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Tables

Contents (Continued)

		Yapa
15.	Average Ressenced Satural Gas Consumption When Main Decting Fact is Natural Gas by End Des for 1973	
14.	(Milliem Sto)	入 章
17.	(Million Acu)	a.
18.	(MELLION 140)	29
	EN 1961 (BOILERS) CONTRACTOR CONT	19
<u>51.</u>	Average Hossebold Consumption and Expenditures for Space Reactor by Main Section 2001	7
82.,	Awaraye Socsahold Dusrgy Expenditures by End Use by	*
%1 ,	Average Rossihold Rearry Communition for Space Missing per Spacing Degrae-Day by Main Measing Fuel	18
***	(Throastad Blu)	器
el.	Differences 1978-1981, 1978-1960, 1980-19901) Assrage Bourehold Electricity Cousseption and Provediments for Same Device Way Web Basting Bud in	9
82.	Electricity by Begion	\$
eses \$	Assering when Fain Assering Fact in Electricity by Square Footage of Bose Average Arosabold Electricity Communication When Main	10
2.	Neuting Yusi in Electricity by End Use by Selected Housing Characteristics for 1975	21
	Besting Fuel is Electricity by End Wes by Selected Sociodenegraphic Characteristics for 1976	22
3.	Average Rossebuld Betwiel Gas Consumption When Main Busting Faci is Betwiel Cas by End Due by Selected	**
à.,	Average Rousehold Mataral Gas Crassmptics Moss Main Rearing Fuel is Mataral Gas by End Mas by Salesred	44
1	Souldenographic Obsrectarized for 1378	这些
₿a	Hoe by Gelected Reading Characteristics for 1978 Average Romachold Frai Dil or Estesson Consumption When Main Masting Fuel is Fuel Cil or Estesson by End	1
	ere by malected Booledsseptophic Characteristics for 1978	24
7.	Average Bousehold LVG Consusption When Main Barting Fuel is LPG by Bod Des by Selected Revaing	
÷.	Cherecteristics for 1978 Shen Main Hesting Average Household LFG Consumption When Main Hesting Fuel 1s LFG by Rod Use by Selected Sociodemonraphic	21
9.	Chelectoristics for 1978	27
34.	Selected Fousing Chargereristics for 1978	ŹØ
11.	Releasted SocioSemographic Characteristics for 1978	30
-1973 19	Reating by Main Meaning Rusl by Selected Housing Characteristics for 1978	jo

Residential Energy Contemption and Expanditures by Sod Une for 1976, 1966, and 1981 Georgy Internation Administration

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in p

Contents (Continued)

		Base
12.	lastage machinels integr inperfitients for Serve Include by Isike Besting Peal, by Selected	
X.See	hallelingeryne therean and an isro and the Averyn Brucheld Machiner Conseption Wen Mile Yening Fod. in Matrialsy by Rol Der by Salastaf	2559
S.S.M.	Readfy Charlendal and Arr Adel correspondences are an arrival and the second se	
13.	husheinspunchis Secondenistiss for 1988	
26 e	Renders (Restative) defined for IAA are an an and a subscription (her bakes) periods beneficial herearch from Correspondention (her bakes) manual fuel is defined. One by Bol for by following	
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t s,	For by Selected America Characteristics Set 1980 Analyse Housefull Fokl 212 or Remains Consequine Ober Make Making Tool is Paul 321 or Assumers by Bod See by Selected Assistance regionalis demonstration for	**
916 2999	1780 autopictoristants are an according to the second seco	37
12to	Channeskolde Alt 1920	Ŵ
iil.	Connection in 1986 are a connected and the second s	- Merica
W.	in den handlig Bernin in 1998 (1999) (1999) Antonya Handila Denga Benedikaran '19 Ini Ina In Galeriad Basimianjanjika Chatestariadas far	ACE.
É.a.	1992)	
M18	Anting by Main Marking Teal by Arbands.	
29+	Freisiensprophie Cherrotristical for 1986	14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4
2au	Severing Adaptatesiaties for 1981 concernancessessesses income Scientified Manuschritz Graningians Shar Main Maning Faul in Sharmalating by Sad Tao by Salaniza	\$\$ \$
and the second s	Southedingthyblic Characteristics for 1981 secondrason decays burcheld Laisaul Das Conception Maps Rais Realing Faul do Bahanal Cas by Del Tor by Salented	新 新
	Bourdagh Aberbarthert fillen den WAR anderen anderen soner ander anderen Bourbarld Reduced, der Baummenstert Mere Mele Bourder: Farl de Bernsel fich for der Bost der he selligenet	蜂野
9% .	Mailadingangdila Unanasainilas her 1988 anananasaanaan Asaraga Kanshald Dael Gil er Karangs Kansandilas Basa Asia Barbing Inal da Parl Gil er Bergane da Ini Dae	nie
39.	by Relation Reacing Characterical Rep 1971	业
	by Informal Indianaparable discount for the for 1981 and a	选择
81.	Bud to 135 by had her for selected Bounder	

Residendel Courses Companifelius and Courselforms by East Man for 1969, 1968, and 1985. Topological Administration

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5 245 Set 0



Contents (Continued)

		Pass
Jac	Average Sundehold LPG Comparation When Minik Emering Faci is LPG by Red Cose by Selected Municipanspire	
\$3.	Characteristics for 1981	38
94	Salastad According Characteristics for 1981 susarristanses	33
্ৰন্দ হ নাজ	Salastad Saciodassirephic Chargestoristics for 1991 assures	54
ಹೆತ್ಕ	by Kein Meating Past by Selected Maining Characteristics	1944
35.	for 1961 Average Moneokold Energy Repeatitures for Space Exeting by Dain Marting Fuel by Salacial Scotedensinghic	100
37.	Cheracteristics for 1981 Porcent of Avarage Nersebold Liectricity Convertica Dead for Space Nesting When Rain Harring Fuel is	58
38.	Electricity by collected booking therectoriselice for 1578, 1969, 1981 Persont of Average Respected Disctricity Conception	· \$7
	Good for Space Basting When Main Brating Sual is Electricity by Salecred Sociodenographic Contraction for 1976 1978	**
39.	Process of Average Boundbold Settral Cas Consequence Need for Space Marting Show Main Marring Puel is	3992
40.	Factories of Sciences Sciences in Advisor Francisco For 1978, 1960, 1981	39
	Tand for Space Fratley Ween Mais Spating Fuel in Astaral Cas by Selected Sociobacographic Characteristics for 1978. 1988. 1981	50
42.	Fereine of Average Boundbuld Puel Oil of Kernsens Counterfield Ford for Space Heating When Main Heating Fuel 1 Mail 111 or Versens by Collected Martin	
49.	Characteristics for 1975, 1986, 1981 creasures	61
59.26 ¥	Communition Nami for Space Heating When Main Menting Fort is Furl Oil or Escomena by Selected	100
AL,	Sectoreagnephic Characteristics for 1978, 1986, 1981 Comparison of These Residential Reargy Conseption	\$ 3
\$2 a	and Expanditures Surveys account and a survey and a survey	53
64.,	1987 construction of Spacebolds that Das Lack Feel and Percent of Spacebolds with Baskle Dael Negords by Sunl	64
	Tand and Type of Revolve Arrospare	6 5



Summary of Findinga

Introduction

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Significant Findings

> Table S1. Average Household Consumption and Expenditures for Space Heating by Main Heating Puel

Summary of Findings (Continued)

The sverage 5.5. every commution per brockhold for all fusio meet in the base declined 24 million Stu From 135 willion Stu in 1975 to 114 willion Stu in 1951. The primary cause of the decline in overall energy consemption was the second of energy and for space heating. Although consemption for all fools declined during this period, the drop was perticularly evident from 1978 through 1950.

From 1978 through 1981, households experienced, an the everage, a 28 percent dealing in the subart of energy used to hast their heave. Even after adjusting for a difference in weather, space beating counsation still declined, on the average, 17 percent for netural gas hasted homes and il purcent for electrically heated beass. The largest decline in space bearing communico was among boundholds ther heated with electricity. These boundelds experienced, on the sverage, a 39 percent decline from 31.8 million Bto is 1978 to 19.2 million Bts in 1981. The second largest decline, 17 percent, occurred among house that beated with fuel oil. Among natural gas heated homeo, there was, on an average, 4 27 parcent decline in space beating consumption from 1978 through 1960. Approximately a 10 parcast increase them occurred from 1980 through 1981. giving an overall decline of about 15 percent from 1978 through 1981. The cost of space besting, bowever, iccreased from 1978 through 1981. Amon households shows not heating fuel was natural gas, the cost of space besting impressed, on the average, by 15 percent, while the cost among boundedide heating with electricity only intreased, on the average, by 7 percent. The largest increase in space hesting cours occurred emony been where the suit beating fuel out fash oil. The following table shows that fuel all costs increased by \$105 from 1978 through 1981.

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iktural (no	169 (3.4)	74a.s)	82(1.7)	272 (7)	285 (5)	387 (I)
1351 (61/ December 1999)	121(4,4)	96(2,3)	建石. 約	475(89)	77MX0	780(26)

Note: The value is parenthesis represents one standard error of the statistic.

Source: Tables 1, 3, 5, 11, 13, 15, 17, 13, 25, 27, 29, 35.

From 1978 through 1981, electrically heated households in the Nest² experienced the largest decline in space heating counseption with, on the suberage, a 58 percent decrease in electricity. However, it is important to note that there was not a steady decline. From 1978 through 1980, there was a 66 percent decrease in electricity consemption, then from 1980 through 1981, consemption increased by 21 percent. Howe heated by natural gas is the West reduced their epece heating consemption by 30 percent from 1978 through 1981. Is 1981, howes in the Martheast heated by electricity used 35 percent more Stn for space heating than

Residualed forming Consumption and Expenditures by find the for 1979, 1980, and 1981 Descentioneration Administration

Appendix) shows the States by region.

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Energy End Use Trends

Average Household Consumption

Figure 1. Average Household Energy Consumption by Main Heating Fuel 1978, 1979, 1980, and 1981 (Million Btu)

Summary of Findings (Continued)

The average energy consumption per bessehold decreased from 1978 through 1962 by 17 (3) percent, while average emergy expenditures during the same period increased by 41 (2) percent. Although all fuels showed a decline in consumption from 1978 through 1981, the intgest decrease was in electricity consumption.

Figure 1 shows that enoug households whose usin heating fuel was electricity there was, to the syntage, a 23 (5)' percent decline in total electricity communities from 1978 through 1991. During the same time, the average total communities of varural gas smort households heated by natural gas declined by 12 (3) percent, while swares consuption for fuel of1 in those households heated by fuel oil doclined by 30 (4) percent.



Connect: Courty Information Administration, 1978, 1939, 1942, and 1941 Scalamital Scarpy Consemption Surveys.

Residential Record Consemption and Repardicus by End the for 1978, 1989, and 1981 Record Education Administration

Note: Asserge consequint partitions he electricily encountions for however, in any most method full is calculated and and an furth.

⁴The value in parenthesis represents one standard error of the statistic. The standard error is assaurs of the variability of an estimate.



Space Hacking Consumption

Figure 2. Average Household Electricity Consecutive for Space Heating and Weiter Heating Wites Mein Heating Fuel is Electricity (Sillies Stat Semmary of Findings (Continued)

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Among house brated by natural gas, approximately 101 (3.4) million bis of natural gas was used for space beating in 1978. Figure 3 above that Like electricity, the largest serveres in gas conception was in space beating with a 19 (3) percess decline from 1978 through 1981. However, while electricity, the estimated second of tectural gas used for restar beating did not remain stable. From 1978 through 1960, water beating conception increased by approximately 18 (3) percess and then decreased by approximately 17 (2) percent from 1966 through 1981. The starage conception for howeehold's beated with



Figure 3. Average Household Naterst Gas Concumption for Space Heating sod Water Heating When Main Heating Fusi is Natural Gas (Million Bto)

> Residential Emergy Connemption and Repeatibures by Ded Dat for 1979, 1999, and 1961 Science Information Administration



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sote: 1979 figures are included in the precell energy expectitores. The date, bacquer, were boundlets for accutate and-use estimates.

Nuclearities Emergy Consumption and Expanditures by End Use for 1978, 1969, and 1961 Emergy Information Administration

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From 1876 through 1881, there are approximately a 26 (5) provides desidente sharpyinking strangention det space heating in the Next securit house builds about the sole baseling field out also visions, while dealling strangenties. Since the line time of the sole (1) protects restarting the manageties. Since the through 1881 through 1881, also straight and the space baseling inclusion by optimizingly if (5) protects. While it shows that derive the particularly if (5) protects. While it shows that derive the particular of the shows have a straight in the space baseling it is been particularly if (5) protects. While it shows that derive the particular of the shows have been been a 37 (5) protect descents in the second of the space of a 10 (10) property descents in the back. Marked we have at a loss and a 10 (11) property descents in the back. Marked we have a loss the space baseling did not appendification in the second. When the back is the back of the back of the second states in the back.

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Table 37 shows that in the 1978, 1980, and 1981 surveys, electricity communition for space heating consistently increased as the heated square fortage of the bound forcessed. Additionally, from 1978 through 1981 in all size categories, there was a decrease in consumption. However, Table 52 shows that there was no consistent fromd by dwelling size in the percept of change for electricity. The statistically significant change in the amount of electricity used for space beating ranged from 31 (10) percent to 52 (19) percent.

Percent Change Between 1978-1981 1978 1980 1981 Square Zeet 11.8 (1.5) 15.7 (1.4) 23 (12) 800-999 25.? (2.7) 14.5 (1.9) 15.9 (1.4) 40 (8) 1.000-1.199 28.3 (3.2) 15.0 (2.0) 19.0 (1.4) 33 (3) 1,200-1,399 29.6 (4.2) 19.6 (2.6) 17.2 (2.2) 42 (11) 1.400-1.799 39.4 (3.2) 29.9 (2.4) 18.9 (3.5) 32 (19) 1,800-2,399 40.5 (4.7) 26.6 (1.7) 28.8 (2.6) 31 (10) 2.400 or More 60.9 (6.5) 27.6 (2.3) 32.2 (2.9) 47 (8)

Note: The value in parenthesis is our standard error of the statistic. Source: Tablas 1, 19, 25.

Whergy aspesditures, particularly for space heating, varied by income, and by geographic region. In 1978, the average space heating cost for electrically heated bosons in the Northwest was approximately 3347 (57). By 1961, this cost had shoot doubled to \$644 (61). Hewever, other regions in the United States expectenced a decline in electricity costs for space heating, with the West experiencing the largest decrease in costs.

Table E2. Average Household Electricity Consumption for Space Heating When Main Heating Fuel Is Electricity, by Square Footage of Home (Million Blu)

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End Use

Figure 7. Average Household Electricity Consumption for All Households That Use Electricity by End Use for 1981 (Million Btui

Summary of Findings (Continued)

Is addition to the tranks in consumption and expanditures, the patterns of energy use within a given time period are also of internet. Figures 7 through 11 describe the distribution of electricity communities and expanditures by and use.

Figure 7 shows that in 1861, should have bolds that used electricity but did not measurally hast with it, approximately 52 (.8) percent of the everage household electricity command was for midcellarsous use. Apprecimately 12 (.7) percent of household electricity communities was used for space heating, while water heating accounted for approximately 13 (.5) percent and cooling accounted for 13 (.6) percent. This pettern was the same for 1978 and 1980.



Source: Seergy Information Administration, 1965 Analdential Emergy Communition Servey.

Figures 8 through 10 show that this pattern of electricity consumption changes when electricity is the main besting fuel. The everage bounded's convergetion for electricity was 33.4 (2) willion bis for those households that beated with electricity it 1931. Approximately 36 (1) percent was used for speece besting and 32 (.3) percent who used for also illentous use. Approximately 12 (1) percent of electricity was used for cooling and 30 (.3) percent was used for water heating.

Residential Energy Communition and Expensioners by find the for 1978, 1986, and 1981 Insert Information Administration



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Figure 10. Average Household Electricity Consumption When Main Heating Fuel Is Electricity by End Use for 1981 (Hitken Bist





Science Berry Delevention Advisionation, 1981 Austrantial Lourgy Compositor Densy.

Figure 11 shows the distribution for 1978, 1980, and 1981 of the average boundaries districtly expanditures by and use for households where asis bearing forl is electricity.



Monteneziei Energy Communication and Expensioners by Sod Use No 1978, 1968, and 1981 Service Information Additionalism



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Summery of Findings (Cambrase)

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Pateral gas aspenditures for space insting increased in all regions of the United States from 1978 through 1961. Households in the Mortheast experienced a 46 (3) percent increase in space basing costs; the Dortha 44 (4) percent increase; the Morth Cantral region. a 39 (3) percent increase; and the Maxi, a 22 (6) percent increase. Figure 13 shows the percentage change between 1978 and 1981 in natural gas concemption and expenditures by region.



these. Altaka and tissues over his included is the 1979 survey.

Reakcenthy Energy Greenmerton and Aspenditures by End ten for 1976, 1986, and 1991 Energy advances a decledy willow

Pigure 13, Percent Change Between 1978 and 1981 of Average Household Consumption and Expenditures for Space Heating When Main Heating Fuel is Natural Gas by Region



End 1988

Figure 14, Average Household Natural Ass Computerion for All Household's Thot Ree Natural Gap by Red Use for 1001 the Marshinson of astrony gap story appre highling, when heating, and closed teams, we must another for humalable they don't control you but fill one papersully lear which it and the foresholds they are but approach you as the refu hyphlicy thete. For abilitation is filterabletion potenties between the just error of boundable was because such boundable this whet makes the just error of boundable was because such boundable this whet

Figures 14 Marshi is she bis in demonstration of spinord, gas summaries in the Life, 1996, and 2001 many break white and forming first the constant gas. In 1997, hereducide that break with metalet gas and, so the scales. This, because the state break spinor and the sum of the scale for spinor breaks, 19 1. If presents for spinor breaks to the transpin line classification parts.



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Figure 15. Average Household Natural Gas Consumption When Main Heating Fuel is Natural Gas by End Use for 1978 Oktilion Dtui





Source: Course information debinistation, 1976 Realdontial Energy Conception Survey.



Sunce: Intropy Information Aministration, 1986 Aministical Every: Conception Detroy.

Residential Compy Consumption and Reparations by Sec Dec Mr 1978, 1988, and 1971 Conservation Administration

Seminary of Fladings (Continued)



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Pigers 17. Average Household Holerei Ges Consumption When Main Heating Paul It Natural Ges by End Des Joy (201 (2010an 201)

Figure 18, Assrage Namidado Natural Geo Sapteniñano Man Main Nacima Fadi is Natural Geo by End Use Ser 1973, 1988, and 1981

> Restituted Rangy Conservation and Organizations by Stat Data for 1995, view, and con-Datagy Internation Administration

Summary of Findings (Configurat)

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Table 2. Average Household Electricity **Consumption When** Main Heating Fuel is Electricity by End **Use by Relected** Sociocanographio Characteristics for 1978

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235.064 für inden bereiten annen	1.1 (0.21	47.1 1 7.61	25.9 (8.8)	19.5 (1.61	28.2 (2.7)			
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	8. 8 16. 25	98.8 T T.42	6.\$ 68.05	6.5 18.63	28.4 42.21			
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Residential Energy Consumption and Expandiance by End Lies for 1976, 1968, and 1981 Kennya Internetikas Adeptetatroklass

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Table 2. Average Housebuld Natural Geo Consemption When Main Healtra Fuel is Matural Gas by End Use by Salepted Housing Charauteristics for 1978

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In the second se	19.25 (19.20) 4.27 (19.21) 4.29 (19.21) 4.29 (19.21) 4.27 (19.21) 5.27 (19.21) 5.27 (19.21)	1982-8 4 5.48 193.7 6 5.43 193.8 7 5.45 193.8 7 5.55 193.8 7 5.55 193.5		5.55 894.100 5.55 894.100 5.55 894.20 6.55 894.20 6.55 894.10 6.55 896.10 6.55 896.10 6.55 896.10
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Table 4. Amerage Household Naturel **Geo Consumption** When Waln Heating Fuel le Natural Ges by End Use by Selected Sociodemographie Choracturiolites for 1978

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STORAPHYS RESTIR						
A TANA PASAFOURASESSA	7.8 45.83	2.93 A & F. 93	82.2 TR.91	4.5 (6.8)		
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2000	16.19 1.28	58.4 1 8.41	20. 4 11.11	5. W (B. 3.)		
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Reation Literal Gard						
S.J. St	2.11 (4.91	38.5 1 2.83	PR. # 53.83	6.3 (6.33)		
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Table B. Average Household Fuel Oil or Kerosene **Constitution** When Main Heating Fuel le Fuel Oil or Kerosana by End Use by Selected Housing Characteristics for 1978

ออาการของของเหมืองของการขององสุดที่สาว เหมืองกุญสามใหญ	אראיניעראין איז איזיעראינעראין איז איזעראין איז				
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Table 6. Average Household Fuel Oll or Kerosene **Consumption** When Main Heating Fuel is Fuel Oll or Korosona by End Use by Selected Sociodemographic Chemctorlatics for 1078

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¥1869.46.989.	T.S. 92.22	254.4 4 5.41	88.2 62.21	3		
A.8888-4.499.	3.7 18.85	282.6 1 2.62	4.1 19.23	18		
8,800-7.699	1.7 28.61	286.8 127.03	Y. S. E.S. 78	總		
5.009 OF 1888	9.8 12.6b	105.4 166.31	4.7 12.51	1.45		
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£7.8.650.416.095	2.9. 53. 73	117.7 111.01	28.5 88.003	1 1 1 1		
\$28. 165.494.968.	8 8 84 36	199.0 (70.0)	5.9 11.63	2.		
228.468-614.668	2 8 44 97	134 2 C 11.21	4.6 11.60	2		
139-229 CR TEALord and account	1.8 (4.2)	163.5 feb.a1	Ø. 2 62.27	*		
NUMBER OF HOMESTICS METRICS						
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	8.5 (8.43	122.8 7 5.61	6.2 11.23	1		
THEP	6. 8 63. 35	111.4 1 4.23	4.5. 80.25	ā		
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STUD ON SCHOOL	5 4 1 R 4 Y	884 8 4 a 814	35 2 29 84	64 65		

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Table 7. Average Household LPG Concumption When Moin Hevilog Fasi is LPG by End Use by Selected Housing Charactoristics for 1978

HERITATION STRAFFICTURE TO STRAFF			1 1990 (1999).			
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	WCME.coressessaweencoress	L1 (0.3)	67.9 T 6.69	tit there	7.19 19 -47	
	ANALY STRUCTURE ANALY STRUCT AT ANALY STRUCTURE ANALY STRUCT AT ANALY STRUCTURE ANALY STRUCT AT ANALY STRUCTURE ANALY STR	3	74.2 (38.4) 2 5 5 6 6 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8	31.7 (5.5) * * * * * * * * * * * * * * * * * * *	77 (24) 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	
	1907 CATERaudokticonserver.	\$~\$ (\$A)}	18-4 - 5.51	18.9 18.99	2.7 12.11	
	MARTIN SILVER FOR ALL AND	8.4 (8.6) 8.4 (8.2) 8.4 (8.2) 8.4 (8.2) 8.4 (8.2) 8.4 (8.2)	84.4 (17.7) 19.2 (17.4) 14.3 (7.8) 14.4 (7.8) 14.4 (18.3) 14.4 (18.3)	8.7 (4.43 4.4 (4.43 14.4 (4.43 14.4 (4.43 14.4 (4.43 14.4 (4.43) 14.4 (4.43) 1	8. 4 52. 8 5 5. 4 5 5 8. 4 5 5 8. 4 5 8. 5 8. 5 8. 5 8. 5 8. 5 8. 5 8. 5 8.	

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Teble & Average Household LPG Consumption When Main Reading Fuel Is 1.PG by End Use by Selected Sociodemographic Characteristics for 1978

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	in an	gangalan ang ang ang ang ang ang ang ang ang a	Baselooningson Sprid in Tormana d	programmentes	
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CONTRACTOR STORAGE STORAGE	2.3 12.65	· · · · · · · · · · · · · · · · · · ·	4.1 62.17	第. 3 其物. 杨 章	
	4.3 (4.2)	66.6 (24.4)	24.4 1岁.49	L.A (L.2)	
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Arath W Maserconcerences	-	*	1		
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\$10.000-\$10.889	\$ 7 10.13	St. 3 2 4.49	28.2 (2.1)	* 8 14.71	
GIV-COR-SID. WWG	4.5 68.23	28.2 534.89	£3.# £5.%8	3.6 (1.2)	
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AND THE WIRL	4	r.	*	**	
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BE CANALLY IN COMPANY THE RECEIPT	0.6 (4.1)	F8. 5 116. T1	8. 4 EV. 4. 1	2.4 11.37	
THE PROPERTY AND ADDRESS AND ADDRESS ADDRE	2.4 (9.2)	35.5 1 4.41	6.2 22.61	2.6 12.61	
THE CONTRACT OF A CONTRACT	8.2 18.11	78.2 826.44	31. + 34.83	S. & #2.62	
The second and second and second	2.4 15.11	A1.00 (13.75	33.9 (3.27	3.4 4B.43	
REAR AN ANTER	8.2 50.29	\$2. \$ \$22. \$?	17.8 13.23	3.6 11.25	

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	and a state	30252 3. 3268	388 \$ 1992.	分款 11 1099	30%2 * 985		

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Table 10. Average Household Energy Exponditures by End Use by Selected Sociodemographic Characterietics for 1978

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ALM DEPARTON CONTRACTOR AND A CONTRACTOR	DOF	毛術等身 2.4.#1	·电子数 · · · · · ·	制版料图	2-88-	10.0	347 4	5 92 B	100 A	1895
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Table 12. Average Household Energy Expanditures for Space Heating by Main Heating Fuel by Salacted Sociodemographic Characteristics for 1978

	DUIN GERTING FREI.							
MCTURITERS MADE ZGANACTONINIII	ELECTROFETTY (DELLARE)	NATURIAL BAR LOULLARD	POSL GIL (& STRINGT (STRINGT (STRILLES)					
METRICA'S COLUMNIC STRACTORS	法成 场 《基础》	R78 F 78	478 I 190					
Letter and the second s	347 (37) 442 (43) 513 (26) 272 (26)	267 (12) 518 (2) 169 (6) 171 (15)	541 (24) 553 (47) 553 (55) 257 (55) 297 (51)					
9845 Fra 1856 58 5975 1-2,578 2,586 - 2,578 2,586 - 2,578 3,586 - 2,578 3,586 - 2,578 3,686 - 2,578 3,686 - 3,578 4,586 - 5,578 4,586 - 5,578 4,58	87 4383 438 2383 398 4383 398 4383 398 4383 398 4383 398 4383 398 4383 398 4383 398 4383 398 4383 399 399 399 393 4384 393 4384 393 4384 393 4384 393 4384 393 4385 394 4385 398 4385 399 4385 398 4355 398 4355 398 4355 398 4555 398 45555 398 455555 398 4555555555555555555555555555555555555	204 (20) 234 (20) 294 (20) 294 (20) 294 (20) 244 (20) 244 (20) 244 (20) 254 (20)	1375 (21) 2016 (232) 2016 (232) 2016 (232) 2016 (232) 2017 (232) 2017 (232) 2017 (232) 2017 (232) 2018 (
386248 1292 JUNE 19, BIR., BIR., CO., C. & C.	278 (27) 298 (22) 287 (22) 288 (22) 181 (22) 181 (22) 181 (22) 183 (22)	200 (26) 206 (21) 206 (21) 206 (22) 206 (22) 211 (26) 288 (25)	488 6 591 488 6 591 488 6 489 488 1 489 489 1 481 889 1 481 489 1 481					
SHOR OF BARRIES PROVIS WEARANT AND	229 (22) 347 (23) 395 (23) 394 (23) 384 (27)	230 F121 288 (\$) 278 7292 478 (31) 324 (34)	4344 (* 1253) 4356 (* 1213) 4356 (* 1223) 6379 (* 1223) 8328 (* 1331)					

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Table 11. Ausrape Household Decembry Consumption When Main Maailog Pusi ie Electricity by Sed Use by Balacted Nonacing Characteristics for 1220

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ารกระการสมพรรษณาในระวทาง-ไว้เวลรักมาต่อสรรมการสายแม่องรางสวมแหล่งไ 	and a second that is a second seco	นี้สายหมายสารสายสาร	ใจสองขณะความเกตะสมารถเหต่ะ	ใหม่สมาครองการเหตุลายการเป	มีเกมสามารถสาวสุภาพระสาวรุ เ			
and the second of the second s	De.3 fr.st	18. 2 41.41	教、基本語。 為55	and that	264番 月影诗音			
REAL CONTRACTOR CONTRACTORS	8.25 (M)4 8.25 (M)4 8.25 (M)4 8.25 (M)4 8.25 (M)4 8.25 (M)4 8.25 (M)4 1	100.00 (C. 107) Inc.n (C. 107) Inc.n (C. 107) Inc.n (C. 107) Inc.n (C. 107) Inc.n (C. 107)	9.7 (6.5) 8.8 (8.6) 8.9 (8.6) 8.7 (8.6) 8.7 (8.6)	19.20 (91.23) (3.5 (5.3) (3.5 (5.3) (3.5 (5.3) (3.5 (5.3) (3.5 (5.3)) (3.5 (5.3))	24-4 (8.7) 12.7 (8.1) 12.2 (2.0) 12.2 (2.0) 12.2 (2.0)			
		85.42 + 44.42 92.42 + 44.43 92.43 + 54.43 93.44 + 54.43 94.44 95.44 + 54.44 95.45 + 54.44 96.45 + 54.75	5.8 (2.8) 5.9 (3.9) 6.7 (3.9) 6.9 (3.9) 6.9 (3.9) 6.3 (3.9) 6.3 (5.9)	7.0 (A.4) A.4 A.4 A.4 A.4 A.4 A.4 A.4 A.4 A.4 A.4	12.80 10.80 10.80			
in the second se	2000 2000 2000 2000 2000 2000 2000 200		2. 5 2 2 2 2 3 2 4 2 4 2 4 2 4 2 4 2 4 2 4 2	8.4 (4.5) 4.2 (4.5) 31.4 (4.5) 31.4 (3.5) 31.4 (3.5) 31.4 (3.5) 31.4 (3.5)	12.5 (4.7) 15.5 (4.7) 15.2 (4.7) 15.2 (1.8) 15.2 (1.8) 15.2 (1.8) 15.2 (1.8) 15.2 (1.8) 15.2 (1.8)			

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Table 14. Average Household Electricity **Consumation** When Main Heating Fuel is Electricity by End Use by Selected Sociodemographic Cheracteristics for 1580

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Belitzifforendenti: Characynatisticz	HERENEN OF HERENENED D NECLERNES	APALE HENTIKS INTLLIGH (200)	entidas (extidente dati)	SATER MEATING (ALLENI MET)	MINGULANDIAN USE UNILION ATOI
WITTERS	34.5 (2.4)	18.2 31.6 1	7.3 (6.5)	15.4 (7.4)	27.6 (9.6)
CECCLORIC SCRIM METHANI CAN CENTRAL CONTRACTOR STRUCTURE MAIN CENTRAL CONTRACTOR STRUCTURE MAIN STRUCTURE STRUCTURE MAINTERS STRUCTURE STRUCTURE	1.6 (8,4) 2,1 (8,4) 7,7 (8,6) 5,7 (8,6)	34,3 (2,4) 24,3 (2,4) 14,9 (2,6) 17,4 (2,3)	1.7 (#.5) 4.3 (8.7) 13.0 (8.7) 2.5 (8.7)	10.8 (9.7) 11.3 (8.8) 10.9 (7.6) 9.2 (7.7)	17.9 (1.8) 19.4 (2.5) 68.6 (8.7) 14.4 (1.1)
921100 (2002) 1401 0-1,753 2,554-2,977 3-609-5,797 5-709-5,797 5-700-5,797 5-700-5,700-5,700-5,700-5,700-5,700-5,700-5,700-5,7	2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2	4.9 (2.91 13.9 13.61 15.9 13.61 26.2 (1.91 27.5 (3.81 25.5 (3.9) 16.9 (4.5) 16.9 (4.5) 16.9 (4.5)	13.8 (12.53) 8.5 (13.53) 8.5 (13.53) 1.5 (13.55) 1.5 (13.55) 1.5 (13.55) 1.5 (13.55) 1.5 (13.55) 1.5 (13.55) 1.5 (13.55) 1.5 (13.55)	4.8 (0.5) 9.3 (1.5) 10.3 (1.5) 10.3 (1.5) 10.3 (1.5) 10.3 (1.5) 10.5 (1.5) 10.5 (1.5) 10.5 (1.5)	19.5 (1.3) 16.5 (1.3) 16.5 (2.4) 16.5 (2.4) 16.7 (2.4) 16.7 (2.4) 16.7 (2.4) 16.7 (2.4) 16.7 (2.4) 16.7 (2.4) 16.7 (2.4) 16.7 (2.4)
1956076 1855 11624 89-385,	1.0 (9.3) 2.3 (9.3) 8.5 (9.3) 1.3 (9.3) 1.3 (9.3) 1.3 (9.3) 2.9 (9.3)	17.4 (2.2) 14.4 (2.3) 14.4 (2.3) 17.4 (2.3) 17.4 (2.3) 18.2 (2.3) 18.2 (2.3) 18.2 (2.3)	2.2 (4.2) 4.4 (4.2) 5.4 (5.2) 5.4 (2,2) 7.5 (2,2) 5.5 (2,2) 5.5 (2,2) 5.5 (2,2)	6.8 (6.8) 9.8 (6.8) 9.8 (6.8) 18.7 (6.8) 13.2 (1.8) 1.3 (1.8) 1.4 (1.8) 1.4 (1.8)	12.4 20.9 14.2 48.00 14.8 (1.2) 24.8 (1.2) 24.8 (1.2) 24.8 (1.2) 24.6 (1.2) 24.6 (1.2) 25.6 (1.2)
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Table 16. Average Household Netural **Gas Consumption** When Main Heating Fuel is Natural Gas by End Use by Selected Sociodemographic Characteristics for 1980

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19637++>++++++++++++++++++++++++++++++++++	11.1 19.21	45.5 (1.))	25.2 12.43	6.5 (0.4)		
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Table 17, Average Household Fuel Oll or Kerosene Consumption When Maln Heating Fuel is Fuel Oll or Kerosene by End Use by Selected Housing Characteristics for 1980

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Hesidenits' Energy Consumption and Expanditures by End Use for 1978, 1989, and 1981 Energy hilormetion Achiel heirabing



Table 18. Average Household Fuel Oll or Kerosens **Consumption When** Mein Heating Fuol le Fuel Oll or Kerosene by End Use by Selected Sociodemographic Characteristics for 1990

