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CHAPTER I

INTRODUCTION

Municipal electric utility systems have existed in the United States for more than 85 years and are almost as old as the electric power industry itself. In every state of the Union, municipal electric systems are to be found. And in one state, Nebraska, all municipal electric service is furnished by government enterprise.

In the years since 1881, when the first municipal generating station was established in Pennsylvania, about 4,000 cities, towns, and villages have operated electric supply systems for their inhabitants.[1] The total number of municipal electric light and power establishments reached a

[1]Twentieth Century Fund, Electric Power and Government Policy (New York: The Twentieth Century Fund, 1948), p. 380.

peak of 3,066 in 1923,[2] declined sharply in the next decade to 1,802 in 1932, and then rose slightly to 1,860 in 1937.[3] By 1940, the number of municipally-owned electric systems had increased to about 2,050.[4] The latest tabulation published by the Federal Power Commission showed 2,067 municipally-owned electric systems serving communities of 250 population and more in the United States in 1948.[5] Since 1940, the number of municipal electric systems has remained comparatively stable at a figure somewhat above 2,000. Comparative figures for these and other electric systems are presented in Table 1.

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[2]Herbert B. Dorau, Changing Character and Extent of Municipal Ownership in the Electric Light and Power Industry (Chicago: The Institute for Research in Land Economics and Public Utilities, 1929), p. 53.

[3]U. S., Bureau of the Census, Census of Electrical Industries, Central Electric Light and Power Stations, 1932, 1937 (Washington: U. S. Government Printing Office, 1934, 1938).

[4]U. S., Federal Power Commission, Directory of Electric Utilities in the United States (Washington: Federal Power Commission, 1941), p. IV. The ownership class "Municipal, County, State and Federal-Owned" included 2,130 systems, of which about 80 are estimated to be other than municipal.

[5]The Federal Power Commission no longer compiles data on all municipal electric systems. Letter from J. H. Guthrie, Secretary, Federal Power Commission, Washington, D. C., dated March 27, 1957.

TABLE 1.--Number of electric utilities serving communities of 250 population and more in the United States, 1948

Ownership class	Systems	Communities[a]	Population[b]
Privately owned	858	18,836	78,179,664
Municipally owned	2,067	2,316	10,680,452
State and federally owned	73	365	2,153,928
Cooperatively owned	887	903	559,227
Total	3,885	22,109	91,573,271
Continental U. S.	3,866	22,017	89,849,508
Territories and possessions	19	92	1,723,763

[a]Where a community was served by two utilities in different ownership classifications the community was counted under each classification but such duplication was eliminated from the totals shown. Population in such instances was apportioned between ownership classifications on the basis of customers served.

[b]Population for incorporated communities is that shown by the Bureau of the Census for 1940. For unincorporated communities data from utility sources were used.

Source: U. S., Federal Power Commission, *Directory of Electric and Gas Utilities in the United States* (Washington: Federal Power Commission, 1948), p. I.

Although numerous and widespread, municipal electric systems have typically been small relative to the sprawling integrated private systems. Usually confined to furnishing service to customers within one city, the municipal electric systems have expanded primarily with the growth of urban population and extension of corporate limits.

National and State Studies

Within twenty years after the birth of the electric light and power industry, professional economists were writing of the impact of the new technology on monopoly problems. John R. Commons, who characteristically described himself as a "municipal ownerist,"[6] contributed a chapter entitled "Municipal Electric Lighting" to a collection of papers by American economists and specialists, published as *Municipal Monopolies*.[7] The lengthy chapter is principally a critical examination of three statistical inquiries based on conditions in the electric light industry as they were in 1893-

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[6]This apt phrase was transmitted to the writer from one of Commons' students *via* Professor Leon Lee of San Jose State College.

[7]Edited by Edward W. Bemis (New York: Crowell, 1899). The chapter by Commons, replete with tables and graphs, is on pp. 55-180.

1895, particularly in reference to municipal electric systems.[8] Explaining the significant differences in the findings of the three studies, Commons laid some of the blame on the use of the "correspondence" method of securing data,[9] but also accused one investigator of being "utterly untrustworthy" in some of his calculations.[10] Then, adjusting the figures (such as those regarding depreciation) to a "reasonable basis" and supplementing them with data of his own collection, Commons presented his own statistical conclusions, all of which were more favorable to municipal ownership than those of the three studies he criticized. And only one of the three, Commons pointed out, was avowedly antagonistic to public ownership. Of course, comparison of

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[8]Commons cited these as follows: Horatio A. Foster, article on municipal electric lighting, The Electrical Engineer, Sept. 5, 1894; Frank Parsons, articles in Arena during the latter half of 1895; and M. J. Francisco, "Municipal Ownership, Its Fallacy," published by the author in Rutland, Vermont, 1895. Ibid., pp. 64, 68.

[9]"Foster, by his own showing, had not personally visited any of the plants concerning which he reports; Francisco appears to have visited but one of the sixty-four plants tabulated in his pamphlet; and Parsons has apparently not visited more than five or six." Ibid., p. 92.

[10]Ibid., p. 95. Francisco, the accused, was an electric utility executive and former president of the National Electric Light Association, predecessor organization to the present-day Edison Electric Institute.

the costs of operation between private and municipal systems was the chief subject of contention.

Another chapter in Municipal Monopolies, by Dr. Edward W. Bemis of Kansas State Agricultural College, is an attempt to synthesize the many fragmentary and conflicting reports on municipal electric systems and to conduct a somewhat detailed study of "typical" successes and failures.[11] Again, the lack of dependable, comparable data impeded the progress of his analysis--a fact he recognized and complained about. He concluded, however, that such an analysis was superior to delaying study until a government agency might provide data.[12]

Comprehensive national statistics were necessary, obviously, for intelligent appraisal of the municipal ownership movement in the electric light and power industry.

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[11]"The Latest Electric Light Reports," ibid., pp. 183-285.

[12]By this time, the Department of Labor had begun planning to conduct the survey culminating in the Bureau of the Census reports, discussed below. Bemis was unduly optimistic about the delay, as he said, "For many a city to defer action on the problem of electric lighting until exhaustive statistics of every plant can be obtained, or even to wait the two years [italics mine] likely to intervene before the reports of the United States Department of Labor are available, is out of the question." Ibid., pp. 183-84. The census report was published six years later.

These were first provided by the United States Bureau of the Census in 1905 in its Census of Electrical Indsutries, describing the status of the industry in 1902. Subsequent studies were conducted at five-year intervals until the final such census in 1937.[13] The Federal Power Commission now collects data on the industry and publishes a number of reports monthly, annually, and irregularly.

Census data have been supplemented by independent studies conducted by a few economists. Most notable of these independent studies were the products of workers at The Institute for Economic Research at Northwestern University, Evanston, Illinois, during the late 1920's and early 1930's. Herbert B. Dorau, while a graduate economics student at the University of Wisconsin, prepared a doctoral dissertation entitled "The Changing Character and Extent of Municipal Ownership in the Electric Light and Power Industry in the United States," which was published by the Institute at Northwestern in 1929. Dorau's ambitious study undertook

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[13]U. S., Bureau of the Census, Census of Electrical Industries: Central Electric Light and Power Stations: 1902, 1907, 1912, 1917, 1922, 1927, 1932, 1937 (Washington: U. S. Government Printing Office, 1905, 1910, 1915, 1920, 1925, 1930, 1934, 1939). Hereafter, these reports are cited as Census of Electrical Industries, followed by the appropriate year.

to collect chronological data on the development of municipal electric ownership by means of mail questionnaires, and in doing so discovered that the Bureau of the Census had consistently under-enumerated the municipal electric systems of the nation. For example, Dorau found that 3,014 municipal systems existed in 1922, while the Census count for that year was 2,581, a difference of 16.5 per cent.[14] Unfortunately, Dorau's tabulations could not be as extensive as those of the Census of Electrical Industries. Therefore, for the sake of comparability the Census figures, rather than those of Dorau, are utilized most of the time in this study.

More in the nature of propaganda is an earlier work by Carl D. Thompson, Municipal Electric Light and Power Plants in the United States and Canada.[15] Thompson depended too heavily upon the incomplete McGraw Central Station Directory, first published in 1913,[16] for his listing of

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[14]No substantial difference in definition led to this startling difference. The most likely explanation, probably, is simply that the Bureau of the Census overlooked a number of smaller systems in their enumeration, and Dorau was more able to discover such omissions by counting at a later date.

[15](Chicago: Public Ownership League of America, 1922).

[16](New York: McGraw-Hill, 1913, 1916, 1922, 1936, 1937, 1948, 1955, 1956). This publication is designed as a

municipal systems in existence in 1916. The first crude comparative rate study, state by state, was encountered in this work.

Two other outstanding studies of national scope emanated from Northwestern University shortly after Dorau's study. Myron H. Umbreit prepared a doctoral dissertation entitled "Social and Economic Factors Affecting the Municipal Ownership Movement in the Electric Light and Power Industry," which was accepted at Northwestern University and published by the same Institute in 1932. Two years following, the doctoral dissertation of Paul J. Raver, later to be Bonneville Power Administrator, was published by the Institute under the title "Recent Technological Changes and the Municipally Owned Power Plant."[17] Raver also published an article in 1933 in which he attempted to bring Dorau's data,

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trade and professional directory. Listings are by response to mail questionnaires. It is believed that this accounts for the number of omissions in the Oklahoma listings. Despite certain known omissions, however, the locations of some abandoned systems were detected from the McGraw listings which could not have been found otherwise.

[17]Raver's study was also published as a series of articles: "Municipal Ownership and the Changing Technology of the Electric Industry," Journal of Land and Public Utility Economics, VI (1930), 241-57, 386-98, and VII (1931), 78-92."

which cut off in 1927, up to the end of 1932.[18] In doing so, he expressed the guarded opinion that the shift of municipal systems to private ownership had reversed, a prediction proved correct by later events. Later in the year, the basic data for his study were published.[19]

A more recent publication dealing with the nation's municipal electric systems is the previously-cited Twentieth Century fund study, Electric Power and Government Policy. Although published in 1948, the data presented are almost wholly the result of pre-1941 investigation.[20] Despite this infirmity, the chapter on municipal electric systems is an excellent discussion, relating the movement to national power policy factually and objectively.[21] In the absence of later comprehensive studies, the Twentieth Century Fund's offering appears to be the best that recent scholarship has

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[18]Paul J. Raver, "Municipal Ownership in the Last Five Years," ibid., IX (1933), 121-34.

[19]Paul J. Raver, "Municipally Owned Generating Plants in Existence in the United States as of December 31, 1932," ibid., IX (1933), 306-13, and "Municipally Owned Establishments Which Were in Existence in the United States on December 31, 1932, and Which Were Purchasing All Current Distributed on December 31, 1930," ibid., IX (1933), 410-17.

[20]Twentieth Century Fund, op. cit., vii.

[21]Ibid., pp. 380-429.

produced. Perhaps if more of the voluminous information in the files of the Federal Power Commission were tabulated and published, more national studies might result.

A number of published and unpublished studies have dealt with the municipal electric systems within specific states. The earliest published work discovered, by Edmund E. Lincoln, treats the systems of Massachusetts.[22] Lincoln's analysis, like those of others[23] following him, was specific and detailed, a circumstance largely made possible by unusual statutory accounting and reporting requirements enforced upon Massachusetts municipal electric systems by a state public utility commission.

An exhaustive survey of the municipal electric systems in Texas is contained in Robert H. Gregory's book, _Municipal Electric Utilities in Texas_.[24] Gregory devotes

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[22] _The Results of Municipal Electric Lighting in Massachusetts_ (New York: Houghton Mifflin, 1918).

[23] For example, Herbert B. Dorau, "Municipal Ownership in the Electric Light and Power Industry of Massachusetts," _Journal of Land and Public Utility Economics_, III (1927), 298-307; and Charles H. Porter, "A Comparison of Public and Private Electric Utilities in Massachusetts," _ibid._, VII (1931), 394-438.

[24] Municipal Studies No. 20, prepared by the Bureau of Municipal Research (Austin: University of Texas Press, 1942). For an intensive analysis of regulation of private

most of his attention to the management problems of the Texas systems, but the work contains considerable historical and legal analysis of value concerning the Texas systems.

A number of other state studies have been conducted, using various methods to achieve varying objectives. Among the other state municipal electric systems so studied are California,[25] Minnesota,[26] Missouri,[27] Nebraska,[28] North

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electric systems under city franchises in Texas, in addition to material in the above work, see Gregory, "Municipally-Owned Electric Utilities in Texas" (unpublished Ph. D. dissertation, University of Texas, 1944).

[25]Frederick L. Bird and Frances M. Ryan, Public Ownership on Trial (New York: New Republic, Inc., 1930), and Frank N. Woodruff, "Comparative Analysis of Operating Costs of Public and Private Electric Utilities in California, 1924-25" (unpublished Ph. D. dissertation, University of Southern California, 1936).

[26]Helen E. Heggie, "Developments in Municipal Ownership of Electric Plants in Minnesota," Journal of Land and Public Utility Economics, IV (1928), 289-94; and Arthur Borak, "Tax Equivalents of Municipal Electric Utilities in Minnesota," ibid., XVII (1941), 59-70, and "Tax Equivalents versus Taxes of Municipal and Private Utilities in Minnesota," ibid., XXIII (1947), 381-98.

[27]Herbert F. Havlik, "The Changing Character and Extent of Municipal Ownership in the Electric Light and Power Industry of Missouri," ibid., IV (1928), 139-46.

[28]Paul J. Raver and Marion R. Sumner, Municipally Owned Electric Utilities in Nebraska (Chicago: Institute for Economic Research, 1932), and University of Nebraska, Survey of Municipal Electric and Water Systems in Nebraska (Lincoln: University of Nebraska, 1937).

Carolina,[29] Virginia,[30] Wisconsin,[31] and probably many others.[32] No studies were found dealing with the municipal electric utility systems of Oklahoma, other than brief articles on individual systems in the _Oklahoma Municipal Review_.

Aim of the Study

Several municipalities in Oklahoma established electric generating plants before statehood in 1907, issuing

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[29] C. E. Kuhlman, "Comparative Operating Costs of Municipally Owned Power Plants in North Carolina" (unpublished Ph. D. dissertation, University of North Carolina, 1941).

[30] James E. Gates, "Municipal Electric Utilities in Virginia" (unpublished Ph. D. dissertation, University of Virginia, 1934; Roland A. Egger and James E. Gates, _Municipal Ownership of Electric Undertakings in Virginia_ (Charlottesville: University of Virginia Bureau of Public Administration, 1937).

[31] Edward O. Malott, "A Study of Municipal Ownership in Wisconsin" (unpublished Ph. D. dissertation, Northwestern University, 1930), "Integration of Public and Private Electric Plants in Wisconsin," _Journal of Land and Public Utility Economics_, IV (1928), 355-66, and "Joint Operation of Municipal Utilities in Wisconsin," _ibid._, VI (1930), 196-203. Also, James R. Wallin, "Public Ownership of Electric Utilities in Wisconsin" (unpublished Ph. D. dissertation, University of Wisconsin, 1930).

[32] No attempt has been made here to collect all the bibliography of state studies. The enumeration is meant to be exemplary, not encyclopedic.

bonds under the provisions of federal law. Many more plants originated in the two decades following. Although a great number have continued to operate under municipal auspices since establishment, another substantial number have been abandoned or sold, with service from privately-owned establishments being substituted.

In the initial search of the literature, no publication could be found that listed all the municipal systems in the state; indeed, none has yet been located. No book, pamphlet, or article could be found which dealt exclusively and generally with the Oklahoma municipal electric systems. No state agency, it was discovered, exercises any general regulatory authority over the operation of the systems. No reports, other than monthly sales tax returns to the Oklahoma Tax Commission, are required by state agencies. No reports are regularly filed with any voluntary association. Electric rates charged by municipal electric systems were found to be exempt from regulation by the Oklahoma Corporation Commission. An official of the Oklahoma Municipal League estimated that there are thirty-five or forty municipal electric systems in the state. The city manager of a city operating an electric distribution system estimated that there are seventeen or eighteen municipal electric systems in Oklahoma.

This study was undertaken to provide factual information about the history and present-day status of the municipal electric utility systems in Oklahoma. The analysis centers upon the changes in their patterns of operation over the years, the aim being to detect and explain the significant shifts in the data. In addition, the study is intended to present the essentials of the role and status of municipal electric systems in the Oklahoma economy.

