REGIONAL ENERGY CONSUMPTION

Second Interim Report
of a Joint Study by

REGIONAL PLAN ASSOCIATION, INC. AND RESOURCES FOR THE FUTURE, INC.

Library of Congress Cataloging in Publication Data

Regional Plan Association, New York.
Regional energy consumption.

1. Power resources--New York metropolitan area--Statistics. I. Resources for the Future. II. Title.
HD9548.N72R43 1974 338.4'7'3338209747 73-20443

RPA Bulletin 121, Printed January, 1974.

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FOREWORD

This is the second in a series of reports resulting from a joint research project conducted by Resources for the Future, Inc. and Regional Plan Association, Inc. under a grant from The Ford Foundation. The purpose of the project was to evaluate energy consumption trends and energy conservation opportunities in the New York Region.

The first interim report, Patterns of Energy Consumption in the Greater New York City Area, published by Resources for the Future in July 1973, presented selected statistical data for an 8-county part of New York State. This report expands the coverage to all 31 counties of the tri-state New York - New Jersey - Connecticut Region, provides data on some fuels that were not covered earlier, and refines many of the statistics.

The report shows energy consumption for 1960 and 1970 (and, in many cases, for 1950 and additional years) broken down by energy form and by consuming sector: residential, commercial and public facilities, industrial and transportation. An effort was made to allocate energy use to these sectors as accurately as possible: conventional reporting categories often suffer from confusing definitions, such as when large-scale residential users are listed as "commercial," or when public housing is listed under "public" rather than "residential." The definition of industrial use in particular was changed to conform to the U.S. Census of Manufactures. A major virtue of the data is their comprehensive scope and integrated presentation: all energy forms are covered in their entirety, not merely gas and electric utility sales. Another advantage of the data is that they are allocated by counties -- basic units for which demographic and economic information is available from the Census -- and not by utility territories. The allocation was performed on the basis of unpublished statistics obtained from the utilities in the case of electricity and gas, and on the basis of a variety of auxiliary sources in the case of liquid and solid fuels. Maps of the utility service areas appear in the report.

The calculation of energy consumption on a small geographic area basis is a pioneering enterprise, and the figures shown vary somewhat in quality. While the data on gas and electricity are "hard," those on the other fuels sometimes represent estimates with varying degrees of reliability. The methodology used in the construction of each of the tables is given in the notes. To aid analysis, selected demographic and economic measures of the 31 counties are given at the end of the report.

The report also contains projections of energy use in the Region to 1985. They assume a population growth from 19.8 million in 1970 to 22.5 million in 1985 (implying population stability by 2020), and a growth in labor productivity of 2.8 percent annually. This increase, though below the 1950-70 national rate of 3.0 percent, when coupled with a growing labor force participation rate, still causes large increases in per capita income, which in turn govern the energy use projections. A lower rate of growth in productivity would lower the energy projections. They should not be taken as predictions of the future, but as benchmarks against which different conservation strategies can be evaluated. They show what would happen in a largely unconstrained market, without supply bottlenecks, higher prices, rationing or other restrictions on use (the two major exceptions to this rule regarding natural gas and residential electricity are defined in the body of the text). The effect of conservation measures and other constraints on demand will be evaluated in the final report of the study, to be prepared by Resources for the Future, Inc.

By way of introducing the tabular material, this report provides a brief summary of key relationships that emerge from the study. Further analysis of the anatomy of energy use in the New York Region will be contained in the final report of this study, as well as in the reports of other studies to which information was supplied in the course of this work, notably those of New York University and Brookhaven National Laboratory. Generally, the purpose of this report is not to propose policies, but to provide quantitative data for analysis of energy issues by researchers and policymakers.

The report would not have been possible without the generous cooperation of some 65 utilities and private and public organizations, which are listed on the next page. Their help is gratefully acknowledged and they are, of course, in no way responsible for any faulty use of the data provided.

John P. Keith, President, Regional Plan Association, Inc.
Joseph L. Fisher, President, Resources for the Future, Inc.
November, 1973.

COOPERATING ORGANIZATIONS:

Consolidated Edison Company of New York, Inc.
Public Service Electric and Gas Company
Long Island Lighting Company
New York State Electric & Gas Corporation
The Connecticut Light and Power Company
Jersey Central Power & Light Company
The Hartford Electric Light Company
The United Illuminating Company
Atlantic City Electric Company
Central Hudson Gas & Electric Corporation
Orange and Rockland Utilities, Inc.
New Jersey Power & Light Company
Rockland Electric Company
Sussex Rural Electric Cooperative, Inc.
and 12 electric Municipal Systems

Brooklyn Union Gas
New Jersey Natural Gas Company
Elizabethtown Gas Company
The Southern Connecticut Gas Company
The Greenwich Gas Company

Brookhaven National Laboratory
New York University, Graduate School of Public Administration
Princeton University

American Gas Association, Inc.
American Petroleum Institute
Citizens for Clean Air, Inc.
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Fuel Merchants Association of New Jersey
National Coal Association
Oil Heat Institute of Long Island, Inc.

Advanced Management Research, Inc.
Paragon Oil Company
Penn Central Transportation Company
Suburban Propane Company

Federal Power Commission
U.S. Department of the Army, Corps of Engineers
U.S. Department of the Interior, Bureau of Mines
U.S. Environmental Protection Agency

New York State Department of Environmental Conservation
New York State Division of Housing and Community Renewal
New York State Metropolitan Transportation Authority
New York State Public Service Commission
New York State Urban Development Corporation
State University of New York at Stony Brook

New Jersey State Department of Environmental Protection
New Jersey State Department of Public Utilities

Connecticut State Department of Environmental Protection
Connecticut State Public Utilities Commission

New York City Department of City Planning
New York City Environmental Protection Administration
New York City Housing Authority
New York City Housing and Development Administration
New York City Interdepartmental Committee on Public Utilities

Tri-State Regional Planning Commission
The Port Authority of New York and New Jersey

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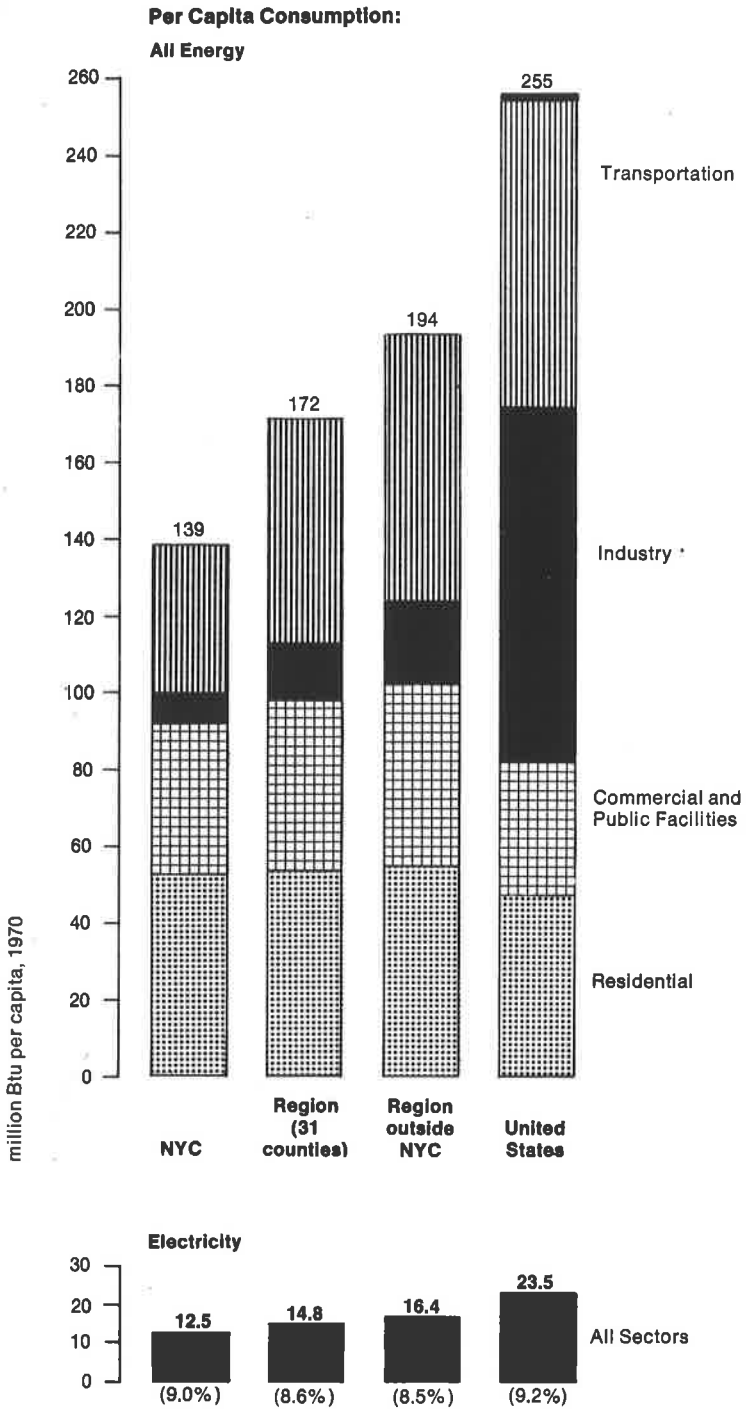
LEVELS OF CONSUMPTION



With 9.7 percent of the nation's population and 12 percent of its money income, the New York Urban Region consumes 6.6 percent of the nation's energy. Consumption per resident in New York City is somewhat over half the national average, and in the City's environs, three quarters. Per dollar of money income, energy consumption in the City is 46 percent, and in the environs 60 percent of the national level.

A major reason for the difference between the nation and the Region is the Region's distinct economic mix. It has less manufacturing industry and depends on imported products for which energy is expended elsewhere. Energy-intensive industries in particular avoid the Region because of higher energy costs. Thus, per capita use of energy for industry in the Region is about 18 percent of the national level. This comparison excludes the use of coal, oil and gas as raw materials for chemical products, which is a significant factor nationally.

A second reason for the difference is the Region's density of development. There is less travel per capita in high density areas and more of it is by energy saving public transportation. Thus, per capita use of energy for transportation in the Region is about 72 percent of the national level.

However, the Region's per capita energy consumption in residences is about 15 percent above the national level, in part because the Region's per capita income is 24 percent above the nation's. Due to the Region's concentration of office jobs, its per capita consumption in commercial and public facilities is about 25 percent above the nation's. One should note, though, that because of estimating difficulties these comparisons are only approximate.

Differences similar in part to those between the Region and the nation prevail between the 5 counties of New York City and the 26 counties in its environs: per capita use of energy for industry and transportation is significantly lower in the City. However, per capita use in the residential and commercial sectors is also lower, though above the national level.

As a result of these differences, the relative importance of the various energy consuming sectors varies greatly among New York City, its environs, and the nation. In the City, the residential sector is most important, accounting for 38 percent of net energy use, and commerce ranks second. In the environs, transportation is the most important user with 37 percent of net energy consumption, and residences rank second. In the nation, industry ranks first with over 35 percent of the use.

Per capita use of electricity in the Region is also lower than in the nation, and so is electricity's share of net energy consumption: 8.6 compared to 9.2 percent. In New York City, per capita use of electricity is substantially lower than in the environs or in the nation, but its share is similar to the nation's and higher than in the environs. As a result the fuel burned to produce electricity accounts for 27 percent of gross energy use in the City compared to 24 percent in the environs.

Table A.
Regional and National Energy Consumption and Related Indicators, 1970.

	New York City	Region (31 counties)	Region outside NYC	United States	Region as % of U.S.
Population *(thousands)*	7,896	19,756	11,860	203,212	9.7
Money income *(million 1969 $$)*	29,373	76,313	46,940	635,563	12.0
Net energy consumption *(trillion Btu)**	1,097	3,398	2,301	51,767	6.6
Gross energy consumption *(trillion Btu)**	1,404	4,186	2,782	63,444	6.6
Electricity consumption *(thousand mWh)*	28,837	85,914	57,077	1,402,988	6.1
PER CAPITA:					
money income *(1969 $$)*	3,720	3,863	3,958	3,118	123.9
net energy consumption *(million Btu)*	138.9	172.0	194.0	254.7	67.5
gross energy consumption *(million Btu)*	177.8	211.9	234.6	312.2	67.9
electricity consumption *(kWh)*	3,652	4,349	4,812	6,884	63.2
PER $ OF MONEY INCOME:					
net energy consumption *(million Btu)*	37.3	44.5	49.0	81.5	54.6
gross energy consumption *(million Btu)*	47.8	54.9	59.3	99.8	55.0
electricity consumption *(kWh)*	0.98	1.13	1.22	2.21	51.1
SHARES OF NET ENERGY USE BY SECTOR:					
(percent of line 3)					
residential	38.2	31.5	28.3	18.4**	11.2
commercial & public facilities	28.2	25.6	24.4	13.9	12.1
industrial	6.1	9.3	10.8	35.5	1.7
transportation	27.5	33.6	36.5	31.9	6.9
NET PER CAPITA USE BY SECTOR:					
(million Btu)					
residential	53.1	54.2	55.0	46.9**	115.6
commercial & public facilities	39.2	44.0	47.3	35.4	124.6
industrial	8.4	16.0	21.0	90.4	17.7
transportation	38.2	57.7	70.8	81.2	71.7

* Net consumption includes electricity sold to users, converted at the direct heat equivalent of 3,412 Btu (British thermal units) per Kilowatt-hour. Gross consumption excludes electricity but instead includes fuels used at power stations for the generation of electricity.
**0.3 percent in the national distribution consists of miscellaneous, not shown separately.

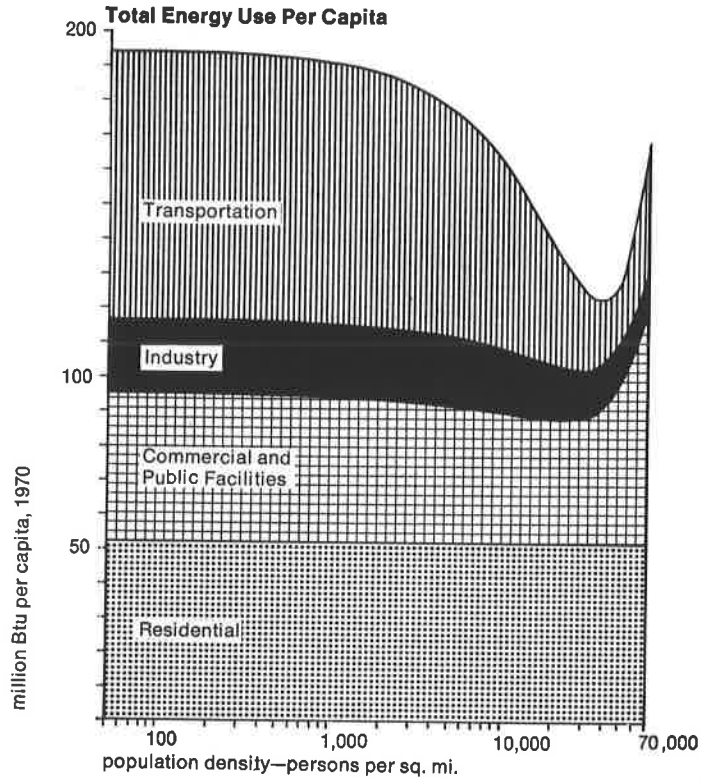
Sources: Regional population and income Table 19, energy Table 17; undistributed category in Table 17 allocated proportionately to population. National population and income from **Statistical Abstract of the U.S.**; energy totals from U.S. Bureau of Mines release dated March 31, 1972; for comparability with regional data, 4,000 trillion Btu of coal, gas and petroleum used as raw material in industry subtracted from the national totals; allocation by sector, adjusted for above subtraction, from **Patterns of Energy Consumption in the U.S.**, a report by the Stanford Research Institute to the Office of Science and Technology, Washington, D.C. January, 1972.

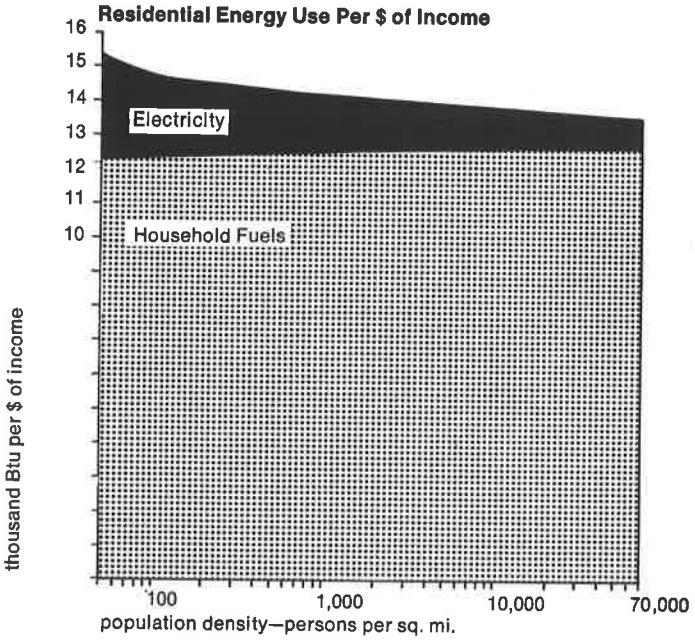
Table B.
Regional and National Electricity Consumption Indicators, 1970.

	New York City	Region (31 counties)	Region outside NYC	United States
ELECTRICITY'S SHARE OF ENERGY USE BY SECTOR:				
(percent of net energy consumption)				
residential	6.8	9.2	10.7	16.0
commercial & public facilities	14.0	13.0	12.4	16.7
industrial	25.5	22.7	21.9	11.1
transportation	3.1	0.9	0.2	0.1
all sectors	**9.0**	**8.6**	**8.5**	**9.2**
ELECTRICITY USE BY SECTOR:				
(percent of total electricity consumption)				
residential	29.1	33.5	35.7	31.9
commercial & public facilities	44.2	38.5	35.6	25.1
industrial	17.2	24.4	28.1	42.7
transportation	9.5	3.6	0.6	0.3
all sectors	100.0	100.0	100.0	100.0
PER CAPITA ELECTRICITY USE BY SECTOR:				
(million Btu direct equivalent)				
residential	3.6	5.0	5.9	7.5
commercial & public facilities	5.5	5.7	5.8	5.9
industrial	2.2	3.6	4.6	10.0
transportation	1.2	0.5	0.1	0.1
all sectors	**12.5**	**14.8**	**16.4**	**23.5**

Sources: As above in Table A.

THE EFFECT OF DENSITY





Differences in consumption between New York City and its environs can be better understood if all counties of the Region are arrayed by population density. As density rises above 1,000 people per square mile, consumption begins to drop from a high of around 200 Btu per capita at the fringe to a low of 100 Btu in the Bronx, only to rise again to 178 Btu in Manhattan.

This effect is a composite of different patterns for each economic sector. Per capita consumption in the residential sector is nearly constant throughout all densities, at somewhat over 50 million Btu. Consumption in the commercial and public facilities sector is constant at low densities with over 40 million Btu per capita. It drops below that level as density rises over 5,000 per square mile, only to rise again in Brooklyn and the Bronx to a high of 68 million Btu in Manhattan. Transportation consumption experiences the sharpest drop of all in the range between 1,000 and 40,000 per square mile -- roughly from 80 to 30 Btu per capita -- then rises moderately in Manhattan. The patterns strongly reflect the geographic distribution of employment, income and floorspace in the Region. Thus, calculated not in relation to resident population, but to daytime population, Manhattan has the lowest per capita consumption of any county in the Region.

To separate out the effect that can be more directly attributed to density, it is useful first to look at consumption per dollar of income. Seen that way, consumption in the transportation sector rises steeply and continuously with declining density, from a low of about 9,000 Btu per dollar in the center to about 33,000 Btu at the edge of the Region. Even consumption in the residential sector, which does not vary with density on a per capita basis, does show an increase from 13,400 Btu in Manhattan to 15,300 Btu at the edge on a per dollar basis. This latter rise is caused by residential use of electricity, which increases threefold per dollar of income in that range.

One would expect that residential consumption per square foot of residential floorspace would also rise with declining density, due to the inherently greater exposure of single-family houses. There is a clear rise in residential consumption per square foot as density declines from the inner boroughs of New York City toward Richmond, Westchester, Nassau and Suffolk. However, the rise in energy use per square foot with declining density does not hold up in the northern counties of New York State (perhaps due to seasonal housing), nor in New Jersey (perhaps due to deficiencies in the data).

Nonresidential consumption per square foot of nonresidential floorspace also rises gradually if irregularly with declining density, though part of this may simply be due to the tendency of energy-intensive users to locate farther out. However, electricity use per employee in commercial and public facilities (including offices and shopping centers) is clearly higher in low density counties. Generally, the direct effect of density on energy use related to floorspace requires further study.

Table C.
Selected Indicators of Energy Consumption Related to Density, 1970.

		Gross population density *pers./sq. mi.*	Total net energy use *million Btu per capita* (average)	(actual)	Residential use *thousand Btu per $* All energy (average)	Electricity (actual)	Transportation use *thousand Btu per $* (actual)	Residential use *thousand Btu per sq. ft. of residential floorspace* (actual)	Comm., Publ. & Industrial *thousand Btu per sq. ft. of nonresidential floorspace* (actual)
1	Manhattan	69,965	**173**	178	**13.4**	0.73	5.1 + 3.7 (unallocated)	138	190
2	Brooklyn	37,531	**126**	124	**13.5**	1.08	5.6 + 3.7	176	359
3	Bronx	35,066	**127**	103	**13.5**	1.06	5.8 + 3.7	134	327
4	Queens	18,293	**147**	151	**13.6**	1.02	9.1 + 3.7	191	408
5	Hudson	13,479	**157**	121	**13.6**	1.05	8.9 + 3.7	115	254
6	Essex	7,291	**174**	167	**13.7**	1.14	8.6 + 3.7	135	291
7	Union	5,273	**180**	191	**13.7**	1.32	11.3 + 3.7	144	248
8	Richmond	5,120	**181**	161	**13.8**	1.38	9.0 + 3.7	200	435
9	Nassau	4,790	**182**	190	**13.8**	1.25	11.3 + 3.7	229	346
10	Bergen	3,845	**185**	200	**13.8**	1.25	13.8 + 3.7	158	275
11	Passaic	2,467	**190**	176	**13.9**	1.45	11.3 + 3.7	148	243
12	Westchester	2,058	**191**	202	**13.9**	1.07	10.5 + 3.7	206	365
13	Middlesex	1,866	**192**	253	**13.9**	1.68	17.5 + 3.7	150	428
14	Mercer	1,336	**194**	180	**14.0**	1.43	15.0 + 3.7	146	313
15	Rockland	1,288	**194**	213	**14.0**	1.46	18.3 + 3.7	191	391
16	Suffolk	1,256	**194**	208	**14.0**	1.76	19.3 + 3.7	192	430
17	Fairfield	1,253	**194**	177	**14.0**	1.56	13.3 + 3.7	182	203
18	New Haven	1,224	**194**	198	**14.0**	1.95	19.9 + 3.7	179	220
19	Monmouth	969	**195**	166	**14.1**	1.71	14.4 + 3.7	146	272
20	Morris	820	**196**	197	**14.1**	1.69	17.3 + 3.7	153	311
21	Somerset	646	**196**	205	**14.2**	1.53	17.0 + 3.7	148	350
22	Ocean	326	**197**	201	**14.4**	2.40	22.9 + 3.7	122	663
23	Dutchess	272	**198**	209	**14.4**	1.98	22.0 + 3.7	148	446
24	Orange	267	**198**	232	**14.5**	2.11	25.0 + 3.7	153	556
25	Putnam	241	**198**	172	**14.6**	2.22	24.2 + 3.7	118	357
26	Warren	205	**198**	186	**14.6**	2.52	22.8 + 3.7	112	323
27	Hunterdon	160	**198**	183	**14.7**	2.19	20.8 + 3.7	119	405
28	Litchfield	153	**198**	181	**14.7**	2.34	22.3 + 3.7	165	280
29	Sussex	147	**198**	153	**14.7**	2.00	21.9 + 3.7	107	336
30	Ulster	124	**198**	214	**14.8**	2.37	24.7 + 3.7	167	450
31	Sullivan	53	**198**	221	**15.3**	3.11	29.7 + 3.7	83	167

Note: "Unallocated" category, consisting mostly of fuel for air travel, rail freight and waterborne freight is evenly distributed among the counties according to population.
Sources: Energy Table 17, Population and Income Table 19, floorspace from TSRPC and Tables 20 and 21

The charts on the opposite page and the "average" columns in Table C are based on lines of best fit defined by the correlation equations below. R^2 indicates what proportion of the dependent variable in each case is explained by the independent variable, such as density (D).

(1) million Btu per capita in transportation $= +0.0315D^2 - 2.7521D + 65.2139$ $R^2 = 0.7574$ (excluding unallocated)
(2) million Btu per capita in industry $= +0.0024D^2 - 0.3305D + 20.3046$ $R^2 = 0.0680$ (excluding unallocated)
(3) million Btu per capita in comm. & publ. facil. $= +0.0146D^2 - 0.6801D + 43.9159$ $R^2 = 0.1005$
(4) million Btu per capita in residences $= -0.0006D^2 + 0.0439D + 51.1004$ $R^2 = 0.0008$
(5) million Btu per capita total $= +0.0479D^2 - 3.7188D + 180.5341$ $R^2 = 0.4684$ (excluding unallocated)
(6) thousand Btu per $ income in res. electricity $= \frac{5.763}{\log D} - 0.285$ $R^2 = 0.8937$
(7) thousand Btu per $ income in res. energy $= \frac{4.940}{\log D} + 12.415$ $R^2 = 0.0289$

Not shown on these pages are the following relationships, used in developing projections described on p. 17:

Residential kWh per $ of Household income:

(8) (1970) $= \frac{1746.5}{\log D} - 102.1$ $R^2 = 0.9026$
(9) (1960) $= \frac{1317.1}{\log D} - 117.7$ $R^2 = 0.8275$
(10) (1950) $= \frac{948.0}{\log D} - 109.4$ $R^2 = 0.7375$

Commercial and public facilities mWh per nonmanufacturing employee:

(11) (1970) $= \frac{0.4431}{FAR} + 4.038$ $R^2 = 0.4715$
(12) (1960) $= \frac{0.2924}{FAR} + 2.206$ $R^2 = 0.4694$
(13) (1950) $= \frac{0.1416}{FAR} + 1.309$ $R^2 = 0.3023$

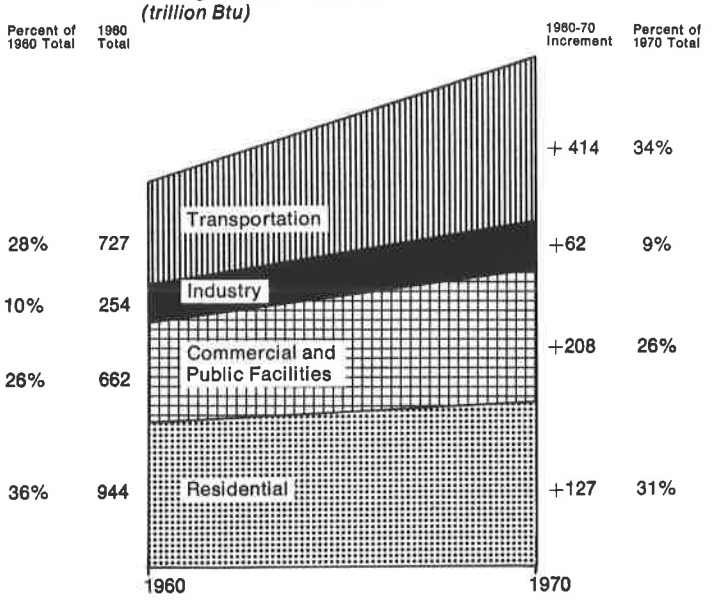
FAR is the county-wide floorspace to lot area ratio of nonresidential buildings, varying from 0.1 in the outer suburbs to 0.3 in the inner suburbs to 3.5 in Manhattan (TSRPC ITR 4291-3204)

Industrial mWh (in thousands):
(14) (1970) $= 15.18\,(J)^{0.93}$ $R^2 = 0.9470$
(15) (1960) $= 6.60\,(J)^{0.99}$ $R^2 = 0.9659$
(16) (1950) $= 2.81\,(J)^{1.05}$ $R^2 = 0.9180$

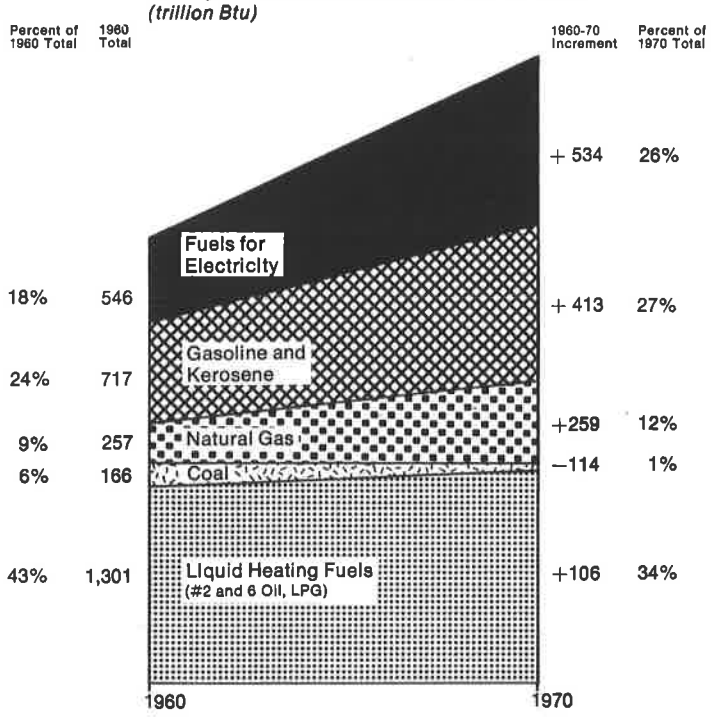
J is plant-site manufacturing employment in thousands (Table 20).

RATES OF GROWTH

Change in Net Consumption by Sector
(trillion Btu)



Change in Gross Consumption by Fuel Type
(trillion Btu)



Energy is used to perform mechanical work, to process materials and food, to modify conditions in the environment (heating, cooling, lighting), to move people and goods. These tasks are related to employment, building floorspace, transportation performance, to the size of the population and its income. In the New York Region during the sixties, each of these indicators grew at a slower rate than in the nation. Thus the growth in energy demand was also slower: 2.8 percent annually compared to 3.7 percent in the nation.

In the course of the decade, net residential consumption in the Region increased 13.5 percent, slightly more than the 12.1 percent increase in population. Industrial consumption increased by 24 percent, compared to a 15.7 percent increase in the value added by manufacture and a 2.3 percent drop in manufacturing employment -- reflecting the substitution of mechanical energy for human work. Energy consumption by commerce and public facilities grew 31.4 percent, matching the 31 percent increase in commercial floorspace (including office buildings). Transportation consumption grew by 56.8 percent, nearly twice as fast as person-miles of travel.

Virtually four-fifths of the increase in net energy consumption in the Region between 1960 and 1970 occurred outside New York City. In the City itself, net residential consumption declined, industrial stayed stable, and only commercial and transportation (the latter including the City's share of aircraft fuel) showed sizeable increases.

Throughout the Region, there was a shift toward rarer and costlier forms of energy. The use of natural gas doubled during the decade, having grown at an annual rate of 4.4 percent in the City and 8.7 percent in its environs. By contrast, the use of liquid heating fuels remained stable in the City and grew only at a rate of 1.3 percent annually in the environs. Their use in residences in the City actually dropped, due to greater use of natural gas. Coal use other than in electricity generation shrank virtually to insignificance.

The use of electricity doubled, having grown at an annual rate of 5.2 percent in the City and 8.4 percent in the environs. Thus, despite its slower overall growth rate, in the electric growth rate the Region matched the nation. About 41 percent of the increase in electricity use went to the commercial and public facilities sector, 37 percent to the residential sector, and 21 percent to industry. Subways and railroads increased their electricity use somewhat, but took only 0.5 percent of the Region's increment in consumption.

In terms of gross energy consumption, that is including the fuels used to generate electricity, these latter showed the largest absolute increase and now account for 26 percent of gross use in the Region. The increase in transportation fuels was second in magnitude. They account for 27 percent of gross use. Both categories deserve closer analysis.

