

Damon Scott states that he moved out of the subject residence on or about September 15, 2004 and that he recalls asking LG&E to take the service out of his name at that time. Damon Scott asks that LG&E be ordered to provide proof that he did not ask for service to be taken out of his name until October 6, 2004.

(4) With respect to the first sentence of paragraph 5 of LG&E's Answer, Damon Scott states that the text of the LG&E e-mail quoted in paragraph (c)(3) of the Complaint is unintelligible as written. It is worth noting that paragraph 5 of LG&E's answer provides 7 subparagraphs, which in turn reference a full-page chart, all of which purport to explain the meaning of the LG&E e-mail at issue, which contains less than three lines of text. LG&E customers and their counsel should not be forced to interpret and take action based on LG&E e-mails or other communications that are unintelligible and indecipherable.

(5) With respect to the first sentence of paragraph 5 of LG&E's Answer, Damon Scott further states that his counsel first asked for clarification of LG&E's e-mail quoted in paragraph (c)(3) of the Complaint in January of 2005. Since then LG&E has provided various, inconsistent versions of its methodology to calculate Damon Scott's past due amount. LG&E customers and their counsel should not be forced to devote many hours to the analysis of a succession of inconsistent accounting schemes, each of which is presented on a take-it-or-leave-it basis.

(6) LG&E's most recent version of its methodology to calculate Damon Scott's past due amount is set forth in the remainder of paragraph 5 of its Answer. Damon Scott objects to LG&E's analysis in part because it contains a math error in the sentence beginning with the phrase, "Fourth, LG&E multiplied the new tenant's estimated daily usage"

(7) The methodology references a full-page chart prepared by LG&E and attached as the second exhibit page following its Answer (hereinafter, the "chart"). The chart states that the

alleged 106 kWh of estimated daily usage by the new tenant multiplied by the alleged 55 days equals 5,830 kWh of usage. The 5,830 kWh is then subtracted from the alleged “total usage 11/19/02 - 11/30/04” meter read of 44,455 kWh to give an alleged 38,625 kWh, which is labeled on the chart as “Usage.” Inexplicably, however, the alleged “Usage billed to Damon Scott” is given on the next line as 38,696 kWh.

(8) The alleged “Usage” of 38,625 kWh referenced in the preceding paragraph, when multiplied by the electric rate of .055, would give an alleged past-due amount of \$2,124.38. The alleged “Usage billed to Damon Scott” of 38,696 kWh referenced in the preceding paragraph, when multiplied by the electric rate of .055, would give an alleged past-due amount of \$2,128.28. If LG&E had followed the methodology it describes on the chart and in paragraph 5 of its Answer, it would have billed Damon Scott one of these past-due amounts. It did not do so, however. Instead it billed Damon Scott for a past-due amount of \$2012.78.

(9) With respect to paragraph 5 of LG&E’s Answer, Damon Scott further states that LG&E’s method of calculating his bill is not conservative, nor is it favorable to him.

(10) LG&E is required to apply the electric rate in effect during the time period being billed. The chart provided by LG&E sets forth an electric rate per kWh of \$0.055. Damon Scott asks that LG&E be ordered to provide proof of the electric rates in effect during 2002, 2003, and 2004. To the extent that LG&E has not used the correct electric rate to calculate his past-due amount, Damon Scott further objects to LG&E’s analysis on that basis.

(11) LG&E may not for the first time bill for usage that occurred more than two years prior to the date of the bill. The electric service in question is for the period beginning on November 20, 2002 and ending when Damon Scott moved out of the subject residence. Damon Scott recalls this date to be on or about September 15, 2004, and LG&E asserts that the service

end date was October 6, 2004. Attachments to LG&E's Answer concede that LG&E did not bill Damon Scott for the disputed electric service until December 8, 2004. Therefore, LG&E is not entitled to any payment for the period from November 20, 2002 until December 8, 2002.

(12) All of the above-described inaccuracies and errors contained within LG&E's calculations evidence its careless and arbitrary approach to Damon Scott's account, if not outright bad faith in its dealings with this particular customer.

(13) Although it does not say so explicitly, LG&E appears to be arguing that Damon Scott's average annual usage was approximately 20,619 kWh per year ($38,696 \text{ kWh} \div 685 \text{ days} = 56.49051 \text{ kWh per day} \times 365 \text{ days} = 20619.036 \text{ kWh per year}$). This is almost twice the average annual consumption of electricity for United States households.

