

Utility Handbook

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FOREWORD

Instructions for preparation of cost studies and selection of proper utility combinations will be issued in this bulletin. Information to be used in rate negotiation and data for the economic evaluation and comparison of the various fuels and energies will be included. All material will be issued in accordance with the parts shown in the Table of Contents. 1/

This handbook is intended to be a working tool for the regional utility rate analysts and others concerned with utility comparison and selection. The material is based on the responsibilities and functions of the utility rate analysts set forth in Sections 3011:13, 3012:11, and 3643:6, of the Manual of Policy and Procedure. National standards of consumption, demand, life of equipment, etc. will be used until such time as actual experience data can be substituted. Ultimately, area standards will supplant national standards.

Material for the handbook, suggestions and inquiries should be sent through the regional office to the Management Standards and Services Division, Attention Utility Handbook.

1/ Parts I and II will be issued initially. Other material will be issued when prepared.

UTILITY HANDBOOK

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Foreword

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Part I. Economics of Public Utilities in Government Housing Projects

The following discussion of the background of utilities in housing projects should assist the regional utility advisers in their rate negotiations with the utility companies.

1. Economic Limit of Utility Costs Under Prevailing Conditions. The basic cost of providing utility services under prevailing conditions is governed by technical considerations of diversity, demand, power and load factors.

To achieve maximum return, the utility industry must reach the greatest number of customers, in greatest density, utilizing the generating and distributing facilities to capacity.

It has been found that the most important factor in achieving this goal is the progressive lowering of utility rates within the framework of public utility regulation; thereby reaching larger and larger economic classes until that portion of the population has been reached whose ability to pay was hitherto insufficient to buy standard utility services at regulated rates.

This group represents approximately 1/3 of the total population. In an effort to alleviate the substandard housing conditions of the most distressed portion of this group, various laws were enacted providing for public low-rent housing projects.

2. Public Housing Tenants Are Beneath the Economic Limit of Prevailing Utility Charges. All efforts on the part of the public utility companies to include in the utility customer's list the above described low income strata of our population failed, because the cost of the utility services as prescribed by Utility Commission regulations for private consumers exceeded the paying ability of the occupants of public housing projects.

The Federal Power Commission and State Utility Commissions recognize the necessity of a sound financial utility company structure with an assured fair return on the investment to attract the required capital for efficient operation. This excludes the possibility of subsidy or unearned special rates to a section of customer groups differing in paying ability only. The extension of this unearned, undeserved privilege would be a discrimination against the rest of the consumers and the shareholders of the company. However, the public housing projects are designed to eliminate or absorb some of the high cost elements of the normal services to private customers.

3. Difference Between a Private and Public Housing Tenant as a Utility Customer. Below are enumerated the basic service requirements and rights of the private utility customer, as defined in federal, state, and municipal regulations and ruled upon by the Supreme Court in numerous instances, and compare them with the unique contracted utility service to a public housing tenant.

- a. Rights of Private Utility Customer. A private utility customer has no obligation towards the utility industry to declare advance commitments as to type and quality of utility service requirements or their continuity. The utility industry accepted the obligation established in the utility regulations written by the State or municipal authorities that it will render specific utility services within the territory involved, to any customer requesting same.

The private customer does not have to use any of the provided services and furthermore has a right to discontinue the service altogether or increase the load requirements without warnings. In other words, the private utility customer has a right to decide which utility service he wants and in what quantities, without sufficient warning to effect changes in the basic plant size. Therefore, the generating capacity of the electric plant and the storage and generating capacity of the gas plant has to be large enough to meet the maximum demand of the combined group of customers at any one time.

The same wasteful, though unavoidable, provision exists in the entire distribution system or any portion thereof. The electric and gas lines are provided ready to serve in all developed city blocks regardless of the number of ultimate users, or quantities consumed, and regardless of continuity of service requirements of any customer.

- b. Promotional Activities of Utility Industry. The utility industry invests profitably great sums for the promotion of additional utilization of their services and to expand their list of customers. Further funds are expended for research studies to create new functional needs and new household equipment which may increase the individual tenant's consumption. Promotional rates are offered to customers at a fraction of the basic rate to induce additional loads.

It is deemed necessary to conduct constant newspaper campaigns and to engage qualified personnel to obtain and hold the good will of the "private customer."

- c. Special Rates for Manufacturers. It is an accepted standard practice in the utility field to extend a special industrial rate to manufacturing customers to meet the competition of privately owned generating plants. The demand and consumption of industrial customers are unpredictably fluctuating in relation with their incoming orders. An industrial peak load may last one month in a year and may coincide with peak utility company plant demand and drop for the rest of the year to the rate schedule established "minimum". This fluctuating, unpredictable load necessitates the creation of oversized, seldom utilized, generating and distributing facilities.

d. Services Provided by Utility Companies

- (1) Individual utility services supply connections up to customer's building (in some instances up to the meter within the building) at the ultimate utilization voltage or gas pressure and the coincidental energy or fuel losses in the secondary distribution system, and service connections are justly included in the private utility customer's rate schedule.
- (2) The utility companies provide each private customer with a metering device for each type of service used on the premises. In addition to the initial expense, the extended rate schedule rightfully includes the cost of testing, repairing, maintaining and amortizing the device and the expense of monthly readings, book-keeping, billing and collecting.
- (3) Bad debts or collection losses, in spite of the "deposit" system, is a small but persistent cost to the utility industry in their private customer business transactions.

