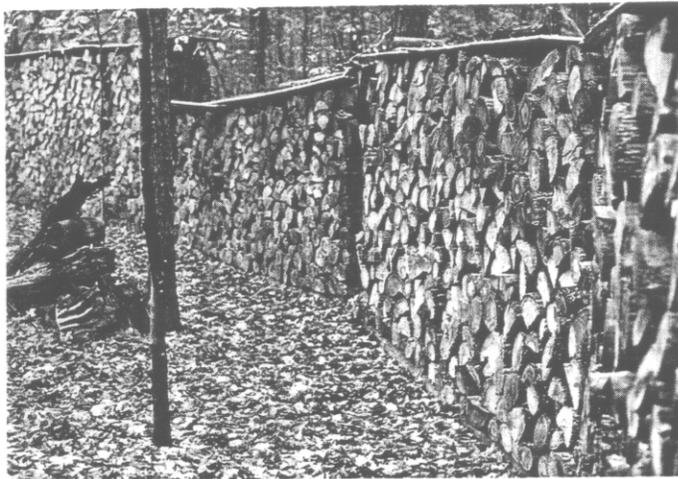


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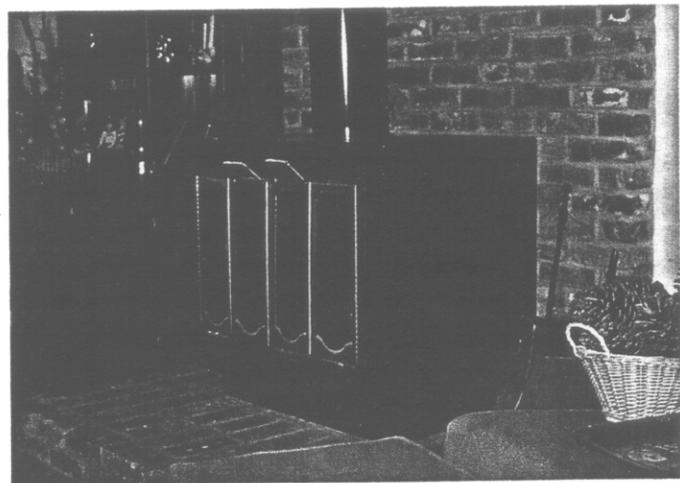
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Recent Trends In The Consumption Of Wood

For
Home Energy
In Georgia



By

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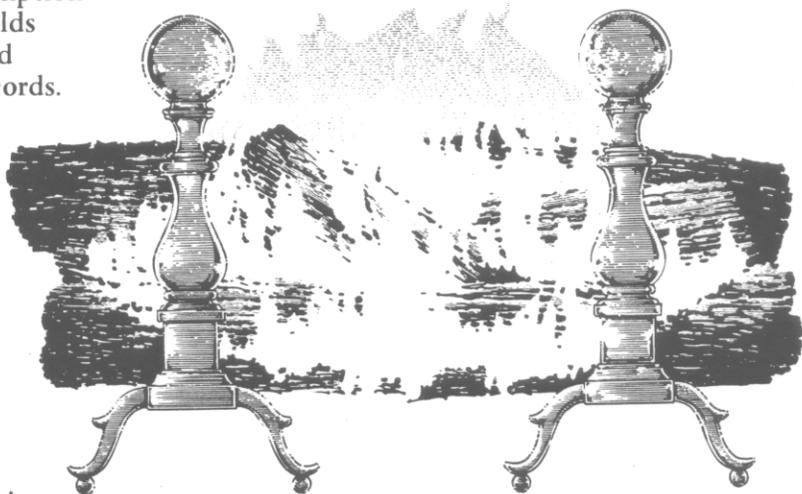
ABSTRACT

Georgia households are continuing to rely upon wood as an important source of fuel for space heating even though natural gas, electricity, and fuel oil costs have stabilized and there is no longer a perceived energy crisis. In 1985 the consumption of firewood by Georgia households was virtually the same as revealed in the 1981 survey, 1.6 million cords.