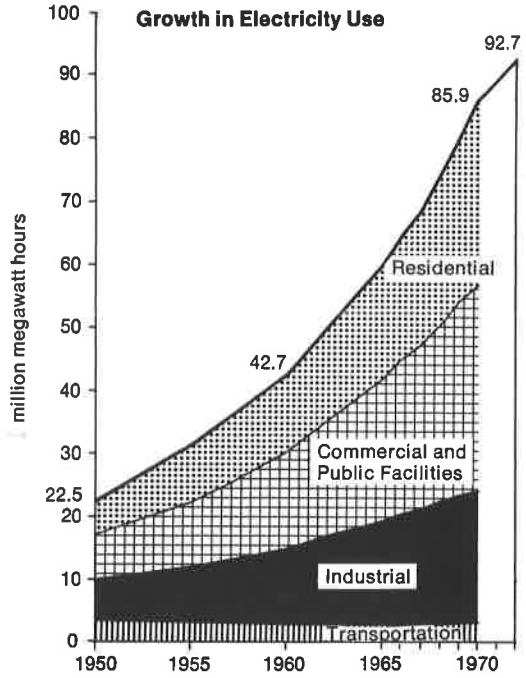
Table D.
Growth in Energy Consumption and Related Indicators, 1960-1970

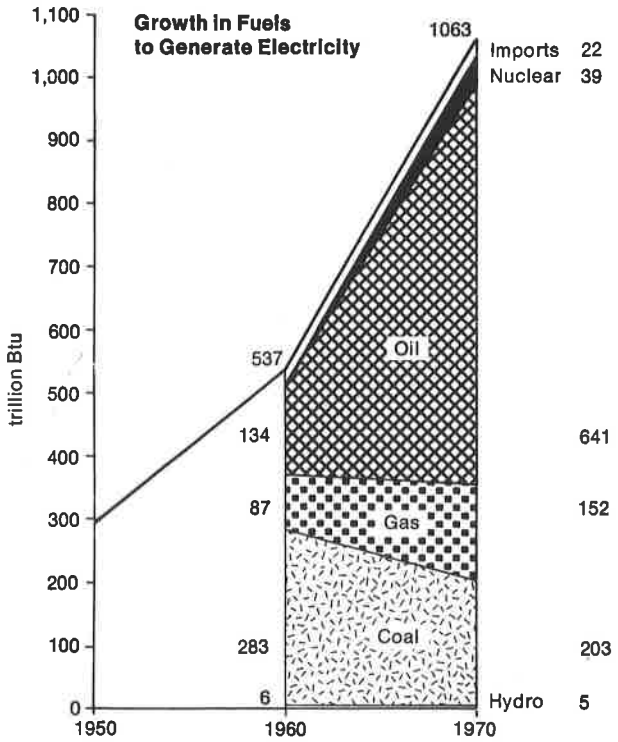
			New York City		Region (31 counties)		Region outside NYC		United States
			number	annual % growth	number	annual % growth	number	annual % growth	annual % growth
POPULATION *(thousands)*		1970	7,896	0.1	19,756	1.2	11,860	1.9	1.3
		1960	7,782		17,624		9,842		
MONEY INCOME *(million 1969 $$)*		1970	29,373	3.0	76,313	4.1	46,940	4.8	4.6
		1960	21,873		51,211		29,338		
EMPLOYMENT *(thousands)*		1970	4,194	0.7	8,624	1.6	4,430	2.6	1.8
		1960	3,908		7,333		3,425		
FLOORSPACE:	residential *(million sq. ft.)*	1970	2,562	0.9	6,460	2.1	3,898	3.1	n.a.
		1963	2,404		5,559		3,155		
	nonresidential *(mill. sq. ft.)*	1970	1,335	1.0	3,918	2.1	2,583	2.8	n.a.
		1963	1,244		3,369		2,125		
PERSON-MILES OF TRAVEL *(billions)*		1970	38	2.4	134	3.0	96	3.2	4.0
		1960	30		100		70		
TON-MILES OF FREIGHT *(billions)* *(exclusive of pipelines)*		1970	n.a.		421	2.5	n.a.		3.1
		1960	n.a.		328		n.a.		
NET ENERGY CONSUMPTION *(trillion Btu)*		**1970**	**1,097**	1.5	**3,398**	2.8	**2,301**	3.4	3.7
		1960	**945**		**2,587**		**1,642**		
BY SECTOR:	RESIDENTIAL	1970	420	−0.3	1,071	1.3	651	2.5	3.8
		1960	434		944		510		
	COMMERCIAL & PUBL. FACIL.	1970	309	2.6	870	2.8	561	2.9	4.3
		1960	240		662		422		
	INDUSTRIAL	1970	67	0.5	316	2.2	249	2.7	2.9
		1960	64		254		190		
	TRANSPORTATION	1970	302	3.8	1,140	4.6	839	4.9	4.3
		1960	207		727		520		
RESIDENTIAL:	electricity	1970	29	7.6	98	8.6	69	9.1	8.1
		1960	14		43		29		
	gas	1970	96	5.9	295	6.2	199	6.4	4.6
		1960	54		161		107		
	other	1970	295	−2.1	678	−0.9	383	0.2	1.0
		1960	366		740		374		
COMM. & PUBL. FAC.:	electricity	1970	43	6.0	113	8.1	70	9.6	10.4
		1960	24		52		28		
	gas	1970	35	2.3	129	8.3	94	12.1	7.0
		1960	28		58		30		
	other	1970	231	2.1	628	1.3	397	0.9	1.8
		1960	188		552		364		
INDUSTRIAL:	electricity	1970	17	3.5	72	5.8	55	6.6	5.4
		1960	12		41		29		
	gas	1970	20	2.3	91	9.1	71	12.4	4.9
		1960	16		38		22		
	other	1970	30	−1.8	153	−1.3	123	−1.2	−0.2
		1960	36		175		139		
BY ENERGY FORM:	electricity	1970	98	5.2	293	7.2	195	8.4	7.4
		1960	59		146		87		
	gas (except for electricity generation)	1970	151	4.4	516	7.2	365	8.7	5.1
		1960	98		257		159		
	coal (except for electricity generation)	1970	15	−11.5	52	−11.0	37	−10.7	−1.0
		1960	51		166		115		
	transportation fuels (gasoline and kerosene)	1970	292	4.0	1,130	4.7	838	4.9	4.3
		1960	198		717		519		
	heating fuels and steam (incl. LPG, distillate & residual)	1970	541	0.1	1,407	0.8	866	1.3	2.1
		1960	538		1,302		764		
Fuel for electricity generation in area & steam loss		1970	401	4.4	1,058	7.3	657	9.7	6.7
		1960	260		520		260		
Fuel for electricity imported into area		1970	3	14.9	22	−1.6	19	−5.0	n.a.
		1960	−13		26		39		
GROSS ENERGY CONSUMPTION *(trillion Btu)*		**1970**	**1,404**	2.2	**4,186**	3.4	**2,782**	4.1	4.0
		1960	**1,133**		**2,988**		**1,855**		

Note: "Unallocated" category in Table 17 distributed in proportion to population; figures are rounded, may not add to totals; for detail see Table 17.

Sources: Same as Table A; also Tables 11, 20 and 21.

FUELS FOR ELECTRICITY





Electricity use in the Region doubled between 1950 and 1960 and again between 1960 and 1970, rising from 22.5 million megawatt-hours in 1950 to 85.9 million in 1970. Only most recently did a slowdown appear, with 1972 use at 92.7 million megawatt-hours reflecting an annual growth rate just under 4 percent, compared to 7.2 percent in the past decade.

Despite electricity's modest share of net energy consumption, this rapid growth had a major impact on gross energy use as fuels used to generate electricity grew from roughly 290 trillion Btu in 1950 to over 1,000 trillion Btu in 1970, and changed in composition.

In 1970, the sale to consumers of 85.9 million megawatt-hours, or 293.1 trillion Btu worth of electricity required the use of 1,062.8 trillion Btu of fuels, of which 1,040.3 were burned at power plants in the Region, and the remainder outside, to produce power imported into the Region. Any conversion of heat into another energy form involves major losses: in this case, 27.6 percent of the heat value of the fuel burned reached the consumer as electricity. Some 70 percent was lost at power plants and 2.4 percent in transmission and distribution. The efficiency of the Region's power plants in 1970 was 29.9 percent, below the 32.7 percent level in the rest of the nation due to much obsolescent equipment and interim gas turbine installations with efficiencies as low as 18 percent. Overall efficiency of electrical generation and distribution in the Region barely improved in the last decade. Heat rejected by power plants now exceeds the total produced by residential use of fuel oil in the Region.

Between 1960 and 1970, the import of electricity into the Region shrank from 5.3 to 2.3 percent of total supply (even though New York City changed from an exporter to an importer of electricity). Meanwhile, fuel use at power plants within the Region more than doubled. Hydropower, which accounts for one-sixth of electric generation nationally, substituted for only 0.5 percent of the Region's electric fuel needs in 1970. Nuclear power emerged as a new source, but filled only 3.7 percent of the need that year. The use of coal for power plant boilers shrank by more than one quarter in absolute terms, mostly due to controls over air quality in densely settled parts of the Region. In 1970, coal filled 19.5 percent of the Region's power generation needs, down from 55.5 percent in 1960. Natural gas took up the slack, nearly doubled in volume, and by 1970 accounted for 14.6 percent of the electric fuel needs. But the full weight of increased fuel requirements for electricity was borne by oil, the use of which grew nearly fivefold. In 1970, it accounted for 61.6 percent of all energy used by power plants in the Region. With nearly two-thirds of the Region's electricity made by burning oil (compared to one-eighth nationwide), 20 percent of all petroleum fuels brought into the Region were consumed in the generation of electricity. Almost 23 percent of the Region's natural gas supply was so consumed.

Table E.
Electric Energy Balance and Fuels Used in Electricity Generation, 1960, 1970

	Fuels Used *(trillion Btu's)*						Electric Energy Balance *(thousand megawatt hours)*				
1960	**Coal**	**Gas**	**Oil**	**Nuclear**	**Hydro***	**Total**	**Total Net Generation**	**Net Import (+)** Net Export (−)**	**Total Supply**	**Company Use & Loss**	**End-Use Sales**
Consolidated Edison Co. of N.Y., Inc.	135.20	37.96	70.18	—	—	**243.34**	**19,528.4**	+1,128.5	20,656.9	1,763.1	**18,893.8**
Long Island Lighting Co.	21.70	16.37	12.54	—	—	**50.61**	**4,853.5**	−526.2	4,327.3	487.5	**3,839.8**
New York State Electric & Gas Corp.	36.01	—	—	—	2.38	**38.39**	**3,718.3**	+506.6	4,224.9	514.6	**3,710.3**
Central Hudson Gas & Electric Corp.	13.05	.73	—	—	1.54	**15.32**	**1,581.9**	−319.8	1,262.1	145.3	**1,116.8**
Orange and Rockland Utilities, Inc.	2.25	4.60	—	—	2.08	**8.93**	**818.5**	−233.4	585.1	69.1	**516.0**
Public Service Electric and Gas Co.	54.19	22.50	57.79	—	—	**134.48**	**12,793.2**	+549.2	13,342.4	1,219.7	**12,122.7**
Jersey Central Power & Light Co.	17.05	4.44	2.30	—	—	**23.79**	**2,300.4**	+111.3	2,411.7	241.7	**2,170.0**
Atlantic City Electric Co.	17.00	—	—	—	—	**17.00**	**1,615.6**	+145.8	1,761.4	194.8	**1,566.6**
New Jersey Power & Light Co.	5.58	—	.04	—	—	**5.62**	**484.6**	+590.8	1,075.4	133.8	**941.6**
Rockland Electric Co.	—	—	—	—	—	—	—	+236.4	236.4	27.7	**208.7**
Connecticut Light and Power Co.	37.03	.20	.55	—	3.18	**40.96**	**3,901.2**	−730.2	3,171.0	398.7	**2,772.3**
Hartford Electric Light Co.	18.37	.91	2.85	—	.49	**22.62**	**2,062.3**	+247.1	2,309.4	211.5	**2,097.9**
United Illuminating Co.	17.05	—	4.14	—	—	**21.19**	**1,585.3**	+348.1	1,933.4	134.6	**1,798.8**
Municipals***	—	—	—	—	—	—	—	+642.0	642.0	62.1	**579.9**
All utilities serving Region	374.48	87.71	150.39	—	9.67	**622.25**	**55,243.2**	+2,696.2	57,939.4	5,604.2	**52,335.2**
Portion within Region	**283.32**	**86.71**	**134.15**	**—**	**5.98**	**510.16**	**44,654.3**	**+2,478.5**	**47,132.8**	**4,409.4**	**42,723.4**
Fuel used outside Region for net import						**+26.38**					
Total fuel used for Region						**536.54**					
1970											
Consolidated Edison Co. of N.Y., Inc.	66.74	81.27	234.09	2.71	—	**384.81**	**31,027.6**	+3,708.2	34,735.8	2,811.9	**31,923.9**
Long Island Lighting Co.	—	10.22	105.16	—	—	**115.38**	**11,065.5**	−239.8	10,825.7	986.5	**9,839.2**
New York State Electric & Gas Corp.	73.80	—	—	—	2.13	**75.93**	**7,090.2**	+1,058.8	8,149.0	847.0	**7,302.0**
Central Hudson Gas & Electric Corp.	16.86	4.04	6.99	—	1.31	**29.20**	**2,858.1**	+101.0	2,959.1	248.1	**2,711.0**
Orange and Rockland Utilities, Inc.	3.23	12.51	13.81	—	1.84	**31.39**	**2,934.7**	−1,311.4	1,623.3	107.2	**1,516.1**
Public Service Electric and Gas Co.	67.67	35.65	200.80	—	—	**304.12**	**27,829.5**	−957.6	26,871.9	1,826.5	**25,045.4**
Jersey Central Power & Light Co.	10.01	5.25	28.60	36.18	—	**80.04**	**7,120.0**	−842.0	6,278.0	557.7	**5,720.3**
Atlantic City Electric Co.	42.70	1.40	.40	—	—	**44.50**	**4,294.4**	−374.4	3,920.0	382.2	**3,537.8**
New Jersey Power & Light Co.	6.52	3.18	.08	—	—	**9.78**	**770.5**	+1,746.4	2,516.9	225.3	**2,291.6**
Rockland Electric Co.	—	—	—	—	—	—	—	+677.7	677.7	35.0	**642.7**
Connecticut Light and Power Co.	41.00	2.85	18.88	.38	2.77	**65.88**	**5,807.1**	+2,015.0	7,822.1	902.7	**6,919.4**
Hartford Electric Light Co.	2.48	2.34	43.76	.20	.38	**49.16**	**4,406.9**	+336.8	4,743.7	398.1	**4,345.6**
United Illuminating Co.	—	—	66.08	—	.001	**66.08**	**5,658.3**	−1,425.2	4,233.1	245.9	**3,987.2**
Municipals***	—	—	—	—	—	—	—	+1,016.9	1,016.9	84.4	**932.5**
All utilities serving Region	331.01	158.71	718.65	39.47	8.43	**1,256.27**	**110,862.8**	+5,510.4	116,373.2	9,658.5	**106,714.7**
Portion within Region	**203.32**	**151.65**	**641.27**	**38.89**	**5.19**	**1,040.32**	**91,242.1**	**+2,153.7**	**93,395.8**	**7,482.1**	**85,913.7**
Fuel used outside Region for net import						**+22.48**					
Total fuel used for Region						**1,062.80**					

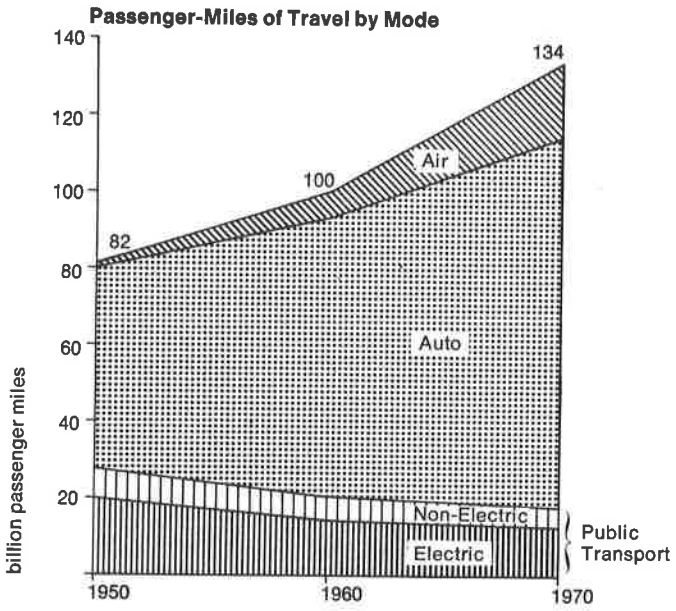
*Converted to Btu equivalent by utility at prevailing alternative steam rate.

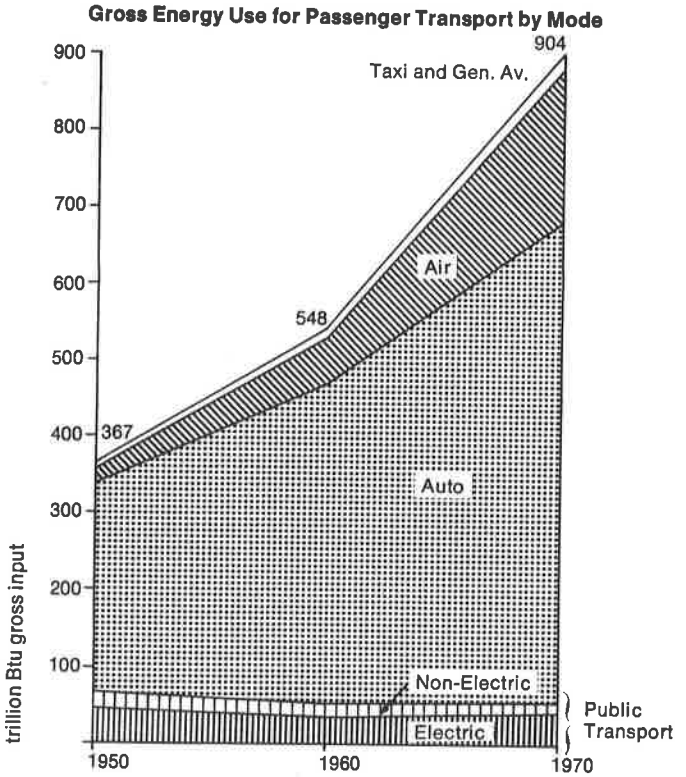
**Comprised of purchases, net interchange, net transmission, and sales to other electric utilities.

***Estimated, based on end-uee sales.

Sources: Fuels used in Electricity Generation Table 16; Federal Power Commission, *Statistics of Privately Owned Electric Utilities in the United States*, 1960, 1970.

ENERGY FOR TRANSPORTATION





Second to fuel for electricity generation, fuel for transportation has shown the largest absolute growth. Passenger transportation consumption rose from 367.4 trillion Btu of gross input in 1950 to 903.7 trillion Btu in 1970. This increase is attributable to five related factors. The largest one was population growth, which accounts for 32.1 percent of the increase. Second, the frequency, with which people make trips increased somewhat, mostly due to wider auto ownership, and the length of the average trip increased considerably, mostly due to more trips to and from points outside the Region. More autos per capita and longer trips (mostly by air) resulted in more passenger-miles of travel per person, which explains 26 percent of the increase in fuel use. Third, the shift away from buses and rail vehicles toward more energy-intensive modes, such as autos and airplanes, accounts for 20.1 percent of the increase. A fourth factor was declining vehicle occupancy -- fewer persons per car, per bus, or per rail vehicle; it accounts for 12.4 percent of the increase. The fifth factor was the increasing energy-intensity of each mode of travel (except for airliners and ferries), i.e., more gallons needed per mile, due to higher performance, more climate control and so on. This explains 9.5 percent of the increase.

In contrast to a 64 percent rise in passenger-miles of travel generated by the Region between 1950 and 1970, ton-miles of freight serving the Region increased 39 percent. This takes into account freight carried to, from, and within the Region by ship, rail, truck and airplane, but excludes commodities carried by pipeline. The energy-intensity of freight movement (units of energy used per ton-mile) stayed relatively constant. While there was a shift toward energy-intensive modes such as trucks and airplanes, and away from rail freight which dropped almost in half, that shift was balanced by an increased energy-efficiency of both trucks and railroads and by a larger share of energy-saving waterborne traffic. As a result, energy consumption by freight transport serving the Region grew at about the same rate as ton-miles of freight, increasing from an estimated 169.6 trillion Btu in 1950 to 245.6 trillion Btu in 1970. The freight's share of total transportation energy use declined from 32 percent in 1950 to 21 percent in 1970.

The individual modes of travel are arrayed in ascending order of energy-intensity in Table F. The bus appears as the least energy-intensive mode, requiring about 2,300 Btu per passenger-mile of travel. The railroad, combining both electric and diesel-electric traction, is a close second, with 2,60 Btu of gross input per passenger-mile in 1970. However, it carries its passengers in the Region at a speed more than thr times faster than the bus. Subways, with 3,100 Btu per passen ger-mile show up to be more energy-intensive primarily due to their stop-and-go operation, which wastes much energy in braking. The rise in energy intensity between 1950 and 1970 is in part due to declining passenger loads per car, and in part

Table F.
Energy Use and Transportation Performance in The Region, 1950, 1960, 1970

PASSENGER TRAVEL		Person trips (billions)	%	Person-miles travelled (billions)	%	Vehicle-miles (billions)	Persons per vehicle	Fuel or electricity used x Heat rate, Btu (millions of units)		Btu gross input (billions)	%	Btu/PMT
Bus	1970	**1.2530**	8.43	**3.31**	2.47	0.2396	13.8	56.797 gal	135,000	**7,667.5**	0.85	**2,314**
	1960	**1.4500**	11.74	**3.84**	3.83	0.2558	15.0	56.525 gal	135,000	**7,630.8**	1.39	**1,989**
	1950	**1.8235**	16.88	**4.84**	5.90	0.2788	17.4	75.018 gal	131,500	**9,864.9**	2.68	**2,094**
Rail diesel	1970	**0.1951**	1.31	**1.41 (e)**	4.71	n.d.	n.d.	24.340 gal	135,000	**3,285.9**	1.82	**2,603**
electric	1970			**4.91 (e)**		n.d.	n.d.	1.064 mWh	12,371,900	**13,163.7**		
diesel	1960	**0.1991**	1.61	**1.94 (e)**	7.70	n.d.	n.d.	33.560 gal	135,000	**4,530.6**	3.29	**2,330**
electric	1960			**5.79 (e)**		n.d.	n.d.	1.073 mWh	12,559,600	**13,476.5**		
diesel	1950	**0.2577**	2.39	**2.93 (e)**	13.47	n.d.	n.d.	50.670 gal	135,000	**6,840.5**	7.29	**2,423**
electric	1950			**8.12 (e)**		n.d.	n.d.	1.587 mWh	12,559,600	**19,932.1**		
Subway	1970	**1.3056**	8.78	**8.75**	6.52	0.3727	23.5	2.062 mWh	13,255,600	**27,333.0**	3.02	**3,124**
	1960	**1.3900**	11.26	**9.31**	9.27	0.3166	29.4	1.740 mWh	13,518,300	**23,521.8**	4.29	**2,688**
	1950	**1.7450**	16.16	**11.52**	14.05	0.3774	30.5	1.764 mWh	13,518,300	**23,846.3**	6.49	**2,070**
Trolley	1960	**0.0147**	0.12	**0.03**	0.03	0.0021	14.3	0.008 mWh	13,518,300	**108.1**	0.02	**3,603**
	1950	**0.1871**	1.73	**0.43**	0.52	0.0207	20.8	0.095 mWh	13,518,300	**1,284.2**	0.35	**2,987**
Auto	1970	**11.6070 (e)**	78.09	**96.69**	72.03	64.4600	1.5 (e)	5036.000 gal	124,952	**629,258.3**	69.63	**6,508**
	1960	**8.8600 (e)**	71.75	**72.66**	72.38	45.4100	1.6 (e)	3369.000 gal	124,952	**420,963.3**	76.83	**5,794**
	1950	**6.4060 (e)**	59.32	**51.70**	63.03	30.4100	1.7 (e)	2186.000 gal	124,952	**273,145.1**	74.34	**5,283**
Ferry	1970	**0.0250**	0.17	**0.13**	0.10	0.0002	581.2	10.500 gal	135,000	**1,417.5**	0.16	**11,161**
	1960	**0.0490**	0.40	**0.18**	0.18	n.d.	n.d.	22.400 gal	124,952	**2,798.9**	0.51	**15,724**
	1950	**0.0670**	0.62	**0.21**	0.26	n.d.	n.d.	26.300 gal	124,952	**3,286.2**	0.89	**15,724**
Airline	1970	**0.0374**	0.25	**17.67**	13.16	0.3185	55.5	1487.500 gal	135,000	**200,812.5**	22.22	**11,365**
	1960	**0.0160**	0.13	**5.54**	5.52	0.1568	35.3	452.700 gal	132,200	**59,846.9**	10.92	**10,706**
	1950	**0.0051**	0.05	**1.37**	1.67	0.0586	23.3	138.600 gal	124,952	**17,318.3**	4.71	**12,641**
Taxi	1970	**0.4374**	2.94	**1.15**	0.86	1.5510	0.7	137.500 gal	124,952	**17,180.9**	1.90	**15,005**
	1960	**0.3689**	2.99	**0.99**	0.99	1.3410	0.7	111.300 gal	124,952	**13,907.2**	2.54	**13,949**
	1950	**0.3074**	2.85	**0.83**	1.01	1.1170	0.7	90.200 gal	124,952	**11,270.7**	3.07	**13,563**
Gen. Av.	1970	**0.0025**	0.02	**0.21**	0.16	0.1218	1.7	28.200 gal	127,700	**3,601.1**	0.40	**17,397**
	1960	**0.0013**	0.01	**0.10**	0.10	0.0672	1.5	9.100 gal	124,952	**1,137.1**	0.21	**11,258**
	1950	**0.0009**	0.01	**0.07**	0.09	0.0485	1.4	5.100 gal	124,952	**637.3**	0.18	**9,372**
Total	1970	**14.8630**	100.00	**134.23**	100.00					**903,720.4**	100.00	**6,733**
	1960	**12.3490**	100.00	**100.38**	100.00					**547,921.2**	100.00	**5,458**
	1950	**10.7997**	100.00	**82.02**	100.00					**367,425.6**	100.00	**4,480**

FREIGHT TRANSPORT		Tons carried (billions)	%	Ton-miles carried (billions)	%		Fuel used x Heat rate, Btu (millions of units)		Btu gross input (billions)		Btu/TMT
Water	1970	**0.1927**	18.12	**362.8**	86.16		133.9 gal	140,300	**18,786.2**	incomplete data	
	1960	**0.1599**	14.09	**273.8**	83.45		91.2 gal	148,550	**13,548.8**		
	1950	**0.1488**	12.14	**243.5**	80.55		n.d.	n.d.	**12,053.3**	**(e)**	
Rail	1970	**0.4836**	45.48	**33.22**	7.89		171.1 gal	135,000	**23,098.5**		**695**
	1960	**0.6156**	54.25	**37.70**	11.49		226.8 gal	135,000	**30,618.0**		**812**
	1950	**0.8395**	68.52	**48.46**	16.03		317.0 gal	135,000	**42,795.0**		**883**
Truck	1970	**0.3860**	36.30	**24.84**	5.90	12.7500	1520.0 gal	127,100	**193,192.6**		**7,777**
	1960	**0.3591**	31.64	**16.56**	5.05	9.0800	1138.0 gal	125,700	**143,059.5**		**8,639**
	1950	**0.2369**	9.39	**10.30**	3.41	8.1100	911.0 gal	124,952	**113,831.3**		**11,052**
Air	1970	**0.0011**	0.09	**0.27**	0.06	including freight	78.3 gal	135,000	**10,570.5**	in air freighters only	
	1960	**0.0002**	0.02	**0.04**	0.01	moved in passen-	23.8 gal	132,200	**3,146.4**		
	1950	**0.0000**	0.00	**0.00**	0.00	ger airliners.	7.3 gal	124,952	**912.1**		

Continued on next page.

Table F continued.

Total freight	1970	**1.0634**	100.00	**421.1**	100.00	**245,647.8**
	1960	**1.1348**	100.00	**328.1**	100.00	**190,372.7**
	1950	**1.2252**	100.00	**302.3**	100.00	**169,591.7**
Total all forms	1970					**1,149,368.2**
	1960					**738,293.9**
	1950					**537,017.3**

Notes and sources.

Bus: Accurate historical data on trips, vehicle-miles and gallons of fuel available only for NYCTA buses (32.8 percent of the Region's bus passengers in 1970) from NYCTA monthly *Transit Record*. Trips for rest of Region from TSRPC, MABSTOA and national data. Trip length 2.3 miles in New York City and 3.5 outside used to obtain person-miles in 1970; slightly shorter outside NYC in earlier years to reflect more local bus travel. NYCTA bus occupancy used throughout the Region to obtain vehicle-miles. NYCTA miles per gallon (3.9 in 1970) used to obtain gallonage in NYC, 5.0 assumed outside. Varying heat rate reflects some use of gasoline, rather than diesel oil in 1950.

Rail: Diesel vs. electric separation available only for LIRR (1,030.15 mill. PMT electric, 730.46 mill. diesel in 1970). Rest estimated. Historical ridership from PA records and TSRPC *ITR 4094-7011* and *4336-1206* multiplied by system-specific trip length from ICC reports and TSRPC. Electricity consumption by railroad from utility records and MTA, similar to Table 4, adjusted for freight use and small amounts used by Region's passengers outside Region on Penn Central mainline. Diesel estimated on the basis of 0.33 mpg per locomotive, 175 PMT per locomotive-mile (TSRPC, *ITR 4330-2601)*. Varying regionwide electric heat rate from Table E; 1950 assumed same as 1960.

Subway: Trips, vehicle-miles and electricity from NYCTA *Transit Record*. Average trip (6.7 miles) calculated from TSRPC 5.8 mile straight line trip length. Passengers on PATH, SIRTOA and Newark Subway from PA records. NYCTA electricity consumption expanded proportionally (x 1.038 in 1970) to account for the three minor systems. Subway electricity consumption as reported by *Transit Record* (1,991,090 mWh in 1970) is lower than Con Edison sales to NYCTA (2,362,513 mWh) as used in Table 4. The former figure used here. Heat rate from Table E for Con Edison territory.

Trolley: Includes trolley cars and trolley buses in 1950, trolley buses only for the beginning of 1960, only within NYC, based on *Transit Record*. Trip length assumed same as by bus.

Auto: Vehicle-miles for 1963 from *Streets and Highways: a Regional Report* (TSRPC, 1968) expanded to RPA region and 1950, 1960, 1970 in relation to motor vehicle registrations by county *(Auto Ownership in the Region,* RPA 1973); reduced by bus-miles (above), taxi-miles (below) and truck VMT. Rising share of driving outside NYC causes average daily miles per passenger car to rise from 24.9 to 25.3 to 25.8 for the three dates. PMT from VMT using occupancies shown; TSRPC 1963 auto occupancy of 1.43 probably low due to underrepresentation of recreational traffic. Gallons of fuel from Table 14. Auto fuel consumption includes school buses. Auto fuel use by residents outside Region assumed to be balanced by fuel used by visitors within Region.

Ferry: NYC Dept. Marine and Aviation data on passengers and fuel expanded by passenger-miles per gallon in past years to cover discontinued ferry operations by others.

Airline: Passengers at three major airports *(Airport Statistics,* PA annual) multiplied by national average trip length (680 mi domestic, 1,722 mi overseas in 1970, average for Region 944); half the resulting PMT assigned to Region to avoid double-counting in a worldwide balance. Fuel actual from PA, same as Table 14, with use for all-cargo flights subtracted in proportion to number of flights. Resulting 11.88 passenger-miles per gallon in 1970 closely matches national data (12.9 mpg domestic, 11.3 mpg overseas).

Taxi: VMT from TSRPC 1963 taxi survey, expanded to other years on the basis of partial registration data; average occupancy 0.7 in NYC, 0.84 outside, average trip 2.1 mi in NYC, 5.8 mi outside; mpg estimated by county in relation to average speed.

General Aviation: Assumes Region's registered aircraft remained a constant percent of nation's (3.8% in 1970, TSRPC *ITR 4320-1207)*. Fuel per aircraft assumed same as nationwide *(Statistical Abstract of the U.S.)*. Persons per vehicle from *General Aviation Airports for the Future,* TSRPC 1965.