c. Factors Affecting Unit Cost of Utilities. It is established and permitted by the utility regulatory authorities, and the utility industry, that the unit cost of electricity, gas, etc., may vary greatly and is affected by the quantity consumed, the number of functions utilized, the ratio of utilization, the hourly demand, the time period of usage, the load and power factors, the type and character of service, the type or kind of utilization (domestic, commercial or industrial), the assurance of continuity, and by the relative competitive status of other fuels or private generating plants in certain localities or industries. The basic principal must not be violated--that the total "fair return" realized on the investment shall continue to attract needed capital and that one customer group shall not be called upon to subsidize another group to whom "below cost" rates are extended to meet competition.

f. Effect of Public Housing on Utility Market. The standard utility market serving private industry, commerce and private domestic customers is based on a scientific survey and an estimate of the probable load created by the need of the people served, and their ability to pay for it.

Because of the lack of paying ability, the future tenants of public low rent housing were not included in the above realistic market analysis. General lowering of rate schedules, extensive promotion campaigns, and installment purchasing methods extended to utilization equipment, failed to absorb the future tenant of low rent housing into the standard market.

f. (cont'd)

Since 1937, the Federal Government, cooperating with the various local housing authorities, developed scientifically planned housing projects for a congressionally defined low income group of the population. It evolved scientific management methods utilizing quantity purchasing methods, absorbing certain duties assigned to the utility industry by Commission Regulations, and extending government created subsidies to augment the paying ability of its tenants.

This market of low income tenants is subsidized, planned public housing projects is an "artificially created market" set up by FPHA and local housing authorities without the help of the utility industry. The cost of private customer promotion cannot be attributed to low-rent housing projects. This "artificially created market" assumed self-imposed limitations not acceptable to individual private customers.

- (1) The load created by this "artificial market" was de facto an increment load not requiring additional, initial capital for generating, transforming or distributing facilities. As a matter of record, there is no single precedent where the utility industry has been called upon to invest capital for the enlargement of their generating and supplying facilities to enable them to serve any of the public housing projects, although the annual utility charges in the low rent housing program alone exceed \$4,000,000.
- (2) The public housing projects are provided with utility distribution systems; uniform utilization equipment such as ranges, refrigerators, domestic water heaters, space heating facilities, and motors for other mechanical equipment; crystallizing a permanent selection of utilities. The continuity of this selection is further assured by a long term renewable utility service contract. Public housing management sets aside and accumulates a reserve fund to repair, maintain and replace utilization equipment and thereby perpetuate the utility selection for the life of the project.
- (3) Public housing management introduced a new conception of the allocation of minimum adequate utility services for the tenants in the form of specifically described and quantitatively defined (in the lease) utility services to be furnished within the rental charges.

The utility service, rendered by the project within rent is in the form of illumination, refrigeration, cooking, water heating, space heating, water supply, sewer service and garbage collection facilities, estimated in limited quantities but within the basic requirements of livability.

f. (3) (cont'd)

The cost of utility services cannot be separated by the tenants. The basic differences between private and public housing purchased utility services is that the private utility customer obtains a commodity at established unit charges while the public housing tenant receives utility services rendered by the project for an inseparable part of the rent paid by him.

- g. Factors in Reduction of Utility Costs in Public Housing. A utility study revealed that the paying ability of the tenants of low-rent housing, augmented by the Government subsidy, is not adequate to pay for the utility services as defined by the regulatory authorities. However, because of the character of public low-rent housing and because of the desire of the Federal Government to avoid excessive utility costs, the expenditures of the utility company for furnishing utilities to this group is considerably reduced:

- (1) To obtain the benefit of quantity purchasing methods and to reduce the utility company's expenditures, the Federal Government furnishes, maintains, repairs, replaces and operates within the site boundary, electrical, gas and water distribution systems including primary and secondary lines and service connections. In special instances, electrical sub-stations, gas pressure reducing stations, and liquefied petroleum central stations have been furnished in order to remain within the permitted utility budget allowance.

The various distribution system losses are borne by the project instead of the utility industry.

- (2) The furnishing of individual tenant meters and all of their operating expenses are also eliminated from the utility industry's budget.
- (3) There are no collection losses, defaults, individual billing, book-keeping, or loss through theft by unlawful tapping of supply lines.
- (4) The load factor of a low rent project is higher than the average load factor of private customers, because the financial limitations result in a constant, uniform occupancy of the home.
- (5) The Federal Government has sponsored and developed various control methods and devices limiting the quantity of demand and its duration thereby increasing the over-all load factor, efficiency of utilization, and ultimate cost.
- (6) There is a continuous utility research observation and control of fuel and energy consumption maintained for the purpose of further reducing excessive utility cost items.

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4. Summary. The above presentation is an over-simplification of an admittedly complex utility problem. It is intended to emphasize the fact that the public housing project represents an increment load in a new utility market artificially created by the Federal Government with superimposed limitations and controls which are not applicable to private customers. The public housing project therefore merits a "special low cost public housing rate" classification and the associated lower utility rates.

Special rates for the above classification have been voluntarily extended in numerous cases by utility companies and approved by utility commissions and courts, but have not yet become universal practice throughout the United States.