(14) According to a March 8, 2005 United States Department of Energy study entitled "End-Use Consumption of Electricity in 2001," the average United States household at that time used 10,656 kWh of electricity annually. A true and accurate copy of the published results of that study, which are available at www.eia.doe.gov, is attached hereto as Exhibit A.

(15) According to a May 22, 2003 United States Department of Energy study entitled "2001 Residential Energy Consumption Survey," the average dwelling unit in the United States at that time measured 2,066 square feet. A true and accurate copy of the published results of that study, which are available at www.eia.doe.gov, is attached hereto as Exhibit B.

(16) According to the Jefferson County Property Valuation Administrator, the rental home at issue in this case measures only 1489 square feet. The fuel source for heating the home is gas and not electric service.

(17) LG&E's estimate of electric usage gives a number that is 1.935 times higher than an average annual usage for a home that is less than three quarters the size of an average home.

Damon Scott denies that such an estimate is conservative or favorable to him. Moreover, even though Damon Scott repeatedly has questioned the accuracy of LG&E's meter readings, to date the utility has been unwilling to test the meter or otherwise prove the accuracy of the readings in question.

(18) With respect to paragraph 6 of LG&E's Answer, Damon Scott states that the date January 24, 2004 should have read January 24, 2005.

(19) With respect to paragraph 8 of LG&E's Answer, Damon Scott states that the Breakdown of Payment and Billing referenced by that paragraph shows credit amounts totaling only \$197.55 (May 21, 2003 deposit interest refund of \$10.80 + August 20, 2003 deposit refund of \$180.00 + August 20, 2003 deposit interest refund of \$6.75 = \$197.55). Therefore, the Breakdown of Payment and Billing does not explain the origin of the credit amounts that appeared on Damon Scott's bills for June 09, 2003 (\$83.00 credit), July 9, 2003 (\$76.04 credit), August 7, 2003 (\$69.08 credit), September 8, 2003 (\$248.87 credit), October 7, 2003 (\$241.91 credit), November 5, 2003 (\$218.08 credit), and January 8, 2004 (\$10.54 credit), especially given that Damon Scott was paying for gas heat during some of those months. Damon Scott believes that the credit amounts resulted from prior excessive charges for electric service, which were later returned to him as credits on subsequent bills. These excessive charges in turn would indicate that Damon Scott did not use an unusually high amount of electric service, and that LG&E's guesstimates of his usage are grossly overstated.

(20) With respect to paragraph 9 of LG&E's Answer, Damon Scott denies that the effect of the energy savings devices installed by LG&E are accounted for in LG&E's calculations.

(21) With respect to paragraph 10 of LG&E's Answer, Damon Scott denies that the

chart attached to LG&E's Answer accurately describes or computes his electric usage during the period in question. Moreover, while Damon Scott admits that LG&E attorney Jim Dimas offered to meet with Damon Scott's attorney about this case, Mr. Dimas did not make that offer until March 28, 2005, the date he received a courtesy copy of the Complaint that Damon Scott's attorney was about to file. At that time, LG&E had given Damon Scott a service cut-off date of April 5, 2005. If Damon Scott's attorney had agreed to meet with Jim Dimas and postpone the filing of the within action, LG&E would have terminated Damon Scott's service for a second time.

(22) With respect to paragraph 11 of LG&E's Answer, Damon Scott states that it is unreasonable to extrapolate a bill for 22 months of service from a reading that includes service provided to a different customer.

(23) With respect to paragraph 12 of LG&E's Answer, Damon Scott states that, for the reasons given previously, the accuracy of the meter readings is very much in doubt and that LG&E should be compelled to prove the accuracy of the meter in question.

(24) With respect to paragraph 13 of LG&E's Answer, Damon Scott states that he is without sufficient information to know whether or not LG&E used the chart attached to the Complaint as Exhibit A to calculate the electric bill in question. LG&E provided the chart to Damon Scott's attorney after she requested an explanation as to how LG&E had calculated his bill.

(25) With respect to paragraph 14 of LG&E's Answer, Damon Scott states that, for the reasons given previously, LG&E has failed to provide reasonable or reliable estimates in this case.

(26) With respect to paragraph 15 of LG&E's Answer, Damon Scott states that his

informal complaint with the Public Services Commission had not been resolved as of March 16, 2005. Damon Scott further states that he did not receive notice of the March 16, 2005 service cut-off. Damon Scott further states that the cut-off notice attached to LG&E's Answer did not specify an overdue balance of \$106.35; rather, it specified the disputed balance as the basis for the March 16, 2005 cut-off.

