

THE WISCONSIN RENTAL WEATHERIZATION PROGRAM: NEW LIFE FOR OLD BUILDINGS

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ABSTRACT

The rental housing sector has been ignored in an era when high energy prices have caused the adoption of conservation measures in other housing types. Wisconsin is beginning to address the energy needs of its 250,000 rental buildings. In 1980 the Wisconsin Legislature enacted a mandatory energy conservation requirement for rental dwellings. The rules, developed by the Department of Industry, Labor & Human Relations (DILHR) over a four-year period, are a workable compromise between prescriptive and performance energy conservation standards. The law became effective on January 1, 1985, and is being implemented and enforced by DILHR.

The weatherization standards mandate that rental buildings conform as a precondition to property ownership transfer. All the conservation measures were chosen for their ability to provide a five-year simple payback of the cost of installation. The successful implementation of the program is dependent upon a cooperative interaction between the state, property owners, realtors, registers of deeds, and an independent inspection force. The existence of the conservation requirement has also been an impetus for shared savings and other creative financing schemes.

This paper will provide an overview of the energy conservation standards and describe the mechanisms for rule administration, implementation, and enforcement. An initial assessment of the program will be made by analyzing the compliance rate and the impact on energy consumption in the state. Tools for evaluation will be discussed including the use of the F-LOAD computer program for cost/payback analysis of energy conservation measures.

Wisconsin has taken the lead in conserving energy in the rental housing sector. The Wisconsin program is one of the few in the nation that has adopted retroactive conservation standards for existing rental buildings on a statewide basis.

INTRODUCTION

The 1980 Wisconsin statute that conceived the rental weatherization standards was a product of the 1979 oil shock. As with the 1973 oil embargo, states with large oil consumption patterns tailored legislation to induce conservation to lessen the economic impact of escalating oil prices. The rental housing stock in Wisconsin was targeted due to the lack of market incentives to perform conservation retrofits on these buildings.

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In Wisconsin, as well as the nation, rental structures tend to be old and occupied by low to moderate income families. Census data for Wisconsin show that approximately 31% of all residential units in the state are occupied by renters. A larger portion, 38%, of the rental stock was constructed prior to 1939. Twelve percent of the rental units are occupied by low-income families at or below 15% of the federally defined poverty level (Wisconsin Public Service Commission 1985). Many of these families are experiencing difficulty paying their utility bill.

The rental weatherization standards counteract some of the inherent financial, technical, and institutional barriers to conservation in the rental sector. Some of these include:

- o Tenants have no interest in conservation because they do not own their buildings and their tenancy is not typically long enough to reap a sufficient rate of return on energy conservation improvements.
- o Landlords hesitate at conservation improvements because tenants are the recipients of increased comfort and lower utility bills. Building owners view tenants as responsible for energy waste in their buildings.
- o Landlords find it difficult to finance conservation due to poor cash flows or the difficulty in obtaining loans.
- o Business tax deductions allowed for energy expenses discourage investment in energy improvements.
- o The technical options for conservation retrofits in multifamily buildings are not proven and need more research and development. (Bleuiss and Gavitz 1984)

Wisconsin has acted positively to the need for energy conservation in the rental sector. This paper will describe the processes and mechanisms for administering, implementing, and enforcing the rental weatherization standards that were developed by the Wisconsin Department of Industry, Labor & Human Relations. A preliminary assessment of the program's compliance rate and energy savings will also be given including a discussion of evaluation techniques.

BACKGROUND

Legislation

In 1980 the Wisconsin State Legislature mandated the Department of Industry, Labor & Human Relations (DILHR) to develop an energy conservation standard that all rental housing units should meet before being sold. The statutes specified that the standard developed must only include conservation measures that would save more in energy costs over a five-year period than the cost of installing that measure. However, it also allowed for a performance option that would restrict rental units to a computed "budget" of energy in order to meet compliance. Some other unique provisions of the statutes place much of the program responsibility on the private sector and local government. A five-year lead time was scheduled for the development and implementation of the regulations. The completed rules, Chapters ILHR 67 & 68, were adopted by DILHR on January 1, 1983, and two years later the law went into effect.

Only residential rental properties that will be used as rental housing * are covered by the code; however, a number of these are excluded as follows:

- o Seasonal dwelling units not rented anytime between November 1 and March 31 each year.
- o Buildings with four or fewer dwelling units, if the buyer will live in one of the units for at least one year immediately after the transfer.

* NOTE: The code applies to future use of property. Single-family homes and individual condominium units that are bought for investment and used as rental properties are subject to the code.

- o One-or two-family dwellings constructed after December 1, 1978, that are less than ten years old. (Regulated by the state's Uniform Dwelling Code.)
- o Buildings, with more than two dwelling units, constructed after April 15, 1976, that are less than 10 years old. (Regulated by the state's Building and Heating, Ventilating & Air Conditioning Code.)
- o Mobile homes.
- o Hotels, motels, and tourist rooms, which are licensed by the Wisconsin Department of Health & Social Services.
- o Hospitals or nursing homes that are licensed by the Wisconsin Department of Health & Social Services.

Table 1 is a summary of the rental units and buildings in Wisconsin subject to the Rental Weatherization Code requirements.

Performance vs. Prescriptive

The original legislation specified that the rules be developed either on a prescriptive basis, where a list of standards justified on a five-year payback are met, or on a performance basis, where a building is allotted a certain energy budget for a specified design condition. The finalized rules are prescriptive, consisting of measures that have been justified by a five-year simple payback. An exemption procedure was created to allow owners to contest any individual requirements on the basis of payback. The exemption procedure provides a built-in mechanism for evaluating the prescribed components and makes departmental review sensitive to the fluctuations in the marketplace.

Compatibility

A major concern during and after the development of the standard has been to coordinate with existing state weatherization programs. The rental weatherization law is the first mandatory state conservation standard for any existing construction and has potential as a model standard for all other weatherization programs implemented in the state. As part of this coordination, Wisconsin's Public Service Commission has modified its utility mandates for Residential Conservation Service (RCS) and Commercial and Apartment Conservation Service (CACS) programs in order to create a new class of inspection services that the utilities could offer to check for compliance with ILHR 67. The utilities play strictly an advisory role, providing information to rental property owners on the requirements of the law. The Wisconsin Department of Health & Social Services also incorporated modifications to their Low Income Weatherization Program to assure that measures taken through their program would not have to be changed in order to meet the DILHR requirements before properties could be sold.