PART II. Procedure for Preparation of the Limited Study of Contracted Fuel and Energy Costs

1. Purpose. The Limited Study of Contracted Fuel and Energy Costs is a set of calculations determining the contracted and the renegotiated energy and fuel costs and contracted RM&R and operating labor costs in order to provide an immediate economic orientation, to direct attention to excessive utility cost items and to serve as a basis for regional corrective action. As set forth in this part, this study is limited to existing utility combination and contracted fuel types but it is not limited to existing purchasing and metering methods. This limited study is not a substitute for a Comparative Utility Cost Analysis. It is only a component part of such an analysis and is dictated by the necessity for making a partial utility survey in order to detect the following items without the delay and detail incident to a comparative Utility Cost Analysis:
 - a. Excessive cost items.
 - b. Excessive consumption without justification.
 - c. Overcharges in billing.
 - d. Need of contract renegotiation due to:
 - (1) An increase in the volume of business; or
 - (2) The existence of a lower cost rate structure in the area for the character of load involved. (This includes projects where the size has been changed and where application of another available rate would reduce utility charges.)
 - e. Unauthorized use of energy or fuels by the tenants for utility functions not contemplated in the leases.
 - f. Unnecessary losses in the delivery or distribution systems, causing waste of fuel or energy.
 - g. Need for meter-testing.
 - h. Excessive minimum charges established in the utility service supply contracts. (This may be due to a lower actual consumption or demand than the original estimate.)
 - i. Municipal services absorbed by the project, where "cash payment in lieu of taxes" duplicates payments for any individual service rendered.

(Cont'd)

Par. 1 (Cont'd)

j. The desirability of the following:

- (1) Changing the present operating labor, maintenance and repair arrangements from contracts with private concerns to project maintenance operations or vice versa, or to renegotiate the present contracts, because operation reveals that the services required are not commensurate with the payments required by the contract; or
- (2) Eliminating service arrangements, where duplication is obvious and unnecessary.

2. Responsibility for Making the Study

- a. Preparation of the Study. The regional utility analyst shall assemble the source material and utility statistical data and prepare the study of Contracted Fuel and Energy Costs in accordance with the procedure set forth in paragraph 5, for each permanent public housing project and a representative number of temporary war housing projects in the region as contained in the current Directory of Active Public Housing, Report S-100. 1/
- b. Recommendations for Corrective Action. Recommendations for regional corrective action, based on the above study, shall be prepared by the regional utility analyst for submission to the assistant regional director for management.

3. Definitions

- a. Study A. Study A determines energy and fuel costs for the project, based on actual consumption and contracted rates (paid bills) where RM&R and operating labor is not contracted.
- b. Study A*. Study A* is similar study to Study A except cost of contracted RM&R and/or contracted operating labor is added to Study A.
- c. Study B. Study B is the same as Studies A and A* except that the contracted rates are applied to an estimated standard consumption in lieu of the actual consumption.

(Cont'd)

- 1/ For projects, or groups of projects served by one utility company, where the result of this limited study indicates a probability of considerable reduction of the over-all utility costs, a detailed "Comparative Utility Cost Analysis" shall be prepared by the regional utility analyst. Instructions for making such a study will be issued as Part II of this bulletin.

Par. 3 (Cont'd)

- d. Study C. Study C is the same as Studies A or A* except that other available rates are applied to the actual consumption if this other rate appears to result in lower operating cost.
 - e. Study BC. Study BC is a combined study determining the energy and fuel cost based on the standard consumption used for Study B and the other available rates used for study C.
 - f. Study D. Study D is same as Study A* except that the contracted RM&R or contracted operating labor cost (or any other contracted utility service outside of fuel and energy cost) is substituted for either (1) a lower cost contract or (2) the cost of project supplied service for the corresponding contracted function.
 - g. Per D.U. Per Month. Except where specifically stated otherwise, this term means per occupied dwelling unit per 30.4 days.
 - h. Unit Cost of Electric Energy. This is considered as the total cost of billed energy cost (including demand charge, minimum charge, charge due to ratchet clause in contract, etc.) per Kwhr. consumed and metered.
 - i. Unit Cost of Gas Fuel. This is considered as the total billed cost of fuel (including maximum hourly demand charge, minimum charge, coal charge, monthly fuel service charge, etc.) per Therm consumed and per 1000 cu. ft. consumed and metered.
4. Information Required for Preparation of Study of Fuel and Contracted Energy Costs.

<u>Information</u>	<u>Source of Information</u>
a. Project construction plans and specifications, including addenda	Regional Technical Adviser
b. Change orders	Regional Technical Adviser
c. Utility company plans and specifications	Regional Technical Adviser or Utility Company
d. Utility service supply contracts	Regional Counsel
e. Maintenance and Repair contracts	Regional Counsel

(Cont'd)

Par. 4 (Cont'd)

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| f. Energy and fuel invoices or bills | For Federally operated projects; Utility Company, Local Manager, Area Manager, or regional finance and accounts section. For Local Authority Operated Projects: Utility Company or Local Housing Authority |
| g. Tenant lease forms for project | For Federally operated projects: Regional Management Section. For Local Authority Operated Projects: LHA Management Resolution. |
| h. Utility operating labor costs | For Federally operated projects: Housing Manager or Regional Finance and Accounts Section. For Local Authority Operated Projects: Housing Manager or Local Housing Authority. |
| i. Average monthly occupancy data | Regional Statistician |
| j. Interim or average national fuel and energy demand and consumption data. | Central Office, Management Standards and Services Division, Utility Section. |
| k. Monthly Degree Days | "Degree Day Handbook" in Regional Library (The Industrial Press, N.Y.C.) |
| l. Average annual cold water temperature | Local Water Department or Water Supply Company (Utility Company) |
| m. All electric, gas and water rate schedules available in the locality | "National Electric Rate Book" in Regional Library (Federal Power Commission, Washington, D. C.)
"AGA Rate Service" in Regional Library (American Gas Association, N.Y.C.) Local Utility Company Offices. |
| n. List of utility services furnished to leased commercial facilities and cafeterias | Area Management Supervisor or Regional Commercial Facility Adviser. |

(Cont'd)

Par. 4 (Cont'd)

3. Commercial Facility leases

Area Management Supervisor or
Regional Commercial Facility
Adviser.