Freight: Tons and ton-miles from TSRPC, *ITR 4293-2505* and *-8081*. Marine bunker fuel from NYC EPA, does not include fuel loaded outside New York Harbor. Gasoline for marine use included in Btu figure (see Table 14 for detail); its use by motor boats for recreational traffic not included under passenger transportation due to absence of data on passengers or passenger-miles. Rail consumption estimated from national data *(Statistical Abstract of the U.S.)*. Truck fuel use: respective State's ton-miles per vehicle and miles per gallon with adjustments for NYC based on BPR *Highway Statistics*. Air freight gallonage subtracted from PA total, as above. Varying heat rate for aircraft reflects varying mix of jet fuel and gasoline.

due to the introduction of air conditioning. The figures shown for trolleys may not be representative, since streetcars were already being phased out in 1950, and 1960 was the last year of trolleybus operation. Generally, while the electric motor is a much more efficient source of mechanical energy than the internal combustion engine, all electric modes labor under the handicap of conversion losses at the power plant, losses in transmission and at rectifier substations. Ferries are shown to be quite energy-intensive but gained in efficiency during the period because of new diesel-powered equipment.

Overall, public transportation in 1950 satisfied 34.2 percent of the Region's travel demand using 17.7 percent of the energy for passenger movement. In 1970 it satisfied 13.8 percent of the demand using 5.8 percent of the energy.

The auto, using 6,500 Btu per person-mile in 1970, was twice as energy-intensive as the subway; this rate reflects a region-wide estimate of 12.8 miles per gallon and an average car occupancy of 1.5. In 1950, the private auto satisfied about 63 percent of the Region's passenger travel demand using 74 percent of the energy. By 1970 these proportions shifted to 72 percent of the demand and 70 percent of the energy.

The auto's share of energy use shrank because of the huge growth in air travel which, with 11,600 Btu per passenger-mile uses twice as much energy as the auto. This is the price the airliner pays for its speed, travelling on the average 15 times faster than the auto. Satisfying 13 percent of the Region's travel demand, airliners consumed 22 percent of the energy used for passenger movement in 1970. Between 1960 and 1970 alone, their use grew 3.4 times, compared to 1.5 times for the auto.

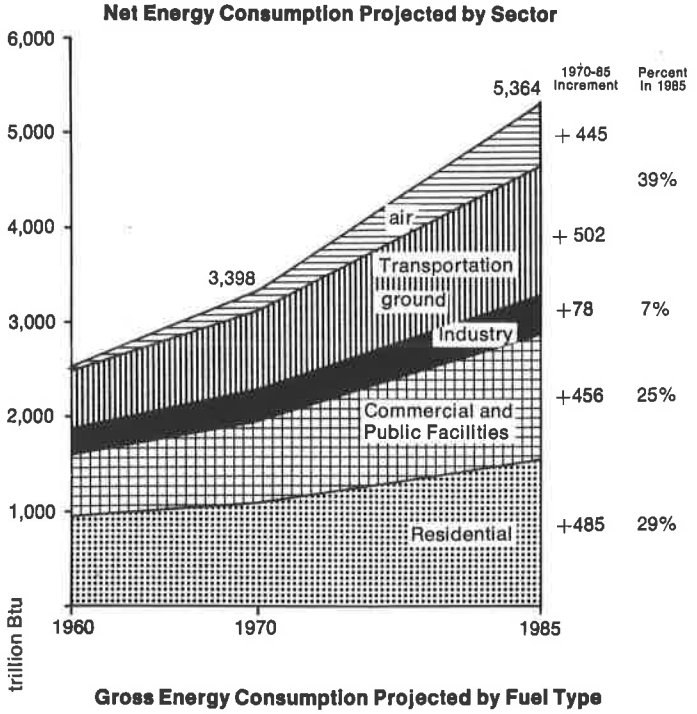
The most energy-intensive passenger modes are the taxicab and the private airplane (general aviation). Together they satisfied about 1 percent of total travel demand, but consumed 2.3 percent of all energy for passenger movement in 1970.

The figures on fuel consumption for freight shown should be viewed as approximations because of incomplete data. In rough terms they indicate that in 1970 water transport used in excess of 60 Btu, railroads around 700 Btu, trucks close to 8,000 Btu, and air freighters on the order of 60,000 Btu for each ton of freight carried one mile.

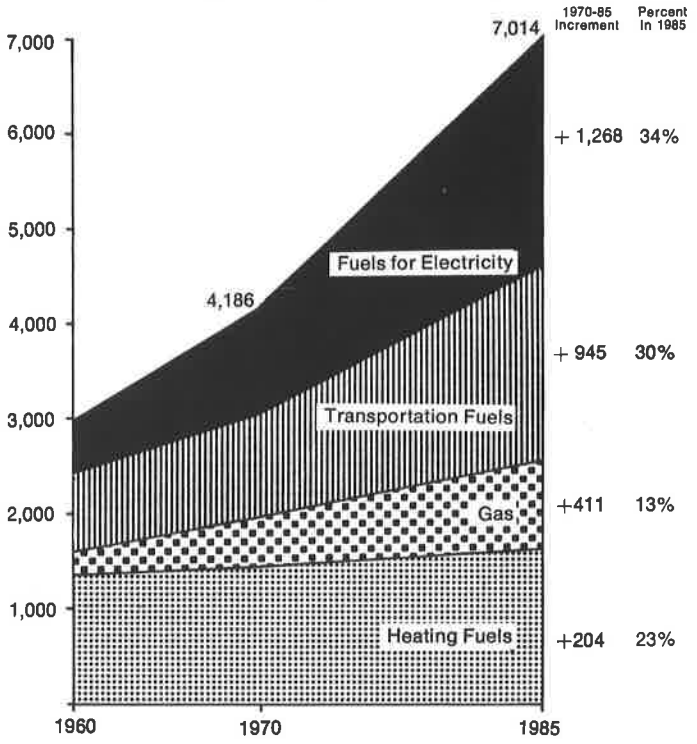
The data suggest that large savings in energy can result from dampening the growth of transportation by energy-intensive modes, notably the auto and the airplane. Reducing the energy intensiveness of particular modes likewise promises savings: improving auto efficiency from 12.8 to 18 miles per gallon would cut energy use for all passenger transportation in the Region by 20 percent. By contrast, savings from reasonable shifts in travel from one mode to another are modest. Thus most private auto travel occurs between places where, and at times when the density of trips is too low to provide a competitive transit service. Conversely, the central square mile of midtown Manhattan, the origin or destination of 30 percent of all subway trips in the Region, accounts for only 0.3 percent of the Region's 79 billion vehicle-miles of roadway travel. A region-wide 50 percent increase in public transit use at the expense of the auto would save 3.3 percent of the energy used in passenger transportation. And, while 35 percent of all auto trips are under 2 miles long, they account for only 6 percent of the miles travelled; this is the most that could be saved if all such trips were made on foot or by bicycle. Similarly, short air trips are about 17 percent of the total, but less than 4 percent of the miles of air travel; this is what could be diverted to high-speed rail without much time penalty.

SOME PROSPECTS AND CONCLUSIONS

Net Energy Consumption Projected by Sector



Gross Energy Consumption Projected by Fuel Type



The 40 percent increase in annual gross energy use in the Region over the past decade represents an absolute increment of 1,198 trillion Btu. Of this, 30 percent is attributable to population growth; 39 percent -- to increased electricity use per capita; 27 percent -- to increased per capita use of transportation fuels (mostly for autos and aircraft), and 4 percent -- largely to increased per capita use of nonelectric energy in nonresidential sectors.

While population growth in the Region is slowing down, that slowdown is causing some of the forces that raise energy consumption per capita to accelerate. On the assumption that the birthrate will remain at its current all-time low, and that inmigration into the Region will continue its steady decline, the Region's population is projected to increase by 14 percent between 1970 and 1985. However, fewer children and smaller households mean more households (a 27 percent rise projected), more workers (a 19 percent rise in employment projected) and an accelerated growth of per capita income (a 65 percent rise projected). In the absence of deliberate measures to cut demand, this would mean more of various energy-consuming things per capita, such as more comfort (only 40 percent of the Region's households have air conditioning now), more housing floorspace (including second homes), more cars and more air travel. It is in this light that the Region's potential for future energy demand must be viewed.

Demand for electricity would rise from 86 million megawatt-hours in 1970 to 205 million in 1985, a figure only slightly lower than the 211 million projected by the electric utilities. Close to half of the increment in demand would come from the residential sector. This assumes that the 1970 relationship between income, settlement density and electric consumption shown on p. 9 would prevail at 1985 incomes. (In the past, people bought more electricity per dollar of income over time; such a rise is not assumed for the future to reflect higher prices). Over one-third of the increment in demand would come from commercial and public facilities, a fast-growing sector, itself highly responsive to income. It includes office floorspace, projected to increase 46 percent. Potential consumption is estimated according to the relationship between building density and employment shown on p. 9, which is allowed to advance to 1985 at the same rate it did in the past decade. About one-sixth of the increment in demand for electricity would come from industry. This is based on a 20-year trend in rising electricity use per worker, but a decline in manufacturing employment. Lastly, the extension of the Region's 264-mile rapid transit network by 29 miles in New York City and by 18 miles in New Jersey, the air-conditioning of more trains and of some subway stations would claim only about 1 percent of the added region-wide requirement for electricity between 1970 and 1985. (The subway's electric consumption now is only about twice the Region's requirement for street lighting).

On the whole, the electric growth rate would decline from 7.2 percent annually in the past decade to 6 percent under this set of assumptions; but electricity's share of total net energy use would rise from 8.6 percent in 1970 to 13 percent in 1985, at which time 23 percent of gross energy use would be heat discharged from the generation and distribution of electricity.

Demand for natural gas would rise from 516 trillion Btu in 1970 to 927 in 1985, assuming a no-growth period between 1973 and 1978 due to current restraints on supply and a resumption of the past trend thereafter.

Demand for distillate and residual fuel oil would rise from 1,367 trillion Btu in 1970 to 1,663 in 1985, mostly to heat the projected increment in floorspace while the supply of natural gas is lagging. A continued improvement in heating efficiency is assumed, while square feet per dwelling unit increase from an estimated 976 in 1970 to 1,118 in 1985, and nonresidential space per worker expands likewise.

Demand for transportation fuels would grow from 1,130 trillion Btu in 1970 to 2,075 in 1985. About 53 percent of the increment would consist of highway fuels and 47 percent of aviation fuels, while those for railroad and marine use would stay about the same. The highway fuel projection assumes auto registrations to rise from 6.86 million to 9.68 million, based on current relationships between autos per household, income and density, and a suburban pattern of population growth. Miles per gallon would continue their downward trend until 1977 and then level off, while annual miles per auto stay constant at 9,400. Truck registration is assumed to remain constant in the core counties and to continue growing at the 1960-70 rate outside, with annual gallons per truck remaining at the 1970 level. The aviation fuel projection assumes an increase in annual passengers from 37.4 million in 1970 to 93 million in 1985, a slowdown in the growth rate consistent with the "middle" projection in "The Region's Airports Revisited" (Regional Plan News # 93); the average trip length would increase by 30 percent and the efficiency of airliners would be 12 passenger-miles per gallon. A factor is added for non-airliner traffic.

Summarizing, the gross energy growth rate would remain essentially the same, 3.5 percent annually in the next 15 years compared to 3.4 percent in the past decade given this set of projections. However, only 20 percent of the potential absolute increase of 2,828 trillion Btu would be attributable to population growth; 40 percent would be due to higher electricity consumption per capita, 28 percent to higher transportation consumption per capita, and 12 percent to higher nonelectric consumption per capita in nonresidential facilities and households. The last factor results from the employment and building floorspace projections, which are unaffected by slower population growth in the near term.

Clearly, many factors quite apart from current emergency restrictions on use can easily combine to make actual demand fall short of this projection: lagging income growth, less housing and office construction. Still, it pinpoints the avarice for energy inherent in the present structure of the Region's economy and can serve as a benchmark for evaluating strategies for change. Among the issues it raises are these:

1. The heavy reliance of the Region's electric generating capacity on natural gas (at a time when it is denied to new customers who could use it more efficiently) and on residual oil (most of which is imported) -- and ways to provide an alternative, environmentally acceptable fuel mix possibly with such sources as solid waste combustion, new uses of coal, nuclear systems topped with pumped storage and hydropower imports.

2. The escalating amounts of waste heat from electricity generation -- and ways of putting it to use, whether at central power stations or in decentralized total energy systems.

3. The prominence of the residential and commercial sectors among rapidly growing consumers of electricity -- and both the opportunity and the difficulty of conservation measures in these areas. Improving the efficiency of appliances, impeding the shift to electricity for those where alternative sources of power are available, and limiting appliance saturation are among the paths that could be pursued.

4. The large increment of energy growth in the highway transportation sector -- and tangible opportunities for conservation here. For example, a hypothetical improvement in private auto efficiency from 12.8 miles per gallon to 18 miles per gallon between now and 1985 (when a complete turnover of all vehicles can be expected) would mean no increase in gasoline for autos at all, even with 2.8 million added cars on the roads. With today's engines, that would require cutting vehicle weight from 3,500 to 2,500 lbs. By comparison, the exclusion of cars from places highly accessible by transit and other ways of shifting travel from auto to public transportation, while offering environmental and social advantages, would have a modest effect on reducing energy consumption.

5. The huge potential growth in the air travel sector, the problems posed by any deliberate curtailment of mobility, and some conservation opportunities through schedule consolidation.

6. The large share of energy consumption (despite a very slow growth rate) that is still represented by space heating -- and the opportunities for conservation here, including lower temperature standards, better insulation, feedback methods superior to opening the window when the room is overheated.

7. The energy conserving nature of urban density -- and its implications both for the short term (allocation priorities) and for long-term urban development policies, including the contro of energy by-products in areas of high concentration.

Lastly, the Region's low per capita energy use compared to the nation, particularly in industry and transport, suggests that the payoff from conservation measures may be higher elsewhere, but raises supply issues here.

DETAILED STATISTICAL TABLES

Table G.
Summary, Gross Energy Use by Fuel Type, 1970

	Trillion Btu	% of total	Annual % growth 1960-70
Gas, end-use	515.75	12.32	+ 7.2
Gas, electricity generation	151.65	3.62	+ 5.8
Gas, steam generation	4.81	0.12	+ 6.5*
Total gas	**672.21**	**16.06**	**+ 6.9**
Liquified petroleum gas	**18.52**	**0.44**	**0.0**
Gasoline, highway use	795.82	19.01	+ 3.6
Gasoline, aviation use	2.51	0.06	−18.6
Gasoline, marine use	6.32	0.15	+28.2
Gasoline, non-transport use	11.87	0.29	+ 2.3
Total gasoline	**816.52**	**19.51**	**+ 3.3**
Kerosene, highway use (diesel)	51.57	1.23	+12.4
Kerosene, rail use (diesel)	26.38	0.63	− 2.8
Kerosene, aviation use (jet)	212.48	5.08	+16.9
Kerosene, ferry use (diesel)**	1.42	0.03	− 6.6
Total kerosene	**291.85**	**6.97**	**+11.8**
Distillate, end-use	692.96	16.55	+ 0.3
Distillate, electricity generation	23.27	0.56	∞
Total distillate	**716.23**	**17.11**	**+ 0.8**
Lubricants, highway use	**9.10**	**0.22**	**+ 3.8**
Residual, marine use	12.47	0.30	− 0.4
Residual, other end-use	655.13	15.65	+ 1.0
Residual, electricity generation	618.00	14.76	+16.5
Residual, steam generation	53.37	1.28	+ 6.5*
Total residual	**1,338.97**	**31.99**	**+ 5.7**
Coal, end-use	52.50	1.25	−11.0
Coal, electricity generation & steam	203.36	4.86	− 3.3
Total coal	**255.86**	**6.11**	**− 5.5**
Hydropower heat equivalent	**5.19**	**0.12**	**− 1.4**
Nuclear power	**38.89**	**0.93**	**∞**
Electric import heat requirement	**22.48**	**0.54**	**− 1.6**
Total gross use	**4,185.82**	**100.00**	**+ 3.4**

Notes: *Growth rate refers to central steam sales, not to fuel used.
**Marine freight diesel use not available.

Sources: Table E; Tables 10, 11, 12, 13, 14, 15, 17.

The statistical tables that follow, the core content of this report, form a four-dimensional matrix cross-classifying energy use by county (with sub-totals for State sections and New York City), by energy form, by consuming sector and by date, with a 1950-70 trend shown for more than half of the present energy sources and 1960 and 1970 for the remainder. The raw data, mostly from cooperating organizations listed on p. 4 were adjusted to define the consuming sectors more accurately by methods described in the notes. Net energy demand, or end-use sales to consumers appear in Tables 1 through 15 for electricity, gas, the petroleum fuels, coal and steam, measured in kWh or in physical units of weight or volume, and excluding fuels for the generation of electricity. These appear separately in Table 16 by utility and by power plant. In Table 17, physical units are summarized in Btu using the following factors:

Manufactured gas	550	Btu/cubic foot
Natural gas	1,030	Btu/cubic foot
Liquified petroleum gas	95,500	Btu/gallon
Gasoline	124,952	Btu/gallon
Kerosene (diesel & jet fuel)	135,000	Btu/gallon
Distillate fuel (#2) oil	138,690	Btu/gallon
Lubricating oil	144,400	Btu/gallon
Residual & bunker (#6) oil	149,690	Btu/gallon
Coal	25,000,000	Btu/ton
Steam	1,093	Btu/pound

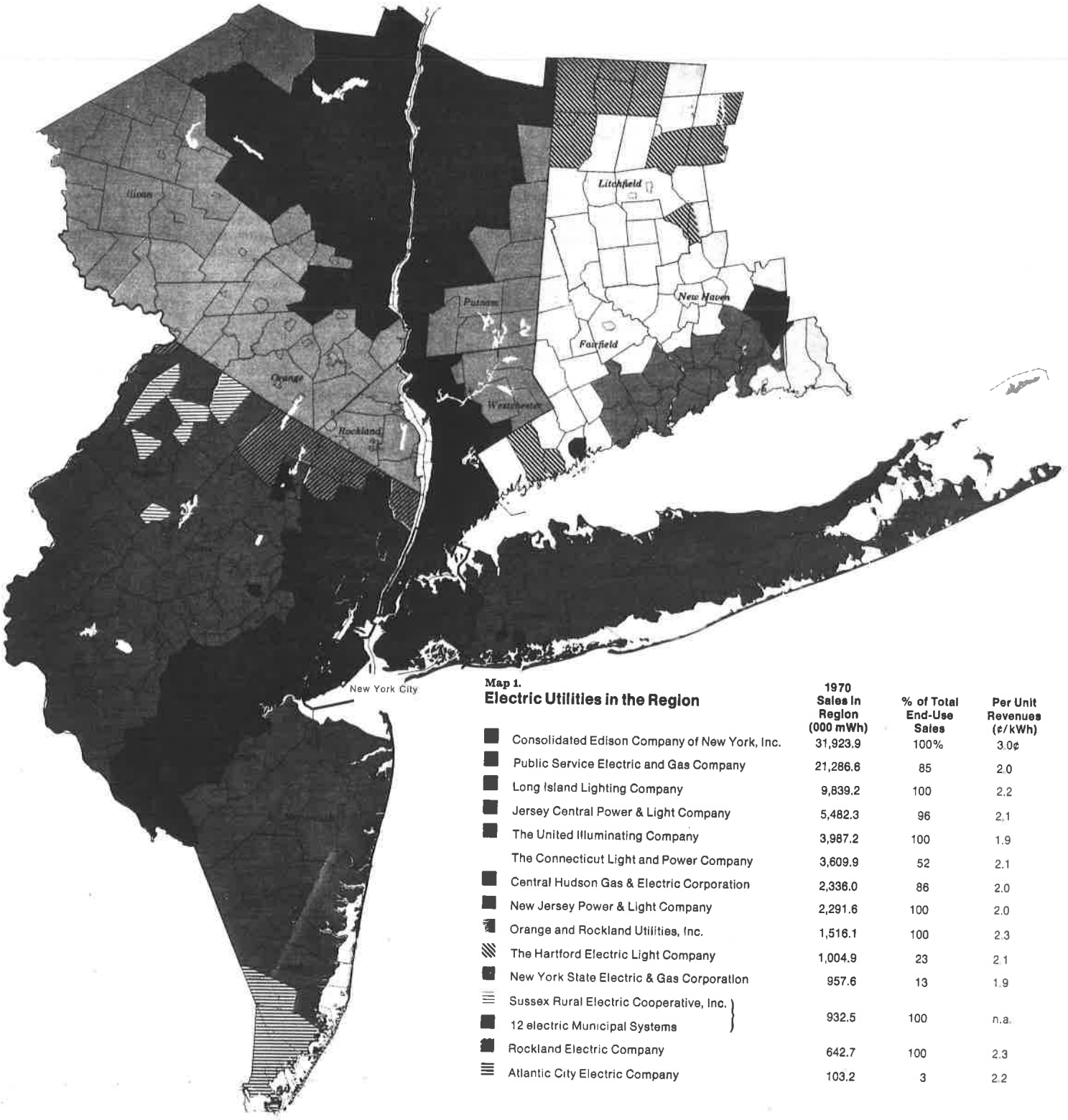
The sum of all end-use sales to consumers, minus the direct heat equivalent of electricity and steam sold, plus the fuels used to generate electricity and steam equals gross energy consumption as here defined. Net consumption excludes on-site electricity generation by consumers (largely covered by their fuel purchases) and a part of marine fuel use. Construction, agricultural and similar equipment fuel use is covered under non-transport use of gasoline. Gross consumption excludes fuels used as raw materials for the chemical industry and losses in the refining and distribution of fuels.

Energy, or the capacity to do work, comes in a variety of forms all of which can ultimately be converted into heat, and in American practice the British thermal unit (Btu, or the amount of energy needed to heat one pound of water one degree Fahrenheit) has been a traditional measure. It is a tiny unit -- a person who consumes 3,000 Calories of food per day consumes 4.3 million Btu per year. Since the consumption of inanimate energy in the Region is about 50 times greater, regional aggregates necessitate dealing with trillions (10^{12}) of Btu. Values for translating Btu into other energy measures are:

1 Btu = 0.252 Calories (Cal) = 0.000293 kilowatt-hours (kWh) = 0.000393 horsepower-hours (hph)

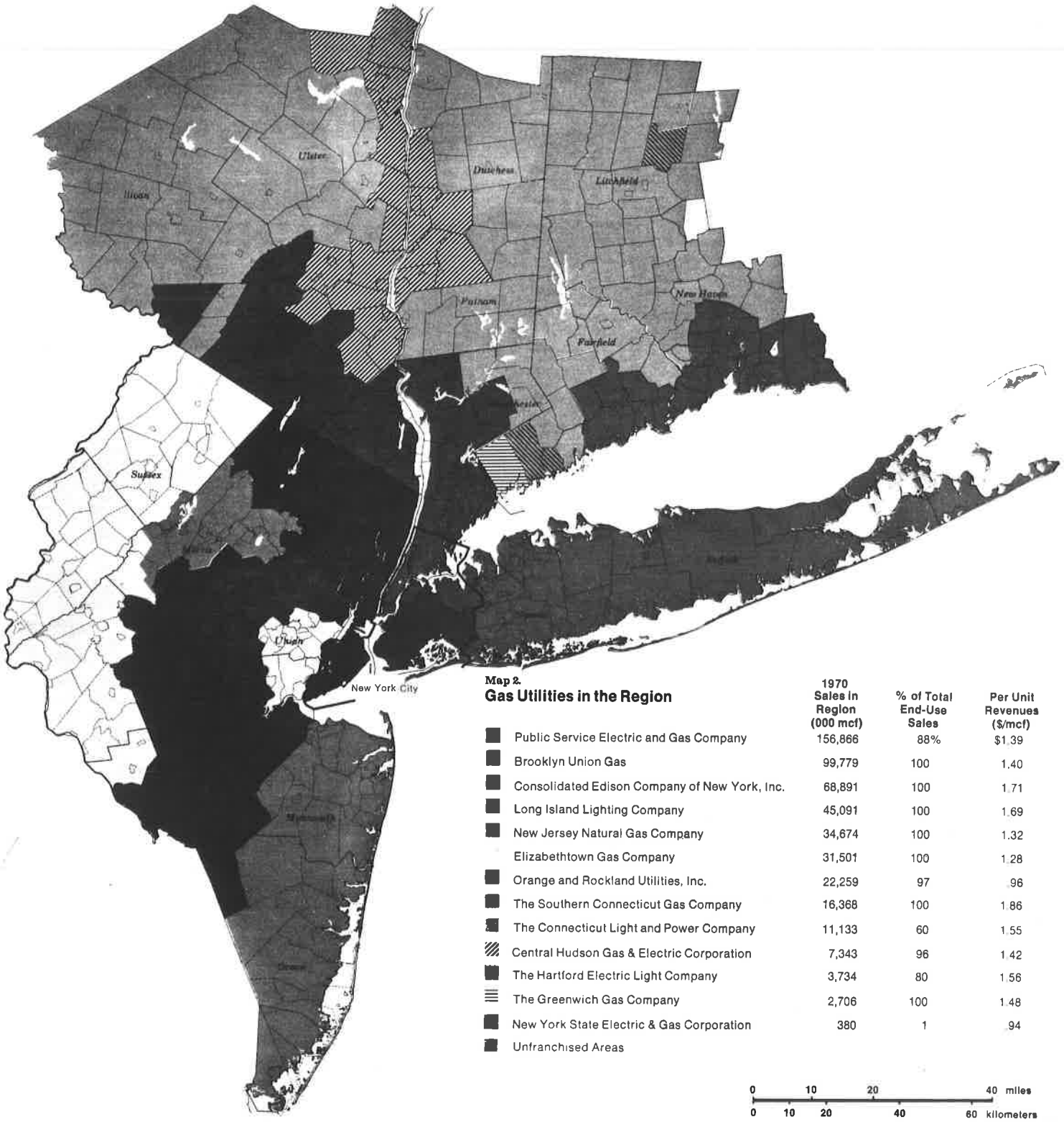
1 Cal = 3.968 Btu
1 kWh = 3,412 Btu or 860 Cal
1 hph = 2,544.5 Btu or 0.746 kWh
1 metric ton of coal equivalent = 27,304,000 Btu
1 therm = 100,000 Btu

Following the regional summary, Table 18 details the projections described on the preceding pages, and Tables 19 through 23 provide selected demographic and economic measures and forecasts pertinent to past and projected energy demand.



Map 1.
Electric Utilities in the Region

	1970 Sales in Region (000 mWh)	% of Total End-Use Sales	Per Unit Revenues (¢/kWh)
Consolidated Edison Company of New York, Inc.	31,923.9	100%	3.0¢
Public Service Electric and Gas Company	21,286.6	85	2.0
Long Island Lighting Company	9,839.2	100	2.2
Jersey Central Power & Light Company	5,482.3	96	2.1
The United Illuminating Company	3,987.2	100	1.9
The Connecticut Light and Power Company	3,609.9	52	2.1
Central Hudson Gas & Electric Corporation	2,336.0	86	2.0
New Jersey Power & Light Company	2,291.6	100	2.0
Orange and Rockland Utilities, Inc.	1,516.1	100	2.3
The Hartford Electric Light Company	1,004.9	23	2.1
New York State Electric & Gas Corporation	957.6	13	1.9
Sussex Rural Electric Cooperative, Inc. 12 electric Municipal Systems	932.5	100	n.a.
Rockland Electric Company	642.7	100	2.3
Atlantic City Electric Company	103.2	3	2.2



Map 2.
Gas Utilities in the Region

	1970 Sales in Region (000 mcf)	% of Total End-Use Sales	Per Unit Revenues ($/mcf)
Public Service Electric and Gas Company	156,866	88%	$1.39
Brooklyn Union Gas	99,779	100	1.40
Consolidated Edison Company of New York, Inc.	68,891	100	1.71
Long Island Lighting Company	45,091	100	1.69
New Jersey Natural Gas Company	34,674	100	1.32
Elizabethtown Gas Company	31,501	100	1.28
Orange and Rockland Utilities, Inc.	22,259	97	.96
The Southern Connecticut Gas Company	16,368	100	1.86
The Connecticut Light and Power Company	11,133	60	1.55
Central Hudson Gas & Electric Corporation	7,343	96	1.42
The Hartford Electric Light Company	3,734	80	1.56
The Greenwich Gas Company	2,706	100	1.48
New York State Electric & Gas Corporation	380	1	.94
Unfranchised Areas			

0 10 20 40 miles
0 10 20 40 60 kilometers

Table 1
Electric Utility Sales: Residential, Selected Years 1950-1970

(thousand megawatt hours)

	1950	1955	1960	1965	1966	1967	1968	1969	1970
Bronx	419.8	587.2	693.8	926.8	986.5	1,023.3	1,107.3	1,200.7	1,339.1
Brooklyn	815.5	1,078.5	1,367.7	1,806.8	1,922.3	1,982.0	2,123.7	2,269.0	2,509.7
Manhattan	525.2	711.9	898.3	1,237.6	1,318.6	1,381.0	1,500.6	1,584.1	1,722.0
Queens	564.8	832.9	1,110.0	1,572.9	1,707.0	1,795.7	1,976.8	2,152.8	2,387.8
Richmond	72.2	107.1	141.1	212.3	250.0	263.4	302.3	346.5	419.7
NEW YORK CITY	2,397.5	3,317.6	4,210.9	5,756.4	6,184.4	6,445.4	7,010.7	7,553.1	8,378.3
Dutchess	74.7	124.1	175.5	267.9	290.3	318.5	346.5	384.8	424.1
Nassau	290.3	782.6	1,168.7	1,644.7	1,767.1	1,901.0	2,076.4	2,253.3	2,448.9
Orange	74.2	112.2	159.1	231.0	255.4	284.5	322.7	350.2	415.7
Putnam	14.1	20.3	37.5	58.4	66.8	82.3	91.4	107.9	124.9
Rockland	25.4	52.2	92.7	169.1	195.0	221.6	263.6	291.0	365.5
Suffolk	145.5	337.4	627.4	1,060.7	1,200.9	1,344.7	1,520.0	1,735.3	1,948.9
Sullivan	38.3	63.9	79.8	77.5	83.6	99.4	110.8	118.7	141.3
Ulster	44.9	71.9	107.2	159.3	175.0	208.3	233.4	263.6	294.9
Westchester	248.1	435.1	652.3	905.0	991.8	998.1	1,177.0	1,283.0	1,423.2
NY excl. NYC	955.5	1,999.7	3,100.2	4,573.6	5,025.9	5,458.4	6,141.8	6,787.8	7,587.4
Bergen	223.4	416.8	629.9	930.9	1,035.4	1,112.5	1,218.8	1,333.5	1,491.0
Essex	299.6	449.5	585.3	788.3	857.1	910.1	990.0	1,073.9	1,167.9
Hudson	184.2	251.6	303.5	400.1	438.7	464.2	509.5	552.6	600.9
Hunterdon	28.7	48.6	71.2	99.5	109.4	121.7	132.7	147.1	162.5
Mercer	81.9	140.7	204.1	297.1	325.7	350.7	385.4	422.2	461.4
Middlesex	100.7	212.3	355.2	572.5	651.7	721.0	810.0	902.6	1,010.0
Monmouth	121.1	215.7	336.0	488.0	544.4	603.2	673.8	752.8	840.6
Morris	92.5	178.1	290.5	443.2	496.7	556.8	621.1	697.5	781.6
Ocean	33.6	72.4	125.8	227.8	262.5	299.7	344.1	394.2	450.6
Passaic	118.0	198.9	282.0	412.5	458.7	496.2	567.3	626.2	694.7
Somerset	46.2	84.6	136.8	214.9	240.4	266.6	296.8	329.6	364.4
Sussex	21.2	37.4	56.5	86.4	96.4	108.5	119.8	134.3	149.9
Union	157.9	275.2	404.5	568.9	625.5	672.2	734.9	801.2	878.0
Warren	36.7	59.3	83.5	110.7	120.5	132.9	143.5	157.8	172.9
NEW JERSEY	1,545.7	2,641.1	3,864.8	5,640.8	6,263.1	6,816.3	7,547.7	8,325.5	9,226.4
Fairfield	234.0	467.8	689.4	1,052.4	1,149.0	1,265.5	1,391.0	1,533.5	1,693.6
Litchfield	41.1	85.6	131.5	213.8	238.5	265.5	293.5	331.3	367.4
New Haven	199.3	382.4	601.1	919.3	1,012.4	1,122.3	1,230.7	1,361.5	1,512.8
CONNECTICUT	474.4	935.8	1,422.0	2,185.5	2,399.9	2,653.3	2,915.2	3,226.3	3,573.8
REGION	5,373.1	8,894.2	12,597.9	18,156.3	19,873.3	21,373.4	23,615.4	25,892.7	28,765.9

Sources: Electric utilities from p. 4; New York State Department of Housing and Community Renewal; New York City Housing Authority; New York City Housing and Development Administration.