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STATIS CENTRAL	8.9 10.29	68.6 1.9.23	3.5 19.35	-		
CAR Harrison Constant and Constant and Constant	3.1 16.43	76.5 14.41	4.9 18.30	-		
MIT	9.5 10.11	48.9 14.51	1.2 (4.7)	4		
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6. 669 x 8. 849	3 9 16.44	48.0 14.74	Se & 10.33			
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8,040 (8 HORE	#.4 CR.23	100.4 17.41	7.8 (2.4)	4		
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\$2.5×1000+\$10,000	1.4 15.03	00.00 /6.00	38.4 12.63	*		
\$15. 16B-\$7% 868.	T. A. 18. 64	48. 4 14. 21	86.2 62.22	alle.		
\$25.46b.\$20.000	8.4 85.24	80.7 18.25	11.8 12.81	*		
328.000-834-899.	2.5 (4.4)	24. 7 24. 76	主命。● 名言。 第1	â		
\$35,900 Of 1885	1.4 10.23	110.8 (5.2)	22.3 (2.3)	-		
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	2. 7 28. 22	48.3 17.23	19.7 14.85	12		
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Tabla 20. Average Household LPG Cossumption When Main Heating Fuel is LPG by End Use by Selected Sociodemographic Characteristics for 1280

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MITTER CLARKER CONTRACTORS	2.7 (9.4)	14.7 1 3.41	19:00 [3-13	\$.F 8\$.\$7
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PERFERENCE DETERMENTS	1.5 (4.2) (4	22.9 1 4.21 35.7 1 4.21 37.8 1 4.21 47.8 1 4.21 37.2 1 4.31 75.2 14.27 75.2 14.27 75.2 14.27 75.2 14.27 75.2 14.27 75 24	7.1 (8.3) 9.2 (8.4) 9.3 (8.4) 10.3 (8.4) 10.3 (8.4) 10.5 (8.4) 10.5 (8.4) 10.5 (8.4) 10.5 (8.4) 10.5 (8.4)	199.20 10
25236 2523 - 2004 - 2025 2523 - 2004 - 2025 2004 - 2025 2005 - 2025 2005 - 2025 2005 - 2025 2025 - 2025 2025 2025 2025 2025 2025 2025 2025	80,22 80,22 90,20 90,200	34.4 (3.4) 25.4 (2.4) 45.3 (4.2) 45.4 (4.2) 91.4 (17.7) 95.4 (3.9) 97.4 (3.2)	19.9 (1.43 8.5 (1.45 8.4 (2.5) 8.4 (2.5) 14.2 (4.7) 14.4 (2.6) 24.7 (3.6)	1
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Teble 21. Ayorogo Household Interpy Expanditures by End Use by Selected Massaling Characteriztics for 1880

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Table 22. Average Household Energy Expenditures by End Use by Selected Sociodemographic Characteristics for 1980

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Table 33. Arrenere Household Energy Expenditures for Opene Heating by Main Heating Fuel by **Beleated Housing Cherecteristics** for 1880

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Table 24. Average Household Energy Expenditures for Space Heating by Melo Heating Fuel by Selected Scelodemographic Characteristics for 1980

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Table 26. Average Household Electricity Consumption When Main Heating Fuel is Electricity by End Use by Selected Sociodemographic Characteristics for 1981

		an 191						
NAC I SMEMORY SERVIC CHARACTERISTICS	HANGS CF HUISEMMAN (HIULKIH)	SPACE HEATING INFLORE HEATING	CORLING (BRAZION STVI	SATIO MATINE LALLEDA D'ET	HORE LANDSON UNC HORE LANDSON			
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MARGER LANGER STREET STREET STREET	19.8 (L.L)	29.3 (4.5)	4.6. (4,6)	2 前,在 3月5 世末	37.2 (4.6)			
Geometaliter Britsine								
HURTHUST CARTEL SCIENCES - CONSISTENCE CONTEL SCIENCES	1.8 (0.7) 1.6 (0.7) 7.7 (0.7) 1.4 (0.7)	23.2 (8.65 34.3 (8.23 25.3 (2.4) 21.5 (2.4) 21.5 (2.4)	1.2 (4.4) 8.4 10.5) 10.4 10.11 20.4 10.11 2.5 (4.7)	14.2 (8.9) 9.5 (9.8) 18.8 (9.8) 18.4 (9.8)	14.9 (2.15 14.9 (3.31 14.9 (1.9) 14.9 (1.9) 25.5 (4.9)			
Listed-Fran Textorenets	an it the statistics of	server a servera		1010 C. 1010 C.	and and monthe-an			
 b-1, 999. b-1, 999. b-2, 999. b-608. 507. b-608. 508. 508. b-608. 508. 508. 508. b-608. 508. 508. b-608. 508. 508. 508. 508. 508. 508. 508. 5	3.4 (3.83 3.7 (4.35 3.7 (4.35 3.6 (1.5,35 3.6 (1.5,35 3.6 (1.5,35 5.6 (1.5,35 5.6 (1.5,35 5.6 (1.5,35 5.6 (1.5,35) 5.7 (1.5,35 5.2 (1.5,35) 5.7 (1.5,35 5.2 (1.5,35) 5.7 (1.5,	4.2 (1.9) 11.7 (1.2) 14.8 (1.2) 14.8 (1.2) 14.8 (1.2) 14.8 (1.6) 15.5 (15.2 (2, 2) 7.2 (2, 2) 4.4 (2, 2) 1.2 (4, 3) 1.2 (4, 3) 2.3 (4, 3) 2.4 (5, 3) 4.9 (5, 5) 4.3 (4, 3) 4.3 (4, 5) 4.3 (4,2 (1,3) 9,3 (1,3) 12,5 (1,9) 12,5 (1,9) 12,5 (1,9) 12,5 (19,7) 12,5 (19,7) 12,5 (19,7) 13,5 (19,7) 13,5 (19,7) 13,5 (19,7) 13,6 (19,5) 12,6 (19,5) 12,6 (19,5) 12,6 (19,5)	16.7 (5.9) 16.1 (1.6) 18.2 (1.6) 18.2 (1.3) 18.4 (1.3) 17.5 (1.3) 17.5 (1.3) 17.5 (1.3) 17.5 (1.3) 17.5 (1.3) 17.5 (1.3) 18.7 (1.4) 18.7 (1.4) 18.7 (1.4) 18.7 (1.4) 19.7 (1.3) 19.7 (1.3)			
919-0220 dil 54966 anno conservatore F19-0220 dil 54966 anno conservatore	1.7 (1.8) 213 (4.8)	29.3 (2.5) 20.8 (2.5)	8-212.44 13.4 (2.13	38.2 (1.1) 33.9 (0.8)	23.7 12.51 23.2 70.93			
areas of subclass wrapps			3 525 10 10 10 10 10 10 10 10 10		AND THE STATE OF			
942	3.1 (0.3) 8.6 (8.2) 8.1 (0.3) 8.1 (0.3) 1.8 (3.1)	16.7 (1.8) 17.3 (1.3) 17.9 (1.6) 20.5 (1.6) (3.4 (1.2)	9.6 (3.82 6.0 10.75 6.3 (8.3) 7.8 (2.47 7.2 (2.23	8.6 (2.8) 9.1 (6.5) 12.2 (9.5) 14.7 (2.8) 14.7 (2.8) 15.3 (1.5)	28,2 (9,9) 24,7 (9,4) 54,5 (9,7) 74,7 (9,4) 74,7 (9,4) 74,2 (1,4)			

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Table 28. Average Household Naturel Gas Consumption When Heln Heating Fuel is Natural Gas by End Use by Selected Sociodemographic Characteristics for 1221

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MTISTERAN PODDARY . PLASSARY . CONTRACTOR	44.5 (1.5)	alon alexy	魏洛 锡鸿	0.7 (8.4)			
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A CALL AND A	T.O EL.M.	392.5 72.2)	24.4 14.41	4.4.13.43			
WETH CENERALANANA CANADA DATA	28.4 (9.83	388.0 (3.1.)	12. 6 40. 97	8.2 18.50			
CONTRACT OF A CHARLEN AND A CH	22.4 24.91	彩华、安 引法:法 书	28.4 (2.4)	·李 (最、罗文			
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ANALYND DERNET DRYN							
S-ILTS LOOPLES CONTRACTORS	3.4 L2.32	32.0 12.93	28.8 FL-85	20. 8 12. 48			
2. HAVZ + STELE IL COMPANY & LAND ON COM	1.4 (5.9)	46.0 JI.13	35 at 32.98	23. 7 12.74			
Jacob Barto Barto Barton and and and a state and	客,按 言語、方言	· · · · · · · · · · · · · · · · · · ·	27-9 52.45	A.4 18-55			
4. 200-Strifferroussesses	2.8 95.71	28.8 (T.9)	重要。在1 第2、终期	Y.4 (2.3)			
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de allado toto ano ana ana ana ina ina	9.4 (1.3)	治法 ,亦 行於,現於	\$X. @ (\$.91	4.8 19.8)			
Tober 7: 927 strangerbarrenses	\$.7 SL.#3	ALE BURNER	23. F 11. P)	秋·泉 13-6 3			
BARRY OR MUNSTERNERSTRATE	2.8 (9.77	118.8 (3.1)	19.5 (3.ex)	4.3 (Q.6)			
NEW							
LAST WAS MASTRANASSANAS	9.1 \$0.AF	¥\$.5 1527	24.5 22.02	7.5 14.71			
·····································	2.2 80.91	· · · · · · · · · · · · · · · · · · ·	27.4 12.21	7.5 16.41			
alter all at a good a second and and and and and and and and and a	6.8 10.38	70. ¥ 13.43	清朝。第 说道:"学生	2.3 (2.4)			
Bissoch-M. P. W	S. S 30.21	02.1 (4.5)	29.3 62.23	Y.S 19.83			
HERE GOU-BOURSER'S AN AND AND AN AND A SAME	8.8 (4.6)	72.4 (3.2)	22.4 19.71	B.\$ 15.32			
S-*****************************	A.2 \$4.41	新客,处 医肌、 建筑	教师上影 兼教士的 第	8.4 14.23			
differing and state concension of a	7.3 (4.9)	98.,7 \$5.**	28 .4 81.45	83.8 (2,4)			
NUMBER OF TRADSSISIES HOMESOM							
Conservation and the standing	8.8 to.81	Ve.# (S.W)	Q. & T. 8.55	3. \$ 38.45			
1959	14.4 10.22	10 A 18.83	24.4 18.45	\$.# CO. 24			
THE STOLTAND STOLES STOLES	8.5 \$6.51	67. 5 63. 99	25.3 (3.6)	8.8 19.81			
FIGHT LATENAL ALENDAL STRUCTURE STRU	S.1 (5.3)	83.3 (A.4)	28.4 (0.7)	12.5 (1.81			
FIRE OF HEREINANCEPERSON	6.2 16.61	38.3 (3.3)	30. \$ 82.2.1	80.6 11.65			

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Table 30. Average Household Fust Off or Keresene **Consumption** When Main Heeting Fuel is Fuel Oll or Kerosone by End Use by Solected Sociodemographic Characteristics for 1981

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STIGRATION RECTOR						
NIR DELETY	7.9 70.69	76.4 6 5.92	梁登 书 建苯二胺苯	14		
HORTH STATERLASS STRATES STRATES	1. 7 16.25	34.2 8 A.M.	5. 9 (4. 28	3		
STATISTICS CREEKESS STATISTICS AND	2.2 14.41	\$2.7 120.31	8.4 11.33	â		
## ##################################	1,4 14.21	87.7 E 4.87	\$			
NEATINE AFFRE LAND						
Station and a second and a second sec	. 4.4 (6.3)	35.4 1 8.61	4.5 16.25	2		
2.000-2.829	20	Ø	2	â		
3-009-3-5%	6.6 19.21	87.8 838.65		15		
4:503-6:534	8.3 14.41	78.# (Q.2)	8.9 12.61	â		
J. 950-3.450	4. 5 (5.6)	93.9 1 2.4)	21 5 14 41	-		
6.866.46. 989	P. 18 18.151	25.4.4 8.81	17.2 12.18	58		
7-898-7-949	5. 2 (A. V)	89.94 8.33	29.3 48.88	66		
Secon III Millers	1.4 (0.5)	12.4 (A.02	4.2 (3.2)	5.66		
STREAM P						
LESS THEN ESSME	1.3 23.24	20.9 6 2.63	92.2 \$W.98.	3		
85.063.428.449.	8.8 19.88	88.24.4.59	18.0 48.72			
516. SAC. 514 . GER.	3.4 63.53	28.6 / 7.57	26.0 15.05	14		
42K-355-414-494.	8.8 82.28	A1 . A & R. A.S	省縣、張 手演、佛美	12		
276. HOL. 372. 499.	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	67.9 1 8.41	58. 8 F. 38	12		
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With the state of	6.2 13.44	88.7 1 2 41	12.4 18.85	13		
A STATES AND A STA	A. T. L. C. S. R.	42.6 6 2. 21	10. A TO AL	*****		
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THERFORE AND A THE AND A DESCRIPTION AND A DESCR	2.1 (4,8) 7.4 (4.2) 2.4 (4.2)	77.6 4 2.3) 88.4 (3.0) 138.3 (9.4)	12,4 (9,8) 12,0 (3,0) 32,5 (4,2)			

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Takis II. Amages Nacionated LPD Contempolato Within Main Heading Fuel is LPG by End Dae by Stelenterst Hometrag Characteristics lor TRAC

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adilaria Tarixi atta	Handble of Statistics History	1996) 1241) 1996) 1241) 1997) 1097 1269	anser instruct				
FREE STATES AND A COMPANY AND A COMPANY AND A COMPANY	ning and	996-7 7 S-899	aa max	76.87 <i>2.</i> 2			
A CARLES AND A CAR	aa (i.a) I Ia (i.a)	40.0 (5.8) 9 9 20 (8.43	44 (R.H 4 4 4	K.S (11.2)] 4.6 (16-92			
THE REAL PROPERTY AND A PROPERTY	and the set	19.4 I 9.89 19.6 I 9.89 19.6 I 9.89 19.6 I 9.89 19.6 I 9.89 19.6 I 9.89					
A CONTRACT OF CONT	8-9 (9-9) 19-8 (9-9) 19-8 (9-9) 19-8 19-8 19-8 19-8 19-8 19-9 19-9 19-9	01-5 (M.S.) 61-6 (0.49) 61-6 (0.49) 61-6 (0.49) 62-6 (0.49) 71-9 (0.24) 71-9 (0.24) 71-9 (0.24)		e.s seast a.s saturation saturati			

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Table 32. Average Household LPG **Censumption When** Main Heating Fuel Ia LPG by End Use by Selected Sociodemographic Characteristics for 节题趋于

		1 15% 15%					
FILMERICAL CHARTERICI	HANNES OF HULLOWART LALLEOWART	SPACE REATING INCLUSE PERMIT	HATER REALIZED (HELLICH DIV)	Hacricagos Ogiliam Bill			
HITHMLASSAN AND AND AND AND AND AND AND AND AND A		54.6 1 9.4X	8.2 (\$,\$)	3.2 (4.3)			
 CERCIPIE REALES NUTRATION STATEMENTS 	1.2.2.4.4.1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.	95. x 1.39. x3 96. 7 5 4. 33 37. 6 5 4. 43 27. 6 5 4. 43 27. 6 5 4. 43 36. 4 6 5. 23 49. 5 6 5. 23 49. 5 1 6. 23 38. 6 1 6. 23 32. 4 7 80. 43 32. 4 7 80. 43 32. 4 7 80. 43 32. 4 7 80. 43 32. 4 7 80. 43 30. 4 7 80. 40 30.	22. 47 32. 47 34. 57 34. 57 57 57 57 57 57 57 57 57	 4.8 (3.8) 5.1 (3.4) 5.1 (3.4) 4.8 (5.4) 4.8 (5.4) 4.8 (5.4) 5.1 (3.8) 5.1 (3.8) 5.1 (3.8) 5.1 (3.8) 5.1 (3.8) 5.3 (3.8) 5.3 (3.8) 5.3 (3.8) 5.4 (3.8) 5.5 (3.8) 			
DESTRE LESS THEN HE ODD IN THE THEN HE ODD IN THE INFORMATION IN THE INFORMATION IN THE INFORMATION IN THE INFORMATION INFORMATION IN THE INFORMATION IN THE INFORMATION IN THE INFORMATION IN THE INFORMATION IN THE INFORMATION IN THE INFORMATION IN THE INFORMATION IN THE INFORMATION IN THE INFORMATION IN THE INFORMATION IN THE INFORMATION IN THE INFORMATION IN THE INFORMATION IN THE INT	8.55 9.85 9.85 9.85 9.85 9.85 9.85 9.85	42.5 (4.5) 43.6 (4.5) 175.7 (4.5) 175.7 (4.5) 175.7 (4.5) 175.7 (4.6) 175.7 (4.6) 175.7 (4.6) 175.7 (4.6) 175.7 (4.6) 176.4 (4.5) 176.4 (4.5) 176.	4.4 (2.8) 8.2 (2.2) 2.8 (2.2) 4.3 (2.2) 4.3 (2.2) 4.3 (2.2) 5.4 (2.2)	2. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4.			

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Table III. Austrop Honeinde Ereni Report Arrient for the Une by Atlante Housing Charactering the 1221

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Table 34. Average Household Energy Expenditures by End Use by Selected Sociociomographic Characteristics for 1981

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SPICEASHITE WEETEN										
MANULARY.	2022	* ****	会学 张	¥ 10.9 5	**	* 44	10 8 to	£ 969 ¥	新始 军	1283
MATTER PERSONNE	16.3.8	5 72.00 %	09.3	¥ 1976 15	4.2	2 4 2	8.5.7	8 4.5	2000	1 10 10 10
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·····································	758G	4427	之事緣	5 249 2	3.862	1768	384	1292	372	22.47
RODER REPERSION OF REAL AND AND A	122	《 法告 》	工物的工	\$ 500	43.5	· · · · · · · · · · · · · · · · · · ·	J Z Z	至 索多	378	(14)
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4+60-6+999+++++++++++++++++++++++++++++++	1.35%	1501	536	1323	25	1 82	243	\$ 53	97.2	file)
9.183-7.389	2.12%	1641	香田 君	TREE	Sile	\$ 250	2.6%	\$2.97	690	1293
85895 TH MARSONALSERVANDER	19.34	有型排 系	BOL.	£ 1283	7	4 30	158	1201	363	1147
THE MAP										
HERE THEFT AN MEN	37.36	首·大学家	14.14.14	6978.5	44	8 64	1 12.42	* **	PAT	****
ALAN ANT THERE AND AN AND AN AND AN AND AND AND AND AN	2000	28933	12 12 12	7 0.46.9	1.19	5 85 10	8.34	\$ 95	37425	4 1.0.1
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御客がうを読むかを見たるあまたってきたまますのとくたかれる	12.1	1.19.0.2	377	1.571	3/2	1 20 2	3.26.07	5 10 2	300	ERET.
@1274E#B>B276779744494 to 40 t	926	\$ 2.0 5	374	14.33	19-18-18-18-18-18-18-18-18-18-18-18-18-18-	9 28 2	3.35%	8 数子	363	1 51
· 後近日日日日日の日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日	2043	自然起来	245	1333.5	35	资 英臣	747	1 22	· 41.2	1.953
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\$75:\$990 OR MARS	1333	名英选手	与热烈	1221	夏季夏	132.0	1.45	美编 月	经入场	(29)
sacia of microscold hypothys										
W.S. ONLY AND DEPENDENCE OF DESCRIPTION	367	1231	港市部	128.1	93	6 32	ジャ	\$ 32	285	11003
THE SALAR AND	9954	133.3	663	1361	22.	1 51	127	2 32	不時間	6 161
YERE	1.675	22344	N. Oak	25:05	22	8 36 10	143	1	\$ 3.8	1 63
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Sumany at Findings (Continued)

Table R. Andree Herodola Enaby The second second the Anexas Hosting by Yado Hosting Post by Alexand Hosting (Records) **Main**

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Table 36. Avenage Household Energy Expenditurns for Space Heating by Main Heating Fuel by Selected Sectodemographic Chasactatica for 1981

	BADA MEATONI FREA							
tsectronsparkie Exhibitionsparkie	CLEUTRICETT IDVILLENSI	MZMAWAL BAS (TULLARS)	PREL DAL CE XINSENE 1901.LEISI					
CLITERIAL CONTRACTOR CONT	2269 1 2323	347 × 73	7892 6 263					
CONSTRUCT (LINK) INTERN INTERN INTERNISSION INTERNISSION	644 (52) 442 (78) 529 (52) 834 (52)	1845 (\$2) 474 (15) 867 (16) 200 (8)	041 (35) 1530 (35) 2547 (35) 1547 (35) 1547 (33)					
ELATION REACTLE DATE 0.1.007 1.007	77 8 82 9 208 8 2 201 208 8 201 202 8 201 201 6 10 20	209 (11) 164 (68 566 (26) 736 (384) 475 (184) 475 (184) 475 (28) 527 (28) 475 (28)	THE : Act The NOT : ST NOT : TE Shi : Act Shi : Act					
1012002 1213 DAAI 59.000 95.100-15.907 812.003-414.907 812.003-414.007 812.003-414.007 812.003-414.007 814.003-414.007 814.003-414.007 814.003-414.007	147 (21) 171 (24) 288 (23) 184 (25) 184 (25) 184 (25) 195 (24) 295 (24)	225 (284) 224 (185) 224 (185) 224 (185) 224 (185) 224 (125) 223 (129) 242 (122)	788 (68) 705 (68) 707 (60) 717 (51) 742 (51) 783 (51) 782 (74)					
NUMER OF ADDICASE PROPERTY NET CONTRACTOR OF A CONTRACT NET CONTRACTOR OF A CONTRACTOR NET CONTRACTOR OF A CONTRACTOR	253 (259) 254 (25) 267 (25) 267 (25) 268 (25) 276 (25)	328 (323 389 (323) 389 (37) 378 (26) 378 (26)	750 1 42) 794 5 21 509 6 31 52 6 461 52 6 461					

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DETAILED BIRLINGTON. EDIRCE- ZIERET DARGHATTER KONTHETTRATION, OFFICE OF INTERT MARKETS AND UNI DEC. VIEWES AND UNE DIVISION. THE 1442 HESTIGNIZATION, RADARY CONSERVITION DEVEL.

Auromany of Findings (Continued)

Table SF. Forent of Assessed Household Elsel-lake Company New Head To: Spean Heading When Mean Heading Post to Risepticity by takatai Kaping Canadatai K 7878, 1980, **196**1

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Table 38. Percent of Average Household Electricity Consemption When Main Heating Fuel Is Electricity by Selected Sociodemographic Characteristics for 1978, 1985, 1981

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METERSUKSISHIC GARAKTERDISIS	3.424	379	10	 890	nisenninen Mi	
WEIRMALANNERS CHRISTIAN AND A RECEIPT	36 (2.9)	38. 38	98.63	38	22.49	
Lenchellenr Chirble						
UNIVERSET	an ra nh	200	8 2 . 6 4	34.56	30× (83)	
NIDTO FRONTEN	54 53.Re	3.8	¥8. 41	25	13.63	
ATA THE	22 52 . 8 3	22	231.014	36	13.23	
1850 az +	64 (E.A)	39.	\$3.\$2	4.2	14.41	
BITTIN HOUSE GAVE						
The Bar Well of a lot of a state of a lot of the state of	14 69.87	32.	2.2.204	自要	38. <u>29</u>	
5.885.4.834	X\$ 19.81	3.4	20.00	0.4	ER. 153	
Sellin- Sellin and a second second second	34 62.01	12.2	42.45	36	12.49	
Hold Barris - 199	68 18.05	-9%	13.83	20	12.43	
E-63*-8-1999	55 19.45	1:4	12.21	34.54	(5.9)	
8:100-2:WW.	\$7 13.09	35	68.21	20	13 3	
3.802 Jug War was a commenced	58 15.01	47	\$6.21	20	13.001	
Bross 60 WWELLERSAMMANNESSER	S.	44	45.51	4.4	\$z.\$1	
ALCINE .						
LESS TRAN WERDERSON	\$4 (2.3)	来的	(3.0)	建設	12.23	
Stabbe-17, 209	20. 13. 05	36	李林745年	14.EX	CE.\$7	
\$20-\$\$\$\$*\$D#*\$D#******************	93 52.27	33	12.01	7.12	11.00	
928:000-927-9982	43 18.0X	X.E	13.24	42	12.07	
The and a strange of the second second second	41 (1.4)	200	28.91	34	\$3.41	
自然多い時にならなったりをいってものもののないとない	43 t.5. 15	100	12.87	1	fr.est	
235.039 OR CARLESSEE CONTRACTOR	的方 医脉,致炎	27 5	12.02	夏季	¢¥493	
Gene of induction and the						
Contrast a contraction of the second	44 75.61	28	2案,数章	杨紫	\$2.83	
Wey've considering the state of the second second	有关 法法 教授	101	王帝, 赵王	88	\$2.83	
WELLAND AND AND AND AND AND AND AND AND AND	杨敏 《安山哲》	21	有是一条制	***	\$2.03	
POR ALLE DE REALERED DE PORTE DE LA CONTRACE	補偿 有效的标准	道法	主要。 教学	33	82.8	
FIRE ON PORCOUNTERS STATES	有限 长角上的色	22	12.28	藩法	23.33	

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Table 38. Percent of Anorago Mexaminald Notural Was Consegnation (faid for Space Heating When Main Haailou Fool in Natural Occ by Selected Housing **Chattinta for** 1979, 1869, 1884

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	i sangar er istand. Die Dahl föl önlig rökning är igen						
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	思有问题	1 3969	能物				
เลกเมนะหม่อนใช้ของเหลือผู้สูงๆหมายกลาดู การแหน่นสาคา ให้เป็นที่สัมษาฐ	SALLHAN WARDER PART	Contanant and the second s	Again and the second states and the				
All Karl water the test of the state of the second states and	THE MEAN	新闻 1944年	總統勝				
(a) A set of the se							

ner – hates deutsche Abdelbei es a recept presentet. Recept deutsche Verschlagen deutsche State von deutsche Aussiehen. Recept deutsche Aussiehen deutsche Die Ferschlagen. Aussiehen deutsche Alter A. genetische Aussiehenen.

Nadiaani Kango Senatipika oni Kaomikan in Keliki ila ta' 1911, 1991, 1991 (Mi Kangy Manadati Akhiriki ata



Table 40. Percent of Average Household **Natural Gas Conservotion** Used for Space Heating When Main Hesting Fuel is Netural Gas by Salacted Sociodemographic Characteristics for 1978. 1980. 1981

	Middent of Matimal Gas 1913) for Deart Deaving St year							
NA DECEMBER 10	1778	1 19	10	1999 1999 1999	69. 69.			
REFERENCE REVERSES OF THE CONSERVATION OF THE PROPERTY OF THE	74 10.03	義守	48 ₈ 442	78	(\$,\$)			
sedsonately: New York								
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WORTH CONTORA	21 (2.97	24	14.43	30	19.41			
Solithe errors and the second second second	21 42.01	64	\$2.02	25	\$1.91			
NEDF-1	77 FL. 85	34	关系。 和3	42	(3, 0)			
ration because taxo								
Asle 982	B# 28.03	43	12.24	28	F.S. 83			
2. 136-2. 664	67 12.01	3.)	18.61	2.4	63.6			
3.698. E. 030	76 12 51	Valle	13.00	200	1四、保			
3.888-A.489	80 17.01	32	\$9.43	**	70 8			
S. Balla Re WW.	.01 11.91	22	22.41	**	13.6			
\$-A25-6-945	\$2. TF. 22	382	80.001	70	23.6			
T. 1160-2.000	55 65 03	75	23.493	100	58.5			
DIOS CO PERSONALIZZARAZZA	06 (1.0)	18	12.01	23	fI.W			
SCI 1942								
1288 West WS.000	#X 12.25	\$2	62.35	76.	82.0)			
S.080-24.994	78 42.25	378	17.01	394	18.8			
42.8. 173	74 21.45	351	62.00	28	15.0			
\$15. 208.67 G. 507	74 78.63	7.36	55.93	340	FR 8			
976.158-979.929.	38. 78.45	£.0.	63.61	3.4	20.2			
197. ACC. 24. 500	20. 23. 33	44	** **	20	25 3			
238:400 DC 18396	61 (3.6)	XØ	18.01	59	13.6			
FEDER ON UNDERSTALLING								
NA SERVICE ALL CONTINUES REPAIRS STUDIES (SA)	A	-	58 22	後日本	84 46			
34288 2418年1月1日:1月日日日月月月月月日日日日日日日日日日日日日日日日日日日日日日日日	· 按照 美国山伊岛 潮景 新田 田田	100	1. A. M. P.	594.30 1974	1 10 y 10			
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PANG SOC ARMATACOUSTICS	工作 相互关键系	18 ja	这些人的 会	\$P.4	K B a 举			

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Table M. Farend of Accretion Household Puel Of or Kennessin Character Hand ins tissues Hosting Sultanti singi Want Fuel to Parel Oll or Karotscine by Definited Henricken Charaotechtica ftr 1973, 1997, 1991

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	21222-122-122-122	ese Į		eres erected and					
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	An and a second manager of the second								
	SANGE CANCER STREET		52. 183.927 193.826.188 195.628 195.62.188 195.62.188 195.62.188 195.627						

¹ • Mar. J. Martin, M. Martin, G. J. (1997) Martines. Martin Martines Property, and the first way in First, and a martiness of the state of the

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Table 42, Percent of Average Household Fuel Oli or Kerosene **Consumption** Used for Space Heating Whon Main Hoating Fuel is Feel Oll or Kercesne by Selected Ecolodemographic Characteristics for 1978, 1982, 1981

	PERCENT OF FIGT. DEL ON ACRESCHE LOED FOR MUCH MEATING OF FEM						
BALINT/NEMPARIN. CRASE/VIEIE/JEE	89	18	and the second	346) }	1 898	i ang tining tining I ang tining t
WATER CONSTRAINTS AND	94	14.97		45	¥8.84	à.	(1.1)
ROMERT REFERENCES	192 97 97 193	(4.5) 13.03 13.0) 15.21		20 76 78 78	\$2.0} \$1.99 \$2.99 \$2.97 \$1.41	60 99 95 87	(1.0) (1.0) (2.4) (2.5)
Henrilds interne start 6-Terry	-	\$7.6 1			8	1.54	it.ex
2,223-2,379,700,000,000,000,000,000,000 3,422-3,399,000,000,000,000,000,000 5,422-3,999,000,000,000,000,000,000 5,422-3,999,000,000,000,000,000,000 5,623-6,999,000,000,000,000,000,000 5,623-6,999,000,000,000,000,000,000,000 5,623-6,999,000,000,000,000,000,000,000 5,623-6,999,000,000,000,000,000,000,000,000 5,623-6,999,000,000,000,000,000,000,000,000,00	**************************************	2 (3.9) (3.9) (3.9) (3.9) (3.9) (3.9) (3.9)		100 AN) 13.61 14.01 (2.95 12.95 17.01 10.01	1982. 1982. 1987. 1997. 1977. 1977.	(3.2) (3.2) (3.2) (2.4) (2.1) (2.1)
NCC22 (NOV #2.200) (200)	经领导和外国	(2.91 (2.91 (1.91 (1.91 (1.91 (1.91 (1.91		10000000000000000000000000000000000000	(1) () () () () () () () () () () () () ()	10.25% 10.25% 10.46%10.46% 10.46% 10.46% 10.46%10.46% 10.46% 10.46%10.46% 10.46% 10.46%10.46% 10	18.29 22.29 22.29 22.29 23.29 12.20 20 20 20 20 20 20 20 20 20 20 20 20 2
LINE C PRIME STATES	能成果是自	10.93 (3.0) (3.0) (3.0) (3.0) (3.0)		於許認 認能	fz.47 98.47 12.47 12.47 12.47	92 85 85 80 74	28.98 28.98 28.98 28.98 28.98 28.98

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Appendix A

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Table A1. Comparison of Threa Residential Encent Garponigation and Ruberd Kursh Service

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Appendix A (Continued)

Table A2. Number of Households by Main Heating Fuel by Survey Year (Million Households)

Main Resting Sucl	1978	1980	1981
ill Douseholde	76.6 (0)	81,6 (0)	83.1 (0)
lausebolds Where			
lain Nesting Publ			
is Blockrickly	12,1(1.2)	14.3(1.0)	14.2(1.1)
iouseholda Where			
dain Heating Pagl			
io Natural Geo	41.8(1.9)	44,5(1.5)	46.2(1.5)
issaebolde Where			
fain Restine Feel			
ts Mael Oil or			
(crosses	16.9(1.3)	19.4(0.7)	12,2(0.6)
Sovenhelds Whete			
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LA LAG ANALANANANANA	3.1(0.5)	3.7(0.4)	3.7(6.4)

Homsehold consumption data for natural gas, electricity, fuel oil/keroseme, and liquefied petrolene gas (LFG) ware collected from the suppliers. Keroseme was combined with fuel oil. Pigeres for natural gas and electricity were based on actual communities, while fuel pil/keroseme and LFG figures were based on the ensure delivered to boundholds rether than on the succet consumed. Both consumption and expenditors information for the three surveys was senselized for April 1976 through March 1979. April 1980 through March 1961, and April 1981 through March 1979. In this report, consumption figures sto reported in Billion Stu except when consumption is adjusted for beating degree-days (ROD). Three figures are reported in thousand bts. Expenditure figures are reported in dollars.

Nour and used wate exceined: space heating, uster heating, cooling², and wincellaneous use. Histellaneous use includes cooking, lighting, disbusching, clothes drying, pool heating, and other uses. Consumption and expenditure estimates for the four and uses were addreaded in terms of estered heating characteristics and selected sociedenographic characteristics. Howeing characteristics included dwelling structure, the age of the structure, and heated space footage of the dwelling. Sociedenographic characteristics included the geographic region, market of heating degree-days, income, and unable of bournhold acchara. The base for the unable of heating degree-days was 65 degrees Fabrenheit. Karame refers to family income issudiately before the survey yeer.

Shalifardisi Dennyyi Consemption and Expanditoren by faul time for 1978, 1986, and 1983 Empoyy information Administration

²looling applies only to electricity consumption. The small amount of natural gas used for sir-conditioning was included in the elecalisation use for material gas.


Appendix B

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The maximum of excitational energy consumption and expenditures be add use undersed in their derive. The first step web to have a chest rights for technology is provide a registric sequellar that products marked pathogetes. Respectively were encounted based on the results the consumption.

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The a noise detailed explanation of the represented program, see leapned is set if dr Schrödenist Solidy Contamptor Society, Scienting contains of theory Consumption, or the USE, SUBSTREET, (Sailorghon, 1981, Director 1985).

Newdor the Science Construction and Experiations by Science (375, 1940, 464, 1931) Science Information Administration

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Appendix B (Continued)

Hary of the independent veriables were multiple interaction terms. For instance, in the 1960 survey, the equation for the space heating component of the valued gap model contained so independent variable that was the product of an indicator variable for normal gap main space heating, times the heated square footega of the dealling, times the heating degree-days. The water heating component of the electricity model for the 1961 survey contained as independent variable that was the product of an indicator variable for electric upter heating, times the madest of an indicator variable for electric upter heating, times the madest of an indicator variable for electric upter heating, times the madest of an indicator.