The Prescribed Standard

During the development of the Rental Weatherization Standard, building envelope and equipment measures were analyzed to determine which items would be feasible for incorporation in the standard. These measures have been successful in other conservation programs. Typical conservation practices were evaluated based upon their practicality, proven acceptability, and cost effectiveness. The following weatherization measures were chosen because of their ability to save sufficient energy within five years to offset the costs of meeting the requirement:

- o Insulation must be installed in "accessible" areas to the levels shown in Table 67.05 of the code (see Table 2). "Accessible" means the space can be reached without removal or alteration of any finish materials of the permanent structure. For example, enclosed wall cavities are considered inaccessible and do not require insulating. An unfinished attic with floorboards, however, must be insulated under the boards if not insulated above.

- o Inward-swinging exterior doors and patio doors must be insulated, double-glazed, or equipped with a storm door, unless they are provided with a vestibule. Storm doors must have a self-closing device.
- o Windows must be double-glazed or equipped with storm windows. Exempted are windows in doors and furnace rooms. Windows located in basements, which are not habitable rooms, may be permanently sealed in lieu of double glazing or installing storm windows.
- o Weatherstripping must be installed on exterior doors and windows where cracks exceed 0.10 inches.
- o Caulking must be applied to exterior joints for the first three stories of the building.
- o Ventilation must be installed in attics and crawl spaces at a rate of 1 ft.² of venting per 300 ft.² of floor area. A vapor barrier must cover the ground in crawl spaces.
- o Heating equipment and water heaters must be certified as being properly adjusted by a service technician in the past six months. Exempted are electric water heaters and electric resistant heaters.
- o Water heaters located in vented spaces, as well as basements and crawl spaces that are uninsulated or have insulated ceilings, must be insulated with a jacket of at least R-5, except high-efficiency heaters meeting the standards of ASHRAE 90-75, 90-77, or 90A-80.
- o Showerheads must restrict flow to 3 gal/min.
- o Air conditioners must be covered and effectively sealed from the inside or outside or both during the heating season.

Future Revisions

Another legislative requirement is to keep the rules current by reinitiating the rulemaking process every five years. This is accomplished by reorganizing an Advisory Code Committee to consider suggested code revisions, holding public hearings on the proposed rule revisions, incorporating the public comment into the rule package, and submitting the package to the legislature. Code interpretations, procedural clarifications, and special variances issued by DILHR during the five-year interim may be included in future revisions.

Creative Financing

The implementation of a mandatory conservation standard may place a financial burden on owners of rental property. Some of this economic hardship can be lessened by financial assistance programs that already exist in Wisconsin. These include the Low Income Weatherization Program, the Community Development Block Grant Program, and the Rental Rehabilitation Program. Third party financing, or shared savings, is a private sector funding mechanism new to Wisconsin that conditions repayment on a "guaranteed savings" from the energy conservation measures installed. Creative financing schemes in Wisconsin can be strongly attributed to weatherization mandates and legislation such as the rental weatherization law.

PROCEDURES

Transfer Authorization

After January 1, 1985, " a register of deeds may not accept for recording any deed or document of transfer of real estate which includes a rental unit unless the deed or document is accompanied by a certificate...waiver...or a stipulation..." (stat. 101.122(6)). One of these three transfer authorizations is prerequisite to the transfer of rental unit property. The front page of each of the transfer authorizations is included in Appendix B.

A certificate, or Certificate of Compliance, is issued by a rental inspector only if the inspector has first confirmed that the property meets all the prescribed requirements of the law. Inspectors are tested, licensed and monitored by DILHR and must adhere to the requirements of Ch. ILHR 68 certification standards for rental unit energy inspectors. There are over 1,700 independent inspectors in Wisconsin certified and regulated by DILHR to perform these inspections and issue the Certificates of Compliance. The fees that inspectors charge are set by the inspectors and controlled by the marketplace but are limited by maximums set by DILHR.

A stipulation agreement or a waiver agreement will allow the register of deeds to record the transfer in lieu of the Certificate of Compliance. The stipulation agreement, signed by the purchaser of a rental property, will allow a postponement of the requirements for one year. After the parties of the transfer have received a stipulation from DILHR, the purchaser is responsible for receiving a certificate within one year after the sale and notifying the Department. If a noncomplying property is planned to be demolished after the sale, the waiver agreement must be signed by the purchaser and authorized by DILHR.

Fee Schedule

While actual inspection fees will be negotiated between owners and inspectors, DILHR has set a maximum fee schedule. For an initial survey and a follow-up certification inspection including issuance of a certificate, the maximum fee is \$200.00 for the first two units, plus \$50.00 for each additional unit up to eight units. Twenty-five dollars can be charged for each additional unit over eight units. A recent survey of 200 certified rental inspectors has provided the department with average inspection fees for the program. Table 3 summarizes the survey results and also itemizes other fees of the program.

EVALUATION METHODS

Five Year Payback

A simple payback method has been adopted to calculate the savings of the conservation measures contained in the code. Both the fuel inflation rate and the discount rate are disregarded. This is a reasonable assumption considering the short time period. Installed costs of each measure, a dominant factor in determining a five year savings, were gathered from a pool of data collected on a continual basis by the Wisconsin Public Service Commission and from an ongoing contractor survey performed by DILHR.

The Public Service Commission information represents actual installed costs of conservation measures by contractors who participate in the utilities' Low Income Weatherization Program. The DILHR contractor survey data are estimated costs based on "typical" installation of specific conservation strategies. A list of average installed costs based on the contractor survey can be found in Appendix A. A summary of payback periods for most of the conservation measures required by the code is provided in Table 4. The spreadsheet calculations shown in the table assume that natural gas is being consumed in rental buildings. Natural gas was chosen because it is the predominant fuel in Wisconsin and the least expensive. Substituting other fuels for natural gas produces shorter payback periods.

The computer spreadsheet provides a convenient method for evaluating the code on an ongoing basis. At the time of rule adoption, insulation in enclosed wall cavities showed a payback in excess of five years due to installed costs and the price of fuel. The spreadsheet indicates that at today's installed costs and fuel prices wall insulation easily meets the five-year statutory payback requirement. This measure can now be considered for inclusion into the code when revisions are made by the department.