Notes: Based on unpublished reports from the utilities and municipals providing annual kilowatt hour sales to residential customers by county or commercial district of residence. New York City data were amended for residential consumption in private master-metered multi-family structures and New York City and Newark, N.J., data were amended for master-metered public housing developments. Private master-metering, which accounts for 3.9% of private residential consumption, was transferred from the commercial customer category based on factors provided by Con Edison. Public housing consumption, which is comprised of middle income Mitchell-Lama purchases in New York City and low income Housing Authority purchases in New York City and Newark, N.J., was reallocated from the government sector based on annual reports of electrical use or cost per dwelling unit by development from the various public agencies.

Table 2
Electric Utility Sales: Commercial and Public Facilities, Selected Years 1950-1970

(thousand megawatt hours)

	1950	1955	1960	1965	1966	1967	1968	1969	1970	Street Lighting
Bronx	354.9	493.2	632.5	870.8	938.8	1,001.6	1,040.8	1,068.3	1,115.5	\
Brooklyn	726.9	915.9	1,026.7	1,143.0	1,205.6	1,279.4	1,373.1	1,423.1	1,572.5	
Manhattan	2,404.1	3,118.8	4,208.3	5,520.2	5,786.9	6,093.3	6,643.7	7,127.5	7,643.6	
Queens	405.3	795.2	1,066.4	1,694.9	1,708.7	1,815.5	1,887.4	1,973.1	2,096.4	
Richmond	113.4	139.3	156.2	209.8	235.7	249.1	259.7	278.0	310.3	
NEW YORK CITY	4,004.6	5,462.4	7,090.1	9,438.7	9,875.7	10,438.9	11,204.7	11,870.0	12,738.3	450.0
Dutchess	63.2	99.0	146.7	257.0	331.9	308.3	332.9	359.0	393.3	13.0
Nassau	294.9	603.2	1,025.9	1,485.4	1,526.1	1,633.5	1,835.6	2,012.9	2,187.1	98.0
Orange	77.8	109.6	157.2	239.3	248.3	290.0	302.8	321.9	332.7	11.0
Putnam	6.8	12.1	23.5	32.0	32.3	30.6	37.5	46.6	51.2	2.9
Rockland	54.0	88.5	148.1	226.2	270.4	261.7	297.5	323.7	367.4	8.7
Suffolk	171.1	300.1	513.6	1,038.6	1,199.4	1,280.0	1,418.8	1,516.2	1,749.8	64.0
Sullivan	25.4	46.8	59.1	72.9	81.3	79.2	83.4	103.3	91.8	1.4
Ulster	37.9	61.5	122.1	200.0	222.7	268.7	297.2	328.6	348.8	8.0
Westchester	245.7	423.4	675.0	987.5	1,072.9	1,154.1	1,263.2	1,370.7	1,495.5	50.0
NY excl. NYC	976.8	1,744.2	2,871.2	4,538.9	4,985.3	5,306.1	5,868.9	6,382.9	7,017.6	257.0
Bergen	191.8	348.7	597.8	948.0	1,071.1	1,158.8	1,227.4	1,342.7	1,488.9	57.2
Essex	329.3	502.2	698.3	993.2	1,063.1	1,104.3	1,179.5	1,254.4	1,359.7	55.4
Hudson	176.5	247.3	324.8	470.6	508.0	541.0	580.1	621.9	678.6	32.1
Hunterdon	41.0	62.1	88.8	129.5	141.4	150.2	159.5	183.4	197.5	2.9
Mercer	188.6	261.9	387.5	629.4	665.8	706.2	769.4	821.5	858.8	17.1
Middlesex	146.3	243.8	429.7	728.1	814.7	881.2	971.1	1,097.9	1,205.2	30.5
Monmouth	181.1	228.3	353.6	536.4	604.9	638.7	698.0	756.3	809.6	21.3
Morris	63.0	124.9	213.2	356.9	406.1	440.4	491.1	545.9	602.9	16.7
Ocean	45.9	74.5	137.8	255.5	302.2	333.3	379.4	427.6	473.7	9.2
Passaic	78.9	132.6	194.5	305.4	332.6	349.4	458.1	508.3	566.0	23.2
Somerset	86.3	117.6	195.0	299.3	337.1	365.2	408.2	466.9	508.7	9.1
Sussex	19.7	28.6	42.3	63.8	74.2	81.9	90.9	109.6	124.1	2.9
Union	246.1	435.5	738.8	1,115.0	1,227.8	1,273.0	1,339.3	1,457.8	1,565.8	31.7
Warren	36.6	53.6	75.0	104.5	114.6	121.9	129.5	147.3	158.8	2.9
NEW JERSEY	1,831.1	2,861.6	4,477.1	6,935.6	7,663.6	8,145.5	8,881.5	9,741.5	10,598.3	312.2
Fairfield	131.3	194.5	260.5	615.3	742.8	749.4	839.1	1,091.0	1,072.3	53.0
Litchfield	4.8	11.5	25.3	63.1	72.4	82.0	92.5	105.5	115.7	6.7
New Haven	145.1	287.7	508.1	987.8	1,082.5	1,154.2	1,284.6	1,415.3	1,498.6	46.9
CONNECTICUT	281.2	493.7	793.9	1,661.2	1,897.7	1,985.6	2,216.2	2,611.8	2,686.6	106.6
REGION	7,093.7	10,561.9	15,232.3	22,574.4	24,422.3	25,876.1	28,171.3	30,606.2	33,040.8	1,125.8

Sources: Electric utilities from p. 4; Regional Plan Association.

Notes: Derived from unpublished reports of the utilities and municipals providing annual kilowatt hour sales to commercial or commercial/industrial customers by county or commercial district of location. Aggregated with sales to government or public authorities, including street lighting, by county or commercial district where consumed. Private master-metered and public housing consumption were deleted from commercial and government categories by the method noted under Table 1. Platform lighting for subways and railroads was transferred from government consumption to transportation by the method noted under Table 4. Electric sales to industry were separated from commercial in combined service areas by the method noted under Table 3. Sales to commercial and public facilities comprise electrical usage by private non-residential, non-industrial facilities, public buildings, and street lighting; street-lighting is also shown separately in 1970.

Table 3
Electric Utility Sales: Industrial, Selected Years 1950-1970

(thousand megawatt hours)

	1950	1955	1960	1965	1966	1967	1968	1969	1970
Bronx	159.6	192.8	278.0	346.0	360.1	358.2	381.6	416.5	405.2
Brooklyn	668.9	800.5	1,056.2	1,401.6	1,460.4	1,468.9	1,469.4	1,568.0	1,487.7
Manhattan	899.2	1,116.5	1,380.4	1,788.6	1,866.1	1,908.7	1,907.8	2,028.7	1,967.6
Queens	411.5	473.6	751.0	877.5	910.4	930.8	963.5	1,046.1	1,045.2
Richmond	31.4	37.0	50.1	67.0	68.3	67.1	72.0	76.7	66.4
NEW YORK CITY	2,170.6	2,620.4	3,515.7	4,480.7	4,665.3	4,733.7	4,794.3	5,136.0	4,972.1
Dutchess	48.2	97.1	121.9	242.5	264.6	279.6	306.4	358.4	400.2
Nassau	114.7	257.0	411.4	658.1	790.7	871.1	905.3	925.1	939.5
Orange	48.2	70.0	100.4	139.1	148.0	155.1	158.3	174.0	185.5
Putnam	.6	2.1	4.5	7.9	10.8	11.2	11.6	12.0	15.5
Rockland	30.1	46.5	67.0	103.4	130.0	132.2	157.9	180.2	214.5
Suffolk	17.7	99.9	191.0	251.1	279.9	324.0	360.9	416.6	452.8
Sullivan	.5	1.0	3.4	5.7	6.4	7.5	8.3	9.0	9.2
Ulster	12.8	23.2	76.2	120.7	134.1	156.0	168.9	182.9	183.5
Westchester	119.8	184.4	279.5	418.7	452.5	457.8	474.8	526.9	518.6
NY excl. NYC	392.6	781.2	1,255.3	1,947.2	2,217.0	2,394.5	2,552.4	2,785.1	2,919.3
Bergen	293.3	450.5	547.2	790.5	850.7	875.0	933.3	981.2	1,021.0
Essex	704.3	867.8	978.9	1,335.9	1,409.1	1,463.8	1,504.0	1,619.1	1,610.4
Hudson	594.8	787.3	833.2	927.6	985.2	1,029.1	1,103.5	1,176.2	1,190.5
Hunterdon	22.2	33.0	44.4	63.4	66.9	68.6	70.5	81.8	85.0
Mercer	172.3	203.0	281.7	380.2	382.7	380.3	403.8	425.4	414.1
Middlesex	353.0	500.5	765.5	1,228.0	1,379.3	1,403.7	1,473.4	1,639.0	1,660.7
Monmouth	70.9	71.1	110.9	172.3	197.7	206.4	220.3	233.8	238.0
Morris	101.4	151.3	251.1	398.1	467.7	509.3	562.2	643.2	689.8
Ocean	9.3	11.6	21.7	39.0	47.6	52.7	59.5	66.6	71.5
Passaic	267.1	355.5	450.2	617.0	685.4	712.2	765.7	806.6	837.1
Somerset	76.0	88.8	148.8	225.0	255.6	273.0	304.7	331.2	341.1
Sussex	9.9	14.3	19.5	27.3	31.4	34.8	38.4	47.7	52.9
Union	354.1	596.7	1,090.0	1,590.2	1,751.3	1,764.7	1,774.5	1,929.8	2,021.7
Warren	43.4	62.0	79.7	108.4	113.4	115.1	117.2	134.7	138.8
NEW JERSEY	3,072.0	4,193.4	5,622.8	7,902.9	8,624.0	8,888.7	9,331.0	10,116.3	10,372.6
Fairfield	443.8	588.5	768.2	1,057.6	1,134.0	1,190.7	1,303.1	1,224.4	1,356.1
Litchfield	54.6	87.3	120.0	189.1	210.5	232.6	255.9	262.7	263.8
New Haven	461.2	614.2	712.6	959.3	1,023.1	1,057.5	1,046.5	1,076.9	1,107.0
CONNECTICUT	959.6	1,290.0	1,600.8	2,206.0	2,367.6	2,480.0	2,605.5	2,564.0	2,726.9
REGION	6,594.8	8,885.0	11,994.6	16,536.8	17,873.9	18,497.7	19,283.2	20,601.4	20,990.9

Sources: Electric utilities from p. 4; Regional Plan Association, based on U.S. Bureau of the Census, Census of Manufactures, Fuels and Electric Energy Consumed, 1954, 1958, 1962, 1967.

Notes: Derived from unpublished reports of the utilities and municipals providing annual kilowatt hour sales to industrial or commercial/industrial customers by county or commercial district of location. Separated from commercial consumption in combined service areas through analysis of detailed (2-digit SIC) manufacturing industry power usage per employee, as reported for selected New York, New Jersey and Connecticut Standard Metropolitan Statistical Areas and the three states in the years 1954, 1958, 1962 and 1967. Adjustments made between utility industrial coverage by comparing annual sales to large power users in detailed manufacturing industries on a per unit basis, as furnished by the companies for the systems as a whole in recent years, with Census establishment reports. Electric sales assigned to counties within the service areas on the basis of their respective manufacturing employment in the reported years, with interpolations made for sales in intervening years.

Table 4
Electric Utility Sales: Transportation, Selected Years 1950-1970

(thousand megawatt hours)

	1950	1955	1960	1965	1966	1967	1968	1969	1970
Bronx	360.3	321.9	300.6	286.9	276.1	290.6	299.2	302.8	308.7
Brooklyn	918.8	803.5	637.4	610.4	587.2	623.0	645.2	659.5	681.4
Manhattan	707.1	620.9	827.4	821.1	789.1	837.4	868.5	886.1	909.6
Queens	835.8	757.1	751.7	746.6	722.9	758.7	773.4	790.7	835.8
Richmond	12.0	12.0	12.4	13.8	13.8	12.9	12.8	12.5	12.4
NEW YORK CITY	2,834.0	2,515.4	2,529.5	2,478.8	2,389.1	2,522.6	2,599.1	2,651.6	2,747.9
Dutchess	--	--	--	--	--	--	--	--	--
Nassau	41.1	45.3	36.4	48.5	47.3	44.3	48.2	58.3	71.1
Orange	--	--	--	--	--	--	--	--	--
Putnam	--	--	--	--	--	--	--	--	--
Rockland	--	--	--	--	--	--	--	--	--
Suffolk	3.8	3.5	4.1	6.0	6.0	6.4	6.6	6.6	12.7
Sullivan	--	--	--	--	--	--	--	--	--
Ulster	--	--	--	--	--	--	--	--	--
Westchester	190.7	184.0	116.0	98.8	96.2	96.0	93.2	89.4	87.6
NY excl. NYC	235.6	232.8	156.5	153.3	149.5	146.7	148.0	154.3	171.4
Bergen	--	--	--	--	--	--	--	--	--
Essex	32.6	35.4	23.3	15.9	16.6	18.1	21.5	21.3	22.6
Hudson	114.6	124.5	82.0	55.9	58.5	63.8	75.5	75.1	79.5
Hunterdon	--	--	--	--	--	--	--	--	--
Mercer	12.8	14.0	9.2	6.3	6.6	7.2	8.5	8.4	8.9
Middlesex	37.6	40.9	26.9	18.3	19.2	20.5	24.8	24.6	26.1
Monmouth	--	--	--	--	--	--	--	--	--
Morris	10.5	11.4	7.5	5.1	5.4	5.8	6.9	6.9	7.3
Ocean	--	--	--	--	--	--	--	--	--
Passaic	--	--	--	--	--	--	--	--	--
Somerset	13.1	14.2	9.4	6.4	6.7	7.3	8.6	8.6	9.1
Sussex	--	--	--	--	--	--	--	--	--
Union	9.2	10.0	6.6	4.5	4.7	5.1	6.0	6.0	6.4
Warren	--	--	--	--	--	--	--	--	--
NEW JERSEY	230.4	250.4	164.9	112.4	117.7	127.8	151.8	150.9	159.9
Fairfield	108.1	115.6	38.2	48.4	55.5	50.8	49.7	33.7	29.5
Litchfield	--	--	--	--	--	--	--	--	--
New Haven	27.0	28.9	9.5	12.1	13.9	12.7	12.4	8.4	7.4
CONNECTICUT	135.1	144.5	47.7	60.5	69.4	63.5	62.1	42.1	36.9
REGION	3,435.1	3,143.1	2,898.6	2,805.0	2,725.7	2,860.6	2,961.0	2,998.9	3,116.1

Sources: Electric utilities from p. 4; New York State Metropolitan Transportation Authority; Penn Central Transportation Company; Regional Plan Association, based on Moody's Handbook of Public Utilities.

Notes: Based on reported annual kilowatt hour sales of utilities by contract to subways and railroads for traction, amended to include platform lighting from government consumption. Several suburban utilities provided transportation sales by county; Con Edison and Public Service Electric and Gas sales to the Metropolitan Transportation Authority and the Penn Central Transportation Company were allocated by county within contracts, such as the New York City Transit Authority, on the basis of train miles of travel. Annual sales in addition to contracted sales, were included. Subway consumption estimated by Regional Plan Association for 1950's, when power was generated by Transit Authority or purchased only in part from Con Edison.

Table 5
Electric Utility Sales: Total, Selected Years 1950-1970

(thousand megawatt hours)

	1950	1955	1960	1965	1966	1967	1968	1969	1970
Bronx	1,294.6	1,595.1	1,904.9	2,430.5	2,561.5	2,673.7	2,828.9	2,988.3	3,168.5
Brooklyn	3,130.1	3,598.4	4,088.0	4,961.8	5,175.5	5,353.3	5,611.4	5,919.6	6,251.3
Manhattan	4,535.6	5,568.1	7,314.4	9,367.5	9,760.7	10,220.4	10,920.6	11,626.4	12,242.8
Queens	2,217.4	2,858.8	3,679.1	4,891.9	5,049.0	5,300.7	5,601.1	5,962.7	6,365.2
Richmond	229.0	295.4	359.8	502.9	567.8	592.5	646.8	713.7	808.8
NEW YORK CITY	11,406.7	13,915.8	17,346.2	22,154.6	23,114.5	24,140.6	25,608.8	27,210.7	28,836.6
Dutchess	186.1	320.2	444.1	767.4	886.8	906.4	985.8	1,102.2	1,217.6
Nassau	741.0	1,688.1	2,642.4	3,836.7	4,131.2	4,449.9	4,865.5	5,249.6	5,646.6
Orange	200.2	291.8	416.7	609.4	651.7	729.6	783.8	846.1	933.9
Putnam	21.5	34.5	65.5	98.3	109.9	124.1	140.5	166.5	191.6
Rockland	109.5	187.2	307.8	498.7	595.4	615.5	719.0	794.9	947.4
Suffolk	338.1	740.9	1,336.1	2,356.4	2,686.2	2,955.1	3,306.3	3,674.7	4,164.2
Sullivan	64.2	111.7	142.3	156.1	171.3	186.1	202.5	231.0	242.3
Ulster	95.6	156.6	305.5	480.0	531.8	633.0	699.5	775.1	827.2
Westchester	804.3	1,226.9	1,722.8	2,410.0	2,613.4	2,706.0	3,008.2	3,270.0	3,524.9
NY excl. NYC	2,560.5	4,757.9	7,383.2	11,213.0	12,377.7	13,305.7	14,711.1	16,110.1	17,695.7
Bergen	708.5	1,216.0	1,774.9	2,669.4	2,957.2	3,146.3	3,379.5	3,657.4	4,000.9
Essex	1,365.8	1,854.9	2,285.8	3,133.3	3,345.9	3,496.3	3,695.0	3,968.7	4,160.6
Hudson	1,070.1	1,410.7	1,543.5	1,854.2	1,990.4	2,098.1	2,268.1	2,425.8	2,549.5
Hunterdon	91.9	143.7	204.4	292.4	317.7	340.5	362.7	412.3	445.0
Mercer	455.6	619.6	882.5	1,313.0	1,380.8	1,444.4	1,567.1	1,677.5	1,743.2
Middlesex	637.6	997.5	1,577.3	2,546.9	2,864.9	3,026.4	3,279.3	3,664.1	3,902.0
Monmouth	373.1	515.1	800.5	1,196.7	1,347.0	1,448.3	1,592.1	1,742.9	1,888.2
Morris	267.4	465.7	762.3	1,203.3	1,375.9	1,512.3	1,681.3	1,893.5	2,081.6
Ocean	88.8	158.5	285.3	522.3	612.3	685.7	783.0	888.4	995.8
Passaic	464.0	687.0	926.7	1,334.9	1,476.7	1,557.8	1,791.1	1,941.1	2,097.8
Somerset	221.6	305.2	490.0	745.6	839.8	912.1	1,018.3	1,136.3	1,223.3
Sussex	50.8	80.3	118.3	177.5	202.0	225.2	249.1	291.6	326.9
Union	767.3	1,317.4	2,239.9	3,278.6	3,609.3	3,715.0	3,854.7	4,194.8	4,471.9
Warren	116.7	174.9	238.2	323.6	348.5	369.9	390.2	439.8	470.5
NEW JERSEY	6,679.2	9,946.5	14,129.6	20,591.7	22,668.4	23,978.3	25,912.0	28,334.2	30,357.2
Fairfield	917.2	1,366.4	1,756.3	2,773.7	3,081.3	3,256.4	3,582.9	3,882.6	4,151.5
Litchfield	100.5	184.4	276.8	466.0	521.4	580.1	641.9	699.5	746.9
New Haven	832.6	1,313.2	1,831.3	2,873.5	3,131.9	3,346.7	3,574.2	3,862.1	4,125.8
CONNECTICUT	1,850.3	2,864.0	3,864.4	6,113.2	6,734.6	7,183.2	7,799.0	8,444.2	9,024.2
REGION	22,496.7	31,484.2	42,723.4	60,072.5	64,895.2	68,607.8	74,030.9	80,099.2	85,913.7

Sources: As in Tables 1-4.

Notes: The sum of Tables 1-4, corresponding to unpublished reports of the utilities and municipals providing total annual kilowatt hour sales by county or commercial district.

Table 6
Gas Utility Sales: Residential, Selected Years 1950-1970

(million cubic feet)

	1950	1955	1960	1965	1966	1967	1968	1969	1970
Bronx	4,683	4,090	5,275	6,859	7,179	7,846	8,027	8,766	9,634
Brooklyn	7,884	11,101	20,749	27,383	29,298	31,520	33,003	34,851	37,563
Manhattan	5,017	4,613	5,119	5,323	5,481	5,956	6,150	6,841	7,512
Queens	11,635	14,532	18,399	24,821	25,986	28,235	29,008	30,619	31,801
Richmond	656	1,060	2,786	4,331	4,550	5,332	5,782	6,060	6,828
NEW YORK CITY	29,875	35,396	52,328	68,717	72,494	78,889	81,970	87,137	93,338
Dutchess	277	633	909	1,186	1,201	1,266	1,264	1,316	1,382
Nassau	2,993	3,755	6,831	10,022	10,815	11,836	11,730	12,497	13,177
Orange	652	1,502	2,696	3,328	3,455	3,714	3,878	3,948	4,524
Putnam	--	--	--	--	--	--	--	--	--
Rockland	1,039	2,584	4,893	7,008	7,513	8,531	8,822	8,759	10,586
Suffolk	831	1,284	4,901	8,591	8,875	9,683	10,114	10,857	11,472
Sullivan	--	--	--	--	--	--	--	--	--
Ulster	142	357	571	701	706	743	737	750	769
Westchester	4,920	6,951	10,385	12,862	13,318	14,281	14,339	14,859	15,724
NY excl. NYC	10,854	17,066	31,186	43,698	45,883	50,054	50,884	52,986	57,634
Bergen	1,761	7,946	13,702	18,726	19,405	21,148	20,282	21,088	22,171
Essex	2,431	6,985	10,500	13,525	13,939	15,033	14,965	15,480	16,189
Hudson	1,937	4,247	5,560	6,453	6,472	6,886	6,716	6,837	7,080
Hunterdon	8	30	77	138	152	171	177	189	201
Mercer	644	1,815	3,154	4,097	4,274	4,711	4,772	5,035	5,404
Middlesex	852	3,169	6,480	9,463	10,215	10,971	11,376	11,851	12,633
Monmouth	2,098	2,195	4,430	7,265	8,337	9,469	10,087	10,857	11,851
Morris	500	1,731	3,164	4,867	5,403	6,163	6,527	7,091	7,670
Ocean	317	613	1,330	3,338	3,969	4,636	5,058	5,556	6,188
Passaic	947	3,460	6,011	7,950	8,308	9,050	9,999	10,345	10,932
Somerset	236	920	1,948	3,185	3,432	3,811	3,885	4,111	4,363
Sussex	8	20	42	45	61	78	92	106	127
Union	1,453	3,546	5,771	8,575	9,328	10,120	10,220	10,453	11,242
Warren	42	96	186	196	267	335	398	456	544
NEW JERSEY	13,234	36,773	62,355	87,823	93,562	102,582	104,554	109,455	116,595
Fairfield	1,139	2,370	6,215	8,079	8,406	8,838	8,992	9,510	10,045
Litchfield	92	233	610	735	765	808	828	872	903
New Haven	618	1,335	3,900	5,617	6,117	6,664	6,931	7,377	7,753
CONNECTICUT	1,849	3,938	10,725	14,431	15,288	16,310	16,751	17,759	18,701
REGION	55,812	93,173	156,594	214,669	227,227	247,835	254,159	267,337	286,268

Sources: Gas utilities from p. 4; New York State Division of Housing and Community Renewal; New York City Housing Authority; New York City Housing and Development Administration.

Notes: Based on unpublished reports from the utilities providing annual cubic feet or therms of gas sold to residential customers with and without heating by county or commercial district of residence. New York City data were amended for residential consumption in public low and middle income housing developments. These sales were reallocated from the government sector based on annual reports of gas usage or cost per dwelling unit by development from the various public agencies. Private master-metered gas consumption was reported to be insignificant by the utilities. Estimates were made of manufactured gas sales or sales by gas companies no longer in existence for earlier years. All sales converted to cubic feet of 1030 Btu content.

Table 7
Gas Utility Sales: Commercial and Public Facilities, Selected Years 1950-1970

(million cubic feet)

	1950	1955	1960	1965	1966	1967	1968	1969	1970
Bronx	772	1,248	1,702	2,122	2,243	2,487	2,618	2,700	2,912
Brooklyn	1,621	7,038	12,740	12,778	11,160	12,544	13,577	14,350	15,506
Manhattan	5,133	5,382	5,549	5,453	5,401	5,493	5,621	5,682	5,893
Queens	469	2,391	5,109	6,386	6,043	6,666	6,937	8,111	7,293
Richmond	35	80	1,920	2,570	2,192	2,333	2,538	3,428	2,504
NEW YORK CITY	8,030	16,139	27,020	29,309	27,039	29,523	31,291	34,271	34,108
Dutchess	89	106	159	322	351	443	567	877	900
Nassau	465	891	2,404	4,466	4,942	6,479	7,211	8,373	9,192
Orange	194	366	627	1,022	1,113	1,323	1,545	1,662	2,792
Putnam	--	--	--	--	--	--	--	--	--
Rockland	178	258	886	2,444	2,459	2,823	3,230	3,735	4,053
Suffolk	134	303	714	1,947	2,176	3,057	3,922	4,812	5,480
Sullivan	--	--	--	--	--	--	--	--	--
Ulster	40	66	104	158	179	220	238	281	307
Westchester	593	778	962	1,354	1,459	1,766	1,762	2,619	6,048
NY excl. NYC	1,693	2,768	5,856	11,713	12,679	16,111	18,475	22,359	28,772
Bergen	2,031	1,189	2,580	5,699	6,307	7,312	7,907	9,042	10,806
Essex	2,677	2,005	3,102	5,704	6,071	6,738	7,152	8,046	9,054
Hudson	1,279	1,588	2,671	4,072	4,560	5,296	5,471	6,111	6,802
Hunterdon	18	26	63	84	152	184	287	322	390
Mercer	524	468	756	1,719	1,947	2,304	2,435	2,376	2,639
Middlesex	400	531	1,226	2,681	3,082	3,602	4,639	5,213	5,790
Monmouth	544	3,187	4,622	5,961	5,280	5,764	5,307	5,731	4,560
Morris	306	153	518	1,235	1,760	1,902	2,235	2,529	2,058
Ocean	152	1,052	1,626	2,613	2,408	2,689	2,547	2,871	2,998
Passaic	517	423	864	1,825	2,097	2,297	2,460	2,788	2,521
Somerset	185	119	254	1,529	630	732	816	976	1,150
Sussex	11	24	59	75	134	167	276	310	393
Union	690	702	1,554	3,082	3,467	4,120	5,820	6,394	6,797
Warren	11	23	56	71	141	170	276	303	370
NEW JERSEY	9,345	11,490	19,951	36,350	38,036	43,277	47,628	53,012	56,328
Fairfield	78	299	1,559	2,405	2,470	2,694	2,717	2,938	3,192
Litchfield	--	4	53	151	170	194	210	232	242
New Haven	191	447	1,409	2,441	2,539	2,600	2,384	2,676	2,954
CONNECTICUT	269	750	3,021	4,997	5,179	5,488	5,311	5,846	6,388
REGION	19,337	31,147	55,848	82,369	82,933	94,399	102,705	115,488	125,596

Sources: Gas utilities from p. 4; Regional Plan Association.

Notes: Derived from unpublished reports of the utilities providing annual cubic feet or therms of gas sold to general, commercial, or commercial/industrial, and interruptible customers by county or commercial district of location. Aggregated with sales to government or public authorities, including street lighting, by county or commercial district where consumed. Public housing consumption was deleted from the government category by the method noted under Table 6. Gas sales to industry were separated from general, or commercial/industrial in combined service areas by the method noted under Table 8. Utilities provided the portions of interruptible gas sales assignable to commercial and industrial customers. Sales to commercial and public facilities comprise gas usage by private non-residential, non-industrial facilities, public buildings, and authorities. Adjustments for manufactured gas, company omissions, and Btu equivalency, as noted under Table 6.

Table 8
Gas Utility Sales: Industrial, Selected Years 1950-1970

(million cubic feet)

	1950	1955	1960	1965	1966	1967	1968	1969	1970
Bronx	1,176	1,183	1,498	1,620	1,596	1,554	1,598	1,622	1,669
Brooklyn	3,016	4,051	5,797	6,758	6,755	6,411	6,640	6,923	7,184
Manhattan	3,020	3,241	3,656	4,692	4,668	4,599	4,651	4,679	4,720
Queens	2,195	2,628	4,051	4,322	4,236	4,132	4,568	4,953	5,005
Richmond	167	204	335	373	364	345	356	356	321
NEW YORK CITY	9,574	11,307	15,337	17,765	17,619	17,041	17,813	18,533	18,899
Dutchess	78	117	119	263	286	301	291	508	517
Nassau	441	963	1,400	2,220	2,484	2,579	2,628	2,628	2,628
Orange	48	53	652	1,060	1,204	1,042	788	900	1,289
Putnam	--	--	--	--	--	--	--	--	--
Rockland	63	98	360	1,054	1,073	1,246	1,442	1,687	1,852
Suffolk	66	165	557	840	972	1,169	1,308	1,467	1,528
Sullivan	--	--	--	--	--	--	--	--	--
Ulster	17	21	38	91	112	122	112	135	1,011
Westchester	633	895	1,445	1,877	1,898	1,901	1,925	2,054	2,167
NY excl. NYC	1,346	2,312	4,571	7,405	8,029	8,360	8,494	9,379	10,992
Bergen	454	991	1,517	3,819	3,632	4,195	5,238	6,436	7,549
Essex	1,452	2,000	2,442	5,307	5,451	5,770	6,252	7,092	7,710
Hudson	824	1,149	1,294	4,777	3,495	3,753	4,194	4,764	5,243
Hunterdon	17	39	92	222	256	258	359	440	444
Mercer	439	781	1,074	2,262	1,788	1,769	1,994	2,406	2,942
Middlesex	213	520	1,243	5,171	3,980	4,015	4,938	5,976	6,264
Monmouth	90	538	584	884	917	966	920	1,178	3,304
Morris	66	127	520	699	964	1,160	1,148	1,362	2,071
Ocean	9	62	73	136	146	157	153	201	584
Passaic	589	909	1,398	2,939	2,911	3,287	3,505	4,060	4,576
Somerset	88	155	354	918	785	853	1,003	1,375	1,493
Sussex	13	35	80	125	227	229	334	406	413
Union	349	834	1,699	4,003	4,514	4,492	6,010	7,105	7,131
Warren	13	33	77	119	239	236	334	397	394
NEW JERSEY	4,616	8,173	12,447	31,381	29,305	31,140	36,382	43,198	50,118
Fairfield	126	459	2,260	2,709	3,028	3,392	3,671	4,059	4,125
Litchfield	10	55	312	283	330	346	347	378	396
New Haven	265	626	2,004	2,890	3,334	3,728	3,794	4,040	4,331
CONNECTICUT	401	1,140	4,576	5,882	6,692	7,466	7,812	8,477	8,852
REGION	15,937	22,932	36,931	62,433	61,645	64,007	70,501	79,587	88,861

Sources: Gas utilities from page 4; Regional Plan Association, based on U.S. Bureau of the Census, Census of Manufactures, Fuels and Electric Energy Consumed, 1954, 1958, 1962, 1967.

Notes: Derived from unpublished reports of the utilities providing annual cubic feet or therms of gas sold to general, industrial or commercial/industrial, and interruptible customers by county or commercial district of location. Separated from commercial consumption in combined service areas through analysis of detailed (2-digit SIC) manufacturing industry gas usage per employee, as reported for selected New York, New Jersey, and Connecticut Standard Metropolitan Statistical Areas and the three states in the years 1954, 1958, 1962, and 1967. Adjustments made between utility industrial coverage by comparing annual sales to large gas users in detailed manufacturing industries on a per unit basis, as furnished by the companies for the systems as a whole in recent years, with Census establishment reports. Gas sales assigned to counties within the service areas on the basis of their respective manufacturing employment in the reported years, with interpolations made for sales in intervening years. Adjustments for manufactured gas, company omissions, and Btu equivalency as noted under Table 6.