All independent variables involved indicator variables for a type of configuration appliance except some of the variables need in the minuchlaneous component for electricity. The use of electricity for neell appliances, lighting, and various other easily uses use represented by independent variables such as heated square foorage, member of beneshold suchars, and number of recap.

The sets of independent periobles that were used varied from entropy to correy. For a given servey, they varied from Seal to fuch. Some sppitzness only used electricity, kence, the indicator veriable for that appliance we only used in the electricity components. Nows if the differences between the indicator variables for electric wells space bearing and the ones for external gas, fuel oil, and LFG usin space bearing and the ones for external gas, fuel oil, and LFG usin space bearing and the ones for external gas, fuel oil, and LFG usin space bearing components were still different. Some of this difference as due to the difference in the populations of households that used the different factor, administry, ware beareholds can extern gas for space bearing them used electricity, fuel oil, or LFG (Table AT). Hower, if use possible to not more households that work the fifting the space heating component for households restailes about fifting the space heating component for households a strickles when fifting the space heating component for households to work about fifting the space heating component for households and works off fifting the space heating component for households and workships them that the space heating component for households that workships the difference heating component for households and workships the space heating component for households and workships the space heating component for households that workships the space heating component for households and workships the space heating component for households and the fifth of the space heating component for households to be a space heating component for households and the fifth of the space heating component for households and the space heating component for households here and the space heating component for households here a space heating component for househ

Unly a for independent variables were used in the mater basting component for any fuel. In addition, relatively for bonesholds used foal oil or LPS as their seter basting fuel. Therefore, the adversary of the estimated weter beating component for fuel oil and LPS my be histord.

Gue resons that the set of independent variables varied from energy to convey was that the annual and type of information changed from entropy to servey. For instance, a reliable estimate of the square fortage was not evallable for the 1978 autrey; nore scentate weather data was available for the 1980 and 1981 serveys and the quartiess conversing applicance stock, besting equipment, and isculation characteristics were changed for each entropy.

We did not attempt to interpret the coefficients of the independent variables in the regression equation. The fact that the set of independent variables changed from survey to three would prevent any comparisons between surveys. Additionally, uses of the independent variables were highly sulmant. An anapple of this is the net of independent terms used in the surmal gas space heating component for the 1981 energy. This set independent houses heating component for the 1981 energy. This set independent heating component for the 1981 energy. This set independent main space heating, multiplied by different watable for esteral gas main space heating, multiplied by different asserves of dealling sizes. These measures were based equate footage, maker of robes, under of doors will bindens. Sence, the effect of dealling size or the space heating temperant of the exercising as component was divided between several of the independent warishing.

As previously estimated, the fitted regression equations pers split into components. The components represent and-use estagories that were estily interpreted. The problem of colinearity is greatly reduced by evening terms that were highly colinear.

Reckensed Compy Communities and Expenditures by And Ves for 1979, 1986, and 1984 General Information Administration

Appendix 8 (Cantingen)

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Appendix C (Continued)

Table C1. Number of Sample Households That Use Each Fuel and Percent of Households with Usable* Fuel Records by Fuel Used and by Type of Housing Simuture*

Type of Real Use	Treal Resolution In Emple Adag the April	ntdle Bog	Aingla- Pectly	Unite in Activity With New to Hear Online	ikite is bildings With Ebs or Mars Dalos
Hantleity					
Subar of Resubility Percent with Undele	5,253	393	4,343	ien	833
Rel Broth concernesses	8.08	80.2	28.0	\$7.3	Stell.
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Nel 61 or Nations					
Rober of Haesholds Persont with Hable	1,132	m	72%	TH-	\$65
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125					
Sober of Exceloids Permat with Saide	\$27	种花	469	36	ş
Hal Record	61.3	M. §	62.4	56.3	24.5

²Into ways manufile for electricity and pointed get if the records covered least that 3 maths and for field will, becomes, and 185 if the records covered least them 2 year.

¹ Meddenidal Darry Conceptian Sorvey: Consection and Exercitizes, April 1951 Compt March 1982, Rose 11 Authors [1912, 202/21A-1911/1 (Matchagter, 20...), Table All.

For these households whose somial analyy communities data were alasing of unshable, the consemption meanits were imported. The importation procedure for the 1878 and 1989 surveys account that the regression equations developed from data on boundables with unable data can also be made to predict the energy concemption for boundables whose communities particular, this assumes that the results on fuel cal communities for write in buildings with five or more units will not be drastically different from the results for the other housing types. If this assumption is not walld, then the resulting same communities and existing with five an activate will be hisped.

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Appendix C (Centinued)

Anglaning with the LEE antity, effectively and when whit is the fourier productions but rialiticative and university in technologies. Note adjustments toke from magnitude allowed differences interactive damage processively physicals due to anyther the technology of anyther manufact includings and filed? Their is being to be Ming a time to be to be to be buildings and filed? Their is being to be Ming a time to be the includings and filed? Their is being to be Ming a time to be to be buildings and filed?

difficulty problem with the stand, data flat are month in biomy in the defense dominant are companies and understraining. The grandmaintains are benieve updat the principality with the flat supersidering and paighboring defensions for similar unitage destants within. While data may be differences independent with body presentation, are approaches fillerance frames angularity displaying preinstants fillerance frames angularity displaying prihere and with the beauty applied by the based of the here and with the beauty applied by the based of the here and with the beauty applied by the based of the based.

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In mapping the results for 2 years, the designs to the population will effort the fatterpretativity of the constitut. The bolarma, when requiring the results arguest waters by parts with the bolarma, when if it, the population is 15% fattering parts with the bolarma is a support of 1868. The population in 1869 independent with a 1879 through the measure of 1878 only on the specific method with its 1878 through the measure of 1878 only on the specific tests built in 1878 through the measure of 1878 only on the specific tests built in 1878 through the measure of 1878 only only of a specific tests built the 1878 through the measure of 1878 through the specific tests built the 1878 through the measure of 1878 through the specific test of a specific test while the measure of 1878 through the through of 1879, the the sharpe is populations in energy presentation will give the 1878 and a set by high strengt.

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Appendix C (Continued)

that many homoshold did not conform to this behavior pattern. If there were syntamic deviations from this pattern, the vocalts given is this report will be blassed. In future studies, SIA plane for use billing period data to belp overcome this problem.

The regression equations for the components were developed using only the bouncholds with useble nonswaption data. The results are applied to all households. This corries with it the zerosption that the population of households with and without would consemption data conformed to the case linear regression model. The assumption was nost removes when applying the results to fuel all consumption for households living in buildings with five or more units. If this assumption was not welld, then end-not solice could be blood, even if the total compution corners was not bigand.

The end-use estimates for expenditures were colculated by applying the sume percentages to expenditures as were applied to consumption. This services that the average cost per unit of energy does not very from billing partial to billing period. If the utility rate attracture is much that the average root is lower for bills with large concerption essents then it is for bills with eacil concumption accurts, then the cost of heating or cooling may be overwarknated. If the tate attracture has the opposite effect, then the cost of heating or cooling may be underestimated. In the former, incorporating the billing period date into the estimation procedute will belp slowing this problem.

Additional biases in the and-use excisits can result from the choice of independent variables used is the regression procedure. The components share the regression technique was the least subject to these potential biases, save the opens heating components for all fusie and the appliance component for electricity. The regression technique must subject to the potential biases was the exter heating and appliance components for fael cil/kernesse and LFG.

The questionneirs has been improved with each servey. Consequencly, the data available to use in constructing independent variables has been improved. Hence, the out-use estimates should be more converte for the 1981 servey than for the 1980 servey which, is turn, should be more occurate than the estimates for the 1976 servey.

In example of improved data is the square footoge data. The data for the 1976 enrows use an extincte provided by the respondent. These estimates were not used in the regression provedute because of inscourses in reporting by the respondent. The square footage data for the 1980 and 1981 surveys were based on measurements taken by the interviewers.

Only livited wrather data was evaluable for the 1978 server. The quastion on the furl used for sir conditioning and improved for the 1981 survey. Questions on the number and types of appliances have been improved with each survey.

The listed standard errors reflect only the sampling variation and the masker of households with each entitlity data. They did not rake into account errors made in disaggregating the samuel energy commention for individual households. One way to account for the disaggregation errors, is to perform a separate cogression analysis for each half-ample using only the observations that fail in the half-sample. The ord-mass estimates for each balf-sample would then be head on the regression for that helf-comple. This would involve a considerable anount of work.

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Appendix D

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Mathrone: A "complete" bethroom has a flash toilet, a bathab or shower, and a sink or unablesia with running satur. A "balf-bath" has a flash toglet or a bathab or shower but does not have all the facilities for a complete bathaous.

Billing Period: The time between manus readings. It does not refer to the time the bill was sent or when the payment was to have been occaived. In some cases, the billing period is the same an the billing cycle that corresponds closely (within several days) to astec-reading dates. For fuel all and LPS, the billing period is the unsher of days between feel deliveries.

Bin (British Reseal Colles): A due to the execut of avery required to reise the temperature of 1 pound of water 1 degree Fabrahait at or near 39.2 degrees formulationed 1 atmosphere of pressure. One Die is short equal to the heat gives off by a blue-tip match.

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ELECTRICY ASSESSMENT AND A CONTRACTOR	3,417 BLU/KLICHBER-BOUT
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	2.510 bro/eable foot
	88,640 Stu/cubic meter
Rod assaurantiasternessanter	20 million Sculeord

Other compareion factors used include:

1 therm = 100,000 Bto 1 barrel = 42 gallons

Almost all LPC reported by the fuel suppliers was propose. Mence, the LDC conversion fortors are those for propace.

Suffr-in Electric Moite: Individual resistance electric bracing units are permenently installed in the fiders, walls, cellings, or basebourds and are part of the electrical installation of the building. Electric histing devices that are plugged into an electric socket ar entist are not considered holit is.

Central System for the Suiding: A central system serving one of more buildings of two or sore housing units each that is pass for pain beating, water beating, or six-conditioning. A system that is for the respondent's living quarters only is not a central system for the building.

Contral Gara-Air Surners: A contral formants providing warm sir through forthe leading to the vertices rosse. Heat people are not furtheded in this category. A "farred-wir" formant is one is shich a fan is used to force the sir through the docre. In a "gravity" formant, sir is circulated by gravity. The warm air rises through docre and the cold air falls through forts that return it to the farmant to be talested. This completes the circulation cycle.

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Glossary (Continued)

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Family income: Is the total combined increas for the calcader year prior to the survey of all members of the family from all sources bafars taxes and deductions. It includes usges, solaries, tips, considering, and increas from Social Security, presides, interact, dividends, rest, public consistence, and unemployment insurance. This includes the total invoke for all family members who lived in the boundaried during the calcader year prior to the curvey, regardless of whether they were living there at the time of the interview. Increas of unefamily members of the boundaried in mat invoked.

"Fmelly" includes the following sypes of relationships: wother, fether, eleter, brother, son, despiter, father-in-law, walls, sont, sizes, greadebild, foster child, sod similar relationships.

Firsplace: Is any messary or probablic installed firsplace. Firsplaces is addie house are included. A firsplace must have a persuant chinway built form the wall of the house. A freestanding firsplace that con be detached from its chimney is a beating store. A firsplace incert is classified as a firsplace.

Flage, Mail, or Figeless Furgers: A "first furness" is located balow the floor and delivers bested sir to the room immediately above or, if ament a pertition, to the room on each side. A "well formate" is installed in a partition or in an outside well and delivers baseds air to the rooms on one or both sides of the well. A "pipeless furness" is installed in a basement and delivers basted air through a large register in the floor of the room or helivery immediately above.

Manin: Refere to the primity fuel delivered to the residential site. It may be converted at the site to some other energy form. "Alactricity" is included in this report as a fuel.

"Cost" includes coke.

"Ricctricity" refers to actered electric power supplied by a central utility company to a residence via underground or aboreground power lines. It does not refer to electricity generated ansite for the enthusive use of the residence. In this case, the fuel used for the generator will be indicated. The Sta equivalent for electricity is the contry value of electricity as received by the household (3,412 Ste per bilowate-bears). Electricity are not included in the generation and treasulesion of electricity are not included in the conversion of electricity into Sta for this report. If these losses ware to be included, in general, the conversion rate would be about 10,353 Sta per kilowate-boar.

"Feel Oil" is No. 1, No. 2, or No. 4 greate fuel oil or residual oil that is burned for space- of unter-besting purposes. No. 1 distillets fael oil is a form of heating oil used mostly as a blooding stock to assure that heavier greater of fael flow under severe cold weather resultions. No. 1 distillate collectively refers to No. 1 bearing oil and No. 7 direct fuel. Although these products are not precisely identical, they are consticlly interchangeable in most applications. No. 2 Weel oil is the most common four of heating oil. No. 4 distillate is a bland of No. 1 and No. 5 or No. 6 residual fuel all used in large stationary discal coll oil refers to the heating with fuel preheating equipment. Residual fuel oil refers to the heating with fuel preheating equipment. Residual fuel oil refers to the heating with fuel preheating equipment. Residual fuel oil refers to the heating oils that remain after the distillate fuel oils and lighter hydrocarbors are boiled off in refinery operations.

Residential Entropy Constantialism and Expanditures by End Van for 1978, 1989, and 1981 Energy Information Administration



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The heusehold does not include persons temperarily visiting with the household if they have a place of residence clowelers, persons who take their scale with the boucehold but usually ledge or along clowelers, demastic employees or other persons molected by the boucehold who do not close in the case bousing out, or persons who are ferner wasbers of the boucehold, but have since bounds inserts of correction or panel institutions, mostal institutions, bound for the aped or newly, bases or hespitals for the chronically ill or bandicapped, surfag homes, converts or monestations, or other places is which residents pay resain for long periods of time. By definition, the cash of households is the same or the court of concepted howeing write.

Monotopidat: The person (or the of the persons) in above asks the boost is baned or rented. If there is no loads or similar agreement of if the person she date the base or pays the rent does not live in the heaving calt, the bouseholder is the person responsible for paying the bounded wills or generally in there.

Boasing Structure: Gas of four structure types and to acceptize the building in which the heating wit was located.

a "single-family bounded unit" televa to a structure that provides living space for our household or family. The structure may be detached, attached on out side (ensidetached), or attached to ter older. Artached houses are considered single-family bounds as long to the house straif is not divided into more than out housing unit and has an independent, conside entrance. A single-family bound is tontained within wells that go from the howsent to the user.

& "boars or building with two to four basing units" is divided into living quarters for two, three, or four faulter or homseholds. This cotogory also includes bounds originally intended for occapency by one faulty or fur some other use that have since been enverted to a sopetops deciling for one to four families. Typical arrangements in these types of living quarters are separate spartweaks, destative and exceller, or one apartment to each of three or four floors.

A "building with five or note housing saits" refers to a building containing living quarters for five or more separate households or features.

à "mobile home or trailes" refers to a structure cher has all the facilities of a decling onit, but is built on a southin channis. It may be placed on a personant or responsely foundation and contain one or nore rooms. If additional rooms are added to the structure, it is will considered a public home.

housing Unit: & structure or part of a structure where a boundhold (fashing or fusividual) Have or could live. It has direct enters from the estated of the building or through a constant hold. Housing units do not include group quarters such as prisons, housitels, dorwiteries, autaing house, free-writy house, or torownite there 10 or pers cursisfied persons live. Horel rooms, notel rooms, subile house, or trailare are considered housing write if occupied.

imputations is a statistical marked used to estimate the response to specific operations for which someway are missing. In general, it is a procedure for filling in alsoing date values.

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Glossary (Continued)

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Naminel Hellern: is the walve of dollars for the year specified. Remetimes called "correct dollars," nominal dollars have use been modified to remove the affects of inflation.

Masser of Record Masia rooms are rooms such as living rooms, dising rooms, bedrooms, kitchens, lodger's moses, fixished basements or sitic rooms, retraction rooms, and permanently analoged sen perches that are used year-round. Scene used for offices by a perset living in the mait are focluded in this servey. Estimates, balls, forers or vestibular, balassies, closets, slaves, pentriss, strip of pellman kitchens, laundry ar furname rooms, unificiabed atting or basements, open perches, and unificial apace used for storage are not included.

A partially divided room, such as a dimetre must to a hitchen or a living room, is a separate room only if there is a partition from floor to calling, but not if the partition consists solary of shelves or rehimits. It a room is much by accounts of more than one unit, the room is included with the unit from which it is more rasily reached.

Ream are constad as post-round living space if they are completely nucleused with permanently installed walls, windows, and a root and can be based.

Described Bonaing Walt: A unit momente are living in as his or her mouse of parameter place of randomnes at the time of the first field contact.

Constrained: Osa/rent values in the situators itself, not the land on which it is located. The boundedly is electriciad "renter" even if the rent is paid by someone not living in the whit. "Next free" means the unit is not consist or being bought and so noney is paid or contracted for rent. Such units are usually provided in exchange for services rendered or as an ellowance or four from a veletive or friend not living in the wait. "Next free" also includes compare who pay only for utilities. Welco shown departely. "sent free" households are grouped together with "contert."

Quaitillion: Equals 1,060,000,000,060,000 or 10¹⁵.

Negleon The States are divided into 10 groups or feilered

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South	Dalamero, Ferneylvanis, Maryland, Virginia, Nast Virginia, District of Colombia, Eastacky, Ternoscove, Worth Carolina, South Gerolina, Georgia, Alabera, Micelastypi, Piorida
2.946	Golovede. Stab, Securizy, Buntans, Idaho, Now Mexico, Neveli, Arizoni, California, Nevels, Aleska, Oregon, Weshington

Recidential Energy Connections and Expandionan by End Line for 1978, 1948, and 1991 Energy between the Administration



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Stors windows are used of deaths or familiting glass, such as electropase. Elect or plexiglase placed over windows on either the interior or exterior side are compared as storn windows. Flashic shorts covaring windows are not compared.

Note: Responses of "don't know" for storn doors, windows, and/or attic insulation were treabed the same as "do not have." Not example, a Respondent wha indicated that his or her house had store windows (some or will) and store doors (some or will), but she did not know if it had attic insulation, you occurs in the "here one or two of these" computy.

Mater-Magting Fund: The envert to the quantion, "Which fund is even next for besting water?" Howseholds that did not have running unter in their boxs were also asked this quantion. The fuel is used for hearing water for bathing and washing. The but water way have been evenlable envelope in the esse building of the respondent's living quarters. This may have been in a building of the respondent's living matts in the building, in the basement, or is so analowed porch, provided the respondent's basedual's had scenes to it.

Mindows: All windows in the year-granul living space. Mindows in the bestweet, artic, garage, and parch are counted only if those areas are heated. Windows in doors are not counted, Each window that opens separately is counted as one window. Windows fixed in place are also counted. Passes of glass in a large window are got counted individually uslans.they open separately. Skylights and stained-glass windows are counted as windows.

* 1.3. GRANDERT MEATINE OFFICE INCA-IN-1921/0113

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Residential Energy Consumption and Expenditures by End Use for 1978, 1980, and 1981



Published: December 1984

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Contents

	igy find use frends
ETe	ctricity Consumption and Expenditures
Nat	ural Gas Consumption and Expenditures
в. с	Methodology Limitations of the Data
U •	

Figures

Summary of Findings

Appendixes

1.	Average Household Energy Consumption by Main Heating	
	Fuel for 1978, 1979, 1980 and 1981 (Million Btu)	4
2.	Average Household Electricity Consumption for Space	
	Heating and Water Heating When Main Heating Fuel is	
	Electricity (Million Btu)	5
3.	Average Household Natural Gas Consumption for Space	
	Heating and Water Heating When Main Heating Fuel is	_
	Natural Gas (Million Btu)	6
4.	Average Household Fuel Oil or Kerosene Consumption for	
	Space Heating and Water Heating When Main Heating Fuel	_
	is Fuel Oil or Kerosene (Million Btu)	7
5.	Average Household Energy Expenditures for 1978, 1979,	_
	1980, and 1981 (Dollars)	8
6.	Average Household Electricity Expenditures for Space	
	Heating for 1978 and 1981 by Selected Level of Income	
	(Dollars)	11
7.	Average Household Electricity Consumption for All	
	Households that Use Electricity by End Use for	
	1981 (Million Btu)	12
8.	Average Household Electricity Consumption When Main	
	Heating Fuel is Electricity by End Use for 1978	
	(Million Btu)	13
9.	Average Household Electricity Consumption When Main	
	Heating Fuel is Electricity by End Use for 1980	
	(Million Btu)	13
10.	Average Household Electricity Consumption When Main	
	Heating Fuel is Electricity by End Use for 1981	
	(Million Btu)	14
11.	Average Household Electricity Expenditures When Main	
	Heating fuel is Electricity by End Use for 1978, 1980,	
10	and 1981 (Dollars)	14
12.	Average Natural Gas Consumption for Space Heating When	
	Main Heating Fuel is Natural Gas by Selected Year House	1.0
	Was Built (Million Btu) 1981 5 h.	12
13.	Percent Change Between 1978 and 1981 of Average	
	Household Consumption and Expenditures for Space Heating	10
17	when main heating fuel is Natural Gas by Kegion	70
14.	Average nousehold Natural Gas Consumption for All	
	households that Use Natural Gas by End Use for 1981	
	(MILLION BEU)	1/



Tables

Contents (Continued)

Pá	age
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		-
15.	Average Household Natural Gas Consumption When Main Heating Fuel is Natural Gas by End Use for 1978	
16.	(Million Btu) Average Household Natural Gas Consumption When Main Heating Fuel is Natural Gas by End Use for 1980	18
17.	(Million Btu) Average Household Natural Gas Consumption When Main Heating Fuel is Natural Gas by End Use for 1981	18
18.	(Million Btu) Average Household Natural Gas Expenditures When Main	19
	and 1981 (Dollars)	19
S1.	Average Household Consumption and Expenditures for Space Heating by Main Heating Fuel	2
S2.	Average Household Energy Expenditures by End Use by Income for 1981 (Dollars)	3
T1.	Average Household Energy Consumption for Space Heating per Heating Degree-Day by Main Heating Fuel	
Τ2.	(Thousand Btu) Average Household Consumption and Expenditures for Space Heating by Main Heating Fuel (Percent	8
E1.	Differences 1978-1981, 1978-1980, 1980-1981) Average Household Electricity Consumption and	9
F2	Expenditures for Space Heating When Main Heating Fuel is Electricity by Region	9
	Heating When Main Heating Fuel is Electricity by Square Footage of Home	10
1.	Average Household Electricity Consumption When Main Heating Fuel is Electricity by End Use by Selected	0.1
2.	Average Household Electricity Consumption When Main Heating Fuel is Electricity by End Use by Selected	21
3.	Sociodemographic Characteristics for 1978 Average Household Natural Gas Consumption When Main	22
4	Heating Fuel is Natural Gas by End Use by Selected Housing Characteristics for 1978	23
4.	Heating Fuel is Natural Gas by End Use by Selected Sociodemographic Characteristics for 1978	24
5.	Average Household Fuel Oil or Kerosene Consumption When Main Heating Fuel is Fuel Oil or Kerosene by End	25
6.	Use by Selected Housing Characteristics for 1978 Average Household Fuel Oil or Kerosene Consumption When Main Heating Fuel is Fuel Oil or Kerosene by End	25
	Use by Selected Sociodemographic Characteristics for 1978	26
7.	Average Household LPG Consumption When Main Heating Fuel is LPG by End Use by Selected Housing	27
8.	Average Household LPG Consumption When Main Heating Fuel is LPG by End Use by Selected Sociodemographic	27
9.	Characteristics for 1978 Average Household Energy Expenditures by End Use by	27
10.	Selected Housing Characteristics for 1978 Average Household Energy Expenditures by End Use by	29
11.	Selected Sociodemographic Characteristics for 1978 Average Household Energy Expenditures for Space	30
	Heating by Main Heating Fuel by Selected Housing Characteristics for 1978	30

Residential Energy Consumption and Expenditures by End Use for 1978, 1980, and 1981 Energy Information Administration

.



Contents (Continued)

v

12.	Average Household Energy Expenditures for Space Heating by Main Heating Fuel by Selected	
13.	Sociodemographic Characteristics for 1978	32
10.	Heating Fuel is Electricity by End Use by Selected	22
14.	Average Household Electricity Consumption When Main	33
	Heating Fuel is Electricity by End Use by Selected Sociodemographic Characteristics for 1980	33
15.	Average Household Natural Gas Consumption When Main	55
	Heating Fuel is Natural Gas by End Use by Selected Housing Characteristics for 1980	35
16.	Average Household Natural Gas Consumption When Main	
	Sociodemographic Characteristics for 1980	36
17.	Average Household Fuel Oil or Kerosene Consumption When Main Heating Fuel is Fuel Oil or Kerosene by End	
	Use by Selected Housing Characteristics for 1980	37
18.	Average Household Fuel Oil or Kerosene Consumption When Main Heating Fuel is Fuel Oil or Kerosene by End	
	Use by Selected Sociodemographic Characteristics for	
10	1980	37
19.	Fuel is LPG by End Use by Selected Housing	
	Characteristics for 1980	39
20.	Average Household LPG Consumption When Main Heating Fuel is LPG by End Use by Selected Sociodemographic	
	Characteristics for 1980	40
21.	Average Household Energy Expenditures by End Use by Selected Housing Characteristics for 1980	41
22.	Average Household Energy Expenditures by End Use	
	by Selected Sociodemographic Characteristics for 1980	42
23.	Average Household Energy Expenditures for Space	
	Heating by Main Heating Fuel by Selected Housing Characteristics for 1980	4.3
24.	Average Household Energy Expenditures for Space	45
	Heating by Main Heating Fuel by Selected	
25.	Average Household Electricity Consumption When Main	44
	Heating Fuel is Electricity by End Use by Selected	
26	Housing Characteristics for 1981	45
20,	Heating Fuel is Electricity by End Use by Selected	
27	Sociodemographic Characteristics for 1981	46
27.	Average Household Natural Gas Consumption when Main Heating Fuel is Natural Gas by End Use by Selected	
	Housing Characteristics for 1981	47
28.	Average Household Natural Gas Consumption When Main	
	Sociodemographic Characteristics for 1981	48
29.	Average Household Fuel Oil or Kerosene Consumption When	
	Main Heating Fuel is Fuel Oil or Kerosene by End Use	40
30.	Average Household Fuel Oil or Kerosene Consumption When	47
	Main Heating Fuel is Fuel Oil or Kerosene by End Use	50
31.	Average Household LPG Consumption When Main Heating	50
	Fuel is LPG by End Use by Selected Housing	_
	Unaracteristics for 1981	51



Contents (Continued)

Page

32.	Average Household LPG Consumption When Main Heating Fuel	
	Characteristics for 1981	52
33.	Average Household Energy Expenditures by End Use by	50
3/	Selected Housing Characteristics for 1981	23
54.	Selected Sociodemographic Characteristics for 1981	54
35.	Average Household Energy Expenditures for Space Heating	
	by Main Heating Fuel by Selected Housing Characteristics	
36.	Average Household Energy Expenditures for Space Heating	
50.	by Main Heating Fuel by Selected Sociodemographic	
	Characteristics for 1981	55
37.	Percent of Average Household Electricity Consumption	
	Electricity by Selected Housing Characteristics for	
	1978, 1980, 1981	57
38.	Percent of Average Household Electricity Consumption	
	Used for Space Heating When Main Heating Fuel is	
	Characteristics for 1978, 1980, 1981	58
39.	Percent of Average Household Natural Gas Consumption	20
	Used for Space Heating When Main Heating Fuel is	
	Natural Gas by Selected Housing Characteristics for	50
40.	Percent of Average Household Natural Gas Consumption	59
	Used for Space Heating When Main Heating Fuel is Natural	
	Gas by Selected Sociodemographic Characteristics for	(0
41	1978, 1980, 1981 Percent of Average Household Evel Ofl or Kerosene	60
711	Consumption Used for Space Heating When Main Heating	
	Fuel is Fuel Oil or Kerosene by Selected Housing	
6.0	Characteristics for 1978, 1980, 1981	61
42.	Consumption Used for Space Heating When Main Heating	
	Fuel is Fuel Oil or Kerosene by Selected	
	Sociodemographic Characteristics for 1978, 1980, 1981	62
A1.	Comparison of Three Residential Energy Consumption	63
A2.	Number of Households by Main Heating Fuel by Survey	05
	Year	64
C1.	Number of Sample Households that Use Each Fuel and	
	rercent of nousenoids with Usable ruel Records by ruel Used and Type of Housing Structure	65
	out and type of housing betweene mananessister and the	55



Summary of Findings

Introduction

There is an increasing interest in information on the amount and cost of residential energy that is used for space heating, air conditioning, water heating, and appliance use. This report, an elaboration of a previous report, is the first to examine trends in average household energy usage by end use.

The end-use estimates of the average household consumption and expenditures are statistical estimates based on the 1978, 1980, and 1981 Residential Energy Consumption Surveys (RECS) conducted by the Energy Information Administration (EIA) rather than on metered observations. The end-use estimates were obtained by developing a set of equations that predict the percentage of energy used for each broad end-use category. The equations were applied separately to each household and to each fuel. The resulting household end-use estimates were averaged to produce estimates of the average end-use consumption and expenditures on a national and regional basis. (Households in Alaska and Hawaii were included in the 1981 survey but not included in the 1978 survey, resulting in a change in sample population in the West from 1978 through 1981.) The accuracy and potential biases of these end-use estimates vary depending on the fuel type, on the year of the survey, and on the type of end use.

The three RECS surveys were cross sectional surveys, thus, they did not have any households in common. Because households were not followed over time, only comparisons of the average consumption and expenditures for similar populations at different times can be made. One problem with this approach is that the population is changing over time. This is particularly true when considering only households living in dwellings that have been built since 1975. The reader should be cautioned that throughout this report 1978 refers to the period April 1978 through March 1979; 1980 refers to April 1980 through March 1981; and 1981 refers to April 1981 through March 1982. Data for April 1979 through March 1980 were not included in this report because there was an insufficient listing of appliances.

The figures and tables presented show the amount and the type of energy consumed, plus the cost of this energy. National averages are given as well as averages for various categories including region, size and age of dwelling, number of heating degree-days, and income. The majority of the report focuses on the amount and the cost of natural gas and electricity used for space heating. However, data on other end uses and fuels are also presented.

The first section of this report discusses some of the significant findings. The second section discusses energy trends by end use for all fuels used in the home for 1978, 1980, and 1981. The third and fourth sections concentrate on electricity consumption and expenditures and natural gas consumption and expenditures, respectively.

^SSee Appendix B, "Limitations of Data" for further discussion of sampling and nonsampling errors.

'Standard errors for the statistics in the significant findings section can be found in sections two through four of this report and in the Residential Energy Consumption Surveys 1978 through 1981. For a discussion on the computation of the standard error of the percent change, See Appendix B.

¹Residential Energy Consumption Survey: Regression Analysis of Energy Consumption by End Use, DOE/EIA-0431 (Washington, D.C., October 1983).

⁷Residential Energy Consumption Surveys: April 1978 through March 1979; April 1980 through March 1981; April 1981 through March 1982. It is important to note that the surveys are cross sectional and not longitudinal; thus, there are different sets of households in each syrvey.



Significant Findings

Table S1. Average Household Consumption and Expenditures for Space Heating by Main Heating Fuel

Summary of Findings (Continued)

The average U.S. energy consumption per household for all fuels used in the home declined 24 million Btu from 138 million Btu in 1978 to 114 million Btu in 1981. The primary cause of the decline in overall energy consumption was the amount of energy used for space heating. Although consumption for all fuels declined during this period, the drop was particularly evident from 1978 through 1980.

From 1978 through 1981, households experienced, on the average, a 28 percent decline in the amount of energy used to heat their homes. Even after adjusting for a difference in weather, space heating consumption still declined, on the average, 17 percent for natural gas heated homes and 31 percent for electrically heated homes. The largest decline in space heating consumption was among households that heated with electricity. These households experienced, on the average, a 39 percent decline from 31.6 million Btu in 1978 to 19.2 million Btu in 1981. The second largest decline, 27 percent, occurred among homes that heated with fuel oil. Among natural gas heated homes, there was, on an average, a 27 percent decline in space heating consumption from 1978 through 1980. Approximately a 10 percent increase then occurred from 1980 through 1981, giving an overall decline of about 19 percent from 1978 through 1981. The cost of space heating, however, increased from 1978 through 1981. Among households whose main heating fuel was natural gas, the cost of space heating increased, on the average, by 35 percent, while the cost among households heating with electricity only increased, on the average, by 7 percent. The largest increase in space heating costs occurred among homes where the main heating fuel was fuel oil. The following table shows that fuel oil costs increased by \$305 from 1978 through 1981.

	Consumption (in million Btu)			Expenditures (in Dollars)		
	1978	1980	1981	1978	1980	1981
Electricity	32(2.2)	18(1.6)	19(1.3)	269(18)	241(24)	289(20)
Natural Gas	101(3.4)	74(1.3)	82(1.7)	272 (7)	285 (5)	367 (7)
Fuel 0il/ Kerosene	121(4.8)	96(2.5)	88(2.8)	475(19)	773(20)	780(26)

Note: The value in parenthesis represents one standard error of the statistic.

Source: Tables 1, 3, 5, 11, 13, 15, 17, 23, 25, 27, 29, 35.

From 1978 through 1981, electrically heated households in the West¹ experienced the largest decline in space heating consumption with, on the average, a 58 percent decrease in electricity. However, it is important to note that there was not a steady decline. From 1978 through 1980, there was a 66 percent decrease in electricity consumption, then from 1980 through 1981, consumption increased by 21 percent. Homes heated by natural gas in the West reduced their space heating consumption by 30 percent from 1978 through 1981. In 1981, homes in the Northeast heated by electricity used 35 percent more Btu for space heating than

Residential Energy Consumption and Expenditures by End Use for 1978, 1980, and 1981 Energy information Administration

Appendix D shows the States by region.

Summary of Findings (Continued)

electrically heated homes in the West and spent, on the average, \$411 more for electricity than households in the West. Households in the Northeast, heated by natural gas used, on the average, 50 percent more natural gas for heating than households in the West. The cost for this heating was approximately \$360 more in the Northeast than in the West.

Natural gas heated homes constructed after 1974 used 36 percent fewer Btu for space heating in 1981 than were used in 1978, compared with a 17 percent decrease in Btu consumption in homes constructed before 1975.²

Average household energy expenditures also varied by size of home, age of home, and income. For example, Table S2 shows that the average household's cost for space heating did not vary greatly by income except at the highest income level. However, the cost for water heating, cooling, and miscellaneous use consistently increased as income increased.