(27) With respect to paragraph 15 of LG&E's Answer, Damon Scott further states that his attorney was not aware that the Public Services Commission had closed her informal complaint on January 25, 2005, the day the Commission referred the case to LG&E employee Katrina Clark. As of March 16, 2005, Katrina Clark had not resolved the matter, and she was on vacation on that date, so that she could not be reached when Damon Scott's service was terminated.

(28) Paragraph 17 of LG&E's Answer appears to concede that one of LG&E's customer service representatives told Damon Scott that it would be "better" for him to negotiate a payment plan on his own rather than for him to involve his attorney. This conversation took place on March 16, 2005, when Damon Scott went to LG&E in person after his service was terminated. Damon Scott states that the actions of LG&E's customer service representative are further evidence of LG&E's improprieties in its dealings with him. On April 25, 2005 Damon Scott's attorney requested a copy of the audio tape described in paragraph 17 but that copy has not been provided.

(29) With respect to paragraph 19 of LG&E's Answer, Damon Scott states that his attorney, who is employed by Legal Aid, has followed LG&E's requested procedure for contacting LG&E personnel. Specifically, Damon Scott's attorney first contacted LG&E employee Alan Bottom, as Legal Aid has been asked to do by LG&E in all individual cases involving the utility.

Damon Scott's attorney's e-mail correspondence with LG&E employee Mike Lowery was initiated by Alan Bottom. Thereafter Damon Scott's attorney contacted Katrina Clark, as she was advised to do by the Public Services Commission. Damon Scott's attorney did not immediately involve LG&E attorney Jim Dimas because LG&E has asked Legal Aid not to initiate contact with Jim Dimas regarding individual cases. Damon Scott's attorney was never told that LG&E had retained outside counsel in this case, and she did not know that LG&E was represented by Ogden Newell & Welch until she received her service copy of LG&E's Answer in this matter.


(30) With respect to paragraph 19 of LG&E's Answer, Damon Scott further states that it is ironic and unfair for LG&E to attempt to characterize Damon Scott's attorney as one who would attempt to bypass counsel of a represented party. Only LG&E is to be blamed for taking such action in this case.

(31) With respect to paragraph 20 of LG&E's Answer, Damon Scott states that the telephone system for LG&E's Accounting Department does not accept incoming calls.

WHEREFORE, in addition to the relief requested in his Complaint, Damon Scott respectfully requests that this matter be referred for a hearing before the Commission.

Dated at Louisville, Kentucky, this 27th day of April, 2005.

Respectfully submitted,


Mary Cartwright
Legal Aid Society, Inc.
Counsel for Damon Scott
425 West Muhammad Ali Blvd.
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CERTIFICATE OF SERVICE

I certify that a true copy of the foregoing was served via first class mail this 27th day of April, 2005, on W. Duncan Crosby III, Ogden Newell & Welch PLLC, 1700 PNC Plaza, 500 West Jefferson Street, Louisville, Kentucky 40202.


Mary Cartwright



Residential



Home > Residential Home > Special Topics > End-Use Consumption of Electricity 2001

End-Use Consumption of Electricity 2001

Electricity is consumed for a wide variety of uses in the home. This web product presents a detailed account of the amount of electricity used to operate numerous appliances in 2001.

Similar analyses were conducted for the 1987, 1990, 1993, and 1997 RECS. Table 1 summarizes the results.

Table 1. Percent of Electricity Consumption by End Use

End Use	Survey Year				
	1987	1990	1993	1997	2001
Air-Conditioning	15.8	15.9	13.9	11.8	16.0
Space Heating	10.3	10.0	12.4	11.4	10.1
Water Heating	11.4	11.2	10.3	11.0	9.1
Total Appliances	62.5	63.0	63.4	65.9	64.7

Summary Results for 2001 RECS:

- The largest use of electricity in the average U.S. household was for appliances (including refrigerators and lights), which consume approximately two thirds of all the electricity used in the residential sector (Figure 1, Table 2);
- Air-conditioning accounted for an estimated 16 percent, space heating 10 percent, and water heating 9 percent;
- No single appliance dominated the use of electricity. Refrigerators consumed the most electricity (14 percent of total electricity use for all purposes), followed by lighting (9 percent), clothes dryers (6 percent), freezers (3 percent), and color TV's (3 percent);
- The many other electrical appliances are grouped together and their total consumption is shown as "All Others" (Figure 1). Included are some appliances, such as VCR's that typically are found in almost all homes but use small amounts of electricity, as well as appliances that use large amounts of electricity but are found in relatively few homes, such as swimming pool pumps;
- "Residual" includes appliances for which RECS did not collect data (irons, hair dryers, electric blankets, power tools, and many more) and errors in the estimation procedure.