Exemptions

The exemption process has been developed to allow a property owner to contest the payback assumption for any of the individual conservation measures required by the code. The process is the same as the method used by the code committee to justify their selection at the time of code's development. The energy savings calculations are specified in section ILHR 67.06 of

the Administrative Code. A simple payback savings analytical model is used to demonstrate cost effectiveness due to the short period under consideration.

The method is a degree-day method, which does not require an initial design load calculation. Climate, fuel heating values, and heating efficiencies are specified by the code but allow substitutions if properly documented. The complete equation, reprinted from the regulations, is shown in Appendix C.

The equation has been used along with standard ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) methods to develop payback calculation worksheets that are incorporated in the exemption application form. These worksheets and application forms can be filled out by anyone who has an available pocket calculator and a knowledge of the building parameters for which the exemption is being requested.

Actual vs. Predicted

An analysis of the expected volume of transfer authorizations was performed to gauge program workload. Based on U.S. Census data for Wisconsin, it was estimated that 180,000 buildings statewide are subject to the Rental Weatherization Code. In order to ascertain the yearly program volume, the frequency of building transfer had to be estimated. After contacts with various local, regional, and national real estate organizations, it was determined that rental buildings typically transfer an average of every 11.5 years.

<u>Type of Building</u>	<u>Years To Transfer</u>	<u>% of Building Type in WI</u>
100 + units	4-5 years	2%
4 + units	5-7 years	10%
1-4 units	10-15 years	88%

The above figures result in approximately 16,000 transfers annually. Expected volumes are also influenced on a yearly basis by a seasonal transfer factor. December through February are the lightest months in terms of real estate sales and account for only 17.5% of the yearly total. The most real estate transfers occur in May through July. These months provide 33% of the yearly total.

Approximately 9,664 rental buildings should have been transferred in the first seven months of the program, according to the assumptions made in the initial estimates. These structures require either a Certificate of Compliance or Stipulation, or Waiver in order for the sale to be recorded at the Register of Deeds. The actual number of transfer authorizations received by DILHR through July 1985 is 2,662. Thus, the number of transfer authorizations is 28% of what was expected.

There are some reasons for the program not obtaining the expected initial volume of transfer authorizations.

1. Noncompliance - The registers of deeds are responsible for seeing that transfer authorizations are present when a property is recorded at the time of sale. A transfer authorization is required if the property is subject to the rental code. The information provided for the record is not always adequate to determine if the property is subject to the law. The registers of deeds are not familiar with the types of exclusions claimed by the owner at the time of transfer. They are not uniformly using the forms that were specifically designed for exclusion claims.
2. Too Many Exclusions Filed - The projections of the number of buildings excluded from the law, based on the U.S. Census, is being exceeded by the number of exclusions actually being filed. The people transferring rental property are avoiding the law by not claiming the true nature of their transactions.
3. Condominiums - The code intends to exclude the declaration of buildings as condominiums. Individual condominium units that are rented are subject to the code. There has been some misinterpretation of the law pertaining to condominiums and some owners have been mistakenly claiming exclusions for their units even though the units may be rented.
4. Inspectors Not Following Procedure - Inspectors are required by law to send a copy of every Certificate of Compliance to DILHR. This is the procedure by which the

department gathers information and statistics. Some inspectors are not following this procedure. As a result, the department has no record or knowledge of some properties that have been certified and transferred.

As with every new program, there are unforeseen difficulties, misinterpretations, nonuniform enforcement, and a "wait and see" attitude by the public anticipating the program's early demise. Corrective action has been taken to remedy many of the initial program problems. Future exclusions will be claimed on the Wisconsin Department of Revenue Transfer Return Form, providing a single place for declaring exclusions. This makes it less difficult for the registers of deeds to determine if properties are excluded and it assists program staff in reviewing exclusion declarations.

An inspector must purchase a transfer authorization stamp from DILHR and affix it on the Certificate of Compliance. Inspectors are being monitored through the purchase of compliance stamps. If DILHR does not receive copies of Certificates of Compliance from inspectors who have purchased many stamps, the program staff will investigate the inspector to determine inspection activity.

There are two external forces to the program that have significantly affected the expected volume of the program. The real estate market in the state is experiencing a poor year. Over the past year, property transfers have declined 15-25% in the counties that have the majority of rental buildings (Wisconsin Department of Revenue 1985).

The potential revamping of the U.S. tax code has also made investors hesitant to purchase income property. The suggested changes in the tax code would make investment property less lucrative by curtailing depreciation allowance.

The program staff projects that the expected volume of transfers will be reached as the program matures and becomes more institutionalized. Confusing program language is being corrected, transfers and inspectors are being monitored, and public education about the requirements of the code is being continued.

Computer Modeling

A building energy analysis program, which incorporates methods published by ASHRAE and NBS (National Bureau of Standards), will be used by DILHR to make projections of statewide energy savings attributable to the law. A survey of inspection field reports will be performed to establish a base level of conservation for noncomplying rental units. A representative building with the base parameters will be modeled in various stages of code compliance. The computer method will also act as a comparative standard for exemption applications that incorporate an alternative analysis rather than the simplified payback worksheet that is included in the exemption application form.

CONCLUSION

Energy conservation in rental housing is just beginning to be addressed by specialists in both the public and private sectors. The complexity of the structures and the lack of incentives for owners and tenants to engage in energy improvements have inhibited retrofits in this housing stock.

Wisconsin is one of the two states that has passed legislation mandating conservation measures for rental properties. The Rental Weatherization Standard is a simple prescriptive requirement that has been in effect since January 1, 1985. As with any new program, it has suffered from misinformation and nonuniformity of enforcement, but these problems are being remedied by program staff.

The code has spurred other public and private organizations, Wisconsin Public Service Commission, Department of State Energy, Wisconsin Energy Conservation Corporation, etc., to consider programs and strategies for the rental sector. Shared savings for multifamily structures should be a reality in Wisconsin by 1986. Class A utilities in the state are now offering free audits for tenants and owners of rental properties.

Wisconsin has been in the forefront of innovative energy conservation programs. The Rental Weatherization Code focuses on a need largely ignored in the open marketplace. With an energy import bill that exceeds \$7 million a year, Wisconsin must continue to provide energy policy that benefits its citizens and curtails the drain of dollars from its communities.

REFERENCES

Bleuiss, D. L. and Gavitz, A. A. 1984. Energy conservation in existing rental housing. Washington: Energy Conservation Coalition.

Magill, R., etc al. 1985. "Program evaluation of the winter heat protection program." Wisconsin Gas Company.