5. Procedure for Preparation of the Study of Fuel and Energy Contract Costs.

The Study of Contracted Fuel and Energy Costs should be confined to contracted utility expenses. Therefore fuel costs or other expense items paid by tenants or lessees and utility services rendered directly by project provided labor should be omitted. Each fuel service cost, regardless of the number and types of usages, provided it is covered by a single contract must be studied and indicated separately for each project. The starting period of the study is the month covered by the first bill received by the project for the contracted service under consideration. Exhibit 1 contains a flow diagram for making this study.

- a. Physical Construction Data Sheet. The Physical Construction Data Sheet, Form FPHA-1465 (Exhibit 2 to this Part 1/), shall be prepared for each project to show type of construction, kind of occupancy utility selection and functions and service and distribution data, using the information available on the "Project Summary Record" (Form FPHA-1170) and "Basic Data on Low-Rent Project" (Form FPHA-1336-P). This form shall be prepared in accordance with the instructions on the reverse. When the data from the project has once been assembled on this form, it can be used for subsequent studies and no additional copies of Form FPHA-1465 need be prepared.
- b. Statistical Data. A Statistical Data Sheet shall be prepared for each utility study to indicate the total cost of the segregated charges for each month, with yearly totals and average cost per occupied dwelling unit per month for each project. Forms FPHA-1466a and FPHA 1466b (Exhibits 3 and 4.1/) shall be used in gathering data for electricity and gas respectively.2/ Where one supplier serves more than one project in a locality within the regional area through one or more contracts, separate Statistical Data shall indicate (1) the monthly unit cost and (2) the total cost of fuel and energy for each project. These forms will form the basis of a Comparative Utility Cost Analysis for each project and should, therefore, indicate the total quantity of fuel and energy purchased per month from each supplier.
- c. Work Sheets. A Work Sheet, Form FPHA-1467 (Exhibit 5 1/) shall be prepared on the basis of the information contained in the physical Construction Data Sheet (FPHA-1465) and the Statistical Data (FPHA-1466a or 1466b), as follows:

(Cont'd)

1/ Exhibits 1, 2, 3, 4 and 5 will be issued shortly.

2/ Forms will also be provided for assembling statistical data on water and sewage and other fuel. These have not yet been developed.

Par. 5 (Cont'd)

- (1) Study A to show cost per dwelling unit per year of project purchased fuel and energy where these are the only contracted utility items. This study is based upon actual consumption.
 - (2) Study A* to show cost per dwelling unit per year where maintenance, repair, replacement and operating labor are contracted utility items, in addition to contracted fuel and energy. This study also is based upon actual consumption.
 - (3) Study B to show cost per dwelling unit per year using Standard Consumption estimates and contracted rates. The purpose of this study, when compared with Study A, is to show the savings in fuel and energy costs which may be obtained by reducing consumption.
 - (4) Study C to show cost per dwelling unit per year using actual consumption and the lowest applicable rate. The purpose of this study, when compared with Study A, is to show the savings in costs which may be obtained by securing a lower rate than the one in force.
 - (5) Study D to show cost per dwelling unit per year using Standard Consumption estimates and contracted rates where maintenance, repair, replacement and operating labor are contracted utility items, in addition to fuel and energy. The purpose of this study, when compared with Study A*, is to show the savings in costs which may be obtained by reducing (1) maintenance, repair and replacement contract cost and (2) operating labor contract cost.
- d. Summary Sheet of Utility Costs. For each study or group of studies, a Summary Sheet of Utility Costs shall be prepared. 1/ This will consist of a recapitulation of actual costs and possible savings.
- e. Recommendations. Accompanying the study or group of studies shall be a memorandum containing recommendations for any desirable changes. This memorandum shall be prepared by the Regional Utility Analyst.

(Cont'd)

1/ Forms for making such summaries will be provided later. Until available, the summary shall be prepared on sheets of paper.