Table 2. Residential Consumption of Electricity by End Use, 2001

End Use/Appliance	Households (millions)	Units (million)	Electricity Consumption for 2001			
			Annual Consumption kWh per unit	kWh per household	Total (billion kWh)	Percent
Total Households	107.0			10,656	1,139.9	100.0
Refrigerators	106.8	126.0	1,239	1,462	156.1	13.7
Air-Conditioning						
Central Air-Conditioners	57.5			2,796	160.6	14.1
Room Air-Conditioners ^a	23.3	38.2	580	950	22.2	1.9
Total					182.8	16.0
Space Heating						

Main Space-Heating Systems	30.9			3,524	109.0	9.6
Secondary Space-Heating Equipment ^b	12.9			503	6.5	0.6
Total					115.5	10.1
Water Heating	40.8			2,552	104.1	9.1
Lighting (indoor and outdoor)	107.0			940 ^f	100.5	8.8
Other Appliances (total of list below)	107.0			4,495	480.8	42.2
Clothes Dryer	61.1			1,079	65.9	5.8
Freezer	34.2	37.9	1,039	1,150	39.3	3.5
Furnace Fan	76.3		500 ^g		38.2	3.3
Dishwasher	56.7			512 ^l	29.0	2.5
Electric Range Top ^c	59.7		536 ^g		32.0	2.8
Electric Oven ^d	47.8		440 ^g		21.0	1.8
Microwave Oven	92.1		209 ^g		19.3	1.7
Electric Toaster Oven	36.1		50 ^g		1.8	0.2
Coffee Makers ^e	51.3		116 ^g		6.0	0.5
Color TV	105.8	242.6	137	313 ^h	33.1	2.9
VCR/DVD	96.1	161.9	70 ^h	118	11.3	1.0
Cable Boxes	24.4		120 ⁱ		2.9	0.3
Satellite Dish	13.9		130 ⁱ		1.8	0.2
Personal Computer (Desk Top)	54.2	65.8	262 ^j	318	17.2	1.5
Personal Computer (Lap Top)	14.2	16.6	77 ^k	90	1.3	0.1
Printer with Fax/copier	12.6		216 ^g		2.7	0.2
Printer without Fax/copier	40.2		45 ^g		1.8	0.2
Pool Filter/pump	6.5		1,500 ^g		9.8	0.9
Pool/Hot Tub/Spa Heater	3.3		2,300 ^g		7.6	0.7
Ceiling Fan	69.6	192.8	50 ^g	138	9.6	0.8
Clothes Washer ^f	84.1		120 ^{g,l}		10.1	0.9
Waterbed Heater	5.5	6.4	900 ^g	1,035	5.7	0.5
Well Water Pump	13.8		400 ^g		5.5	0.5
Dehumidifier	12.1		400 ^g		4.8	0.4
Evaporator Cooler	2.7		1,183 ^g		3.2	0.3
Compact Stereo System	36.5		81 ^g		3.0	0.3
Component Stereo System	36.3		55 ^g		2.0	0.2
Portable Stereo (Boom Box)	26.1		19 ^g		0.5	0.0
Other Stereo System	3.1		55 ^g		0.2	0.0
Large, Heated Aquarium	4.5		548 ^g		2.5	0.2
Answering Machine	65.7		35 ^g		2.3	0.2
Cordless Telephone	81.5		26 ^g		2.1	0.2
Rechargeable Tools	47.7		43 ^g		2.1	0.2
Humidifier	15.6		100 ^g		1.6	0.1
Automobile Block/Engine/Battery Heater	2.3		200 ^g		0.5	0.0
Residual	107.0				83.1	7.3

^a2001 RECS reported 0.8 million households having both central air-conditioning and room/wall air-conditioners. These households were included in the count of 57.5 million households using central air-conditioning and they were excluded from the count of 23.3 million households with room/wall air-conditioners.

^bThe 2001 RECS reported 2.8 million households having both electric main space-heating and electric secondary space-heating equipment. These households were included in the count of 30.9 million households using electric main space-heating and they were excluded from the count of 12.9 million households with electric secondary space-heating.

^cHouseholds where most used range was electric and the household cooked more than one meal per week.

^dHouseholds where most used oven was electric and the household used oven more than once per week.

^eHouseholds that used the coffee maker more than once per week.

^f1993 Residential Energy Consumption Survey (RECS) does not cover halogen torchiere lamps.

^gEnergy Data Sourcebook for the U.S. Residential Sector, Lawrence Berkeley National Laboratory, 1997.