But Georgia households are consuming half again as much firewood as at the height of the energy crisis in 1979. The number of firewood using households, if not total household firewood consumption, has continued to increase in consequence of Georgia's population growth and the increasing popularity of firewood use.

The proportion of households using firewood has increased from 1 in 4, as revealed in the 1979 survey, to more than 1 in 3 in 1985.

Moreover, an increasing share of households using firewood have come to rely upon wood for more than half of their space heating needs, from 19 percent in 1979 to 38 percent in 1985. Although natural gas is by far the major fuel source for space heating among all Georgia households, more than a quarter of a million Georgia households rely upon wood as their major fuel source. The volume of firewood purchased from the emerging firewood vendor industry has increased significantly since the 1981 survey, 41 percent from \$22 million in sales to \$31 million in sales. In 1981 less than 1 in 5 cords of firewood used by Georgia households was supplied by vendors, while in 1985 1 in 4 cords was purchased from vendors. If the average cost per cord of about \$80 is imputed to firewood cut by users themselves, the value of firewood consumed by households in 1985 totaled about \$125 million, virtually the same as in 1981. By 1985 only about 1 in 10 households had plans for installing wood-burning equipment, as compared with 1 in 5 households in 1981. The scaling down of plans to buy wood-burning equipment reflects in part the substantial increase in equipment actually installed since 1981. In 1985 there were nearly one third more homes with at least 1 fireplace than in 1981, due in part to the fact that most new detached homes and many new condominiums and apartments are being built with fireplaces. But growth in total household firewood use did not keep pace with these installations as less than two thirds of the installed fireplaces were being used in 1985. Nevertheless, the potential for considerable future growth in household firewood use exists because of these installations and the recent emergence of wood burning equipment producers and firewood vendors promoting wood as a home heating source.



level of state estimation are subject to a less 10 percent error. The estimates shown for the three regions of the state are subject to relatively greater errors, especially in the Central and South regions from which a much smaller proportion of the sample was drawn than in the heavily populated North region.

Findings

The consumption of firewood by Georgia households showed little, if any, growth from 1981 to 1985; but the apparent consumption of 1,585,178 cords in 1985 was half again larger than the total use of firewood by households at the height of the energy crisis in 1979, Table 1. The apparent 0.8 percentage growth in firewood use since 1981 is so small as to be accounted for sampling errors in the two surveys.

Reflecting the state's population growth and, possibly, the increased popularity of firewood use, the total number of firewood-using households continued to grow, if at a more modest pace, Table 2. The estimated 700,830 households using firewood in 1985 represented a 12.0 percent increase over the 625,897 households using wood in 1981 and a 45.9 percent increase over the 480,449 households using wood in 1979. The recent growth in firewood-using households partly reflects a 6.8 percent growth in the total number of Georgia households, from 1,872,564 in 1980 to 2,000,113 in 1985. The proportion of all households using firewood apparently increased 5.4 percent from 33.4 percent in 1981 to 35.2 percent in 1985 but this small increase may be due to sampling error. At the same time, the marked increase in the popularity of firewood use from 1 in 4 households in 1979 to 1 in 3 households in the latter two survey years is both statistically and economically significant. The increased popularity of firewood use gained during the energy crisis appears to have outlasted the crisis. Importantly also, it will be seen that the number of households with wood-burning equipment is about 25 percent greater than the number burning firewood in 1985, 876,990 versus 700,830. By the same token, the proportion of all Georgia households with wood-burning equipment is much greater than the proportion burning wood in 1985, 43.8 percent versus 35.2 percent. The potential for increased future use of firewood by Georgia households is considerably greater than indicated by the trend in actual use.