6. Distribution of Documents.

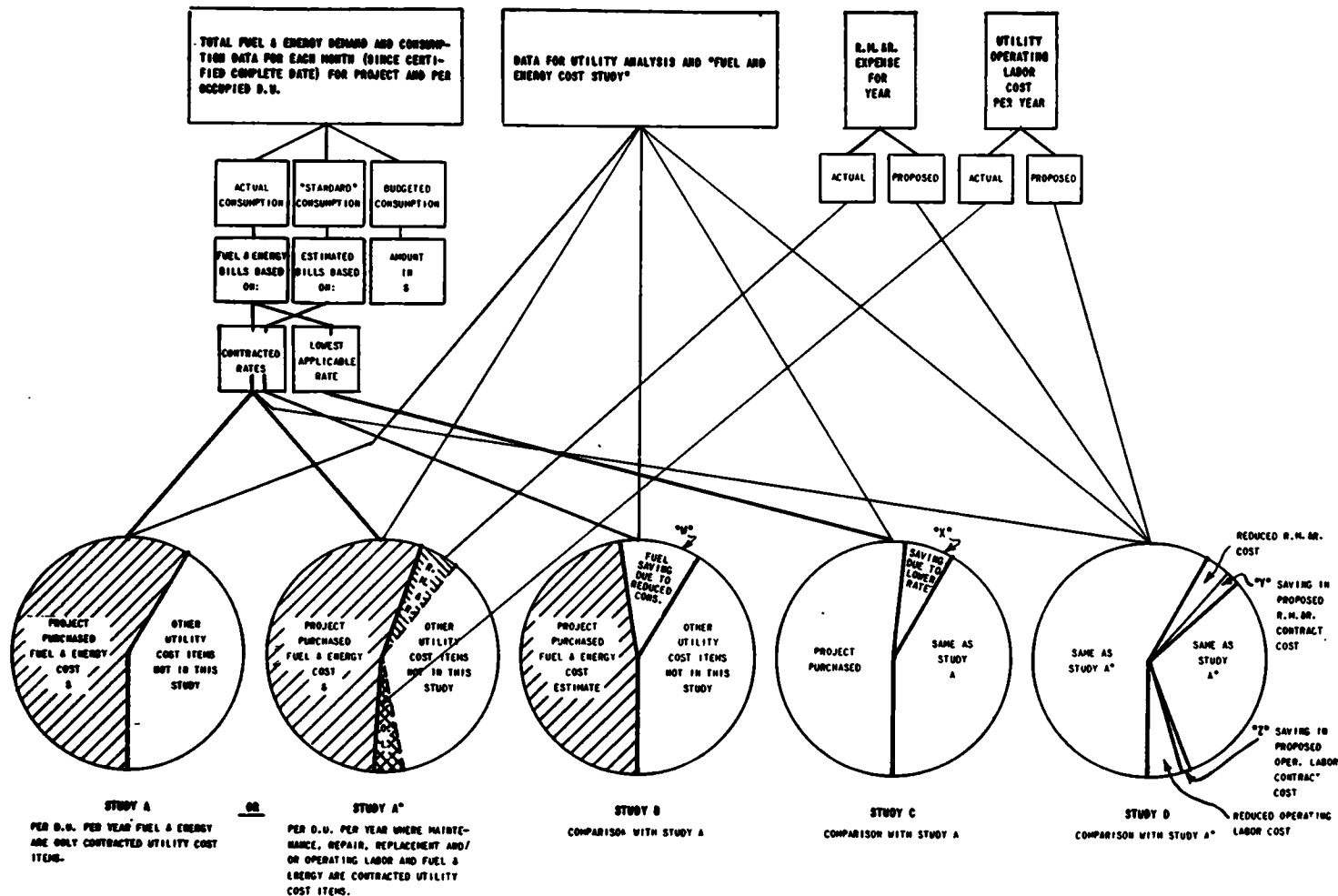
a. Study of Contracted Fuel and Energy Costs.

Original of Form FPHA-1465, 1466a or 1466b, 1467 and summary
sheets - to regional utility analyst's file
1 copy of each - to LHA Management or FPHA Housing Manager
1 copy of each - to Utility Section, Management Branch, Central Office.

b. Memorandum containing recommendation for Action.

Original - to Assistant Regional Director for Management
1 copy - to regional utility analyst's file
1 copy - to each office concerned with the recommended action
and whose cooperation is required.
1 copy - to Utilities Section, Management Division, Central Office

FLOW DIAGRAM FOR THE PREPARATION OF LIMITED STUDY OF CONTRACTED FUEL AND ENERGY COSTS



Total Saving "W" + "T" + "Y" + "Z" in \$/Proj./Year. (Based on latest occupancy)

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FPNA-1a-5 12-1-45 NATIONAL HOUSING AGENCY FEDERAL PUBLIC HOUSING AUTHORITY PHYSICAL CONSTRUCTION DATA <i>(For Utility analysis and study of contracted fuel and utility costs)</i>		DATE: _____ REGION: _____ SIGNATURE: _____	
1. PROJECT NO: _____		LOCATION: _____	
		TYPE: (Accommodation and construction)	
2. DESCRIPTION OF DWELLING UNITS:		3. STORIES AND DESIGN TYPES OF DWELLING BUILDINGS:	
4. NON-DWELLING FACILITIES AND SPACES:		5. PROJECT AREAS:	
6. COMMERCIAL SPACES:		7. UTILITIES PROVIDED AND METHOD OF PURCHASE:	
A. DWELLING UNITS			
UTILITY FUNCTIONS	FUEL OR ENERGY USED	WHOLESALE OR RETAIL	PROJECT OR TENANT FURNISHED
LIGHTING			P.F. OR B.T.U.
REFRIGERATION			
COOKING			
DOMESTIC WATER HEATING			
SPACE HEATING			
B. PROJECT OPERATED		CONSUMPTION CONTROL METHOD	
STREET LIGHTS			
AREA LIGHTS			
BUILDING SPACE LIGHTS			
FIRE ALARM			
REFRIGERATION			
COOKING			
SPACE HEATING			
WATER SUPPLY			
SEWER DISPOSAL			
B. ELECTRIC SYSTEM		9. GAS SYSTEM	
VOLTS _____	PHASE _____	TYPE: (Check one)	PRESSURE _____
LOCATION: (Check one)		MANUFACTURED _____	NATURAL _____
<input type="checkbox"/> OVERHEAD <input type="checkbox"/> UNDERGROUND		L.P. _____	BTU/100 FT. _____
OWNED BY: (Check one)		OWNED BY: (Check one)	
R.H.A.R. BY: (Check one)		R.H.A.R. BY: (Check one)	
<input type="checkbox"/> COMPANY <input type="checkbox"/> PROJECT	<input type="checkbox"/> COMPANY <input type="checkbox"/> PROJECT	<input type="checkbox"/> COMPANY <input type="checkbox"/> PROJECT	<input type="checkbox"/> COMPANY <input type="checkbox"/> PROJECT
METERING: (Check)		METERING: (Check)	
<input type="checkbox"/> WHOLESALE <input type="checkbox"/> INDIVIDUAL <input type="checkbox"/> CHECK METERS	<input type="checkbox"/> WHOLESALE <input type="checkbox"/> INDIVIDUAL <input type="checkbox"/> CHECK METERS		
10. REMARKS. (Using space at top of reverse of form, enter any additional remarks)			