^hEnergy Use of Televisions and Videocassette Recorders in the U.S., Lawrence Berkeley National Laboratory, 1999;

ⁱVideo Networks: A Surprising Energy Drain, Home Energy Magazine Online May/June 1999;

^j*Electricity Consumption by Small End Uses in Residential Buildings, Arthur D. Little, 1998;*

^k*2004 Annual Energy Outlook.*

^lDoes not include energy used to heat water coming into the washer

Notes: • "Residual" includes appliances not listed, such as irons, hair dryers, electric blankets, power tools, air cleaners, and a myriad of other small electrical appliances. • "Residual" also includes errors that may be present in estimates of annual consumption. • Totals may not equal sum of components due to independent rounding. • This table does not reflect the interactive effects of appliance usage, especially when mixing the estimates from RECS with those from outside sources.

Sources: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-C, E, and H of the 1997 RECS; Energy Information Administration, Office of Energy Markets and End Use, *1993 and 2001 Residential Energy Consumption Surveys.*

A regression-based procedure End-Use Estimation Methodology was used to estimate the amount of electricity used for the major end uses (air conditioning, space heating, water heating, refrigerators, clothes dryers and freezers). Results of the 1993 RECS special lighting supplement Residential Lighting Use and Potential Savings were used to estimate the average amount of electricity used for lighting. Data on the annual electricity consumption of other electrical appliances were obtained from outside sources.

The 2001 RECS estimates are air-conditioning 16 percent, space heating 10 percent, water heating 9 percent, and appliances 65 percent. Changes in the percentages reflect actual changes in the percentages, changes in the methodology used to estimate the amount of electricity used for the various end uses, and errors in the estimation procedure. An example where a change in methodology resulted in a large change is the estimated amount of electricity used for cooking. The 1997 end-use and appliance table used a regression-based estimate and an outside estimate of the amount of electricity used in microwave ovens. The 2001 end-use and appliance table did not use a regression estimate. It used outside estimates of the amount of electricity used in electricity ranges, electric ovens, microwave ovens, electric toaster ovens, and coffee makers.

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URL: <http://www.eia.doe.gov/emeu/recs/recs2001/enduse2001/enduse2001.html>

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Residential

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Square Footage Measurements and Comparisons: *Caveat Emptor*

2001 Residential Energy Consumption Survey

Total square footage as presented in the 2001 Residential Energy Consumption Survey includes living space (living rooms, bedrooms, dining rooms, kitchens, dens, and other living space not separately reported), other enclosed interior space (space not included in any other category such as laundry rooms, hallways, and closets), attached garages, basements, finished and heated attics, and enclosed porches. These same areas were last measured in the 1993 RECS. The average total square footage of U.S. housing units, as measured in the 2001 RECS, was 2,066 square feet. This is a 10.6 percent increase above the average total square footage of 1,875 square feet in 1993, when it was last measured (see Table 1).

	Total Square Footage		Percentage Change
	1993	2001	
All Housing Units	1,875	2,066	10.6
Single-Family Housing Units	2,278	2,527	10.9
-Single-Family Detached	2,337	2,553	9.2
-Single-Family Attached	1,799	2,373	31.9
Apartments	972	1,043	7.3
-In 2-4 Unit Buildings	1,198	1,393	16.3
-In 5 or more Unit Buildings	861	847	-1.6
Mobile Homes	975	1,062	8.9

This increase can be attributed to two factors: first, the size of the average housing unit in the United States has, in fact, increased over the past 7 years; and second, the improved methodology employed in measuring the square footage of housing units in the 2001 RECS was more thorough than the previously used methodology, resulting in the inclusion of space (particularly garages and basements) that was previously overlooked by those performing the measurements. (See the [Appendix](#) for a detailed discussion of the 2001 RECS housing measurements methodology.)

As shown in Table 1, the 1993-2001 changes varied by the type of housing unit. Single-family attached housing units had the largest 1993-2001 change, increasing 31.9 percent from an average of 1,799 square feet in 1993, to 2,373 square feet in 2001. In contrast, the average single-family detached housing unit increased by 9.2 percent growing from 2,337 square feet in 1993, to 2,553 square feet in 2001.

The increase in size of apartments and mobile homes was more modest than that of single-family housing units (see Table 1). Apartments increased from an average of 972 square feet in 1993 to an average 1,043 square feet in 2001, a 7.3 percent increase. Within this category, the average apartment in a 2-4 unit building increased by 16.3 percent, growing from 1,198 square feet in 1993, to 1,393 square

feet in 2001. In contrast, the average apartment in buildings with 5 or more units decreased by 1.6 percent from 861 square feet in 1993, to 847 square feet in 2001. The floorspace in mobile homes increased by 8.9 percent, growing from 975 square feet in 1993, to 1,062 square feet in 2001.

