefit of downsizing HVAC equipment because of reduced space conditioning loads (DOE 1989).

### Prototype Dimensions

A one-story, single-family house, with dimensions of 30 ft wide and 63 ft long, with a conditioned floor area of 1890 ft<sup>2</sup>, was assumed in this analysis. Other dimension assumptions were 8-ft-high ceilings; ceiling area (bordering the unconditioned attic) of 1890 ft<sup>2</sup>; gross exterior above-grade wall area of 1488 ft<sup>2</sup>; and basement wall area of 1488 ft<sup>2</sup>. The basement is assumed to be unheated. A total door area of 56 ft<sup>2</sup> (approximately 3 doors) was used. For the single-family analysis, a window area of 15% of the wall area (223 ft<sup>2</sup>, or 11.8% of the conditioned floor area) was assumed.

The multifamily prototype was assumed to be a 1100-ft<sup>2</sup> two-story unit in a six-unit building. Each unit was assumed to be 20 by 27.5 ft, with the dimensions of the six-unit building being 120 by 27.5 ft. Assuming 8-ft-high ceilings, the average gross exterior wall area per unit is 787 ft<sup>2</sup>. Because multifamily units often have relatively little exterior wall area, the percentage of the wall that is windows tends to be higher than that for single-family houses. The prototype is assumed to have a window-to-wall area percentage of 20%. This gives 157 ft<sup>2</sup> of window area, equivalent to 14.2% of the floor area. The door area is assumed to be 40 ft<sup>2</sup>, which equates to approximately two exterior doors.

### Analysis Tool

This analysis utilized the energy database in the Automated Residential Energy Standard (ARES) program. The ARES software was developed for DOE and contains an economic methodology for residential energy-efficiency decisions (Lortz and Taylor 1989). Given a set of fuel-price, financial, economic, and energy-efficiency measure cost parameters for a building at a specific location, ARES identifies the economic impacts of incremental improvements in energy efficiency. ARES considers both space heating and cooling, and is designed specifically for residential energy-efficiency analyses.

In addition to an economic analysis model, ARES incorporates an energy database produced by a simulation model, allowing it to estimate the energy use for a specific selection of insulation and window measures. The energy usage associated with each combination of measures becomes an input to the ARES economic analysis. The ARES energy simulation is a parameterization of a large database of DOE-2 simulations (DOE 1989) (DOE-2 is a sophisticated energy-analysis software commonly used to estimate building energy consumption).

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THE MODEL ENERGY CODE IN KANSAS  
AND HOUSING AFFORDABILITY

The most central question in being able to purchase a house is the ability to obtain a mortgage on that portion of the purchase price that is financed, i.e., the portion remaining after the down payment.

One of the most common strategies for obtaining a mortgage for a buyer of limited financial means is to have the mortgage issued by a private lender, but the mortgage money is guaranteed by a Federal government agency for repayment to the lender in the event of the buyer's default on the loan. The Federal Housing Administration (HUD), the Rural Economic & Community Development group (Agriculture), and the Department of Veterans Affairs all have programs to guarantee private loans or, in some cases, to provide the mortgage money directly.

**FINDING: Repealing the current Kansas Corporation Commission authority to enforce an energy code for residential buildings will actually decrease housing affordability in the State because new construction will not automatically qualify for Federal loan guarantees.**

**FACT: A buyer can get mortgage guarantee insurance from the Federal Housing Administration for a new single family house in Wichita with \$2000 less annual income under the current Commission regulations than the annual income he would need if the Commission's authority is repealed.**

**FACT: A single family house buyer in Topeka can also get mortgage guarantee insurance from the Federal Housing Administration with \$2000 less annual income under the current Commission regulations than the annual income he would need if the Commission's authority is repealed.**

DISCUSSION / GENERAL

The Federal Housing Administration qualifies prospective buyers financially by using certain ratios of debt to income. A Federal Housing Administration-insured buyer must meet the following requirements:

$$\frac{\text{Housing Debt}}{\text{Income}} = \frac{\text{Monthly Mortgage Payment (PITI)}}{\text{Gross Monthly Income (before taxes)}} = 29\% \leq$$

The Federal Housing Administration also requires that **total indebtedness** (i.e., mortgage payment plus car loans, credit card payments, etc.) not exceed 41% of gross income. For purposes of this evaluation, we have assumed that this 12% margin is adequate to cover the other debts of the prospective home buyer.

The Federal Housing Administration allows the 29% ratio to increase to 31% if the buyer is trying to qualify for a home that meets (or exceeds) the 1992 Model Energy Code design requirements. ("Other debt" margin is still 12%.) This so-called "stretch" qualifying ratio is formalized in Federal Housing Administration Mortgagee Letter #93-26, August 24, 1993. In fact, the Federal Housing Administration now requires Model Energy Code compliance for all mortgage guarantee applications.

If the KCC can continue to reference the 1993 Model Energy Code for energy design of residential housing, per its order of January 23, 1996, all new houses complying with KCC regulations will be eligible for Federal Housing Administration finance guarantees under the stretch qualification ratio. (DOE has already officially determined that the 1993 MEC requirements exceed those of the 1992 MEC.)

\* \* \*

SINGLE FAMILY DWELLING IN WICHITA

The U.S. Department of Energy analyzed a 1890 sq.ft. 1-story single-family dwelling as typical of new housing stock in Kansas. Houses in Wichita and Topeka were considered.