This study, it is believed, will add to our relatively scant knowledge about the municipal electric systems of Oklahoma. As the operation of electric systems by city officials has become, from time to time and from place to place, a subject of active controversy, the facts and analysis presented here may aid in resolving some vexing questions of public policy in the future. Of course, the controversy over municipal versus private power is only one aspect of a broader controversy. But this aspect is particularly interesting in view of certain technological developments which raise questions about the value of small isolated generating plants.

Additional knowledge of the municipal electric systems is probably desirable for use in assessing the effect of such systems on the electric power industry in Oklahoma. A significant part of the municipal electric utility group purchase their power requirements from either state or federal power projects; another portion purchase power from private electric companies.

Since knowledge expands only with use, another purpose of this study is that it may serve as a basis for further study by others in years to come. Others may wish to extend the study, while some may wish to intensify the examination of only a particular portion of the systems, utilizing the classifications and basic data presented here as guides to further investigation.

Scope of the Study

After considering the apparent paucity of primary and secondary data, it was decided that a survey of all the systems was both necessary and desirable before more detailed studies should be made. This decision was made with the full realization that the study of municipal electric utility systems in Oklahoma might be pursued in a variety of ways. For instance, the technical aspects of their operation might be given primary attention. Accounting systems might be analyzed, or comparative operating costs might be sought. The system's managerial problems might be studied, either from the viewpoint of the business manager or the public administrator. Social and cultural conditions leading to establishment of municipal systems might be examined. Interstitial economic and technical arrangements among the municipal systems, the other public power agencies, and the private utility systems might command attention. A number of other topics for detailed study surely exist. But it would be difficult, probably, to place such isolated studies in their proper perspective without the aid of a more general study encompassing all the systems within a wider framework.

Without sufficient sources of primary and secondary data on municipal electric systems in Oklahoma, personal visits to each of the systems appeared necessary. The possibility of securing adequate, complete and comparable data by mail questionnaire was discarded as unlikely. After a few exploratory visits to cities known to have municipal electric systems, the diversity of accounting methods, recordkeeping, and financial reports was apparent. This diversity (and frequent inadequacy) precluded the assembly of much desirable primary data because of the problems of establishing comparability. Decisions as to scope, then, were dictated by desire for a comprehensive approach and the availability of comparable records.

Historically, the study includes the determination of the year of establishment of all systems and the circumstances of the establishment, where such were determinable from municipal records, newspapers, and the memories of the citizenry.

Technically, the scope extends to general data for all systems on generating capacity, output, number of customers and similar information for certain years between 1902 and 1937. Data of this nature for each existing system were obtainable only for the years 1945, 1950, and 1955. Although more complete technical data are available for some of the larger generating systems in the state on an annual basis, detailed studies of only these few on an annual basis were considered outside the scope of the study.

Financially, the research was limited to analysis of bond financing, revenue from electric sales, property tax levies, and electric rate schedules in effect in 1956. Attempts to secure more adequate financial information were blocked by diverse accounting systems, inadequate reports, and in some cases absence of the necessary records. Such deficiencies rendered the task of determining costs and "profits" virtually impossible for the systems as a group. Compilation of income statements would first require intensive research in collecting the necessary data from sometimes poorly organized accounting systems. Standard forms for entry would have to be devised and a myriad of decisions made concerning cost allocation. Capital accounts would in most cases have to be reconstructed from inadequate inventory records. A financial analysis of this type was discarded as being a separate study in itself, and one that would most likely be inconclusive because of the practice of the municipalities in substituting electric sales revenue for property taxes.

The scope of study into the legal circumstances surrounding the operation of municipal electric utilities includes those statutes and cases directly applicable to municipal electric systems within the state.

Methods of Procedure

Following the preliminary investigation and establishment of the aim and scope, methods of procedure were determined. The survey of the literature disclosed that most of the investigation of municipal electric utilities took place during the two decades between 1920 and 1940.

The Federal Power Commission, it was discovered, began collecting information about all municipal electric systems in 1940, but none of the Commission's publications has presented individual data on all Oklahoma systems. The next step, then, involved study of the available records in the Federal Power Commission Regional Office in Fort Worth, Texas. Power System Statements (F.P.C. Form 12) furnished almost complete coverage of Oklahoma systems for only the years ending on December 31 in 1945, 1950, and 1955. But the Power System Statements include principally data on generating capacity, energy production and disposal, and number of customers. Other operating data, together with financial and historical information, it was seen, would have to be secured by personal visits to each of the systems.

Preliminary data collection sheets were prepared and tested on three systems of different types. After revision, another data sheet was tested on seven additional systems. Following another revision, the data sheet was standardized, reproduced, and used during all subsequent visits to systems.[33] Revision consisted principally of elimination of data categories found to be unobtainable in most systems.

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[33] A copy of the data sheet is included in Appendix A.

Where possible, system data were drawn from the written records of the municipality, including council minutes, ordinance books, bond registers, operating statements and reports, financial statements, collection registers, and auditors' reports. Newspaper accounts were consulted, when practical, if municipal records were imperfect, lost, or destroyed. Information drawn from the memories of interviewees was used only when documentary sources could not be located. Where possible the data considered unreliable or questionable were checked against bond transcripts in the Attorney General's Office, municipal budgets in the State Auditor's Office, and against material published in the literature.

Travel to each of the systems by automobile required thirty-six days, during which over 5,000 miles were covered. Three trips to the Federal Power Commission Regional Office in Fort Worth, Texas, consumed nine days. Eleven full days were spent in state offices in Oklahoma City interviewing officials and examining documents filed by municipalities. Three days were spent at the Southwestern Power Administration headquarters in Tulsa, and a half-day was consumed at the Grand River Dam Authority headquarters in Vinita. A schematic outline of travel within the state is shown in

Figure 1.

Visits to all systems were completed within the period from September 25, 1956, to February 14, 1957. Depending on the availability of records, each visit required from two to eight hours. An average of two systems a day were visited. Every municipal generating plant was inspected.

Questionnaires were mailed to the city clerks of all municipalities reported to have abandoned or sold their municipal electric systems. Additional letters were mailed to those who did not reply to the first. Inquiries were also directed to older citizens, to former city officials or employees, and to others who were able to supply some information on the abandoned systems. Since this study is primarily concerned with existing municipal systems, the data on abandonments were sought to aid in identifying certain trends. The questionnaire, which requested only readily available data, appeared justified.[34] Results of this study of abandoned municipal systems are presented in Chapter II.

Definitions

For the purpose of this study the terms "municipal

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[34] A copy of the questionnaire is included in Appendix A.

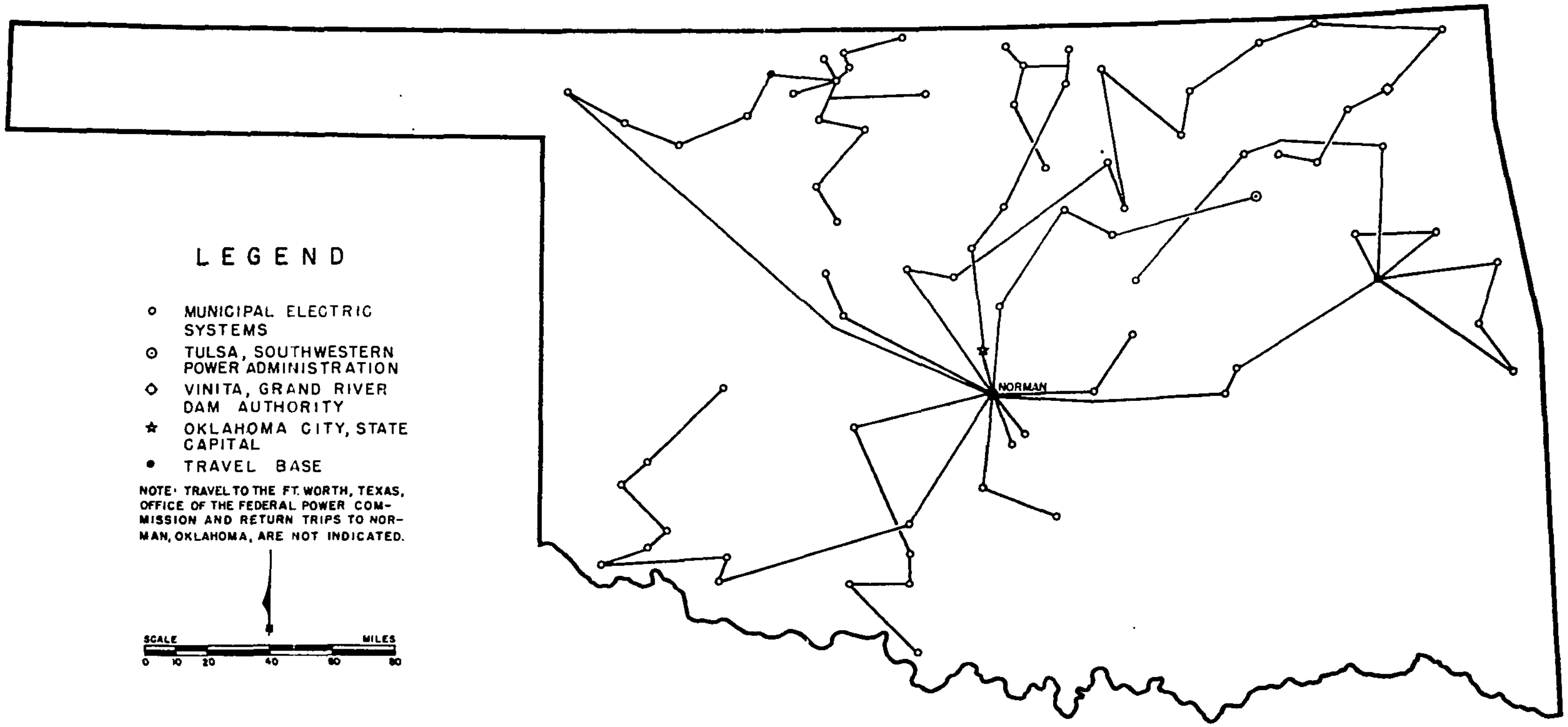

FIG. I.— SCHEMATIC OUTLINE OF TRAVEL PERFORMED BY THE WRITER IN VISITING THE MUNICIPAL ELECTRIC SYSTEMS IN OKLAHOMA, SEPTEMBER 1956 — FEBRUARY 1957.

electric utilities" and "municipal electric utility systems" will be used to refer to electric generating and distributing systems owned by cities or towns and operated by the officials of a municipality for the purpose of selling electricity to the public as well as supplying municipal needs. This definition excludes those systems still nominally owned by the city, but leased in their entirety to private utility firms under long-term contracts.[35] The definition also excludes municipal systems used only for such purposes as providing electricity for water-pumping and street-lighting, without sale to the public.

Other definitions include the following:

1. System: electric plant and equipment operated as a unit. This term conforms closely with the Census Bureau's term "establishment," a term used in earlier publications of that agency.

2. Commercial or private systems: those systems privately owned or privately operated. In Oklahoma, the two

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[35] Aline and Wilson are excluded for this reason. Both relinquished control of their systems to the Oklahoma Gas and Electric Company under 25-year contracts. As far as is known, no city in Oklahoma has ever re-established control of its system after relinquishing it under such circumstances. Such systems are therefore considered, for the purpose of this study, as "abandoned" systems.

most important private systems are the Oklahoma Gas and Electric Company and Public Service Company of Oklahoma. The Empire District Electric Company serves only a minor portion of Ottawa County in the northeastern corner of the state. Another private system, Southwestern Public Service Company, serves communities in Cimarron, Beaver, and Texas Counties, all located in the sparsely settled Oklahoma panhandle.

3. Generating systems: those municipal systems which generate all or part of the electricity they sell.

4. Purchasing or distributing systems: those municipal systems which purchase all the electricity they sell and distribute it over municipally-owned lines. Systems which maintain generating equipment on a stand-by basis, generating only infrequently and for brief periods, are included in this category.

5. Generating-purchasing systems: those municipal systems which generate a major part of their requirements but supplement their generation with electricity purchased from another source.

6. Capacity: the amount of power or load for which a machine, apparatus, station, or system is rated. Although sometimes expressed in horsepower and kilovolt-amperes, in

this study the term will always be measured by kilowatts, as expressed in the manufacturer's name plate rating. Defined in this fashion, the term is sometimes referred to as "installed capacity."

7. Energy: that which does or is capable of doing work, measured in terms of the work it is capable of doing. Electric energy is usually measured in kilowatt-hours.

The definitions of capacity and energy used above, and other more technical terms used later, conform with those usually employed in the electric power industry.[36]

Organization of the Chapters

Chapter II of the study presents the history and general characteristics of municipal electric systems in the United States and in Oklahoma. The chapter also includes a section on abandoned municipal electric systems in Oklahoma.

Chapter III presents the Oklahoma constitutional provisions and statutes and a number of state and federal court decisions that have or have had a direct effect on the establishment, operation, and abandonment of municipal

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[36]U. S., Federal Power Commission, Glossary of Important Power and Rate Terms, Abbreviations, and Units of Measurement (Washington: U. S. Government Printing Office, 1949).

electric utilities in the state.

Chapter IV is a study of chronological data on generating capacity, production and consumption of electric energy, sources of purchased current, and number of customers. Effects of certain technological developments are examined here.

Chapter V includes a discussion of some of the accounting and financing problems of municipal electric utilities, and presents data on revenue from electric sales and on bond financing. The role of the municipal electric utility as a substitute for property taxation is studied, and some recent data on tax rates and anticipated tax revenue are presented.

Chapter VI includes an analysis of electric rate schedules of all municipal systems in Oklahoma. A limited comparison of such rates with those charged by municipal and private utility systems in Oklahoma and other states is presented.

Chapter VII contains the summary and conclusions.

CHAPTER II

DEVELOPMENT AND CHARACTERISTICS OF MUNICIPAL ELECTRIC SYSTEMS IN THE UNITED STATES AND OKLAHOMA

Introduction

Appreciation of the role of the municipal electric systems in Oklahoma's urban electric industry requires a study of the history of the public ownership movement, not only in Oklahoma but in the entire United States. The developmental sequence, while not chronologically parallel in all instances, is similar in both cases. Economic and technological factors affecting the growth and decline of the movement do not appear to have been bounded by state lines.

As community endeavors, municipal electric systems have grown primarily because of the group's desire for electric power and light. City governments borrowed funds and installed generating plants when electricity was not otherwise available on attractive terms. This simple and direct method proved satisfactory, on the whole, until new financial and technological developments made it unnecessary for municipalities to engage in such business enterprises. When these developments occurred, many cities sold their plants. Others continued to operate their systems, but discarded their generating plants and began buying power wholesale. Those municipal electric systems surviving today have been forced, to a large extent, to adapt their modes of operation to a changing technology.

Municipal ownership has primarily been a small town phenomenon. Most of the establishments have been in communities with less than 2,000 population. Dorau, who examined this aspect of the movement closely, wrote in 1930:

> . . . Out of the 3,814 cases recorded at that time 29 per cent originated in communities with populations of less than 500, 55 per cent in communities having less than 1,500 population, and 80 per cent in communities with less than 2,000 population.[1]

At the same time Dorau found that approximately four out of every five municipally-owned establishments originated as municipal establishments. That is, they were built and developed by the community rather than being purchased from

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[1] Herbert B. Dorau, "The Reasons for the Decline of the Municipal Plant," Public Utilities Fortnightly, V (1930), 219.

some previous private owner.

Development of Municipal Electric Systems in the United States

Although authorities vary in specifying the exact number of municipal electric systems from year to year, it is clear that the number of municipal systems grew steadily from 1882 to 1922, decreased sharply in the next decade, and increased slowly from 1932 to 1953. Despite extreme variations in numbers, the municipal electric systems have maintained a significant share of the electricity market. But municipally-owned electric systems have never become as widespread as their proponents, such as Commons, hoped they would become. Nor have they become the threat to privately-owned systems that their early opponents feared they might. The arguments that raged in the early days of the electric light and power industry and continued into the 1930's have largely quieted, flaring only sporadically as unusual events have stirred the slowly fading coals of controversy. Today municipal electric systems are an accepted activity in many American cities, large and small. Nevertheless, it seems highly probable that each establishment of a municipal electric system and each abandonment or sale was marked by lively public discussion as the community chose a new direction in dealing with its problems of electricity supply. The numerical data to follow frequently must have had human meanings far beyond those susceptible to trend analysis.