10. REMARKS. (Cont'd)

INSTRUCTIONS FOR PREPARING FORM FPMA-1465
(See Bulletin No. 46, Part II, for use and distribution)

1. Project Name, Location and Type. Enter project number, location and type of construction and accommodation of project as defined in Section 3401.2 of the Manual. Examples: Detachable family dwelling; dormitory trailer.
2. Description of Dwelling Units. List number of dwelling units of each of the following classifications: 0, 1, 2, 3 bedroom units, single dormitory rooms, double dormitory rooms, trailers and the number of persons accommodated in converted buildings. Enter total number of dwelling units in project.
3. Stories and Design Types of Dwelling Buildings. List and enter number of stories of the design types of dwelling buildings as defined in Section 3401.2, paragraph 1b. Describe combination of design types as 1 stories and arrangement.
4. Non-Dwelling Facilities and Spaces. List and give area in square feet non-dwelling facilities on projects (except commercial facilities) including offices, repair shops, garages, heating plants, schools, fire houses, infirmaries, child care centers, tenant activity buildings or spaces, bus stations, telephone booths, etc. If facilities are in separate buildings, enter an "S" after the facility listed. Indicate Boiler H.P., gallon capacity of L.P. gas storage plant; K.W. of generating plant, gallons per hour of water supply pumps; H.P. of water and sewage pumps; square feet of incinerator plant, etc. In addition, list and give area in square feet of all remaining non-dwelling space such as crawl and attic spaces; corridors and stairways; storage, perambulator and janitorial space; meters; laundry and drying rooms; furnace, fuel and garbage rooms.
5. Project Areas. Describe all project areas other than buildings by listing and giving lineal feet of non-dedicated streets, and square yards of playgrounds, swimming and wading pools, sports fields, parking lots, etc.
6. Commercial Spaces. List and give square feet of each leased commercial facility such as stores, beauty parlors, snack bars, doctor's offices, etc.
7. Utilities Provided and Method of Purchase. Describe present utilities provided and method of purchase for dwelling units and for project spaces and areas.
8. Electric System. Describe electric system now in use.
9. Gas System. Describe gas system now in use.
10. Remarks. (Reverse) On reverse of form, enter any additional information or comments.

FPH-1466a 12-1-46 NATIONAL HOUSING AGENCY FEDERAL PUBLIC HOUSING AUTHORITY STATISTICAL DATA - ELECTRIC <i>(For utility analysis and study of contracted fuel and utility costs)</i>		DATE: _____ REGION: _____ SHEET NO. _____ OF _____ SPEE: _____ SIGNATURE: _____						
1. PROJECT NUMBER: _____ LOCATION: _____ 2. NAME OF UTILITY COMPANY: _____		5. BILLS INCLUDE ENERGY USED BY: (Indicate whether all or part of the bills are included) TENANT _____ PROJECT _____ COMMERCIAL _____ OTHERS _____						
3. RATE: _____ M. NO. OF MASTER METERS: _____ CONTRACTED: _____ APPLIED: _____		6. ENERGY USED FOR: _____						
7. MONTHLY BILLING DATA AND MONTHLY OCCUPANCY OF DWELLING UNITS:								
MONTHS (1)	DATE BILLING PERIOD STARTS (2)	DATE BILLING PERIOD ENDS (3)	DAYS IN BILLING PERIOD (4)	DEMAND METER READING (5)	BILLED DEMAND (6)	TOTAL BILLED KW. HOURS (7)	TOTAL NET BILL IN \$ (8)	DWELLING UNITS OCCUPIED (9)
JANUARY . . .							\$	
FEBRUARY . . .								
MARCH								
APRIL								
MAY								
JUNE								
JULY								
AUGUST								
SEPTEMBER . . .								
OCTOBER								
NOVEMBER . . .								
DECEMBER . . .								
TOTALS							\$	
8. POWER FACTOR _____ %								
9. TOTAL NUMBER OF OCCUPIED DWELLING UNITS (Col. 9) ÷ 12 = _____ AVERAGE DWELLING UNITS PER MONTH								
10. TOTAL NUMBER OF OCCUPIED DWELLING UNITS (Col. 9) X 30.4 = _____ TOTAL D.U./DAYS FOR THE YEAR								
11. TOTAL NET BILL FOR YEAR (Col. 8) ÷ TOTAL D.U./DAYS FOR YEAR (Item 10) = _____ ¢ COST PER DWELLING UNIT PER DAY								
12. TOTAL BILLED KW. HOURS (Col. 7) ÷ TOTAL D.U./DAYS FOR YEAR (Item 10). = _____ KW. HOURS PER DWELLING UNIT PER DAY								
13. TOTAL NET BILL FOR YEAR (Col. 8) ÷ 12 = \$ _____ AVERAGE COST PER MONTH FOR THE PROJECT								
14. TOTAL BILLED KW. HOURS (Col. 7) ÷ 12 = _____ AVERAGE KW. HOURS PER MONTH								
15. TOTAL D.U./DAYS FOR YEAR (Item 10) ÷ 12 = _____ AVERAGE D.U./DAYS PER MONTH								
16. TOTAL NET BILL FOR YEAR (Col. 8) ÷ TOTAL BILLED KW. HOURS (Col. 7). = _____ ¢ AVERAGE COST PER KW. HOUR								
17. TOTAL BILLED KW. HOURS ÷ (Demand Meter Reading X 24 Hours X Days in Billing Period) = LOAD FACTOR FOR:								
JAN. _____ FEB. _____ MAR. _____ APRIL _____ MAY _____ JUNE _____ JULY _____ AUG. _____ SEPT. _____ OCT. _____ NOV. _____ DEC. _____								