If the house were originally designed per current practice in Kansas, we estimated the increased cost of the house to meet the 1993 Model Energy Code is \$1,270.

1. If the cost increase is financed 100%, the buyer's monthly payment will increase \$9.32 for principle and interest (30 years @ 8% fixed rate) + \$1.59 for increase in property taxes = \$10.91 /



month. {Although property taxes are currently tax-deductible, FHA evaluates borrower qualifications on a pre-tax basis.}

2. Assume average single-family house construction costs are approximately \$59 / sq.ft. in Wichita. The house will have a purchase price of  $\$59 \times 1890 = \$111,500$ .

3. Assume that the buyer makes a down payment of 10%, or \$11,150. (He can cover all other closing costs.) (FHA allows lower down payments.)

4. The balance of the purchase price is  $\$111,500 - 11,150 = \$100,350$ . A 30 year / 8% mortgage has a monthly principle + interest payment of \$736.57. (FHA will insure approx. \$152,000 maximum.)

5. Property taxes on the house are  $\$111,500 \times 1.5\% = \$1672.50$  annually, or \$139.38 per month.

6. Assume that the homeowners insurance is (estimated) \$300 annually >>> \$25 per month. (No change in insurance cost due to Model Energy Code "improvements.")

7. The homeowner's total monthly payment to his lender is  
 $\$736.57 + 139.38 + 25 = \$901.15 / \text{month}$ .

8. If the buyer were to try to qualify a "non-MEC" house with the Federal Housing Administration, the buyer would have to meet the following test:

$$\$901.15 / \text{GMI} \leq 29\%,$$

where "GMI" = gross monthly income.

$$\text{GMI} = \$901.15 / .29 = \$3,107.42 / \text{month},$$

or approximately \$37,300 per year. This is the minimum annual income of the purchaser for the Federal Housing Administration to (ordinarily) guarantee this mortgage.

9. Since the Federal Housing Administration will now provide guarantees for "Model Energy Code" houses, we must include the monthly increase of \$10.91 for the Model Energy Code improvements (see Step #1) in the buyer's payments.

10. Now the buyer must meet the following test to qualify with Federal Housing Administration:

$$(\$901.59 + 10.91) / \text{GMI} \leq 31\%$$

$$\text{GMI} = \$912.50 / .31 = \$2,944 / \text{month},$$

or approximately \$35,300 per year.

**CONCLUSION: A buyer in Wichita can get mortgage guarantee insurance from the Federal Housing Administration with \$2000 less annual income under the existing Kansas Corporation Commission regulations for residential energy codes than the annual income he would need if the house is not built to the energy code.**

\* \* \*

### SINGLE FAMILY DWELLING IN TOPEKA

The U.S. Department of Energy also analyzed a 1890 sq.ft. 1-story single-family dwelling as typical of new housing stock in Topeka.

If the house were originally designed per current practice in Kansas, we estimated the increased cost of the house to meet the 1993 Model Energy Code is \$1,304.

1. If the cost increase is financed 100%, the buyer's monthly payment will increase \$9.54 for principle and interest (30 years @ 8% fixed rate) + \$1.63 for increase in property taxes = \$11.17 / month. {Although property taxes are currently tax-deductible, FHA evaluates borrower qualifications on a pre-tax basis.}
2. Assume average single-family house construction costs are approximately \$59 / sq.ft. in Wichita. The house will have a purchase price of  $\$59 \times 1890 = \$111,500$ .
3. Assume that the buyer makes a down payment of 10%, or \$11,150. (He can cover all other closing costs.) (FHA allows lower down payments.)
4. The balance of the purchase price is  $\$111,500 - 11,150 = \$100,350$ . A 30 year / 8% mortgage has a monthly principle + interest payment of \$736.57. (FHA will insure approx. \$152,000 maximum.)
5. Property taxes on the house are  $\$111,500 \times 1.5\% = \$1672.50$  annually, or \$139.38 per month.
6. Assume that the homeowners insurance is (estimated) \$300 annually >>> \$25 per month. (No change in insurance cost due to Model Energy Code "improvements.")
7. The homeowner's total monthly payment to his lender is  
 $\$736.57 + 139.38 + 25 = \$901.15 / \text{month}$ .
8. If the buyer were to try to qualify a "non-MEC" house with the Federal Housing Administration, the buyer would have to meet the following test:

$$\$901.15 / \text{GMI} \leq 29\%,$$

where "GMI" = gross monthly income.

$$\text{GMI} = \$901.15 / .29 = \$3,107.42 / \text{month},$$

or approximately \$37,300 per year. This is the minimum annual income of the purchaser for the Federal Housing Administration to (ordinarily) guarantee this mortgage.

9. Since the Federal Housing Administration will now provide guarantees for "Model Energy Code" houses, we must include the monthly increase of \$11.17 for the Model Energy Code improvements (see Step #1) in the buyer's payments.

10. Now the buyer must meet the following test to qualify with Federal Housing Administration:

$$(\$901.59 + 11.17) / \text{GMI} \leq 31\%$$

$$\text{GMI} = \$912.76 / .31 = \$2,944 / \text{month},$$

or approximately \$35,300 per year.

**CONCLUSION: A buyer in Topeka can get mortgage guarantee insurance from the Federal Housing Administration with \$2000 less annual income under the existing Kansas Corporation Commission regulations for residential energy codes than the annual income he would need if the house is not built to the energy code.**

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