Before the data on growth are considered, it should be pointed out that the early municipal systems were for the most part street lighting systems, with little or no direct service to consumers. Many of the early comparisons of operating costs between public and private plants failed to take account of the fundamental difference between a street lighting plant operating only at night and a commercial establishment furnishing current at all times of the day and night. As a consequence, the results were not valid. Gradually the state legislatures became more lenient and cities were allowed to sell electricity to more and more customers. In the process of expansion, the character of municipal electric systems changed. Significant economies in overhead expense per unit of current and per arc lamp were made possible. During the evolution, a municipal street lighting plant of the 1880's and 1890's usually became a fully integrated system in the first or second decade of the twentieth century, a change not reflected in the bare numbers.

The initial establishment of a municipal electric plant occurred in Pennsylvania in 1881 and by 1887, fifty municipal plants had begun operations. Five years later, 185 more municipal systems had been established. After five more years, 273 additional systems were added. Between 1898 and 1902, 307 more municipal systems began generating current. The total in operation in 1902, according to the Census Bureau, was 815.[2] Since it is known that some of the plants established before 1902 were abandoned or sold soon after establishment,[3] the census figures do not reveal the number in existence in any year before the census was taken. Dorau's study was an attempt to supply this information and shows the number of municipal establishments in existence at five-year intervals from 1882 to 1902 as follows:[4]

1882	4
1887	36
1892	190
1897	460
1902	851

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[2] Census of Electrical Industries: 1902, p. 107.

[3] Bemis, op. cit., pp. 218-23.

[4] Dorau, Changing Character and Extent of Municipal Ownership, p. 48.

It will be noticed that Dorau also counted an additional thirty-six municipal systems apparently overlooked by the census enumerators in 1902.

Most of the systems established before 1902 were in the states near the Great Lakes. Five states had sixty or more municipal systems within their borders: Ohio had 88, Indiana 82, Michigan 81, Minnesota 70, and Illinois 62. Only six states or territories had no municipally owned systems at all: Arizona, District of Columbia, Indian Territory, Nevada, New Mexico, and Wyoming.[5]

In the twenty years after 1902, according to Table 2, the number of municipal electric systems more than tripled. They reached a peak of 2,581 in 1922. The quinquennial accretions were greatest between 1912 and 1917, when 756 systems were established. Although Dorau's data are consistently above the census figures, the pattern of growth found in both sets of data is similar.[6]

The number of private systems reached its zenith in 1917, five years before the municipal systems. The

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[5] _Census of Electrical Industries: 1902_, p. 107.

[6] Dorau shows the number of municipal systems peaking in 1923, a year later than the census report, at 3,066. Dorau, _op. cit._, p. 12.

TABLE 2.--Number of municipally and privately owned electric systems in the United States at the end of selected years, 1902-1954

Year	Municipally owned: U. S. government sources[a]	Municipally owned: Dorau[b]	Privately owned: U. S. government sources[a]
1902	815	851	2,805
1907	1,252	1,274	3,462
1912	1,562	1,737	3,659
1917	2,318	2,411	4,224
1922	2,581	3,014	3,774
1927	2,198	2,320	2,137
1932	1,802	.....	1,627
1937	1,860	.....	1,340
1940	2,057[c]	.....	1,150
1945	2,092	.....	1,060
1948	2,067[d]	.....	858[d]
1949	2,074	.....	815
1950	2,077	.....	821
1951	2,079	.....	778
1952	2,070	.....	744
1953	2,063	.....	710
1954	1,980[e]	.....	592

TABLE 2.--*Continued*

[a]Data for 1902 through 1937 are from *Census of Electrical Industries: 1902-1937*; data for 1940 are from U. S., Federal Power Commission, *Directory of Electric Utilities: 1941* (Washington: Federal Power Commission, 1941); data for 1948 are from U. S., Federal Power Commission, *Directory of Electric and Gas Utilities: 1948* (Washington: Federal Power Commission, 1948); data for 1945, 1949-1954 are from U. S., Bureau of the Census, *Statistical Abstract of the United States: 1954, 1956* (Washington: U. S. Government Printing Office, 1954, 1956).

[b]Dorau, *Changing Character and Extent of Municipal Ownership*, p. 48.

[c]Number estimated by subtracting the number of county, state, and federal systems in 1948 from the number of publicly-owned systems listed in 1940.

[d]Includes only systems serving communities of 250 population or more.

[e]Original source of this number was unavailable. The count in 1954 probably excludes some smaller systems. In answer to an inquiry, the Secretary of the Federal Power Commission replied that the number of municipal systems in 1956 was "some 2,000." Letter from J. H. Guthrie, Secretary, Federal Power Commission, Washington, D. C., dated March 27, 1957.

Sources: As shown in footnotes *a* and *b* above.

reduction in private systems did not mean that electric service was reduced or that municipal systems were replacing the private plants. On the contrary, consolidations and mergers were combining the smaller private systems into larger integrated networks, bound together by high-voltage transmission lines and the ties of ownership. Census data reveal that the corporate form of organization was most common among private systems even in 1902, when 2,049 of the 2,805 private systems were owned by corporations. From 1902 to 1922, about three-fourths of the private systems were under corporate control. After 1922, the proportion owned by individuals, firms, and partnerships again dropped and by 1927 only about 15 per cent were non-corporate. The proportion remained fairly stable at about that point until 1937.[7]

From 1923 to 1932 the number of municipal systems declined sharply. There were a number of factors responsible for the decrease. The progress in high-voltage long-distance transmission of electrical energy made it technically possible for the private systems to furnish service to isolated communities long before the service was actually made available. Expansion required both increased generating

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[7] Census of Electrical Industries: 1902-1937.

capacity and heavier, longer transmission systems and the capital funds for such expansion were not readily available until the early 1920's.

The expansion of the private systems coincided with a period of readjustment among the municipal systems. In many instances the reciprocating steam engines and diesel engines installed in the early municipal systems needed replacement. Although the newer diesel engines could generate energy at less than half the cost of steam engines and somewhat less than earlier internal combustion engines, their installation often required borrowing the necessary funds. Faced with the necessity of buying expensive equipment to secure better service and tempted by attractive offers from private systems to sell, many cities chose to abandon their municipal enterprise.[8]

Given this situation, it is not particularly surprising that the Census shows the number of municipal systems decreasing from 2,581 in 1922 to 2,198 in 1927. By 1932 the number was only 1,802. Dorau found the decline more precipitate with the number dropping from 3,014 in 1922 to 2,320 in 1927.

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[8]Dorau, Public Utilities Fortnightly, V (1930), 220.

This severe decline led many to believe that the municipal electric system was a doomed institution. When the results of the 1927 census were announced, it could well be asked whether the movement was a dying one. After reviewing the census data, Professor Ralph L. Dewey concluded that the movement had indeed sustained severe blows but still would continue to live. He pointed out that the municipal plant could still compete in rates and service with the private companies when conditions of generation and transmission were not favorable to interconnection. Furthermore, he wrote, "even when conditions are favorable to interconnection, local pride, inertia, a desire to frame a financial policy for both local utilities and city government as a whole, and a belief that state regulation of private companies fails to assure low rates to domestic consumers, will tend to keep in existence a considerable number of small electric light and power systems."[9] In addition, he could see no economic reasons why large plants should not continue to operate indefinitely under municipal ownership. His analysis has proved to be substantially

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[9] Ralph L. Dewey, "The Municipal Plant: Is It Coming or Going?" Public Utilities Fortnightly, V (1930), 728.

correct.

After 1932 the number of municipal systems again increased. Although the census data do not make this clear, it seems probable that the collapse of the acquisition movement occurred about 1930.[10] The economic depression spreading over the land jolted the optimism of the business community. Legal and financial difficulties forced the huge electric utility holding companies to lay aside their expansion plans. Public resentment of the business methods of the private systems provided a setting for renewed efforts to establish municipal systems. With the hope of lower rates, the promise of federal financial assistance, and the prospect of low-cost hydroelectric power from government dams, more cities entered the field.[11] Only fifty-eight had been added to the list by 1937, but by 1940 approximately 255 more municipal systems were in operation than had been

[10] Paul J. Raver, "Municipal Ownership in the Last Five Years," Journal of Land and Public Utility Economics, IX (1933), 121.

[11] Non-federal electric power projects financed in whole or in part with Public Works Administration funds, as of March 1, 1939, numbered 340, with an installed capacity of 815,016 kilowatts. For these projects, Public Works Administration arranged $107,493,540 in loans and granted $97,581,768. U. S., Public Works Administration, America Builds: The Record of PWA (Washington: U. S. Government Printing Office, 1939), p. 278.

counted eight years before. The gain continued and in 1948 2,067 were reported by the Federal Power Commission. The available data indicate a slight decline since 1951.

Another significant development in the municipal utility field has been the shift from generating to purchasing energy. Systems generating no energy but purchasing all their distribution requirements from other systems first became important about 1912. In that year, about 12 per cent of the municipal systems purchased all their energy needs. The number of distributing systems increased more rapidly than the number of generating systems and by 1922 more than one-third of the municipal systems purchased all their energy. The sharp decline in the number of municipal systems between 1922 and 1927 was confined to the generating systems. According to Dorau, there were 1,807 generating plants in 1922. Five years later this number had decreased to only 995. During the same time period the number of distributing systems increased by 101 systems, from 1,118 to 1,219.[12] Of course, many of these systems merely shifted from one type to the other. While both types declined from 1927 to 1932, the distributing systems outnumbered all

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[12]Dorau, Changing Character and Extent of Municipal Ownership, p. 53.

generating systems slightly in 1932 and 1937. From 1932 to 1937, the number of distributing systems rose from 937 to 975 and the number of generating systems increased from 865 to 885.[13] While data are not available to indicate the proportion in the United States today, the trend toward distributing-only systems has probably continued. Such has certainly been the case in Oklahoma. Nevertheless, distributing-only establishments are probably no more important than generating systems in terms of sales of energy to ultimate consumers. In 1937 distributing systems accounted for somewhat less than one-fourth of kilowatt-hour sales of electricity by municipal systems to ultimate consumers, despite their numerical superiority.[14]

Geographical Distribution of Municipal Systems

From 1902 to 1912, more municipal electric systems were located in the East North Central states than in any other of the nine standard regional groups.[15] The West

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[13] _Census of Electrical Industries_: _1932_, p. 50; _Census of Electrical Industries_: _1937_, p. 44.

[14] _Census of Electrical Industries_: _1937_, pp. 55, 61.

[15] The standard classification of states into geographical divisions, used by the Bureau of the Census and in this study, is as follows: New England--Connecticut, Maine,

North Central states were close behind and the two regions together accounted for between 56 and 62 per cent of the total number of municipal systems in the United States. The South Atlantic region is the only other area ever having as much as 10 per cent of the nation's systems. Its high point was reached in 1922, when about 14.5 per cent of the systems were counted there.

The East North Central and West North Central states have continuously shared more than half of the municipal systems. Since 1917, however, the greater share of the municipal systems has been in the West North Central states. In that year, about one-third of the systems were in the West North Central states and about one-fourth in the East North Central states. Except for 1927, when their share rose to about 41.5 per cent, the West North Central states accounted for about 37 per cent of the municipal systems

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Massachusetts, New Hampshire, Rhode Island and Vermont; Middle Atlantic--New Jersey, New York, Pennsylvania; East North Central--Illinois, Indiana, Michigan, Ohio, Wisconsin; West North Central--Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota; South Atlantic--Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia; East South Central--Alabama, Kentucky, Mississippi, Tennessee; West South Central--Arkansas, Louisiana, Oklahoma, Texas; Mountain--Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming; Pacific--California, Oregon, Washington.

from 1922 to 1937. During the same period, the proportion of systems in the East North Central states stabilized at about one-fifth of the total.[16]

In Table 3 the geographical divisions are ranked by number of electric systems within each division in 1937, the last year for which these data are obtainable. The number of systems is divided into two categories or types: generating only and distributing only. The census data for 1937 do not reflect the number of systems that both generated and purchased power. The total for the United States, however, indicates that all systems were placed in one or the other category.[17]

The West North Central states with 37 per cent of the systems had more of either type than any other division. Distributing systems predominated in the East North Central states, which had about 21 per cent of the total systems. Similarly, in the South Atlantic, Middle Atlantic, New England, and Pacific divisions, distributing systems

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[16] Census of Electrical Industries: 1902-1937.

[17] Those classified as "generating only" probably conform to the definition given for "generating establishments": "those which produce all or any part of their output in their own generating stations." Census of Electrical Industries: 1937, p. 2.

TABLE 3.--Number of generating and distributing municipal electric systems in the United States in 1937, by geographic divisions ranked by number of systems in each division

Division	Rank	Generating only	Distributing only	Total	Per cent of total U. S.
West North Central	1	347	341	688	37.0
East North Central	2	182	212	394	21.2
South Atlantic	3	63	149	212	11.4
West South Central	4	116	35	151	8.1
Mountain	5	59	54	113	6.1
Middle Atlantic	6	39	63	102	5.5
New England	7	25	52	77	4.1
East South Central	8	38	33	71	3.8
Pacific	9	16	36	52	2.8
United States		885	975	1,860	100.0

Source: *Census of Electrical Industries: 1937*, p. 44.

outnumbered generating systems. On the other hand, generating systems exceeded distributing systems in the West South Central, Mountain, and East South Central regions. In no division, however, did the proportion of generating to distributing systems rise as high as in the West South Central division. There generating systems outnumbered distributing systems by more than three to one. In the nation, distributing systems outnumbered generating systems by a margin of ninety, 975 to 885.[18]

With the continued population growth of urban places, the municipal ownership movement by 1956 had lost some of its small town flavor. While 80 per cent of the establishments of municipal electric systems up to 1930 had been in communities of less than 2,000 population,[19] about one-fourth of the existing systems are located today in cities of 5,000 population and over. According to Table 4, 509 cities of that size operated municipal systems. These larger systems are located in forty-three states. Seven of the states contained more than twenty larger systems: Ohio,

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[18]Data for 1882 through 1927 are based on Dorau, Changing Character and Extent of Municipal Ownership, p. 48; those for 1932 and 1937 are from Census of Electrical Industries: 1932, 1937.

[19]See above, p. 29.

TABLE 4.--Number of municipal electric systems in cities of 5,000 population or more in the United States in 1956, by geographic divisions and states

Division and state	Number of systems: State	Number of systems: Division
New England		26
Maine	3	
New Hampshire	0	
Vermont	1	
Rhode Island	0	
Massachusetts	18	
Connecticut	4	
Middle Atlantic		37
New York	15	
New Jersey	3	
Pennsylvania	19	
East North Central		102
Ohio	31	
Indiana	24	
Illinois	19	
Michigan	17	
Wisconsin	11	
West North Central		75
Minnesota	19	
Iowa	11	
Missouri	15	
North Dakota	1	
South Dakota	6	
Nebraska	13	
Kansas	10	
South Atlantic		83
Delaware	4	
Maryland	1	
Virginia	7	
West Virginia	1	
North Carolina	25	
South Carolina	14	
Georgia	16	
Florida	15	

TABLE 4.--Continued

Division and state	Number of systems: State	Number of systems: Division
East South Central		70
Kentucky	10	
Tennessee	30	
Alabama	20	
Mississippi	10	
West South Central		60
Arkansas	6	
Louisiana	15	
Oklahoma	12	
Texas	27	
Mountain		22
Montana	0	
Utah	8	
Idaho	2	
Wyoming	0	
Colorado	8	
New Mexico	3	
Arizona	1	
Nevada	0	
Pacific		34
Washington	9	
Oregon	4	
California	21	
United States		509

Source: Moody's Investors Service, *Moody's Public Utility Manual: 1956* (New York: Moody's Investors Service, 1956), p. a83.

Tennessee, Texas, North Carolina, Indiana, California, and Alabama. The East North Central states, with 102 large systems, continue to dominate the listing. The South Atlantic region is next in rank with 83 large systems, followed by the West North Central states with 75, East South Central states with 70, and West South Central states with 60.

Customers, Generation, and Revenue

Comparison of municipal and private electric systems by number alone is misleading. Despite their numerical superiority, municipal systems share a small but still significant proportion of the nation's electric utility business. In terms of customers, energy generated, and revenue from electric service, municipal systems have always been below the private systems. The municipal systems' portions of the total customers and total revenues have varied with the number of municipal systems. On the other hand, their share of energy generated has remained relatively stable.