Of the total volume of firewood consumed by households, hardwoods were preferred over softwoods by a large margin, Table 3. In 1985 an estimated 1,369,710 cords, 86.4 percent of state-wide consumption, consisted of hardwood species. Hardwoods accounted for 88.6 percent of the firewood used in the North region, 83.5 percent in the Central region, and 81.4 percent in the South region. The use of firewood of all species was

Table 1
Total Volume of Firewood Used by Georgia Households (Cords)

	<u>1979</u>	<u>1981</u>	<u>1985</u>
	1,057,098	1,573,239	1,585,178
Percentage Change			
	<u>1979-1981</u>	<u>1981-1985</u>	
	+48.8	+0.8	

Table 2
The Number and Proportion of Georgia Households Using Firewood

	<u>1979</u>	<u>1981</u>	<u>1985</u>
Number			
	480,449	625,897	700,830
Percentage Change			
	<u>1979-1981</u>	<u>1981-1985</u>	
	30.3	12.0	
Proportion of All Georgia Households (Percent)			
	25.7	33.4	35.2
Percentage of Change			
	<u>1979-1981</u>	<u>1981-1985</u>	
	30.3	5.4	

Table 3
Household Consumption of Firewood in 1985
By Species and Region
(Cords)

<u>Species</u>	<u>Georgia</u>	<u>North</u>	<u>Central</u>	<u>South</u>
All	1,585,177	1,015,797	299,079	270,302
Percent	100.0	100.0	100.0	100.0
Hardwood	1,369,710	900,150	249,669	219,891
Percent	86.4	88.6	83.5	81.4
Softwood	215,467	115,646	49,410	50,411
Percent	13.6	11.4	16.5	18.6
Regional Distribution of Consumption				
	Percent			
All Species	100.0	64.1	18.9	17.0

Table 4
Estimated Firewood Consumption in 1985
By Source and Region
(Cords)

Sources of Firewood	Georgia	North	Central	South
	Total Cords	Total Cords	Total Cords	Total Cords
Cut by User	1,157,418	719,679	215,417	222,322
Pct. of Total	73.0	70.8	72.0	82.2
Bought from Dealer	393,127	277,616	71,387	44,124
Pct. of Total	24.8	27.3	23.9	16.3
From Other Sources	34,633	18,502	12,276	3,855
Pct. of Total	2.2	1.8	4.1	1.4
Totals	1,585,178	1,015,797	299,080	270,301
Pct. of Total	100.0	100.0	100.0	100.0

Table 5
Distribution of Households Using Firewood in 1985
By Annual Cords of Wood Used and Region
(Percent of Using Households)

Cords Used Per Year Per Household	Georgia Pct.	North Pct.	Central Pct.	South Pct.
.5 cords or less	13.0	14.1	8.1	14.4
.6 to 1 cords	20.8	23.2	10.1	23.8
1.1 to 2 cords	26.6	21.9	33.1	34.4
2.1 to 3 cords	16.5	16.0	22.3	12.5
3.1 to 4 cords	7.9	8.0	11.5	4.4
4.1 to 5 cords	6.2	6.5	8.1	3.8
5.1 to 6 cords	3.2	4.3	1.4	1.9
More than 6 cords	5.7	6.1	5.4	5.0
Totals	100.0	100.0	100.0	100.0
Average Cords Used	2.65	2.74	2.91	2.15

dominated by the North region, which accounted for 64.1 percent of the state total as compared with 18.9 percent and 17.0 percent of the total consumption by households, respectively, in the Central and South regions.

Most firewood used by Georgia households is cut by the user, Table 4. Statewide, 73.0 percent of the 1,585,178 cords consumed in 1985 were cut by the using household, 24.8 percent were bought from firewood dealers, and 2.2 percent were obtained from other sources. Relatively more households in the North Region bought firewood from a dealer, 27.3 percent. Conversely, relatively more households in South Georgia cut their own wood, 82.2 percent. Significantly, the volume of firewood purchased from vendors increased 42.0 percent from an estimated 276,890 cords in 1981 to 393,127 cords in 1985. In the earlier year, less than 1 in 5 cords of firewood used by Georgia households was supplied by the firewood vending industry as compared with 1 in 4 cords in 1985.