As noted earlier, the methodology used in 2001 differed from that used in 1993 and may account for some of the change in average total square footage. This is particularly the case for mobile homes and single-family housing units that have garages, and single-family attached housing units and apartments in 2-4 unit buildings that have basements. Initially, the Computer Assisted Personal Interview questionnaire used for the 2001 RECS did a much better job of simply identifying those housing units with garages and with basements than did the paper-and-pencil questionnaire used in the 1993 RECS. Once garages and basements were identified, the computers used by the interviewers provided them with instructions to actually measure them.

Table 2 presents the numbers of housing units reported to have both attached and detached garages in the 1993 and 2001 RECS. (Prior to the 2001 RECS data about attached and detached garages were not collected separately, but only the square footage of attached garages was included in the square footage totals. Accordingly, any 1993 versus 2001 comparisons of the number of garages must include both attached and detached garages.) Overall, the number of mobile homes, single-family detached, and single-family attached housing units having a garage increased by 31.9 percent. The number of mobile homes with a garage more than doubled from 1993 to 2001, increasing by 142.6 percent. Among single-family detached housing units the number with a garage increased by 22.3. In contrast, the proportion of single-family attached housing units with a garage more than doubled, increasing by 134.5 percent.

	Number of Housing Units			Percentage
	1993	2001	Change	Change
All Housing Units	96.6	107.0	10.4	10.8
With Attached or Detached Garage	41.1	54.2	13.4	31.9
All Mobile Homes	5.6	6.8	1.2	21.4
With Attached or Detached Garage	0.5	1.1	0.6	142.6
All Single-Family Detached	59.5	63.1	3.6	6.1
With Attached or Detached Garage	37.6	46.1	8.5	22.3
All Single-Family Attached	7.3	10.6	3.3	45.1
With Attached or Detached Garage	3.0	6.9	3.9	134.6

What is remarkable about these findings is that in all categories, with the exception of mobile homes, the 1993-2001 increase in the number of housing units having a garage was larger than the increase in the total number of housing units. For this to reflect reality not only must all the housing units built between 1993 and 2001 have had a garage, but also a large number of existing structures would have added a garage during the same period. This is particularly implausible for single-family attached housing units, which have little ground space around them where a garage could be added.

The effect of identifying garages attached to the housing unit and including their square footage in the total is illustrated in Table 3. This table shows that the 1993-2001 increases in total square footage for single-family detached and single-family attached housing units with garages were substantially larger than the changes for the housing units in these two categories without garages.

	Total Square Footage		Percentage Change
	1993	2001	
All Mobile Homes	975	1,062	8.9
With Garages	1,111	1,165	4.9
- Attached	n/a	1,395	--
- Detached	n/a	1,120	--
Without Garages	963	1,040	8.0
All Single-Family Detached	2,337	2,553	9.2
With Garages	2,626	2,793	6.4
- Attached	n/a	2,996	--
- Detached	n/a	2,442	--
Without Garages	1,842	1,902	3.3
All Single-Family Attached	1,799	2,373	31.9
With Garages	2,114	2,764	30.7
- Attached	n/a	2,870	--
- Detached	n/a	1,968	--
Without Garages	1,577	1,657	5.1

n/a Data is not available. Prior to the 2001 RECS respondents were simply asked if they had a garage. No data were collected that distinguished attached from detached garages. Interviewers when measuring the square footage included in their measurements only garages that were attached to the housing unit.

Table 4 presents the numbers of housing units reported to have basements in the 1993 and 2001 RECS. Overall, the number of single-family detached and single-family attached housing units and apartments in 2-4 unit buildings having a basement increased by 15.7 percent. (Mobile homes were assumed to have no basement and respondents in apartments in buildings with more than 4 units were simply not asked on the assumption that they did not have exclusive use of any part of the basement.)

Among single-family detached housing units the number of units with a basement increased by 10.2 percent. In contrast, the number of single-family attached housing units with a basement nearly doubled, increasing by 94.2 percent. The number of apartments in 2-4 unit buildings with a basement decreased by 4.8 percent. This change is likely due to the more precise determination of whether the respondent actually had exclusive use of some or all of the basement, which, in turn, determined if it should be included in the square footage measurements.