In Table 5, data are presented showing the lesser role of municipal electric systems in the national electric utility industry. The data also show the lesser role of municipal electric systems in Oklahoma. But in the case of Oklahoma municipal systems, their percentage of the state

TABLE 5.--Percentage of customers served, electricity generated, and gross revenues received by municipal electric systems in the United States and Oklahoma, at five-year intervals, 1902-1937 and 1940-1955

Year	Percentage of customers served		Percentage of electricity generated		Percentage of revenues	
	U. S.	Okla.	U. S.	Okla.	U. S.	Okla.
1902	....	....	7.8	5.6[a]	8.1	5.7[a]
1907	14.6	10.0	4.9	7.7	8.1	7.8
1912	13.7	22.4	4.6	12.8	7.8	18.0
1917	13.6	28.4	4.1	13.7	7.9	21.8
1922	12.9	....	4.7	15.9	8.2	18.1
1927	9.8	18.8	4.5	7.6	6.8[b]	11.9[b]
1932	9.3	17.3	5.0	7.8	6.5	10.7
1937	9.8	20.0	4.6	7.2	6.9	11.1
1940[c]	....	16.2	4.4	8.7	....	11.8
1945	12.5	15.2	4.3	6.2	12.7	10.7[d]
1950	11.9	12.9	4.6	5.4	11.2	12.2[d]
1955	12.3	13.2	5.0	4.7	10.8	10.9[d]

[a]Includes ten private generating systems in Indian Territory.

[b]Data for this year and after were calculated on the basis of revenues from sale of electric service. Previous data include an estimate of the dollar value of free services rendered communities (street-lighting, etc.) by municipal electric systems.

TABLE 5.--*Continued*

[c]Data for this year through 1955 are not strictly comparable with previous years.

[d]Revenues of municipal electric systems are for the fiscal year ending June 30, while the estimates for total sales of electric service are for the year ending December 31.

Sources: *Census of Electrical Industries: 1902-1937*; data for 1940-1955 are from U. S., Federal Power Commission, *Production of Electric Energy and Capacity of Generating Plants: 1940-1955* (Washington: Federal Power Commission, 1941-1956); Edison Electric Institute, *Statistical Bulletins for the Years 1940-1955* (New York: Edison Electric Institute, 1941-1956); and, for municipal systems in Oklahoma, compilations prepared by the writer from data collected directly from municipal electric systems.

electricity business has almost always been above the national average share for municipal electric systems.

The proportion of electric utility customers served by municipal systems in the United States declined slowly from 1907 to 1922, dropping from 14.6 per cent to 12.9 per cent. After this, their share fell off sharply to somewhat less than 10 per cent in 1927. This decrease coincided with the 15 per cent reduction in the number of municipal systems between 1922 and 1927. It also coincided with a 97 per cent increase in the number of customers--an increase from 11,065,124 in 1922 to 21,790,236 in 1927.[20] It is apparent that municipal electric systems existing during this period continued to increase their aggregate number of customers. By 1945 their share had risen to 12.5 per cent and remained at about that level through 1955.

Meanwhile in Oklahoma the municipal electric systems increased their proportion of the state's electricity customers rapidly from 10 per cent in 1907 to over 28 per cent in 1917. The Oklahoma systems' share of customers dropped more sharply than that of all municipal systems between 1917 and 1927, falling to slightly less than 19 per cent. By

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[20] Census of Electrical Industries: 1922, 1927.

1955 their percentage had slipped to less than one point above the national level.

Throughout the fifty-three years depicted by the data in Table 5, municipal electric systems in the United States generated a fairly constant proportion of the nation's electricity supply. Exceeding 5 per cent of total production only in 1902, the percentage moved thereafter through a range of less than a point. In 1955 the municipal systems' share was still 5 per cent, 0.1 per cent more than their share in 1907. The stability of this series was maintained despite the decline in number of municipal generating stations and demonstrates the continuing growth of municipal capacity and output.

While never securing as large a part of the state's electric generation as of customers or revenues, the Oklahoma municipal systems' proportion of electricity generated did increase to more than three times the national share in 1922. In that year the Oklahoma municipal systems produced almost 16 per cent of the state's electric energy. Five years later municipal output had dropped to less than half this proportion. This precipitate decline is best explained by the fact that at least forty municipal generating systems in the state were abandoned from 1922 to 1927. Following this drop, the remaining municipal generating systems continued to produce about the same percentage of the state's electricity until 1945, when their share began sliding downward to the low point of the series. In 1955 it stood at 4.7 per cent, slightly less than the national level. Most of this decline resulted from the shift away from generation as municipal systems in the state began purchasing power from government hydroelectric plants.

Municipal systems in the United States maintained a comparatively stable portion of electric revenues between 1902 and 1937, ranging between 6.5 and 8.2 per cent of the total. Their share of revenues during this time was always less than their share of customers, indicating that municipal systems collected less revenue per customer than the private systems. Between 1945 and 1955 the proportion of total revenues collected by municipal systems dropped from 12.7 per cent to 10.8 per cent, according to estimates by the Federal Power Commission. As the later data are not strictly comparable with earlier Census Bureau reports, no particular importance can be ascribed to the increase in the municipal share of revenues in the later period.

In Oklahoma municipal electric utility revenues follow much the same pattern over the years as the systems' proportion of customers. Swelling rapidly with the increase in number of systems, their revenues grew from about 6 per cent in 1902 to almost 22 per cent in 1917, the peak year. By 1927 the revenues had dropped to about 12 per cent of the state total and have remained fairly stable about that level since then.

In all these respects, it is noteworthy that by 1955 Oklahoma municipal systems had established a part in the state's electric utility business closely approximating that of all municipal systems in the national totals of customers, generation, and revenues. After extreme divergence from the national scheme in the 1912-1922 period, municipal electric systems in Oklahoma have now apparently fallen into the national developmental pattern.

Development of Municipal Electric Systems in Oklahoma

According to Dorau, over half of all the municipal electric systems established in the West South Central states prior to 1928 originated in Oklahoma. His count showed that 161 systems had been established by 1928 in Oklahoma, while Texas had 70, Louisiana had 61, and Arkansas had 29.[21]

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[21]Dorau, Changing Character and Extent of Municipal Ownership, p. 35.

Some of these, of course, had been abandoned by 1928.

Similarly, the number of municipal electric systems in existence in Oklahoma at the end of five-year periods outstripped the other West South Central states from 1912 to 1937. The growth and decline in the number of municipal systems operating in this region is shown in Table 6.

One can see from Table 6 that Oklahoma was the last of the four states to begin establishing municipal electric systems. Yet by 1912, only ten years after the first four systems were reported in Oklahoma, the state had over twice as many systems as any other and more systems than the other three states combined. Oklahoma systems continued to outnumber the rest of the region until 1932. The state still had more than any of the other states in 1937.

Annual data gathered by the writer on the establishment of municipal electric systems in Oklahoma show essentially the same pattern of growth as Dorau's data, although the figures vary in unimportant respects. Table 7 presents these data for all Oklahoma establishments, where the year of establishment could be determined, in separate annual series for existing and abandoned systems. These annual series show that the greatest number of establishments took place in 1910, when twenty-two systems originated. Other

TABLE 6.--Number of municipal electric systems in existence in the West South Central states at five-year intervals, 1887-1937

Year	Oklahoma	Arkansas	Louisiana	Texas	Total
1887	...	1	...	...	1
1892	...	2	...	5	7
1897	...	3	2	6	11
1902	4	7	13	6	30
1907	14	15	23	11	63
1912	63	18	28	16	125
1917	102	22	33	28	185
1922	128	25	49	52	254
1927	90	16	36	32	174
1932	69	13	28	34	144
1937	71	14	29	37	151

Sources: Dorau, Changing Character and Extent of Municipal Ownership, p. 48; Census of Electrical Industries: 1932, p. 50; Census of Electrical Industries: 1937, p. 44.

TABLE 7.--Number of establishments of municipal electric systems in Oklahoma, by systems existing in 1956 and abandoned systems, 1901-1951

Year	Existing	Abandoned	Total
1901	2	0	2
1902	0	0	0
1903	1	0	1
1904	2	1	3
1905	1	0	1
1906	6	0	6
1907	2	2	4
1908	1	5	6
1909	8	5	13
1910	8	14	22
1911	3	5	8
1912	3	4	7
1913	1	3	4
1914	1	9	10
1915	2	6	8
1916	3	4	7
1917	3	3	6
1918	1	2	3
1919	1	2	3
1920	0	1	1
1921	7	2	9
1922	5	3	8
1923	1	1	2
1924	1	0	1
1925	1	1	2
1926	1	0	1
1927	0	1	1
1928	1	0	1
1929	0	0	0
1930	0	0	0
1931	0	2	2
1932	0	0	0
1933	0	0	0
1934	0	0	0

TABLE 7.--*Continued*

Year	Existing	Abandoned	Total
1935	1	0	1
1936	2	0	2
....[a]	...	...	...
1951[b]	2	0	2
Year undetermined	0	8	8
Total	71	84	155

[a]No establishments of either type system took place from 1937 through 1950.

[b]No establishments of either type system took place from 1952 through 1956.

Sources: Tables 10 and 13.

high years were 1909 with thirteen, 1914 with ten, and 1921 with nine.

Differences in the concentration of establishments among existing and abandoned systems are more clearly shown in Table 8, where the same data are grouped in periods of five years. These data indicate that the peak in establishments among existing systems occurred earlier than the peak among abandoned systems. Eighteen of the existing systems, or about 25 per cent, were established in the 1905-1909 period. The number established in succeeding five-year periods declined until 1920-1924, when fourteen systems began operating. Among the existing systems, sixty-three were in operation by 1924. From 1925 to 1954 only eight of the present seventy-one existing systems were established.

The peak period of establishment of now-abandoned systems came in the 1910-1914 period, when thirty-five systems originated. The number included about 42 per cent of the total abandoned. About twenty per cent of the abandoned systems were established in the following five-year period. No more than nineteen and perhaps as few as eleven of the eighty-four originations took place after 1920.

After the available data on establishments and abandonments were compiled, it was possible to attempt a

TABLE 8.--Number of establishments of municipal electric systems in Oklahoma, by existing and abandoned systems, by five-year periods, 1900-1954

Period	Existing		Abandoned		Total	
	No.	Per cent	No.	Per cent	No.	Per cent
1900-1904	5	7.0	1	1.2	6	3.9
1905-1909	18	25.4	12	14.3	30	19.4
1910-1914	16	22.5	35	41.7	51	32.9
1915-1919	10	14.1	17	20.2	27	17.4
1920-1924	14	19.7	7	8.3	21	13.5
1925-1929	3	4.2	2	2.4	5	3.2
1930-1934	0	0.0	2	2.4	2	1.3
1935-1939	3	4.2	0	0.0	3	1.9
1940-1944	0	0.0	0	0.0	0	0.0
1945-1949	0	0.0	0	0.0	0	0.0
1950-1954	2	2.8	0	0.0	2	1.3
Undetermined	0	0.0	8	9.5	8	5.2
Total	71	99.9[a]	84	100.0	155	100.0

[a]Components do not add to 100.0 because of rounding.

Source: Table 7.

reconciliation of conflicting reports of the number of municipal electric systems in existence in Oklahoma in selected years from 1902 to 1955. This reconciliation is presented in Table 9. The Bureau of the Census count was apparently accepted by Dorau for 1902, 1907, and 1912. But in 1917 the Census Bureau reported 106 systems operating in the state while Dorau counted only 102. Dorau did not comment on the discrepancy in his study. In view of the probability that the Bureau of the Census canvass was much more likely to omit municipal systems than to include four systems erroneously, the Bureau's count was accepted as more likely to be correct. In 1922, however, it appears that the Census Bureau inadvertently failed to include a large number of Oklahoma municipal systems in its canvass and counted only 100. Dorau detected 128, which more closely fits the estimate this writer was able to make. Unfortunately, the year of establishment could not be determined for eight systems. And although the year of abandonment could be found in nearly all instances, in two cases it could be established only that the systems were abandoned in some year before 1928. These gaps in the writer's data prevent accurate determination of the number of systems in existence before 1929 and force the acceptance of Dorau's count of 128

TABLE 9.--Number of municipal electric systems in existence in Oklahoma at the end of five-year intervals, 1902-1937 and 1945-1955, according to three different studies

Year	Census	Dorau	Self[a]
1902	2	4	2
1907	14	14	14
1912	63	63	63
1917	106	102	106
1922	100	128	128
1927	NA[b]	90	86
1932	69	...	71
1937	71	...	73
1945	...	...	73
1950	...	...	69
1955	...	...	71

[a]This column constitutes a reconciliation by the writer of other counts of the number of municipal electric systems in operation in the years shown. For an explanation of this reconciliation, see text.

[b]*Census of Electrical Industries: 1927*, p. 69, shows only the number of generating systems for Oklahoma (49).

Sources: *Census of Electrical Industries: 1902-1937*; Dorau, *Changing Character and Extent of Municipal Ownership*, p. 48; and data collected by the writer of this study.

in 1922.

The Census Bureau failed to publish the total number of municipal electric systems it canvassed in Oklahoma in 1927.[22] Dorau estimated that ninety systems were in operation in that year, but this writer found that only eighty-six could have been operating at the end of the year. In 1932 and 1937 it appears that the Census Bureau failed to enumerate the small distributing systems established in 1931 at May and Lambert. The writer's data show seventy-one and seventy-three systems operating in 1932 and 1937 while the Census count was two less in each year. This writer's data indicate that the number of existing systems was seventy-three in 1945, sixty-nine in 1950, and seventy-one in 1955.

Characteristics of Existing Systems in Oklahoma

Table 10 is an alphabetical list of the seventy-one Oklahoma municipalities operating municipal electric systems. For each system, the year of establishment of the municipal

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[22]The 1927 census does not include as many tabulations by states as earlier and later studies by the same agency. Comprising only ninety-two pages, it includes principally summary tables by regions and for all central electric light and power stations. Nowhere does it show the number of "purchasing-only" systems in Oklahoma; only the "generating-only" establishments are enumerated.

TABLE 10.--Municipalities in Oklahoma operating municipal electric systems as of December 31, 1956, by year of establishment, type of system, population, and county

Municipality	Year of establishment	Type system[a]	Population (1950)	County
Altus	1906	D	9,735	Jackson
Amorita	1921	D	125	Alfalfa
Anadarko	1904	G-P	6,184	Caddo
Blackwell	1910	G	9,199	Kay
Braman	1925	D	392	Kay
Burlington	1936	D	181	Alfalfa
Byron	1921	D	131	Alfalfa
Carmen	1909	D	654	Alfalfa
Cashion	1922	D	3,345	Kingfisher
Chelsea	1914	D	1,437	Rogers
Cherokee	1909	G	2,635	Alfalfa
Claremore	1906	D	5,494	Rogers
Collinsville	1912	D	2,011	Tulsa
Comanche	1911	D	2,083	Stephens
Copan	1921	D	459	Washington
Cordell	1910	D	2,920	Washita
Crescent	1921	D	1,341	Logan
Cushing	1935	G	8,414	Payne

TABLE 10.--Continued

Municipality	Year of establishment	Type system[a]	Population (1950)	County
Dacoma	1926	D	256	Woods
Duncan	1921	D	15,325	Stephens
Edmond	1909	D	6,086	Oklahoma
Eldorado	1922	D	732	Jackson
Fairview	1909	G	2,411	Major
Fort Supply	1917	D	293	Woodward
Frederick	1917	D	5,467	Tillman
Geary	1922	D	1,614	Blaine-Canadian
Goltry	1916	D	277	Alfalfa
Granite	1910	D	1,096	Greer
Hominy	1936	G-P	2,702	Greer
Kaw City	1917	D	561	Kay
Kingfisher	1901	G	3,345	Kingfisher
Laverne	1919	G	1,269	Harper
Lexington	1915	D	1,176	Cleveland
Lindsay	1910	G	3,021	Garvin
Manchester	1922	D	190	Grant
Mangum	1918	G	4,271	Greer
Manitou	1921	D	293	Tillman

TABLE 10.--Continued

Municipality	Year of establishment	Type system[a]	Population (1950)	County
Marlow	1906	G	3,399	Stephens
Miami	1910	D	11,801	Ottawa
Mooreland	1916	D	867	Woodward
Newkirk	1904	G	2,201	Kay
Okeene	1916	G	1,170	Blaine
Olustee	1923	D	455	Jackson
Orlando	1928	D	262	Logan
Pawhuska	1907	G	5,331	Osage
Pawnee	1905	D	2,861	Pawnee
Perry	1903	G	5,137	Noble
Ponca City	1913	G	20,180	Kay
Pond Creek	1909	D	1,066	Grant
Prague	1909	D	1,546	Lincoln
Pryor	1951	D	4,486	Mayes
Purcell	1912	D	3,546	McLain
Ryan	1909	D	1,019	Jefferson
Sallisaw	1908	D	2,885	Sequoyah
Skiatook	1951	D	1,734	Osage-Tulsa
S. Coffeyville	1924	D	527	Nowata

TABLE 10.--Continued

Municipality	Year of establishment	Type system[a]	Population (1950)	County
Spiro	1910	D	1,365	LeFlore
Stillwater	1901	G	20,238	Payne
Stilwell	1911	D	1,813	Adair
Stroud	1907	D	2,450	Lincoln
Tahlequah	1921	D	4,750	Cherokee
Tecumseh	1906	D	2,275	Pottawatomie
Tonkawa	1909	G	3,643	Kay
Wagoner	1910	D	4,395	Wagoner
Walters	1910	D	2,743	Cotton
Watonga	1906	D	3,249	Blaine
Waynoka	1912	G	2,018	Woods
Weleetka	1922	D	1,548	Okfuskee
Wetumka	1911	D	2,025	Hughes
Wynnewood	1906	D	2,423	Garvin
Yale	1915	D	1,359	Payne

[a]"G" means the system generates all requirements; "D" means the system is a distributing-only system; "G-P" means the system both generates and purchases power.