Among Georgia households using firewood in 1985, the large majority burned 2 or fewer cords, Table 5. The reported average for the state as a whole was 2.65 cords per using household. Of all Georgia households using firewood, 60.4 percent burned 2 or fewer cords and 76.9 percent burned 3 or fewer cords in 1985. At either extreme of the distribution, 13.0 percent of the using households burned a half cord or less while 5.7 percent burned more than 6 cords during the year. Households in the Central Region evidenced the highest average use of firewood among the three regions, 2.9 cords.

There has been no significant change in the average price per cord of firewood in recent years, the statewide average being \$79.99 in 1981 and \$78.90 in 1985, Table 6. A difference this small could well be explained by sampling error and is trifling in any case. But the average amount spent upon firewood in either year varies significantly from one region to another, being lowest in the Central Region and highest in the North Region. The reported cost of purchased firewood also varied greatly from one survey respondent to another with some reporting paying as little as \$25 or less and some reporting as much as \$135 or more. Respondent errors of recollection or misunderstanding of the question may explain many of the extreme values that were reported. If the firewood sold by vendors is valued at the \$79.99 and \$78.90 average prices indicated for 1981 and 1985, firewood industry sales to households are estimated to be \$31 million in 1985, up 41 percent from the estimated \$22 million of sales by the firewood vending industry in 1981. Further, if the average price per cord of purchased firewood is imputed to the firewood cut by users themselves, the value of firewood burned by households is estimated to be about \$125 million, virtually the same as in 1981.



Of the total volume of firewood consumed by households, hardwoods were preferred over softwoods by a large margin.



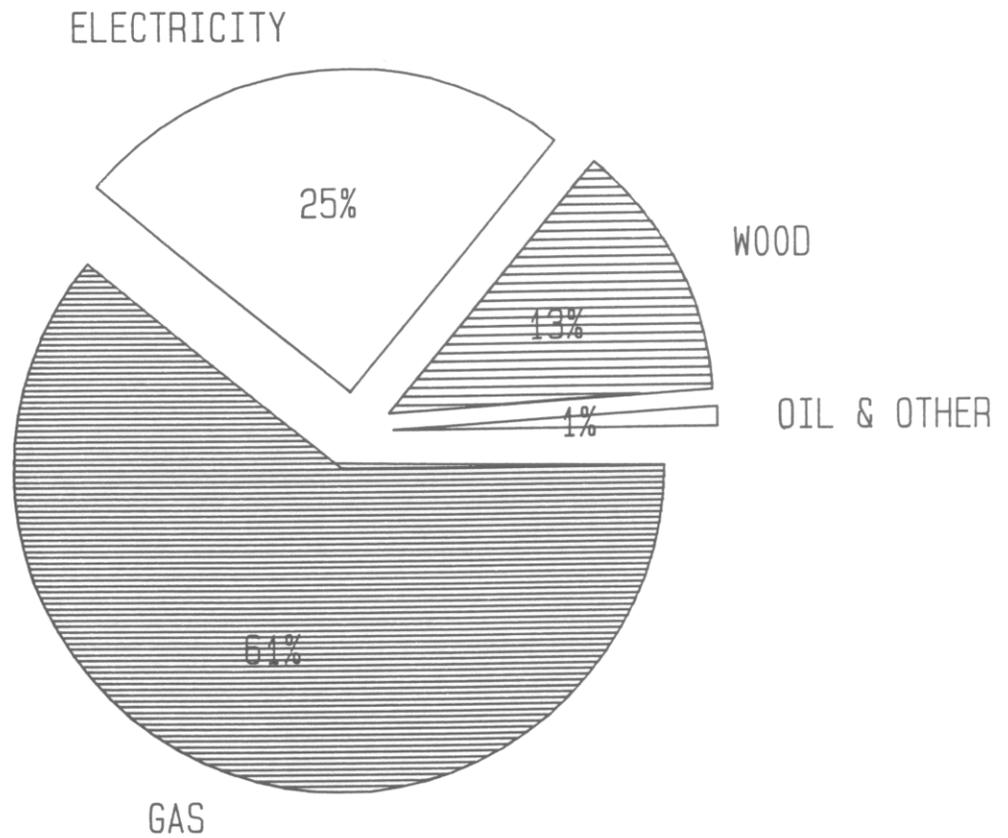
The study shows a significantly greater volume of firewood purchased from vendors in 1985 as compared to 1981.