United States Department of Commerce. 1980 Wisconsin Census Summary Tape, File-3A.

Wisconsin Department of Revenue, "1984-1985 real estate transfer returns." Madison, Wisconsin.

Wisconsin Public Service Commission. 1985. "Energy conservation and rental housing in Wisconsin."

BIBLIOGRAPHY

ASHRAE. 1985. ASHRAE Handbook-1985 Fundamentals. Atlanta: American Society of Heating, Refrigerating and Air-Conditioning Engineers.

F-LOAD users manual - Microcomputer version. F-CHART Software, July 1983.

Mitchell, J.W. 1983. Energy engineering. New York: John Wiley and Sons.

1984 annual report-Rental weatherization program. Safety and Buildings Division, Department of Industry, Labor and Human Relations.

APPENDIX A
Installed Costs of Conservation Measures

Conservation Measure	N	\bar{X}	S.D.
<u>A. ATTIC INSULATION</u>			
A1. Blown Cellulose Below Floorboards			
Add R-11	18	\$.28 ft ²	\$.08
Add R-19	24	\$.38 ft ²	\$.08
A2. Blown Cellulose in Open Cavities			
Add R-11	18	\$.23 ft ²	\$.08
Add R-19	24	\$.35 ft ²	\$.08
Add R-38	24	\$.52 ft ²	\$.10
A3. Blown Fiberglass in Open Cavities			
Add R-11	14	\$.42 ft ²	\$.13
Add R-19	19	\$.49 ft ²	\$.12
Add R-38	18	\$.78 ft ²	\$.13
A4. Fiberglass Batt in Open Cavities			
Add R-11	17	\$.25 ft ²	\$.07
Add R-19	19	\$.34 ft ²	\$.08
Add R-38	17	\$.57 ft ²	\$.10
A5. Fiberglass Batt between Roof Rafters			
Add R-11	17	\$.43 ft ²	\$.12
Add R-19	18	\$.52 ft ²	\$.11
<u>B. FOUNDATION WALL</u>			
B1. Exterior 2 ft above and 1 ft below grade (rigid board) including finish			
Add R-5	18	\$2.46 ft ²	\$.77
B2. Interior (full height) Rigid Board-Furred and Sheetrock			
Add R-5	10	\$1.89 ft ²	\$.87
B3. Interior (full height) Fastened or Glued Rigid Board			
Add R-5	9	\$1.64 ft ²	\$.67
<u>C. BASEMENT CEILING</u>			
C1. Fiberglass Batt			
Add R-11	24	\$.42 ft ²	\$.09
Add R-19	22	\$.52 ft ²	\$.11
<u>D. BOX SILL</u>			
D1. Fiberglass Batt			
Add R-11	29	\$.45 ft ²	\$.14
Add R-19	29	\$.55 ft ²	\$.15
<u>E. WALLS</u>			
E1. Fiberglass Batt in Open Wall Cavity			
Add R-11	23	\$.44 ft ²	\$.14
E2. Blown Cellulose-Finished Wall Cavity (exterior)			
Add R-11	28	\$.55 ft ²	\$.13
E3. Blown Cellulose-Finished Wall Cavity (interior)			
Add R-11	26	\$.61 ft ²	\$.17
E4. Blown Cellulose-Finished Wall Cavity (remove siding)			
Add R-11	23	\$.70 ft ²	\$.17

NOTES: N=Number of Responses; \bar{X} = Mean; S. D. = Standard Deviation

APPENDIX A (continued)

<u>Conservation Measure</u>	<u>N</u>	<u>\bar{X}</u>	<u>S.D.</u>
F. WINDOWS			
<u>F1. Storms over Operable Windows</u>			
Combination Exterior Alum. Storm (glass)	31	\$ 4.85 ft ²	\$ 1.60
Combination Exterior Wood Storm (glass)	10	\$ 5.58 ft ²	\$ 1.98
Exterior/Interior Vinyl Storm (glass)	20	\$ 5.21 ft ²	\$ 1.38
Interior Vinyl Storm (Acrylic)	14	\$ 4.55 ft ²	\$ 1.72
<u>F2. Basement Storms</u>			
Exterior/Interior Alum. Storm (glass)	28	\$ 5.32 ft ²	\$ 1.69
Exterior/Interior Vinyl Storm (glass)	13	\$ 6.14 ft ²	\$ 1.86
Exterior Wood Storm (glass)	8	\$ 5.33 ft ²	\$ 1.67
Interior Vinyl Storm (Acrylic)	13	\$ 5.64 ft ²	\$ 1.43
<u>F3. Storm over Fixed Glazing</u>			
Glass	32	\$ 5.48 ft ²	\$ 1.90
Acrylic	15	\$ 5.42 ft ²	\$ 1.65
G. STORM DOORS			
<u>G1. Hollow Core Alum. Storm Door</u>			
G2. Solid Core Alum. Storm Door	22	\$149.16/unit	\$ 26.01
G3. Wood Storm Door	30	\$188.55/unit	\$ 28.60
G4. Patio Storm Door	10	\$171.72/unit	\$ 39.23
G5. Insulated Metal Storm Door	24	\$238.52/unit	\$ 40.00
	19	\$298.02/unit	\$ 57.32
H. WATER HEATER INSULATION			
<u>Add R-5</u>			
	16	\$ 27.19/unit	\$ 7.32
I. AIR CONDITIONER COVER (Wall Type)			
<u>Exterior</u>			
Interior	4	\$ 32.50/unit	\$ 4.33
	4	\$ 33.00/unit	\$ 6.67
J. LOW FLOW SHOWERHEAD			
<u>Less than 3 gallon per minute</u>			
	7	\$ 16.43/unit	\$ 3.50
K. SHOWER FLOW RESTRICTOR			
<u>Less than 3 gallon per minute</u>			
	4	\$ 5.25/unit	\$ 2.28
L. CAULKING STRUCTURES			
<u>(Exterior joints and all penetrations with butyl or silicone caulk)</u>			
1 Family	18	\$119.97/bldg.	\$ 66.99
2 Family	18	\$192.22/bldg.	\$ 90.31
4 Family	16	\$266.33/bldg.	\$117.91
8+ Family	12	\$479.83/bldg.	\$223.26
M. WEATHERSTRIPPING			
<u>M1. Weatherstrip Average Access Panel</u>			
M2. Weatherstrip Average Window	12	\$ 6.08/panel	\$ 2.52
M3. Weatherstrip Average Door	14	\$ 14.86/window	\$ 4.70
	20	\$ 18.75/door	\$ 5.79
N. PIPE INSULATION			
<u>N1. Hydronic Heat Pipes (1-1/2" O.D.)</u>			
Add R-2, 1/2" Neoprene	3	\$ 2.36 lin. ft	\$.66
Add R-2, 1/2" Fiberglass	5	\$ 2.41 lin. ft	\$.70
<u>N2. Steam Heat Pipes (2" O.D.)</u>			
Add R-4, 1" Fiberglass	5	\$ 2.76 lin. ft	\$.64
<u>N3. Domestic Water Heater Pipes (3/4" O.D.- 5 ft. on hot and cold pipes)</u>			
Add R-2, 1/2" Neoprene	4	\$ 1.79 lin. ft	\$.47
Add R-2, 1/2" Fiberglass	3	\$ 2.40 lin. ft	\$.74