Sources: Data collected during personal visits to each system. Population data are from U. S., Bureau of the Census, Census of Population: 1950, Vol. I (Washington: U. S. Government Printing Office, 1952), pp. 36-9--36-16.

electric system is indicated as it was determined from municipal records and newspaper files. Paul J. Raver's information concerning the year of establishment of Oklahoma municipal electric systems varies from the data in Table 10 in certain cases, sometimes by as little as one year and in two cases by as much as eleven years.[23] All such conflicts with earlier published material were carefully checked against primary documentary sources. It is believed that the inaccuracies of Raver's data resulted from his dependence upon questionnaire responses for the chronology of establishment.

An indication of the type of system operated by each municipality, whether generating, distributing, or generating-purchasing, is presented in Table 10, as well as each municipality's population in 1950 and the county or counties in which each municipality is located.

The seventy-one existing municipal electric systems

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[23]Year of establishment for thirty-nine generating systems in Oklahoma may be found in Paul J. Raver, "Municipally Owned Generating Plants in Existence in the United States as of December 31, 1932," Journal of Land and Public Utility Economics, IX (1933), 306-13. For thirty-one distributing systems, year of establishment is in Raver, "Municipally Owned Establishments Which Were in Existence in the United States on December 31, 1932, and Which Were Purchasing All Current Distributed on December 31, 1930," ibid., 410-17.

are scattered over three-quarters of the state. Not any are located in the southeastern quarter, an area of predominantly rural low-income population. Forty-one of the seventy-seven counties have at least one municipal system within their borders. The map plot in Figure 2 shows the scattered geographical location of the systems. As may be seen, Kay and Alfalfa Counties, with six systems apiece, have the heaviest concentration of systems. Blaine, Jackson, Paine, and Stephens Counties each have three systems. Two systems are located in each of twelve counties: Garvin, Grant, Greer, Kingfisher, Lincoln, Logan, Osage, Rogers, Tillman, Tulsa, Woods, and Woodward. The other twenty-three counties have only one system in each. No other significant pattern could be discerned in the geographical locations.

Table 11 presents an analysis of municipal electric systems in Oklahoma by population size and type of system. The analysis clearly shows that the bulk of the municipal electric systems in Oklahoma serve the smaller communities. Considering first the systems of both types, generating and distributing-only, it may be seen that over one-fourth of the systems are in communities of less than 1,000 population, according to the 1950 census. Two-thirds are in communities with less than 3,000 population. Only about 10 per cent of

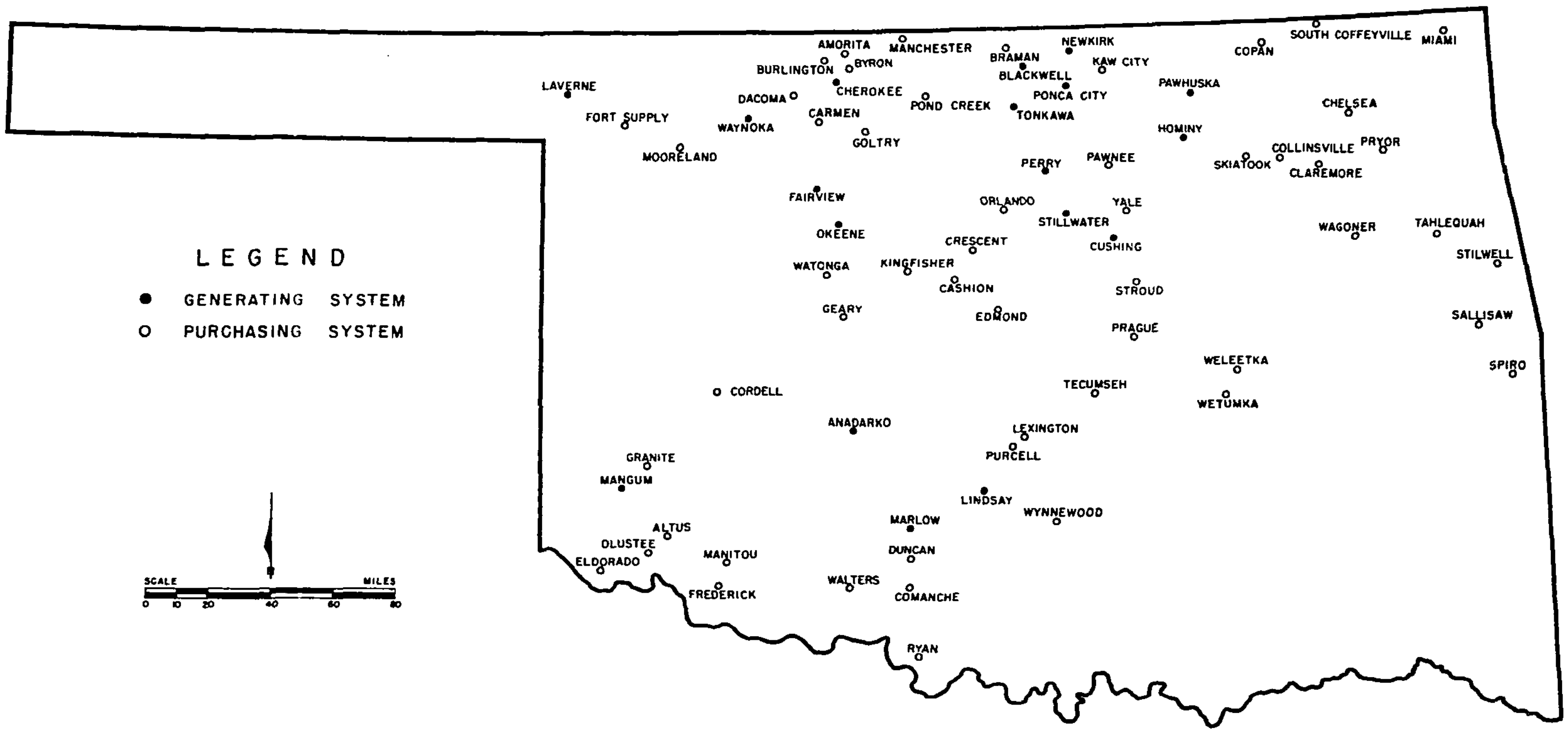

FIG. 2.— MUNICIPAL ELECTRIC SYSTEMS IN OKLAHOMA, 1956

TABLE 11.--Number and percentage distribution of municipal electric systems in Oklahoma on December 31, 1956, by type of system and population group

Population (1950)	Generating		Distributing only		Total	
	No.	Per cent	No.	Per cent	No.	Per cent
1 - 999	0	0	18	100	18	25.4
1,000 - 1,999	2	13	13	87	15	21.1
2,000 - 2,999	5[a]	33	10	67	15	21.1
3,000 - 4,999	5	50	5	50	10	14.1
5,000 - 7,499	3[b]	50	3	50	6	8.5
7,500 - 25,000	4	57	3	43	7	9.8
Total	19	..	52	..	71	....
Per cent of total	..	26.8	..	73.2	..	100.0

[a]One city in this class, Hominy, also purchases a part of its requirements from Southwestern Power Administration.

[b]One city in this class, Anadarko, also purchases a part of its requirements from Southwestern Power Administration.

Source: Table 10.

the systems are operating in cities with more than 7,500 population. Even then, the two largest cities in this class had populations only slightly more than 20,000 in 1950.

In this respect, an interesting proposition to consider is that the municipal electric system in Oklahoma is a phenomenon of the intermediate-size cities rather than one of the small towns. It is true that there are eighteen systems in communities of less than 1,000 population--communities that might be called "small towns." While these eighteen systems are a greater percentage of the total than that occurring in any other population class in Table 11, this might be simply because there are more small towns in Oklahoma where a municipal system might operate.

To test the hypothesis, incorporated places in Oklahoma were grouped into the same population classes as those in Table 11. The percentage of incorporated places in each class was calculated. If it is assumed that the existing municipal electric systems are distributed solely according to the number of communities, then it would be expected that the ratio of systems to communities would be the same as the ratio of communities in the population group to the total number of incorporated places. That is, if half the places are communities of less than 1,000 population, one would expect half the municipal systems to be in communities of less than 1,000 population. If this assumption may be granted, then the number of municipal electric systems "expected" to occur in each size class can be determined. This operation was performed, and the results are shown in Table 12.[24]

The computations show clearly that municipal systems are not distributed in the expected manner. If they were, there would be twenty-nine more systems than there are in communities of less than 1,000. On the other hand, a greater than expected number of systems are found among communities of 1,000 to 25,000 population. Further, fewer than the expected number of systems--actually, none--are operating in Oklahoma cities of 25,000 and over. Therefore it is possible to say, within the limits of the assumption, that municipal electric systems are proportionately more concentrated among Oklahoma cities from 1,000 to 25,000 population

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[24]Fearing the results might have been distorted by the inclusion of incorporated places with populations too small to support municipal electric systems, the writer stripped the distribution of all communities of less than 100 population. This figure was chosen because the smallest community now operating a municipal electric system had a population of 125 in 1950. This action reduced the number of communities in the smallest size class from 356 to 323.

TABLE 12.--Distribution of expected and actual number of municipal electric systems in Oklahoma in 1956, by population size class

Population group (1950)	Expected number	Actual number	Difference
1 - 999	47	18	-29
1,000 - 1,999	9	15	+ 6
2,000 - 2,999	5	15	+10
3,000 - 4,999	3	10	+ 7
5,000 - 7,499	3	6	+ 3
7,500 - 25,000	3	7	+ 4
25,000 and over	1	0	- 1
Total	71	71	0

Source: Table 11 and U. S., Bureau of the Census, *Census of Population: 1950*, Vol. I (Washington: U. S. Government Printing Office, 1952), pp. 36-9--36-16.

than among communities either larger or smaller.

Returning to the data in Table 11, one can see that no generating plants are operated by the eighteen systems in communities of less than 1,000; all distribute electricity purchased from other sources. Only two of fifteen systems in communities of 1,000 to 1,999 population operate generating plants; 87 per cent distribute only. In the next larger class of cities, those with populations between 2,000 and 2,999, ten of the fifteen systems are simply distribution systems. It is not until the group of cities having populations of 3,000 but less than 5,000 that the proportion of each type system is even, each type numbering five. In the next higher class, cities of 5,000 to 7,499 population, again half the systems have generating facilities, but one of the six systems supplements its generation with purchased power. In the highest bracket, including seven cities of 7,500 and over, the proportion favors the generating systems for the first time, but only slightly so, with four generating systems and three distributing systems.

About one-fourth of the systems generate all their requirements while almost three-fourths operate no generating facilities at all. Only two systems attempt to generate continuously while purchasing supplementary needs. It is apparent, then, that generation plants are considered feasible only in the communities of 1,000 population and more. And even in those communities that might consider themselves of sufficient size to operate a generating plant economically, the opportunity to do so has not been accepted recently. For instance, among the cities with populations of 3,000 and more, twelve operate generating plants while the other eleven continue to purchase all power at wholesale.

Reasons for Origination

Information was collected from council minutes and other records of communities operating municipal electric systems in an attempt to determine why they embarked upon municipal ownership. The available records left much to be desired in this respect, but it was possible in most cases at least to infer the main reasons for origination of the systems.

City clerks and newspaper editors rarely recorded the influences in favor of municipal ownership of a power plant. The clues from which inferences could be drawn generally took the form of brief entries in council minutes summarizing reports by "electric light plant committees," reports of contract negotiations with individuals seeking to sell their electric systems to the city, copies of purchase contracts, special election proclamations calling for voting on bond propositions, emergency clauses attached to municipal ordinances, and other entries of this nature. Judging from the recorded votes of council members and the comfortable majorities accorded most bond issues for the initial establishment of an electric system, little controversy attended the establishments before 1920. This lack of controversy undoubtedly contributes to the difficulty of determining the reasons for origination, but it also indicates that the problem of providing satisfactory electric service was the major consideration of both municipal officials and the electorate.

While it is true that the peak period of establishments of municipal electric systems in the state coincides with the peak of Socialist Party strength in Oklahoma, no overt connection between the two was detected. It is this writer's opinion, based on council minutes, newspaper accounts, and interviews, that no municipal electric system was originated as part of a grand socialistic program endorsed by the community. This is not to say, however, that the municipal ownership movement was never influenced by the climate of opinion toward socialism in Oklahoma. Perhaps some individual or group favoring the socialist program for government ownership of utilities exercised considerable influence over the decision to install or buy an electric system. The bare face of the documents examined do not, however, reveal any such influence.[25]

By far the most commonly encountered reason for the establishment of a system was an expressed desire to furnish electric utility service to the community. In thirty-nine of the seventy-one existing systems, no other source of electricity was available to the community, and the municipal system was brought into being to remedy this lack. In some cases private individuals were operating small gasoline generators, furnishing direct-current service to their own business establishments or homes.[26] Nevertheless, these

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[25]A study of the social, cultural, and political factors leading to the establishment and abandonment of municipal electric systems in Oklahoma would probably produce a significant contribution to the fields of economic history and public policy. It is possible that a comprehensive research program aimed specifically at these factors might unearth evidence this writer did not find. In addition to examining the available documents, the investigator of social, cultural, and political conditions, it seems, would have to conduct interviews of considerable depth with knowledgeable persons in each community.

[26]The number of communities in which such service was furnished would be difficult to determine. Citizens of both Manitou and Braman were able to give specific examples,

individuals were not equipped to furnish utility service to all who might desire it, although some strung wires to neighbors' homes or business houses.

In fifteen of the thirty-nine instances where no electric utility service was being provided the community before establishment, the electric plant was built in conjunction with the waterworks installation.[27] Engineers probably pointed out to the councilmen that an electric system could be installed at only slightly more expense and could be operated by the same crew. In addition, electricity could be used to drive the water pumps.

In twenty-eight municipalities all or part of the community was being served by a private system before the municipality began furnishing service. In these instances it was most difficult to determine the city's motive for

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but the question was not vigorously pursued in each community visited. Newspaper advertisements for "Delco" generating and battery storage systems were found to be quite common among newspapers of the 1910-1920 period.

[27]In five of these fifteen cases, the conjunction was so close that bond funds from waterworks bond issues were diverted to the installation of an electric plant. This occurred in Edmond, Kingfisher, Pawhuska, Prague, and Tecumseh. Waterworks bond funds were used in Claremore and Perry to purchase private systems. In Wynnewood, the bond issue for establishment was designated for both water and light purposes. This was permissible before statehood.

establishing a municipal plant. Unsatisfactory service by the private system can be inferred from the fact that small "Delco" plants served only a few of the residents and businesses in Amorita, Braman, Cashion, and Fort Supply. Without much doubt, however, unsatisfactory service by a private system was the reason for starting municipal plants in Blackwell, Duncan, Laverne, Lexington, Mangum, Okeene, and Stillwater; and it was probably the reason in Waynoka.