In 1981, among households whose main heating fuel was natural gas, on the average, 73 percent was used for space heating, 19 percent was used for water heating, and 8 percent was used for miscellaneous purposes. Among households whose main heating fuel was electricity, 36 percent of electricity was used for space heating, 32 percent was used for miscellaneous purposes, 19 percent was used for water heating, and 12 percent was used for cooling.

Income	Space Heating	Cooling	Water Heating	Miscellaneous Use
Less Than \$5,000	335(22)	39 (6)	109(6)	281(12)
5,000 - 9,999	396(25)	47 (5)	129(7)	335(10)
10,000 - 14,999	399(19)	55 (5)	140(4)	366(11)
15,000 - 19,999	395(23)	54 (5)	154(6)	383 (9)
20,000 - 24,999	396(23)	73 (3)	161(6)	413(11)
25,000 - 34,999	399(23)	85 (7)	168(6)	454(11)
35,000 or More	483(28)	141(11)	195(8)	514(19)

Note: The value in parenthesis represents one standard error of the statistic.

Source: Table 34.

Table S2. Average Household Energy Expenditures by End Use by Income for 1981 (Dollars)

²Homes built after 1978 were not included in the 1978 survey; consequently, the changes in the average energy consumption from 1978 through 1981 may be heavily influenced by the post-1978 survey construction. For a discussion on the implications of this difference in populations, see Appendix C "Limitations of the Data."

³Miscellaneous use refers to other uses such as lighting, cooking, appliance use.



Energy End Use Trends

Average Household Consumption

Figure 1. Average Household Energy Consumption by Main Heating Fuel 1978, 1979, 1980, and 1981 (Million Btu)

Summary of Findings (Continued)

The average energy consumption per household decreased from 1978 through 1981 by 17 (3) percent, while average energy expenditures during the same period increased by 41 (2) percent. Although all fuels showed a decline in consumption from 1978 through 1981, the largest decrease was in electricity consumption.

Figure 1 shows that among households whose main heating fuel was electricity there was, on the average, a 23 (5) percent decline in total electricity consumption from 1978 through 1981. During the same time, the average total consumption of natural gas among households heated by natural gas declined by 12 (3) percent, while average consumption for fuel oil in those households heated by fuel oil declined by 20 (4) percent.



Source: Energy Information Administration, 1978, 1979, 1980, and 1981 Residential Energy Consumption Surveys.

Note: Energy consumption pertains to electricity consumption for households whose main heating fuel is electricity, natural gas for households whose main heating fuel is natural gas, and so forth.

¹The value in parenthesis represents one standard error of the statistic. The standard error is measure of the variability of an estimate.



Space Heating Consumption

Figure 2. Average Household Electricity Consumption for Space Heating and Water Heating When Main Heating Fuel is Electricity (Million Btu)

Summary of Findings (Continued)

The decrease in consumption from 1978 through 1981 is primarily attributed to a decline in the amount of energy used for space heating, rather than a change in the amount of energy used for other end uses such as cooling, water heating, and miscellaneous use.² Additionally, it appears that the greatest portion of this decline occurred from 1978 through 1980. Figure 2 shows that from 1978 through 1981, there was approximately a 40 (6) percent decrease in electricity used for space heating among homes heated by electricity, while during this same time, there was no significant change in the amount of electricity used for water heating.





 2 Miscellaneous use refers to other uses such as lighting, cooking, appliance use.

Among homes heated by natural gas, approximately 101 (3.4) million Btu of natural gas was used for space heating in 1978. Figure 3 shows that like electricity, the largest decrease in gas consumption was in space heating with a 19 (3) percent decline from 1978 through 1981. However, unlike electricity, the estimated amount of natural gas used for water heating did not remain stable. From 1978 through 1980, water heating consumption increased by approximately 18 (3) percent and then decreased by approximately 17 (2) percent from 1980. through 1981. The average consumption for household's heated with



³See Appendix C "Limitations of the Data" for a discussion on the variability of the amount of natural gas consumed for water heating.

Residential Energy Consumption and Expenditures by End Use for 1978, 1980, and 1981 Energy Information Administration

Figure 3. Average Household Natural Gas Consumption for Space Heating and Water Heating When Main Heating Fuel is Natural Gas (Million Btu)



fuel oil or kerosene during the same period (1978 through 1981) also showed a decrease in the amount used for space heating but an increase in the amount used for water heating (Figure 4).

Million Btu 160 121 120 96 88 80 40 15 16 8 NA NA 0 1980 1981 1979 1980 1981 1979 1978 1978 Space Heating Water Heating

Source: Energy Information Administration, 1978, 1979, 1980, and 1981 Residential Energy Consumption Surveys.

The difference in the number of heating degree-days for 1978, 1980, and 1981 may have influenced energy consumption levels particularly for space heating. The following table shows average bousehold consumption for space heating per heating degree-days. The data suggest that even after controlling for the weather, electricity consumption still declined by 31 (5) percent, natural gas consumption declined by 17 (3) percent, and fuel oil or kerosene consumption declined by 26 (6) percent. This suggests that factors other than weather may have also influenced the decreases in consumption from 1978 through 1981.

Figure 4. Average Household Fuel Oil or Kerosene Consumption for Space Heating and Water Heating When Main Heating Fuel is Fuel Oil or Kerosene (Million Btu)

⁴Heating degree-days are base 65 degrees Fahrenheit. See Appendix B, "Methodology" for a discussion on how consumption was adjusted for heating degree-days.



Table T1. Average Household Energy Consumption for Space Heating per Heating Degree-Day by Main Heating Fuel (Thousand Btu)

Average Household Expenditures

Figure 5. Average Household Energy Expenditures for 1978, 1979, 1980, and 1981 (Dollars)

Electricity	Natural Gas	Fuel Oil/ Kerosene
7.5 (.4)	20.4 (.5)	22.7 (.7)
4.6 (.2)	15.6 (.2)	17.6 (.4)
5.2 (.2)	17.0 (.3)	16.7 (1.0)
	Electricity 7.5 (.4) 4.6 (.2) 5.2 (.2)	Natural Gas7.5 (.4)20.4 (.5)4.6 (.2)15.6 (.2)5.2 (.2)17.0 (.3)

Note: The value in parenthesis represents one standard error of the statistic.

Source: Energy Information Administration, 1978, 1980, 1981, Residential Energy Consumption Surveys.

From 1978 through 1981, average household energy consumption decreased while the cost of energy steadily increased. Figure 5 shows that in 1978, the average household spent approximately \$724 (13) for all fuels. This amount increased to \$916 (14) in 1980 and \$1,022 (17) in 1981. The average cost for space heating increased 28 (3) percent from \$315 (8) to \$403 (12) between 1978 and 1981.



Source: Energy Information Administration, 1978, 1979, 1980, and 1981 Residential Energy Consumption Surveys.

Note: 1979 figures are included in the overall energy expenditures. The data, however, were incomplete for accurate end-use estimates.

Residential Energy Consumption and Expenditures by End Use for 1978, 1980, and 1981 Energy Information Administration

Among homes that were heated by natural gas, the average cost for space heating increased by approximately 35 (4) percent, from \$272 (7) in 1978 to \$367 (7) in 1981. The greatest proportion of this increase occurred from 1980 through 1981. The average electricity cost for space heating among homes heated by electricity increased by 7 (8) percent from \$269 (18) in 1978 to \$289 (20) in 1981. (This increase was not statistically significant.) The largest increase in costs occurred among homes heated by fuel oil or kerosene. In these homes, the average household's space heating expenditures increase occurred primarily from 1978 through 1980 (Table T2).

Table T2. Average Household Consumption and Expenditures for Space Heating by Main Heating Fuel (Percent Differences 1978-1981, 1978-1980, 1980-1981)

Electricity Consumption and Expenditures

Space Heating

Table E1. Average Household Electricity Consumption and Expenditures for Space Heating When Main Heating Fuel is Electricity by Region

	Consumption (Percent Differences)			Expenditures (Percent Differences)			
	1970-1901	1970-1900	1900-1901	19/0-1901	19/0-1900	1900-1901	
Electricity	-39(6)	-42(6)	+05(10)	+7(8)	-10(10)	+20(9)	
Natural Gas	-19(3)	-27(3)	+10 (3)	+35(4)	+5 (3)	+29(2)	
Fuel 0il/ Kerosene	-27(3)	-20(3)	-08 (3)	+64(2)	+63 (2)	+0.9(3)	

Note: The value in parenthesis represents one standard error of the statistic. Source: Tables 1, 3, 5, 11, 13, 15, 17, 23, 25, 27, 29, 35.

From 1978 through 1981, there was approximately a 58 (3) percent decline in electricity consumption for space heating in the West among households where the main heating fuel was electricity. This decline occurred from 1978 through 1980 with a 66 (3) percent reduction in consumption. Then, from 1980 through 1981, electricity used for space heating increased by approximately 22 (9) percent. Table E1 shows that during the same period (1978 through 1981) there was about a 37 (9) percent decrease in the amount of electricity consumed for space heating in the North Central region and a 38 (11) percent decrease in the South. Electricity consumption for space heating did not significantly change in the Northeast from 1978 through 1981.

	Consumption (Million Btu)			Expenditures (Dollars)			
 	1978	1980	1981	1978	1980	1981	
Northeast	33 (5.4)	24 (2.0)	33 (2.8)	347 (57)	426 (44)	644 (81)	
North Central	46 (4.1)	27 (2.4)	29 (4.3)	492 (43)	359 (42)	442 (71)	
South	21 (2.1)	15 (2.6)	13 (2.0)	215 (20)	205 (34)	212 (32)	
West	52 (1.9)	18 (1.5)	22 (1.8)	272 (31)	150 (8)	233 (15)	

Note: The value in parenthesis represents one standard error of the statistic. Source: Tables 2, 12, 14, 24, 26, 36.

Residential Energy Consumption and Expenditures by End Use for 1978, 1980, and 1981 Energy Information Administration



Table E2 shows that in the 1978, 1980, and 1981 surveys, electricity consumption for space heating consistently increased as the heated square footage of the house increased. Additionally, from 1978 through 1981 in all size categories, there was a decrease in consumption. However, Table E2 shows that there was no consistent trend by dwelling size in the percent of change for electricity. The statistically significant change in the amount of electricity used for space heating ranged from 31 (10) percent to 52 (19) percent.

Table E2. Average Household Electricity Consumption for Space Heating When Main Heating Fuel is Electricity, by Square Footage of Home (Million Btu)

Square Feet	1978	1980	1981	Percent Change Between 1978-1981
1-799	20.3 (2.9)	11.8 (1.5)	15.7 (1.4)	23 (12)
800-999	26.7 (2.7)	14.5 (1.3)	15.9 (1.4)	40 (8)
1,000-1,199	28.3 (3.2)	16.0 (2.0)	19.0 (1.4)	33 (3)
1,200-1,399	29.6 (4.2)	19.4 (2.6)	17.2 (2.2)	42 (11)
1,400-1,799	39.4 (3.2)	19.9 (2.4)	18.9 (3.5)	52 (19)
1,800-2,399	40.5 (4.7)	26.6 (1.7)	28.0 (2.6)	31 (10)
2,400 or More	60.9 (6.5)	27.6 (2.3)	32.2 (2.9)	47 (8)

Note: The value in parenthesis is one standard error of the statistic. Source: Tables 1, 13, 25.

Energy expenditures, particularly for space heating, varied by income, and by geographic region. In 1978, the average space heating cost for electrically heated homes in the Northeast was approximately \$347 (57). By 1981, this cost had almost doubled to \$644 (81). However, other regions in the United States experienced a decline in electricity costs for space heating, with the West experiencing the largest decrease in costs.



Electricity costs for space heating decreased from 1978 through 1981 by 28 (10) percent for households in the highest income bracket (\$35,000 or more). The 9 (11) percent decrease in electricity costs among households in the lowest income bracket (less than \$5,000) was not statistically significant. At all other income levels, the cost of heating with electricity increased from 1978 through 1981. Figure 6 shows electricity expenditures for 1978 and 1981 by selected categories of income.

Summary of Findings (Continued)



Source: Energy Information Administration, 1978 and 1981 Residential Consumption Surveys.

Figure 6. Average Household Electricity Expenditures for Space Heating for 1978 and 1981 by Selected Level of Income (Dollars)



End Use

In addition to the trends in consumption and expenditures, the patterns of energy use within a given time period are also of interest. Figures 7 through 11 describe the distribution of electricity consumption and expenditures by end use.

Summary of Findings (Continued)

Figure 7 shows that in 1981, among households that used electricity but did not necessarily heat with it, approximately 62 (.8) percent of the average household electricity consumed was for miscellaneous use. Approximately 12 (.7) percent of household electricity consumption was used for space heating, while water heating accounted for approximately 13 (.5) percent and cooling accounted for 13 (.6) percent. This pattern was the same for 1978 and 1980.



Source: Energy Information Administration, 1981 Residential Energy Consumption Survey.

Figures 8 through 10 show that this pattern of electricity consumption changes when electricity is the main heating fuel. The average household consumption for electricity was 53.4 (2) million Btu for those households that heated with electricity in 1981. Approximately 36 (1) percent was used for space heating and 32 (.5) percent was used for miscellaneous use. Approximately 12 (1) percent of electricity was used for cooling and 20 (.3) percent was used for water heating.

Figure 7. Average Household Electricity Consumption for All Households That Use Electricity by End Use for 1981 (Million Btu)



Figure 8. Average Household Electricity Consumption When Main Heating Fuel is Electricity by End Use for 1978 (Million Btu)







Source: Energy Information Administration, 1980 Residential Energy Consumption Survey.

13

Residential Energy Consumption and Expenditures by End Use for 1978, 1980, and 1981 Energy Information Administration

Figure 9. Average Household Electricity Consumption When Main Heating Fuel is Electricity by End Use for 1980 (Million Btu)



Figure 10. Average Household Electricity Consumption When Main Heating Fuel is Electricity by End Use for 1981 (Million Btu)



Source: Energy Information Administration, 1981 Residential Energy Consumption Survey.

Figure 11 shows the distribution for 1978, 1980, and 1981 of the average household electricity expenditures by end use for households whose main heating fuel is electricity.



Figure 11. Average Household Electricity Expenditures When Main Heating Fuel is Electricity by End Use for 1978, 1980, and 1981 (Dollars)



Natural Gas Consumption and Expenditures

Space Heating

Figure 12. Average Natural Gas Consumption for Space Heating When Main Heating Fuel is Natural Gas by Selected Year House Was Built (Million Btu)

Summary of Findings (Continued)

Among those households in the West whose main heating fuel was natural gas, there was approximately a 30 (7) percent decrease in natural gas used for space heating from 1978 through 1981 compared with a 14 (3) percent decrease in the North Central region. (The 14 (7) percent decrease in the Northeast and the 11 (8) percent decrease in natural gas consumption in the South from 1978 through 1981 were not statistically significant.) However, in the Northeast between 1978 and 1980, there was a significant decline in natural gas consumption for space heating. Households in this region experienced, on the average, a 21 (6) percent decrease in consumption.

Between 1978 and 1981 households of 1,000 to 1,199 square feet and households of 2,400 or more square feet both experienced approximately the same percentage decrease (31 percent) in consumption for space heating.

Energy consumption also varied by the age of the house. Figure 12 shows natural gas consumption for space heating by the year the house was constructed. Homes constructed after 1974 and heated by natural gas used 36 (8) percent less energy in 1978 than they did in 1981; older homes (constructed before 1975) experienced a 17 (3) percent decrease in natural gas consumption.



Residential Energy Consumption and Expenditures by End Use for 1978, 1980, and 1981 Energy Information Administration



Natural gas expenditures for space heating increased in all regions of the United States from 1978 through 1981. Households in the Northeast experienced a 46 (3) percent increase in space heating costs; the South, a 44 (4) percent increase; the North Central region, a 39 (2) percent increase; and the West, a 22 (6) percent increase. Figure 13 shows the percentage change between 1978 and 1981 in natural gas consumption and expenditures by region.



Note: Alaska and Hawaii were not included in the 1978 survey.

Figure 13. Percent Change Between 1978 and 1981 of Average Household Consumption and Expenditures for Space Heating When Main Heating Fuel is Natural Gas by Region



End Use

Figure 14. Average Household Natural Gas Consumption for All Households That Use Natural Gas by End Use for 1981 (Million Btu)

Summary of Findings (Continued)

The distribution of natural gas among space heating, water heating, and miscellaneous use was similar for households that used natural gas but did not necessarily heat with it and for households that used natural gas as the main heating fuel. The similarity in distribution patterns between the two types of households was because most households that used natural gas, used it for the main heating fuel.

Figures 15 through 17 show the distribution of natural gas consumption for 1978, 1980, and 1981 among homes whose main heating fuel was natural gas. In 1981, households that heated with natural gas used, on the average, 111.9 (2) million Btu of which approximately 73 (.5) percent was used for space heating, 19 (.2) percent for water heating and 8 (.4) percent for miscellaneous use.







Figure 15. Average Household Natural Gas Consumption When Main Heating Fuel is Natural Gas by End Use for 1978 (Million Btu)



Source: Energy Information Administration, 1978 Residential Energy Consumption Survey.



Source: Energy Information Administration, 1980 Residential Energy Consumption Survey.

Residential Energy Consumption and Expenditures by End Use for 1978, 1980, and 1981 Energy Information Administration

Figure 16. Average Household Natural Gas Consumption When Main Heating Fuel is Natural Gas by End Use for 1980 (Million Btu)

Figure 17. Average Household Natural Gas Consumption When Main Heating Fuel is Natural Gas by End Use for 1981 (Million Btu)

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Source: Energy Information Administration, 1981 Residential Energy Consumption Survey.

Figure 18 shows the average household expenditures for natural gas by end use when the main heating fuel is natural gas for 1978, 1980, and 1981.



Figure 18. Average Household Natural Gas Expenditures When Main Heating Fuel is Natural Gas by End Use for 1978, 1980, and 1981 (Dollars)



Table 1. Average Household Electricity Consumption When Main Heating Fuel is Electricity by End Use by Selected Housing Characteristics for 1978

		END USE				
HOUSING CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING	COOLING (MILLION BTU)	WATER HEATING	MISCELLANEOUS USE (MILLION BTU)	
NATIONAL	12.1 (1.2)	31.6 (2.2)	7.4 (1.0)	10.2 (0.5)	20.2 (0.9)	
HOUSING STRUCTURE SINGLE-FAMILY DETATCHED SINGLE-FAMILY ATTACHED TWO TO FOUR UNITS FIVE OR MORE UNITS MOBILE HOME YEAR HOUSE BUILT BEFORE 1940 1940-1949 1950-1959 1960-1964 1965-1969 1975 OR LATER	6.4 (0.9) Q 1.6 (0.5) 2.5 (0.6) 1.1 (0.2) 1.1 (0.3) 0.4 (0.1) 1.3 (0.3) 1.6 (0.2) 2.2 (0.3) 3.0 (0.5) 2.4 (0.6)	38.4 (2.6) Q $18.5 (3.5)$ $19.2 (3.1)$ $34.8 (3.1)$ $41.4 (4.3)$ $42.9 (5.1)$ $30.9 (5.5)$ $28.7 (2.7)$ $25.8 (3.7)$ $32.8 (3.2)$ $31.3 (4.8)$	$\begin{array}{c} 8.2 & (1.3) \\ Q \\ 6.8 & (3.6) \\ 7.6 & (1.9) \\ 2.9 & (0.9) \\ \hline 3.6 & (1.3) \\ 10.0 & (4.0) \\ 8.9 & (1.1) \\ 8.5 & (1.1) \\ 7.6 & (1.6) \\ 7.3 & (2.3) \end{array}$	12.9 (0.5) Q 7.6 (0.9) 5.6 (0.8) 9.5 (0.9) 9.2 (1.2) 10.9 (2.2) 9.6 (0.9) 10.0 (1.0) 8.1 (1.2) 10.4 (0.8) 12.7 (1.0)	25.0 (3.4) Q 14.5 (4.7) 21.1 (9.3) 19.8 (8.7) 18.1 (2.2) 22.4 (2.9) 21.3 (1.9) 21.2 (1.5) 16.8 (1.8) 20.4 (1.2) 22.2 (2.1)	
HEATED SQUARE FOOTAGE 1-799	1.9 (0.3) 2.4 (0.4) 2.4 (0.5) 1.5 (0.3) 2.0 (0.3) 1.2 (0.3) 0.7 (0.2)	20.3 (2.9) 26.7 (2.7) 28.3 (3.2) 29.6 (4.2) 39.4 (3.2) 40.5 (4.7) 60.9 (6.5)	5.0 (1.5) 5.7 (1.4) 4.6 (1.4) 8.5 (1.4) 8.9 (1.3) 11.7 (2.8) 16.6 (4.3)	3.8 (0.5) 8.4 (0.6) 9.4 (0.6) 10.2 (1.1) 13.7 (1.0) 16.0 (1.3) 18.0 (1.5)	10.8 (1.1) 17.0 (1.2) 18.6 (1.6) 21.0 (1.6) 25.8 (1.2) 27.6 (1.5) 33.0 (2.3)	

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE.

NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1978 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 2. Average Household Electricity **Consumption When** Main Heating Fuel is Electricity by End Use by Selected Sociodemographic Characteristics for 1978

		END USE					
SOCIODEMOGRAPHIC CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING (MILLION BTU)	(COOLING (MILLION BTU)	 WATER HEATING (MILLION BTU) 	 MISCELLANEOUS USE (MILLION BTU)		
NATIONAL	12.1 (1.2)	31.6 (2.2)	7.4 (1.0)	10.2 (0.5)	20.2 (0.9)		
GEOGRAPHIC REGION NORTHEAST NORTH CENTRAL SOUTH WEST	1.4 (0.5) 1.1 (0.3) 6.7 (0.9) 2.8 (0.6)	32.6 (5.4) 46.5 (4.1) 20.7 (2.1) 51.6 (1.9)	0.3 (0.3) 4.0 (1.7) 12.4 (1.1) 0.5 (0.2)	7.7 (1.3) 12.0 (1.8) 9.7 (0.7) 12.1 (1.2)	14.0 (2.1) 23.7 (2.8) 19.6 (1.1) 23.2 (2.1)		
HEATING DEGREE DAYS 0-1,999 2,000-2,999 4,000-4,999 5,000-5,999 6,000-6,999 7,000-7,999 8,000 OR MORE	2.3 (0.7) 1.5 (0.5) 1.6 (0.6) 1.4 (0.4) 2.5 (0.4) 1.5 (0.4) 1.3 (0.7) Q	6.7 (2.9) 21.5 (3.3) 29.5 (2.3) 30.0 (1.2) 50.0 (7.6) 45.4 (2.9) 42.3 (15.6)	18.3 (3.6) 10.6 (1.5) 10.5 (2.7) 6.2 (1.4) 1.3 (1.1) 1.5 (0.6) 0.3 (0.8) q	6.7 (1.5) 9.6 (1.3) 12.7 (1.2) 10.4 (0.5) 11.5 (2.1) 11.7 (1.4) 9.8 (2.1) Q	15.7 (3.5) 19.5 (2.4) 23.9 (0.8) 20.2 (1.0) 22.8 (3.9) 21.4 (2.5) 17.8 (4.0) Q		
INCOME LESS THAN \$5,000 \$5,000-\$9,999 \$10,000-\$14,999 \$15,000-\$19,999 \$20,000-\$24,999 \$25,000-\$34,999 \$35,600 OR MORE	1.2 (0.2) 1.8 (0.3) 2.7 (0.5) 2.1 (0.3) 1.6 (0.3) 1.6 (0.3) 1.1 (0.2)	34.6 (2.5) 30.1 (2.9) 25.5 (2.9) 30.3 (3.2) 30.2 (3.7) 34.4 (4.1) 47.1 (7.0)	0.9 (0.3) 4.1 (0.7) 7.1 (1.1) 9.2 (1.7) 9.0 (2.0) 15.9 (3.6)	5.3 (0.7) 8.0 (0.7) 8.7 (0.8) 11.2 (0.9) 12.0 (0.8) 13.0 (0.8) 14.3 (1.6)	13.5 (1.2) 16.9 (1.2) 17.5 (1.3) 22.4 (1.4) 22.1 (1.5) 22.9 (1.5) 28.2 (2.7)		
NUMBER OF HOUSEHOLD MEMBERS ONE THO THREE FOUR FIVE OR MORE	2.2 (0.3) 4.5 (0.7) 2.1 (0.2) 1.9 (0.2) 1.3 (0.2)	28.6 (3.4) 29.3 (3.6) 32.7 (2.2) 33.6 (3.1) 40.3 (2.5)	4.2 (0.9) 8.1 (1.4) 8.0 (1.2) 8.6 (1.6) 7.7 (1.4)	4.0 (0.4) 7.8 (0.5) 11.3 (0.5) 14.3 (0.9) 21.0 (1.1)	12.4 (1.2) 18.3 (1.3) 22.6 (1.0) 24.2 (1.5) 29.8 (1.2)		

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1978 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 3. Average Household Natural Gas Consumption When Main Heating Fuel is Natural Gas by End Use by Selected Housing Characteristics for 1978

HOUSING CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING (MILLION BTU)	WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)
NATIONAL	41.8 (1.9)	100.8 (3.4)	21.8 (0.7)	5.0 (0.2)
HOUSING STRUCTURE SINGLE-FAMILY DETATCHED SINGLE-FAMILY ATTACHED TWO TO FOUR UNITS FIVE OR MORE UNITS MOBILE HOME	26.9 (1.2) 2.2 (0.4) 6.7 (0.9) 4.4 (0.7) 1.3 (0.4) 0.2 (0.1) 14.3 (1.3) 4.9 (0.6) 8.0 (0.8) 4.5 (0.6) 4.5 (0.6) 4.5 (0.5) 20.7 (0.4)	114.0 (3.8) 100.3 (6.5) 90.4 (8.2) 47.6 (9.3) 65.4 (13.7) Q 113.0 (5.0) 96.7 (5.0) 99.0 (5.0) 96.0 (5.6) 88.2 (8.1) 85.0 (6.2) 99.2 (11.9)	24.5 (0.8) 18.5 (2.7) 20.4 (2.0) 10.0 (3.2) 18.3 (2.3) Q 20.3 (1.0) 22.0 (1.5) 21.9 (1.2) 22.1 (1.3) 24.1 (1.9) 21.4 (1.8) 25.5 (1.8)	5.4 (0.3) 4.9 (1.2) 4.6 (0.4) 2.6 (0.7) 5.5 (0.6) Q 5.0 (0.3) 5.6 (0.8) 5.6 (0.6) 4.0 (0.5) 5.0 (0.8) 4.4 (0.7) 4.2 (0.7)
HEATED SQUARE FOOTAGE 1-799	7.2 (0.8) 8.5 (0.7) 7.9 (0.6) 6.1 (0.5) 7.0 (0.7) 3.6 (0.4) 1.5 (0.3)	62.5 (6.7) 87.5 (4.5) 95.3 (4.3) 107.3 (4.7) 115.6 (5.7) 143.3 (5.8) 191.4 (16.9)	12.3 (1.4) 18.6 (1.1) 22.8 (1.2) 25.9 (1.4) 25.5 (1.1) 26.9 (1.4) 32.5 (2.8)	3.6 (0.4) 5.2 (0.3) 5.2 (0.4) 5.1 (0.5) 4.7 (0.3) 7.1 (1.5) 4.2 (1.1)

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1978 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



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Table 4. Average **Household Natural Gas Consumption** When Main Heating **Fuel is Natural Gas** by End Use by Selected Sociodemographic **Characteristics** for 1978

		END USE		
SOCIODEMOGRAPHIC CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING (MILLION BTU)	WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)
NATIONAL	41.8 (1.9)	100.8 (3.4)	21.8 (0.7)	5.0 (0.2)
GEOGRAPHIC REGION NORTHEAST NORTH CENTRAL SOUTH WEST	7.0 (0.6) 15.3 (1.0) 10.1 (1.4) 9.6 (0.6)	120.6 (7.8) 132.0 (3.6) 65.4 (5.0) 73.8 (6.4)	22.1 (1.5) 24.3 (1.0) 20.9 (1.1) 18.4 (2.1)	5.6 (0.5) 5.1 (0.3) 5.5 (0.6) 3.7 {0.5)
HEATING DEGREE DAYS 0-1,999	$\begin{array}{c} 2.3 & (0.9) \\ 6.5 & (0.8) \\ 5.0 & (1.4) \\ 1.8 & (1.0) \\ 8.4 & (1.3) \\ 7.8 & (1.9) \\ 8.5 & (1.9) \\ 1.5 & (0.1) \end{array}$	38.1 (5.6) 54.9 (4.1) 75.5 (5.0) 76.1 (14.7) 119.5 (6.2) 128.0 (4.3) 122.6 (9.9) 142.5 (8.0)	25.9 (3.8) 20.9 (1.5) 20.2 (1.7) 15.7 (6.6) 23.0 (1.6) 23.0 (1.6) 21.5 (2.0) 20.1 (2.1)	6.4 (0.8) 6.6 (0.9) 3.5 (0.9) 3.3 (1.5) 5.2 (0.6) 4.4 (0.3) 5.1 (0.6) 3.9 (0.4)
INCOME LESS THAN \$5,000 \$5,000-\$9,999 \$10,000-\$14,999 \$15,000-\$19,999 \$20,000-\$24,999 \$25,000-\$24,999 \$35,000 OR MORE	6.4 (0.7) 8.0 (0.6) 7.8 (0.6) 5.8 (0.5) 5.5 (0.5) 5.4 (0.5) 3.0 (0.4)	79.7 (4.4) 92.9 (5.4) 91.3 (4.4) 102.1 (5.2) 111.3 (5.1) 117.4 (5.9) 140.9 (10.6)	14.8 (1.3) 19.1 (1.3) 19.1 (1.2) 24.3 (1.3) 25.6 (1.3) 28.6 (1.1) 26.3 (1.2)	4.4 (0.3) 5.1 (0.5) 4.8 (0.4) 4.1 (0.5) 5.2 (0.5) 4.6 (0.4) 7.1 (1.4)
NUMBER OF HOUSEHOLD MEMBERS OHE ThO ThREE FOUR FIVE OR MORE	8.3 (0.7) 13.6 (0.8) 7.5 (0.5) 6.5 (0.4) 5.9 (0.5)	77.9 (4.6) 99.4 (3.6) 108.3 (4.7) 110.4 (4.6) 116.9 (6.3)	7.2 (0.4) 15.1 (0.4) 23.9 (0.8) 31.4 (0.9) 44.5 (1.8)	3.9 (0.3) 4.7 (0.3) 5.4 (0.4) 5.9 (0.6) 5.4 (0.5)

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"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS.

NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1978 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 5. Average Household Fuel Oil or Kerosene Consumption When Main Heating Fuel is Fuel Oil or Kerosene by End Use by **Selected Housing** Characteristics for 1978

		I END USE		
HOUSING CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING (MILLION BTU)	WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)
NATIONAL	16.9 (1.3)	120.7 (4.8)	8.3 (0.9)	Q
HOUSING STRUCTURE SINGLE-FAMILY DETATCHED SINGLE-FAMILY ATTACHED TWO TO FOUR UNITS	11.1 (1.1) 0.4 (0.1) 2.1 (0.4)	123.3 (5.0) 119.8 (16.9) 154.6 (13.1)	6.6 (0.8) 9.7 (5.8) 13.6 (4.8)	G G
MOBILE HOME.	1.3 (0.3)	9 62.2 (5.8)	0.2 (0.3)	9 9
BEFORE 1940 1940-1949	7.7(0.9) 1.9(0.3)	142.1 (6.8) 110.4 (7.7)	9.4 (1.6) 6.8 (2.1)	Q Q
1950-1957. 1960-1964. 1965-1969. 1970-1974.	1.2 (0.3) 0.9 (0.2) 1.1 (0.2)	$\begin{array}{c} 107.4 (0.7) \\ 101.1 (16.9) \\ 82.3 (9.4) \\ 87.9 (10.1) \end{array}$	$\begin{array}{c} 3.5 & (1.7) \\ 10.0 & (7.2) \\ 5.3 & (3.3) \\ 3.3 & (1.3) \end{array}$	प Q Q Q
1975 OR LATER	0.4 (0.2)	106.4 (17.4)	8.6 (8.3)	Q
1-799. 800-999. 1,000-1,199	3.0 (0.5) 3.6 (0.5) 3.2 (0.4)	105.1 (11.3) 107.1 (8.7) 108.0 (5.3)	10.2 (4.6) 7.9 (3.0) 5.4 (1.5)	ष द द
1,200-1,599 1,400-1,799 1,800-2,399 2,400 OR MORE	2.2 (0.3) 3.0 (0.5) 1.5 (0.2) 0.6 (0.1)	121.4 (7.8) 130.9 (11.1) 156.9 (14.5) 201.6 (28.3)	1.1 (1.7) 8.3 (2.1) 11.6 (2.1) 11.6 (4.1)	ୟ ସ ସ ହ

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED

DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1978 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 6. Average Household Fuel **Öil** or Kerosene **Consumption When** Main Heating Fuel is Fuel Oil or Kerosene by End Use by Selected Sociodemographic Characteristics for 1978

		END USE		
SOCIODEMOGRAPHIC CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING (MILLION BTU)	WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)
NATIONAL	16.9 (1.3)	120.7 (4.8)	8.3 (0.9)	Q
GEOGRAPHIC REGION NORTHEAST NORTH CENTRAL	8.8 (0.8) 3.1 (0.8) 4.2 (0.6) 0.8 (0.2)	135.8 { 6.0) 145.4 (12.6) 73.4 (6.4) 105.4 (7.4)	14.0 (1.3) 2.3 (1.0) 2.3 (0.5) 0.1 (0.8)	ନ ସ ନ
HEATING DEGREE DAYS 0-1,999 2,000-2,999 3,000-3,999 4,000-4,999 5,000-5,999 6,000-6,999 7,000-7,999 8,000 OR MORE	1.0 (0.1) Q 1.2 (0.4) 0.6 (0.5) 7.5 (1.2) 3.7 (1.0) 1.7 (0.6) 0.6 (0.5)	30.4 (3.4) Q 81.9 (8.9) 76.6 (3.4) 128.9 (6.4) 131.4 (7.6) 154.8 (22.9) 185.6 (66.3)	0.5 (0.1) Q 3.1 (1.0) 2.4 (1.6) 13.2 (2.2) 6.1 (2.0) 7.5 (3.7) 0.7 (1.5)	ବ ବ ବ ବ ବ ବ ବ ବ ବ ବ ବ ବ ବ ବ ବ ବ ବ ବ ବ
INCOME LESS THAN \$5,000 \$5,000-\$9,999 \$10,000-\$14,999 \$15,000-\$19,999 \$20,000-\$24,999 \$25,000-\$34,999 \$25,000-\$34,999 \$35,000 OR MORE	2.2 (0.3) 3.4 (0.4) 3.0 (0.3) 2.8 (0.3) 2.2 (0.2) 2.1 (0.3) 1.2 (0.2)	115.8 (9.5) 109.8 (9.0) 108.5 (7.5) 117.7 (11.0) 121.9 (10.9) 138.2 (8.8) 163.3 (20.0)	6.6 (2.5) 7.6 (3.5) 7.5 (2.1) 11.2 (2.8) 8.2 (1.5) 8.4 (1.6) 8.2 (2.2)	ନ ଜ ଜ ଜ ଜ ଜ
NUMBER OF HOUSEHOLD MEMBERS ONE TWO THREE FOUR FIVE OR MORE	2.9 (0.4) 5.5 (0.5) 2.9 (0.3) 3.2 (0.4) 2.4 (0.3)	115.2 (7.4) 121.8 (5.2) 116.6 (8.3) 118.9 (13.7) 132.5 (8.5)	3.3 (1.2) 5.9 (1.0) 6.8 (2.1) 10.9 (2.2) 18.3 (2.5)	ସ ସ ଦ ଦ ଦ

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE.

NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1978 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 7. Average Household LPG **Consumption When** Main Heating Fuel is LPG by End Use by Selected Housing **Characteristics for** 1978

		END USE		
HOUSING CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	 SPACE HEATING (MILLION BTU) 	WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)
NATIONAL	3.1 (0.5)	67.3 (8.6)	9.9 (1.5)	3.0 (0.4)
HOUSING STRUCTURE SINGLE-FAMILY DETATCHED SINGLE-FAMILY ATTACHED TWO TO FOUR UNITS FIVE OR MORE UNITS MOBILE HOME YEAR HOUSE BUILT BEFORE 1940	1.9 (0.3) Q Q 0.9 (0.2) 0.8 (0.2)	74.1 (10.0) Q Q 55.8 (12.0) 85.6 (15.0)	11.7 (1.3) Q Q 8.2 (4.7) 8.4 (2.1)	2.7 (0.4) Q 3.8 (0.5) 2.4 (0.7)
1940-1949. 1950-1959. 1960-1964. 1965-1969. 1970-1974. 1975 OR LATER.	G C.4 (C.1) O.4 (0.1) O.5 (C.2) C.7 (C.2) O.2 (C.1)	Q 73.7 (40.3) 58.3 (11.9) 50.3 (12.7) 53.3 (8.1) 87.6 (8.3)	4 9.7 (5.9) 8.7 (3.1) 13.5 (3.1) 10.1 (5.0) 15.9 (3.3)	4 2.7 (1.3) 1.9 (0.7) 3.8 (1.1) 3.5 (0.6) 2.7 (2.1)
HEATED SQUARE FOOTAGE 1-799	0.6 (0.2) 0.8 (0.2) 0.6 (0.1) 0.6 (0.2) 0.4 (0.1) Q	36.6 (17.7) 50.2 (11.8) 84.1 (9.8) 80.6 (10.2) 89.9 (21.0) Q Q	2.7 (2.4) 6.2 (2.1) 14.3 (3.7) 14.2 (3.1) 15.2 (4.7) Q Q	2.9 (1.2) 2.9 (0.6) 3.1 (0.9) 3.7 (0.7) 1.9 (0.9) Q Q

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NDTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1978 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 8. Average Household LPG **Consumption When** Main Heating Fuel is LPG by End Use by Selected Socio~ demographic Characteristics for 1978

		END USE			
SOCIODEMOGRAPHIC CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING (MILLION BTU)	WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)	
NATIONAL	3.1 (0.5)	67.3 (8.6)	9.9 (1.5)	3.0 (0.4)	
GEOGRAPHIC REGION NORTHEAST	Q 0.8.(0.2)	Q 110 1 (23 8)	Q 163(18)	Q 3 2 (1 2)	
SOUTH	2.0 (0.4) 0.3 (0.2)	46.6 (5.9) 85.6 (28.6)	8.1 (2.1) 10.4 (7.4)	3.1 (0.5) 1.1 (1.2)	
HEATING DEGREE DAYS					
0-1,999 2,000-2,999	0.2 (0.1) 1.0 (0.4)	19.5 (3.7) 44.6 (10.4)	6,4 (4.2) 9,5 (3,3)	2.8 (1.4) 3.4 (0.7)	
3,000-3,999 4,000-4,999	0.8 (0.3) Q	55.3 (3.5) Q	7.8 (2.1) Q	2.9 (0.9) Q	
5,000-5,999 6,000-6,999	0.5 (0.2) 0.4 (0.2)	86.2 (15.7) 113.8 (19.3)	11.0 (3.5) 14.7 (8.8)	3.0 (1.2) 3.0 (1.8)	
8,000 OR MORE	G Q	G G	G G	4 9	
INCOME					
\$5,000-\$9,999	1.0(0.2)	52.1 (7.6)	4.8 (1.8) 6.1 (1.8)	2.7 (0.7)	
\$10,000-\$14,999 \$15,000-\$19,999	0.7 (0.1) 0.5 (0.1)	55.1 (6.6) 85.2 (16.0)	12.1 (2.1) 13.8 (5.5)	2.5 (0.7) 3.6 (1.2)	
\$20,000-\$24,999 \$25,000-\$34,999	0.4 (0.1) Q	74.4 (28.2) Q	13.1 (4.5) Q	3.5 (1.9) Q	
\$35,000 OR MORE	Q	ହ	Q	Q	
NUMBER OF HOUSEHOLD MEMBERS	0.5(0.1)	79.1 (18.7)	3.9 (1.4)	2.4 (1.0)	
TWO	1.0 (0.2)	55.8 (8.8)	6.2(1.6)	2.9(1.0)	
FOUR.	0.5(0.1) 0.6(0.1) 0.5(0.1)	61.5 (11.7)	13.9 (3.1) 17.5 (4.2)	3.4(0.6) 2.5(1.0)	
	0.5 (0.1)		1,.5 (4.2)	2.5 (1.0)	

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1978 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 9. Average Household Energy Expenditures by End Use by Selected Housing Characteristics for 1978

		ן נער דא USE			
HOUSING CHARACTERISTICS	TOTAL EXPENDITURES (DOLLARS)	SPACE HEATING (DOLLARS)	COOLING (DOLLARS)	WATER HEATING (DOLLARS)	MISCELLANEOUS USE (DOLLARS)
NATIONAL	724 (13)	315 (8)	52 (3)	91 (2)	267 (6)
HOUSING STRUCTURE SINGLE-FAMILY DETATCHED THO TO FOUR UNITS FIVE OR MORE UNITS MOBILE HOME OTHER YEAR HOUSE BUILT BEFORE 1940 1940-1949 1950-1959 1960-1964 1965-1969 1965-1969 1965-1969 1965-1969	800 (14) 742 (49) 655 (40) 476 (46) 587 (22) 459 (210) 756 (21) 697 (25) 756 (23) 712 (27) 669 (35) 704 (30)	339 (9) 345 (26) 322 (21) 221 (21) 226 (16) 234 (112) 379 (16) 307 (17) 304 (12) 285 (18) 249 (17) 269 (15) 27 (20)	57 (4) 54 (18) 36 (9) 43 (11) 54 (9) 13 (8) 24 (4) 36 (6) 64 (8) 67 (7) 77 (8) 78 (9) 71 (10) 71 (10) 73 (10) 73 (10) 74 (10) 74 (10) 75 (10) 77 (10) 78 (10) 71 (10)	100 (3) 89 (10) 83 (7) 54 (7) 88 (5) 37 (20) 86 (5) 84 (4) 94 (5) 91 (5) 85 (5) 100 (5)	305 (6) 254 (17) 214 (11) 158 (11) 219 (11) 176 (61) 261 (8) 270 (10) 265 (10) 269 (10) 258 (18) 256 (10)
HEATED SQUARE FOOTAGE ZERO HEATED SQUARE FOOTAGE 1-799	463 (29) 613 (14) 686 (15) 768 (19) 877 (19) 1026 (25) 1234 (68)	276 (21) 273 (15) 273 (10) 291 (10) 324 (12) 362 (15) 446 (20) 559 (50)	26 (6) 36 (5) 43 (3) 52 (4) 70 (7) 86 (10) 145 (19)	52 (4) 82 (3) 94 (3) 98 (4) 109 (4) 120 (7) 125 (9)	161 (8) 221 (5) 259 (7) 23 (8) 336 (9) 375 (11) 404 (23)

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1978 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 10. Average Household Energy Expenditures by End **Use by Selected** Sociodemographic Characteristics for 1978

] 	END USE				
SOCIODEMOGRAPHIC CHARACTERISTICS) TOTAL (EXPENDITURES) (DOLLARS)	SPACE HEATING (DOLLARS)	COOLING (DOLLARS)	WATER HEATING (DOLLARS)	MISCELLANEOUS USE (DOLLARS)	
NATIONAL	724 (13)	315 (8)	52 (3)	91 (2)	267 (6)	
GEOGRAPHIC REGION NORTHEAST NORTH CENTRAL SOUTH WEST HEATING DEGREE DAYS 0-1,999	887 (48) 821 (20) 674 (19) 469 (24) 651 (52)	468 (20) 387 (17) 209 (10) 207 (14) 113 (21)	18 (3) 44 (6) 106 (7) 9 (2) 179 (10)	104 (6) 89 (5) 102 (3) 56 (2) 107 (12)	298 (19) 300 (9) 256 (9) 197 (11) 252 (24)	
2,000-2,999. 3,000-3,999. 4,000-4,999. 5,000-5,999. 6,000-6,999. 7,000-7,999. 8,000 OR MORE.	553 (51) 649 (37) 573 (44) 831 (51) 798 (34) 722 (57) 915 (51)	165 (16) 222 (17) 232 (16) 403 (24) 393 (22) 382 (30) 501 (64)	73 (12) 64 (13) 53 (17) 42 (6) 20 (5) 17 (6) 20 (7)	76 (6) 95 (8) 84 (6) 98 (7) 97 (7) 74 (6) 91 (24)	238 (18) 269 (9) 205 (24) 289 (17) 289 (16) 249 (21) 303 (34)	
INCOME LESS THAN \$5,000 \$5,000-\$9,999 \$10,000-\$14,999 \$15,000-\$19,999 \$20,000-\$24,999 \$25,000-\$34,999 \$35,000 OR MORE	522 (23) 627 (15) 659 (17) 769 (23) 816 (20) 874 (23) 1047 (50)	264 (13) 288 (11) 282 (10) 318 (14) 336 (15) 361 (18) 455 (36)	16 (2) 34 (4) 46 (4) 56 (5) 70 (7) 71 (6) 112 (15)	58 (4) 76 (3) 88 (3) 105 (5) 102 (5) 113 (5) 111 (7)	184 (9) 228 (7) 243 (6) 290 (8) 307 (8) 329 (11) 369 (14)	
NUMBER OF HOUSEHOLD MEMBERS ONE	489 (21) 669 (14) 776 (15) 853 (19) 959 (26)	268 (11) 305 (9) 333 (11) 338 (13) 352 (16)	30 (3) 53 (4) 59 (6) 64 (5) 54 (5)	33 (1) 69 (2) 100 (3) 126 (4) 168 (6)	158 (6) 241 (6) 284 (6) 325 (8) 385 (10)	

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE.

NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION,

THE 1978 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 11. Average Household Energy **Expenditures for** Space Heating by Main Heating Fuel by Selected Housing Characteristics for 1978

	MAIN HEATING FUEL				
HOUSING CHARACTERISTICS	ELECTRICITY (DOLLARS)	NATURAL GAS (Dollars)	FUEL OIL OR Kerosene (Dollars)		
NATIONAL	269 (18)	272 (7)	475 (19)		
HOUSING STRUCTURE SINGLE-FAMILY DETATCHED SINGLE-FAMILY ATTACHED TWO TO FOUR UNITS FIVE OR MORE UNITS HOBILE HOME OTHER YEAR HOUSE BUILT BEFORE 1940 1940-1949 1950-1959	312 (21) 431 (55) 190 (35) 253 (24) Q 306 (26) 290 (27) 242 (23)	298 (8) 305 (18) 261 (18) 139 (14) 173 (33) 244 (84) 306 (12) 264 (12) 261 (12)	483 (20) 468 (67) 612 (51) 9 246 (22) 9 558 (27) 437 (25)		
1960-1964 1955-1969 1970-1974	269 (24) 237 (33) 291 (28)	263 (19) 236 (21) 224 (18)	399 (72) 325 (38) 343 (38)		
1975 OR LATER	264 (31) 219 (22) 252 (24) 246 (29) 329 (24) 377 (39) 468 (39)	274 (26) 238 (10) 259 (9) 284 (11) 366 (12) 364 (20) 508 (45)	416 (71) 413 (45) 422 (34) 421 (20) 478 (33) 516 (44) 616 (55) 790 (110)		

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A

DETAILED DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1978 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 12. Average Household Energy Expenditures for Space Heating by Main Heating Fuel by Selected Sociodemographic Characteristics for 1978

	MAIN HEATING FUEL				
SOCIODEMOGRAPHIC CHARACTERISTICS	ELECTRICITY (DOLLARS)	NATURAL GAS (Dollars)	FUEL OIL OR KEROSENE (DOLLARS)		
NATIONAL	269 (18)	272 (7)	475 (19)		
GEOGRAPHIC REGION NORTHEAST NORTH CENTRAL SOUTH WEST	347 (57) 492 (43) 215 (20) 272 (31)	389 (19) 338 (8) 185 (8) 171 (12)	541 (24) 556 (47) 289 (25) 397 (31)		
HEATING DEGREE DAYS 0-1,999	87 (33) 232 (36) 302 (18) 282 (12) 306 (48) 437 (59) 321 (76) Q	126 (25) 131 (9) 190 (16) 195 (57) 339 (17) 332 (18) 342 (29) 384 (30)	133 (11) 246 (45) 313 (33) 294 (20) 512 (25) 515 (32) 602 (85) 696 (277)		
INCOME LESS THAN \$5,000 \$5,000-\$9,999 \$10,000-\$14,999 \$15,000-\$14,999 \$20,000-\$24,999 \$25,000-\$34,999 \$25,000 OR MORE NUMBER OF HOUSEHOLD MEMBERS ONE TWO TWO FOUR FIVE OR MORE	270 (29) 249 (26) 237 (22) 255 (28) 261 (27) 284 (37) 396 (46) 229 (22) 247 (25) 300 (23) 296 (25) 324 (27)	220 (16) 246 (11) 249 (9) 274 (13) 300 (13) 311 (16) 385 (30) 215 (10) 266 (8) 298 (10) 295 (11) 306 (14)	452 (39) 431 (34) 426 (29) 465 (44) 480 (43) 545 (33) 638 (78) 450 (28) 478 (21) 458 (33) 470 (52) 522 (33)		

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. Note: Because of Rounding, data may not sum to totals. Number in parenthesis indicates one standard deviation. See Appendix B For A DETAILED DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1978 RESIDENTIAL ENERGY CONSUMPTION SURVEY.

Table 13. Average Household Electricity **Consumption When** Main Heating Fuel is **Electricity** by End Use by Selected Housing Characteristics for 1980

		END USE			
HOUSING CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING	COOLING (MILLION BTU)	 WATER HEATING (MILLION BTU) 	MISCELLANEOUS USE (MILLION BTU)
NATIONAL	14.3 (1.0)	18. 2 (1.6)	7.3 (0.5)	10.4 (0.4)	19.6 (0.6)
HOUSING STRUCTURE SINGLE-FAMILY DETATCHED SINGLE-FAMILY ATTACHED TWO TO FOUR UNITS FIVE OR MORE UNITS MOBILE HOME YEAR HOUSE BUILT BEFORE 1940 1940-1949 1950-1959 1960-1964 1965-1969 1970-1974 1975 OR LATER	7.7 (0.6) 0.5 (0.2) 1.3 (0.4) 3.7 (0.5) 1.1 (0.2) 0.8 (0.1) 0.5 (0.1) 1.1 (0.2) 0.8 (0.1) 1.7 (0.2) 3.7 (0.4) 5.7 (0.7)	23.5 (1.5) 19.8 (3.4) 13.5 (4.4) 8.5 (1.1) 19.2 (3.2) 25.8 (4.0) 22.2 (3.2) 19.5 (4.0) 25.3 (4.1) 19.9 (1.6) 18.8 (1.4) 14.7 (1.7)	9.7 (0.6) 4.8 (1.6) 5.3 (2.0) 3.9 (0.5) 5.2 (1.1) 6.1 (1.3) 4.9 (2.4) 6.7 (1.8) 6.0 (1.5) 6.0 (1.0) 6.3 (0.8) 8.9 (0.8)	$\begin{array}{c} 13.5 \ (0.4) \\ 8.3 \ (2.0) \\ 7.2 \ (0.7) \\ 6.7 \ (0.6) \\ 5.9 \ (0.6) \\ \hline \end{array}$ $\begin{array}{c} 7.0 \ (0.9) \\ 9.5 \ (1.3) \\ 8.9 \ (1.3) \\ 10.6 \ (1.6) \\ 10.5 \ (0.7) \\ 11.1 \ (0.7) \end{array}$	24.6 (0.7) 15.7 (2.1) 12.3 (1.0) 20.2 (1.6) 20.2 (1.9) 15.3 (1.3) 17.7 (2.3) 18.5 (1.6) 21.3 (2.4) 19.0 (1.3) 20.2 (0.9)
HEATED SQUARE FOOTAGE 1-799	3.6 (0.4) 2.2 (0.2) 1.7 (0.2) 1.4 (0.2) 2.0 (0.2) 2.0 (0.3) 1.4 (0.2)	11.8 (1.5) 14.5 (1.3) 16.0 (2.0) 19.4 (2.6) 19.9 (2.4) 26.6 (1.7) 27.6 (2.3)	2.7 (0.4) 4.9 (0.7) 5.8 (0.6) 8.9 (1.3) 11.1 (1.1) 10.6 (1.3) 12.6 (1.5)	5.4 (0.4) 8.2 (0.6) 10.6 (0.9) 11.1 (1.0) 13.8 (0.8) 13.8 (0.7) 15.6 (1.3)	11.5 (0.7) 15.1 (0.9) 18.3 (1.0) 21.1 (1.2) 23.8 (1.2) 27.1 (1.0) 30.2 (2.2)

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Table 14. Average Household Electricity **Consumption When** Main Heating Fuel is **Electricity by End Use by Selected** Sociodemographic **Characteristics for** 1980

		END USE			
SOCIODEMOGRAPHIC CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	 SPACE HEATING (MILLION BTU) 	COOLING (MILLION BTU)	WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)
NATIONAL	14.3 (1.0)	18.2 (1.6)	7.3 (0.5)	10.4 (0.4)	19.6 (0.6)
GEOGRAPHIC REGIDN NORTHEAST NORTH CENTRAL SOUTH WEST	1.6 (0.4) 2.1 (0.4) 7.7 (0.8) 2.9 (0.4)	24.3 (2.0) 26.5 (2.4) 14.9 (2.6) 17.8 (1.5)	1.7 (0.5) 4.1 (0.7) 11.0 (0.7) 2.5 (0.4)	10.8 (0.7) 11.3 (1.2) 10.5 (0.6) 9.2 (0.7)	17.9 (1.3) 20.4 (2.3) 20.6 (0.7) 16.9 (1.1)
HEATING DEGREE DAYS 0-1,999 2,000-2,999 3,000-3,999 4,000-4,999 5,000-5,999 6,000-6,999 7,000-7,999 8,000 OR MORE	3.8 (1.1) 1.2 (0.3) 1.7 (0.4) 2.8 (0.5) 2.0 (0.5) 2.0 (0.5) 0.4 (0.1) 0.3 (0.1)	4.9 (2.0) 11.9 (1.5) 18.0 (1.4) 26.2 (1.0) 27.2 (0.8) 23.5 (3.7) 24.4 (4.5) 32.6 (8.9)	13.4 (1.2) 12.4 (2.2) 8.0 (0.9) 4.5 (1.0) 3.9 (0.8) 1.8 (0.8) 0.3 (0.1) 0.8 (0.5)	8.9 (0.5) 9.1 (1.7) 10.3 (1.0) 12.2 (0.9) 10.9 (0.7) 10.6 (1.2) 10.6 (2.3) 11.3 (1.9)	19.5 (1.3) 18.1 (2.4) 18.8 (1.4) 21.3 (1.2) 19.9 (0.6) 18.7 (2.8) 16.2 (3.3) 22.5 (6.1)
INCOME LESS THAN \$5,000 \$5,000-\$9,999 \$10,000-\$14,999 \$20,000-\$24,999 \$20,000-\$24,999 \$25,000-\$34,999 \$35,000 OR MORE	1.8 (0.3) 2.1 (0.3) 2.5 (0.2) 2.0 (0.3) 1.7 (0.2) 2.4 (0.3) 1.8 (0.3)	17.4 (2.2) 16.4 (2.8) 16.3 (1.5) 17.4 (2.2) 20.5 (2.2) 18.8 (2.3) 21.9 (2.6)	2.3 (0.3) 4.3 (0.6) 6.4 (0.8) 5.9 (1.0) 9.2 (1.2) 9.5 (1.1) 13.7 (1.5)	6.0 (0.5) 8.3 (0.6) 9.2 (0.8) 10.7 (0.6) 13.1 (0.9) 11.2 (1.0) 14.6 (1.0)	12.6 (0.9) 16.1 (0.9) 16.8 (1.2) 19.0 (0.9) 24.5 (1.1) 22.0 (1.3) 26.9 (1.6)
NUMBER OF HOUSEHOLD MEMBERS ONE	3.6 (0.4) 4.8 (0.5) 2.3 (0.2) 1.8 (0.2) 1.7 (0.2)	13.5 (1.4) 17.1 (2.5) 20.7 (1.4) 20.8 (1.8) 25.3 (2.8)	4.7 (0.8) 6.7 (0.9) 9.2 (0.8) 10.0 (1.1) 8.4 (1.2)	5.4 (0.4) 8.3 (0.4) 12.5 (0.7) 15.3 (0.8) 18.9 (1.1)	12.6 (0.9) 16.9 (0.5) 23.4 (1.3) 25.9 (0.9) 29.9 (1.5)

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1980 RESIDENTIAL ENERGY CONSUMPTION SURVEY.

Table 15. Average Household Natural **Gas Consumption** When Main Heating Fuel is Natural Gas by End Use by Selected Housing Characteristics for 1980

		END USE		
HOUSING CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	 SPACE HEATING (MILLION BTU)	 WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)
NATIONAL	44.6 (1.5)	74.1 (1.3)	25.8 (0.5)	7.2 (0.4)
HOUSING STRUCTURE SINGLE-FAMILY DETATCHED. SINGLE-FAMILY ATTACHED. THO TO FOUR UNITS. FIVE OR MORE UNITS. MOBILE HONE. YEAR HOUSE BUILT BEFORE 1940. 1940-1949. 1950-1959. 1960-1964. 1975 OR LATER.	$\begin{array}{c} 30.1 \ (1.3) \\ 1.9 \ (0.3) \\ 6.6 \ (0.5) \\ 4.6 \ (0.3) \\ 1.4 \ (0.3) \\ 1.4 \ (0.3) \\ 4.6 \ (0.3) \\ 9.1 \ (0.8) \\ 4.6 \ (0.4) \\ 4.8 \ (0.4) \\ 4.6 \ (0.4) \\ 3.6 \ (0.4) \end{array}$	81.7 (1.5) 62.1 (5.5) 69.5 (3.2) 41.8 (6.0) 53.6 (5.6) 90.6 (2.7) 71.6 (2.9) 70.4 (2.7) 69.3 (3.1) 64.8 (3.6) 62.4 (3.8) 59.1 (4.1)	28.5 (0.5) 23.0 (2.0) 23.2 (1.0) 15.4 (1.2) 18.1 (1.1) 25.5 (1.1) 26.9 (0.9) 26.7 (0.9) 26.7 (0.9) 26.9 (1.1) 24.6 (1.2)	6.8 (0.5) 10.8 (0.6) 7.7 (0.6) 6.5 (1.3) 10.0 (1.1) 6.8 (0.4) 6.1 (0.7) 7.9 (0.9) 7.6 (1.1) 7.5 (1.2) 6.8 (1.5)
HEATED SQUARE FOOTAGE 1-799	8.3 (0.5) 6.3 (0.5) 5.1 (0.3) 4.4 (0.3) 7.2 (0.4) 7.0 (0.4) 6.3 (0.4)	48.3 (1.8) 57.7 (2.9) 68.5 (3.0) 67.3 (3.0) 75.8 (2.5) 89.2 (3.4) 115.1 (5.0)	18.0 (1.0) 23.0 (1.0) 27.0 (1.1) 26.9 (1.4) 27.8 (0.7) 29.5 (1.1) 30.7 (1.0)	5.9 (0.5) 6.1 (0.5) 6.2 (0.4) 9.5 (1.3) 7.3 (0.6) 7.4 (0.7) 8.8 (1.3)

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED

DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1980 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



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Table 16. Average **Household Natural Gas Consumption** When Main Heating Fuel is Natural Gas by End Use by Selected Sociodemographic Characteristics for 1980

		END USE		
SOCIODEMOGRAPHIC CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING (MILLION BTU)	WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)
NATIONAL	44.6 (1.5)	74.1 (1.3)	25.8 (0.5)	7.2 (0.4)
GEOGRAPHIC REGION				
NORTHEAST	6.6 (0.9)	94.9 (2.9)	25.1 (0.7)	8.0 (0.5)
NORTH CENTRAL	5.0 (0.6)	99.1 (2.2)	27.0 (0.6)	7.2 (0.4)
SOUTH	11.8 (0.9)	57.5 (2.8)	25.2 (1.3)	7.4 (0.7)
WEST	11.1 (0.5)	45.5 (1.3)	25.2 (1.0)	6.5 (0.9)
HEATING DEGREE DAYS				
0-1,999	6.4 (1.1)	27.8 (1.3)	26.8 (1.4)	9.8 (1.2)
2,000-2,999	5.5 (1.2)	42.4 (2.2)	25.7 (1.9)	6.6 (1.1)
3,000-3,999	5.0 (0.7)	58.6 (4.1)	24.6 (1.5)	6.1 (1.0)
4,000-4,999	3.3 (0.7)	68.3 (3.1)	22.6 (2.0)	5.1 (0.8)
5,000-5,999	8.1 (0.9)	88.4 (2.4)	26.5 (1.2)	7.9 (0.7)
6,000-6,999	10.1 (1.0)	100.4 (2.1)	27.1 (0.6)	7.5 (0.4)
7,000-7,999	4.6 (0.6)	104.3 (4.0)	24.9 (1.0)	5.7 (0.6)
8,000 OR MORE	1.5 (0.6)	107.1 (7.4)	22.5 (2.1)	5.4 (1.4)
INCOME				
LESS THAN \$5,000	5.5 (0.3)	66.9 (4.2)	22.0 (1.1)	5.9 (0.3)
\$5,000-\$9,999	7.3 (0.4)	68.7 (2.8)	23.1 (0.8)	6.9 (0.9)
\$10,000-\$14,999	6.9 (0.5)	68.4 (3.1)	23.3 (1.0)	6.7 (0.6)
\$15,000-\$19,999	6.6 (0.4)	70.1 (2.5)	25.8 (1.0)	6.8 (0.5)
\$20,000-\$24,999	6.0 (0.4)	79.5 (4.0)	29.4 (1.1)	7.3 (0.5)
\$25,000-\$34,999	6.7 (0.4)	79.1 (2.2)	28.2 (0.7)	7.9 (0.7)
\$35,000 OR MORE	5.6 (0.4)	87.9 (5.4)	29.3 (1.1)	9.1 (1.5)
NUMBER OF HOUSEHOLD MEMBERS				
ONE	8.2 (0.4)	60.6 (2.5)	14.4 (0.5)	5.4 (0.3)
τωο	14.4 (0.6)	72.5 (2.0)	21.0 (0.5)	6.8 (0.7)
THREE	8.3 (0.5)	74.1 (2.2)	26.4 (0.7)	8.2 (0.5)
FOUR	7.7 (0.5)	82.2 (2.9)	33.9 (0.9)	7.6 (0.6)
FIVE OR MORE	5.9 (0.4)	86.0 (2.5)	41.9 (1.1)	8.6 (1.0)

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"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED

DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1980 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 17. Average Household Fuel Oil or Kerosene **Consumption When** Main Heating Fuel is Fuel Oil or Kerosene by End Use by **Selected Housing** Characteristics for 1980

		end use		
HOUSING CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING	WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)
NATIONAL	13.4 (0.7)	96.0 (2.5)	16.4 (1.2)	Q
HOUSING STRUCTURE SINGLE-FAMILY DETATCHED. TWO TO FOUR UNITS. TWO TO FOUR UNITS. MOBILE HOME YEAR HOUSE BUILT BEFORE 1940. 1940-1949. 1960-1959. 1965-1969. 1975 OR LATER.	7.9 (0.5) 0.7 (0.1) 1.6 (0.2) 2.4 (0.3) 0.7 (0.1) 6.1 (0.5) 1.6 (0.2) 2.5 (0.3) 1.1 (0.2) 0.7 (0.1) 0.8 (0.1)	98.0 (2.5) 11.0 (10.9) 105.3 (10.5) 90.0 (42.6) 58.4 (7.2) 105.3 (3.5) 91.6 (7.1) 90.8 (4.1) 90.3 (8.7) 88.0 (9.7) 82.1 (10.3) 75.0 (12.0)	11.7 (1.0) 12.2 (3.1) 21.7 (2.6) 34.2 (19.9) 1.4 (0.9) 15.2 (1.6) 17.9 (4.2) 14.5 (2.0) 22.5 (8.0) 16.3 (5.3) 21.4 (6.9) 14.0 (3.3)	9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9
HEATED SQUARE FOOTAGE 1-799	3.1 (0.4) 1.6 (0.2) 1.4 (0.2) 1.2 (0.2) 1.9 (0.2) 1.7 (0.2) 2.5 (0.2)	80.8 (6.6) 81.5 (8.2) 90.1 (4.9) 85.9 (6.3) 98.7 (4.4) 107.3 (6.0) 122.9 (4.7)	22.3 (5.3) 18.0 (3.5) 17.6 (2.8) 12.9 (2.9) 12.3 (2.0) 13.1 (2.1) 14.4 (1.8)	ଟ ବ ଦ ଦ ଦ ଦ ଦ ଦ

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1980 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 18. Average Household Fuel Oil or Kerosene **Consumption When** Main Heating Fuel is Fuel Oil or Kerosene by End Use by Selected Sociodemographic **Characteristics** for 1980

		I END USE			
SOCIODEMOGRAPHIC CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLICN)	SPACE HEATING (MILLION BTU)	WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)	
NATIONAL	13.4 (0.7)	96.0 (2.5)	16.4 (1.2)	Q	
GEOGRAPHIC REGION NORTHEAST NORTH CENTRAL SOUTH WEST	8.2 (0.5) 1.5 (0.2) 3.1 (0.4) 0.5 (0.1)	106.5 (2.7) 88.8 (4.2) 76.5 (4.4) 68.0 (4.3)	23.4 (1.6) 3.3 (2.3) 6.9 (3.0) 1.2 (0.7)	ନ ସ କ	
HEATING DEGREE DAYS					
0-1,999	Q	Q	Q	Q	
2,000-2,999	Q	Q	Q	Q	
3,000-3,999	1.0 (0.3)	73.5 (2.6)	1.8 (1.3)	Q	
4,000-4,999	1.2 (0.4)	85.0 (6.7)	10.4 (5.9)	Q	
5,000-5,999	5.6 (0.7)	96.9 (6.1)	22.8 (3.8)	Q	
6,000-6,999	2.9 (0.5)	105.0 (4.9)	16.2 (2.2)	Q	
7,000-7,999	1.4 (0.2)	109.4 (6.3)	15.9 (2.6)	Q	
8,000 OR MORE	0.9 (0.5)	100.6 (7.4)	7.6 (2.0)	Q	
INCOME					
LESS THAN \$5,000	2.0 (0.2)	94.0 (9.4)	16.4 (6.5)	Q	
\$5,000-\$9,999	2.5 (0.2)	95.2 (8.9)	20.4 (5.8)	Q	
\$10,000-\$14,999	2.4 (0.2)	88.8 (6.0)	15.4 (2.6)	Q	
\$15,000-\$19,999	1.8 (0.2)	95.0 (6.3)	14.2 (2.5)	Q	
\$20,000-\$24,999	1.4 (0.1)	98.7 (8.5)	11.8 (2.6)	Q	
\$25,000-\$34,999	2.0 (0.2)	96.7 (4.7)	14.9 (2.1)	Q	
\$35,000 OR MORE	1.4 (0.2)	110.8 (5.2)	20.3 (2.1)	Q	
NUMBER OF HOUSEHOLD MEMBERS					
ONE	2.7 (0.3)	94.1 (7.1)	19.7 (4.0)	Q	
τωο	4.8 (0.2)	93.7 (3.8)	16.5 (2.6)	Q	
THREE	2.3 (0.2)	97.6 (6.2)	14.3 (2.0)	Q	
FOUR	2.0 (0.2)	91.7 (4.7)	12.0 (1.3)	Q	
FIVE OR MORE	1.6 (0.2)	109.1 (6.1)	18.9 (2.5)	9	

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. Note: Because of Rounding, data may not sum to totals. Number in parenthesis indicates one standard deviation. See Appendix B for a detailed DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1980 RESIDENTIAL ENERGY CONSUMPTION SURVEY.