	Number of Housing Units			Percentage Change
	1993	2001	Change	
All Housing Units	96.6	107.0	10.4	10.8
With Basement	33.8	39.1	5.3	15.7
All Single-Family Detached	59.5	63.1	3.6	6.1
With Basement	27.0	29.7	2.7	10.2
All Single-Family Attached	7.3	10.6	3.3	6.1
With Basement	2.9	5.7	2.8	94.2

All Apartments in 2-4 Unit Buildings	8.0	9.5	1.5	18.8
With Basement	3.9	3.8	-0.1	-4.8

Among single-family detached housing units surveyed in 1993, 45.3 percent had a basement. In the 2001 RECS, 47.1 percent of these units had a basement. In contrast, among the single-family attached housing units surveyed in 1993, 40.0 percent had a basement. In the 2001 RECS a much larger percentage, 53.7 percent, reported having a basement. Among the 3.3 million single-family attached housing units built between 1993 and 2001 84.8 percent reported having a basement.

The effect of identifying garages and basements and including their square footage in the total is illustrated in Table 5. The 1993-2001 increase in average total square footage for single-family attached housing units and apartments in 2-4 unit buildings with basements were substantially larger than the increases for the housing units in these two categories without basements.

	Total Square Footage		Percentage Change
	1993	2001	
All Single-Family Detached	2,337	2,553	9.2
With Basements	2,968	3,196	7.7
Without Basements	1,814	1,981	9.2
All Single-Family Attached	1,799	2,373	31.9
With Basements	2,249	2,883	28.2
Without Basements	1,499	1,782	18.9
All Apartments in 2-4 Unit Buildings	1,198	1,393	16.3
With Basements	1,457	1,998	37.1
Without Basements	947	997	5.3

Table 6 presents the average total square footage of single-family housing units for the four possible combinations of with and without garages and with and without basements. (Respondents residing in apartments in 2-4 unit buildings were not asked about garages, those residing in apartments in buildings with more than 4 units were not asked about garages and basements, and those living in mobile homes were not asked about basements, so comparable data are not available for these housing units.)

While Tables 3 and 5 illustrated that housing units with garages and basements, taken separately, tended to have larger 1993-2001 increases in square footage than those without, Table 6 suggests that garages were the principle contributor to the larger 2001 measurements compared to 1993 among single-family detached housing units. Regardless of the presence or absence of a basement, the single-family detached housing units with a garage had larger 1993-2001 percentage change increases (5.0 percent and 7.3 percent, respectively) than those units without a garage.

This result contrasts with the more mixed findings for single-family attached housing units. The largest 1993-2001 percentage change increase was among the housing units in this category with both basements and garages (39.0 percent), followed by the housing units with neither a basement nor a garage (17.7 percent).

Table 6. Average Total Square Footage and 1993-2001 Change for Detached and

Attached Single-Family U.S. Housing Units With and Without Basements and With and Without Garages			
	Total Square Footage		Percentage Change
	1993	2001	
All Single-Family Detached	2,337	2,553	9.2
Without a Basement/Without a Garage	1,428	1,487	4.1
With a Basement/Without a Garage	2,598	2,626	1.1
Without a Basement/With a Garage	2,113	2,218	5.0
With an Attached Garage	n/a	2,346	--
With a Detached Garage	n/a	1,841	--
With a Basement/With a Garage	3,118	3,346	7.3
With an Attached Garage	n/a	3,708	--
With a Detached Garage	n/a	2,807	--
All Single-Family Attached	1,799	2,373	31.9
Without a Basement/Without a Garage	1,118	1,316	17.7
With a Basement/Without a Garage	2,170	1,996	-0.8
Without a Basement/With a Garage	1,966	2,068	5.2
With an Attached Garage	n/a	2,172	--
With a Detached Garage	n/a	1,472	--
With a Basement/With a Garage	2,387	3,318	39.0
With an Attached Garage	n/a	3,392	--
With a Detached Garage	n/a	2,597	--

n/a Data is not available. Prior to the 2001 RECS respondents were simply asked if they had a garage. No data were collected that distinguished attached from detached garages. Interviewers when measuring the square footage included in their measurements only garages that were attached to the housing unit.

In summary, users of the 2001 RECS square footage data are advised to take care when making comparisons between these data and those obtained in previous RECS. Unquestionably, the “active living area” and the total square footage of the average U.S. housing unit have increased over the 1993-2001 period. However, part of the observed 1993-2001 increases can be attributed to the improved measurements methodology used in the 2001 RECS resulting in the increased identification and inclusion of garages and basements in the housing unit measurements.