Table 9
Gas Utility Sales: Total, Selected Years 1950-1970

(million cubic feet)

	1950	1955	1960	1965	1966	1967	1968	1969	1970
Bronx	6,631	6,521	8,475	10,601	11,018	11,887	12,243	13,088	14,215
Brooklyn	12,521	22,190	39,286	46,919	47,213	50,475	53,220	56,124	60,253
Manhattan	13,170	13,236	14,324	15,468	15,550	16,048	16,422	17,202	18,125
Queens	14,299	19,551	27,559	35,529	36,265	39,033	40,513	43,683	44,099
Richmond	858	1,344	5,041	7,274	7,106	8,010	8,676	9,844	9,653
NEW YORK CITY	47,479	62,842	94,685	115,791	117,152	125,453	131,074	139,941	146,345
Dutchess	444	856	1,187	1,771	1,838	2,010	2,122	2,701	2,799
Nassau	3,899	5,609	10,635	16,708	18,241	20,894	21,569	23,498	24,997
Orange	894	1,921	3,975	5,410	5,772	6,079	6,211	6,510	8,605
Putnam	--	--	--	--	--	--	--	--	--
Rockland	1,280	2,940	6,139	10,506	11,045	12,600	13,494	14,181	16,491
Suffolk	1,031	1,752	6,172	11,378	12,023	13,909	15,344	17,136	18,480
Sullivan	--	--	--	--	--	--	--	--	--
Ulster	199	444	713	950	997	1,085	1,087	1,166	2,087
Westchester	6,146	8,624	12,792	16,093	16,675	17,948	18,026	19,532	23,939
NY excl. NYC	13,893	22,146	41,613	62,816	66,591	74,525	77,853	84,724	97,398
Bergen	4,246	10,126	17,799	28,244	29,344	32,655	33,427	36,566	40,526
Essex	6,560	10,990	16,044	24,536	25,461	27,541	28,369	30,618	32,953
Hudson	4,040	6,984	9,525	15,302	14,527	15,935	16,381	17,712	19,125
Hunterdon	43	95	232	444	560	613	823	951	1,035
Mercer	1,607	3,064	4,984	8,078	8,009	8,784	9,201	9,817	10,985
Middlesex	1,465	4,220	8,949	17,315	17,277	18,588	20,953	23,040	24,687
Monmouth	2,732	5,920	9,636	14,110	14,534	16,199	16,314	17,766	19,715
Morris	872	2,011	4,202	6,801	8,127	9,225	9,910	10,982	11,799
Ocean	478	1,727	3,029	6,087	6,523	7,482	7,758	8,628	9,770
Passaic	2,053	4,792	8,273	12,714	13,316	14,634	15,964	17,193	18,029
Somerset	509	1,194	2,556	5,632	4,847	5,396	5,704	6,462	7,006
Sussex	32	79	181	245	422	474	702	822	933
Union	2,492	5,082	9,024	15,660	17,309	18,732	22,050	23,952	25,170
Warren	66	152	319	386	647	741	1,008	1,156	1,308
NEW JERSEY	27,195	56,436	94,753	155,554	160,903	176,999	188,564	205,665	223,041
Fairfield	1,343	3,128	10,034	13,193	13,904	14,924	15,380	16,507	17,362
Litchfield	102	292	975	1,169	1,265	1,348	1,385	1,482	1,541
New Haven	1,074	2,408	7,313	10,948	11,990	12,992	13,109	14,093	15,038
CONNECTICUT	2,519	5,828	18,322	25,310	27,159	29,264	29,874	32,082	33,941
REGION	91,086	147,252	249,373	359,471	371,805	406,241	427,365	462,412	500,725

Sources: As in Tables 6-8.

Notes: The sum of Tables 6-8, corresponding to unpublished reports of the utilities providing total annual cubic feet or therms of gas sold by county or commercial district. Estimates were made of manufactured gas sales or sales by gas companies no longer in existence for earlier years. All sales converted to cubic feet of 1030 Btu content.

Table 10
Liquified Petroleum Gas Consumption 1960 and 1970

(thousand gallons)

	1960				1970			
	Residential	Commercial	Industrial	Total	Residential	Commercial	Industrial	Total
Bronx	2,762			2,762	6,587			6,587
Brooklyn	10,909			10,909	12,957			12,957
Manhattan	5,594			5,594	7,669			7,669
Queens	5,947			5,947	5,756			5,756
Richmond	1,466			1,466	583			583
NEW YORK CITY	26,678			26,678	33,552			33,552
Dutchess	3,048			3,048	2,622			2,622
Nassau	3,470			3,470	2,251			2,251
Orange	4,250			4,250	3,908			3,908
Putnam	863			863	1,068			1,068
Rockland	1,583			1,583	875			875
Suffolk	9,543			9,543	10,610			10,610
Sullivan	1,883			1,883	2,174			2,174
Ulster	4,188			4,188	4,094			4,094
Westchester	5,484			5,484	4,116			4,116
NY excl. NYC	34,312			34,312	31,718			31,718
Bergen	2,996			2,996	1,824			1,824
Essex	4,072			4,072	3,383			3,383
Hudson	3,695			3,695	2,550			2,550
Hunterdon	1,375			1,375	1,360			1,360
Mercer	2,218			2,218	1,248			1,248
Middlesex	3,508			3,508	2,108			2,108
Monmouth	4,240			4,240	3,413			3,413
Morris	3,841			3,841	2,818			2,818
Ocean	2,911			2,911	2,227			2,227
Passaic	3,450			3,450	2,259			2,259
Somerset	1,588			1,588	928			928
Sussex	1,597			1,597	1,899			1,899
Union	1,590			1,590	837			837
Warren	1,088			1,088	937			937
NEW JERSEY	38,169			38,169	27,791			27,791
Fairfield	6,861			6,861	4,932			4,932
Litchfield	2,128			2,128	1,979			1,979
New Haven	6,445			6,445	4,200			4,200
CONNECTICUT	15,434			15,434	11,111			11,111
REGION	114,593	3,777	75,556	193,926	104,172	8,083	81,641	193,896

Sources: U. S. Bureau of the Census, Census of Housing, 1960: State and Small Areas, 1970: Detailed Housing Characteristics; U.S. Department of the Interior, Bureau of Mines; New York State Public Service Commission; Suburban Propane Company; Regional Plan Association.

Notes: Based on the number of dwelling units using bottled, tank, or LP gas for house heating, water heating, and cooking fuels as reported by county in 1960 and 1970. Units converted to residential gallonage by application of average consumption ratios supplied by several local distributors; i.e., 1200 gallons per unit of house heating per year, 179 gallons per unit of water heating per year, and 94 gallons per unit of cooking per year. Commercial and industrial gallonage estimated by state sector from the relationship between residential consumption and commercial, industrial, transport, and miscellaneous consumption portrayed in the three state energy balances of the U.S. Bureau of Mines for 1960 and 1965, and the New York State Public Service Commission balance for 1960 and 1970.

Table 11
Consumption of Coal Other than in Electricity Generation, 1960 and 1970

(thousand tons)

	1960				1970			
	Residential	Commercial	Industrial	Total	Residential	Commercial	Industrial	Total
Bronx	440.4	66.8	15.3	522.5	95.2	36.2	11.8	143.2
Brooklyn	312.1	85.1	56.1	453.3	34.3	61.9	33.9	130.1
Manhattan	639.8	129.1	27.3	796.2	161.4	19.5	16.3	197.2
Queens	161.7	19.7	39.6	221.0	19.7	49.3	23.5	92.5
Richmond	27.6	31.0	2.4	61.0	3.1	31.6	1.5	36.2
NEW YORK CITY	1,581.6	331.7	140.7	2,054.0	313.7	198.5	87.0	599.2
Dutchess	19.5	61.2	58.3	139.0	2.0	32.8	34.9	69.7
Nassau	41.8	2.9	3.8	48.5	4.5	1.3	3.3	9.1
Orange	31.6	19.6	68.9	120.1	5.1	10.5	70.2	85.8
Putnam	3.6	--	.7	4.3	.1	--	1.7	1.8
Rockland	4.6	7.7	9.5	21.8	.4	8.7	8.6	17.7
Suffolk	29.9	410.9	241.0	681.8	2.1	235.0	126.2	363.3
Sullivan	11.8	8.2	2.8	22.8	2.6	4.4	3.3	10.3
Ulster	23.4	15.1	57.3	95.8	1.9	8.1	31.2	41.2
Westchester	46.1	44.0	26.6	116.7	7.2	4.6	73.4	85.2
NY excl. NYC	212.3	569.6	468.9	1,250.8	25.9	305.4	352.8	684.1
Bergen	74.2	42.6	169.8	286.6	1.9	11.0	69.3	82.2
Essex	275.6	132.2	86.3	494.1	35.5	14.2	24.2	73.9
Hudson	139.3	140.6	135.8	415.7	7.0	18.8	40.0	65.8
Hunterdon	18.2	7.8	.5	26.5	.8	.8	.2	1.8
Mercer	47.9	72.7	45.9	166.5	1.3	7.5	19.0	27.8
Middlesex	57.7	7.5	415.0	480.2	4.0	5.9	197.8	207.7
Monmouth	33.8	5.8	.8	40.4	4.8	--	.7	5.5
Morris	41.4	37.8	343.8	423.0	7.2	--	95.6	102.8
Ocean	6.0	--	1.9	7.9	.5	--	1.3	1.8
Passaic	98.6	58.3	126.9	283.8	15.8	.3	50.3	66.4
Somerset	20.3	36.2	66.8	123.3	3.7	--	27.6	31.3
Sussex	13.4	--	--	13.4	3.5	--	--	3.5
Union	119.4	117.5	22.0	258.9	19.6	2.3	6.2	28.1
Warren	26.3	9.7	1.3	37.3	6.1	1.0	.6	7.7
NEW JERSEY	972.1	668.7	1,416.8	3,057.6	111.7	61.8	532.8	706.3
Fairfield	18.7	19.7	28.7	67.1	4.0	--	18.7	22.7
Litchfield	6.1	2.1	6.4	14.6	1.9	--	3.1	5.0
New Haven	25.5	22.9	163.8	212.2	3.3	--	79.4	82.7
CONNECTICUT	50.3	44.7	198.9	293.9	9.2	--	101.2	110.4
REGION	2,816.3	1,614.7	2,225.3	6,656.3	460.5	565.7	1,073.8	2,100.0

Sources: U.S. Bureau of the Census, Census of Housing, 1960: States and Small Areas, 1970: Detailed Housing Characteristics, Census of Manufactures, Fuels and Electric Energy Consumed, 1958, 1967; U.S. Department of Health, Education, and Welfare, New York-New Jersey Air Pollution Abatement Activity, Phase II: Particulate Matter; U.S. Environmental Protection Agency, Guide for Compiling a Comprehensive Emission Inventory, and unpublished emission inventory reports; U.S. Department of the Interior, Bureau of Mines; New York State Public Service Commission; Connecticut State Department of Environmental Protection; New York City Environmental Protection Administration; National Coal Association; Regional Plan Association.

Notes: 1970 estimates obtained from county wide area and point source data of the various emission inventories by state submitted to the U.S. Environmental Protection Agency under requirements of the National Ambient Air Quality Standards issued in 1971. 1960 estimates derived from 1970 consumption by end-use customer on the following basis: the methodology, published by the U.S. Environmental Protection Agency for estimating residential coal consumption was applied to data in both years:

(1) coal tons per year in state = coal-heated dwelling units in state $\times$ 0.0012 $\frac{\text{tons of coal}}{\text{dwelling unit degree day}}$ $\times$ degree days $\times$ $\frac{\text{median rooms per dwelling unit}}{5 \text{ (national average)}}$;

(2) coal tons per year in county = $\frac{\text{coal tons per year in state}}{\text{coal heated dwelling units in state}}$ $\times$ coal heated dwelling units in county

The rate of change in residential consumption by county, 1960-1970, was then attributed to the 1970 residential data. Commercial and industrial consumption by county was estimated on the basis of locally provided indicators of non-residential conversion from coal usage, changes in manufacturing coal consumption by county 1958-1967, the three state energy balances of the U.S. Bureau of Mines, the Health, Education and Welfare fuel balance for the New York-New Jersey Study Area prepared by county and customer in 1965, and historical data on deliveries of coal by type to residential/commercial and industrial customers in each state less derived residential consumption.

Table 12
Distillate Fuel Oil Consumption in Uses Other than Electricity Generation, 1960 and 1970

(thousand gallons)

	1960				1970			
County	Residential	Commercial	Industrial	Total	Residential	Commercial	Industrial	Total
Bronx	131,410	32,240	6,560	170,210	110,170	34,730	5,690	150,590
Brooklyn	494,280	7,100	16,240	517,620	385,380	8,920	12,990	407,290
Manhattan	32,110	197,220	11,000	240,330	20,690	203,310	8,300	232,300
Queens	443,910	2,740	15,760	462,410	405,030	3,170	12,100	420,300
Richmond	55,020	5,380	2,920	63,370	60,730	14,270	2,000	77,000
NEW YORK CITY	1,156,730	244,680	52,530	1,453,940	982,000	264,400	41,080	1,287,480
Dutchess	35,160	25,970	1,570	62,700	43,170	29,460	2,430	75,060
Nassau	518,300	47,880	6,440	572,620	533,820	54,590	8,710	597,120
Orange	28,390	25,390	1,640	55,420	33,170	25,600	4,530	63,300
Putnam	9,110	3,010	110	12,230	15,700	3,700	110	19,510
Rockland	7,030	17,280	400	24,710	5,490	23,010	610	29,110
Suffolk	251,740	2,630	3,050	257,420	381,350	3,530	4,740	389,620
Sullivan	11,840	8,880	130	70,850	16,190	7,780	280	24,250
Ulster	28,440	14,360	1,120	43,920	32,750	14,990	1,690	49,430
Westchester	250,460	196,250	7,050	453,760	247,580	200,080	9,050	456,710
NY excl. NYC	1,140,470	341,650	21,510	1,503,630	1,309,220	362,740	32,150	1,704,110
Bergen	127,620	153,770	15,460	296,850	86,850	150,090	15,620	252,560
Essex	78,280	207,760	17,010	303,050	62,040	150,090	14,360	226,490
Hudson	48,070	99,030	15,000	162,100	41,030	107,210	14,350	162,590
Hunterdon	8,740	**	1,660	10,400	12,260	7,910	1,310	21,480
Mercer	31,140	6,200	8,400	45,740	27,810	40,580	7,770	76,160
Middlesex	61,560	8,770	13,050	83,380	59,090	75,050	16,520	150,660
Monmouth	57,860	15,880	1,650	75,390	55,730	66,470	2,700	124,900
Morris	45,360	12,280	4,180	61,820	60,560	50,390	4,690	115,640
Ocean	12,560	26,380	1,520	40,460	14,350	50,640	2,390	67,380
Passaic	31,660	35,090	9,720	76,470	17,910	82,550	10,740	111,200
Somerset	19,450	13,620	1,780	34,850	20,400	24,660	3,480	48,540
Sussex	6,460	2,020	260	8,740	10,360	8,630	270	19,260
Union	70,370	17,850	24,120	112,340	66,130	16,080	21,010	103,220
Warren	8,120	**	2,280	10,400	10,200	7,190	2,810	20,200
NEW JERSEY	607,250	598,650	116,090	132,990	544,720	837,540	118,020	1,500,280
Fairfield	122,670	123,540	8,400	254,610	129,790	100,590	9,550	239,930
Litchfield	31,680	**	1,680	33,360	32,010	2,540	1,780	36,330
New Haven	124,300	129,620	12,540	266,460	118,720	98,170	11,410	228,300
CONNECTICUT	278,650	253,160	22,620	554,430	280,520	201,300	22,740	504,560
REGION	3,183,100	1,438,140	212,750	4,833,990	3,116,460	1,665,980	213,990	4,996,430

Sources: U.S. Bureau of the Census, Census of Housing, 1960: States and Small Areas, 1970: Detailed Housing Characteristics, Census of Manufactures, Fuels and Electric Energy Consumed, 1958, 1967; U.S. Department of Health, Education and Welfare, New York-New Jersey Air Pollution Abatement Activity, Phase II: Particulate Matter; U.S. Environmental Protection Agency; U.S. Department of the Interior, Bureau of Mines; Connecticut State Department of Environmental Protection; New York City Environmental Protection Administration; American Petroleum Institute; Fuel Merchants Association of New Jersey; Oil Heat Institute of Long Island, Inc.; Paragon Oil Company; Tri-State Regional Planning Commission; Regional Plan Association.

Notes: 1970 estimates of fuel grade and/or customers obtained from county wide area and point source data of the various emission inventories by state submitted to the U.S. Environmental Protection Agency under requirements of the National Ambient Air Quality Standards issued in 1971. 1970 data were disaggregated to full customer and grade-oil detail, and 1960 estimates were derived from change to 1970 end-use consumption on the following basis: Residential fuel oil consumption in New York City was calculated by grade from reported oil heated dwelling units in 1960 and 1970 converted to floorspace by structure type; locally estimated fuel factors from the New York City Environmental Protection Administration (varying from 1.65 to .70 gallons per square foot per year with improvements due to burner efficiencies between 1960 and 1970) were then applied to derive gallonage in grade 2 oils (1 to 4 story buildings), through grade 6 oils (20 and over story buildings) for 1960 and 1970. Outside the City most residential consumption was of distillate oil; locally reported consumption ratios of fuel oil per single family dwelling unit (2000 to 2500 gallons per unit per year in detached structures) were applied to the reported number of oil heated homes estimated to be of this type. Apartment consumption of residual oils was based on locally provided estimates of the number of such units within the total reported oil heated dwellings and consumption ratios of 750 to 1000 gallons per unit per year. Industrial fuel oil consumption was independently estimated from an analysis of detailed (2-digit SIC) manufacturing industry fuel usage per employee, as reported for selected New York, New Jersey and Connecticut Standard Metropolitan Statistical Areas, and imputed to component counties for the period 1958 to 1967. New York City and New Jersey emission inventories provided separate grade oil gallonage, or processing vs. space heating consumption, for industrial customers in 1970; inferences were drawn for the remainder of the Region. The level of change indicated in 1958 to 1967 industrial

Table 13
Residual Fuel Oil Consumption in Uses Other than Electricity Generation and Bunkers, 1960 and 1970

(thousand gallons)

County	1960				1970			
	Residential	Commercial	Industrial	Total	Residential	Commercial	Industrial	Total
Bronx	224,670	141,190	12,300	378,160	206,950	152,100	11,060	370,110
Brooklyn	264,240	314,730	51,210	630,180	233,430	395,560	42,310	671,300
Manhattan	429,670	112,530	37,220	579,420	358,390	116,000	29,430	503,820
Queens	136,120	277,070	37,320	450,510	137,400	320,760	39,990	498,150
Richmond	2,580	20,440	7,190	30,210	5,200	54,220	4,850	64,270
NEW YORK CITY	1,057,280	865,960	145,240	2,068,480	941,370	1,038,640	127,640	2,107,650
Dutchess	6,090	34,420	3,330	43,840	12,180	39,060	6,570	57,810
Nassau	10,370	247,300	11,120	268,790	15,080	281,960	24,520	321,560
Orange	6,090	33,650	3,500	43,140	7,310	33,940	12,250	53,500
Putnam	**	4,000	230	4,230	**	4,900	300	5,200
Rockland	**	22,900	2,570	25,470	**	30,510	4,980	35,490
Suffolk	810	226,450	4,630	231,890	2,000	304,260	11,740	318,000
Sullivan	**	11,760	270	12,030	**	10,320	740	11,060
Ulster	**	19,030	2,380	21,410	4,870	19,880	4,560	29,310
Westchester	30,810	54,020	15,080	99,910	38,620	55,070	24,530	118,220
NY excl. NYC	54,170	653,530	43,110	750,810	80,060	779,900	90,190	950,150
Bergen	7,400	36,400	41,800	85,600	44,380	35,970	42,230	122,580
Essex	76,690	101,200	45,990	223,880	86,190	80,060	38,830	205,080
Hudson	63,140	72,740	40,560	176,440	68,980	72,220	38,800	180,000
Hunterdon	**	1,470	4,490	5,960	**	2,170	3,540	5,710
Mercer	14,560	120	14,910	29,590	18,240	810	15,640	34,690
Middlesex	5,710	120,870	35,280	161,860	17,340	192,500	44,670	254,510
Monmouth	**	320	3,380	3,700	**	1,320	7,040	8,360
Morris	**	9,660	11,300	20,960	**	16,680	12,680	29,360
Ocean	**	530	4,090	4,620	**	1,530	6,460	7,990
Passaic	37,080	3,320	26,280	66,680	49,720	8,000	29,040	86,760
Somerset	**	12,500	4,810	17,310	**	24,130	9,410	33,540
Sussex	**	40	360	400	**	170	620	790
Union	11,520	21,760	65,210	98,490	17,550	18,960	56,800	93,310
Warren	**	**	4,180	4,180	**	140	5,510	5,650
NEW JERSEY	216,100	380,930	302,640	899,670	302,400	454,660	311,270	1,068,330
Fairfield	45,330	34,170	22,680	102,180	63,470	10,070	25,810	99,350
Litchfield	**	5,360	4,530	9,890	6,040	6,010	4,810	16,860
New Haven	44,780	37,560	33,920	116,260	62,690	40,720	30,840	134,250
CONNECTICUT	90,110	77,090	61,130	228,330	132,200	56,800	61,460	250,460
REGION	1,417,660	1,977,510	552,120	3,947,290	1,456,030	2,330,000	590,560	4,376,590

Sources and Notes: See Table 12

Notes from Table 12, continued.
fuel consumption by county was attributed to 1970 data for 1960 estimating purposes. When not separately provided, commercial fuel oil use represented the unaccountable portion of distillate and residual gallonage by county in 1970. Checks were made for reasonableness of data and to establish a time series by applying commercial fuel factors (1 gallon per square foot per year) to the level of oil consumption to determine the volume of oil heated commercial floorspace; this in turn was compared to natural gas sales to commercial establishments by county and the corresponding volume of likely gas heated commercial floorspace; estimates of total commercial floorspace in 1970 and 1960 provided the final controls. Overall, the three state energy balances of the U.S. Bureau of Mines, the Health, Education and Welfare fuel balance for the New York-New Jersey Study Area in 1965 and historical data on deliveries of residual and distillate fuel oils to the states as maintained by the American Petroleum Institute were utilized to assure that change in the level of consumption over the decade corresponded to expectations on statewide or quasi-regional basis.

Table 14
Fuel and Oil Consumption in Transportation, by Type of Vehicle, 1950, 1960 and 1970

I. Highway Fuel

(million gallons)

	1950					1960					1970				
	Passenger cars	Bus	Taxi	Trucks/ Other	Total	Passenger cars	Bus	Taxi	Trucks/ Other	Total	Passenger cars	Bus	Taxi	Trucks/ Other	Total
Bronx	75	7	11	34	127	96	7	11	37	151	133	7	9	40	189
Brooklyn	122	11	17	68	218	155	9	20	84	268	211	11	17	91	330
Manhattan	86	14	29	132	261	104	12	39	125	280	116	13	68	99	296
Queens	228	6	7	73	314	300	5	9	75	389	434	6	9	101	550
Richmond	12	1	1	8	22	25	1	2	12	40	54	2	2	15	73
NEW YORK CITY	523	39	65	315	942	680	34	81	333	1,128	948	39	105	346	1,438
Dutchess	37	**	**	16	53	62	**	**	21	83	101	**	**	26	127
Nassau	134	3	5	50	192	288	2	6	93	389	458	2	6	127	593
Orange	40	**	**	21	61	63	**	**	28	91	100	**	**	33	133
Putnam	9	**	**	3	12	15	**	**	5	20	30	**	**	7	37
Rockland	26	**	**	8	34	49	**	**	13	62	106	**	**	18	124
Suffolk	86	**	2	39	127	120	**	3	79	202	448	**	5	122	575
Sullivan	15	**	**	10	25	17	**	**	12	29	23	**	**	13	36
Ulster	27	**	**	14	41	36	**	**	19	55	60	**	**	23	83
Westchester	116	3	5	41	165	195	2	6	64	267	291	2	5	77	375
NY excl. NYC	490	6	12	202	710	845	4	15	334	1,198	1,617	4	16	446	2,083
Bergen	180	3	**	36	219	310	2	1	44	357	375	1	1	67	444
Essex	136	10	5	68	219	156	6	4	65	231	149	4	3	77	233
Hudson	74	7	2	36	119	84	4	2	33	123	78	3	1	51	133
Hunterdon	15	**	**	7	22	21	**	**	9	30	26	**	**	15	41
Mercer	56	1	**	19	76	81	1	1	21	104	96	1	1	32	130
Middlesex	77	1	**	18	96	171	1	**	30	202	231	1	**	56	288
Monmouth	64	**	**	24	88	104	1	1	28	134	144	**	1	45	190
Morris	56	**	**	12	68	120	**	**	20	140	176	**	1	39	216
Ocean	22	**	**	8	30	46	**	**	12	58	89	**	**	27	116
Passaic	58	2	**	29	89	83	1	**	29	113	101	1	1	43	146
Somerset	45	**	2	8	55	56	**	2	10	68	88	**	3	18	109
Sussex	12	**	**	6	18	19	**	**	8	27	29	**	**	15	44
Union	84	3	2	29	118	128	1	2	31	162	149	1	1	51	202
Warren	20	**	**	7	27	24	**	**	9	33	28	**	**	14	42
NEW JERSEY	899	27	11	307	1,244	1,403	17	13	349	1,782	1,759	12	13	550	2,334
Fairfield	108	1	2	50	161	181	1	2	66	250	309	1	3	74	387
Litchfield	30	**	**	7	37	44	**	**	12	56	70	**	**	24	94
New Haven	136	2	**	30	168	216	1	1	44	262	333	1	1	80	415
CONNECTICUT	274	3	2	87	366	441	2	3	122	568	712	2	4	178	896
REGION	2,186	75	90	911	3,262	3,369	57	112	1,138	4,676	5,036	57	138	1,520	6,751
Including:															
Gasoline					n.d.					4,533					6,369
Diesel Oil					n.d.					143					382
Lubricating Oil					30					44					63
TOTAL HIGHWAY FUEL AND OIL					3,292					4,720					6,814

II. Non-highway Fuel

Jet fuel, 3 PA airports	--	328.0	1,564.5
Gasoline, 3 PA airports	145.9	148.5	1.3
Jet fuel, other airports	--	--	9.4
Gasoline, other airports	5.1	9.1	18.8
Diesel oil, railroads	367.7	260.4	195.4
Gasoline, marine use	n.d.	4.2	50.6
Diesel oil, ferry use	26.3	22.4	10.5
Bunker fuel	n.d.	87.0	83.3
Gasoline, non-transport use	n.d.	76.0	95.0
TOTAL NON-HIGHWAY FUEL	n.d.	935.6	2,028.8

For sources and notes see next page.

Table 15
Utility Steam Sales, 1960 and 1970

(million pounds)

	Manhattan	NEW YORK CITY	REGION
1960			
Residential	4,631.3	4,631.3	4,631.3
Commercial and Public facilities	14,849.6	14,849.6	14,849.6
Total	19,480.9	19,480.9	19,480.9
1970			
Residential	6,106.1	6,106.1	6,106.1
Commercial and Public facilities	30,559.7	30,559.7	30,559.7
Total	36,665.8	36,665.8	36,665.8

Source: Consolidated Edison Company of New York, Inc.

Notes: As reported by the utility for annual Con Edison system steam sales to apartment houses (residential), general, government, and annual power customers (commercial, industrial, and public facilities). The steam service area is entirely within Manhattan south of 96th Street. Non-residential sales are confined mainly to commercial and public facilities, with industrial sales to apparel manufactures accounting for an insignificant portion of total. A small amount of steam sold by Public Service Electric and Gas within Newark was not accountable.

Fuels used in the generation of steam in 1970 were as follows:

Coal	1,681 tons	or	0.042 trillion Btu
Oil	356,555 thousand gals	or	53.373 trillion Btu
Gas	4,664 million cu. ft.	or	4.804 trillion Btu
			58.219 trillion Btu

These were burned partly in steam-only, partly in combined steam-and-electric generating plants, the latter contributing to greater efficiency of fuel utilization. The difference between the heat value of steam sold to customers - 40.08 trillion Btu and the heat value of fuels used, above, is 18.14 trillion Btu, which appears in Table 17 as "Fuel loss from steam generation". 1960 loss assumed proportional to 1960 sales.

Sources and Notes for Table 14.

Sources: U.S. Department of Transportation, Bureau of Public Roads: Highway Statistics (annual); Tri-State Regional Planning Commission: Streets and Highways, a Regional Report (1968); Vehicle Miles of Travel...1970-ITR 4407-1205 (1973); Tri-State Regional Statistics.. - Analysis Notes (1968); Truck Transportation - Regional Profile (1968); Who Rides Taxis - Regional Profile (1969); New York City Transit Authority: Transit Record (monthly); Port Authority of New York and New Jersey; New York City Environmental Protection Administration; New York City Department of Marine and Aviation; U.S. Department of Commerce, Bureau of the Census: Statistical Abstract of the United States (annual).

Notes: Highway fuel: Vehicle-miles of travel in the TSRPC Region for 1963 and 1970(calculated by TSRPC from a sample of traffic counts) used as a basic control, expanded to RPA boundaries in relation to vehicle registrations with adjustments for miles-per-vehicle. Bus and taxi VMT (calculated as in footnote to Table F), and truck VMT (derived from 1963 TSRPC data and distributed in relation to non-auto registrations by county) subtracted from total. Remainder assigned to auto and adjusted for consistency of VMT/auto trends over time and ratios by county, specifically one-third lower VMT/auto in New York City. Fuel assigned to auto VMT by varying statewide averages from BPR in relaton to prevailing speeds by county from TSRPC; similarly to taxi VMT; fuel for buses within the TA service area (which in 1970 accounted for 17.36 million gallons of diesel oil) from TA, outside based on estimated miles per gallon; fuel assigned to trucks on the basis of BPR nationwide average, on the assumption that smaller share of large trucks in the Region balances greater consumption due to urban driving conditions. Resulting total highway fuel use in Region represents 69 percent of three-state highway fuel use as shown in BPR Table MF-21, compared to 67 percent of all motor vehicle registrations, for both 1960 and 1970. Diesel fuel apportioned in relation to three-state usage from BPR Table MF-25.

Non-highway fuel: Three major airports from PA data; other airports - national data allocated by based aircraft; rail fuel based on national data allocated approximately on the basis of TSRPC figures on rail ton-miles generated by the Region as in Table F; gasoline for marine and non-transport use - BPR Table MF-24 for the three states, with two-thirds allocated to the Region in the case of marine fuel, and varying shares in the case of the different components of non-transport use. Bunker fuel for ships - NYC Environmental Protection Administration (data are for New York Harbor and do not cover entire Region). Ferry fuel - NYC Department of Marine and Aviation.

Sources and Notes for Table 16.

Sources: Federal Power Commission, Statistics of Privately Owned Electric Utilities in the United States,1960, 1970; Steam Electric Plant Construction Cost and Annual Production Expenses, 1960, 1970; New York State Department of Public Service, Electric Statistics Handbook 1965-1971; Annual reports and unpublished reports from the electric utilities on page 4.

Notes: The Btu content of the different fuels used in electricity generation is given for 1960 and 1970 for all privately owned electric utilities serving the Region. System-wide figures are followed by major power plants, which are separately identified. Those marked * are located in portions of utility service areas lying outside the Region; generating facilities of New York State Electric and Gas Corp. and Atlantic City Electric Co. are wholly outside the Region. Heat rate denotes the number of Btu's consumed to generate one kWh of electricity. Figures in parentheses are estimates. Totals for the utilities covered are shown on p. 13 in Table E.