Table 19. Average Household LPG **Consumption When** Main Heating Fuel is LPG by End Use by **Selected Housing Characteristics for** 1980

		END USF		
HOUSING CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING (MILLION BTU)	WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)
NATIONAL	3.7 (0.4)	60.7 (3.4)	10.8 (1.2)	5.3 (0.5)
HOUSING STRUCTURE SINGLE-FAMILY DETATCHED TWO TO FOUR UNITS FIVE OR MORE UNITS MOBILE HOME YEAR HOUSE EUILT BEFORE 1940	2.3 (0.3) Q Q 1.2 (0.2) 0.9 (0.2) 0.2 (0.1) 0.4 (0.1) 0.5 (0.1) 0.8 (0.2) 0.4 (0.1)	67.9 (4.7) Q Q 45.7 (5.3) 79.9 (6.5) 48.4 (5.3) 63.8 (10.1) 55.3 (7.3) 43.5 (11.8) 56.4 (6.1) 56.2 (7.0)	12.9 (1.0) Q Q 7.0 (1.8) 12.4 (2.1) 15.5 (6.1) 13.1 (2.6) 8.0 (2.6) 8.8 (2.1) 10.2 (3.9)	5.1 (0.7) Q Q 6.4 (0.8) 5.1 (0.8) 5.1 (2.7) 3.5 (1.3) 4.0 (2.0) 3.5 (0.6) 7.5 (1.2) 6.0 (1.3)
HEATED SQUARE FOOTAGE 1-799	1.4 (0.2) 0.5 (0.1) 0.6 (0.1) 0.3 (0.1) 0.4 (0.1) 0.3 (0.1) 0.3 (0.1)	51.6 (5.1) 44.4 (5.8) 66.1 (8.9) 56.5 (7.7) 61.1 (7.0) 73.4 (12.8) 103.8 (13.3)	8.6 (2.4) 10.7 (3.0) 10.5 (2.3) 10.9 (3.6) 6.8 (2.3) 17.2 (2.7) 19.1 (4.9)	5.6 (0.6) 3.1 (0.9) 5.3 (0.6) 3.4 (0.9) 4.0 (2.0) 7.8 (3.7) 7.7 (2.4)

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED

DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1980 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



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Table 20. Average Household LPG **Consumption When** Main Heating Fuel is LPG by End Use by Selected Sociodemographic Characteristics for 1980

		END USE		
SOCIODEMOGRAPHIC CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING (MILLION BTU)	WATER HEATING (MILLION BTU)	MISCELLÂNEOUS USE (MILLION BTU)
NATIONAL	3.7 (0.4)	60.7 (3.4)	10.8 (1.2)	5.3 (0.5)
GEOGRAPHIC REGION NORTHEAST NORTH CENTRAL SOUTH WEST HEATING DEGREE DAYS	0.2 (0.1) 1.2 (0.2) 2.0 (0.3) 0.4 (0.1)	75.4 (28.2) 89.3 (5.2) 43.9 (3.7) 57.7 (8.7)	4.1 (2.2) 14.4 (0.9) 9.5 (2.6) 9.7 (2.7)	2.6 (1.4) 5.1 (0.5) 5.7 (1.0) 4.4 (1.3)
0-1,999. 2,000-2,999. 3,000-3,999. 4,000-4,999. 5,000-5,999. 6,000-6,999. 7,000-7,999. 8,000 OR HORE.	0.5 (0.1) 0.4 (0.2) 0.9 (0.3) 0.4 (0.1) 0.6 (0.2) 0.3 (0.1) 0.4 (0.2) Q	22.5 (4.1) 36.7 (4.9) 53.9 (6.2) 67.8 (8.7) 80.7 (8.3) 79.2 (12.7) 82.6 (10.7) Q	7.1 (8.3) 19.2 (1.3) 7.7 (2.6) 10.1 (2.6) 12.6 (2.1) 10.0 (2.8) 11.9 (1.3) Q	10.6 (3.5) 6.0 (3.8) 3.7 (0.6) 3.8 (0.9) 4.9 (1.1) 4.6 (1.1) 3.8 (1.1) Q
INCOME LESS THAN \$5,000 \$5,000-\$9,999 \$10,000-\$14,999 \$15,000-\$19,999 \$20,000-\$24,999 \$25,000-\$34,999 \$35,000 OR MORE	0.5 (0.1) 0.9 (0.1) 0.9 (0.1) 0.4 (0.1) 0.3 (0.1) 0.5 (0.1) 0.3 (0.1)	54.6 (5.9) 55.0 (5.8) 60.3 (6.2) 61.8 (8.8) 71.0 (17.7) 60.8 (6.9) 77.2 (16.2)	10.9 (4.4) 5.5 (1.4) 11.9 (2.4) 8.4 (2.8) 14.1 (4.7) 14.6 (3.8) 16.7 (3.4)	4.7 (0.6) 3.8 (0.8) 4.3 (1.4) 5.7 (2.3) 4.7 (1.5) 7.6 (1.9) 9.5 (3.1)
NUMBER OF HOUSEHOLD MEMBERS ONE	0.6 (0.1) 1.2 (0.2) 0.8 (0.2) 0.6 (0.1) 0.4 (0.1)	59.8 (9.0) 62.2 (5.2) 54.7 (8.0) 58.0 (8.3) 72.7 (13.1)	3.2 (1.1) 8.3 (1.1) 9.9 (3.7) 15.5 (3.9) 25.0 (4.6)	3.5 (0.8) 4.9 (0.9) 5.2 (1.2) 4.5 (1.3) 10.1 (1.8)

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"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION.

SOURCE ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1980 RESIDENTIAL ENERGY CONSUMPTION SURVEY.

Table 21. Average Household Energy Expenditures by End **Use by Selected** Housing **Characteristics for** 1980

		ENO USE			
HOUSING CHARACTERISTICS	TOTAL EXPENDITURES (DOLLARS)	SPACE HEATING (DOLLARS)	COOLING (DOLLARS)	WATER HEATING (DOLLARS)	MISCELLANEOUS USE (DOLLARS)
NATIONAL	916 (14)	355 (9)	62 (3)	145 (3)	354 (6)
HOUSING STRUCTURE					
SINGLE-FAMILY DETATCHED	984 (15)	367 (9)	74 (3)	153 (3)	390 (7)
SINGLE-FAMILY ATTACHED	985 (77)	430 (53)	42 (6)	151 (14)	362 (20)
TWO TO FOUR UNITS	822 (34)	374 (20)	29 (7)	126 (5)	293 (9)
FIVE OR MORE UNITS	703 (43)	287 (48)	39 (5)	135 (12)	241 (13)
MOBILE HOME	789 (42)	285 (27)	66 (10)	99 (9)	339 (18)
YEAR HOUSE BUILT					
BEFORE 1940	981 (18)	469 (20)	29 (3)	146 (4)	337 (5)
1940-1949	898 (29)	370 (28)	45 (6)	146 (6)	337 (13)
1950-1959	919 (16)	347 (13)	66 (8)	134 (3)	372 (8)
1960-1964	932 (25)	344 (20)	64 (6)	140 (7)	383 (13)
1965-1969	858 (24)	291 (20)	74 (8)	137 (5)	356 (14)
1970-1974	900 (35)	295 (21)	86 (7)	150 (8)	369 (14)
1975 OR LATER	840 (33)	231 (19)	105 (8)	158 (10)	346 (13)
HEATED SQUARE FOOTAGE					
ZERO HEATED SQUARE FOOTAGE	702 (88)	Q.	13 (7)	180 (27)	509 (73)
1-799	686 (24)	285 (20)	34 (3)	116 (4)	250 (6)
800-999	739 (21)	283 (11)	46 (5)	126 (4)	285 (9)
1,000-1,199	849 (27)	331 (16)	56 (4)	142 (6)	321 (10)
1,200-1,399	888 (29)	320 (18)	69 (5)	145 (7)	354 (10)
1.400-1.799	971 (22)	357 (15)	77 (7)	151 (4)	386 (10)
1.800-2.399	1078 (21)	404 (12)	A1 (7)	166 (6)	429 (12)
2 400 00 MODE	1000 (21)	-754 (12) E7E (27)		177 (4)	467 (12)
2,400 UK HUKE	1202 (20)	222 (23)	05 (0)	7// (6)	405 (12)

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1960 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 22. Average Household Energy Expenditures by End Use by Selected Sociodemographic **Characteristics** for 1980

	1 	END USE			
SOCIODEMOGRAPHIC CHARACTERISTICS	TOTAL EXPENDITURES (DOLLARS)	SPACE HEATING (DOLLARS)	CDOLING (DOLLARS)	WATER HEATING (DOLLARS)	MISCELLANE OUS USE (DOLLARS)
NATIONAL	916 (14)	355 (9)	62 (3)	145 (3)	354 (6)
GEOGRAPHIC REGION NORTHEAST NORTH CENTRAL SOUTH WEST HEATING DEGREE DAYS 0-1,999 2.000-2.999	1268 (28) 910 (15) 876 (28) 603 (16) 761 (28) 717 (26)	627 (24) 388 (12) 261 (18) 170 (6) 109 (16)	22 (4) 39 (5) 128 (8) 24 (3) 134 (15) 124 (16)	199 (5) 126 (3) 149 (6) 101 (3) 140 (7) 112 (9)	420 (8) 356 (9) 338 (10) 308 (14) 378 (14)
3,000-3,999. 4,000-4,999. 5,000-5,999. 6,000-6,999. 7,000-7,999. 8,000 OR MORE.	791 (25) 824 (73) 1099 (48) 990 (26) 1011 (35) 979 (57)	262 (17) 316 (29) 495 (27) 457 (18) 506 (19) 450 (49)	$\begin{array}{c} 83 & (7) \\ 67 & (11) \\ 50 & (6) \\ 19 & (4) \\ 4 & (1) \\ 4 & (2) \end{array}$	128 (5) 138 (16) 169 (7) 145 (6) 149 (8) 149 (10)	317 (10) 302 (28) 384 (15) 370 (13) 351 (13) 376 (24)
INCOME LESS THAN \$5,000 \$5,000-\$9,999 \$10,000-\$14,999 \$15,000-\$19,999 \$20,000-\$24,999 \$25,000-\$24,999 \$35,000 CR MORE	753 (33) 805 (21) 837 (20) 900 (22) 986 (19) 1005 (22) 1206 (38)	347 (29) 342 (18) 339 (17) 330 (16) 367 (18) 365 (15) 414 (20)	26 (3) 36 (4) 49 (4) 61 (5) 73 (6) 81 (6) 123 (9)	120 (6) 132 (4) 136 (6) 146 (5) 154 (4) 155 (6) 176 (7)	260 (9) 296 (8) 312 (9) 363 (8) 392 (9) 404 (11) 492 (17)
NONER OF HOUSEHOLD HERBERS ONE	686 (25) 855 (15) 961 (21) 1053 (28) 1171 (33)	323 (19) 354 (11) 353 (12) 366 (19) 395 (18)	40 (3) 63 (4) 72 (5) 75 (5) 61 (6)	94 (4) 120 (3) 152 (5) 178 (5) 226 (6)	229 (6) 318 (8) 385 (8) 433 (10) 489 (13)

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1980 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 23. Average Household Energy **Expenditures for** Space Heating by Main Heating Fuel by Selected Housing Characteristics for 1980

	MAIN HEATING FUEL					
HOUSING CHARACTERISTICS	ELECTRICITY (DOLLARS)	NATURAL GAS (DOLLARS)	FUEL OIL OR KEROSENE (DOLLARS)			
NATIONAL	241 (24)	285 (5)	773 (20)			
HOUSING STRUCTURE SINGLE-FAMILY DETATCHED SINSLE-FAMILY ATTACHED TWO TO FOUR UNITS FIVE OR MORE UNITS MOBILE HOME	309 (24) 322 (75) 163 (53) 123 (14) 234 (41) 268 (53) 264 (53) 241 (54) 302 (53) 246 (23) 267 (27) 202 (25)	303 (6) 278 (28) 300 (16) 174 (32) 192 (20) 352 (12) 278 (12) 259 (10) 268 (12) 253 (16) 245 (14)	788 (19) 882 (85) 850 (90) 723 (348) 482 (62) 739 (57) 732 (32) 726 (72) 707 (76) 660 (82) 604 (94)			
HEATED SQUARE FOOTAGE 1-799	156 (21) 187 (17) 211 (35) 242 (38) 267 (32) 370 (29) 357 (33)	194 (9) 223 (12) 264 (13) 256 (11) 294 (12) 335 (12) 437 (20)	652 (53) 656 (65) 728 (37) 692 (51) 796 (35) 862 (47) 984 (38)			

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END

USE, ENERGY END USE DIVISION, THE 1980 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 24. Average Household Energy Expenditures for Space Heating by Main Heating Fuel by Selected Sociodemographic Characteristics for 1980

SOCIODEMOGRAPHIC CHARACTERISTICS	ELECTRICITY (DOLLARS)	NATURAL GAS (DOLLARS)	FUEL OIL OR KEROSENE (DOLLARS)			
NATIONAL	241 (24)	285 (5)	773 (20)			
GEOGRAPHIC REGION						
NORTHEAST	426 (44)	456 (20)	857 (22)			
NORTH CENTRAL	359 (42)	353 (11)	706 (29)			
SOUTH	205 (34)	220 (10)	622 (32)			
WEST	150 (8)	160 (5)	536 (37)			
HEATING DEGREE DAYS						
0-1,999	86 (36)	103 (6)	Q			
2,000-2,999	154 (13)	155 (8)	Q			
3,000-3,999	248 (21)	209 (13)	598 (17)			
4,000-4,999	270 (33)	269 (23)	685 (58)			
5,000-5,999	364 (30)	368 (16)	780 (51)			
6,000-6,999	352 (60)	369 (9)	842 (37)			
7,000-7,999	358 (63)	422 (24)	877 (48)			
8,000 OR MORE	495 (152)	390 (33)	810 (64)			
INCOME						
LESS THAN \$5,000	228 (25)	261 (16)	760 (79)			
\$5,000-\$9,999	206 (37)	261 (11)	764 (68)			
\$10,000-\$14,999	222 (23)	271 (12)	712 (44)			
\$15,000-\$19,999	225 (32)	266 (10)	763 (50)			
\$20,000~\$24,999	264 (31)	304 (14)	799 (69)			
\$25,000~\$34,999	242 (28)	302 (11)	779 (40)			
\$35,000 OR MORE	320 (46)	334 (20)	891 (44)			
NUMBER OF HOUSEHOLD MEMBERS						
ONE	185 (21)	235 (10)	760 (57)			
τωο	223 (34)	277 (6)	752 (30)			
THREE	269 (24)	281 (11)	783 (50)			
FOUR	279 (32)	322 (13)	741 (39)			
FIVE OR MORE	338 (42)	327 (12)	880 (47)			

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1980 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 25. Average Household Electricity **Consumption When** Main Heating Fuel is **Electricity** by End Use by Selected Housing **Characteristics for** 1981

		END USE			
HOUSING CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING (MILLION BTU)	COOLING (MILLION BTU)	WATER HEATING (MILLION BTU)	 MISCELLANE OUS USE (MILLION BTU)
NATIONAL	14.2 (1.1)	19.2 (1.3)	6.6 (0.6)	10.4 (0.4)	17.2 (0.6)
HOUSING STRUCTURE SINGLE-FAMILY DETATCHED SINGLE-FAMILY ATTACHED TWO TO FOUR UNITS FIVE OR MORE UNITS MOBILE HOME YEAR HOUSE BUILT BEFORE 1940 1940-1949 1950-1959 1960-1964 1965-1969 1970-1974 1975 OR LATER	6.6 (0.5) 0.7 (0.3) 1.8 (0.3) 4.3 (0.6) 0.8 (0.2) 1.2 (0.2) 0.5 (0.1) 1.1 (0.1) 0.9 (0.2) 1.8 (0.3) 3.3 (0.3) 5.4 (0.7)	22.2 (1.1) 14.1 (7.3) 15.8 (1.6) 16.8 (2.6) 19.0 (2.1) 23.2 (4.9) 19.0 (2.9) 14.7 (2.3) 17.7 (2.6) 20.2 (1.4) 18.6 (1.9)	8.9 (0.6) 9.4 (0.8) 5.0 (4.6) 3.9 (1.0) 4.4 (0.7) 3.1 (0.8) 6.2 (2.2) 6.0 (1.2) 6.8 (1.7) 7.9 (1.2) 6.0 (0.9) 7.6 (1.0)	12.7 (0.5) 8.5 (1.3) 8.0 (1.1) 8.0 (0.6) 10.3 (0.8) 7.8 (0.8) 8.3 (1.3) 9.0 (0.7) 10.1 (1.0) 9.3 (0.8) 11.2 (0.7) 11.3 (0.6)	22.2 (0.7) 14.8 (2.0) 13.5 (1.0) 11.3 (0.6) 17.0 (1.1) 13.6 (1.1) 18.1 (1.2) 17.1 (1.2) 16.9 (1.4) 16.6 (1.1) 17.5 (1.1) 17.9 (0.7)
HEATED SQUARE FOOTAGE 1-799	3.9 (0.4) 2.6 (0.3) 2.0 (0.3) 1.5 (0.2) 1.8 (0.3) 1.4 (0.2) 1.1 (0.2)	15.7 (1.4) 15.9 (1.4) 17.2 (2.2) 18.9 (3.5) 28.0 (2.6) 32.2 (2.9)	3.0 (0.6) 4.5 (0.7) 4.7 (0.9) 10.0 (2.3) 10.2 (1.2) 9.6 (1.5) 14.5 (1.8)	6.8 (0.4) 8.9 (0.5) 11.3 (0.6) 12.2 (0.9) 10.8 (1.2) 13.9 (1.1) 17.0 (0.8)	11.1 (0.5) 14.4 (0.6) 17.5 (0.7) 19.0 (1.0) 20.8 (2.1) 24.0 (1.8) 28.0 (0.9)

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 26. Average **Household Electricity Consumption When** Main Heating Fuel is **Electricity by End Use by Selected** Sociodemographic **Characteristics for** 1981

	 	END USE			
SOCIODEMOGRAPHIC CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	 SPACE HEATING (MILLION BTU)	COOLING (MILLION BTU)	 WATER HEATING (MILLION BTU)	 MISCELLANEOUS USE (MILLION BTU)
NATIONAL	14.2 (1.1)	19.2 (1.3)	6.6 (0.6)	10.4 (0.4)	17.2 (0.6)
GEOGRAPHIC REGION					
NORTHEAST	1.5 (0.3)	33.2 (2.8)	1.3 (0.4)	12.1 (0.9)	16.8 (2.1)
NORTH CENTRAL	1.6 (0.3)	29.3 (4.3)	2.4 (0.5)	9.5 (0.8)	14.0 (1.2)
SOUTH	7.7 (0.9)	13.3 (2.0)	10.5 (0.8)	10.2 (0.8)	18.2 (1.0)
WEST	3.4 (0.3)	21.5 (1.8)	2.3 (0.7)	10.4 (0.6)	16.5 (0.9)
HEATING DEGREE DAYS					
0-1,999	3.5 (1.0)	4.1 (1.9)	15.2 (1.1)	8.2 (1.3)	16.7 (1.9)
2,000-2,999	1.7 (0.3)	11.7(1.3)	7.8 (1.8)	9.2 (1.1)	16.1 (1.6)
3,000-3,999	2.1 (0.4)	18.3 (1.9)	6.4(1.3)	10.0 (1.4)	18.0 (1.5)
4,000-4,999	2.0 (0.5)	20.9 (1.5)	3.8 (1.2)	11.1 (0.9)	18,2 (1.5)
5,000-5,999	2.4 (0.3)	30.4 (2.1)	1.7 (0.5)	12.9 (0.7)	18.4 (1.0)
6,000-6,999	1.9 (0.5)	32.3 (2.3)	1.8 (0.4)	12.8 (0.7)	17.2 (1.2)
7.000-7.999	0.4 (0.2)	30.1 (5.6)	0.1(0.1)	6.7 (0.9)	11.7 (2.6)
8,000 OR MORE	0.4 (0.1)	42.9 (10.9)	0.4 (0.3)	9.8 (3,5)	14.5 (3.9)
INCOME					
LESS THAN \$5,000	2.0 (0.2)	14.8 (1.4)	4.0 (0.9)	7.2 (0.7)	11.7 (0.8)
\$5,000-\$9,999	2.2 (0.3)	17.5 (1.7)	4.5 (0.6)	7.6 (0.6)	13.8 (0.7)
\$10,000-\$14,999	2.2 (0.2)	19.9 (1.4)	4.5 (0.5)	10.0 (0.5)	16.4 (0.9)
\$15,000-\$19,999	2.1 (0.3)	23.1 (2.1)	4.6 (0.9)	11.1 (0.7)	17.7 (1.2)
\$20,000-\$24,999	1.8 (0.3)	18.2 (2.3)	6.8 (1.0)	11.0 (0.8)	18.2 (1.1)
\$25,000-\$34,999	1.9 (0.2)	20.9 (2.5)	8.9 (1.4)	12.2(1.1)	21.7 (1.5)
\$35,000 OR MORE	2.1 (0.3)	20.0 (2.3)	13.6 (1.1)	13.9 (0,8)	21.3 (0.9)
NUMBER OF HOUSEHOLD MEMBERS					
ONE	3.1 (0.3)	16.7 (1.8)	3.6 (0.5)	5.6 (0.5)	10.2 (0.6)
τωο	5.4 (0.6)	18.3 (2.1)	6.6 (0.7)	9.1 (0.5)	15.7 (0.6)
THREE	2.4 (0.3)	19.9 (1.6)	9.1 (1.3)	12.1 (0.5)	20.1 (0.7)
FOUR	2.1 (0.2)	20.5 (1.6)	7.8 (1.4)	14.0 (0.8)	22.2 (1.0)
FIVE OR MORE	1.2 (0.1)	25.4 (2.2)	7.2 (1.2)	18.0 (1.0)	26.3 (1.4)

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION. SOURCE ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.

Table 27. Average Household Natural **Gas Consumption** When Main Heating Fuel is Natural Gas by End Use by Selected Housing Characteristics for 1981

		END USE		
HOUSING CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING (MILLION BTU)	WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)
NATIONAL	46.2 (1.5)	81.8 (1.7)	21.4 (0.4)	8.7 (0.4)
HOUSING STRUCTURE SINGLE-FAMILY DETATCHED SINGLE-FAMILY DETATCHED THO TO FOUR UNITS FIVE OR MORE UNITS MOBILE HOHE YEAR HOUSE BUILT BEFORE 1940 1940-1949 1950-1959 1965-1969 1970-1974 1975 OR LATER.	$\begin{array}{c} 32.5 \ (1.3) \\ 1.7 \ (0.2) \\ 5.6 \ (0.5) \\ 5.1 \ (0.6) \\ 1.3 \ (0.3) \end{array}$ $\begin{array}{c} 14.2 \ (0.8) \\ 4.4 \ (0.3) \\ 9.0 \ (0.6) \\ 4.8 \ (0.5) \\ 4.8 \ (0.6) \\ 4.8 \ (0.3) \\ 4.1 \ (0.4) \end{array}$	88.0 (2.0) 71.6 (6.7) 79.0 (4.6) 53.3 (10.3) 65.2 (7.7) 100.8 (3.6) 77.8 (4.8) 76.8 (2.7) 77.7 (5.0) 73.3 (3.5) 67.8 (6.3) 63.7 (3.8)	24.3 (0.4) 20.4 (0.7) 15.7 (1.1) 10.7 (1.7) 14.5 (2.2) 20.6 (0.7) 17.6 (0.9) 21.7 (0.7) 24.9 (1.0) 22.2 (1.4) 21.5 (1.3) 22.1 (1.7)	9.7 (0.5) 9.4 (0.8) 6.5 (0.9) 4.2 (1.3) 9.5 (1.3) 8.7 (0.5) 8.3 (0.7) 10.2 (0.8) 9.6 (1.2) 8.5 (0.7) 7.4 (1.0) 6.6 (2.2)
HEATED SQUARE FOOTAGE 1-799	8.0 (0.5) 6.0 (0.4) 5.9 (0.4) 4.6 (0.4) 7.3 (0.4) 7.8 (0.5) 6.6 (0.5)	57.6 (2.7) 68.4 (3.0) 66.0 (2.5) 67.5 (3.5) 83.1 (2.9) 95.2 (1.9) 131.4 (5.7)	11.0 (0.8) 15.2 (1.1) 18.3 (0.6) 20.4 (0.9) 21.9 (0.7) 27.0 (0.7) 35.8 (0.9)	6.4 (0.3) 6.8 (0.5) 8.8 (1.1) 8.0 (0.7) 9.5 (0.8) 8.5 (0.7) 13.0 (2.3)

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED

DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 28. Average **Household Natural Gas Consumption** When Main Heating **Fuel is Natural Gas** by End Use by Selected Sociodemographic Characteristics for 1981

		END USE			
SOCIODEMOGRAPHIC CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING (MILLION BTU)	WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)	
NATIONAL	46.2 (1.5)	81.8 (1.7)	21.4 (0.4)	8.7 (0.4)	
GEOGRAPHIC REGION NORTHEAST NORTH CENTRAL	7.0 (1.0) 15.4 (0.6) 13.0 (0.9)	103.5 (3.2) 113.0 (3.1) 58.0 (3.1)	22.4 (0.9) 22.6 (0.9) 19.6 (1.0)	9.4 (0.6) 8.2 (0.5) 8.5 (0.7)	
WEST,	10.8 (0.4)	51.6 (1.7)	21.1 (0.7)	9.2 (1.6)	
HEATING DEGREE DATS 0-1,999 2,000-2,999 3,000-3,999 4,000-4,999 5,000-5,999 6,000-6,999 7,000-7,999 8,000 OR MORE	3.4 (1.0) 9.0 (0.9) 5.4 (0.7) 2.8 (0.7) 7.4 (1.2) 9.0 (1.3) 6.7 (1.0) 2.6 (0.7)	32.8 (2.3) 40.0 (1.1) 62.0 (2.7) 74.9 (7.4) 94.6 (3.0) 111.6 (2.8) 115.8 (6.0) 112.6 (3.3)	20.2 (1.4) 21.7 (1.0) 17.9 (1.4) 20.9 (1.4) 20.8 (0.8) 23.2 (0.9) 23.5 (1.9) 19.3 (1.4)	10.0 (1.4) 11.7 (1.7) 6.4 (0.6) 7.4 (1.3) 7.9 (0.8) 8.5 (0.8) 9.1 (0.6) 4.3 (0.6)	
INCOME LESS THAN \$5,000 \$5,000-\$9,999 \$10,000-\$14,999 \$15,000-\$19,999 \$20,000-\$24,999 \$25,000-\$34,999 \$35,000 OR MORE	5.1 (0.4) 7.2 (0.4) 6.7 (0.3) 5.5 (0.3) 5.8 (0.4) 8.2 (0.4) 7.8 (0.6)	70.5 (5.1) 81.8 (4.2) 78.9 (3.0) 81.1 (5.1) 79.3 (3.3) 83.2 (4.2) 92.7 (5.7)	14.3 (1.0) 17.4 (1.2) 19.3 (0.7) 19.8 (1.1) 22.4 (0.9) 24.5 (0.6) 28.4 (1.0)	7.5 (0.7) 7.3 (0.4) 7.5 (0.8) 7.5 (0.5) 8.5 (0.7) 8.6 (0.7) 13.0 (1.6)	
NUMBER OF HOUSEHOLD MEMBERS ONE	8.5 {0.5} 14.9 (0.5) 8.6 (0.5) 8.1 (0.5) 6.1 (0.4)	72.2 (3.5) 80.6 (2.6) 87.6 (3.9) 83.2 (3.4) 88.3 (3.1)	9.0 (0.5) 16.6 (0.4) 23.3 (0.6) 28.6 (0.7) 38.0 (1.1)	5.9 (0.4) 8.3 (0.7) 8.9 (0.8) 10.6 (1.3) 10.8 (1.0)	

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE.

NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 29. Average Household Fuel **Ŏil** or Kerosene Consumption When Main Heating Fuel is **Fuel Oil or Kerosene** by End Use by Selected Housing **Characteristics for** 1981

		 	END USE	
HOUSING CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING (MILLION BTU)	WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)
NATIONAL	12.2 (0.6)	87.9 (2.8)	15.1 (1.2)	Q
HOUSING STRUCTURE SINGLE-FAMILY DETATCHED SINGLE-FAMILY ATTACHED TWO TO FCUR UNITS FIVE OR HORE UNITS MOBILE HOME YEAR HOUSE BUILT BEFORE 1940	7.0 (0.5) 0.5 (0.2) 1.7 (0.1) 2.3 (0.2) 0.7 (0.2) 5.1 (0.4) 1.2 (0.2) 2.2 (0.2) 1.1 (0.1) 1.0 (0.2) 1.1 (0.2) 0.5 (0.1)	93.1 (3.1) 88.3 (12.8) 90.5 (11.2) 9 51.1 (5.0) 97.3 (4.8) 81.3 (6.8) 86.3 (5.6) 78.2 (6.9) 85.1 (8.2) 75.7 (6.6) 67.2 (9.6)	11.7 (1.0) 16.0 (8.9) 20.9 (7.0) Q 0.9 (0.8) 15.9 (3.7) 11.9 (4.9) 15.8 (2.1) 16.0 (3.1) 14.3 (3.7) 15.7 (4.8) 9.7 (4.4)	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
HEATED SQUARE FOOTAGE 1-799	2.9 (0.4) 1.7 (0.2) 1.2 (0.2) 0.9 (0.2) 1.7 (0.2) 1.7 (0.2) 2.1 (0.3)	71.9 (7.4) 75.7 (8.7) 71.4 (6.1) 83.8 (7.9) 97.3 (4.9) 96.8 (7.2) 116.4 (7.2)	15.0 (7.2) 18.0 (7.3) 10.8 (5.0) 12.5 (3.1) 15.8 (3.4) 11.6 (2.6) 18.6 (3.1)	ନ ଜ ଜ ଜ ଜ ଜ

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE.

NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED

DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 30. Average Household Fuel Oil or Kerosene Consumption When Main Heating Fuel is Fuel Oil or Kerosene by End Use by Selected Sociodemographic Characteristics for 1981

			END USE	
SOCIODEMOGRAPHIC CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING (MILLION BTU)	WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)
NATIONAL	12.2 (0.6)	87.9 (2.8)	15.1 (1.2)	Q
GEOGRAPHIC REGION				
NORTHEAST	7.9 (0.4)	94.4 (3.9)	22.2 (1.4)	Q
NORTH CENTRAL	1.7 (0.2)	94.1 (4.2)	0.7 (0.7)	Q
SOUTH	2.2 (0.4)	63.7 (10.3)	2.9 (1.5)	Q
WEST	0.4 (0.1)	67.7 (9.2)	Q	9
HEATING DEGREE DAYS				
0-1,999	0.4(0.3)	35.8 (5.0)	0.1 (0.1)	Q
2.000-2.999	Q	Q	Q	Q
3.000-3.999	0.6 (0.3)	57.6 (14.4)	Q	Q
4.000-4.999	0.8 (0.4)	75.8 (9.2)	5.9 (2.8)	Q
5.000-5.999	4.9 (0.6)	90.0 (6.8)	21.5(4.9)	Q
6.000-6.999	2.8 (0.5)	54.4 (8.3)	17.3 (3.1)	Q
7.000-7.999	1.1 (0.3)	97.7 (5.5)	14.1 (3.2)	Q
8,000 OR MORE	1.4 (0.5)	92.8 (5.9)	4,8 (3,1)	Q
INCOME				
LESS THAN \$5,000	1.2 (0.1)	79.9 (7.0)	11.1 (7.0)	Q
\$5.000-\$9.999	2.3 (0.3)	83.3 (4.5)	13.0 (5.7)	Q
\$10,000-\$14,999	2.1 (0.2)	84.0 (9.5)	14.0 (3.4)	Q
\$15,000-\$19,999	1.5 (0.1)	81.9 (5.8)	15.5 (3,9)	Q
\$20,000-\$24,999	1.6 (0.3)	89.5 (6.0)	15.9 (5.3)	Q
\$25,000-\$34,999	1.8 (0.2)	84.0 (6.0)	15.4 (2.2)	Q
\$35,000 OR MORE	1.8 (0.2)	111.3 (7.8)	20.5 (2.9)	Q
NUMBER OF HOUSEHOLD MEMBERS				
ONF.	2.6 (0.3)	87.9 (10.8)	7.5 (2.3)	Q
ТМО	4.1 (0.2)	89.7 (3.4)	11.4 (1.8)	Q
THREE	2.1 (0.2)	77.6 (5.3)	13.8 (3.4)	Q
FOUR	1.9 (0.2)	86.4 (5.0)	22.0 (3.0)	ġ
FIVE OR MORE	1.4 (0.2)	100.1 (9.5)	32.0 (6.2)	G.

"Q" = DATA WITHNELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS.

NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED

DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 31. Average Household LPG **Consumption When** Main Heating Fuel is LPG by End Use by Selected Housing Characteristics for 1981

		END USE			
HOUSING CHARACTERISTICS	NUMBER OF HOUSEHOLDS (NILLION)	SPACE HEATING (MILLION BTU)	 WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)	
NATIONAL	3.7 (0.4)	55.2 (4.5)	8.2 (0.8)	3.1 (0.3)	
HOUSING STRUCTURE SINGLE-FAMILY DETATCHED SINGLE-FAMILY ATTACHED TWO TO FOUR UNITS FIVE OR MORE UNITS NOBILE HOME YEAR HOUSE BUILT BEFORE 1940 1940-1949 1950-1959 1960-1964 1965-1969	2.6 (0.4) Q Q 1.1 (0.2) 1.2 (0.2) 0.2 (0.1) 0.3 (0.1) 0.3 (0.1)	64.0 (4.9) Q Q 33.8 (5.6) 78.4 (7.2) 47.4 (6.2) 36.6 (16.0) 53.7 (21.3) 49.2 (9.9)	9.2 (0.9) Q Q 6.0 (1.1) 9.1 (1.2) 10.5 (4.5) 6.2 (1.7) 8.4 (4.5) 6.1 (3.4)	2.4 (0.3) Q Q 4.9 (0.4) 3.0 (0.4) 3.0 (0.6) 1.1 (0.6) 2.1 (0.6) 3.9 (0.7)	
1970-1974 1975 CR LATER	0.7 (0.1) 0.6 (0.2)	43.3 (7.8) 38.6 (5.2)	8.7 (1.4) 7.0 (1.9)	4.5 (0.6) 3.1 (0.6)	
HEATED SQUARE FOOTAGE 1-799	0.9 (0.2) 0.5 (0.1) 0.5 (0.1) 0.5 (0.1) 0.6 (0.1) 0.6 (0.1) 0.4 (0.1) 0.3 (0.1)	31.6 (10.6) 43.5 (6.0) 51.4 (8.0) 68.8 (16.9) 60.9 (8.8) 79.7 (11.2) 94.3 (14.2)	5.9 (1.5) 6.3 (1.5) 8.4 (2.0) 5.7 (1.9) 10.3 (2.3) 14.5 (2.5) 10.7 (3.4)	3.6 (0.8) 4.4 (0.3) 2.7 (0.7) 2.3 (1.2) 3.0 (0.5) 2.7 (1.4) 2.5 (1.2)	

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED

DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



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Table 32. Average Household LPG **Consumption When** Main Heating Fuel is LPG by End Use by Selected Sociodemographic Characteristics for 1981

		END USE		
SOCIODEMOGRAPHIC CHARACTERISTICS	NUMBER OF HOUSEHOLDS (MILLION)	SPACE HEATING (MILLION BTU)	WATER HEATING (MILLION BTU)	MISCELLANEOUS USE (MILLION BTU)
NATIONAL	3.7 (0.4)	55.2 (4.5)	8.2 (0.8)	3.1 (0.3)
GEOGRAPHIC REGION NORTHEAST NORTH CENTRAL SOUTH	0.1 (0.1) 1.0 (0.2) 2.1 (0.4) 0.4 (0.1) 0.7 (0.1)	93.2 (39.0) 86.7 (8.3) 37.8 (4.4) 57.9 (18.4) 20.0 (6.2)	12.2 (5.7) 11.2 (1.1) 5.3 (1.0) 14.7 (3.0)	6.4 (3.0) 2.8 (0.4) 3.1 (0.4) 3.5 (0.6) 4.8 (0.4)
2,000-2,999. 3,000-3,999. 4,000-4,999. 5,000-5,999. 6,000-6,999. 7,000-7,999. 8,000 OR MORE.	0.6 (0.3) 0.8 (0.2) 0.4 (0.2) 0.4 (0.1) 0.3 (0.1) 0.2 (0.1) 0.3 (0.1)	36.6 { 4.3} 49.3 { 4.3} 59.8 { 6.4} 85.8 { 6.2} 117.6 { 26.5} 98.8 { 13.3} 72.1 { 12.4}	10.9 (3.3) 5.7 (2.0) 8.2 (3.2) 12.0 (2.2) 9.8 (4.2) 16.8 (4.5) 10.0 (2.8)	2.8 (0.7) 1.8 (0.7) 3.5 (1.0) 3.1 (0.8) 1.0 (1.3) 5.1 (2.1) 3.8 (0.8)
INCOME LESS THAN \$5,000 \$10,000-\$14,999 \$10,000-\$14,999 \$20,000-\$24,999 \$25,000-\$24,999 \$25,000-\$34,999 \$35,000 OR MORE	0.6 (0.1) 0.7 (0.1) 0.4 (0.1) 0.5 (0.1) 0.6 (0.2) 0.4 (0.1) 0.4 (0.1)	42.5 (6.2) 55.9 (6.9) 57.6 (8.5) 58.9 (11.2) 51.4 (20.9) 51.1 (8.8) 75.3 (10.2)	6.0 (2.8) 8.2 (1.5) 7.2 (2.1) 10.3 (2.5) 4.5 (2.9) 7.4 (3.4) 15.8 (2.3)	2.6 (0.8) 3.9 (0.5) 3.0 (0.5) 3.0 (0.8) 3.7 (1.5) 3.0 (1.2) 3.5 (0.7)
NUMBER OF HOUSEHOLD MEMBERS ONE	0.6 (0.1) 1.4 (0.2) 0.6 (0.2) 0.6 (0.2) 0.4 (0.1)	37.7 (9.9) 51.9 (4.9) 70.4 (9.1) 57.3 (15.1) 66.3 (20.6)	5.6 (2.3) 6.6 (1.1) 9.1 (1.5) 9.5 (2.7) 14.2 (3.6)	3.3 (0.8) 3.3 (0.4) 3.0 (0.3) 3.2 (1.0) 2.5 (0.6)

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"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. Note: Because of Rounding, data may not sum to totals. Number in parenthesis indicates one standard deviation. See Appendix B for a detailed

DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 33. Average Household Energy Expenditures by End Use by Selected Housing Characteristics for 1981

	!					
	1	END USE				
HOUSING CHARACTERISTICS	TOTAL	SPACE HEATING	COOLING (DOLLARS)	WATER HEATING (DOLLARS)	MISCELLANEOUS USE (DOLLARS)	
NATIONAL	1022 (17)	403 (12)	72 (4)	152 (3)	396 (7)	
HOUSING STRUCTURE						
SINGLE-FAMILY DETATCHED	1088 (20)	415 (12)	84 (5)	160 (3)	430 (7)	
SINGLE-FAMILY ATTACHED	1015 (53)	411 (44)	69 (28)	144 (13)	390 (18)	
TWO TO FOUR UNITS	969 (37)	440 (34)	36 (6)	140 (12)	353 (13)	
FIVE OR MORE UNITS	827 (39)	356 (59)	44 (9)	131 (16)	297 (11)	
MOBILE HOME	843 (54)	296 (21)	74 (12)	141 (12)	332 (22)	
YEAR HOUSE BUILT						
BEFORE 1940	1091 (27)	520 (21)	25 (3)	150 (6)	396 (9)	
1940-1949	964 (34)	388 (18)	58 (8)	136 (6)	382 (19)	
1950-1959	998 (20)	383 (16)	71 (7)	135 (5)	409 (10)	
1960-1964	1061 (39)	370 (19)	96 (11)	150 (7)	446 (17)	
1965-1969	1023 (31)	369 (29)	104 (10)	148 (7)	402 (11)	
1970-1974	995 (38)	350 (26)	98 (7)	167 (9)	380 (13)	
1975 OR LATER	940 (25)	287 (18)	115 (12)	174 (6)	364 (9)	
HEATED SQUARE FOOTAGE						
ZERO HEATED SQUARE FOOTAGE	717 (67)	Q	Q	182 (13)	533 (65)	
1-799	737 (19)	315 (23)	33 (5)	109 (5)	279 (8)	
800-999	860 (28)	346 (24)	53 (4)	131 (6)	331 (10)	
1,000-1,199	903 (25)	333 (18)	62 (5)	141 (7)	367 (13)	
1,200-1,399	975 (26)	347 (22)	84 (12)	150 (5)	394 (12)	
1,400-1,799	1103 (31)	422 (19)	92 (6)	156 (7)	433 (14)	
1,800-2,399	1192 (18)	468 (15)	89 (8)	174 (5)	461 (7)	
2,400 DR MORE	1511 (53)	627 (30)	112 (13)	220 (7)	552 (21)	

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 34. Average **Household Energy** Expenditures by End **Use by Selected** Sociodemographic Characteristics for 1981

		END USE			
SOCIODEMOGRAPHIC CHARACTERISTICS	 TOTAL EXPENDITURES (DOLLARS)	 SPACE HEATING (DOLLARS)	COOLING (DOLLARS)	WATER HEATING	MISCELLANEOUS USE (DOLLARS)
NATIONAL	1022 (17)	403 (12)	72 (4)	152 (3)	396 (7)
GEOGRAPHIC REGION					
NORTHEAST	1426 (35)	675 (32)	26 (6)	218 (10)	507 (15)
NORTH CENTRAL	1042 (32)	487 (21)	41 (6)	127 (4)	387 (12)
SOUTH	922 (28)	266 (19)	148 (9)	150 (5)	357 (10)
WEST	739 (22)	226 (8)	31 (5)	113 (4)	350 (15)
HEATING DEGREE DAYS					
0-1,999	952 (47)	138 (31)	265 (15)	157 (10)	391 (17)
2,000-2,999	755 (26)	180 (8)	85 (9)	112 (6)	378 (14)
3,000-3,999	850 (19)	282 (14)	84 (8)	141 (10)	343 (16)
4,000-4,999	932 (61)	345 (30)	76 (13)	149 (13)	362 (21)
5,000-5,999	1207 (56)	539 (33)	42 (6)	176 (7)	449 (22)
6,000-6,999	1158 (50)	558 (32)	25 (5)	163 (6)	412 (18)
7,000-7,999	1128 (49)	552 (27)	26 (8)	146 (10)	404 (19)
8,000 OR MORE	1030 (39)	501 (35)	7 (3)	158 (20)	363 (14)
INCOME					
LESS THAN \$5,000	765 (29)	335 (22)	39 (6)	109 (6)	281 (12)
\$5,000-\$9,999	986 (27)	396 (25)	47 (5)	129 (7)	335 (10)
\$10,000-\$14,999	959 (31)	399 (19)	55 (5)	140 (4)	366 (11)
\$15,000-\$19,999	986 (26)	395 (23)	54 (5)	154 (6)	383 (9)
\$20,000-\$24,999	1043 (25)	396 (23)	73 (3)	161 (6)	413 (11)
\$25,000-\$34,999	1106 (30)	399 (23)	85 (7)	168 (6)	454 (11)
\$35,000 OR MORE	1333 (53)	483 (28)	141 (11)	195 (8)	514 (19)
NUMBER OF HOUSEHOLD MEMBERS					
ONE	767 (23)	390 (26)	43 (3)	79 (3)	255 (10)
тко	956 (21)	401 (36)	74 (5)	125 (3)	355 (8)
THREE	1076 (25)	406 (19)	83 (6)	160 (4)	428 (9)
FOUR	1157 (26)	394 (16)	85 (10)	201 (6)	477 (8)
FIVE OR MORE	1307 (24)	434 (15)	73 (7)	250 (9)	551 (11)

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 35. Average Household Energy Expenditures for Space Heating by Main Heating Fuel by Selected Housing **Characteristics for** 1981

	MAIN HEATING FUEL				
HOUSING CHARACTERISTICS	ELECTRICITY (DOLLARS)	NATURAL GAS (DOLLARS)	FUEL OIL OR KEROSENE (DOLLARS)		
NATIONAL	289 (20)	367 (7)	780 (26)		
HOUSING STRUCTURE SINGLE-FAMILY DETATCHED SINGLE-FAMILY ATTACHED THO TO FOUR UNITS FIVE OR MORE UNITS MOBILE HOME YEAR HOUSE BUILT BEFORE 1940 1940-1949 1950-1959 1960-1964	308 (17) 203 (93) 247 (31) 299 (46) 248 (29) 330 (28) 300 (64) 273 (44) 204 (33)	382 (8) 374 (4) 396 (23) 259 (52) 286 (37) 459 (16) 346 (21) 327 (10) 341 (22)	826 (29) 782 (104) 805 (95) 9 468 (47) 867 (43) 717 (57) 763 (50) 694 (63)		
1965-1969 1970-1974 1975 OR LATER	265 (41) 324 (20) 283 (30)	344 (16) 305 (27) 287 (19)	753 (76) 676 (64) 597 (86)		
HEATED SQUARE FOOTAGE 1-799	270 (21) 236 (22) 274 (21) 257 (31) 265 (49) 404 (40) 453 (37)	265 (13) 313 (15) 304 (10) 298 (19) 373 (16) 424 (10) 570 (24)	643 (64) 675 (77) 634 (54) 742 (66) 858 (45) 861 (65) 1030 (69)		

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES DNE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 36. Average Household Energy Expenditures for Space Heating by Main Heating Fuel by Selected Sociodemographic Characteristics for 1981

	MAIN HEATING FUEL			
SOCIODEMOGRAPHIC CHARACTERISTICS	ELECTRICITY (DOLLARS)	NATURAL GAS (DOLLARS)	FUEL OIL OR KEROSENE (DOLLARS)	
NATIONAL	289 (20)	367 (7)	780 (26)	
GEOGRAPHIC REGION NORTHEAST NORTH CENTRAL SOUTH WEST	644 (81) 442 (71) 212 (32) 233 (15)	568 (23) 470 (15) 267 (15) 208 (8)	841 (36) 820 (39) 569 (85) 592 (83)	
HEATING DEGREE DAYS 0-1,999	77 (31) 198 (27) 284 (22) 310 (29) 393 (32) 505 (75) 541 (108) 601 (114)	169 (11) 164 (6) 260 (16) 330 (39) 475 (18) 479 (19) 527 (23) 465 (14)	328 (46) Q 517 (137) 670 (75) 801 (64) 846 (73) 875 (49) 811 (44)	
INCOME LESS THAN \$5,000 \$10,000-\$14,999 \$15,000-\$14,999 \$25,000-\$24,999 \$25,000-\$24,999 \$35,000 CR MORE	247 (21) 271 (24) 285 (22) 366 (35) 271 (35) 296 (36) 287 (28)	320 (24) 364 (18) 357 (13) 366 (23) 356 (16) 373 (19) 412 (22)	712 (62) 738 (40) 749 (85) 727 (51) 793 (51) 743 (52) 991 (74)	
NUMBER OF HOUSEHOLD MEMBERS ONE	268 (25) 284 (32) 287 (21) 285 (21) 376 (36)	328 (15) 359 (11) 397 (17) 371 (16) 391 (15)	780 (92) 794 (31) 689 (49) 771 (44) 892 (86)	

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. Note: Because of Rounding, data may not sum to totals. Number in parenthesis indicates one standard deviation. See Appendix B for A DETAILED DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 37. Percent of **Average Household** Electricity **Consumption Used** for Space Heating When Main Heating Fuel is Electricity by **Selected Housing Characteristics for** 1978, 1980, 1981

PERCENT OF ELECTRICITY USED FOR SPACE HEATING BY YEAR				
1978	1980	1981		
46 (2.0)	33 (2.0)	36 (1.0)		
45 (2.0)	33 (2.0)	34 (1.0)		
56 (9.0)	41 (2.0)	30 (12.0)		
39 (7.0)	35 (10.0)	37 (4.0)		
43 (5.0)	27 (3.0)	42 (4.0)		
52 (1.0)	38 (3.0)	37 (2.0)		
59 (2.0)	48 (5.0)	49 (2.0)		
54 (5.0)	41 (2.0)	42 (6.0)		
43 (5.0)	36 (4.0)	37 (4.0)		
42 (3.0)	40 (4.0)	30 (3.0)		
44 (3.0)	36 (2.0)	34 (4.0)		
46 (3.0)	34 (2.0)	37 (2.0)		
43 (3.0)	27 (2.0)	34 (2.0)		
51 (4.0)	37 (3.0)	43 (3.0)		
46 (3.0)	34 (2.0)	36 (2.0)		
47 (2.0)	32 (2.0)	36 (2.0)		
43 (4.0)	32 (3.0)	30 (4.0)		
45 (2.0)	29 (3.0)	31 (3.0)		
42 (4.0)	34 (1.0)	37 (2.0)		
47 (3.0)	32 (2.0)	35 (2.0)		
	PEI USED F0 1978 46 (2.0) 56 (9.0) 39 (7.0) 43 (5.0) 52 (1.0) 59 (2.0] 54 (5.0) 43 (PERCENT OF ELECTRIC USED FOR SPACE HEATING 1978 1980 46 (2.0) 33 (2.0) 45 (2.0) 33 (2.0) 46 (2.0) 33 (2.0) 45 (2.0) 33 (2.0) 45 (2.0) 33 (2.0) 56 (9.0) 41 (2.0) 39 (7.0) 35 (10.0) 43 (5.0) 27 (3.0) 52 (1.0) 38 (3.0) 59 (2.0) 48 (5.0) 54 (5.0) 41 (2.0) 43 (5.0) 36 (4.0) 42 (3.0) 40 (4.0) 44 (3.0) 36 (2.0) 43 (3.0) 27 (2.0) 51 (4.0) 37 (3.0) 46 (3.0) 34 (2.0) 47 (2.0) 32 (2.0) 43 (4.0) 32 (3.0) 45 (2.0) 29 (3.0) 42 (4.0) 34 (1.0) 47 (3.0) 34 (1.0) 47 (3.0) 32 (2.0)		

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS.

NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1978, 1980, 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 38. Percent of **Average Household** Electricity **Consumption When** Main Heating Fuel is Electricity by Selected Sociodemographic Characteristics for 1978, 1980, 1981

	PERCENT OF ELECTRICITY USED FOR SPACE HEATING BY YEAR				
SOCIODEMOGRAPHIC CHARACTERISTICS	1978	1980	1981		
NATIONAL	46 (2.0)	33 (2.0)	36 (1.0)		
GEOGRAPHIC REGION NORTHEAST NORTH CENTRAL	60 (4.0) 54 (3.0) 33 (2.0) 59 (2.0)	44 (2.0) 43 (2.0) 26 (3.0) 38 (1.0)	52 (2.0) 53 (3.0) 25 (2.0) 42 (2.0)		
HEATING DEGREE DAYS 0-1,999 2,000-2,999 3,000-3,999 4,000-4,999 5,000-5,999 6,000-5,999 7,000-7,999 8,000 GR MORE	14 (2.0) 35 (2.0) 39 (2.0) 45 (2.0) 58 (2.0) 57 (3.0) 60 (5.0) 9	11 (4.0) 23 (1.0) 33 (1.0) 41 (1.0) 43 (2.0) 47 (6.0) 49 (5.0)	09 (3.0) 26 (1.0) 35 (2.0) 39 (1.0) 48 (1.0) 50 (1.0) 62 (3.0) 63 (3.0)		
INCOME LESS THAN \$5,000 \$5,000-\$9,999 \$10,000-\$14,999 \$15,000-\$14,999 \$20,000-\$24,999 \$25,000-\$24,999 \$25,000-\$24,999 \$35,000 OR MORE	64 (2.0) 51 (3.0) 43 (2.0) 43 (2.0) 41 (3.0) 43 (3.0) 45 (4.0)	45 (3.0) 36 (4.0) 33 (2.0) 30 (2.0) 31 (2.0) 31 (2.0) 28 (2.0)	39 (3.0) 40 (2.0) 39 (1.0) 41 (2.0) 34 (3.0) 33 (2.0) 29 (2.0)		
NUMBER OF HOUSEHOLD MEMBERS ONE TWO THREE FOUR FIVE OR MORE	58 (3.0) 46 (3.0) 44 (2.0) 42 (2.0) 41 (2.0)	37 (2.0) 35 (3.0) 31 (2.0) 29 (2.0) 31 (3.0)	46 (3.0) 37 (2.0) 32 (2.0) 33 (2.0) 32 (2.0)		

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1978, 1980, 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 39. Percent of **Average Household Natural Gas Consumption Used** for Space Heating When Main Heating **Fuel is Natural Gas** by Selected Housing **Characteristics for** 1978, 1980, 1981

	PERCENT OF NATURAL GAS USED FOR SPACE HEATING BY YEAR				
HOUSING CHARACTERISTICS	1978	1980	1981		
NATIONAL	79 (0.4)	60 (0.4)	73 (0.5)		
HOUSING STRUCTURE					
SINGLE-FAMILY DETATCHED	79 (1.0)	70 (1.0)	72 (0.5)		
SINGLE-FAMILY ATTACHED	81 (2.0)	65 (2.0)	71 (2.0)		
TWO TO FOUR UNITS	78 (1.0)	69 (1.0)	78 (1.0)		
FIVE OR MORE UNITS	79 (2.0)	66 (4.0)	78 (5.0)		
MOBILE HOME	73 (3.0)	66 (2.0)	73 (3.0)		
OTHER	83 (4.0)	Q	Q		
YEAR HOUSE BUILT					
BEFORE 1940	82 (1.0)	74 (1.0)	77 (1.0)		
1940-1949	78 (1.0)	69 (1.0)	75 (1.0)		
1950-1959	78 (1.0)	67 (1.0)	71 (1.0)		
1960-1964	79 (1.0)	67 (1.0)	69 (2.0)		
1965-1969	75 (1.0)	65 (1.0)	70 (1.0)		
1970-1974	77 (2.0)	66 (2.0)	70 (2.0)		
1975 OR LATER	77 (2.0)	65 (2.0)	69 (3.0)		
HEATED SQUARE FOOTAGE					
1-799	80 (1.0)	67 (1.0)	77 (1.0)		
800-999	79 (1.0)	67 (1.0)	76 (1.0)		
1,000-1,199	77 (1.0)	67 (1.0)	71 (1.0)		
1,200-1,399	78 (1.0)	65 (1.0)	70 (2.0)		
1,400-1,799	79 (1.0)	68 (1.0)	72 (1.0)		
1,800-2,399	81 (1.0)	71 (1.0)	73 (1.0)		
2,400 OR MORE	84 (1.0)	74 (1.0)	73 (1.0)		

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1978, 1980, 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 40. Percent of **Average Household Natural Gas Consumption Used** for Space Heating When Main Heating **Fuel is Natural Gas** by Selected Sociodemographic Characteristics for 1978, 1980, 1981

	PERCENT OF NATURAL GAS USED FOR SPACE HEATING BY YEAR				
SOCIODEMOGRAPHIC CHARACTERISTICS	1978	1980	1981		
NATIONAL	79 (0.4)	69 (0.4)	73 (0.5)		
GEOGRAPHIC REGION					
NORTHEAST	61 (1.0)	74 (1.0)	76 (0,4)		
NORTH CENTRAL	82 (0.5)	74 (0.4)	79 (0.4)		
SOUTH	71 (1.0)	64 (1.0)	67 (1.0)		
WEST	77 (1.0)	59 (2.0)	63 (1.0)		
HEATING DEGREE DAYS					
0-1,999	54 (5.0)	43 (1.0)	52 (3.0)		
2,000-2,999	67 (1.0)	57 (2.0)	54 (1.0)		
3,000-3,999	76 (2.0)	66 (2.0)	72 (2.0)		
4,000-4,999	80 (7.0)	71 (2.0)	73 (2.0)		
5,000-5,999	81 (1.0)	72 (1.0)	77 (1.0)		
6,000-6,999	82 (1.0)	74 (0.4)	78 (1.0)		
7,000-7,999	82 (1.0)	77 (1.0)	78 (1.0)		
8,000 OR MORE	86 (1.0)	79 (1.0)	83 (1.0)		
INCOME					
LESS THAN \$5,000	81 (1.0)	71 (1.0)	76 (2.0)		
\$5,000-\$9,999	79 (1.0)	70 (1.0)	77 (1.0)		
\$10,000-\$14,999	79 (1.0)	70 (1.0)	75 (1.0)		
\$15,000-\$19,999	78 (1.0)	68 (1.0)	75 (1.0)		
\$20,000-\$24,999	78 (1.0)	68 (1.0)	72 (1.0)		
\$25,000-\$34,999	78 (1.0)	69 (1.0)	72 (1.0)		
\$35,000 OR MORE	81 (1.0)	70 (2.0)	69 (1.0)		
NUMBER OF HOUSEHOLD MEMBERS					
ONE	88 (1.0)	75 (1.0)	83 (1.0)		
τωο	83 (1.0)	72 (1.0)	76 (1.0)		
THREE	79 (1.0)	68 (1.0)	73 (1.0)		
FOUR	75 (1.0)	66 (1.0)	68 (1.0)		
FIVE OR MORE	70 (1.0)	63 (1.0)	64 (1.0)		
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"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE.

NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A

NUMBER IN PARENIMESIS INJUGATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1978, 1980, 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 41. Percent of Average Household Fuel Oil or Kerosene **Consumption Used** for Space Heating When Main Heating Fuel is Fuel Oil or Kerosene by Selected Housing Characteristics for 1978, 1980, 1981

1	PERCENT OF FUEL OIL OR KEROSENE USED FOR SPACE HEATING BY YEAR				
HOUSING   CHARACTERISTICS	1978	1980	1981		
NATIONAL	93 (0.5)	85 (1.0)	85 (1.0)		
HOUSING STRUCTURE SINGLE-FAMILY DETATCHED SINGLE-FAMILY ATTACHED TWO TO FOUR UNITS FIVE OR MORE UNITS MOBILE HOME	95 (0.6) 92 (2.0) 92 (1.0) 87 (2.0) 100 (0.4)	89 (1.0) 99 (2.0) 83 (1.0) 72 (7.0) 97 (3.0)	89 (1.0) 85 (8.0) 81 (3.0) 98 (0.4)		
YEAR HOUSE BUILT BEFORE 1940 1940-1949 1950-1959 1960-1964 1965-1969 1970-1974 1975 OR LATER	94 (1.0) 94 (1.0) 93 (1.0) 91 (3.0) 94 (2.0) 96 (1.0) 93 (4.0)	87 (1.0) 84 (2.0) 86 (1.0) 80 (4.0) 84 (3.0) 79 (3.0) 84 (3.0)	86 (2.0) 87 (4.0) 84 (1.0) 83 (2.0) 86 (3.0) 83 (3.0) 87 (6.0)		
HEATED SQUARE FODTAGE 1-799	91 (1.0) 93 (1.0) 95 (1.0) 94 (1.0) 94 (1.0) 93 (1.0) 95 (2.0)	78 (2.0) 82 (2.0) 84 (2.0) 87 (2.0) 89 (1.0) 89 (1.0) 90 (1.0)	83 (2.0) 81 (4.0) 87 (3.0) 86 (2.0) 89 (2.0) 86 (2.0)		

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. Note: Because of Rounding, data may not sum to totals. Number in Parenthesis Indicates one standard deviation. See Appendix B for A

DETAILED DISCUSSION. SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1978, 1980, 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



Table 42. Percent of **Average Household** Fuel Oil or Kerosene **Consumption Used** for Space Heating When Main Heating Fuel is Fuel Oil or **Kerosene by Selected** Sociodemographic Characteristics for 1978, 1980, 1981

	PERCENT OF FUEL OIL OR KEROSENE Used for space heating by year				
SOCIODEMOGRAPHIC CHARACTERISTICS	1978	1980	1981		
NATIONAL	94 (0.5)	85 (1.0)	85 (1.0)		
GEOGRAPHIC REGION					
NORTHEAST	91 (0.5)	82 (1.0)	81 (1.0)		
NORTH CENTRAL	99 (1.0)	96 (1.0)	99 (1.0)		
SOUTH	97 (1.0)	92 (2.0)	96 (2.0)		
WEST	100 (0.2)	98 (1.0)	97 (2.0)		
HEATING DEGREE DAYS					
0-1,999	98 (2.0)	Q	100 (1.0)		
2,000-2,999	Q	Q	Q		
3,000-3,999	96 (1.0)	98 (3.0)	Q		
4,000-4,999	97 (1.0)	89 (4.0)	93 (3.0)		
5,000-5,999	91 (1.0)	81 (1.0)	81 (3.0)		
6,000-6,999	96 (1.0)	87 (1.0)	85 (2.0)		
7,000-7,999	95 (2.0)	87 (2.0)	87 (2.0)		
8,000 OR MORE	100 (1.0)	93 (2.0)	95 (2.0)		
INCOME					
LESS THAN \$5,000	95 (1.0)	85 (3.0)	88 (5.0)		
\$5,000-\$9,999	94 (1.0)	82 (2.0)	87 (2.0)		
\$10,000-\$14,999	94 (1.0)	85 (1.0)	86 (1.0)		
\$15,000-\$19,999	91 (1.0)	87 (2.0)	84 (2.0)		
\$20,000-\$24,999	94 (1.0)	89 (2.0)	85 (3.0)		
\$25,000-\$34,999	94 (1.0)	87 (1.0)	84 (2.0)		
\$35,000 OR MORE	95 (1.0)	84 (1.0)	84 (2.0)		
NUMBER OF HOUSEHOLD MEMBERS					
0NE	97 (0.4)	82 (2.0)	92 (1.0)		
тю	95 (1.0)	85 (1.0)	89 (1.0)		
THREE	94 (1.0)	87 (1.0)	85 (2.0)		
FOUR	92 (1.0)	88 (1.0)	80 (2.0)		
FIVE OR MORE	88 (1.0)	85 (1.0)	76 (3.0)		

"Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE.

NOTE: BECAUSE OF ROUNDING, DATA MAY NOT SUM TO TOTALS. NUMBER IN PARENTHESIS INDICATES ONE STANDARD DEVIATION. SEE APPENDIX B FOR A DETAILED DISCUSSION.

SOURCE: ENERGY INFORMATION ADMINISTRATION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY END USE DIVISION, THE 1978, 1980, 1981 RESIDENTIAL ENERGY CONSUMPTION SURVEY.



# **Appendix A**

The data contained in this report were from three residential energy consumption and expenditure surveys conducted by the Energy Information Administration, U.S. Department of Energy. The information was collected from a sample of households during 1978, 1980, and 1981. Households were selected using a multiple stage probability sampling design.

The housing characteristic information was collected in personal interviews with adult residents of a representative national sample of households. Figures on actual total consumption and expenditures were obtained from the household's fuel suppliers. Estimates for end-use data are statistical rather than metered data.

Although the three surveys were very similar in questionnaire construction and data collection, there were, nevertheless, several differences. Table Al highlights these differences.

Table A1. Comparison of Three Residential Energy Consumption and Expenditures Surveys

1978 (NIECS) 1980 (RECS 1)		1981 (RECS 2)	
Sample design not specifically created for EIA's needs. Instead created as all purpose design.	Sample design created for collection of residential energy consumption and related housing characteristics.	Same as 1980	
Target population does not include households in Alaska, Hawaii, or on U.S. military bases.	Target population includes all households in the United States, including Alaska, Hawaii, and U.S. military bases.	Same as 1980	
Uses respondent's estimate of square footage for dwelling.	Uses interviewer's measurement of square foot- age for dwelling.	Same as 1980	
Heating degree-days calculated using a base 65° F.	Heating degree-days calculated using bases 50°F through 80°F.	Same as 1980	
Weather data obtained using long-term averages adjusted by Census division for April 1978 through March 1979.	Weather data obtained using recorded daily highs and lows at the National Oceanic and Atmospheric Administration's (NOAA) district weather stations.	Same as 1980	
Geographic units were four Census regions: Northeast, North Central, South, West.	The four geographic regions were further divided into nine Census division.	Same as 1980	

Residential Energy Consumption Survey: Consumption and Expenditures, April 1978 through March 1979, DOE/EIA-0207/5 (Washington D.C., July 1980). Residential Energy Consumption Survey: Consumption and Expenditures, April 1980 through March 1981, DOE/EIA-0321/1 (Washington D.C., September 1982). Residential Energy Consumption Survey: Consumption and Expenditures, April 1981 through March 1982, DOE/EIA-0321/1 (Washington D.C., September 1983).



#### **Appendix A (Continued)**

#### Table A2. Number of Households by Main Heating Fuel by Survey Year (Million Households)

Main Heating Fuel	1978	1980	1981
All Households	76.6 (0)	81.6 (0)	83.1 (0)
Households Where Main Heating Fuel is Electricity	12.1(1.2)	14.3(1.0)	14.2(1.1)
Households Where Main Heating Fuel is Natural Gas	41.8(1.9)	44.6(1.5)	46.2(1.5)
Households Where Main Heating Fuel is Fuel Oil or Kerosene	16.9(1.3)	13.4(0.7)	12.2(0.6)
Households Where Main Heating Fuel is LPG	3.1(0.5)	3.7(0.4)	3.7(0.4)

Household consumption data for natural gas, electricity, fuel oil/kerosene, and liquefied petroleum gas (LPG) were collected from the suppliers. Kerosene was combined with fuel oil. Figures for natural gas and electricity were based on actual consumption, while fuel oil/kerosene and LPG figures were based on the amount delivered to households rather than on the amount consumed. Both consumption and expenditure information for the three surveys was annualized for April 1978 through March 1979, April 1980 through March 1981, and April 1981 through March 1982. In this report, consumption figures are reported in million Btu except when consumption is adjusted for heating degree-days (HDD). These figures are reported in thousand Btu. Expenditure figures are reported in dollars.

Four end uses were examined: space heating, water heating, cooling², and miscellaneous use. Miscellaneous use includes cooking, lighting, dishwashing, clothes drying, pool heating, and other uses. Consumption and expenditure estimates for the four end uses were addressed in terms of selected housing characteristics and selected sociodemographic characteristics. Housing characteristics included dwelling structure, the age of the structure, and heated square footage of the dwelling. Sociodemographic characteristics included the geographic region, number of heating degree-days, income, and number of household members. The base for the number of heating degree-days was 65 degrees Fahrenheit. Income refers to family income immediately before the survey year.

 $^{^{2}}$ Cooling applies only to electricity consumption. The small amount of natural gas used for air-conditioning was included in the miscellaneous use for natural gas.



# 

#### **Appendix B**

The analysis of residential energy consumption and expenditures by end use occurred in three steps. The first step was to use a robust regression technique to provide a regression equation that predicts energy consumption. Energy expenditures were estimated based on the results for consumption.

Twelve equations were developed. For each of the three surveys, a separate equation was developed for each of the four main fuels: electricity, natural gas, fuel oil, and LPG. In each equation, the dependent variable was energy consumption from April to March of the following year. (That is, for the 1978 survey, measured consumption was from April 1978 to March 1979; for the 1980 survey, consumption was from April 1980 to March 1981, and so forth.)

For electricity, the theoretical model that was used for all surveys was

Total Consumption = Space Heating Component + Water Heating Component + Air-Conditioning + Miscellaneous Component.

The space heating component consisted of all electricity used in electric space heating equipment. Similarly, for water heating and airconditioning, the components consisted of all electricity used in electric water heating equipment and electric air-conditioning equipment. The miscellaneous component consisted of all electricity not used specifically for any of the other end uses. This miscellaneous use included refrigeration, cooking, lighting, entertainment, clothes drying as well as many other uses. In many households, the miscellaneous component equaled the total consumption.

It is true that electricity used for many miscellaneous uses during the winter will contribute to the space heating requirements. In this report, this secondary effect of miscellaneous consumption will be ignored. The water heating component only included electricity used to heat water for hot running water or bath water. It did not include energy used for heating water on a stove or on an appliance for cooking or drinking purposes. The latter use of electricity was included in the miscellaneous component.

The theoretical model used for natural gas, fuel oil, and LPG consisted of only three components: space heating, water heating, and miscellaneous use. The air-conditioning component was added to the miscellaneous component.

The independent variables used in the regression equations were grouped together into sets of independent variables corresponding to the components. The components can be estimated by using the linear equations formed from the independent variables in the corresponding sets and their estimated regression coefficients.

¹For a more detailed explanation of the regression program, see Chapter 5 and 6 in <u>Residential Energy Consumption Survey:</u> <u>Regression</u> <u>Analysis of Energy Consumption by End Use</u>, DOE/EIA-0431 (Washington, D.C., October 1983).



#### **Appendix B (Continued)**

Many of the independent variables were multiple interaction terms. For instance, in the 1980 survey, the equation for the space heating component of the natural gas model contained an independent variable that was the product of an indicator variable for natural gas main space heating, times the heated square footage of the dwelling, times the heating degree-days. The water heating component of the electricity model for the 1981 survey contained an independent variable that was the product of an indicator variable for electric water heating, times the number of household members.

All independent variables involved indicator variables for a type of equipment or appliance except some of the variables used in the miscellaneous component for electricity. The use of electricity for small appliances, lighting, and various other small uses was represented by independent variables such as heated square footage, number of household members, and number of rooms.

The sets of independent variables that were used varied from survey to survey. For a given survey, they varied from fuel to fuel. Some appliances only used electricity, hence, the indicator variable for that appliance was only used in the electricity components. Even if the differences between the indicator variables for electric main space heating and the ones for natural gas, fuel oil, and LPG main space heating components were still different. Some of this difference is due to the type of equipment used with the different fuels and some is due to the different fuels. Additionally, more households that used the different fuels. Additionally, more independent variables used natural gas for space heating than used electricity, fuel oil, or LPG (Table A2). Hence, it was possible to use more independent variables when fitting the space heating component for natural gas.

Only a few independent variables were used in the water heating component for any fuel. In addition, relatively few households used fuel oil or LPG as their water heating fuel. Therefore, the accuracy of the estimated water heating component for fuel oil and LPG may be limited.

One reason that the set of independent variables varied from survey to survey was that the amount and type of information changed from survey to survey. For instance, a reliable estimate of the square footage was not available for the 1978 survey; more accurate weather data was available for the 1980 and 1981 surveys; and the questions concerning appliance stock, heating equipment, and insulation characteristics were changed for each survey.

We did not attempt to interpret the coefficients of the independent variables in the regression equation. The fact that the set of independent variables changed from survey to survey would prevent any comparisons between surveys. Additionally, many of the independent variables were highly colinear. An example of this is the set of interaction terms used in the natural gas space heating component for the 1981 survey. This set included three interaction terms involving an indicator variable for natural gas main space heating, multiplied by different measures of dwelling sizes. These measures were heated square footage, number of rooms, number of doors and windows. Hence, the effect of dwelling size on the space heating component of the natural gas component was divided between several of the independent variables.

As previously outlined, the fitted regression equations were split into components. The components represent end-use categories that were easily interpreted. The problem of colinearity is greatly reduced by summing terms that were highly colinear.