APPENDIX A (continued)

<u>Conservation Measure</u>	N	\bar{X}	S.D.
<u>0. DUCT INSULATION</u>			
01. Foil-faced Fiberglass Board Add R-5	4	\$ 1.77 ft ²	\$.23
02. Fiberglass Wrap Add R-5	8	\$.99 ft ²	\$.46
03. Fiberglass Batt Add R-11	3	\$ 1.57 ft ²	\$.31

NOTES: N = Number of Responses; \bar{X} = Mean; S. D. = Standard Deviation

Rental Unit Energy Efficiency Standards

This Instrument Was Drafted By:

Wisconsin Department of Industry
Labor and Human Relations
Division of Safety & Buildings
P.O. Box 7989
Madison, WI. 53707
(608) 266-3151

Doc. No. _____

DILHR USE

Certificate of Compliance

Name of all Owners		Number of Dwelling Units	Recording Information (leave blank)		
		Building Location, Street & No.			
Street & No.		City			County
City		State & Zip			
Owner's Telephone Number		Manager or Agency			
		Manager's Address			
Has this unit ever been issued a Stipulation? <input type="checkbox"/> Yes <input type="checkbox"/> No	Stipulation No. S - _____	Manager's Telephone Number			

Legal description of property:

Certificate Instructions

This certificate is to be completed and signed by an inspector currently licensed by the Department of Industry, Labor and Human Relations for Rental Unit Energy Efficiency inspection. The original copy must be retained by the owner of the rental unit for use at time of transfer of ownership.

CERTIFICATE CHECKLIST			FAIL			PASS	EXEMPTION NUMBER*	N A
	R =	Must add R =	1	2	3			
Ceiling	R =	Must add R =						
Box Sill	R =	Must add R =						
Side Wall	R =	Must add R =						
Floor	R =	Must add R =						
Duct	R =	Must add R =						
Steam Pipe	R =	Must add R =						
Heat Pipe	R =	Must add R =						
Attic Door	R =	Must add R =						
Foundation	R =	Must add R =						
Windows								
Weatherstripping								
Caulking								
Storm Doors								
Attic & Crawl Space Ventilation								
Shower Flow Restrictor								
Air Conditioner Cover								
Water Heater Insulation								
Space & Water Heater Inspection								

INSPECTION DATES	
1	
2	
3	
4	

Section 101.122, Wisconsin Statutes, requires that an Energy Efficiency Certificate, Stipulation or Waiver authorized by the Department of Industry Labor and Human Relations (DILHR) must accompany the documents of transfer at the time of document recordation. This process is defined in Chapter ILHR 67, Wisconsin Administrative Code. A Certificate is proof of compliance with the standards of ILHR 67.05. In lieu of the Certificate, the purchaser may accept responsibility for compliance with either a Stipulation or a Waiver in accordance with ILHR 67.08.

*DILHR Exemption Number indicates department acceptance.

CERTIFICATE OF COMPLIANCE			
The rental unit described above is certified as meeting the minimum rental unit energy efficiency standards of ILHR 67. Each applicable item on the checklist complies with ILHR 67.05 or has been issued an exemption number.			
Inspector Signature	Date Certified	Certified Inspector Number	Place DILHR Transfer Authorization Number Stamp Here
This Certificate is valid for 5 years from the date of the inspector's signature above and is transferrable during that period.		DILHR Transfer Authorization Number: C - _____	

Doc. No. _____
 DILHR USE _____

Rental Unit Energy Efficiency Standards

This Instrument Was Drafted By:
 Wisconsin Department of Industry
 Labor and Human Relations
 Safety & Buildings Division
 Rental Weatherization Program
 Box 7971, Madison, WI 53707
 (608) 266-0671

STIPULATION

TYPE OR PRINT USING **BLACK INK**

Seller(s) Name:		Rental Building Location - Street Address:		Recording Information (Leave Blank)	
Street Address:		City:	County:	Purchaser's Street Address:	
City:	State & Zip Code:	Number of Buildings on Property:	Total Number of Units:	City:	State & Zip Code:
Seller(s) Telephone Number (include area code):				Purchaser's Telephone Number (include area code):	

Section 101.122, Wisconsin Statutes, requires that a Certificate of Compliance, Stipulation or Waiver validated by the Department of Industry, Labor and Human Relations (DILHR) must accompany the documents of transfer for residential rental building ownership changes. This process is defined in Chapter ILHR 67, Wisconsin Adm. Code. Receipt of a Certificate indicates conformance with ILHR 67.05. In lieu of the Certificate, the purchaser may accept responsibility for program compliance with either a Stipulation under ILHR 67.08(3), or a Waiver under ILHR 67.08(2).

Stipulation: The seller of the residential rental building may present this Stipulation signed by the purchaser and validated (See Instructions below), stating that the new residential rental building owner shall bring the rental building into compliance with energy measures specified in Chap. ILHR 67 no later than one year after the date of transfer. (The date of transfer is the date this Stipulation is validated below by an agency official, unless documentation of another date is provided to DILHR).