Table 16
Fuels Used in Electricity Generation, 1960 and 1970

(trillion Btu's)

	1960							1970						
	COAL	GAS	OIL	NUC-LEAR	HYDRO	TOTAL FUELS	HEAT RATE	COAL	GAS	OIL	NUC-LEAR	HYDRO	TOTAL FUELS	HEAT RATE
CONSOLIDATED EDISON CO. OF N.Y., INC.	135.20	37.96	70.18	--	--	243.34	12,461	66.74	81.27	234.09	2.71	--	384.81	12,402
Steam	135.20	37.96	70.18	--	--	243.34	12,461	66.74	75.19	218.38	--	--	360.31	12,167
Arthur Kill	17.60	--	.85	--	--	18.45		26.37	--	18.74	--	--	45.11	
Astoria	34.15	4.93	--	--	--	39.08		30.73	23.43	20.38	--	--	74.54	
East River	37.07	.21	--	--	--	37.28		--	24.17	14.97	--	--	39.14	
Hell Gate	5.19	13.05	12.84	--	--	31.08		--	4.80	27.15	--	--	31.95	
Hudson	11.67	--	30.67	--	--	42.34		--	.02	37.88	--	--	37.90	
Ravenswood	--	--	--	--	--	--		9.63	8.50	51.52	--	--	69.65	
Sherman Creek	13.16	.38	1.11	--	--	14.65		--	.16	8.89	--	--	9.05	
Waterside	16.36	19.39	2.30	--	--	38.05		--	14.11	22.81	--	--	36.92	
Other	--	--	(22.41)	--	--	22.41		--	--	(16.04)	--	--	16.04	
Nuclear	--	--	--	--	--	--		--	--	1.20	2.71	--	3.91	11,928
Indian Point	--	--	--	--	--	--		--	--	1.20	2.71	--	3.91	
Hydro	--	--	--	--	--	--		--	--	--	--	--	--	
Other	--	--	--	--	--	--		--	6.08	14.51	--	--	20.59	18,953
Gas Turbines	--	--	--	--	--	--		--	6.08	14.51	--	--	20.59	
LONG ISLAND LIGHTING CO.	21.70	16.37	12.54	--	--	50.61	10,427	--	10.22	105.16	--	--	115.38	10,427
Steam	21.70	16.37	12.54	--	--	50.61	10,427	--	8.95	102.91	--	--	111.86	10,305
Barrett	8.71	.41	--	--	--	9.12		--	4.71	14.25	--	--	18.96	
Far Rockaway	.91	3.65	2.59	--	--	7.15		--	.75	4.38	--	--	5.13	
Glenwood	1.82	12.31	4.91	--	--	19.04		--	3.49	11.14	--	--	14.63	
Northport	--	--	--	--	--	--		--	--	47.98	--	--	47.98	
Port Jefferson	10.26	--	5.04	--	--	15.30		--	--	25.16	--	--	25.16	
Nuclear	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hydro	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other	--	--	--	--	--	--	--	--	1.27	2.25	--	--	3.52	16,730
Gas Turbines, Internal Combustion	--	--	--	--	--	--	--	--	1.27	2.25	--	--	3.52	
NEW YORK STATE ELECTRIC AND GAS CORP.*	36.01	--	--	--	2.38	38.39	10,324	73.80	--	--	--	2.13	75.93	10,709
Steam	36.01	--	--	--	--	36.01	10,324	73.80	--	--	--	--	73.80	10,709
Nuclear	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hydro	--	--	--	--	2.38	2.38	10,324	--	--	--	--	2.13	2.13	10,709
Other	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CENTRAL HUDSON GAS AND ELECTRIC CORP.	13.05	.73	--	--	1.54	15.32	9,688	16.86	4.04	6.99	--	1.31	29.20	10,217
Steam	13.05	.73	--	--	--	13.78	9,688	16.86	3.48	6.64	--	--	26.98	10,075
Danskammer	13.05	.73	--	--	--	13.78		16.86	3.48	6.64	--	--	26.98	
Nuclear	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hydro	--	--	--	--	1.54	1.54	9,688	--	--	--	--	1.31	1.31	10,217
Other	--	--	--	--	--	--	--	--	.56	.35	--	--	.91	17,602
Gas Turbines*	--	--	--	--	--	--		--	.56	.35	--	--	.91	
ORANGE AND ROCKLAND UTILITIES, INC.	2.25	4.60	--	--	2.08	8.93	10,909	3.23	12.51	13.81	--	1.84	31.39	10,696
Steam	2.25	4.60	--	--	--	6.85	10,909	3.23	12.51	13.81	--	--	29.55	10,696
Lovett	2.25	4.60	--	--	--	6.85		3.23	12.51	13.81	--	--	29.55	
Nuclear	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hydro	--	--	--	--	2.08	2.08	10,909	--	--	--	--	1.84	1.84	10,696
Other	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PUBLIC SERVICE ELECTRIC AND GAS CO.	54.19	22.50	57.79	--	--	134.48	10,512	67.67	35.65	200.80	--	--	304.12	10,928
Steam	54.19	22.50	57.79	--	--	134.48	10,512	67.67	26.11	195.35	--	--	289.13	10,743
Bergen	12.20	11.18	--	--	--	23.38		22.44	7.44	--	--	--	29.88	
Burlington*	13.32	--	13.32	--	--	26.64		--	--	30.85	--	--	30.85	
Essex	--	2.26	8.48	--	--	10.74		.34	.29	18.95	--	--	19.58	
Hudson	--	--	--	--	--	--		17.09	9.81	17.22	--	--	44.12	
Kearney A	--	--	4.44	--	--	4.44		--	--	--	--	--	--	
Kearney B	16.25	--	.54	--	--	16.79		.35	--	14.37	--	--	14.72	
Marion	--	--	5.90	--	--	5.90		--	--	7.94	--	--	7.94	
Mercer	--	--	--	--	--	--		27.43	7.73	--	--	--	35.16	
Sewaren	12.27	8.82	3.81	--	--	24.90		--	.84	42.21	--	--	43.05	
Other	.15	.24	21.30	--	--	21.69		.02	--	63.81	--	--	63.83	
Nuclear	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hydro	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other	--	--	--	--	--	--	--	--	9.54	5.45	--	--	14.99	16,352
Gas Turbines	--	--	--	--	--	--	--	--	9.54	5.45	--	--	14.99	--
JERSEY CENTRAL POWER AND LIGHT CO.	17.05	4.44	2.30	--	--	23.79	10,342	10.01	5.25	28.60	36.18	--	80.04	11,242
Steam	17.05	4.44	2.30	--	--	23.79	10,342	10.01	4.33	28.17	--	--	42.51	11,861
Sayreville	14.21	4.44	--	--	--	18.65		.27	4.33	20.41	--	--	25.01	
Werner	2.84	--	2.30	--	--	5.14		--	--	7.76	--	--	7.76	
Other	--	--	--	--	--	--		9.74	--	--	--	--	9.74	
Nuclear	--	--	--	--	--	--	--	--	--	--	36.18	--	36.18	10,475
Oyster Creek	--	--	--	--	--	--		--	--	--	36.18	--	36.18	
Hydro	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other	--	--	--	--	--	--	--	--	.92	.43	--	--	1.35	16,524
Gas Turbines	--	--	--	--	--	--		--	.92	.43	--	--	1.35	
ATLANTIC CITY ELECTRIC CO.*	(17.00)	--	--	--	--	(17.00)	(10,500)	(42.70)	(1.40)	(.40)	--	--	(44.50)	(10,400)
Steam	(17.00)	--	--	--	--	(17.00)	(10,500)	(42.70)	--	--	--	--	(42.70)	(10,200)
Nuclear	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hydro	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other	--	--	--	--	--	--	--	--	(1.40)	(.40)	--	--	(1.80)	(16,500)
NEW JERSEY POWER & LIGHT CO.	5.58	--	.04	--	--	5.62	11,598	6.52	3.18	.08	--	--	9.78	12,693
Steam	5.58	--	.04	--	--	5.62	11,598	6.52	2.45	.04	--	--	9.01	12,454
Gilbert	5.58	--	.04	--	--	5.62		6.52	2.45	.04	--	--	9.01	
Nuclear	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hydro	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other	--	--	--	--	--	--	--	--	.73	.04	--	--	.77	16,348
Gas Turbines	--	--	--	--	--	--		--	.73	.04	--	--	.77	
CONNECTICUT LIGHT AND POWER CO.	37.03	.20	.55	--	3.18	40.96	10,499	41.00	2.85	18.88	.38	2.77	65.88	11,345
Steam	37.03	--	.48	--	--	37.51	10,468	41.00	--	17.93	--	--	58.93	11,089
Devon	22.34	--	.48	--	--	22.82		13.79	--	14.48	--	--	28.27	
Montville*	8.40	--	--	--	--	8.40		8.71	--	3.07	--	--	11.78	
Norwalk Harbor	6.29	--	--	--	--	6.29		18.50	--	.38	--	--	18.88	
Nuclear	--	--	--	--	--	--	--	--	--	--	.38	--	.38	10,660
Millstone 1*	--	--	--	--	--	--		--	--	--	.38	--	.38	
Hydro*	--	--	--	--	3.18	3.18	10,499	--	--	--	--	2.77	2.77	11,345
Other	--	.20	.07	--	--	.27	17,880	--	(2.85)	(.95)	--	--	(3.80)	(17,880)
Gas Turbines, Internal Combustion*	--	.20	.07	--	--	.27		--	(2.85)	(.95)	--	--	(3.80)	
HARTFORD ELECTRIC LIGHT CO.	18.37	.91	2.85	--	.49	22.62	10,966	2.48	2.34	43.76	.20	.38	49.16	11,155
Steam	18.37	.91	2.85	--	--	22.13	10,966	2.48	.09	43.01	--	--	45.58	10,889
Middletown*	12.28	--	.09	--	--	12.37		2.48	--	26.75	--	--	29.23	
South Meadow*	4.15	.80	2.76	--	--	7.71		--	--	14.26	--	--	14.26	
Other	1.94	.11	--	--	--	2.05		--	.09	2.00	--	--	2.09	
Nuclear	--	--	--	--	--	--		--	--	--	.20	--	.20	10,660
Millstone 1*	--	--	--	--	--	--	--	--	--	--	.20	--	.20	
Hydro*	--	--	--	--	.49	.49	10,966	--	--	--	--	.38	.38	11,115
Other	--	--	--	--	--	--	--	--	(2.25)	(.75)	--	--	(3.00)	(17,880)
Gas Turbines*	--	--	--	--	--			--	(2.25)	(.75)	--	--	(3.00)	
UNITED ILLUMINATING CO.	17.05	--	4.14	--	--	21.19	13,367	--	--	66.08	--	.001	66.08	11,678
Steam	17.05	--	4.14	--	--	21.19	13,367	--	--	65.84	--	--	65.84	11,666
Bridgeport Harbor	5.79	--	--	--	--	5.79		--	--	43.13	--	--	43.13	
English	5.63	--	2.31	--	--	7.94		--	--	10.17	--	--	10.17	
Steel Paint	5.63	--	1.83	--	--	7.46		--	--	12.09	--	--	12.09	
Other	--	--	--	--	--	--		--	--	.45	--	--	.45	
Nuclear	--	--	--	--	--	--		--	--	--	--	--	--	--
Hydro	--	--	--	--	--	--		--	--	--	--	.001	.001	11,678
Other	--	--	--	--	--	--		--	--	.24	--	--	.24	18,000
Gas Turbines	--	--	--	--	--	--		--	--	.24	--	--	.24	

For Sources and Notes see opposite page.

Table 17
Total Consumption of Energy, including Fuels Used in Electricity Generation, 1960 and 1970

	Bronx	Brooklyn	Manhattan	Queens	Richmond	NEW YORK CITY	Dutchess	Nassau	Orange	Putnam	Rockland	Sullivan	Suffolk	Ulster	Westchester	NY excl. NYC
1960																
Part I. In units indicated																
Residential:																
Electricity (thous. megawatt hours)	693.8	1,367.7	898.3	1,110.0	141.1	4,210.9	175.5	1,168.7	159.1	37.5	92.7	627.4	79.8	107.2	652.3	3,100.2
Gas (million cu. ft.)	5,275	20,749	5,119	18,399	2,786	52,328	909	6,831	2,696	--	4,893	4,901	--	571	10,385	31,186
Other (trillion Btu)	63.13	116.94	90.37	86.56	8.85	365.85	6.57	74.81	6.05	1.43	1.24	36.69	2.11	4.93	41.02	174.85
Commercial and public facilities:																
Electricity (thous. megawatt hours)	632.5	1,026.7	4,208.3	1,066.4	156.2	7,090.1	146.7	1,025.9	157.2	23.5	148.1	513.6	59.1	122.1	675.0	2,871.2
Gas (million cu. ft.)	1,702	12,740	5,549	5,109	1,920	27,020	159	2,404	627	--	886	714	--	104	962	5,856
Other (trillion Btu)	27.28	50.23	63.65	42.34	4.58	188.08	10.28	43.73	9.05	1.02	6.02	44.53	3.20	5.22	36.40	159.45
Industrial:																
Electricity (thous. megawatt hours)	278.0	1,056.2	1,380.4	751.0	50.1	3,515.7	121.9	411.4	100.4	4.5	67.0	191.0	3.4	76.2	279.5	1,255.3
Gas (million cu. ft.)	1,498	5,797	3,656	4,051	335	15,337	119	1,400	652	--	360	557	--	38	1,445	4,571
Other (trillion Btu)	3.13	11.32	7.78	8.77	1.55	32.55	2.18	2.65	2.47	.06	.68	7.14	.13	1.95	3.90	21.16
Transportation:																
Electricity (thous. megawatt hours)	300.6	637.4	827.4	751.7	12.4	2,529.5	--	36.4	--	--	--	4.1	--	--	116.0	156.5
Other (trillion Btu)	19.16	34.00	35.58	49.24	5.19	143.17	10.63	49.22	11.51	2.53	7.84	25.57	3.68	6.96	33.80	151.74
Total:																
Electricity (thous. megawatt hours)	1,904.9	4,088.0	7,314.4	3,679.1	359.8	17,346.2	444.1	2,642.4	416.7	65.5	307.8	1,336.1	142.3	305.5	1,722.8	7,383.2
Gas (million cu. ft.)	8,475	39,286	14,324	27,559	5,041	94,685	1,187	10,635	3,975	--	6,139	6,172	--	713	12,792	41,613
Other (trillion Btu)	112.70	212.49	197.38	186.91	20.17	729.65	29.66	170.41	29.08	5.04	15.78	113.93	9.12	19.06	115.12	507.20
Part II. In Btu's (trillion)																
Residential:																
Electricity	2.37	4.67	3.07	3.79	.48	14.38	.60	3.99	.54	.13	.32	2.14	.27	.37	2.22	10.58
Gas	5.44	21.37	5.27	18.95	2.87	53.90	.93	7.03	2.78	--	5.04	5.05	--	.59	10.70	32.12
Other	63.13	116.94	90.37	86.56	8.85	365.85	6.57	74.81	6.05	1.43	1.24	36.69	2.11	4.93	41.02	174.85
Total	70.94	142.98	98.71	109.30	12.20	434.13	8.10	85.83	9.37	1.56	6.60	43.88	2.38	5.89	53.94	217.55
Commercial and public facilities:																
Electricity	2.16	3.50	14.36	3.64	.53	24.19	.50	3.50	.54	.08	.51	1.75	.20	.42	2.30	9.80
Gas	1.75	13.12	5.72	5.26	1.98	27.83	.16	2.48	.65	--	.91	.73	--	.11	.99	6.03
Other	27.28	50.23	63.65	42.34	4.58	188.08	10.28	43.73	9.05	1.02	6.02	44.53	3.20	5.22	36.40	159.45
Total	31.19	66.85	83.73	51.24	7.09	240.10	10.94	49.71	10.24	1.10	7.44	47.01	3.40	5.75	39.69	175.28
Industrial:																
Electricity	.95	3.60	4.71	2.56	.17	11.99	.42	1.40	.34	.02	.23	.65	.01	.26	.95	4.28
Gas	1.54	5.97	3.77	4.17	.35	15.80	.13	1.44	.67	--	.37	.57	--	.04	1.49	4.71
Other	3.13	11.32	7.78	8.77	1.55	32.55	2.18	2.65	2.47	.06	.68	7.14	.13	1.95	3.90	21.16
Total	5.62	20.89	16.26	15.50	2.07	60.34	2.73	5.49	3.48	.08	1.28	8.36	.14	2.25	6.34	30.15
Transportation:																
Electricity	1.02	2.18	2.82	2.57	.04	8.63	--	.12	--	--	--	.01	--	--	.40	.53
Other	19.16	34.00	35.58	49.24	5.19	143.17	10.63	49.22	11.51	2.53	7.84	25.59	3.68	6.96	33.80	151.74
Total	20.18	36.18	38.40	51.81	5.23	151.80	10.63	49.34	11.51	2.53	7.84	25.58	3.68	6.96	34.20	152.27
Total:																
Electricity	6.50	13.95	24.96	12.56	1.22	59.19	1.52	9.01	1.42	.23	1.06	4.55	.48	1.05	5.87	25.19
Gas	8.73	40.46	14.76	28.38	5.20	97.53	1.22	10.95	4.10	--	6.32	6.35	--	.74	13.18	42.86
Other	112.70	212.49	197.38	186.91	20.17	729.65	29.66	170.41	29.08	5.04	15.78	113.93	9.12	19.06	115.12	507.20
Net Total	127.93	266.90	237.10	227.85	26.59	886.37	32.40	190.37	34.60	5.27	23.16	124.83	9.60	20.85	134.17	575.25
Net Total without Electricity						827.18										550.06
Electric Utility Fuels: Region						250.49										67.71
Import						-13.28										16.54
Fuel loss from steam generation						9.64										--
Gross Total:						1,074.03										634.31
1970																
Part I: In units indicated																
Residential:																
Electricity (thous. megawatt hours)	1,339.1	2,509.7	1,722.0	2,387.8	419.7	8,378.3	424.1	2,448.9	415.7	124.9	365.5	1,948.9	141.3	294.9	1,423.2	7,587.4
Gas (million cu. ft.)	9,634	37,563	7,512	31,801	6,828	93,338	1,382	13,177	4,524	--	10,586	11,472	--	769	15,724	57,634
Other (trillion Btu)	49.27	90.49	67.95	77.78	9.34	294.83	8.11	76.63	6.19	2.28	.86	54.25	2.52	5.71	40.69	197.24
Commercial and public facilities:																
Electricity (thous. megawatt hours)	1,115.5	1,572.5	7,643.6	2,096.4	310.3	12,738.3	393.3	2,187.1	332.7	51.2	367.4	1,749.8	91.8	348.8	1,495.5	7,017.6
Gas (million cu. ft.)	2,912	15,506	5,893	7,293	2,504	34,108	900	9,192	2,792	--	4,053	5,480	--	307	6,048	28,772
Other (trillion Btu)	28.48	62.00	79.45	49.69	10.89	230.51	10.76	49.81	8.89	1.24	7.98	51.91	2.73	5.26	36.11	174.69
Industrial:																
Electricity (thous. megawatt hours)	405.2	1,487.7	1,967.6	1,045.2	66.4	4,972.1	400.2	939.5	185.5	15.5	214.5	452.8	9.2	183.5	518.6	2,919.3
Gas (million cu. ft.)	1,669	7,184	4,720	5,005	321	18,899	517	2,628	1,289	--	1,852	1,528	--	1,011	2,167	10,992
Other (trillion Btu)	2.73	8.98	5.97	8.26	1.05	26.99	2.19	4.96	4.22	.10	1.04	5.58	.23	1.69	6.77	26.78
Transportation:																
Electricity (thous. megawatt hours)	308.7	681.4	909.6	835.8	12.4	2,747.9	--	71.1	--	--	--	12.7	--	--	87.6	171.4
Other (trillion Btu)	24.03	41.99	37.73	69.74	9.28	182.77	16.10	75.19	16.87	4.69	15.70	72.88	4.58	10.54	47.55	264.10
Total:																
Electricity (thous. megawatt hours)	3,168.5	6,251.3	12,242.8	6,365.2	808.8	28,836.6	1,217.6	5,646.6	933.9	191.6	947.4	4,164.2	242.3	827.2	3,524.9	17,695.7
Gas (million cu. ft.)	14,215	60,253	18,125	44,099	9,653	146,345	2,799	24,997	8,605	--	16,491	18,480	--	2,087	23,939	97,398
Other (trillion Btu)	104.51	203.46	191.10	205.47	30.56	735.10	37.16	206.59	36.17	8.31	25.58	184.62	10.06	23.20	131.12	662.81
Part II. In Btu's (trillion)																
Residential:																
Electricity	4.57	8.56	5.88	8.15	1.43	28.59	1.45	8.35	1.42	.43	1.25	6.65	.48	1.01	4.85	25.89
Gas	9.92	38.69	7.74	32.76	7.03	96.14	1.42	13.57	4.66	--	10.91	11.82	--	.79	16.20	59.37
Other	49.27	90.49	67.95	77.78	9.34	294.83	8.11	76.63	6.19	2.28	.86	54.25	2.52	5.71	40.69	197.24
Total	63.76	137.74	81.57	118.69	17.80	419.56	10.98	98.55	12.27	2.71	13.02	72.72	3.00	7.51	61.74	282.50
Commercial and public facilities:																
Electricity	3.81	5.36	26.08	7.15	1.06	43.46	1.34	7.46	1.14	.18	1.25	5.97	.31	1.19	5.11	23.95
Gas	3.00	15.97	6.07	7.51	2.58	35.13	.93	9.47	2.87	--	4.17	5.64	--	.32	6.23	29.63
Other	28.48	62.00	79.45	49.69	10.89	230.51	10.76	49.81	8.89	1.24	7.98	51.91	2.73	5.26	36.11	174.69
Total	35.29	83.33	111.60	64.35	14.53	309.10	13.03	66.74	12.90	1.42	13.40	63.52	3.04	6.77	47.45	228.27
Industrial:																
Electricity	1.38	5.08	6.71	3.57	.23	16.97	1.36	3.21	.63	.05	.73	1.55	.03	.63	1.77	9.96
Gas	1.72	7.40	4.86	5.16	.33	19.47	.53	2.71	1.33	--	1.91	1.57	--	1.04	2.23	11.32
Other	2.73	8.98	5.97	8.26	1.05	26.99	2.19	4.96	4.22	.10	1.04	5.58	.23	1.69	6.77	26.78
Total	5.83	21.46	17.54	16.99	1.61	63.43	4.08	10.88	6.18	.15	3.68	8.70	.26	3.36	10.77	48.06
Transportation:																
Electricity	1.05	2.33	3.10	2.85	.04	9.37	--	.24	--	--	--	.04	--	--	.30	.58
Other	24.03	41.99	37.73	69.74	9.28	182.72	16.10	75.19	16.87	4.69	15.70	72.88	4.58	10.54	47.55	264.10
Total	25.08	44.32	40.83	72.59	9.32	192.14	16.10	75.43	16.87	4.69	15.70	72.92	4.58	10.54	47.85	264.68
Total:																
Electricity	10.81	21.33	41.77	21.72	2.76	98.39	4.15	19.26	3.19	.66	3.23	14.21	.82	2.83	12.03	60.38
Gas	14.64	62.06	18.67	45.43	9.94	150.74	2.88	25.75	8.86	--	16.99	19.03	--	2.15	24.66	100.32
Other	104.51	203.46	191.10	205.47	30.56	735.10	37.16	206.59	36.17	8.31	25.58	184.62	10.06	23.20	131.12	662.81
Net Total	129.96	286.85	251.54	272.62	43.26	984.23	44.19	251.60	48.22	8.97	45.80	217.86	10.88	28.18	167.81	823.51
Net Total without Electricity						885.84										763.13
Electric Utility Fuels: Region						383.46										176.41
Import						3.63										27.32
Fuel loss from steam generation						18.14										--
Gross Total:						1,291.07										966.86

Bergen	Essex	Hudson	Hunterdon	Mercer	Middlesex	Monmouth	Morris	Ocean	Passaic	Somerset	Sussex	Union	Warren	NEW JERSEY	Fairfield	Litchfield	New Haven	CONNECTICUT	Unallocated	REGION
629.9	585.3	303.5	71.2	204.1	355.2	336.0	290.5	125.8	282.0	136.8	56.5	404.5	83.5	3,864.8	689.4	131.5	601.1	1,422.0	--	12,597.9
13,702	10,500	5,560	77	3,154	6,480	4,430	3,164	1,330	6,011	1,948	42	5,771	186	62,355	6,215	610	3,900	10,725	--	156,594
20.96	29.62	19.95	1.79	7.91	11.18	9.27	7.69	2.17	12.74	3.36	1.37	14.62	1.89	144.52	24.92	4.74	25.20	54.86	--	740.08
597.8	698.3	324.8	88.8	387.5	429.7	353.6	213.2	137.8	194.5	195.0	42.3	738.8	75.0	4,477.1	260.5	25.3	508.1	793.9	--	15,232.3
2,580	3,102	2,671	63	756	1,226	4,622	518	1,626	864	254	59	1,554	56	19,951	1,559	53	1,409	3,021	--	55,848
27.85	47.27	28.14	.41	2.70	19.50	2.39	4.08	3.74	6.83	4.66	.28	8.68	.24	156.77	22.74	.85	24.18	47.77	.36	552.43
547.2	978.9	833.2	44.4	281.7	765.5	110.9	251.1	21.7	450.2	148.8	19.5	1,090.0	79.7	5,622.8	768.2	120.0	712.6	1,600.8	--	11,994.6
1,517	2,442	1,294	92	1,074	1,243	584	520	73	1,398	354	80	1,699	77	12,447	2,260	312	2,004	4,576	--	36,931
12.64	11.41	11.54	.91	4.54	17.47	.76	10.87	.87	8.45	2.64	.09	13.65	.98	96.82	5.28	1.07	10.91	17.26	7.22	175.01
--	23.3	82.0	--	9.2	26.9	--	7.5	--	--	9.4	--	6.6	--	164.9	38.2	--	9.5	47.7	--	2,898.6
45.14	29.29	15.46	3.67	13.17	25.55	16.96	17.83	7.47	14.30	8.60	3.43	20.50	4.18	225.68	31.39	6.96	33.13	71.48	124.97	717.04
1,774.9	2,285.8	1,543.5	204.4	882.5	1,577.3	800.5	762.3	285.3	926.7	490.0	118.3	2,239.9	238.2	14,129.6	1,756.3	276.8	1,831.3	3,864.4	--	42,723.4
17,799	16,044	9,525	232	984	8,949	9,636	4,202	3,029	8,273	2,556	181	9,024	319	94,753	10,034	975	7,313	18,322	--	249,373
106.59	117.59	75.09	6.91	28.32	73.70	29.38	40.47	14.25	42.32	19.26	5.17	57.45	7.29	623.79	84.33	13.62	93.42	191.37	132.55	2,184.56
2.15	2.00	1.03	.24	.70	1.21	1.15	.99	.43	.96	.47	.19	1.38	.28	13.18	2.35	.45	2.05	4.85	--	42.99
14.11	10.82	5.73	.08	3.25	6.67	4.56	3.26	1.37	6.19	2.01	.04	5.94	.19	64.22	6.40	.63	4.02	11.05	--	161.29
20.96	29.62	19.95	1.79	7.91	11.18	9.27	7.69	2.17	12.74	3.36	1.37	14.62	1.89	144.52	24.92	4.74	25.20	54.86	--	740.08
37.22	42.44	26.71	2.11	11.86	19.06	14.98	11.94	3.97	19.89	5.84	1.60	21.94	2.36	221.92	33.67	5.82	31.27	70.76	--	944.36
2.04	2.38	1.11	.30	1.32	1.47	1.21	.73	.47	.66	.66	.14	2.52	.26	15.27	.89	.09	1.73	2.71	--	51.97
2.66	3.20	2.75	.06	.78	1.26	4.76	.53	1.68	.89	.26	.06	1.60	.06	20.55	1.61	.05	1.45	3.11	--	57.52
27.85	47.27	28.14	.41	2.70	19.50	2.39	4.08	3.74	6.83	4.66	.28	8.68	.24	156.77	22.74	.85	24.18	47.77	.36	552.43
32.55	52.85	32.00	.77	4.80	22.23	8.36	5.34	5.89	8.38	5.58	.48	12.80	.56	192.59	25.24	.99	27.36	53.59	.36	661.92
1.87	3.34	2.84	.15	.96	2.61	.38	.86	.07	1.54	.51	.07	3.72	.27	19.19	2.62	.41	2.43	5.46	--	40.92
1.56	2.51	1.33	.10	1.11	1.28	.60	.54	.07	1.44	.37	.08	1.75	.08	12.82	2.33	.32	2.06	4.71	--	38.04
12.64	11.41	11.54	.91	4.54	17.47	.76	10.87	.87	8.45	2.64	.09	13.65	.98	96.82	5.28	1.07	10.91	17.26	7.22	175.01
16.07	17.26	15.71	1.16	6.61	21.36	1.74	12.27	1.01	11.43	3.52	.24	19.12	1.33	128.83	10.23	1.80	15.40	27.43	7.22	253.97
--	.08	.29	--	.03	.09	--	.03	--	--	.03	--	.02	--	.57	.13	--	.03	.16	--	9.89
45.14	29.29	15.46	3.80	13.17	25.55	16.96	17.83	7.47	14.30	8.60	3.43	20.50	4.18	225.68	31.39	6.96	33.13	71.48	124.97	717.04
45.14	29.37	15.75	3.80	13.20	25.64	16.96	17.86	7.47	14.30	8.63	3.43	20.52	4.18	226.25	31.52	6.96	33.16	71.64	124.97	726.93
6.06	7.80	5.27	.69	3.01	5.38	2.74	2.61	.97	3.16	1.67	.40	7.64	.81	48.21	5.99	.95	6.24	13.18	--	145.77
18.33	16.53	9.81	.24	5.14	9.21	9.92	4.33	3.12	8.52	2.64	.18	9.29	.33	97.59	10.34	1.00	7.53	18.87	--	256.85
106.54	117.59	75.09	6.91	28.32	73.70	29.38	40.47	14.25	42.32	19.26	5.17	57.45	7.29	623.79	84.33	13.62	93.42	191.37	132.55	2,184.56
130.98	141.92	90.17	7.84	36.47	88.29	42.04	47.41	18.34	54.00	23.57	5.75	74.38	8.43	769.59	100.66	15.57	107.19	223.42	132.55	2,587.18
														721.38				210.24	132.55	2,441.41
														137.25				54.71		510.16
														24.05				- 7.76	6.83	26.38
														--				--	--	9.64
														882.68				257.19	139.38	2,987.59
1,491.0	1,167.9	600.9	162.5	461.4	1,010.0	840.6	781.6	450.6	694.7	364.4	149.9	878.0	172.9	9,226.4	1,693.6	367.4	1,512.8	3,573.8	--	28,765.9
22,171	16,189	7,080	201	5,404	12,633	11,851	7,670	6,188	10,932	4,363	127	11,242	544	116,595	10,045	903	7,753	18,701	--	286,268
18.91	22.71	16.43	1.85	6.74	11.10	8.18	8.85	2.21	10.54	3.01	1.71	12.37	1.65	126.26	28.07	5.59	26.32	59.98	--	678.31
1,488.9	1,359.7	678.6	197.5	858.8	1,205.2	809.6	602.9	473.7	566.0	508.7	124.1	1,565.8	158.8	10,598.3	1,072.3	115.7	1,498.6	2,686.6	--	33,040.8
10,806	9,054	6,802	390	2,639	5,790	4,560	2,058	2,998	2,521	1,150	393	6,797	370	56,328	3,192	242	2,954	6,388	--	125,596
26.46	33.14	26.15	1.44	5.94	39.38	9.42	9.49	7.25	12.66	7.03	1.23	5.13	1.04	185.76	15.46	1.25	19.71	36.42	.77	628.15
1,021.0	1,610.4	1,190.5	85.0	414.1	1,660.7	238.0	689.8	71.5	837.1	341.1	52.9	2,021.7	138.8	10,372.6	1,356.1	263.8	1,107.0	2,726.9	--	20,990.9
7,549	7,710	5,243	444	2,942	6,264	3,304	2,071	584	4,576	1,493	413	7,131	394	50,118	4,125	396	4,331	8,852	--	88,861
10.22	8.41	8.80	.71	3.90	13.93	1.45	4.94	1.33	7.10	2.58	.13	11.56	1.22	76.28	5.65	1.05	8.18	14.88	7.80	152.73
--	22.6	79.5	--	8.9	26.1	--	7.3	--	--	9.1	--	6.4	--	159.9	29.5	--	7.4	36.9	--	3,116.1
56.23	29.62	16.94	5.21	16.49	36.51	24.10	27.36	14.71	18.54	13.81	5.59	25.63	5.34	296.08	49.01	11.93	52.60	113.54	273.45	1,129.94
4,000.9	4,160.6	2,549.5	445.0	1,743.2	3,902.0	1,888.2	2,081.6	995.8	2,097.8	1,223.3	326.9	4,471.9	470.5	30,357.2	4,151.5	746.9	4,125.8	9,024.2	--	85,913.7
0,526	32,953	19,125	1,035	10,985	24,687	19,715	11,799	9,770	18,029	7,006	933	25,170	1,308	223,041	17,362	1,541	15,038	33,941	--	500,725
111.82	93.88	68.32	9.21	33.07	100.92	43.15	50.64	25.50	48.84	26.43	8.66	54.69	9.25	684.38	98.19	19.82	106.81	224.82	282.02	2,589.13
5.09	3.98	2.05	.55	1.57	3.45	2.87	2.67	1.54	2.37	1.24	.51	3.00	.59	31.48	5.78	1.25	5.16	12.19	--	98.15
22.84	16.67	7.29	.21	5.57	13.01	12.21	7.90	6.37	11.26	4.49	.13	11.58	.56	120.09	10.34	.93	7.99	19.26	--	294.86
18.91	22.71	16.43	1.85	6.74	11.10	8.18	8.85	2.21	10.54	3.01	1.71	12.37	1.65	126.26	28.07	5.59	26.32	59.98	--	678.31
46.84	43.36	25.77	2.61	13.88	27.56	23.26	19.42	10.12	24.17	8.74	2.35	26.95	2.80	277.83	44.19	7.77	39.47	91.43	--	1071.32
5.08	4.64	2.32	.67	2.93	4.11	2.76	2.06	1.62	1.93	1.74	.42	5.34	.54	36.16	3.66	.40	5.11	9.17	--	112.74
11.13	9.33	7.01	.40	2.72	5.96	4.70	2.12	3.09	2.60	1.18	.40	7.00	.38	58.02	3.29	.25	3.04	6.58	--	129.36
26.46	33.14	26.15	1.44	5.94	39.38	9.42	9.49	7.25	12.66	7.03	1.23	5.13	1.04	185.76	15.46	1.25	19.71	36.42	.77	628.15
42.67	47.11	35.48	2.51	11.59	49.45	16.88	13.67	11.96	17.19	9.95	2.05	17.47	1.96	279.94	22.41	1.90	27.86	52.17	.77	870.25
3.48	5.50	4.06	.29	1.41	5.67	.81	2.35	.24	2.86	1.16	.18	6.90	.48	35.39	4.62	.90	3.78	9.30	--	71.62
7.77	7.94	5.40	.46	3.03	6.45	3.40	2.13	.60	4.71	1.54	.43	7.35	.41	51.62	4.25	.41	4.46	9.12	--	91.53
10.22	8.41	8.80	.71	3.90	13.93	1.45	4.94	1.33	7.10	2.58	.13	11.56	1.22	76.28	5.65	1.05	8.18	14.88	7.80	152.73
21.47	21.85	18.26	1.46	8.34	26.05	5.66	9.42	2.17	14.67	5.28	.74	25.81	2.11	163.29	14.52	2.36	16.42	33.30	7.80	315.88
--	.08	.27	--	.03	.09	--	.03	--	--	.03	--	.02	--	.55	.10	--	.3	.13	--	10.63
56.23	29.62	16.94	5.21	16.49	36.51	24.10	27.36	14.71	18.54	13.81	5.59	25.63	5.34	296.08	49.01	11.93	52.60	113.54	273.45	1,129.94
56.23	29.70	17.21	5.21	16.52	36.60	24.10	27.39	14.71	18.54	13.84	5.59	25.65	5.34	296.63	49.11	11.93	52.63	113.67	273.45	1,140.57
13.65	14.20	8.70	1.51	5.94	13.32	6.44	7.11	3.40	7.16	4.17	1.11	15.26	1.61	103.58	14.16	2.55	14.08	30.79	--	293.14
41.74	33.94	19.70	1.07	11.32	25.42	20.31	12.15	10.06	18.57	7.21	.96	25.93	1.35	229.73	17.88	1.59	15.49	34.96	--	515.75
111.82	93.88	68.32	9.21	33.07	100.92	43.15	50.64	25.50	48.84	26.43	8.66	54.69	9.25	684.38	98.19	19.82	106.81	224.82	282.02	2,589.13
167.21	142.02	96.72	11.79	50.33	139.66	69.90	69.90	38.96	74.57	37.81	10.73	95.88	12.21	1,017.69	130.23	23.96	136.38	290.57	282.02	3,398.02
														914.11				259.78	282.02	3,104.88
														363.09				117.36	--	1,040.32
														- 9.05				-10.03	10.61	22.48
														--				--	--	18.14
														1,268.15				367.11	292.63	4,185.82

For Sources and Notes see next page.