#### **Appendix B (Continued)**

The second step in predicting end-use consumption consisted of using the regression results to produce end-use estimates for the individual components for each household. The end-use estimates were normalized so that the sum of the end-use estimates was equal to the actual or imputed yearly consumption. As a result, the regression results were used only to estimate the proportion of energy used by each end use. The estimated end-use expenditures were obtained by assuming the proportion of dollars spent on each end use was the same as the proportion of energy used. This assumption ignores any effect of the utility rate structure.

The third step in the analysis consisted of producing end-use estimates for selected categories based on demographic characteristics and housing characteristics. Tables and figures in this report include estimates of the average normalized household end-use consumption and expenditures both nationally and for selected subgroups. The averages are weighted by the number of households in the subpopulations that the sample represents. Consumption figures are given in Btu and expenditure figures are given in dollars. Consumption figures for Table T1 have been adjusted for weather. In this instance, the annual space heating consumption of each household was divided by the household's annual number of heating degree-days, base 65 degrees Fahrenheit. The values in Table T1 are the average value of the index of consumption per heating degree-days.

The estimates for the standard errors were obtained using a balanced half-sample replication technique. The technique was used to produce an estimate of the relative standard error (also called the coefficient of variation) of the statistics computed using only the households whose energy consumption was not imputed using a regression estimate. This relative standard error was multiplied by the statistics computed using all households. The justification for only using households whose consumption was not based on a regression estimate was that the households with imputed consumption values did not contribute any information about the relationship between energy consumption and the variables collected by RECS.

In calculating standard errors for percentage change, the following approximation was used. Let Z be the percentage change from Y to X. Then  $Z = 100 \times ((X-Y)/Y)$ . Hence, the standard error of Z equals 100 times the standard error of X/Y. The standard error for X/Y can be obtained using the approximation RSE²(X/Y) = RSE²(X) + RSE²(Y), where RSE is the relative standard error. The approximation is valid when X and Y are uncorrelated. This should be true when X and Y are based on data from different surveys. All of the percentage changes sited in this report involved changes between two surveys.

This report also contains statistics on the percentage of the total consumption that is represented by each component. The standard errors of these statistics were calculated directly using the half-sample procedure. The above approximation was not used.

The error terms shown in parenthesis in the tables and text are one standard error.

Residential Energy Consumption and Expenditures by End Use for 1978, 1980, and 1981 Energy Information Administration

¹Residential Energy Consumption Survey: Regression Analysis of Energy Consumption by End Use, DOE/EIA-0431 (Washington, D.C., October 1983).

²Residential Energy Consumption Survey: Consumption and Expenditures, April 1981 through March 1982, DOE/EIA-0321/1(81) (Washington, D.C., September 1983). Appendix A.




# **Appendix C**

The limitations of the data can be divided into three parts: first, problems with the annual consumption and expenditure data upon which the end-use estimates were based; second, problems with the disaggregation technique; and third, problems with the estimated standard errors.

The end-use estimates were derived by disaggregating the annual consumption and expenditure data. Any deficiencies in the annual amounts were carried over into the end-use estimates. The number of households that use each fuel and the percentage of cases where the annual amount was based upon usable consumption data were of particular interest. Table Cl lists the number of households in the sample that use each fuel along with the percentage of households with consumption amounts based upon usable data for each fuel by housing type for the 1981 survey. The results for the other surveys were similar except the total sample size was 35 percent smaller for the 1978 survey. Other RECS reports discuss in detail limitations of the data pertaining to consumption and expenditure figures.

¹<u>Residential Energy Consumption Survey:</u> <u>Consumption and Expenditures,</u> <u>April 1978 Through March 1979, DOE/EIA-0207/5 (Washington, D.C., July</u> 1980); <u>Residential Energy Consumption Survey:</u> <u>Consumption and</u> <u>Expenditures, April 1980 Through March 1981, DOE/EIA-0321/1 (Washington, D.C., September 1982); and <u>Residential Energy Consumption Survey:</u> <u>Consumption and Expenditures, April 1981 Through March 1982,</u> <u>DOE/EIA-0321/1 (Washington, D.C., September 1983).</u></u>



Table C1. Number of Sample Households That Use Each Fuel and Percent of Households with Usable^a Fuel Records by Fuel Used and by Type of Housing Structure^b

Type of Fuel Use I	Total Households in Sample Using the Fuel	Mobile Home	Single- Family	Units in Buildings With Two to Four Units	Units in Buildings With Five or More Units
Electricity					
Number of Households Percent with Usable	6,263	390	4,343	697	833
Fuel Records	80.8	80.8	88.8	67.3	52.1
Natural Gas					
Number of Households Percent with Usable	3,850	119	2,650	544	537
Fuel Records	71.7	69.7	88.2	49.5	13.0
Fuel 011 or Kerosene					
Number of Households Percent with Usable	1,122	70	724	159	169
Fuel Records	46.7	37.1	64.2	20.7	0
LPG					
Number of Households Percent with Usable	627	144	465	16	2
Fuel Record	61.3	56.9	62.8	56.2	50.0

 $^{\rm a}{\rm Data}$  were unusable for electricity and natural gas if the records covered less than 5 months and for fuel oil, kerosene, and LPG if the records covered less than 1 year.

^bResidential Energy Consumption Survey: Consumption and Expenditures, April 1981 through March 1982, Part 1: National Data, DOE/EIA-0321/1 (Washington, D.C.), Table All.

For those households whose annual energy consumption data were missing or unusable, the consumption amounts were imputed. The imputation procedure for the 1978 and 1980 surveys assumes that the regression equations developed from data on households with usable data can also be used to predict the energy consumption for households whose consumption needs to be imputed. In particular, this assumes that the results on fuel oil consumption for units in buildings with five or more units will not be drastically different from the results for the other housing types. If this assumption is not valid, then the resulting annual consumption estimates and end-use consumption estimates will be biased.



Beginning with the 1981 survey, adjustments were made in the imputation procedures for electricity and natural gas consumption. These adjustments take into account some differences between energy consumption patterns for households living in master metered buildings and those living in buildings with individual meters. Future surveys will expand and refine these adjustments.

Additional problems with the annual data that may result in biases in the end-use estimates are nonresponse and undercoverage. The annual estimates are derived under the assumption that the nonrespondents and neighboring respondents have similar energy characteristics. While there may be differences between neighboring households, any systematic difference between neighboring respondents and nonrespondents will result in biased estimates.

The RECS data did not cover vacant units and vacation or second residential units. This convention resulted in an underestimate of the total energy used in the residential sector. The results in this report give estimates for average end-use consumption only for occupied primary residences. If the vacant units and secondary units were included in the averages, then it is expected that the results would be lower.

The sample design for the 1978 survey did not cover Alaska, Hawaii, and residential housing units in military bases. The 1980 and 1981 survey did cover these residential units. Barracks in military bases were not classified as residential units. The results for the 1978 survey were biased by this undercoverage. This affects comparisons between the 1978 results and the results for 1980 and 1981.

The effect of not covering Alaska and Hawaii in the 1978 survey was examined by analyzing the results for the 1980 and 1981 surveys. The results of the analysis tentatively showed that dropping Hawaii and Alaska would increase the average electricity consumption in the West Census region by approximately .5 percent, increase the average natural gas consumption by approximately 1 percent, decrease the average fuel oil and kerosene consumption by approximately 4 percent, and decrease the average LPG consumption by approximately 6 percent. The effect on the national averages were approximately a .1 percent increase, a .2 percent increase, a .4 percent increase, and a .5 percent decrease for electricity, natural gas, fuel oil/kerosene, and LPG, respectively.

In comparing the results for 2 years, the changes in the population will affect the interpretation of the results. For instance, when comparing the results across surveys for units built during or after 1975, the population in 1978 includes units built in 1975 through the summer of 1978. The population in 1980 includes units built in 1975 through the summer of 1980. If the type of units built in 1975 through the summer of 1978 vary from the type of units built from the winter of 1978 through the summer of 1980, then the change in population housing characteristics will alter the interpretation of any comparison in energy consumption between the 1978 survey and the 1980 survey.

The disaggregation technique used the regression results to estimate only the percentage of each fuel consumed by each end use. Implicit in this technique was the assumption that if a household used more fuel or less fuel on the average for one end use, it will do so for all end uses by the same percentage. For example, if a household increased its electricity bill by raising the thermostat setting in the winter, then during the summer, the household will have also increased its usage of air conditioning. The percentage of the increase would have been the same for both end uses. It is obvious



that many household did not conform to this behavior pattern. If there were systematic deviations from this pattern, the results given in this report will be biased. In future studies, EIA plans to use billing period data to help overcome this problem.

The regression equations for the components were developed using only the households with usable consumption data. The results are applied to all households. This carries with it the assumption that the population of households with and without usable consumption data conformed to the same linear regression model. The assumption was most tenuous when applying the results to fuel oil consumption for households living in buildings with five or more units. If this assumption was not valid, then end-use estimates could be biased, even if the total consumption estimate was not biased.

The end-use estimates for expenditures were calculated by applying the same percentages to expenditures as were applied to consumption. This assumes that the average cost per unit of energy does not vary from billing period to billing period. If the utility rate structure is such that the average cost is lower for bills with large consumption amounts than it is for bills with small consumption amounts, then the cost of heating or cooling may be overestimated. If the rate structure has the opposite effect, then the cost of heating or cooling may be underestimated. In the future, incorporating the billing period data into the estimation procedure will help alleviate this problem.

Additional biases in the end-use estimates can result from the choice of independent variables used in the regression procedure. The components where the regression technique was the least subject to these potential biases, were the space heating components for all fuels and the appliance component for electricity. The regression technique most subject to the potential biases was the water heating and appliance components for fuel oil/kerosene and LPG.

The questionnaire has been improved with each survey. Consequently, the data available to use in constructing independent variables has been improved. Hence, the end-use estimates should be more accurate for the 1981 survey than for the 1980 survey which, in turn, should be more accurate than the estimates for the 1978 survey.

An example of improved data is the square footage data. The data for the 1978 survey was an estimate provided by the respondent. These estimates were not used in the regression procedure because of inaccuracy in reporting by the respondent. The square footage data for the 1980 and 1981 surveys were based on measurements taken by the interviewers.

Only limited weather data was available for the 1978 survey. The question on the fuel used for air conditioning was improved for the 1981 survey. Questions on the number and types of appliances have been improved with each survey.

The listed standard errors reflect only the sampling variation and the number of households with usable utility data. They did not take into account errors made in disaggregating the annual energy consumption for individual households. One way to account for the disaggregation errors, is to perform a separate regression analysis for each half-sample using only the observations that fall in the half-sample. The end-use estimates for each half-sample would then be based on the regression for that half-sample. This would involve a considerable amount of work.

As a test of the effect of the disaggregation error, separate end-use estimates for each half-sample were computed for LPG consumption amounts for the 1980 survey. Half-sample estimates of the variance were computed for the three LPG components for the national averages and the averages for each Census division. The standard errors using the separate end-use estimates for each half-sample were higher than the standard errors where the end-use half-sample estimates were based on the full sample regression analysis. Standard errors were, on the average, 3.2 percent higher for the space heating component, 14.5 percent higher for the water heating component, and 8.7 percent higher for the appliance component.

It was conjectured, based on the results of the half-sample estimates of the variance for the LPG components, that the underestimation of the standard error was greatest in the instances where the disaggregation procedure was the least precisely determined. Hence, the underestimation would be greatest for the water heating component for LPG and fuel oil. Conversely, the underestimation would be smallest for the space heating component for all fuels and smallest for the appliance component for electricity. Additionally, the standard errors of the end-use estimates would be underestimated in cases where the estimates were averages over cells which contained a substantial proportion of households with imputed consumption data, such as the fuel estimates in large buildings.

The procedure for producing the end-use estimates has been improved with each survey. Hence, it can be conjectured that the standard error estimates for the 1978 survey will be subject to more underestimation than the standard error estimates for the 1980 and 1981 surveys.





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# Appendix D

U.S. Census Regions and Divisions







## Glossary

<u>Air-Conditioning</u>: Cooling of air by a refrigeration unit. This does not include fans, blowers, or evaporative cooling systems not connected to a refrigeration unit. Air-conditioning units that are not currently in working condition or are not used, but are in place in the housing unit, are included in this survey.

"Number of rooms that can be air-conditioned" refers to the number of rooms the air-conditioning equipment is capable of cooling when the equipment is used. Question 36 "How many rooms in your house (apartment) are cooled by air-conditioning?" refers to rooms that could be cooled if the air-conditioning equipment were used. There are, therefore, no cases in the data set of a household with air-conditioning equipment that cooled zero rooms.

"All rooms air-conditioned" means that 100 percent of the rooms are air-conditioned. "Some rooms air-conditioned" means that fewer than 100 percent are air conditioned.

"Central air-conditioning system" refers to a system that air-conditions a number of rooms in a home. See also <u>Central System for the</u> <u>Building</u>. For a definition of rooms, see <u>Number of Rooms</u>.

<u>All-Electric Home</u>: Uses electricity for space heating, water heating, and cooking. Other fuels may be used for supplementary heating or other purposes.

Appliances Used: Appliances possessed and used by the household. Appliances possessed by the household but not used are not counted. Air-conditioning units are an exception. Air-conditioning is counted as present whether or not it is used. (See <u>Air-Conditioning</u>.) Appliances 'loaned to the household for their regular use are included. Appliances temporarily not in working condition but generally used by the household are included only if a repair person has been called or the appliance has been taken to a repair shop. "Swimming pool heater" applies only to swimming pools that are for the exclusive use of the housing unit. Swimming pools in apartment buildings, condominiums, or cooperatives that are for the use of many resident households are not included. "Oven" includes microwave and convection ovens, but does not include toaster ovens. "An evaporative cooler (swamp cooler)" is an air-cooling unit that turns air into moist, cool air by saturating the air with water vapor. (See also <u>Refrigerators</u>.)

April 1978 through March 1979, April 1980 through March 1981, April 1981 through March 1982: The annual consumption period is a 365-day period beginning as close as possible to April 1. For natural gas and electricity, the actual beginning date for a household may vary from April 1 in either direction by several weeks depending on that household's billing cycle. For fuel oil or kerosene and LPG, the beginning date is always April 1, but the amounts represent deliveries received by the household during the 365-day period, not gallons consumed The expenditures for fuel oil or kerosene and LPG represent expenditures, for the amount of fuel delivered to the home, not the amount of fuels consumed. (See <u>Consumed.</u>)

<u>Basement</u>: An enclosed space in which a person can walk upright under all or part of the building. A "crawl space" is the space between the ground and the floor of a house. An "enclosed" crawl space is one <u>not</u> accessible from the outside of the house because the walls of the space protect it from the weather. A crawl space "open to the outside" is accessible from outside the house even though it may be covered by a trellis or lathwork, or some kind of brickwork that leaves space for circulation of air.



Bathroom: A "complete" bathroom has a flush toilet, a bathtub or shower, and a sink or washbasin with running water. A "half-bath" has a flush toilet or a bathtub or shower but does not have all the facilities for a complete bathroom.

<u>Billing Period</u>: The time between meter readings. It does not refer to the time the bill was sent or when the payment was to have been received. In some cases, the billing period is the same as the billing cycle that corresponds closely (within several days) to meter-reading dates. For fuel oil and LPG, the billing period is the number of days between fuel deliveries.

Btu (British Thermal Units): A Btu is the amount of energy required to raise the temperature of 1 pound of water 1 degree Fahrenheit at or near 39.2 degrees Fahrenheit and 1 atmosphere of pressure. One Btu is about equal to the heat given off by a blue-tip match.

Btu conversion factors for this survey are

Electricity	3,412	Btu/kilowatt-hour
Natural Gas	1,027	Btu/cubic foot
Fuel 0il No. 1	135,000	Btu/gallon
Kerosene	135,000	Btu/gallon
Fuel Oil No. 2	138,690	Btu/gallon
LPG (propane)	21,540	Btu/pound
	91,330	Btu/gallon
	2,510	Btu/cubic foot
	88,640	Btu/cubic meter
Wood	20 mil)	lion Btu/cord

Other conversion factors used include:

1 therm = 100,000 Btu 1 barrel = 42 gallons

Almost all LPG reported by the fuel suppliers was propane. Hence, the LPG conversion factors are those for propane.

<u>Built-in Electric Units</u>: Individual resistance electric heating units are permanently installed in the floors, walls, ceilings, or baseboards and are part of the electrical installation of the building. Electric heating devices that are plugged into an electric socket or outlet are not considered built in.

<u>Central System for the Building</u>: A central system serving one or more buildings of two or more housing units each that is used for main heating, water heating, or air-conditioning. A system that is for the respondent's living quarters only is not a central system for the building.

<u>Central Warm-Air Furnace</u>: A central furnace providing warm air through ducts leading to the various rooms. Heat pumps are not included in this category. A "forced-air" furnace is one in which a fan is used to force the air through the ducts. In a "gravity" furnace, air is circulated by gravity. The warm air rises through ducts and the cold air falls through ducts that return it to the furnace to be reheated. This completes the circulation cycle.



<u>Consumed</u>: Is the amount of electricity or natural gas used by the household during the 365-day period. For fuel oil, kerosene, and LPG, the quantity represents fuel purchased, not fuel consumed. If the level of fuel in the tank was the same at the beginning and end of the annual period, then the quantity consumed would be the same as the quantity purchased. Measurements or reports of the level of fuel in the tank were not included in the data collection.

<u>Cooling Degree-Days</u>: Refers to the number of degrees per day the daily average temperature is above 65 degrees Fahrenheit. Normally, cooling is not required in a building when the outdoor average daily temperature is below 65 degrees. Cooling degree-days are determined by subtracting the base of 65 from the daily average temperature. For example, a day with an average temperature of 85 degrees has 20 cooling degree-days (85-65 = 20), while one with an average temperature of 65 degrees or lower has none. The average daily temperature is the mean of the maximum and minimum temperatures for a 24-hour period. The cooling degree-days for RECS households in the 48 States and the District of Columbia were assigned according to the NOAA division in which each household was located (see <u>NOAA Division</u>). Cooling degreeday totals for Alaskan and Hawaiian households were assigned by appropriate nearby weather stations.

<u>Doors</u>: (Outside doors) go from a heated area to the outside or to an unheated area, such as a porch or garage. Doors to a heated hallway in an apartment building, doors permanently sealed shut, and doors to an unheated attic or basement were not counted because these doors are not usually fitted with storm doors. The NIECS survey counted doors to an unheated attic or basement, but this rule was not followed in the RECS survey. Double doors were counted as one door. A pair of sliding glass doors was counted as two doors in the NIECS survey. "Standard" doors include doors with and without glass panels.

Electricity: See "Fuels."

End Use: Refers to the amount of energy used for space heating, space cooling, water heating, and miscellaneous use. Miscellaneous use includes energy used for lighting, cooking, and appliances.

Estimated Bills: Are calculated by the fuel supplier when the meter is not read. The estimate may be based on one or more of the following factors: past usage, usage by similar households, and weather data.

Expenditures: Refers to the cost for electricity or natural gas consumed during the 365-day period. Expenditures include State and local taxes, but exclude merchandise, repairs, or special service charges. For households on a budget plan, the expenditures are for the actual consumption. Fuel oil, kerosene, and LPC expenditures are for the amount of fuel purchased, which may differ from the amount of fuel consumed (see <u>Consumed</u>). For households that do not pay directly to their fuel supplier, the expenditures for fuels are estimated and included in the tables.

The reader should also be aware that the consumption and expenditures data include households that do not pay directly for the energy used.



Family Income: Is the total combined income for the calendar year prior to the survey of all members of the family from all sources before taxes and deductions. It includes wages, salaries, tips, commissions, and income from Social Security, pensions, interest, dividends, rent, public assistance, and unemployment insurance. This includes the total income for all family members who lived in the household during the calendar year prior to the survey, regardless of whether they were living there at the time of the interview. Income of nonfamily members of the household is not included.

"Family" includes the following types of relationships: mother, father, sister, brother, son, daughter, father-in-law, uncle, aunt, niece, grandchild, foster child, and similar relationships.

<u>Fireplace</u>: Is any masonry or prebuilt installed fireplace. Fireplaces in mobile homes are included. A fireplace must have a permanent chimney built into the wall of the house. A freestanding fireplace that can be detached from its chimney is a heating stove. A fireplace insert is classified as a fireplace.

Floor, Wall, or Pipeless Furnace: A "floor furnace" is located below the floor and delivers heated air to the room immediately above or, if under a partition, to the room on each side. A "wall furnace" is installed in a partition or in an outside wall and delivers heated air to the rooms on one or both sides of the wall. A "pipeless furnace" is installed in a basement and delivers heated air through a large register in the floor of the room or hallway immediately above.

<u>Fuels</u>: Refers to the primary fuel delivered to the residential site. It may be converted at the site to some other energy form. "Electricity" is included in this report as a fuel.

"Coal" includes coke.

"Electricity" refers to metered electric power supplied by a central utility company to a residence via underground or aboveground power lines. It does not refer to electricity generated onsite for the exclusive use of the residence. In this case, the fuel used for the generator will be indicated. The Btu equivalent for electricity is the energy value of electricity as received by the household (3,412 Btu per kilowatt-hours). Electrical energy losses that occur in the generation and transmission of electricity are not included in the conversion of electricity into Btu for this report. If these losses were to be included, in general, the conversion rate would be about 10,353 Btu per kilowatt-hour.

"Fuel Oil" is No. 1, No. 2, or No. 4 grade fuel oil or residual oil that is burned for space- or water-heating purposes. No. 1 distillate fuel oil is a form of heating oil used mostly as a blending stock to assure that heavier grades of fuel flow under severe cold weather conditions. No. 2 distillate collectively refers to No. 2 heating oil and No. 2 diesel fuel. Although these products are not precisely identical, they are essentially interchangeable in most applications. No. 2 fuel oil is the most common form of heating oil. No. 4 distillate is a blend of No. 2 and No. 5 or No. 6 residual fuel oil used in large stationary diesel engines and boilers equipped with fuel preheating equipment. Residual fuel oil refers to the heavier oils that remain after the distillate fuel oils and lighter hydrocarbons are boiled off in refinery operations.

"Kerosene" refers to a distilled product of oil or coal with the generic name "kerosene." Kerosene is similar to No. 1 distillate fuel oil and is used for space heating or water heating or lighting equipment using wicks. It is sometimes sold under the names "range oil" or "stove oil."

"LPG or liquefied petroleum gas" refers to any fuel gas supplied to a residence in liquid form such as propane or butane. It is usually delivered by tank truck and stored near the residence in a tank or cylinder until used. Propane was the most common liquefied petroleum gas supplied to RECS households. Household use of LPG solely for out-door gas grills is not considered sufficient use to mark the household as an LPG user.

"Natural gas" is utility gas supplied by underground pipeline to individual housing units by a central utility company. It does not refer to privately owned gas wells operated by the household.

<u>Heating Degree-Days</u>: The number of degrees per day the daily average temperature is below 65 degrees Fahrenheit. Normally, heating is not required in a building when the outdoor average daily temperature is above 65 degrees. Heating degree-days are determined by subtracting the average daily temperature below 65 degrees from the base 65. For example, a day with an average temperature of 50 degrees has 15 heating degree-days (65 - 50 = 15), while one with an average temperature of 65 or higher has none. The average daily temperature is the mean of the maximum and minimum temperature for a 24-hour period.

The heating degree-days for RECS households in the 48 States and the District of Columbia were assigned according to the NOAA division in which each household is located (See <u>NOAA Division</u>). Heating degreedays for Alaskan and Hawaiian households were assigned by appropriate nearby weather stations.

<u>Heat Pump (Reverse Cycle System)</u>: A year-round heating/air-conditioning system in which refrigeration equipment supplies both heating and cooling through ducts leading to individual rooms. It generally consists of a compressor, both indoor and outdoor coils, and a thermostat.

When the heat pump is attached to a central furnace, the heat pump is either the main or secondary heating equipment depending on how often the heat pump operates. If it operates for a short time and then the furnace comes on, the heat pump is secondary (or additional heating equipment). If the heat pump is sufficient to provide the desired warmth, the heat pump is the main heating equipment.

<u>Hot-Deck Imputation</u>: A procedure by which the household file is sorted by variables related to the missing item. A household is then selected that has the same value on the matching variables, and this "donor" household supplies the value for the missing item. (See Imputation).

Household: A group of up to 12 persons occupying the same housing unit. "Occupy" means the housing unit was the person's usual or permanent place of residence at the time of the first field contact. The household includes babies, lodgers, boarders, employed persons who live in the housing unit, and persons who usually live in the household, but are away traveling or in a hospital. The household does not include persons who are normally members of the household but who were away from home as college students or members of the armed forces at the time of the contact.



The household does not include persons temporarily visiting with the household if they have a place of residence elsewhere, persons who take their meals with the household but usually lodge or sleep elsewhere, domestic employees or other persons employed by the household who <u>do not</u> sleep in the same housing unit, or persons who are former members of the household, but have since become inmates of correction or penal institutions, mental institutions, homes for the aged or needy, homes or hospitals for the chronically ill or handicapped, nursing homes, convents or monasteries, or other places in which residents may remain for long periods of time. By definition, the count of households is the same as the count of occupied housing units.

Householder: The person (or one of the persons) in whose name the home is owned or rented. If there is no lease or similar agreement or if the person who owns the home or pays the rent does not live in the housing unit, the householder is the person responsible for paying the household bills or generally in charge.

Housing Structure: One of four structure types used to categorize the building in which the housing unit was located.

A "single-family housing unit" refers to a structure that provides living space for one household or family. The structure may be detached, attached on one side (semidetached), or attached on two sides. Attached houses are considered single-family houses as long as the house itself is not divided into more than one housing unit and has an independent, outside entrance. A single-family house is contained within walls that go from the basement to the roof.

A "house or building with two to four housing units" is divided into living quarters for two, three, or four families or households. This category also includes houses originally intended for occupancy by one family or for some other use that have since been converted to a separate dwelling for two to four families. Typical arrangements in these types of living quarters are separate apartments, downstairs and upstairs, or one apartment on each of three or four floors.

A "building with five or more housing units" refers to a building containing living quarters for five or more separate households or families.

A "mobile home or trailer" refers to a structure that has all the facilities of a dwelling unit, but is built on a movable chassis. It may be placed on a permanent or temporary foundation and contain one or more rooms. If additional rooms are added to the structure, it is still considered a mobile home.

Housing Unit: A structure or part of a structure where a household (family or individual) lives or could live. It has direct access from the outside of the building or through a common hall. Housing units do not include group quarters such as prisons, hospitals, dormitories, nursing homes, fraternity houses, or convents where 10 or more unrelated persons live. Hotel rooms, motel rooms, mobile homes, or trailers are considered housing units if occupied.

Imputation: Is a statistical method used to estimate the response to specific questions for which answers are missing. In general, it is a procedure for filling in missing data values.



<u>Insulation</u>: Refers to any material that, when placed between the interior of the dwelling and the outdoor environment, reduces the rate of heat loss to the environment or heat gain from the environment. The four forms of insulation, illustrated in a drawing shown to respondents, are listed below:

"Blankets or batts"--rolls or pieces of insulation that are nailed or stapled between the rafters or wall joists (beams). It is usually made of fiberglass or rock wool.

"Loose particles or loose fill"--loose insulation comes in a bag and is poured between joists (beams). Loose insulation can also be blown into open spaces. Loose fill can be glass fiber, rock-wool fibers, cellulose fiber, or vermiculite.

"Firm foam or firm plastic"--rigid boards (such as styrofoam) that can be cut to size and either edged, nailed, or glued into place.

"Sprayed-in urethane foam" is not shown separately as a category because the description used in the survey was inaccurate. Urethane foam is not sprayed in because it expands so much that confined areas may be broken apart by the force of the expanding substance. The more general category of "sprayed foam" will be used in the future to include all types of foam insulation.

"Floor insulation" is insulation between the bottom floor and the unheated basement or crawl space. Carpeting or carpeting pads are not insulation.

<u>Main Cooking Fuel</u>: Is the answer to the question: "Thinking of all the different kinds of cooking done here, including cooking in the oven, on a range, and with small appliances, which fuel is used most?"

<u>Main Heating Equipment</u>: (See description of specific heating equipment.) Main heating equipment, if temporarily out of order, is reported as the main heating equipment. If two types of heating equipment are used, the main equipment is the one used more. If both are used equally, the main equipment is the one that appears first on the list in the question.

Main Heating Fuel: The fuel mentioned by the respondent in response to the Question: "What is the main fuel used for heating this house (apartment)?"

<u>Master Metered</u>: The method used by utility companies (e.g., electricity and natural gas) to measure the total volume of energy used by several individual customers collectively.

NIECS: The National Interim Energy Consumption Survey, the first developmental survey in the planned series of Residential Energy Consumption Surveys. The NIECS contacted 4,081 households in October and November 1978. Fuel suppliers provided data on consumption and expenditures for the period April 1978 through March 1979.

NOAA Division: One of the 344 weather divisions designated by the National Oceanic and Atmospheric Administration (NOAA) encompassing the 48 contiguous States. These divisions usually follow county borders to encompass counties with similar weather conditions. The NOAA division does not follow county borders when weather conditions vary considerably within a county such as is likely to happen when the county borders the ocean or contains high mountains. A State contains an average of seven NOAA divisions; a NOAA division contains an average of nine counties.



Nominal Dollars: is the value of dollars for the year specified. Sometimes called "current dollars," nominal dollars have not been modified to remove the effects of inflation.

Number of Rooms: Whole rooms are rooms such as living rooms, dining rooms, bedrooms, kitchens, lodger's rooms, finished basements or attic rooms, recreation rooms, and permanently enclosed sun porches that are used year-round. Rooms used for offices by a person living in the unit are included in this survey. Bathrooms, halls, foyers or vestibules, balconies, closets, alcoves, pantries, strip or pullman kitchens, laundry or furnace rooms, unfinished attics or basements, open porches, and unfinished space used for storage are not included.

A partially divided room, such as a dinette next to a kitchen or a living room, is a separate room only if there is a partition from floor to ceiling, but not if the partition consists solely of shelves or cabinets. If a room is used by occupants of more than one unit, the room is included with the unit from which it is most easily reached.

Rooms are counted as year-round living space if they are completely enclosed with permanently installed walls, windows, and a roof and can be heated.

Occupied Housing Unit: A unit someone was living in as his or her usual or permanent place of residence at the time of the first field contact.

<u>Owner/Renter</u>: Own/rent refers to the structure itself, not the land on which it is located. The household is classified "renter" even if the rent is paid by someone not living in the unit. "Rent free" means the unit is not owned or being bought and no money is paid or contracted for rent. Such units are usually provided in exchange for services rendered or as an allowance or favor from a relative or friend not living in the unit. "Rent free" also includes occupants who pay only for utilities. Unless shown separately, "rent free" households are grouped together with "renters."

Quadrillion: Equals 1,000,000,000,000 or 10¹⁵.

Region: The States are divided into 10 groups as follows:

Region	States
Northeast	Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut New York, New Jersey
North Central	Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas
South	Delaware, Pennsylvania, Maryland, Virginia, West Virginia, District of Columbia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Florida
West	Colorado, Utah, Wuoming, Montana, Idaho, New Mexico, Hawaii, Arizona, California, Nevada, Alaska, Oregon, Washington



<u>Residential</u>: Refers to occupied housing units including mobile homes, single-family housing units (attached and detached), and apartments. The definition of housing units is the same as that used by the U.S. Bureau of the Census. (See <u>Household</u> and <u>Housing Unit</u> for further definition.)

<u>Residential Energy Consumption Survey (RECS) 1980, 1981</u>: The Residential Energy Consumption Surveys that contacted 6,051 households in 1980 and 6,269 households in 1981. Fuel suppliers provided data on consumption and expenditures for the period April 1980 through March 1981 and April 1981 through March 1982.

Rooms: (See Number of Rooms.)

<u>Refrigerators</u>: With no freezer sections are included in the nonfrost-free category. "Frost-free" means that frost does not build up on the insides of the freezer section or ice cube section.

Room Heaters Burning Gas, Oil, Kerosene: Are circulating heaters, convectors, radiant gas heaters, space heaters, or other <u>nonportable</u> room heaters that may or may not be connected to a flue, vent, or chimney.

<u>Screener Survey</u>: The Residential Energy Consumption Survey that contacted 4,033 households in October and November 1979. Fuel suppliers provided data on consumption and expenditures for the period April 1979 through March 1980. This survey was named the Household Screener Survey because it was used to screen households for participation in the Household Transportation Panel.

Secondary Heating Equipment: Equipment used in addition to the main equipment. Description of the secondary heating equipment is the same as for the main heating equipment.

Square Feet: The floor area of the housing unit that is enclosed from the weather. Basements are included whether or not they contain finished space. Garages are included if they have a wall in common with the house. Attics that have finished space and attics that have some heated space are included. Crawl spaces are not included even if they are enclosed from the weather. Sheds and other buildings that are not attached to the house are not included. "Measured" square feet means that the measurement of the dimensions of the home did not rely on the respondent's reports but was an actual measurement by the interviewer using a metallic, retractable, 50-foot tape measure.

"Heated square feet" are that portion of the measured square feet that is heated during most of the season. Rooms that are shutoff during the heating season to save on fuel use are not counted as heated square footage. Attached garages that are unheated and unheated areas in basements and attics are not counted as heated square feet.

Steam or Hot Water System with Radiators or Convectors: A central heating system supplying steam or hot water to conventional radiators, baseboard radiators, heating pipes embedded in the walls or ceilings, or heating coils or equipment that are part of a combined heating/ ventilating or heating/air-conditioning system. This category also includes radiant heating through hot water pipes inlaid in a concrete, slab floor.

Storm Doors and Windows: Storm doors made of double or insulating glass such as thermopane. Glass or plexiglass placed over a sliding glass door on either the exterior or interior is counted as a storm door. A plastic sheet covering the door is not counted as a storm door.



Storm windows are made of double or insulating glass, such as thermopane. Glass or plexiglass placed over windows on either the interior or exterior side are counted as storm windows. Plastic sheets covering windows are not counted.

Note: Responses of "don't know" for storm doors, windows, and/or attic insulation were treated the same as "do not have." For example, a respondent who indicated that his or her house had storm windows (some or all) and storm doors (some or all), but who did not know if it had attic insulation, was counted in the "have one or two of these" category.

Water-Heating Fuel: The answer to the question, "Which fuel is used most for heating water?" Households that did not have running water in their home were also asked this question. The fuel is used for heating water for bathing and washing. The hot water may have been available anywhere in the same building as the respondent's living quarters. This may have been in a hallway, in a room used by several units in the building, in the basement, or in an enclosed porch, provided the respondent's household had access to it.

<u>Windows</u>: All windows in the year-round living space. Windows in the basement, attic, garage, and porch are counted only if these areas are heated. Windows in doors are not counted. Each window that opens separately is counted as one window. Windows fixed in place are also counted. Panes of glass in a large window are <u>not</u> counted individually unless they open separately. Skylights and stained-glass windows are counted as windows.

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