Instructions: To receive a Stipulation, the seller of the residential rental building must provide the seller and purchaser information requested above, as well as have the purchaser sign the applicable signature/address block below. The Stipulation must then be submitted to DILHR, an Authorized Municipality*, or a DILHR Agent* for validation. If your local municipality is not authorized or a DILHR Agent is not in your area, the Stipulation and **\$20.00** filing fee (do not send cash) should be sent to: DILHR, Rental Weatherization Program, P.O. Box 7971, Madison, WI 53707. Make sure the check is made payable to DILHR or your municipality, whichever is applicable, and that it accompanies this Stipulation application. The DILHR validated Stipulation Agreement will be returned to the seller, unless another party is designated (give complete name and mailing address):

*A list of Authorized Municipalities and DILHR Agents is available from DILHR. Call (608) 266-0671.
This document is valid only if no previous Stipulation or Waiver is currently on file for this property.

STIPULATION AGREEMENT

(WS)

I (we) accept all responsibility to bring the above described residential rental building into compliance with Chapter ILHR 67 no later than one (1) year from the date of transfer. This required action is in specific accordance with ILHR 67.08(3), ILHR 67.13(4) and Wisconsin Statutes 101.122.

Print Purchaser's Name:		Purchaser's Signature:		Date Signed:
Validated By: <input type="checkbox"/> DILHR <input type="checkbox"/> DILHR Agent <input type="checkbox"/> Authorized Municipality		Date Validated:	Expiration Date (add one (1) year to Date Validated):	Place Yellow DILHR Transfer Authorization Number Stamp Here On White Copy
Print Official's Name:		Official's Signature:		
Municipality/County Name:		Office of:		
		Enter DILHR Transfer Authorization Number From Stamp Here: S. _____		

TRANSFER OF STIPULATION

If the above described residential rental building is transferred within one year of the validation date of this Stipulation and before the residential rental building has been certified as being in compliance with ILHR 67, the new purchaser must sign below and forward a copy of this document to DILHR. By signing below, the new purchaser accepts the compliance responsibility to this Stipulation, thus requiring Code compliance before the expiration date given above.

Print New Purchaser's Name:		New Purchaser's Signature:		Date Signed:
New Purchaser's Street Address:		City, State & Zip Code:	Telephone Number (include area code):	

BUILDINGS WITH EXISTING LEASE(S)

The purchaser should sign below if the property is a rental building having four or fewer dwelling units and the purchaser(s) intends to occupy one dwelling unit in the building as their primary residence within a year of this original Stipulation, but cannot occupy immediately because of an existing lease obligation to current tenants. To satisfy this Stipulation, the purchaser should notify DILHR at the time he/she takes occupancy. Send written notification of owner occupancy and a copy of this Stipulation to DILHR.

Print Purchaser's Name:		Purchaser's Signature:		Date Signed:
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Doc. No.
 DILHR USE

Rental Unit Energy Efficiency Standards

This Instrument Was Drafted By:
 Wisconsin Department of Industry,
 Labor and Human Relations
 Safety & Buildings Division
 Rental Weatherization Program
 Box 7971, Madison, WI 53707
 (608) 266-0671

Waiver

TYPE OR PRINT USING BLACK INK

Seller(s) Name(s):		Rental Building Location - Street Address:		Recording Information (Leave Blank)	
Street Address:		City:	County:	Purchaser's Street Address:	
City:	State & Zip Code:	Number of Buildings on Property:	Total Number of Units:	City:	State & Zip Code:
Seller(s) Telephone Number (include area code):				Purchaser's Telephone Number (include area code):	

Section 101.122, Wisconsin Statutes, requires that a Certificate of Compliance, Stipulation or Waiver validated by the Department of Industry, Labor and Human Relations (DILHR) must accompany the documents of transfer for residential rental building ownership changes. This process is defined in Chapter ILHR 67, Wisconsin Adm. Code. Receipt of a Certificate Indicates conformance with ILHR 67.05. In lieu of the Certificate, the purchaser may accept responsibility for program compliance with either a Stipulation under ILHR 67.08(3), or a Waiver under ILHR 67.08(2).

Waiver: The seller of the residential rental building may present, to the Register of Deeds, this Waiver signed by the purchaser and validated (See Instructions below), stating that the new residential rental building owner will demolish the building no later than two years after the date of transfer. (That date of transfer is the date this Waiver is validated below by an agency official, unless documentation of another date is provided to DILHR).

INSTRUCTIONS: To receive a Waiver, the seller of the residential rental building must provide the seller and purchaser information requested above, as well as have the purchaser sign the applicable signature/address block below. The Waiver must then be submitted to DILHR, an Authorized Municipality*, or a DILHR Agent* for validation. If your local municipality is not authorized or a DILHR Agent is not in your area, the Waiver and \$20.00 filing fee (do not send cash) should be sent to: DILHR, Rental Weatherization Program, P.O. Box 7971, Madison, WI 53707. Make sure the check is made payable to DILHR or your municipality, whichever is applicable, and that it accompanies this Waiver application. The DILHR validated Waiver Agreement will be returned to the seller, unless another party is designated here (give complete name and mailing address):

*A list of Authorized Municipalities and DILHR Agents is available from DILHR. Call (608) 266-0671.
 This document is valid only if no previous Stipulation or Waiver is currently on file for this property.

WAIVER AGREEMENT

(WW)

In lieu of meeting the Rental Unit Energy Efficiency Certificate requirements, I (we) agree to notify the Department of Industry, Labor and Human Relations (DILHR) of the above described rental unit's demolition. Demolition shall occur within two years of the effective date of transfer. Upon demolition I (we) shall notify DILHR, at the above address, of the date the building was demolished. This action is required in specific accordance with ILHR 67.08(2), ILHR 67.13(3) and Wisconsin Statutes 101.122.

Print Purchaser's Name:		Purchaser's Signature		Date Signed:
Validated By: <input type="checkbox"/> DILHR Agent <input type="checkbox"/> DILHR <input type="checkbox"/> Authorized Municipality		Date Validated:	Expiration Date (add two (2) years to Date Validated):	Place Blue DILHR Transfer Authorization Number Stamp HERE On White Copy
Print Official's Name:		Official's Signature:		
Municipality/County Name:		Office of: W- _____		

TRANSFER OF WAIVER

If the above described residential rental building is transferred within two years of the validation date of this Waiver and before the residential rental building has been demolished in compliance with ILHR 67, the new purchaser must sign below and forward a copy of this document to DILHR. By signing below, the new purchaser accepts the compliance responsibility to this Waiver, thus requiring the above described rental unit's demolition before the expiration date given above.