Table 22
Fuels and Heating Equipment Utilized by Households, 1960 and 1970

1960	Bronx	Brooklyn	Manhattan	Queens	Richmond	NEW YORK CITY	Dutchess	Nassau	Orange	Putnam	Rockland	Suffolk	Sullivan	Ulster	Westchester	NY excl. NYC
All occupied units	463,401	850,866	695,763	583,141	61,731	2,654,902	46,962	348,729	53,919	9,287	34,699	173,412	14,112	36,067	241,281	958,468
House-heating fuel:																
Utility gas	19,455	120,372	25,775	96,885	14,389	276,876	4,656	27,711	15,151	85	25,461	23,101	66	3,028	47,028	146,287
Fuel oil, kerosene, etc.	360,103	656,000	526,801	449,887	41,031	2,033,822	37,551	310,546	31,286	8,432	7,033	139,771	10,959	26,331	181,483	753,392
Coal or coke	80,750	57,220	117,321	29,649	5,063	290,003	3,569	7,663	5,788	668	846	5,480	2,170	4,283	8,454	38,921
Electricity	311	1,123	865	455	144	2,898	59	844	151	--	83	928	22	61	364	2,512
Bottled, tank, or LP-gas	1,267	7,249	3,043	3,625	774	15,958	691	1,119	1,155	81	1,027	3,136	395	1,608	2,361	11,573
Other fuel	1,100	4,013	17,204	1,637	230	24,184	377	692	329	--	155	810	478	715	1,007	4,563
None	396	5,376	4,726	955	76	11,529	59	145	59	21	90	186	22	41	584	1,207
Water-heating fuel:																
Utility gas	24,967	134,666	35,272	130,882	19,651	345,438	9,814	53,488	19,388	64	27,546	35,456	68	5,409	66,808	218,041
Electricity	1,325	5,086	6,270	3,413	1,168	17,262	9,323	12,401	7,618	1,832	1,602	16,108	1,422	5,404	6,303	62,013
Coal or coke	78,169	48,223	115,634	20,617	2,127	264,770	1,564	5,296	2,184	294	352	2,600	980	1,489	5,555	20,314
Bottled, tank, or LP-gas	2,538	8,945	3,272	5,594	1,593	21,942	6,152	3,534	8,549	1,748	1,881	11,843	3,143	6,834	8,042	51,726
Fuel oil, kerosene, etc.	353,964	630,690	509,236	417,935	36,092	1,947,917	17,883	271,451	13,596	5,096	2,620	103,878	7,539	14,032	148,493	584,588
Other fuel	1,368	4,477	16,948	1,887	294	24,974	315	1,227	209	--	57	708	396	158	988	4,058
None	1,051	19,266	9,103	2,765	782	32,967	1,911	1,323	2,375	253	637	2,819	564	2,741	5,092	17,715
Cooking fuel:																
Utility gas	444,635	800,660	619,147	546,049	47,617	2,458,108	14,949	208,891	23,922	304	28,616	68,638	367	8,296	186,708	540,691
Electricity	1,984	11,643	22,898	12,996	8,473	57,994	16,337	118,015	10,351	3,705	2,412	54,174	2,688	10,598	30,256	248,536
Bottled, tank, or LP-gas	12,052	27,537	23,275	16,861	4,925	84,650	13,893	19,153	17,548	5,051	3,136	48,038	10,148	15,680	19,744	152,391
Fuel oil, kerosene	2,038	3,291	3,281	3,352	319	12,281	1,007	1,364	560	140	124	1,360	65	618	1,566	6,804
Coal or coke	1,679	5,493	4,771	2,449	270	14,662	398	738	881	43	124	454	237	381	2,081	5,337
Other fuel	605	1,235	1,725	887	87	4,539	259	266	346	--	156	533	566	451	385	2,962
None	389	1,494	20,638	499	16	23,036	119	293	311	44	127	215	41	43	541	1,734
All housing units	473,159	875,757	727,424	617,077	65,156	2,758,573	54,647	366,303	67,133	17,701	38,988	224,451	45,020	49,359	254,766	1,118,368
Heating equipment:																
Steam or hot water	464,148	807,704	702,702	564,258	50,850	2,589,662	24,519	305,076	29,859	6,727	21,393	122,553	24,173	19,496	201,803	755,599
Warm-air furnace	4,694	12,982	5,396	23,397	8,192	54,461	17,758	44,458	21,779	5,369	11,710	49,431	7,127	10,980	35,824	204,436
Floor, wall, or pipeless furnace	588	2,145	1,175	1,870	709	6,487	1,834	8,938	3,403	1,250	2,610	18,707	3,838	3,244	2,183	46,007
Built-in electric	245	671	427	392	146	1,881	72	594	81	53	75	1,271	16	39	338	2,539
Other means (with flue)	1,891	32,627	5,638	8,782	3,086	52,024	7,511	3,620	10,361	1,593	2,382	12,300	7,585	8,367	10,205	63,924
Other means (without flue)	755	12,207	6,336	2,112	992	22,402	440	994	638	181	420	3,348	1,706	718	1,543	9,988
None	578	7,060	5,698	15,830	1,137	30,303	2,513	2,553	1,012	2,528	394	16,841	575	6,515	2,832	35,763

1970	Bronx	Brooklyn	Manhattan	Queens	Richmond	NEW YORK CITY	Dutchess	Nassau	Orange	Putnam	Rockland	Suffolk	Sullivan	Ulster	Westchester	NY excl. NYC
All occupied units	497,222	876,119	687,283	690,056	86,192	2,836,872	62,495	401,056	65,607	15,995	60,359	295,587	16,865	43,533	282,629	1,244,126
House heating fuel:																
Utility gas	127,474	290,946	162,411	228,758	41,018	850,607	9,413	64,342	24,131	160	52,999	63,500	52	4,292	80,078	298,967
Fuel oil, kerosene, etc.	335,529	552,668	452,938	439,280	42,395	1,822,810	49,974	328,895	36,709	14,537	5,493	220,433	14,987	34,323	191,863	897,214
Electricity	5,216	6,571	14,619	8,818	1,439	36,663	1,982	4,423	2,170	924	1,177	6,324	496	2,317	5,890	25,703
Other fuel	28,701	25,197	56,747	12,960	1,298	124,903	1,107	3,275	2,597	374	690	5,170	1,307	2,525	4,687	21,732
None	302	737	568	240	42	1,889	19	121	--	--	--	160	23	76	111	510
Water-heating fuel:																
Utility gas	136,210	312,273	185,113	267,630	46,019	947,245	13,168	86,752	27,686	337	54,039	74,033	301	6,923	100,543	363,782
Fuel oil, kerosene, etc.	326,297	525,236	425,681	397,442	36,356	1,711,012	32,746	294,378	19,199	11,043	2,510	183,528	10,432	20,314	160,273	734,423
Electricity	6,654	11,121	21,328	10,597	1,811	51,511	11,880	14,162	11,894	2,843	2,342	24,491	2,546	9,549	11,082	90,789
Other fuel	27,124	24,687	53,323	12,425	1,485	119,044	4,387	3,612	6,209	1,646	1,298	11,448	3,296	5,963	9,256	47,106
None	937	2,802	1,838	1,962	521	8,060	314	2,152	619	126	170	2,087	290	784	1,475	8,017
Cooking fuel:																
Utility gas	464,678	826,119	624,552	644,655	74,770	2,634,774	18,829	233,170	30,756	1,049	54,938	113,459	718	10,496	212,121	675,536
Fuel oil, kerosene, etc.	13,570	15,603	12,768	8,979	529	51,449	326	3,955	346	110	82	2,349	163	329	3,156	10,816
Electricity	7,630	14,815	28,140	27,708	8,875	87,168	30,063	153,701	18,547	9,349	3,559	128,070	5,216	17,729	51,277	417,511
Other fuel	10,695	17,493	12,733	7,971	1,906	50,798	13,053	9,689	15,802	5,419	1,742	51,439	10,578	14,866	15,528	138,116
None	649	2,089	9,090	743	112	12,683	224	541	156	68	38	270	190	113	547	2,147
All year-round units	508,649	902,236	714,371	703,154	89,289	2,917,699	67,962	407,416	71,665	19,017	62,176	313,489	22,805	50,286	290,377	1,305,193
Heating equipment:																
Steam and hot water	461,071	805,727	615,360	602,143	58,550	2,542,851	39,860	335,212	38,893	12,291	36,691	213,225	12,818	27,098	222,928	939,016
Warm-air furnace	28,931	47,767	70,364	64,934	25,726	237,722	20,800	54,525	23,822	4,531	20,382	74,903	5,247	14,194	50,219	268,623
Built-in electric	3,680	5,306	9,313	7,232	1,044	26,575	2,072	4,149	1,687	756	1,062	6,468	574	2,312	5,354	24,434
Floor, wall, or pipeless	3,328	5,640	4,066	5,307	782	19,123	351	7,459	803	101	1,816	7,831	385	623	2,646	22,015
Room heaters (with flue)	7,681	24,426	9,247	15,855	2,214	59,423	2,942	3,643	4,140	723	1,567	6,776	1,242	3,261	5,714	30,008
Room heaters (without flue)	3,179	10,365	4,029	5,962	670	24,205	885	1,447	1,050	157	274	1,431	394	770	1,753	8,161
Fireplace, stoves, portable	428	1,949	1,279	1,178	199	5,033	764	813	868	280	335	1,643	1,148	1,302	1,432	8,585
None	351	1,056	713	543	104	2,767	288	168	402	178	49	1,212	997	726	331	4,351

Sources: U.S. Bureau of the Census, Census of Housing, 1960: State and Small Areas, 1970: Detailed Housing Characteristics.

Notes: All occupied units, All year-round units, and All housing units may differ slightly from totals for a given energy-using characteristic because of derivation from different samples.

Bergen	Essex	Hudson	Hunterdon	Mercer	Middlesex	Monmouth	Morris	Ocean	Passaic	Somerset	Sussex	Union	Warren	NEW JERSEY	Fairfield	Litchfield	New Haven	CONNECTICUT	REGION
230,578	289,008	198,029	16,077	76,587	120,404	96,168	71,970	33,207	125,926	40,083	14,434	150,179	19,233	1,481,883	194,314	36,442	198,815	429,571	5,524,824
79,158	58,026	56,177	399	18,077	36,269	24,936	13,289	7,169	41,223	9,257	--	33,164	1,103	378,247	31,125	3,302	30,019	64,446	865,856
137,282	181,675	113,604	12,095	49,266	72,120	63,021	49,961	23,164	66,023	26,858	11,881	96,950	13,524	917,424	151,939	29,556	154,905	336,400	4,041,038
11,759	43,662	22,073	2,888	7,582	9,138	5,350	6,563	954	15,615	3,209	2,127	18,910	4,179	154,009	6,684	2,190	9,154	18,028	500,961
159	404	830	20	157	171	291	233	144	297	39	--	95	42	2,882	336	59	474	869	9,161
1,507	2,176	2,615	377	839	1,761	1,915	1,351	1,498	1,919	421	385	660	204	17,628	2,768	545	2,843	6,156	51,315
486	1,624	669	259	582	521	554	440	238	551	136	41	282	181	6,564	1,070	690	1,039	2,799	38,110
219	1,430	2,061	39	84	399	101	133	40	290	163	--	118	--	5,077	392	100	381	873	18,686
123,435	105,375	73,847	764	38,128	55,666	40,288	21,655	8,798	62,957	13,652	215	68,108	3,571	616,459	60,682	7,045	75,902	143,629	1,323,567
5,393	2,848	1,004	4,965	5,123	6,676	21,136	12,598	11,681	3,132	4,582	5,973	3,970	6,107	95,188	30,699	10,372	35,981	77,052	251,515
4,217	18,205	13,733	953	1,606	3,482	1,292	2,177	286	4,175	1,182	568	7,636	1,124	60,636	1,756	541	1,420	3,717	349,437
4,109	5,365	3,635	1,744	4,126	4,649	6,001	6,122	3,532	4,512	2,637	2,468	2,678	1,817	53,395	11,754	3,803	10,823	26,380	153,443
91,861	147,400	91,874	6,527	26,274	46,255	23,990	27,652	7,414	46,170	17,073	4,237	65,259	5,451	607,437	83,809	12,848	67,887	164,544	3,304,486
408	1,232	658	157	266	750	302	249	115	452	134	42	400	101	5,266	1,023	245	835	2,103	36,401
1,147	8,572	13,278	967	1,064	2,901	3,159	1,517	1,381	4,520	823	931	2,128	1,062	43,450	4,591	1,588	5,967	12,146	106,278
199,755	260,174	185,408	1,572	56,243	86,806	53,601	30,275	11,469	106,332	20,361	656	127,555	5,394	1,145,603	89,842	8,887	102,959	201,688	4,346,090
20,523	10,710	2,446	6,454	11,294	20,797	26,098	24,819	11,833	8,763	11,553	4,771	15,264	7,053	182,378	77,855	16,080	70,973	164,908	653,816
9,185	11,643	6,601	7,594	7,467	11,100	14,792	15,877	9,475	9,181	7,718	8,492	5,302	6,107	130,534	23,315	10,027	19,913	53,255	420,830
484	1,928	1,097	180	509	577	714	437	246	602	196	204	805	230	8,209	1,886	637	2,511	5,034	32,328
293	2,721	1,282	156	563	358	515	336	41	482	129	83	670	220	7,849	654	277	513	1,444	29,292
154	746	265	121	169	334	315	207	100	258	100	186	218	143	3,316	352	389	583	1,324	12,181
176	1,075	930	--	340	407	133	19	43	300	26	42	365	86	3,942	410	145	1,363	1,918	30,630
236,696	299,832	204,800	18,029	79,477	125,347	115,619	82,327	71,657	134,391	42,323	25,098	154,180	21,324	1,611,100	208,997	43,343	212,735	465,075	5,953,116
165,223	237,629	142,296	9,921	42,588	71,252	46,791	46,037	17,261	88,251	27,036	8,835	105,121	10,940	1,019,181	116,226	18,490	97,188	231,904	4,596,346
60,639	25,634	9,881	3,803	28,072	39,211	40,786	26,065	22,853	19,872	11,568	8,029	39,239	5,513	341,165	60,309	11,825	65,755	137,889	737,951
3,139	1,732	689	1,245	4,710	4,624	10,294	4,293	14,949	2,882	1,078	2,974	1,562	1,653	55,824	3,603	1,805	4,937	10,345	118,663
182	355	570	44	145	108	288	105	705	183	57	21	95	40	2,898	364	32	247	643	7,961
6,223	27,979	43,788	2,630	3,043	7,866	9,407	3,590	7,177	20,283	1,810	3,771	6,887	2,423	146,877	24,010	9,024	38,116	71,150	333,975
711	4,842	5,037	194	691	1,459	1,385	722	658	1,435	426	406	960	278	19,204	2,233	548	2,159	4,940	56,534
566	1,582	2,499	192	212	797	6,668	1,472	8,054	1,485	347	1,062	301	477	25,714	2,241	1,608	4,328	8,177	99,957
279,625	302,582	207,499	21,063	93,486	168,076	135,230	109,823	68,362	147,214	57,013	22,809	171,580	23,271	1,807,633	243,806	45,550	231,754	521,110	6,404,741
141,545	109,887	85,079	1,419	38,201	79,173	65,359	36,162	33,528	76,371	26,219	896	64,563	3,848	762,250	56,432	6,646	49,993	113,071	2,024,895
129,119	175,617	111,878	16,965	49,592	80,619	60,703	66,705	26,466	63,426	28,172	19,052	99,482	16,992	944,788	173,580	34,860	164,634	373,074	4,037,886
5,542	5,390	3,243	1,532	2,649	5,062	5,718	4,260	6,805	2,463	1,602	1,358	3,014	1,115	49,753	9,141	2,676	12,938	24,755	136,874
3,230	11,330	6,631	1,147	3,044	3,049	3,368	2,615	1,499	4,762	1,020	1,432	4,476	1,316	48,919	4,398	1,368	3,846	9,612	205,166
189	358	668	--	--	173	82	81	64	192	--	71	45	--	1,923	255	--	343	598	4,920
185,752	149,814	102,275	1,943	55,261	98,501	77,991	44,547	33,925	95,196	32,039	1,419	96,535	6,092	981,290	79,453	8,250	84,737	172,440	2,464,757
77,966	135,501	90,541	9,693	27,456	53,774	23,953	40,786	10,836	41,831	17,273	8,568	64,847	7,980	611,005	108,870	17,701	81,538	208,109	3,264,549
10,754	7,267	3,738	6,876	7,758	10,918	27,780	19,131	20,352	5,027	6,117	9,569	6,456	7,008	148,751	45,934	16,153	58,457	120,544	411,595
3,953	8,040	5,291	1,934	2,665	3,508	4,445	4,548	2,650	4,081	1,315	2,784	3,021	1,800	50,035	7,975	2,933	5,757	16,665	232,859
1,200	1,960	5,654	617	346	1,375	1,061	811	599	1,079	269	469	721	391	16,552	1,574	513	1,265	3,352	35,981
241,538	270,964	194,806	2,659	67,961	126,550	85,461	52,948	37,926	123,775	34,194	2,283	145,775	7,703	1,394,543	101,351	9,184	98,170	208,705	4,913,558
1,269	3,616	1,886	163	909	1,115	591	538	389	2,063	218	161	1,275	163	14,358	1,788	242	1,908	3,938	80,561
32,294	21,519	6,993	11,710	20,351	33,946	39,176	44,333	22,839	16,099	18,262	12,417	22,549	10,743	313,231	122,869	28,393	119,015	270,277	1,088,187
4,026	4,503	3,282	6,460	3,659	6,142	9,792	11,808	7,186	4,867	4,339	7,930	1,680	4,600	80,274	17,133	7,455	11,793	36,381	305,569
498	1,980	532	71	606	323	208	196	22	410	--	18	301	62	5,227	665	276	868	1,809	21,866
283,575	311,566	214,665	22,116	96,401	171,599	142,927	113,033	80,460	151,093	58,149	24,415	174,328	24,553	1,868,880	252,334	48,947	240,628	541,909	6,633,681
192,205	240,774	161,384	13,400	48,989	91,822	61,320	66,538	26,052	104,143	31,110	12,941	113,077	13,752	1,177,507	152,260	24,309	118,989	295,558	4,954,932
75,244	43,586	17,925	5,059	37,229	65,569	61,368	37,195	34,811	24,830	23,233	7,892	50,309	7,011	491,261	70,956	14,412	80,901	166,269	1,163,875
5,623	4,884	3,108	1,414	2,422	4,565	5,185	4,085	8,506	2,283	1,358	1,219	2,493	1,211	48,356	8,233	3,097	11,948	23,278	122,643
2,804	2,476	1,678	683	2,731	2,884	6,676	2,257	4,365	2,198	787	896	1,908	776	33,119	3,455	1,106	3,872	8,433	82,690
4,661	12,206	18,928	890	3,665	4,405	5,554	1,700	4,273	9,313	1,091	756	4,070	1,142	72,654	10,477	3,739	15,966	30,182	192,267
1,310	4,012	4,318	271	892	1,084	1,408	469	530	3,882	251	109	1,397	203	20,136	2,124	521	2,567	5,212	57,714
1,511	3,012	6,407	339	452	1,063	722	573	1,085	4,072	273	453	980	348	21,290	4,415	1,473	5,935	11,823	46,731
217	616	917	60	21	207	694	216	838	372	46	149	94	110	4,557	414	290	450	1,154	12,829

Table 23
Appliances and Automobiles Owned by Households, 1960 and 1970

	Bronx	Brooklyn	Manhattan	Queens	Richmond	NEW YORK CITY	Dutchess	Nassau	Orange	Putnam	Rockland	Suffolk	Sullivan	Ulster	Westchester	NY excl. NYC
1960																
All occupied units	463,401	850,866	695,763	583,141	61,731	2,654,902	46,962	348,729	53,919	9,287	34,699	173,412	14,112	36,067	241,281	958,468
Clothes washing machine:																
Yes	177,526	363,619	107,450	304,434	45,641	998,670	36,980	283,691	42,244	7,831	27,308	136,434	11,417	27,814	155,312	729,031
No	285,856	487,734	588,285	278,659	16,066	1,656,600	9,982	65,029	11,675	1,456	7,387	36,978	2,695	8,253	85,969	229,424
Clothes dryer:																
Gas heated	1,731	9,919	2,063	16,380	1,810	31,903	336	19,416	1,173	65	4,736	4,165	200	202	12,349	42,642
Electric heated	2,534	7,073	3,967	11,390	2,337	27,301	5,749	68,674	5,461	1,315	2,056	24,110	1,880	4,179	23,937	137,361
None	459,117	834,361	689,705	555,323	57,560	2,596,066	40,877	260,630	47,285	7,907	27,903	145,137	12,032	31,686	204,995	778,452
Home food freezer:																
One or more	7,760	20,438	10,142	25,139	3,998	67,477	7,938	58,006	8,879	2,250	4,838	28,548	3,749	6,248	30,245	150,701
None	455,622	830,915	685,591	557,954	57,709	2,587,793	39,024	290,714	45,040	7,037	29,857	144,864	10,363	29,819	211,036	807,754
Television																
One set	375,178	666,737	470,666	445,453	48,816	2,006,850	38,616	222,887	43,793	7,306	26,236	137,511	10,829	28,912	171,611	687,701
Two or more sets	53,538	110,871	49,014	109,498	10,316	333,237	3,868	117,524	5,331	1,300	6,133	28,032	1,170	2,307	56,434	222,099
None	34,666	73,745	176,055	28,142	2,575	315,183	4,478	8,309	4,795	681	2,326	7,869	2,113	4,848	13,236	48,655
Automobiles available:																
One	171,870	341,886	126,367	338,301	39,623	1,018,047	30,327	214,349	34,879	5,742	20,719	112,663	9,123	23,768	141,328	592,898
Two	11,020	23,442	6,527	42,712	6,353	90,054	8,282	98,114	8,516	2,423	8,756	41,713	1,870	5,539	50,570	225,783
Three or more	3,584	5,906	3,928	5,329	648	19,395	1,360	9,446	1,057	246	1,176	4,386	325	714	7,098	25,808
None	276,921	479,502	558,943	196,805	15,107	1,527,278	6,993	26,811	9,467	876	4,044	14,650	2,794	6,046	42,285	113,966
Air conditioning:																
One room unit	39,145	75,197	73,006	75,751	4,857	267,956	3,051	42,636	3,080	437	2,744	8,350	384	1,401	28,223	90,306
Two or more units	7,231	17,923	32,417	22,056	1,097	80,724	782	18,017	838	127	623	2,353	108	502	10,765	34,115
Central	722	1,156	4,013	2,317	315	8,523	219	5,368	535	101	274	862	64	258	3,808	11,489
None	416,284	757,077	586,299	482,969	55,438	2,298,067	42,910	282,699	49,466	8,622	31,054	161,847	13,556	33,906	198,485	822,545
1970																
All occupied units	497,222	876,119	687,283	690,056	86,192	2,836,872	62,495	401,056	65,607	15,995	60,359	295,587	16,865	43,533	282,629	1,244,126
Clothes washing machine:																
Yes	173,162	348,458	115,510	325,719	63,222	1,026,071	44,911	320,334	49,364	13,287	46,538	236,043	13,097	32,749	179,297	935,620
No	324,060	527,661	571,773	364,337	22,970	1,810,801	17,584	80,722	16,243	2,708	13,821	59,544	3,768	10,784	103,332	308,506
Clothes dryer:																
Gas heated	10,299	41,093	9,443	61,444	21,267	143,546	1,857	58,243	6,374	467	24,370	33,032	950	1,036	34,812	161,141
Electric heated	14,639	33,191	29,649	48,829	9,733	136,041	23,601	158,246	19,374	7,635	9,786	125,666	6,428	15,202	65,772	431,710
None	472,284	801,835	648,191	579,783	55,192	2,557,285	37,037	184,567	39,859	7,893	26,203	136,889	9,487	27,295	182,045	651,275
Dishwasher:																
Yes	22,651	60,746	82,578	97,717	16,503	280,195	16,569	174,775	12,802	5,076	25,691	104,927	4,098	8,616	91,097	443,651
No	474,571	815,373	604,705	592,339	69,689	2,556,677	45,926	226,281	52,805	10,919	34,668	190,660	12,767	34,917	191,532	800,475
Home food freezer:																
Yes	23,439	49,244	23,598	56,572	9,393	162,246	14,960	103,459	15,416	4,534	13,355	77,222	6,358	10,435	51,104	296,823
No	473,783	826,875	663,685	633,484	76,799	2,674,626	47,555	297,597	50,191	11,461	47,004	218,365	10,507	33,098	231,525	947,303
Television:																
One set	338,945	567,925	480,245	408,909	48,475	1,844,499	43,065	161,938	45,993	9,728	29,471	160,538	11,650	30,543	152,047	644,973
Two or more sets	133,561	258,850	128,305	265,045	36,124	821,855	17,448	234,447	17,623	6,031	29,384	130,873	3,902	10,911	124,211	574,830
None	24,716	49,344	78,733	16,102	1,593	170,488	1,982	4,671	1,991	236	1,504	4,176	1,313	2,079	6,371	24,323
Automobiles available:																
One	163,524	317,307	136,772	349,073	48,435	1,015,111	30,532	170,190	33,309	6,933	24,404	132,948	8,718	23,033	131,577	561,644
Two	21,143	42,424	9,343	79,902	18,354	171,166	21,049	164,743	18,918	7,073	26,461	122,534	4,613	12,606	86,931	464,928
Three or more	2,291	3,685	1,700	9,956	2,224	19,856	3,293	32,883	2,656	997	3,955	19,791	697	2,146	14,878	81,296
None	310,264	512,703	539,468	251,125	17,179	1,630,739	7,621	33,240	10,724	992	5,539	20,314	2,837	5,935	49,243	136,445
All year-round units	508,649	902,236	714,371	703,154	89,289	2,917,699	67,962	407,416	71,665	19,017	62,176	313,489	22,805	50,286	290,377	1,305,193
Air conditioning:																
One room unit	88,256	171,511	154,642	190,407	19,822	624,638	14,197	95,924	11,880	2,505	14,708	55,263	1,862	7,446	66,008	269,793
Two or more units	37,650	97,164	82,782	129,572	13,126	360,294	5,822	98,898	3,814	943	9,758	25,572	470	2,653	47,720	195,650
Central	8,414	9,651	46,434	24,055	7,548	96,102	1,489	27,790	1,335	205	5,301	9,343	173	1,123	16,794	63,553
None	374,268	623,856	430,524	359,014	48,803	1,836,465	46,455	184,742	54,608	15,346	32,395	223,195	20,230	39,105	159,783	775,859

Sources: U.S. Bureau of the Census, Census of Housing, 1960: States and Small Areas, 1970: Detailed Housing Characteristics.

Notes: All occupied units, and All year-round units may differ slightly from totals for a given energy-using characteristic because of derivation from different samples.