In Duncan the municipal plant began competing full-scale with the private system in 1921, but electric service was furnished earlier by a private system owned by L. E. Bumpas. Bumpas was granted a fifty-year franchise in 1902 to provide electric service to the town.[28] In June, 1909, Bumpas sold his plant to three Duncan men for $40,000. In November of that year, voters overwhelmingly defeated a bond proposition to buy the system, 246 to 67. Shortly afterward the system was purchased by Southwestern Cities Electric Company, serving both Duncan and Lawton. According to the writer of a booklet published by Public Service Company of Oklahoma, "The systems were bad in both towns . . . so that

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[28] Town of Duncan, Indian Territory, Ordinance No. 67, Sept. 8, 1902.

by 1915 they [the people] were ready to do anything."[29] When the company discontinued day current in February, 1917, Duncan installed two gas engines connected to generators and strung circuits to pump water and light the streets. The next month the Oklahoma Corporation Commission ordered the company to resume its discontinued day current. But city employees had already begun installing duplicate poles and lines, cutting down the company installations. After some court battles over rights-of-way, easements, and the city crews' destructive behavior, city voters in September, 1918, approved a $30,000 bond issue for improvement of the small municipal light plant and extension of service. Besides generating current for street lighting and water pumping, the city system began servicing business houses and residences.[30]

Frequent outages occurring on the company circuits contributed to extension of the municipal system's competitive success. As the company was now operating a generating plant only in Lawton, it had to transmit current to Duncan

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[29] R. H. McVey, _A History of Electric Service in Duncan, Oklahoma_ (Durant: Public Service Co. of Oklahoma, 1946), p. 5.

[30] _Ibid_.

over a poorly insulated, wood-pole transmission line, and electrical storms along this line frequently caused outages for as long as eight or ten hours. To remedy this condition, the company began constructing a steel tower transmission line in 1920. But apparently this improvement came too late. Voters approved $300,000 in power plant and distribution bonds May 5, 1921, by a majority of 307 to 96, and competition began in earnest. When Southwestern Light and Power Company took over the private franchise in 1925, it offered to buy the municipal system for $305,500, the amount of the outstanding bonds, but the proposition was defeated 571 to 392.[31]

Competition between the Duncan municipal system and Public Service Company of Oklahoma, which absorbed the assets of Southwestern Light and Power Company in 1944, continues to this day. But the unique competition has evolved into a "workable" scheme, under which the municipal system purchases all its power requirements from Public Service Company and both bill all their customers under identical rate schedules. The municipal generating system stands idle, none of its 2,410 kilowatts of capacity in use. Apparently,

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[31] _Ibid._, pp. 6-7.

the citizenry are satisfied with the situation for in 1952 the voters approved a new twenty-five year franchise for Public Service Company. And in a seemingly contradictory move, the voters turned down a proposition to sell the complete municipal system to Public Service Company the following year.[32]

The other instances of unsatisfactory service by private systems are less complex. The Blackwell city council purchased a small generating system in 1910 from an individual who told the city council that he wanted out of the business, which he considered unprofitable; they immediately ordered new steam generating equipment and began extending service to residential areas. In Laverne, a small private plant had been providing current only in the evenings before the town council bought the system in 1919. Under municipal ownership the Laverne system began providing twenty-four hour service. In Lexington, only a few business houses that were served by a short transmission line from the Purcell Light and Power Company had electricity before the municipal plant was established in 1915. In Mangum, the city council bought the Mangum Electric Company properties in 1918 after

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[32]Interview with J. B. Davidson, Duncan city manager, Nov. 20, 1956.

councilmen complained for three years about poor and insufficient service. In Okeene, the local feed mill and grain elevator sold its small generating system to the city in 1916. The city then expanded the plant and extended the service. In 1901, the town council of Stillwater purchased a fifty kilowatt dynamo from two local cotton gin owners for $5,600, payable in installments at 12 per cent interest. In Waynoka, an antiquated steam engine was replaced with two gas engines as soon as the privately owned plant was purchased by the city in 1912.

In the other instances, the evidence examined left the motives for purchase unclear. In Burlington, only a few were served from a private "Delco" system until a private individual constructed a transmission line from the Cherokee municipal plant. Burlington bought the line and distribution circuits in 1936. In Claremore, Miami, Perry, Purcell, Sallisaw, Wagoner, Walters, and Weleetka, municipal purchases of going private concerns were negotiated in conjunction with the establishment of municipal water systems. Purchases of private electric plants alone occurred in Comanche, Frederick, Geary, Hominy, Manchester, Pawnee, and Tahlequah.

The establishment of municipal systems in three of the cities--Cushing, Skiatook, and Pryor--was accomplished only after lengthy legal battles. The story of Cushing's struggle from 1930 to 1935 to establish a municipal electric system is longer and more complex than that of any other Oklahoma establishment. Before the issue was finally settled, sixty-four lawsuits had been filed. In addition, four initiative petitions were circulated in the city and presented to the Cushing city council. Two newspapers, alleged to have been supported financially by the private power company were established in opposition to the Cushing Daily Citizen, which supported the city council's moves. Both of these papers failed and one went into bankruptcy. Four special elections were held: two for electric bond issues, one for franchise renewal, and one for repeal of the council-manager charter form. Supporters of the municipal electric plant proposition and the city administration won all four elections. Before the crucial elections, the power company reduced its electric rates, until near the end the rates were almost the same as the municipal system's proposed schedule.[33]

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[33] For a more complete narrative of the Cushing establishment, see J. W. Flint, "A Small City's Fight for Lower Electric Rates," Oklahoma Municipal Review, X (1936), 146-49, 158. Also, for a discussion of a court decision relating to one bond issue, see Ch. III, below.

Without going into excessive detail, it appears that the main impetus for the establishment of a municipal system in Cushing sprang from local dissatisfaction with the rates charged by Interstate Power Company of Dubuque, Iowa. This company was the owner of the private distribution system and had acquired a twenty-year franchise issued to an individual during the oil boom in 1912. In 1927 a lengthy controversy arose over the renewal of the city's street lighting contract with the company and as a result the city in 1928 voted $25,000 in bonds for an improved street lighting system. This action has been described as "a definite step toward public ownership."[34] Another step was the adoption of a council-manager charter in 1929. The new council, city manager, and city engineer began studying the possibility of constructing a municipal plant after the expiration of the company's franchise in 1932. Hearing of these plans, the company circulated an initiative petition asking for an immediate vote on renewal of the franchise. Circulators of a counter-petition induced enough persons to withdraw their signatures to render the original petition insufficient.

Realizing the need for haste, the council called a

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[34] Flint, _op_. _cit_., p. 147.

bond election for December 2, 1930, and the voters approved $300,000 in power plant bonds by a vote of 585 to 282. The bond sale was prevented by a company-supported lawsuit asking a temporary injunction. Although the issue and sale were validated by the state district court, the delay made it impossible to deliver the bonds within the sixty-day period specified by the bond buyer's bid and the sale was lost. The Oklahoma Supreme Court refused to approve a later sale of the bonds authorized at this election because the purposes stated in the election proposition and in the bonds themselves were different.

In early 1931 a second initiative was circulated, asking that the franchise renewal be submitted to the voters. After a year's legal wrangling, including an appeal to the state supreme court, voters turned down a new franchise for Interstate Power Company by a vote of 1,925 to 1,181. Meanwhile, two other petitions calling for repeal of the city charter had been circulated. One was rejected by the city clerk for insufficiencies. After the Oklahoma Supreme Court ordered the election, the other proposition for charter repeal was defeated in 1934 by a vote of 1,418 to 604.

As a result of statements printed in the newspapers of Cushing, indictments for libel were returned against the alleged offenders, all of whom were supporters of the power company. Acquittals and dismissals disposed of the cases, and the persons indicted for libel later filed suits charging city officials with malicious prosecution and asking $190,750 in damages. The damage suits were filed shortly after the incumbent city council was returned to office in the spring election of 1932. The damage cases were never tried.

When the city council encountered difficulty in selling the bonds voted in 1930 through normal brokerage outlets, they asked the federal government for financial aid. The Public Works Administration agreed to buy a new $280,000 bond issue, which was approved in 1934 by a vote of 490 to 183. The federal agency also agreed to grant $70,000 to help pay for the new power plant. The bonds were sold in April, 1934, to the Public Works Administration and although the sale was enjoined, it was finally validated in late 1934. Another suit sought to prevent delivery of the bonds, but failed. Four additional suits were filed seeking to halt the construction work, which had commenced in June, 1935. All four were unsuccessful.

The company at first announced its intention to continue supplying electricity in competition with the municipal system. But faced with rapidly declining revenues in early 1936, it sold much of the remaining distribution system to the city for $7,500.[35]

In the light of this heated controversy, it is not surprising that the Cushing power plant bears a bronze tablet near its entrance with this inscription: "Dedicated to the service of humanity and to the faith and courage of an enlightened people, whose loyalty and determination, during a five year controversy, has established their right to self government and their independence from selfish interests."

Controversies over the two most recent establishments in 1951 at Skiatook and Pryor were less involved than the Cushing episode. Both provoked legal skirmishes, however, and the establishment at Pryor was marked by a unique method of raising funds for the acquisition of a private system.

The board of trustees of Skiatook enacted an ordinance on October 13, 1947, authorizing a bond election to raise funds for the purpose of acquiring an electric distribution system. On November 4 the bond issue, amounting

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[35]*Ibid.*, pp. 148-49, 158.

to $49,600, was approved. The purpose of the bond proposition was so worded that the town might use the funds either for purchasing the existing system or constructing a new distribution system, if the latter were more expedient or desirable.

Public Service Company, then serving the town without a franchise, joined two resident taxpayers in seeking an injunction. They charged that certain annexations to the town were void, that the bonds were not issued in accordance with the statutes, that the proposition submitted to the voters was void because of indefiniteness and uncertainty, and that the town trustees were actuated by a secret purpose in holding the bond election. It was charged that the trustees secretly knew that the bond issue was insufficient either to purchase or to construct a distribution system and that the first issue would have to be followed by another to complete the system.[36]

Meanwhile, a group of citizens in January, 1950, filed a petition with the town clerk asking for a referendum vote on the ordinance authorizing the bond election. The town clerk found the petition insufficient, saying the

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[36]Palmer v. Skiatook, 203 Okla. 316, 220 P. 2d 273 (1950).

ordinance was administrative in nature and not subject to the reserve powers of initiative and referendum under the state constitution. The Oklahoma Supreme Court upheld this view, saying the ordinance "is not a general law or municipal legislation."[37] After all the litigation was settled, Skiatook concluded the purchase of Public Service Company's distribution system on July 21, 1951, paying only $25,000.

The rates charged by the municipal system today are the same as those previously charged by Public Service Company, which leads one to the conclusion that one of the primary reasons for the Skiatook origination was a desire for municipal revenue. This conclusion was confirmed by city officials in personal interviews. It appears also that Skiatook was encouraged by the prospects of buying power at low rates from the Southwestern Power Administration, the federal power marketing agency in the area. Skiatook began buying power for about 5.6 mills per kilowatt-hour from this agency immediately after the acquisition of the private system.[38]

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[37] _In re Initiative Petition No. 2, Town of Skiatook_, 205 Okla. 160,236 P. 2d 247 (1951).

[38] Interview with Sam Scales, contract representative, Southwestern Power Administration, Tulsa, Oklahoma, Oct. 3, 1956.

Similar motives appeared to lead the Pryor city council to seek acquisition of Public Service Company's distribution system in that city. The city officials were aided in acquiring the system by the philanthropy of the late W. A. Graham, local banker and multimillionaire.[39] Graham offered to give the city $100,000 if the electorate would approve a $180,000 bond issue, the two amounts to be joined for purchasing the distribution system. After the bond issue was approved in 1950, Graham was called to testify in an injunction suit questioning the validity of the bond issue. The aged banker, seemingly annoyed at the legal ruckus, amended his original offer to include the full purchase price of $280,000. This of course made the bond issue unnecessary and enabled the city to proceed immediately with the purchase. The sale was consummated March 1, 1951.[40]

Just as in the case of Skiatook, Pryor began purchasing power from a government power agency, Grand River Dam

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[39] Graham's will, which the city of Pryor claimed left most of his estate to the city, provoked extended legal controversy and even some state legislation before the terms of the bequest were settled.

[40] These facts were secured by interviews with and inspection of documents filed with Frank O. Karney, office manager of the Pryor Municipal Utility Board, and Mary Jo Langley, Pryor city clerk, in Pryor, Dec. 14, 1956.

Authority. The Authority is an agency of the state of Oklahoma rather than a federal agency, but its power rates are somewhat comparable to those of the Southwestern Power Administration. Like Skiatook, Pryor continues to charge the same rates that Public Service Company charged before the city acquired the distribution system.

Administrative Control of Systems

As one might expect from the number of small towns among municipalities operating municipal electric systems, the greatest number of the systems are administered by a town board of trustees. Twenty-six of the systems fall into this category. Next in number is the council-manager form of city administration with twenty-one. In nineteen cities, a council or commission exercises control over the systems, usually through an appointive utility superintendent.

Two unusual forms of administrative control of municipal electric systems in Oklahoma are the utility board and the utility authority. The two are clearly distinguishable, as the utility board never includes council members while the utility authority, in the one case encountered, includes only council members.

Utility boards are found in four cities located in eastern Oklahoma: Miami, Pryor, Stilwell, and Tahlequah. All are similar in organization and powers. Generally, the boards are composed of four or five members, appointed by the mayor with the consent of the council for long overlapping terms. The board controls all the municipal utilities, setting policies, hiring employees, and fixing rates, subject to certain limitations contained in the charter provisions relating to the board.[41] Officials in all four cities said the utility boards were established in an attempt to free the utilities from political control and to provide continuity in administrative policies.[42]

A utility authority established in 1955 administers the utilities of Wynnewood, which include water, electricity, and sewer. The authority, whose trustees include the mayor and council, was created in order to take advantage of a new statute permitting trusts for governmental purposes to issue revenue bonds. The Wynnewood authority has issued $160,000

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[41] Charter provisions were examined in charters filed with the Secretary of State, Capitol Building, Oklahoma City, Oklahoma, by the cities of Miami, Pryor, and Tahlequah.

[42] Interviews with Ed Wright, Miami city clerk, Feb. 12, 1957; Frank A. Karney, Pryor utility board office manager, Dec. 14, 1956; Robert Dougherty, Stilwell treasurer, Dec. 13, 1956; and James M. Hicks, Tahlequah utility superintendent, Dec. 12, 1956.

in revenue bonds, which it is retiring from water and sewer revenues. No revenue bond funds were used for the electric system and electric revenues are not pledged for payment of the bonds.[43]

Water and Gas Utility Systems

Almost all of the seventy-one communities operating electric systems also operate water utility systems; sixty-six do so while only five do not. Those not operating water systems include four towns of less than 300 population where residents have their own water wells: Amorita, Burlington, Byron, and Dacoma. Kingfisher, with a 1950 population of 3,345, is served by a privately owned water company.

Gas utility systems are operated by six communities also furnishing water and electric service. These include Carmen, Cashion, Granite, Kaw City, Mangum, and Pryor.

Abandoned Systems

More municipal electric systems in the United States have been abandoned or sold than are in existence today. The same is true in Oklahoma. While seventy-one municipal

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[43] Interview with O. D. McLaughlin, Wynnewood city clerk, Nov. 14, 1956. The legal basis for utility authorities is discussed in Chapter III, below.

systems were still operating in 1956, about eighty-four had been abandoned or sold.

Availability of a firm supply of electricity from the high-voltage transmission lines of a private system most frequently led to abandonment during the 1920's. Small generating plants were costly and troublesome to a small community. In some instances, generating plants were installed by municipalities only because private systems were unable or reluctant to provide high-line service on reasonable terms to the small municipality.[44] While long-distance high-voltage transmission was in use as early as 1911,[45] a far-reaching transmission network was not constructed by the large private power systems in Oklahoma until the 1920's.

Although in most cases the systems were sold to private interests, municipal electric systems no longer in

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[44]During interviews with officials of small communities in Oklahoma now operating distributing systems, the comment was frequently heard that power companies refused to provide them with high-line service, forcing the communities to install small generating plants. Other city officials said they were able to secure service only by building their own transmission line and substation--an expensive undertaking.

[45]In this year, "the maximum transmission voltage had reached 140,000; 110,000 volts was coming into use as a standard, whereas the standard had previously been 66,000 volts." Census of Electrical Industries: 1927, p. 88.

existence will be classified, for simplicity, as "abandoned" systems. Such systems should not be confused, however, with existing municipal electric systems which have ceased operating municipal generating plants but continue to operate distributing systems while purchasing power from another source.