Print New Purchaser's Name:		New Purchaser's Signature:		Date Signed:
New Purchaser's Street Address:		City, State & Zip Code:	Telephone Number (include area code):	

APPENDIX C

$$ES = \frac{(U_i - U_f) \times A \times D \times 24}{K \times V}$$

where

ES = The fuel or energy savings in the appropriate energy units for one year, e.g., hundreds of cubic feet of natural gas, gallons of fuel oil, or kilowatt-hours of electricity.

U_i = U-value of the existing building element, including any insulation that is already contained in the building element being evaluated, expressed in Btu/hr·ft²·F.

U_f = U-value of the existing building element, including the level of insulation required in Table 67.05 for the specific building element being evaluated, expressed in Btu/hr·ft²·F.

A = The gross area of the building element being evaluated, in square feet.

V = The heating value of the fuel type:

Oil	138,500 Btu/gal
Gas	100,000 Btu/CCF
Electricity	3413 Btu/kWh
LP (Propane & Butane)	91,500 Btu/gal
Coal	10,000 Btu/lb
Wood	4,000 Btu/lb or 25,000,000 Btu/cord

K = A correction factor, which includes the effects of rated full-load efficiency, part-load performance, oversizing, and energy conservation devices. The following factors shall be used unless higher efficiencies for newer equipment can be substantiated:

LP	.55
Gas	.55
Oil	.55
Electricity	1.00
Wood	0.50
Coal	0.50

D = Number of 65F degree-days for the estimated period based on geographical zones as shown in ILHR 67.06.

TABLE 1

RENTAL UNITS COVERED BY CH. ILHR 67

<u>RENTER OCCUPIED UNITS</u> (by year built in Wisconsin)*	Number of Units *	Estimated Number of Buildings
1979 to 1980	13,506	-----
1975 to 1978	49,637	-----
Interpolated 1975 to December 1, 1978	48,603	-----
1975 to April 15, 1976	17,063	-----
1970 to 1975	64,920	-----
1960 to 1969	85,792	-----
1950 to 1959	54,685	-----
1940 to 1949	57,730	-----
1939 and earlier	198,624	-----
	<u>524,894</u>	
	(includes mobile homes)	
<u>RENTER OCCUPIED</u>		
singles	127,550 units	127,550
duplexes	140,261 units	70,130
3 & 4 units	60,432 units	17,266
5 & more	187,775 units	23,472
mobile homes	8,876 units	8,876
	<u>524,894</u>	<u>247,294</u>
<u>EXCLUSIONS PER ILHR 67.03</u>		<u>61,964</u>
<u>NUMBER OF BUILDINGS SUBJECT TO CH. ILHR 67</u>		185,330

* From 1980 Wisconsin Census Summary Tape File 3A

TABLE 2

REQUIRED INSULATION LEVELS

<u>Building Element</u>	<u>Amount of Insulation</u>
Attic	
If currently R-0 to R-10.9, then bring to R-38	
" " R-11 to R-18.9, then add R-19	
" " R-19 or more, then OK	
Box Sill	
If currently R-0 to R-2.5, then bring to R-19	
" " R-2.6 to R-10.9, then add R-11	
" " R-11 or more, then OK	
Side Walls When Cavities Are Accessible	
If currently R-0 to R-2.5, then bring to R-11	
" " R-2.6 or more, then OK	
* Ceilings of Basements and Crawl Spaces	
If currently R-0 to R-2.5, then bring to R-19	
" " R-2.6 to R-10.9, then add R-11	
" " R-11 or more, then OK	
Heating Supply and Return Ducts	R-5
Steam Heating Pipes	R-4
Hydronic Heat Pipes	R-2
Domestic Hot Water Pipes	
Circulating	R-2
Noncirculating Hot and Cold Water	
Pipes within 5 ft. of Water Heater	R-2
Access Openings to Attics or Vented Areas	
Horizontal	R-19
Vertical	R-5
* Foundations	
External (insulated above grade	
and to 18" below grade)	R-5
OR Internal (insulated full height)	R-5

* Note: A basement or crawl space must be insulated either at the foundation or in the ceiling.

TABLE 3 INSPECTION FEES

<u>Number of Units</u>	<u>1</u>	<u>2</u>	<u>4</u>	<u>8</u>	<u>more than 8</u>
Sample Size	76	83	73	63	53
Average Fee (N)	\$ 91	\$ 105	\$ 148	\$ 218	\$ 18/unit
Range of Fees (\bar{X})	\$20-160	\$35-200	\$50-380	\$55-480	\$2-50/unit
Standard Deviation (S.D.)	\$ 33	\$ 37	\$ 53	\$ 96	\$ 10/unit

Other program related fees include:

Exemption processing	\$ 10
Stipulation processing	\$ 20
Waiver processing	\$ 20
Petition for Variance	\$150