Table 6

Distribution of Firewood Purchasing Households in 1981 and 1985
By Amount Paid per Cord and Region
(Percent of Purchasing Households)

Dollars Paid per Cord per Year	Georgia		North		Central		South	
	1981 Pct.	1985 Pct.	1981 Pct.	1985 Pct.	1981 Pct.	1985 Pct.	1981 Pct.	1985 Pct.
Less than 25	1.1	6.4	0.9	5.8	3.2	9.6	---	4.8
25 to 34.99	8.0	5.3	4.3	6.3	19.4	5.8	10.3	---
35 to 44.99	8.0	9.9	7.8	10.6	6.5	7.7	10.3	9.5
45 to 54.99	6.3	7.1	5.2	5.3	12.9	9.6	3.4	11.9
55 to 64.99	6.3	7.8	5.2	6.9	9.7	13.5	6.9	4.8
65 to 74.99	12.5	10.2	12.9	5.3	12.9	21.2	10.3	19.0
75 to 84.99	16.5	15.9	18.1	17.5	12.9	13.5	13.8	11.9
85 to 94.99	15.3	8.5	13.8	2.1	6.5	5.8	31.0	11.9
95 to 104.99	9.7	8.8	11.2	17.5	6.5	5.8	6.9	2.4
105 to 114.99	5.7	3.5	4.3	3.2	9.7	3.8	6.9	4.8
115 to 124.99	5.7	6.0	8.6	5.8	---	---	---	11.9
123 to 134.99	---	1.4	---	2.1	---	1.9	---	---
135 or More	5.1	9.2	7.8	11.6	---	1.9	---	7.1
Totals	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Average Cost	\$79.99	\$78.90	\$85.78	\$83.08	\$61.80	\$64.86	\$73.95	\$77.52