18. REMARKS: (if necessary, continue on reverse)

18. REMARKS (Cont'd)

INSTRUCTIONS FOR PREPARING FORM FPNA-1466a
(See Bulletin No. 46, Part II, for use and distribution)

1. Project Number and Location. Enter project number and location.
2. Name of Utility Company. Enter name of company furnishing the electricity.
3. Rate. Enter rate called for in the contract and the rate actually used for billing.
4. Number of Master Meters. Enter the number of master meters on the project.
5. Bills Include Energy Used By. Show who uses the fuel and whether all or part of the bills are included in the study.
6. Energy Used For. Enter uses of the electricity - cooking, refrigeration, space heating, etc.
7. Monthly Billing Data and Monthly Occupancy of Dwelling Units. Enter monthly billing data for the calendar year reported and monthly occupancy of dwelling units for the period as reported in item 4 of form FPNA-1226. Enter totals of columns (7), (8) and (9).
8. Power Factor. Enter power factor in %.
9. Figure and enter the average monthly occupancy of dwelling units in project.
10. Figure and enter the total D.U./days of occupancy for the year.
11. Figure and enter the average cost of energy in cents per dwelling unit per day.
12. Figure and enter the average consumption of energy per dwelling unit per day.
13. Figure and enter the average cost of energy per month for the project.
14. Figure and enter the average consumption of energy per month for the project.
15. Figure and enter the average D.U./days of occupancy per month for the project.
16. Figure and enter the average cost in cents per K.W. hour of energy.
17. Enter load factor for each month.
18. Remarks. Enter additional information. Continue on reverse if necessary.

FPHA-1466B 12-1-46		NATIONAL HOUSING AGENCY FEDERAL PUBLIC HOUSING AUTHORITY		DATE:	REGION:	SHEET NO. _____ OF _____ SHEETS		
STATISTICAL DATA - GAS <i>(For utility analysis and study of contracted fuel and energy costs)</i>								
1. PROJECT NUMBER		LOCATION:		5. BILLS INCLUDE ENERGY USED BY: (Indicate whether all or part of the bills are included) TENANT PROJECT COMMERCIAL OTHERS				
2. NAME OF UTILITY COMPANY:								
3. RATE:		4. NO. OF MASTER METERS:						
CONTRACTED:		APPLIED:						
6. ENERGY USED FOR:								
7. MONTHLY BILLING DATA AND MONTHLY OCCUPANCY OF DWELLING UNITS:								
MONTHS (1)	DATE BILLING PERIOD STARTS (2)	DATE BILLING PERIOD ENDS (3)	DAYS IN BILLING PERIOD (4)	BILLED HOURLY DEMAND (5)	BILLED M. CUBIC FEET (6)	TOTAL NET BILL IN \$ (7)	TOTAL THERMS DELIVERED (8)	DWELLING UNITS OCCUPIED (9)
JANUARY . . .						\$		
FEBRUARY . . .								
MARCH								
APRIL								
MAY								
JUNE								
JULY								
AUGUST								
SEPTEMBER . . .								
OCTOBER								
NOVEMBER								
DECEMBER								
8. B.T.U. CONTENT						TOTALS	\$	
9. TOTAL NUMBER OF OCCUPIED DWELLING UNITS (Col. 9) ÷ 12 = _____ AVERAGE DWELLING UNITS PER MONTH 10. TOTAL NUMBER OF OCCUPIED DWELLING UNITS (Col. 9) X 36.5 = _____ TOTAL D.U./DAYS FOR THE YEAR 11. TOTAL NET BILL FOR YEAR (Col. 7) ÷ TOTAL D.U./DAYS FOR YEAR (item 10) = _____ ¢ COST PER DWELLING UNIT PER DAY 12. TOTAL M. CUBIC FEET (Col. 6) ÷ TOTAL D.U./DAYS FOR YEAR (item 10) . . = _____ M. CUBIC FEET PER DWELLING UNIT PER DAY 13. TOTAL NET BILL FOR YEAR (Col. 7) ÷ 12 = \$ _____ AVERAGE COST PER MONTH FOR THE PROJECT 14. TOTAL M. CUBIC FEET (Col. 6) ÷ 12 = _____ AVERAGE M. CUBIC FEET PER MONTH 15. TOTAL D.U./DAYS FOR YEAR (item 10) ÷ 12 = _____ AVERAGE D.U./DAYS PER MONTH 16. TOTAL NET BILL FOR YEAR (Col. 7) ÷ TOTAL M. CUBIC FEET (Col. 6) . . . = _____ ¢ AVERAGE COST PER M. CUBIC FOOT 17. 100,000 - B.T.U. CONTENT (item 8) = _____ CUBIC FEET PER THERM X AVERAGE COST PER M. CUBIC FEET (item 16) = _____ ¢ AVERAGE COST PER THERM								
18. REMARKS: (if necessary, continue on reverse)								