Bergen	Essex	Hudson	Hunterdon	Mercer	Middlesex	Monmouth	Morris	Ocean	Passaic	Somerset	Sussex	Union	Warren	NEW JERSEY	Fairfield	Litchfield	New Haven	CONNECTICUT	REGION
230,578	289,008	198,029	16,077	76,587	120,404	96,168	71,970	33,207	125,926	40,083	14,434	150,179	19,233	1,481,883	194,314	36,442	198,815	429,571	5,524,824
181,166	180,640	117,992	13,833	57,770	99,356	71,541	60,524	25,297	90,277	33,744	12,489	117,877	16,550	1,079,056	155,209	30,756	156,169	342,134	3,148,891
49,404	108,357	80,037	2,244	18,817	21,023	24,627	11,446	7,910	35,641	6,339	1,945	32,302	2,683	402,775	39,105	5,686	42,646	87,437	2,376,236
25,844	17,271	3,347	424	3,832	7,862	5,165	5,352	1,913	6,889	2,180	105	14,183	465	94,832	4,385	364	1,860	6,609	175,986
18,050	10,805	2,462	2,770	7,088	10,509	12,372	11,557	4,313	6,558	5,185	2,328	11,925	2,703	108,625	30,406	4,958	23,892	59,256	332,543
186,676	260,921	192,220	12,883	65,667	102,008	78,631	55,061	26,981	112,471	32,718	12,001	124,071	16,065	1,278,374	159,523	31,120	173,063	363,706	5,016,598
26,649	19,679	4,301	5,003	9,664	14,827	14,988	13,562	6,155	10,094	7,732	3,825	14,092	3,495	154,066	27,311	7,176	22,276	56,763	429,007
203,921	269,318	193,728	11,074	66,923	105,552	81,180	58,408	27,052	115,824	32,351	10,609	136,087	15,738	1,327,765	167,003	29,266	176,539	372,808	5,096,120
162,662	217,962	160,773	12,838	59,908	93,135	73,897	55,044	27,513	97,604	31,115	11,737	110,358	15,592	1,130,138	151,264	30,499	162,311	344,074	4,168,763
61,070	51,658	25,029	2,074	11,203	22,684	17,422	14,467	4,257	21,517	7,153	1,557	33,975	2,140	276,206	31,258	2,445	22,377	56,080	887,622
6,838	19,377	12,227	1,165	5,476	4,560	4,849	2,459	1,437	6,797	1,815	1,140	5,846	1,501	75,487	11,792	3,498	14,127	29,417	468,742
139,448	150,729	102,962	8,359	44,226	77,731	57,112	39,951	20,274	70,412	22,367	8,622	88,896	11,792	842,881	103,386	20,854	116,112	240,352	2,694,178
58,137	46,171	13,270	5,579	15,333	25,300	24,096	23,657	7,734	23,560	12,723	4,079	35,189	4,177	299,005	54,094	9,887	39,569	103,550	718,392
7,097	7,537	3,109	735	2,519	3,322	3,150	3,366	1,321	3,495	1,832	539	4,866	433	43,321	8,206	1,383	5,707	15,296	103,820
25,888	84,567	78,688	1,404	14,505	14,026	11,810	4,996	3,878	28,451	3,161	1,194	21,228	2,831	296,627	28,633	4,318	37,427	70,378	2,008,249
34,512	33,440	22,817	1,233	11,267	17,241	10,009	6,788	2,536	14,152	4,489	876	21,972	1,582	182,914	12,408	1,475	8,649	22,532	563,708
10,484	9,062	5,007	445	3,492	4,428	3,053	1,865	650	3,958	1,295	277	5,878	265	50,159	3,517	307	2,209	6,033	171,031
4,091	2,526	573	178	960	986	732	448	306	912	383	109	1,708	61	13,973	1,519	101	1,259	2,879	36,864
181,483	243,969	169,632	14,221	60,868	97,724	82,374	62,869	29,715	106,896	33,916	13,172	120,621	17,325	1,234,785	176,870	34,559	186,698	398,127	4,753,524
279,625	302,582	207,499	21,063	93,486	168,076	135,230	109,823	68,362	147,214	57,013	22,809	171,580	23,271	1,807,633	243,806	45,550	231,754	521,110	6,409,741
210,608	175,529	114,944	17,085	66,521	127,289	95,854	84,777	49,943	98,448	46,015	18,522	127,529	19,082	1,252,146	189,646	36,261	176,047	401,954	3,615,791
69,017	127,053	92,555	3,978	26,965	40,787	39,376	25,046	18,419	48,766	10,998	4,287	44,051	4,189	555,487	54,160	9,289	55,707	119,156	2,793,950
79,242	44,744	16,733	1,186	13,857	38,944	30,597	20,988	17,324	26,572	11,304	1,214	41,250	1,985	345,940	14,075	1,032	10,059	25,166	675,793
49,890	33,763	12,398	9,577	22,542	36,092	36,821	40,063	19,008	20,888	18,637	10,871	32,376	8,807	351,733	96,140	19,124	80,919	196,183	1,115,667
150,493	224,075	178,368	10,300	57,087	93,040	67,812	48,772	32,030	99,754	27,072	10,724	97,954	12,479	1,109,960	133,591	25,394	140,776	299,761	4,618,281
83,309	52,448	11,975	5,191	18,162	34,595	39,320	39,809	15,279	23,214	17,568	5,234	39,828	4,043	389,975	76,678	10,015	47,225	133,918	1,247,739
196,316	250,134	195,524	15,872	75,324	133,481	95,910	70,014	53,083	124,000	39,445	17,575	131,752	19,228	1,417,658	167,128	35,535	184,529	387,192	5,162,002
49,873	37,845	11,173	8,176	18,315	28,217	30,055	26,128	13,564	19,650	14,304	6,971	25,772	6,377	296,420	53,094	12,546	45,997	111,637	867,126
229,752	264,737	196,326	12,887	75,171	139,859	105,175	83,695	54,798	127,564	42,709	15,838	145,808	16,894	1,511,213	190,712	33,004	185,757	409,473	5,542,615
135,989	179,057	133,340	13,743	57,822	93,242	76,914	59,281	44,074	88,960	31,283	15,340	91,370	16,658	1,037,073	144,208	32,582	151,680	328,470	3,855,015
139,628	111,352	66,592	6,655	32,884	71,812	55,558	49,088	22,746	53,212	24,628	6,880	76,373	6,120	723,528	93,650	11,499	73,765	178,914	2,299,157
4,008	12,173	7,567	665	2,780	3,022	2,758	1,454	1,542	5,042	1,102	589	3,837	493	47,032	5,948	1,469	6,309	13,726	255,569
124,126	129,464	97,653	8,836	42,056	75,271	59,887	42,485	35,544	62,860	20,590	10,065	76,301	11,537	796,675	93,736	20,120	101,224	215,080	2,588,510
106,001	66,003	21,915	8,281	29,556	63,366	50,588	51,287	21,807	44,410	27,007	9,256	58,986	7,220	565,683	98,992	17,567	79,372	195,931	1,397,708
20,782	11,626	3,073	2,333	5,580	12,579	9,274	9,483	4,021	9,188	5,451	1,994	12,001	1,629	109,014	21,715	3,826	14,235	39,776	249,942
28,716	95,489	84,858	1,613	16,294	16,860	15,481	6,568	6,990	30,756	3,965	1,494	24,292	2,885	336,261	29,363	4,037	36,923	70,323	2,173,768
283,575	311,566	214,665	22,116	96,401	171,599	142,927	113,033	80,460	151,093	58,149	24,415	174,328	24,553	1,868,880	252,334	48,947	240,628	541,909	6,633,681
79,960	67,812	54,770	4,356	23,976	51,037	32,154	28,296	16,923	38,745	14,908	3,172	49,500	4,996	470,605	46,693	5,679	36,064	88,436	1,453,472
65,110	40,207	28,382	2,271	17,370	31,299	18,585	13,678	6,235	23,323	8,039	1,245	36,250	1,902	293,896	25,267	1,774	15,928	42,969	892,809
24,387	15,391	6,201	685	7,295	16,813	16,478	6,469	6,164	6,292	6,545	299	11,548	605	125,172	6,953	496	6,872	14,321	299,148
114,118	188,147	125,300	14,840	47,759	72,448	75,759	64,560	51,126	82,686	28,657	19,773	77,019	17,006	979,198	173,480	41,000	181,772	396,252	3,987,774

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REGIONAL PLAN BOOKS BY OUTSIDE PUBLISHERS

Urban Design Manhattan. A Studio Book. New York: The Viking Press, 1969. 130 pp. 48 maps and diagrams. Illus. $ 7.00 paper, $ 17.50 hard cover.

The Office Industry: Patterns of Growth and Location. Cambridge, Mass.: The MIT Press, 1972. 179 pp. 90 tables. 26 charts. 10 maps. Illus. $ 11.25/ $ 15.00

How To Save Urban America: Key Issues Confronting Cities and Suburbs. Choices for '76 Publication. A Signet Special. New York: New American Library, 1973. 234 pp. 13 tables. 9 figures. Illus. $ 1.00/ $ 1.50

The Distribution of Air Quality in the New York Region. Washington, D.C.: Resources for the Future, Inc., 1973. 87 pp. 29 tables. 16 figures. $ 2.80/ $ 3.50

Table 18
Projected Total Consumption of Energy, including Fuels Used in Electricity Generation, 1985

	NEW YORK CITY	NY excl. NYC	NEW JERSEY	CONNECTICUT	Unallocated	REGION
I. In units indicated						
Residential:						
Electricity (thous. megawatt hours)	23,500	23,700	28,000	9,000	--	84,200
Gas (million cu. ft.)	150,000	100,000	200,000	30,000	--	480,000
Other (trillion Btu)	234.5	294.4	166.1	79.4	--	774.4
Commercial and public facilities:						
Electricity (thous. megawatt hours)	29,750	19,250	22,700	5,700	--	77,400
Gas (million cu. ft.)	38,000	82,000	125,000	30,000	--	275,000
Other (trillion Btu)	275.2	171.1	303.9	28.6	--	778.8
Industrial:						
Electricity (thous. megawatt hours)	11,500	6,850	16,000	5,250	--	39,600
Gas (million cu. ft.)	12,000	18,000	100,000	15,000	--	145,000
Other (trillion Btu)	24.1	26.1	46.7	12.8	--	109.7
Transportation:						
Electricity (thous. megawatt hours)	3,250	200	300	50	--	3,800
Other (trillion Btu)	263.9	391.3	560.0	158.1	701.3	2,074.6
Total:						
Electricity (thous. megawatt hours)	68,000	50,000	67,000	20,000	--	205,000
Gas (million cu. ft.)	200,000	200,000	425,000	75,000	--	900,000
Other (trillion Btu)	797.7	882.9	1,076.7	278.9	701.3	3,737.5
Sum of utility projections (electricity in thous. megawatt hours)	54,000	50,000	80,750	26,250	--	211,000
II. In Btu's (trillion)						
Residential:						
Electricity	80.2	80.9	95.5	30.7	--	287.3
Gas	154.5	103.0	206.0	30.9	--	494.4
Other	234.5	294.4	166.1	79.4	--	774.4
Total	469.2	478.3	467.6	141.0	--	1,556.1
Commercial and public facilities:						
Electricity	101.5	65.7	77.5	19.4	--	264.1
Gas	39.1	84.5	128.8	30.9	--	283.3
Other	275.2	171.1	303.9	28.6	--	778.8
Total	415.8	321.3	510.2	78.9	--	1,326.2
Industrial:						
Electricity	39.2	23.4	54.6	17.9	--	135.1
Gas	12.4	18.5	103.0	15.4	--	149.3
Other	24.1	26.1	46.7	12.8	--	109.7
Total	75.7	68.0	204.3	46.1	--	394.1
Transportation:						
Electricity	11.1	0.7	1.0	.2	--	13.0
Other	263.9	391.3	560.0	158.1	701.3	2,074.6
Total	275.0	392.0	561.0	158.3	701.3	2,087.6
Total:						
Electricity	232.0	170.7	228.6	68.2	--	699.5
Gas	206.0	206.0	437.8	77.2	--	927.0
Other	797.7	882.9	1,076.7	278.9	701.3	3,737.5
Total	1,235.7	1,259.6	1,743.1	424.3	701.3	5,364.0
Total without Electricity						4,664.5
Electric Utility Fuels						2,349.5
Gross total						7,014.0

Source: Regional Plan Association.

Note: On assumptions and methodology, see pages 17 and 18.

Sources and Notes for Table 17.

Sources: As in Tables 1-16

Notes: Part II in Btu derived by applying the conversion factors listed on page 19 to the physical units shown in Tables 1 through 16 and summarized in Part I of the table.

State summary estimates of Electric Utility Fuels: Region represent the total Btu content of fuels used in generating plants located within the respective areas, while Electric Utility Fuels: Import represent the balance of Btu content required to meet total supply, or end-use sales plus company use and loss, within the respective areas. Unallocated units and Btu's are comprised of liquified petroleum gas consumption in Commercial and Industrial sectors; aviation, marine, and rail diesel in Transportation; and Municipal utility purchases in Electric Utility Fuels: Import.

DEMOGRAPHIC AND ECONOMIC MEASURES

Table 19
Population and Income, in Current Dollars and Constant 1969 Dollars, 1950, 1960, 1970 and Projected 1985

	1950				1960				1970			1985		
		Total Income (000,000)		Per cap Income		Total Income (000,000)		Per cap Income		Total Income (000,000)	Per cap Income		Total Income (000,000)	Per cap Income
County	Population	1949 $	1969 $	1969 $	Population	1959 $	1969 $	1969 $	Population	1969 $	1969 $	Population	1969 $	1969 $
Bronx	1,451,277	1,990	3,007	2,072	1,424,815	2,837	3,458	2,427	1,471,701	4,304.4	2,925	1,400,000	5,635	4,025
Brooklyn	2,738,175	3,540	5,350	1,954	2,627,319	5,179	6,313	2,403	2,602,012	7,964.5	3,061	2,520,000	11,844	4,700
Manhattan	1,960,101	3,410	5,155	2,630	1,698,281	4,944	6,027	3,549	1,539,233	8,054.5	5,233	1,410,000	14,142	10,030
Queens	1,550,849	2,455	3,711	2,393	1,809,578	4,528	5,519	3,050	1,987,174	8,016.7	4,034	2,100,000	13,860	6,600
Richmond	191,555	235	355	1,855	221,991	456	556	2,504	295,443	1,032.9	3,496	410,000	2,542	6,200
NEW YORK CITY	7,891,957	11,630	17,578	2,227	7,781,984	17,944	21,873	2,811	7,895,563	29,373.0	3,720	7,840,000	48,023	6,125
Dutchess	136,781	151	228	1,669	176,008	333	406	2,307	222,295	732.4	3,295	310,000	1,835	5,920
Nassau	672,765	1,215	1,837	2,730	1,300,171	3,737	4,556	3,504	1,428,838	6,686.0	4,679	1,530,000	11,965	7,820
Orange	152,255	172	260	1,707	183,734	337	411	2,236	221,657	673.8	3,040	315,000	1,630	5,175
Putnam	20,307	28	42	2,085	31,722	68	83	2,614	56,696	194.0	3,422	100,000	559	5,585
Rockland	89,276	108	163	1,828	136,803	289	352	2,576	229,903	857.5	3,730	310,000	2,097	6,765
Suffolk	276,129	324	490	1,773	666,784	1,310	1,598	2,396	1,127,030	3,775.4	3,350	1,650,000	9,702	5,880
Sullivan	40,731	45	68	1,672	45,272	81	99	2,181	52,580	154.1	2,931	65,000	316	4,865
Ulster	92,621	108	163	1,763	118,804	220	268	2,258	141,241	425.7	3,014	190,000	960	5,050
Westchester	625,816	1,329	2,009	3,211	808,891	2,631	3,208	3,966	894,406	4,541.7	5,078	1,050,000	8,117	7,730
NY excl. NYC	2,106,681	3,480	5,260	2,497	3,468,189	9,006	10,981	3,166	4,374,646	18,040.6	4,124	5,520,000	37,181	6,736
Bergen	539,139	893	1,349	2,503	780,255	2,123	2,588	3,317	897,148	4,085.8	4,554	1,050,000	8,211	7,820
Essex	905,949	1,486	2,246	2,479	923,545	2,266	2,763	2,992	932,299	3,477.0	3,729	965,000	5,095	5,280
Hudson	647,437	860	1,300	2,008	610,734	1,246	1,519	2,487	609,266	1,944.3	3,191	660,000	3,208	4,860
Hunterdon	42,736	49	74	1,735	54,107	110	134	2,479	69,718	251.4	3,606	100,000	652	6,515
Mercer	229,781	318	481	2,092	266,392	590	719	2,700	303,968	1,101.2	3,623	365,000	2,219	6,080
Middlesex	264,872	330	499	1,883	433,856	900	1,097	2,529	583,813	2,055.4	3,521	825,000	5,086	6,165
Monmouth	225,327	270	408	1,811	334,401	693	845	2,526	461,849	1,675.0	3,627	690,000	4,502	6,525
Morris	164,371	260	393	2,391	261,620	662	807	3,084	383,454	1,581.6	4,125	585,000	4,019	6,870
Ocean	56,622	64	97	1,710	108,241	200	244	2,253	208,470	642.7	3,083	345,000	1,825	5,290
Passaic	337,093	422	638	1,893	406,618	850	1,036	2,548	460,782	1,634.8	3,548	525,000	3,247	6,185
Somerset	99,052	140	212	2,136	143,913	343	418	2,905	198,372	811.9	4,093	285,000	2,066	7,250
Sussex	34,423	39	59	1,714	49,255	94	115	2,326	77,528	254.6	3,284	120,000	704	5,870
Union	398,138	670	1,013	2,544	504,255	1,326	1,617	3,206	543,116	2,276.0	4,191	575,000	3,838	6,675
Warren	54,374	58	88	1,611	63,220	112	137	2,160	73,960	233.9	3,163	95,000	553	5,820
NEW JERSEY	3,999,314	5,859	8,857	2,215	4,940,412	11,515	14,039	2,842	5,803,743	22,025.6	3,795	7,185,000	45,225	6,294
Fairfield	504,342	861	1,301	2,580	653,589	1,826	2,226	3,406	792,814	3,693.9	4,659	950,000	7,567	7,965
Litchfield	98,872	135	204	2,063	119,856	267	326	2,716	144,091	534.7	3,711	175,000	1,111	6,350
New Haven	545,784	755	1,141	2,091	660,315	1,449	1,766	2,675	744,948	2,644.7	3,550	845,000	4,943	5,850
CONNECTICUT	1,148,998	1,751	2,646	2,303	1,433,760	3,542	4,318	3,012	1,681,853	6,873.3	4,087	1,970,000	13,621	6,914
REGION	15,146,950	22,720	34,341	2,267	17,624,345	42,007	51,211	2,906	19,755,805	76,312.5	3,863	22,515,000	144,050	6,397

Sources: U.S. Bureau of the Census, Census of Population, Number of Inhabitants: 1960, 1970, General Social and Economic Characteristics: 1970, County and City Data Book: 1967; Regional Plan Association.

Notes: The 1950, 1960, and 1970 income figures refer, respectively, to money income of families and unrelated individuals (not to be confused with personal income) expressed in current and constant dollars for the years 1949, 1959, and 1969. Money income excludes non-monetary items, mainly the estimated net rental value to owner-occupants of their homes, the value of services furnished without payment by financial intermediaries, and the value of food consumed on farms. Per capita money income computed by dividing the aggregate income of families and unrelated individuals by the total population. Assumptions and methodology of population and income projections contained in the Regional Plan Association press releases numbered 1181 and 1205, with accompanying documentation. Computation of 1969 $ (constant dollar) income by Regional Plan Association based on historical indices of the personal consumption expenditures price deflator.

Table 20
Employment and Floorspace, 1950, 1960, 1970 and Projected 1985

(thousands)

County	1950 Employment Total	1950 Employment Mfg.	1960 Employment Total	1960 Employment Mfg.	1960 Floorspace Comm'l.	1960 Floorspace Office	1970 Employment Total	1970 Employment Mfg.	1970 Floorspace Comm'l.	1970 Floorspace Office	1985 Employment Total	1985 Employment Mfg.	1985 Floorspace Comm'l	1985 Floorspace Office	TOTAL NON-RESIDENTIAL FLOORSPACE (000's sq. ft.) 1963	TOTAL NON-RESIDENTIAL FLOORSPACE (000's sq. ft.) 1970
Bronx	260.69	55.98	296.86	55.20	42,100	7,575	299.92	50.03	49,100	9,500	308.28	46.00	45,000	11,590	114,030	125,600
Brooklyn	718.20	251.37	728.33	226.22	92,300	21,789	719.09	197.10	102,300	23,794	724.82	172.00	97,500	27,410	275,720	292,300
Manhattan	2,501.88	558.40	2,343.24	445.21	289,800	185,000	2,556.40	352.87	360,000	250,640	2,728.51	250.00	446,400	348,810	648,650	681,200
Queens	389.09	115.50	486.85	127.05	50,500	15,331	561.62	131.13	59,800	17,807	626.25	120.80	64,000	22,580	173,010	199,200
Richmond	38.73	11.17	52.57	9.73	6,700	2,100	56.49	6.09	9,800	2,604	74.25	3.00	12,300	3,510	32,160	37,100
NEW YORK CITY	3,908.59	992.42	3,907.85	863.41	481,400	231,795	4,193.52	737.22	581,000	304,345	4,462.11	591.80	665,200	413,900	1,243,570	1,335,400
Dutchess	60.25	16.50	66.54	22.35	8,300	2,666	87.11	19.68	10,700	3,500	129.63	18.00	22,200	7,600	34,350	38,400
Nassau	189.11	44.14	374.13	92.28	59,600	15,029	524.63	106.05	85,500	22,793	640.19	110.00	103,800	27,530	198,390	224,600
Orange	52.49	14.46	59.13	16.12	8,500	1,758	74.26	15.66	13,000	2,495	104.78	14.40	22,100	5,050	30,840	34,300
Putnam	3.07	.36	6.10	.97	600	237	9.77	1.31	1,600	427	21.03	1.55	5,100	1,780	3,270	4,400
Rockland	26.60	10.28	41.34	11.94	5,900	1,563	64.46	11.79	15,100	4,786	95.47	14.60	25,700	9,260	33,860	43,700
Suffolk	76.20	6.63	168.16	42.39	29,800	9,885	288.85	58.48	54,600	12,900	459.73	69.00	96,200	26,000	128,310	168,100
Sullivan	14.29	.72	15.76	.66	2,400	356	18.83	1.02	2,700	448	24.52	2.00	3,000	640	8,620	8,700
Ulster	35.16	9.48	38.46	14.03	5,800	1,076	48.92	14.60	7,400	1,314	70.01	14.60	11,300	2,730	19,030	22,500
Westchester	199.53	42.20	261.59	58.33	41,700	9,945	338.03	57.05	66,900	17,196	448.21	57.00	96,900	27,870	152,180	159,500
NY excl. NYC	656.70	144.77	1,031.40	259.07	162,600	42,515	1,454.86	285.64	257,500	65,859	1,993.57	301.15	386,300	108,460	608,850	704,200
Bergen	155.17	67.01	242.32	92.69	45,600	11,996	334.23	105.58	60,500	16,910	485.74	122.50	92,600	28,330	154,010	232,900
Essex	396.83	145.95	414.69	127.94	67,200	22,069	436.31	107.39	81,900	28,279	472.25	86.00	93,000	34,050	211,630	236,600
Hudson	269.47	136.85	264.42	117.67	43,200	7,976	260.34	99.89	47,900	9,122	274.93	78.50	57,100	10,080	182,100	211,600
Hunterdon	14.43	3.72	15.14	4.56	2,000	348	21.25	6.33	2,500	445	32.56	9.30	4,600	880	7,740	9,800
Mercer	122.17	46.90	114.19	35.96	17,800	6,173	140.66	29.51	23,900	8,283	174.94	23.50	30,600	11,920	58,880	63,700
Middlesex	113.81	63.79	142.06	68.73	26,800	6,454	208.38	74.74	37,400	8,899	326.65	92.50	62,900	17,550	126,950	176,200
Monmouth	69.38	13.19	90.00	18.12	18,500	5,293	129.68	24.30	29,500	6,606	227.54	42.00	54,400	16,780	76,880	83,000
Morris	48.42	12.96	83.64	26.93	13,800	3,616	122.98	30.07	20,900	6,185	195.58	31.50	36,000	13,190	58,560	74,300
Ocean	17.70	.91	26.92	3.19	5,600	896	46.28	4.72	8,700	1,440	73.02	9.00	13,700	2,590	15,580	21,300
Passaic	152.15	83.85	167.67	78.40	31,400	5,332	194.44	77.58	40,600	6,978	223.64	73.00	52,500	10,820	103,810	131,000
Somerset	32.43	15.15	43.00	18.32	9,000	2,241	72.57	30.19	12,200	2,714	119.57	43.50	25,700	6,980	32,990	43,600
Sussex	10.86	2.88	13.48	2.74	2,100	428	17.89	3.12	2,700	576	27.71	4.75	4,600	970	6,730	8,300
Union	156.32	77.74	201.58	80.70	38,700	10,512	263.72	95.23	48,000	13,648	306.33	101.00	54,300	16,330	127,020	174,300
Warren	21.78	11.11	21.95	10.68	1,900	319	27.29	12.48	3,000	808	34.44	13.00	4,700	1,760	11,010	12,600
NEW JERSEY	1,580.92	682.01	1,841.06	686.63	323,600	83,653	2,286.02	701.13	419,700	110,893	2,974.90	730.05	586,700	172,230	1,173,890	1,479,200
Fairfield	215.92	98.56	253.93	111.85	39,500	10,882	326.51	120.85	59,400	15,869	426.42	130.00	84,900	30,500	159,780	182,200
Litchfield	40.67	19.36	39.23	16.91	4,200	747	48.76	18.12	5,800	924	67.00	26.40	8,100	1,580	19,310	15,200
New Haven	262.46	116.83	259.86	103.68	46,000	8,158	313.92	103.45	59,900	10,799	384.33	100.00	76,300	18,330	164,000	201,800
CONNECTICUT	519.05	234.75	553.02	232.44	89,700	19,787	689.19	242.42	125,100	27,592	877.75	256.40	169,300	50,410	343,090	399,200
REGION	6,665.26	2,053.95	7,333.33	2,041.54	1,057,300	377,750	8,623.59	1,966.41	1,383,300	508,689	10,308.33	1,879.40	1,807,500	745,000	3,369,400	3,918,000

Sources: Tri-State Regional Planning Commission; Regional Plan Association.

Notes: Estimates and projections of employment prepared by Regional Plan Association: assumptions and methodology for estimating contained in Regional Plan Association, The Region's Growth (May, 1967); and for projecting, in Regional Plan Association press release numbered 1205, with accompanying documentation. Estimates of floorspace in commercial and office buildings prepared by Regional Plan Association based on Tri-State Regional Planning Commission Land Use Inventory, 1963, and F.W. Dodge Co. unpublished annual reports of commercial and office building construction by county in the Region, 1963-1970. Projections of floorspace based on employment and square feet per worker forecasts contained in Regional Plan Association, The Office Industry (The MIT Press, 1972). Total non-residential floorspace, 1963 and 1970, from Tri-State Regional Planning Commission.
Total nonresidential floorspace consists of Manufacturing, Warehousing, Transportation-Communications-Utility floorspace, Public buildings and Commercial. The commercial category is shown separately above; it includes retail, services, and most of office building floorspace. Office floorspace as here defined includes both commercial office buildings and public office buildings.

Table 21
Households and Housing, 1950, 1960, 1970 and Projected 1985

County	1950 Households	1950 Average Annual Starts 1950-59	1950 Total Dwelling Units	1960 Households	1960 Average Annual Starts 1960-69	1960 Total Dwelling Units	1970 Households	1970 Average Annual Starts 1970-72	1970 Total Dwelling Units	1985 Households	1985 Average Annual Starts 1973-84	1985 Total Dwelling Units	TOTAL RESIDENTIAL FLOORSPACE (000's sq. ft.) 1963	1970
Bronx	424,992	4,646	432,259	463,402	6,965	473,159	497,222	4,194	508,789	535,000	8,861	561,000	436,740	475,480
Brooklyn	795,762	6,637	814,134	850,555	7,801	875,757	876,119	4,628	902,622	925,000	16,837	974,000	754,650	784,070
Manhattan	625,897	6,594	635,944	695,771	9,208	727,424	687,283	6,107	714,593	725,000	19,213	777,000	577,600	593,260
Queens	461,834	11,178	495,308	582,986	9,963	617,077	690,056	3,986	708,316	800,000	15,830	836,000	570,590	621,430
Richmond	51,496	725	55,820	61,731	2,940	65,156	86,192	3,520	89,961	130,000	4,179	139,000	64,440	88,930
NEW YORK CITY	2,359,981	29,780	2,433,465	2,654,445	36,877	2,758,573	2,836,872	22,435	2,924,281	3,115,000	64,920	3,287,000	2,404,020	2,563,170
Dutchess	34,680	221	38,344	46,962	1,270	54,647	62,495	1,293	69,126	105,000	4,488	118,000	59,820	73,740
Nassau	188,666	15,886	206,701	348,729	5,318	366,303	401,056	2,685	410,391	465,000	8,020	485,000	372,000	430,280
Orange	43,253	423	50,964	53,919	1,384	67,133	65,607	2,222	76,753	107,500	4,604	128,500	68,480	79,640
Putnam	6,091	124	11,574	9,287	538	17,701	15,995	482	22,326	33,000	1,874	44,000	19,080	23,470
Rockland	21,659	986	25,382	34,699	2,698	38,988	60,359	2,795	62,401	92,500	2,595	96,500	43,650	67,510
Suffolk	71,652	10,353	108,402	173,412	12,160	224,451	295,587	12,073	334,979	505,000	20,309	588,000	257,460	365,480
Sullivan	12,314	5	35,419	14,112	150	45,020	16,865	272	47,401	24,000	4,277	92,000	45,160	50,670
Ulster	27,891	117	36,788	36,067	318	49,359	43,533	825	55,739	67,000	3,661	93,000	50,230	59,580
Westchester	176,309	6,465	187,257	241,281	4,949	254,766	282,629	3,431	291,550	395,000	12,072	414,500	247,810	298,880
NY excl. NYC	582,515	34,580	700,831	958,468	28,785	1,118,368	1,244,126	26,078	1,370,666	1,794,000	61,900	2,059,500	1,163,690	1,449,250
Bergen	157,396	5,647	162,427	230,578	5,054	236,696	279,625	3,575	283,311	375,000	10,255	392,000	233,550	297,040
Essex	256,661	3,472	260,870	289,008	3,658	299,832	302,582	1,750	312,416	350,000	8,468	370,000	287,620	322,120
Hudson	187,859	1,018	189,614	198,029	2,119	204,800	207,499	1,213	214,749	250,000	7,084	264,000	194,530	224,520
Hunterdon	12,606	138	14,081	16,077	413	18,029	21,063	413	22,267	35,000	1,637	40,000	18,850	23,670
Mercer	59,338	1,128	60,784	76,587	2,027	79,477	93,486	2,408	96,430	135,000	4,117	142,500	83,070	101,930
Middlesex	73,107	3,688	76,353	120,404	5,190	125,347	168,076	3,240	171,711	280,000	10,660	293,000	131,550	183,780
Monmouth	64,015	2,406	82,668	96,168	4,434	115,619	135,230	4,050	150,406	240,000	10,316	269,000	122,040	159,430
Morris	44,276	2,166	53,237	71,970	3,696	82,327	109,823	2,978	116,032	200,000	8,295	213,000	85,900	125,300
Ocean	17,720	2,235	38,485	33,207	4,272	71,657	68,362	8,464	110,311	140,000	10,151	248,500	79,800	117,920
Passaic	100,911	2,279	107,577	125,926	2,279	134,391	147,214	1,017	152,767	183,000	4,893	194,500	133,600	163,060
Somerset	26,349	926	27,742	40,083	1,722	42,323	57,013	1,132	58,310	95,000	3,620	99,500	44,830	58,860
Sussex	10,076	34	17,900	14,434	912	25,098	22,809	963	31,218	40,000	2,170	56,000	26,820	33,370
Union	112,255	3,487	114,849	150,179	2,603	154,180	171,580	1,216	174,330	195,000	3,632	204,000	159,920	187,160
Warren	16,044	135	17,639	19,233	515	21,324	23,271	415	24,907	35,000	1,260	38,000	21,580	26,150
NEW JERSEY	1,138,613	28,759	1,224,226	1,481,883	38,894	1,611,100	1,807,633	32,834	1,919,165	2,553,000	86,495	2,824,000	1,623,660	2,024,310
Fairfield	143,872	5,562	153,716	194,314	5,452	208,997	243,806	4,385	254,618	325,000	8,769	348,000	210,910	264,800
Litchfield	28,915	314	33,866	36,442	841	43,343	45,550	1,400	51,052	63,000	2,068	74,000	40,520	50,590
New Haven	155,815	4,033	163,974	198,815	5,049	212,735	231,754	6,886	242,851	290,000	5,917	307,500	198,710	239,210
CONNECTICUT	328,602	9,909	351,556	429,571	11,342	465,075	521,110	12,671	548,521	678,000	16,754	729,500	450,140	554,600
REGION	4,409,711	103,028	4,710,078	5,524,367	115,898	5,953,116	6,409,741	94,018	6,762,633	8,140,000	230,069	8,900,000	5,641,510	6,591,330

Sources: U.S. Bureau of the Census, Census of Housing, 1950: General Characteristics, 1960: State and Small Areas, 1970: General Housing Characteristics; Construction Reports, Housing Authorized by Building Permits and Public Contracts, C40 Annual Summaries; Tri-State Regional Planning Commission; Regional Plan Association.

Notes: Assumptions and methodology of projections contained in the Regional Plan Association press release numbered 1205, with accompanying documentation. Total residential floorspace, 1963 and 1970, from Tri-State Regional Planning Commission.