The data on abandoned municipal electric systems in Oklahoma were collected by examining the published material in the field of municipal electric systems, by studying newspaper files in the Oklahoma Historical Society library in Oklahoma City, and by compiling replies from questionnaires sent to 106 city and town clerks. The data gathered from the different sources were then compared and the conflicts resolved where possible. Some of the results of this study are summarized in Table 13.

Because of the more recent occurrence of abandonment and the inadequacy of early records, the year of abandonment could be determined more easily than the year of establishment. This is reflected in the fact that the year of abandonment could be determined satisfactorily in eighty-two of eighty-four cases, while the year of establishment of abandoned systems could be determined in only seventy-six cases. In Kiowa the exact year of establishment could not be

TABLE 13.--Abandoned municipal electric systems in Oklahoma, with year of establishment, year of abandonment, type of system at abandonment, and population in the census year nearest abandonment

System	Year established	Year abandoned	Type system[a]	Population in census year nearest abandonment
Afton	1911	1925	G	1,219
Aline	1917	1949	D	385
Antlers	1915	1919	G	1,842
Apache	1910	1925	G	1,302
Arapaho	1908	1930	G	414
Bessie	....	1927	G	415
Billings	1912	1925	G	658
Blair	1922	1927	G	585
Boise City	....	1927	G	1,256
Boley	....	1925	G	874
Boswell	....	1922	.	1,212
Burbank	....	pre-1928[b]	D	.....
Butler	1917	1927	G	473
Calera	1927	1928	D	503
Clinton	1909	1924	G	2,596
Custer City	1911	1928	G	698

TABLE 13.--Continued

System	Year established	Year abandoned	Type system[a]	Population in census year nearest abandonment
Douglas	1925	1927	D	163
Drummond	1922	1928	D	254
Durant	1910	1916	G	7,340
Erick	1907	1928	G	2,231
Fairland	1923	1927	D	679
Forgan	1914	1929	G	605
Fort Cobb	1921	1927	D	827
Foss	1910	1918	G	348
Gage	1910	1927	G	856
Gotebo	1920	pre-1928[b]	G	...
Grove	1911	1927	G	804
Guymon	1911	1927	G	2,181
Hammon	1912	1926	G	736
Haworth	1915	1922	G	400
Healdton	1918	1926	G	2,017
Heavener	1915	1922	G	1,850
Helena	1908	1924	G	615
Hinton	1914	1927	G	1,009

TABLE 13.--Continued

System	Year established	Year abandoned	Type system[a]	Population in census year nearest abandonment
Hooker	1913	1929	G	1,628
Hydro	1916	1929	G	948
Ingersoll	1914	1946-1949[c]	D	78
Jet	1914	1917	G	370
Jones	1916	1926	G	288
Kiowa	pre-1916[d]	1925	G	689
Lambert	1931	1946-1949[c]	D	55
Lamont	1913	1931	G	554
Lehigh	1910	1913	G	1,880
Locust Grove	1922	1927	G	510
Lone Wolf	1908	1926	G	1,023
McLoud	1914	1926	D	812
Mannsville	1910	1911	G	515
Marietta	1911	1921	G	1,977
Marshall	1915	1927	D	695
May	1931	1948	D	143
Medford	1910	1925	G	1,084
Milburn	....	1926	.	429

TABLE 13.--Continued

System	Year established	Year abandoned	Type system[a]	Population in census year nearest abandonment
Minco	1908	1922	G	606
Mountain Park	1910	1924	G	334
Mountain View	1914	1926	G	1,025
Okemah	1909	1927	G	4,002
Paden	1914	1931	G	595
Pocasset	1910	1920	G	840
Porum	1912	1930	G	471
Ralston	1910	1920	G	703
Ramona	1918	1923	G	793
Rocky	1921	1924	G	322
Roff	1908	1913	G	1,044
Sayre	1909	1926	G	3,157
Sentinel	1909	1924	G	723
Shattuck	1915	1926	G	1,490
Snyder	1909	1923	G	1,197
Soper	1915	1923	G	538
Stonewall	....	1926	G	478
Stratford	1916	1927	G	950

TABLE 13.--Continued

System	Year established	Year abandoned	Type system[a]	Population in census year nearest abandonment
Talihina	1914	1925	G	1,032
Texhoma	1913	1927	G	819
Thomas	1907	1928	G	1,256
Tishomingo	1919	1925	G	1,281
Tyrone	1919	1929	G	482
Wanette	1916	1925	G	758
Wapanucka	1910	1926	G	553
Waukomis	1904	1917	G	463
Weatherford	1909	1926	G	2,417
Westville	1912	1928	G	691
Wewoka	1910	1927	G	10,401
Wilson	1917	1952	D	1,832
Wister	1915	1924	G	586
Woodward	1910	1929	G	5,056

[a]"G" means generating; "D" means distributing only.

[b]System listed as abandoned or sold, but no date indicated, in National Electric Light Association, *Government (Political) Ownership and Operation and the Electric*

TABLE 13.--Continued

Light and Power Industry (New York: National Electric Light Association, 1928), pp. 356-71.

[c]Power System Statements (F. P. C. Form 12) were filed with the Federal Power Commission Regional Office in Fort Worth, Texas, in 1946, but none was filed in either 1951 or 1956. Both communities now receive electric service from Alfalfa Electric Cooperative, Cherokee, Oklahoma.

[d]System listed by Thompson, op. cit., p. 31.

Note: In addition to the systems listed above, twenty-one other communities were reported to have abandoned or sold their municipal electric systems. Cities cited as abandoning their electric systems by the National Electric Light Association, but which responded to the questionnaire that they had never operated municipal systems, include Arnett, Breckenridge, Bromide, Coweta, Cyril, Dale, Fairmont, Gracemont, Lahoma, Leedey, Muldrow, Roosevelt, Salina, Temple, and Vici. Leedey and Vici are not included among the abandonments despite the detailed nature of the National Electric Light Association's entry concerning their abandonment. For these two entries, see National Electric Light Association, op. cit., pp. 364, 370; and in contradiction, see Leedey Times, Sept. 10, 1925, and Vici Beacon, April 5, 1928. No response was secured from questionnaires sent to three other communities cited by the National Electric Light Association source. These include Cement, Fargo, and Tipton. Navina and Seward, cited by Edna C. Macmahon, do not have post offices, and inquiries directed there were returned. Hopeton, also cited by Macmahon, replied that the system had always been private.

Sources: National Electric Light Association, Government (Political) Ownership and Operation and the Electric Light and Power Industry (New York: National Electric Light Association, 1928), pp. 356-71; John Moody, Moody's Analyses of Investments: Government and Municipal Investments (New York: Moody's Investor's Service, 1922), pp. 1492, 1493, 1496, 1510; Edna C. Macmahon, Municipal Electric Plant Managers (Chicago: Public Administration Service, 1934), pp.

TABLE 13.--<u>Continued</u>

26-27; Carl D. Thompson, Municipal Electric Light and Power Plants (Chicago: Public Ownership League of America, 1917), pp. 31-32; U. S., Bureau of the Census, Thirteenth Census of the United States: 1910, Vol. III (Washington: U. S. Government Printing Office, 1913), pp. 440-45; idem, Fourteenth Census of the United States: 1920, Vol. I (Washington: U. S. Government Printing Office, 1921), pp. 571-80; idem, Fifteenth Census of the United States: 1930, Vol. III, Pt. 2 (Washington: U. S. Government Printing Office, 1932), pp. 587-605; idem, Census of Population: 1950, Vol. I (Washington: U. S. Government Printing Office, 1952), pp. 36-9--36-16; bound files of the following newspapers in the Oklahoma Historical Society library: Antlers American, Apache Review, Cimarron Courier, Boley Progress, Boswell News, Custer City Journal, Fort Cobb Express, Fort Cobb Record, Gotebo Gazette, Hydro Review, Leedey Times, Vici Beacon, Tyrone Observer, Kiowa Chronicle, McLoud Observer, Marietta Monitor, Mountain View Times, Shattuck Monitor, and Talihina American-Tribune; and ninety responses to questionnaires mailed to 106 Oklahoma cities and towns.

determined, but it was reported that the system was in existence by 1916. In the case of Burbank and Gotebo, it was reported that they had been abandoned by 1928. Two other systems at Ingersoll and Lambert were abandoned between 1946 and 1949, according to Federal Power Commission records.

In all but two of the eighty-four cases of abandoned systems enumerated in Table 13, it was possible to determine satisfactorily whether the system was a generating or distributing system at the time of abandonment. The tabulation shows that sixty-nine were generating systems, while only thirteen were distributing systems, a proportion of 84 per cent to 16 per cent. Not any of those abandoned before 1926 were distributing systems.

The concentration in time periods of establishments and abandonments among abandoned municipal systems is shown in Table 14. It may be seen that the number of abandonments is concentrated in the decade between 1920 and 1929, when about 79 per cent of all determined abandonments took place. Sixteen systems, or about 20 per cent of those abandoned, left municipal control between 1920 and 1924. But a striking forty-nine systems, or about 60 per cent, were abandoned between 1925 and 1929. Of these, seventeen took place in

TABLE 14.--Establishments and abandonments of abandoned municipal electric systems in Oklahoma, by five-year periods, 1900-1954

Period	Number of establish- ments	Per cent of total number determined	Number of abandon- ments	Per cent of total number determined
1900-1904	1	1.3	0	0.0
1905-1909	12	15.8	0	0.0
1910-1914	35	46.1	3	3.7
1915-1919	17	22.4	5	6.1
1920-1924	7	9.2	16	19.5
1925-1929	2	2.6	49	59.7
1930-1934	2	2.6	4	4.9
1935-1939	0	0.0	0	0.0
1940-1944	0	0.0	0	0.0
1945-1949	0	0.0	4	4.9
1950-1954	0	0.0	1	1.2
Period deter- mined	76	100.0	82	100.0
Period not determined	8[a]	.....	2[b]	.....
Total	84	.....	84	.....

[a]Includes two systems reported in existence in 1916, in Thompson, *op. cit.*, pp. 31-32.

[b]Systems reported abandoned before 1928, in National Electric Light Association, *op. cit.*, pp. 356-71.

Source: Table 13.

1927 alone. Following this period of frequent abandonments the number declined to the point that no abandonments at all took place between 1935 and 1944. The last two establishments which were later abandoned were small distributing systems at Lambert and May. Both originated in 1931 and both were abandoned between 1945 and 1949.

The largest city to abandon its system since 1929 is Wilson, which leased its distribution system to the Oklahoma Gas and Electric Company in 1952. The 1950 population census reported 1,832 inhabitants for Wilson.

Except for Wilson, all of the eight systems abandoned since 1930 have served quite small communities. The arithmetic mean population of the communities other than Wilson abandoning their systems since that year was computed to be only 497. Again excluding Wilson, the total population in 1950 of four of the five systems abandoned since World War II was only 661.

The distribution of municipalities abandoning their electric systems, by population group in the census year nearest the year of abandonment, when determined, may be found in Table 15. As the table shows, most abandonments took place in communities of less than 1,500 population. Sixty-six of eighty-two abandonments, or about 81 per cent,

TABLE 15.--Number and percentage distribution of Oklahoma municipalities abandoning municipal electric systems, by population group in census year nearest year of abandonment

Population group	Number of municipalities	Per cent of total
1 - 499	20	24.4
500 - 999	32	39.0
1,000 - 1,499	14	17.1
1,500 - 1,999	6	7.3
2,000 - 2,499	4	4.9
2,500 and over	6	7.3
Total	82	100.0

Source: Table 13.

occurred in such small communities. Only six abandonments, or about 7 per cent, were found among cities with a population of 2,500 and over. The largest city abandoning its system was Wewoka, which had a 1930 population of 10,401.[46] The population of the six larger cities abandoning their municipal systems was 32,552; the arithmetic mean of this class is 5,426.

[46] Population of Wewoka in 1950 was 6,747.

The arithmetic mean population of the eighty-two municipalities analyzed in the table was 1,194, while the median population was 736. This difference between mean and median is an additional indication of the preponderance of small towns abandoning their electric systems.

The 1950 population of municipalities abandoning their systems was compared with their population in the census year nearest abandonment. This comparison revealed that most of the larger cities had increased slightly in population size, while most of the smaller towns and villages had decreased in size.

The questionnaire mailed to city clerks asked for a statement of reasons for abandonment of the system. Replies to this question were obtained from fifty-eight of the eighty-two systems listed in Table 13. Others left this space blank or indicated that the reason was unknown to them. In a number of cases, the clerk merely stated that the system had been sold or leased to a certain private organization, or that service was replaced by a rural electric co-operative.[47] Usable replies were classified into the

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[47]Logically, a reply citing sale, lease, or grant of franchise does not constitute a reason for abandonment, unless an enfranchised private system was so vigorous a competitor of a competing municipal system as to force the

categories shown in Table 16.

The reason for abandonment cited most frequently dealt with the problem of securing better electric service. The seventeen replies placed in this category included such comments as the following: "better service," "was too small," "kept having to enlarge and use nights and needed more power," "inadequate," "extension of stronger and better electrical facilities offered by company," "electricity could be supplied by a power company," "was necessary to enlarge plant on account increase of load . . .," "voted franchise to the one the plant was sold to so they could get 24-hour service," "worn out," and "was not the proper type of power unit or generator."

Replies classified as indicating excessive expense relative to income, a reason encountered in fifteen cases, included among others the following: "unprofitable," "was not paying," "upkeep was getting expensive," "unable to make it pay," "lack of revenue; did not pay cost of operation," "revenue would not maintain plant," and "too expensive to

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municipal system into abandonment. No evidence has been found to suggest that any of the abandoned systems studied ever continued in operation after a franchise was approved for a private system.

TABLE 16.--Reasons given for abandonment of municipal electric systems in Oklahoma by city clerks of municipalities which had abandoned municipal electric systems before 1956

Reason cited	Number of replies citing reason
1. To secure better service	17
2. Excessive expense or unprofitability	15
3. Debt burden problem	4
4. Management problem	4
5. To secure electricity at lower cost	4
6. Inducement of sales price	3
7. Generating plant destroyed by fire	2
8. "Politics"	1
9. Influence of power company	1
10. Sold, leased, or granted franchise[a]	23
Total reasons given	74
Number of replies giving reasons	58

[a]This category is included in the tabulation because of its frequent mention as a reason in itself and as a part of a more detailed reply to the request for reason for abandonment.

Source: Questionnaires returned in 1956 from city and town clerks of communities once operating municipal electric systems.

operate."

The problem of debt burden was mentioned in four replies. Two such comments were "could not meet expenses and bond interest" and "plant needed major repairs and the city owed a considerable amount on original system."

Management problems, named in four instances, were indicated by such comments as "city management was not successful" and "too much to oversee by the council for means derived."

The possibility of securing service at lower cost was reflected in four comments. These included the following: "thought could purchase electricity cheaper," "cheaper rates," "we received . . . a rate decrease," and "rates out of reason."

The sales price as an inducement to abandoning operation of the system, a reason cited only three times, was mentioned in remarks such as these: "town received $16,000 for plant," "don't know why same was sold as it was making money; however, funds from sale was [*sic*] used to build waterworks plant," and "we received a good price."

The single comment regarding political control was, in full: "System was controlled by politics, badly run, rates out of reason, and loosing [*sic*] money." Power company influence was named in another brief reply as "influence of Power Company for high line."

CHAPTER III

LEGAL STATUS OF MUNICIPAL ELECTRIC UTILITIES IN OKLAHOMA

According to the data in Chapter II, thirteen municipal electric systems were established in Oklahoma before 1907, when the Oklahoma and Indian territories were welded together to form the present state. These early systems were founded and financed under the provisions of federal law. The great bulk of the establishments, however, has taken place under authority granted by the new state's constitution and early statutes. The legal framework within which the municipal systems operate has grown more complex as additional statutes have been passed and court decisions have interpreted the law. The basic constitutional provisions have not been altered, except by judicial interpretation, in the past fifty years.

Definition of Public Utilities

Almost as if acknowledging the financial difficulties of cities operating under severe constitutional debt and taxation limits, the Oklahoma Supreme Court has been quite liberal in defining a number of municipal functions as "public utilities." As will be shown later, this tendency toward a broad definition has permitted many Oklahoma cities to escape otherwise unwanted limitations on their borrowing and taxing power.