18. REMARKS (Cont'd)

INSTRUCTIONS FOR PREPARING FORM FPNA-1460b
(See Bulletin No. 46, Part II, for use and distribution)

1. Project Number and Location. Enter project number and location.
2. Name of Utility Company. Enter name of company furnishing the gas.
3. Rate. Enter rate called for in the contract and the rate actually used for billing.
4. Number of Master Meters. Enter the number of master meters on the project.
5. Bills Include Energy Used by. Show who uses the fuel and whether all or part of the bills are included in the study.
6. Energy Used For. Enter uses of the gas - cooking, refrigeration, space heating, etc.
7. Monthly Billing Data and Monthly Occupancy of Dwelling Units. Enter monthly billing data for the calendar year reported and monthly occupancy of dwelling units for the period as reported in Item 4 of Form FPNA-1236. Enter totals of columns (6), (7), (8) and (9).
8. B.T.U. Content. Enter B.T.U. content per cubic foot.
9. Figure and enter the average monthly occupancy of dwelling units in project.
10. Figure and enter the total B.U./days of occupancy for the year.
11. Figure and enter the average cost of gas in cents per dwelling unit per day.
12. Figure and enter the average consumption of gas per dwelling unit per day.
13. Figure and enter the average cost of gas per month for the project.
14. Figure and enter the average consumption of gas per month for the project.
15. Figure and enter the average B.U./days of occupancy per month for the project.
16. Figure and enter the average cost in cents per M. cubic foot of gas.
17. Figure and enter the average cost per therm of gas.
18. Remarks. Enter additional information. Continue on reverse if necessary.

FHWA-1067 12-1-66		NATIONAL HOUSING AGENCY FEDERAL PUBLIC HOUSING AUTHORITY		REGION:	UTILITY STUDIED:	SHEET NO. _____ OF _____ SHEETS
UTILITY WORK SHEET (For utility analysis and study of contracted fuel and energy costs)				SIGNATURE:		DATE:
1. PROJECT NUMBER:		LOCATION:		10. CONTRACTED SERVICES:		
2. TYPE AND KIND OF ENERGY:				a. OPERATING LABOR:		
3. TYPE OF PURCHASE: (Check one)		d. NO. OF METERS:		b. P.M.A.:		
<input type="checkbox"/> WHOLESALE <input type="checkbox"/> RETAIL		MASTER: CHECK:		c. COST:		
5. AREAS SERVED:				11. RATE USED:		
4. FUNCTIONS:				ACTUAL: OTHER:		
<input type="checkbox"/> LIGHTING <input type="checkbox"/> COOKING <input type="checkbox"/> REFRIGERATION				12. CONSUMPTION:		
<input type="checkbox"/> HOT WATER <input type="checkbox"/> SPACE HEATING				ACTUAL: OTHER:		
7. DISTRIBUTION LOSSES:		8. STEPS OF TRANSFORMATION:		13. VOLTS OR PRESSURE:		
9. BUILDINGS CONTROLLED BY METERS:				14. TYPE OF STUDY:		
				15. BTU CONTENT: PER: (insert unit of fuel)		
16. ADDITIONAL INFORMATION AND CALCULATIONS:						
a. COMMENTS AND INFORMATION:						
b. CALCULATIONS: (continue on reverse if necessary)						

B. CALCULATIONS (Cont'd)

INSTRUCTIONS FOR PREPARING FORM FPHA-1467

(See Bulletin No. 46, Part II, for use and distribution)

In heading of form under Utility Studied, enter whether sheet is used for electric or gas study, etc..

1. Project Number and Location. Enter project number and location.
2. Type and Kind of Energy. Describe energy such as "Natural Gas," "L.P. Gas," "No. ____ Fuel Oil," etc.
3. Type of Purchase. Check whether purchased wholesale or retail.
4. No. of Meters. Enter number of master meters and number of check meters on the project.
5. Areas Served. Enter areas served such as "Tenant," "Project," "Street Lights," etc.
6. Functions. Check functions served by the energy.
7. Distribution Losses. Enter estimated distribution losses.
8. Steps of Transformation. Enter whether 1 or 2 steps of transformation.
9. Buildings Controlled By Meters. List by types the number of buildings connected through meters.
10. Contracted Services. Describe briefly the contracted services and the cost.
11. Rate Used. Enter actual rate or the cost used.
12. Consumption. Enter actual consumption or estimated consumption used.
13. Volts or Pressure. Enter volts or gas pressure in pounds per square inch at which energy is purchased.
14. Type of Study. Enter type of study made as defined in Bulletin No. 46, Part II, paragraph 3.
15. BTU Content. Enter BTU content per unit of fuel.
16. Additional Information and Calculations:
 - A. Comments and Additional Information. In the space provided, list all commercial facilities, concessions and other leased spaces. Describe any additional fuel or energy purchased by the tenant at retail. Enter any additional information or comments.
 - B. Calculations. Use this space for calculations. Use reverse side if necessary.