MAJOR SOURCES OF FUEL FOR SPACE HEATING



PERCENTAGES OF HOME HEATING FROM WOOD

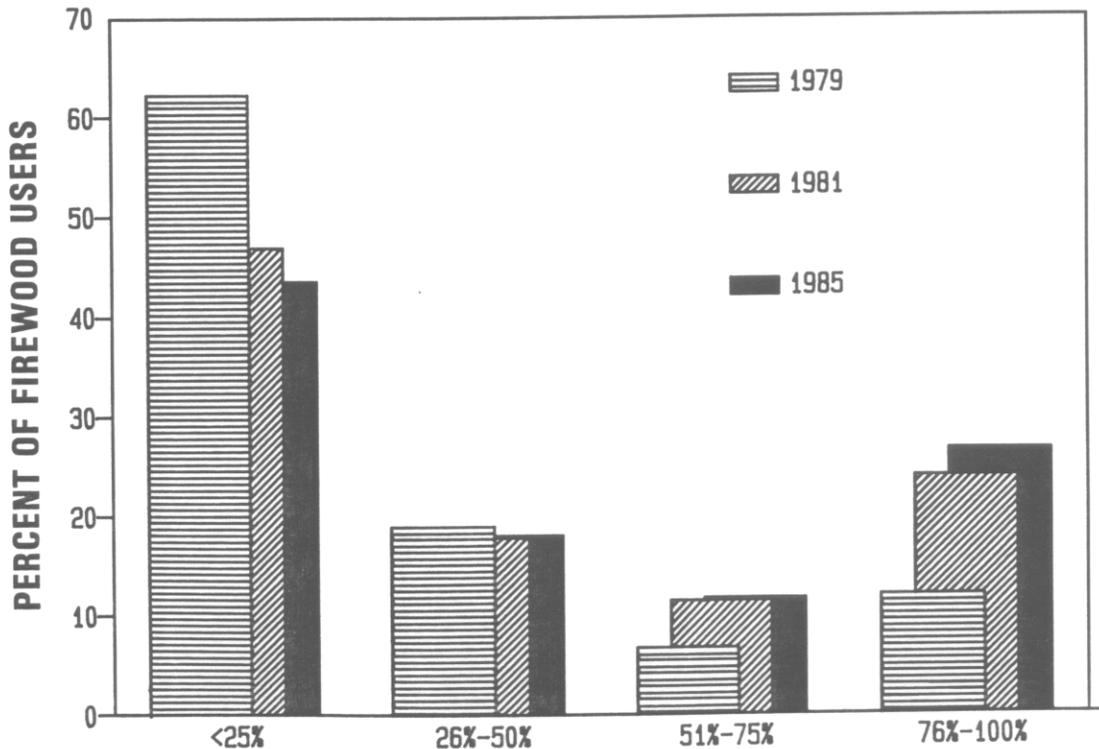


Table 7

Distribution of Households Purchasing Firewood
from Vendors in 1985
By Size of the Order and Region
(Percent)

Size of Orders in Cords	Georgia	North	Central	South
.01 to .60	43.1	33.8	60.7	63.8
.61 to 1.00	34.8	41.4	25.0	17.0
1.01 to 2.00	12.8	14.3	8.9	10.6
2.01 to 4.00	5.1	5.7	3.6	4.3
Over 4	4.2	4.8	1.8	4.3
Totals	100.0	100.0	100.0	100.0
Average Cords Per Order	1.22	1.31	1.03	1.05

Among households purchasing firewood from dealers in 1985, the size of the order tended to be a cord or less for most households, but the average order was more than a cord because of large orders on the part of relatively few households, Table 7. Statewide and in all regions, more than three fourths of the orders from vendors were for a cord or less. The average order statewide was 1.22 cords with households in the North averaging 1.31 cords per order and households in the Central and South regions averaging 1.03 cords each.

Among all Georgia households wood has become a much more important source of energy for space heating since 1979, primarily at the expense of natural gas, fuel oil, and other fossil fuels, Table 8. In 1979 only about 5 percent of Georgia's households depended upon wood as a major source of home space heating, only slightly more than depended upon fuel oil and other fossil fuels for heating their homes. By 1981 more than 13 percent of Georgia households depended upon wood as a major source of fuel for home heating, a share that held up in 1985 as well, Chart 1.

Among Georgia households using firewood, the number which were dependent upon wood for more than half of their space heating needs increased faster even than the growth in firewood-using households from 1979 to 1985, Table 9 and Chart 2. In 1979 only 18.7 percent of firewood-using homes relied upon wood for more than half of their space heating needs. In 1985, 38.0 percent of wood-using homes depended upon wood for more than half of their space heating needs. More than a quarter million Georgia homes are dependent upon wood for more than half their space heating needs. Most of these homes are located in the North region due to the concentration of population there but, relatively speaking, people living in the Central region are

more dependent upon wood for their space heating needs. In 1985, 44.5 percent of the homes using firewood in Central Georgia received more than half of their space heat from wood.

Importantly, there are far more households with wood-burning equipment than used firewood in 1985. An estimated 876,990 Georgia households had at least one item of wood burning equipment, Table 10. Statewide, 43.8 percent of all

Table 8
Major Sources of Fuel for Home
Space Heating
Percent of Georgia Households

Fuel	1979	1981	1985
Gas	68.5	65.4	60.1
Electricity	23.9	19.2	25.4
Wood	5.1	13.7	13.5
Oil and Other	2.5	1.7	2.5
Totals	100.0	100.0	100.0

households had a fireplace or other item of wood-burning equipment. In North Georgia 46.5 percent of all households had wood-burning equipment. Almost 600,000 Georgia households, 29.7 percent of all households, had open fireplaces, 223,000, 11.1 percent of all households, had free-standing wood stoves, and 129,000, 6.5 percent, had fireplace inserts.