TABLE 4

CITY OF		MADISON		WI		RESIDENTIAL		COMMERCIAL		LINE 5 COEFFICIENT=		10.68041		9.669333	
Degree Days =		7730		DD's		7730		DD's							
Unit Fuel Cost =		0.6338		\$ per CCF		0.5738		\$ per CCF		RESIDENTIAL RATE		COMMERCIAL RATE			
STRATEGY	AREA sq ft	INSULATION ONLY INITIAL R	FINAL R	U CHANGE	COST PER sq ft	RETROFIT COST	5 YEAR SAVINGS	PAYBACK YEARS	5 YEAR SAVINGS	PAYBACK YEARS					
BASEMENT CEILING															
Fiberglass Batt	912	0	19	0.194	\$0.52	\$474.24	\$1,889.66	1.25	\$1,710.78	1.39					
ACTUAL COSTS PSC DATA*	912	0	19	0.194	\$0.57	\$517.10	\$1,889.66	1.37	\$1,710.78	1.51					
FOUNDATION (rigid board/finish)															
1 ft Above/1 ft Below Grade	250	0	5	0.276	\$2.46	\$615.00	\$736.95	4.17	\$667.18	4.61					
2 ft Above/1 ft Below Grade	375	0	5	0.276	\$2.46	\$922.50	\$1,105.42	4.17	\$1,000.78	4.61					
3 ft Above/1 ft Below Grade	500	0	5	0.276	\$2.46	\$1,230.00	\$1,473.90	4.17	\$1,334.37	4.61					
ACTUAL COSTS PSC DATA*	500	0	5	0.276	\$2.03	\$1,015.00	\$1,473.90	3.44	\$1,334.37	3.80					
ATTIC															
Cellulose Below Floor	912	0	19	0.157	\$0.38	\$346.56	\$1,529.26	1.13	\$1,384.47	1.25					
Cellulose Below Floor	912	3.5	19	0.068	\$0.32	\$291.84	\$662.36	2.20	\$599.65	2.43					
Cellulose Open Cavity	912	0	38	0.542	\$0.52	\$474.24	\$5,279.37	0.45	\$4,779.59	0.50					
Cellulose Open Cavity	912	10	38	0.055	\$0.38	\$346.56	\$535.73	3.23	\$485.01	3.57					
Cellulose Open Cavity	912	11	30	0.049	\$0.31	\$282.72	\$477.29	2.96	\$432.10	3.27					
Fiberglass Batt Open Cavity	912	0	38	0.542	\$0.78	\$711.36	\$5,279.37	0.67	\$4,779.59	0.74					
Fiberglass Batt Open Cavity	912	11	30	0.049	\$0.49	\$446.88	\$477.29	4.68	\$432.10	5.17					
Blown Fiberglass Open Cavity	912	0	38	0.542	\$0.57	\$519.84	\$5,279.37	0.49	\$4,779.59	0.54					
Blown Fiberglass Open Cavity	912	11	30	0.049	\$0.34	\$310.08	\$477.29	3.25	\$432.10	3.59					
ACTUAL COSTS PSC DATA*	912	0	30	0.542	\$0.33	\$296.40	\$5,279.37	0.28	\$4,779.59	0.31					
BOX SILL															
Fiberglass Batt	83.3	0	19	0.18	\$0.55	\$45.82	\$160.14	1.43	\$144.98	1.58					
ACTUAL COSTS PSC DATA*	83.3	0	19	0.18	\$0.82	\$67.97	\$160.14	2.12	\$144.98	2.34					
WALLS															
Open, Fiberglass Batt	1000	0	11	0.427	\$0.44	\$440.00	\$4,560.54	0.48	\$4,128.81	0.53					
Closed, Cellulose (drill exterior)	1000	0	11	0.118	\$0.55	\$550.00	\$1,260.29	2.18	\$1,140.98	2.41					
Closed, Cellulose (drill interior)	1000	0	11	0.118	\$0.61	\$610.00	\$1,260.29	2.42	\$1,140.98	2.67					
Closed, Cellulose (remove siding)	1000	0	11	0.118	\$0.70	\$700.00	\$1,260.29	2.78	\$1,140.98	3.07					
ACTUAL COSTS PSC DATA*	1000	0	11	0.118	\$0.63	\$633.00	\$1,260.29	2.51	\$1,140.98	2.77					
DUCTS															
Fiberglass Wrap	100	0	5	0.67	\$0.99	\$99.00	\$715.59	0.69	\$647.85	0.76					
PIPES															
	LENGTH ft	HEAT LOSS COEFF.**			COST PER ft	RETROFIT COST									
Hydronic 1.5 in., .5 in Neoprene	100	0.6697			\$2.27	\$227.00	\$715.27	1.59	\$647.56	1.75					
Steam 2.0 in., 1.0 in Fiberglass	100	2.262			\$2.76	\$276.00	\$2,415.91	0.57	\$2,187.20	0.63					
DHW .75 in., .5 in Neoprene (circ.)	100	5110			\$1.79	\$179.00	\$677.24	1.32	\$580.04	1.54					
DHW .75 in., .5 in Neop. (non-circ.)	10	2555			\$1.79	\$17.90	\$33.86	2.64	\$29.00	3.09					
ACTUAL COSTS, WIS. ELEC. POWER	100	0.3439			\$1.62	\$162.00	\$367.30	2.21	\$332.53	2.44					
STORM WINDOWS															
	AREA sq ft	PERIMETER ft	AREA COEFF.**	PERIMETER COEFF.**	COST PER sq ft	RETROFIT COST									
Aluminum Combination (glass)	175	210	0.6	0.28	\$4.85	\$848.75	\$1,749.45	2.43	\$1,583.84	2.68					
Wood Combination (glass)	175	210	0.6	0.28	\$5.59	\$977.38	\$1,749.45	2.79	\$1,583.84	3.09					
Exterior/Interior Vinyl (glass)	175	210	0.6	0.28	\$5.21	\$911.75	\$1,749.45	2.61	\$1,583.84	2.88					
Interior Vinyl (acrylic)	175	210	0.62	0.28	\$4.55	\$796.25	\$1,786.83	2.23	\$1,617.68	2.46					
Basement Aluminum (glass)	30	32	0.6	0.315	\$5.32	\$159.60	\$299.91	2.66	\$271.51	2.94					
Basement Wood (glass)	30	32	0.6	0.315	\$5.33	\$159.90	\$299.91	2.67	\$271.51	2.94					
Basement Vinyl (glass)	30	32	0.6	0.315	\$6.14	\$184.20	\$299.91	3.07	\$271.51	3.39					
Basement Vinyl (acrylic)	30	32	0.62	0.315	\$5.64	\$169.20	\$306.31	2.76	\$277.32	3.05					
Fixed Storm (glass)	22.5	48	0.6	0.146	\$5.48	\$123.30	\$219.03	2.81	\$198.30	3.11					
Fixed Storm (acrylic)	22.5	48	0.62	0.146	\$5.42	\$121.95	\$223.84	2.72	\$202.65	3.01					
STORM DOORS															
	AREA sq ft	PERIMETER ft	AREA COEFF.**	PERIMETER COEFF.**	COST PER Unit	RETROFIT COST									
Hollow Core Aluminum	20	19.33	0.08	0.675	\$149.16	\$149.16	\$156.44	4.77	\$141.63	5.27					
Solid Core Aluminum	20	19.33	0.08	0.675	\$188.53	\$188.53	\$156.44	6.03	\$141.63	6.66					
Wood	20	19.33	0.11	0.675	\$171.72	\$171.72	\$162.85	5.27	\$147.44	5.82					
Insulated Metal	20	19.33	0.08	0.675	\$298.02	\$298.02	\$156.44	9.52	\$141.63	10.52					
Patio Door	20	19.33	0.6	0.729	\$238.52	\$238.52	\$278.67	4.28	\$252.29	4.73					
ACTUAL COSTS PSC DATA*	20	19.33	0.08	0.675	\$135.00	\$135.00	\$156.44	4.31	\$141.63	4.77					

* Installed cost data from actual jobs reported to the Wisconsin Public Service Commission.
 ** Coefficients standardized for use in the DILHR EXEMPTION worksheet.