Square Footage Measurements and Comparisons: *Caveat Emptor*

Appendix: Household Measurements Methodology

2001 Residential Energy Consumption Survey

The methodology for measuring the square footage of housing units used in the 2001 Residential Energy Consumption Survey is a departure from that used in previous RECS. Accordingly, the data presented here are not directly comparable to those collected and presented in the past. However, we believe that this new methodology has resulted in improved accuracy of the measurements. And, for the first time, we present a breakdown of the total heated and unheated square footage of the housing units into its

component parts—the attic, basement, attached garage, and all other floorspace (the living space of the housing unit). Table A-1 presents the areas of U.S. housing units that were separately measured (and reported in the 2001 RECS data set) and included or excluded in total and heated square footage data in the 2001 RECS. These same areas were measured in previous surveys.

Table A-1. Summary of Areas in U.S. Housing Units Included or Excluded in Total and Heated Square Footage Totals

	Included in Total Square Footage				Included in Heated Square Footage			
	Finished		Unfinished		Finished		Unfinished	
	Heated	Unheated	Heated	Unheated	Heated	Unheated	Heated	Unheated
Attached Garage	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Detached Garage	No	No	No	No	No	No	No	No
Basement	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Attic	Yes	Yes	Yes	No	Yes	No	Yes	No
Enclosed Porch	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Living Rooms ¹	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Other Enclosed Interior Space ²	Yes	Yes	Yes	Yes	Yes	No	Yes	No

1 Include bedrooms, dining rooms, kitchens, dens, and other living space not separately reported.
 2 Space not included in any other category such as laundry rooms, hallways, and closets.

In past RECS the interviewers were responsible for identifying all the floorspace in each housing unit, actually measuring all of it, and identifying which portions of the measured floorspace were heated and unheated. All the data, including drawings of each floor, were manually recorded in the questionnaire booklet and later transcribed and entered into the computerized data files and then edited.

In contrast, the CAPI household interview used in the 2001 RECS permitted most of the tasks previously assigned to the interviewer to be performed by the computer. To accomplish this a number of conventions that were obtained from an examination of the data collected in previous RECS were adopted. These conventions resulted in less reliance on the interviewer and allowed for enhanced statistical imputation of square footage data.

The large majority of housing units are square, rectangular, L-shaped, or T-shaped. Also, for most units with a basement or more than one floor, the shape and size of the basement or floors above the main floor are the same as the main floor. Only if the basement below the main level differed in size or shape from the main floor was it measured. Similarly, the floor above the main floor was measured only if it differed in size or shape from the main floor. Where a third floor was present, and its size and shape were the same as the second, it also was not measured. Given that the basement or the floor above the main floor are the same size and shape as the main floor the measurements of the main floor, which was obtained for all housing units, imputations of the area of the floor above or below it could be made.

Garages are very standardized in size and have not changed over time. Based on previous RECS, it is known that a one-car garage averages 250 square feet in size, a two-car garage is 400 square feet, and a three-car garage is 600 square feet in size. Accordingly, garages were not measured as separate sections of the housing unit, as in the past. Where the garage was an integral part of a floor containing living space or the basement, the entire floor or basement, including the garage, was measured. In the editing of the data the square footage of the garage, depending on the number of cars it could hold, was deducted from the total basement or living space. Garages that were attached to the housing unit, but not an integral part of the housing unit, were not measured and the square footage imputed based on the number of cars the garage could hold.

Based on this information, the CAPI provided instructions to the interviewers that specified what they were to measure. The measurements collected were then entered into the CAPI system by the interviewers. Included in the CAPI interview programs were range edits that questioned unusually small

or large areas that were entered. Only in cases where the housing unit was more than three stories high or some shape other than L-shaped or T-shaped, was the interviewer required to make drawings and record their measurements in a supplementary booklet.

Unlike previous RECS, the interviewers were not required to identify the space they measured as heated or unheated. In Section A of the household questionnaire the householder was directly asked if any basements, attics, or garages that were part of their housing unit were heated or not (specifically, they were asked if the area was warm enough to sit, work, or play in during the winter months). In those cases where only a portion of the basement or attic was reported to be heated, the householder was asked what portion was heated (specifically, very little (1-4 percent), some (5-33 percent), about half (34-66 percent), about three-quarters (67-95 percent), or most of it (96-99 percent)). Also householders were asked the specific number of rooms in the housing unit that were not heated. Based on the responses to these questions the total space in each category was allocated between heated and unheated space by imputation.

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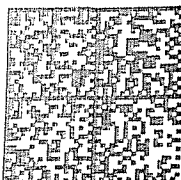
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