The 876,990 households with at least

Table 9

Distribution of Wood-Using Households
By Share of Home Space Heating Supplied by Wood
1979, 1981, and 1985 for State and 1985 for Regions
(Percent)

Percent of Heat Supplied by Wood	Georgia		North 1985	Central 1985	South 1985
	1979	1981			
25% or Less	62.3	46.9	43.6	49.4	36.3
26% to 50%	19.0	17.8	18.1	14.1	19.1
51% to 75%	6.7	11.4	11.7	9.3	15.4
76% to 100%	12.0	23.9	26.6	27.2	29.1
Totals	100.0	100.0	100.0	100.0	100.0

Table 10

Households with Wood-Burning Equipment Installed in 1985
(Number and Percent of All Households)

State and Regions	Installed Equipment		Estimated Households With Open Fireplaces		Free-Standing Stoves		Fireplace Inserts	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
North	563,001	46.5	398,443	32.9	152,392	12.6	68,647	5.3
Central	161,077	39.7	102,056	25.2	33,894	8.4	35,672	8.8
South	152,912	39.7	92,950	24.2	36,368	9.5	29,612	7.7
Georgia	876,990	43.8	593,449	29.7	222,654	11.1	129,360	6.5

one item of wood-burning equipment in 1985 had more than a million installed items, Table 11. The 593,443 households with open fireplaces had a total of 710,060 fireplaces, of which it is estimated that only 440,188 or 62.0 percent were used in 1985. In contrast it is seen that a very high percentage of installed free-standing stoves, fireplace inserts, and

central wood furnaces were being used in 1985.

An estimated 232,995 households in 1985, 11.6 percent of all households, had plans to install one or more items of wood-burning equipment, Table 12. The most popular item planned for installation was a fireplace insert, for which an estimated 80,736 households or 4.0 per-

cent of all households indicated interest. Indicated interest was high as well for installing free-standing stoves, an estimated 74,686 households, and fire places, 70,754 households. The households having plans to install equipment in 1985 were substantially fewer than the estimated 372,468 households, 19.9 percent of all households, with such plans in 1981.

Table 11

Estimated Items of Wood-Burning Equipment Installed and Used in 1985 (Numbers of Items)

Type of Equipment	Installed	In Use	Percent in Use
Open Fireplaces	710,60	440,188	62.0
Free-Standing Stoves	238,954	230,465	96.4
Fireplace Inserts	134,584	119,912	89.1
Central Wood Furnaces	7,065	7,065	100.0
All Items	1,090,663	797,630	73.1

Table 12

Household Plans to Install One or More Items of Wood-Burning Equipment By Type of Equipment and Region

Number and Percent of All Households

Type of Equipment Planned for Install.	Georgia		North		Central		South	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Fireplace	70,754	3.5	45,160	3.7	13,959	3.4	11,635	3.0
Insert	80,736	4.0	46,236	3.8	15,773	3.9	18,727	4.9
Stove	74,686	3.7	47,091	3.9	10,728	2.6	16,867	4.4
Furnace	10,965	0.5	8,903	0.7	652	0.2	1,410	0.4
Other	2,095	0.3	1,431	0.1	664	0.2	—	—
Not Sure	5,831	0.3	1,966	0.2	1,127	0.3	2,738	0.7
Total Items Planned	245,067	12.3	150,787	12.5	42,903	10.6	51,377	13.4
Total Households Planning	232,995	11.6	144,255	11.9	41,614	10.3	47,126	12.2

SUMMARY AND CONCLUSIONS

This study, the third of three surveys of household use of firewood in Georgia, reveals that the household use of wood for energy no longer exhibits the growth it did between 1979 and 1981, when the energy crisis was at its height. However the study does reveal that firewood has become established as an important source of energy for households in the state, with the potential to become even more important if the need arises.

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