There appears to have been little legal controversy over the definition of municipal electric systems as "public utilities" within the meaning of the state constitution. In 1911 the Oklahoma Supreme Court defined a municipal electric light plant as a public utility, and not until 1920 did the question arise again.[1] Public waterworks are also public utilities, as would be expected.[2] Sewer systems, including the mains and submains but not lateral lines, are public utilities.[3] In addition to these commonplace municipal services, a number of others have been defined by the courts as public utilities. These include public

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[1] City of Woodward v. Raynor, 29 Okla. 493, 119 P. 964 (1911); and Williams v. City of Norman, 85 Okla. 230, 205 P. 144 (1921).

[2] Dunagan v. Town of Red Rock, 58 Okla. 218, 158 P. 1170 (1916).

[3] State ex rel. Edwards v. Millar, 21 Okla. 448, 96 P. 747 (1908).

parks,[4] cemeteries,[5] fire stations and street cleaning machinery,[6] convention halls,[7] airports,[8] and an art gallery.[9] While the question has not been adjudicated, a number of Oklahoma cities operate hospitals as public utilities, under authority granted them by the state legislature in 1949.[10]

Power of Municipalities to Acquire and Operate Utilities

Wide powers to operate business enterprises are granted to the state by its constitution: "The right of the State to engage in any occupation or business for public purposes shall not be denied or prohibited . . ."[11]

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[4] Schmoldt v. Oklahoma City, 144 Okla. 208, 291 P. 119 (1930).

[5] Denton v. City of Sapulpa, 78 Okla. 178, 189 P. 532 (1920).

[6] Oklahoma City v. State, 28 Okla. 780, 115 P. 1108 (1911).

[7] State v. Barnes, 22 Okla. 191, 97 P. 997 (1908).

[8] Price v. Storms, 191 Okla. 410, 130 P. 2d 523 (1942).

[9] Tulsa v. Williamson, 276 P. 2d 209 (1954).

[10] Oklahoma Statutes (1951), Title 11, secs. 544.1-544.9.

[11] Oklahoma, Constitution, Art. 2, sec. 31.

Much the same extensive powers are granted to the creatures of the state, cities and towns: "Every municipal corporation within this State shall have the right to engage in any business or enterprise which may be engaged in by a person, firm or corporation by virtue of a franchise from said corporation."[12] In addition, regulatory powers of cities cannot be surrendered, nor can exclusive franchises be granted.[13] This provision guarantees that cities may, if they wish, establish public utility systems to compete with private systems enjoying franchises.[14]

Statutory authority for exercising this power is contained in separate statutes governing cities and towns. For cities, the statute reads, in part:

> Every municipal corporation within this state shall have the right to engage in any business or enterprise which may be engaged in by a person, firm or corporation by virtue of a franchise from said corporation; and every city containing a population of more than two thousand inhabitants shall have the

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[12]Oklahoma, Constitution, Art. 18, sec. 6.

[13]Oklahoma, Constitution, Art. 18, sec. 7; and Art. 2, sec. 32.

[14]Duncan is the only Oklahoma municipality now operating a municipal electric system in competition with a private system. No evidence was found that such competition has ever taken place in other Oklahoma municipalities operating municipal electric systems.

> right and power to acquire, own and maintain, within or without the corporate limits of such city, real estate for sites and rights of way for public utility and park purposes, and for the location thereon of waterworks, electric light and gas plants, aviation airports, hospitals, quarantine stations, garbage reduction plants, pipe lines for the transmission and transportation of gas, water and sewerage, and for any plant for the manufacture of any material for public improvement purposes, [and] public buildings . . .[15]

The board of trustees of a legally constituted town in Oklahoma is also granted the power to establish, maintain, operate, and extend a system of electric lights for the town. Provision is made in the law for trustees to purchase a privately owned electric light plant, when authorized to do so by an election procedure similar to that for issuance of bonds.[16]

The Oklahoma Supreme Court has acknowledged that the public utility powers granted to a municipality by the Constitution and the statutes are broad and pervasive:

> The authority given the municipality to undertake the operation of a business enterprise necessarily carries with it the authority to deal with the same in the same manner that a private corporation would deal with its property, subject only to constitutional and legislative restrictions.[17]

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[15] Oklahoma Statutes (1951), Title 11, sec. 563.

[16] Ibid., Title 11, secs. 1007, 1009.

[17] Moomaw v. Sions, 96 Okla. 202, 220 P. 865 (1923).

One of the powers necessary for the establishment and extension of an electric utility system is the right of eminent domain.[18] Cities of 2,000 population and more may exercise the right of eminent domain in acquiring real estate for public utility purposes, "either within or without the corporate limits of such city." Plants and pipelines may be located on any land or right of way secured through exercise of the right of eminent domain. If the right of eminent domain is exercised under this statute any private business or profession affected must be considered and valued as a "going concern."[19]

The statutes, however, make no provisions for condemnation proceedings against an entire private electric system. Thus a city or town may utilize either of two methods for acquiring a municipal electric system. The governing board may purchase the private system outright, or it may establish a competing system.[20] The right to

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[18] Tuttle v. Jefferson Power Co., 31 Okla. 710, 122 P. 1102 (1913).

[19] Oklahoma Statutes (1951), Title 11, sec. 563.

[20] A city is empowered by the same statute cited in the previous paragraph to lease private utility facilities if unable to pay for title outright. Although this power might be used to acquire a private system, as distinct from

establish a competing system offers the city a powerful bargaining point in negotiations for the purchase of a private system.

Once established, the municipal electric system in Oklahoma may pursue price-making policies at its own discretion. Its rates are subject to regulation by no state or federal agency. The Oklahoma Corporation Commission which is empowered to regulate the rates of private electric systems, is specifically denied any power over municipal corporations.[21] No statute demands that a municipal system's rates even be "reasonable." The Oklahoma Supreme Court has pointed this out in several cases, using language similar to that of the following syllabus paragraph:

> Neither the Constitution nor statutes specifically prescribe what rates may be charged for a municipally owned utility, nor to what purpose the profits derived

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an engine or generator, no evidence was found of cities acquiring systems in this fashion.

[21]The Oklahoma Corporation Commission is a constitutional body. In the first section of the article outlining its organization and powers, this statement is made: "As used in this article, the term 'corporation' or 'company' shall . . . exclude all municipal corporations." Oklahoma, Constitution, Art. 9, sec. 1. Oklahoma Statutes (1951), Title 17, sec. 151, also excludes municipal utilities from the definition of public utilities subject to regulation by the Oklahoma Corporation Commission.

therefrom must be appropriated.[22]

The court has indicated, however, that the rates must be reasonable as a matter of common law. In a case involving a sewer charge the court made this plain:

> The reasonableness of the charge was a matter of fact, to be determined by the district court, and the same will not be disturbed on appeal unless against the clear weight of the evidence. There is ample evidence in the record to sustain the conclusion reached by the lower court. . . . The city could make a charge for the use of the sewer system under the authority granted by the Constitution, where the same was not arbitrary, discriminatory, [or] unreasonable. . . .[23]

Since 1933, municipal electric systems have been specifically empowered by statute to extend their lines beyond the municipality's corporate limits and market electricity to any who desire the service. The statute reads thus:

> Every municipal corporation owning or operating its own electric light plant, gas plant or gas distribution system, and every such municipal corporation engaged in the distribution of electricity or natural gas is hereby authorized and empowered to extend its lines and mains beyond the corporate limits of such municipal corporations and is authorized to acquire, erect, construct and own all necessary poles, wire,

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[22] St. Louis-San Francisco Railway Co. v. Andrews, County Treasurer, 137 Okla. 222, 278 P. 617 (1928); also see Jones, County Treasurer, v. Blaine, 149 Okla. 153, 300 P. 369 (1931), and others.

[23] Sharp v. Hall, 198 Okla. 678, 181 P. 2d 972 (1947).

> lines, pipe lines and mains, apparatus and substations, and to acquire rights-of-way, and to do all other things necessary and proper in carrying on the said business outside of the corporate limits of the city to the same effect as it may now do within the corporate limits of said city.
>
> And said municipal corporations are authorized and empowered to construct or acquire such lines, pipe lines or mains, by purchase or otherwise and to sell said service to any person, firm or corporation outside of the limits of such corporations.[24]

Although statutorily unauthorized before passage of the permissive acts contained in the above section, a number of municipal systems did in fact sell electricity to customers outside the corporate limits. The Cherokee municipal plant, for example, furnished power to several smaller municipal distributing systems in Alfalfa County during the 1920's.

Public Utility Bond Issues

Most of the instances of legal dispute concerning municipal electric utility systems in Oklahoma have concerned the question of legality of bond issues. Since all bond issues for the purpose of establishing or improving municipal electric systems have been general obligation tax bonds, taxpayers have often protested the legality of issues. Private electric systems have sometimes joined taxpayers as

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[24] Oklahoma Statutes (1951), Title 11, sec. 447.

intervenors in protesting such bond issues.[25] Constitutional and statutory provisions and administrative regulations governing the issue of bonds are rather detailed, requiring that certain legal procedures be followed to the letter. Only one municipal electric utility bond issue, however, has been invalidated by the Oklahoma Supreme Court since 1940.

Money borrowed by issuing bonds may be used only for the purpose specified in the ordinances and the election authorizing the issue. Any variance may be fatal to the issue, if the discrepancy is noted by the Attorney General or if it is protested before the bonds become incontestable. The constitutional provision requires that:

> All laws authorizing the borrowing of money by and on behalf of the State, county, or other political subdivision of the State, shall specify the purpose for which the money is to be used, and the money so borrowed shall be used for no other purpose.[26]

The City of Cushing ran afoul of this provision during its five-year efforts to establish a municipal electric

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[25] This occurred, for instance, in _Palmer_ v. _Town of Skiatook_, 203 Okla. 316, 220 P. 2d 273 (1950), in which Public Service Co. of Oklahoma was intervenor, and in _Hughes_ v. _City of Cushing_, 170 Okla. 118, 39 P. 2d 13 (1934), in which Interstate Power Co. intervened. The latter power company also filed for an injunction as a resident taxpayer in _Interstate Power Co._ v. _City of Cushing_, 12 F. Suppl. 806 (1935).

[26] Oklahoma, _Constitution_, Art. 10, sec. 16.

system. Cushing voters had approved a $300,000 bond issue at a special election held on December 2, 1930. The election ordinance and ballot stated that the issue was "for the purpose of constructing an electric _plant_ [italics mine], distribution and transmission lines, and furnishing electric current to the city of Cushing and the citizens of said city, to be owned exclusively by said city of Cushing." When $215,000 in Series B bonds were presented to the Attorney General for approval, he refused to approve them on the grounds that the purpose stated in the bonds differed from the purpose stated in the election ordinance and ballot. The bonds stated that the indebtedness was contracted "for the purpose of constructing an electric light _equipment_ [italics mine], distribution and transmission lines, and furnishing electric current to the city of Cushing and the citizens of said city, to be owned exclusively by the said city." Cushing sought a writ of mandamus to force the Attorney General to approve the bonds. The Oklahoma Supreme Court refused to grant the writ, holding that the purposes as stated were different.[27]

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[27] _State ex rel. City of Cushing v. King, Attorney General_, 162 Okla. 69, 19 P. 2d 138 (1933).

Failure to specify the purpose of a bond issue in sufficient detail prevented the sale of a $60,000 bond issue by the City of Erick. This city had once operated a municipal system between 1907 and 1928, when the system was sold. Attracted by the offer of a federal grant from the Public Works Administration, Erick city officials had proposed that a municipal electric system be re-established. Council minutes reflected that city officials had officially discussed the promised grant of about $50,000 and were counting upon the grant to defray substantially the total costs of the electric system. But in the ordinance calling the special election to approve the bond issue and in the ballot proposition, no mention of the federal grant was made. Voters approved the issue. Subsequently, the offer of the grant was withdrawn by the federal agency. Nevertheless, Erick officials attempted to sell the bonds and use the funds for construction of a power plant. The Attorney General approved the issue, but delivery to the bond buyers was enjoined by a taxpayer. The Oklahoma Supreme Court upheld the injunction, saying that the ordinance calling the election and the ballot submitted were violative of the constitutional requirement, in that they did not disclose the contemplated supplementary grant from the government for construction of a larger plant.[28]

The restriction on purpose applies not only to the immediate use of the money borrowed through a bond issue, but also to any subsequent use, according to one decision affecting the City of Woodward. The city had issued $30,000 of twenty-five-year bonds in 1910 to finance construction of its own electric plant. In 1928, before the bonds were retired, Western Light & Power Corporation offered to buy the plant for $505,000. Voters approved the sale and a franchise grant that year, and city officials sought to retire all indebtedness of the plant, transfer funds to the sinking account to cover debts not immediately repayable, and retain the balance of some $326,000 in a special account. The sale was attacked in court, but the Oklahoma Supreme Court upheld its validity.[29] While this appeal was pending, however, a charter revision establishing the council-manager type of government was approved by the governor in 1929. New city officials sought to devote the special fund to construction

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[28] Borin v. City of Erick, 190 Okla. 519, 125 P. 2d 768 (1942). Under this interpretation, it seems that Erick officials would have been blocked had they disclosed the contemplated supplementary grant. If the purpose had been stated as the court required, then the bonds could not have been sold after the federal grant was withdrawn.

[29] Thomas v. Reid, 142 Okla. 38, 285 P. 92 (1930).

of a new light, water, and gas plant, but were enjoined from doing so. In its syllabus of the decision, the court said:

> 3. The provisions of sections 16 and 27, art. 10, of the Constitution are applicable not only to the immediate use of the money borrowed, but to any subsequent use thereof. They apply as well to the proceeds of the sale of property purchased with money borrowed pursuant thereto as to the borrowed money with which the property was purchased.
>
> 4. . . . When the proceeds of the sale are not used for the purpose for which the money was borrowed, they must be used to reimburse the taxpayers.[30]

In addition to the requirements relating to purpose, two other sections of the constitution prescribe other restrictions on bonded indebtedness. The first requires, among other things, that at least three-fifths of the voters must approve any indebtedness exceeding the anticipated income of the municipality in any year, and that all indebtedness must not exceed five per cent of the taxable valuation of the property located in the governmental unit. The other section exempts debt incurred for public utility purposes from the debt limitations of the former section, provided that a majority of the qualified property tax paying voters approve the indebtedness. A number of court cases have interpreted these provisions.

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[30] Protest of Reid, et al., 160 Okla. 3, 15 P. 2d 995 (1932).

The first section, as found in the constitution, provides that:

> No county, city, town, township, school district, or other political corporation, or subdivision of the State, shall be allowed to become indebted, in any manner, or for any purpose, to an amount exceeding, in any year, the income and revenue provided for such year, without the assent of three-fifths of the voters thereof, voting at an election, to be held for that purpose, nor in cases requiring such assent, shall any indebtedness be allowed to be incurred to an amount including existing indebtedness, in the aggregate exceeding five per centum of the valuation of the taxable property therein, to be ascertained from the last assessment for State and county purposes previous to the incurring of such indebtedness: Provided, That any county, city, town, township, school district, or other political corporation, or subdivision of the State incurring any indebtedness, requiring the assent of the voters as aforesaid, shall, before or at the time of doing so, provide for the collection of an annual tax sufficient to pay the interest on such indebtedness as it falls due, and also to constitute a sinking fund for the payment of the principal thereof within twenty-five years from the time of contracting the same.[31]

Section 26 of Article 10, then, forbids creation of a debt which must be paid from income of future years, unless approved by sixty per cent of the voters, and also provides for the levy of a tax sufficient to pay that debt. The intent of the framers was undoubtedly to prevent the taxpayers from being saddled with a tax burden without their consent by a spendthrift governing body, and also to prevent

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[31] Oklahoma, Constitution, Art. 10, sec. 26.

default on debt from failure to levy a tax. Most of the legal dispute concerning this section has involved the judicial interpretation of the term "indebted" and, to some extent, the necessity of levying a tax when a debt is incurred.

The other constitutional provision, already mentioned earlier, provides that:

> Any incorporated city or town in this State may, by a majority of the qualified property tax paying voters of such city or town, voting at an election to be held for that purpose, be allowed to become indebted in a larger amount than that specified in section twenty-six, for the purpose of purchasing or constructing public utilities, or for repairing the same, to be owned exclusively by such city: Provided, That any such city or town incurring any such indebtedness requiring the assent of the voters as aforesaid, shall have the power to provide for, and, before or at the time of incurring such indebtedness, shall provide for the collection of an annual tax in addition to the other taxes provided for by this Constitution, sufficient to pay the interest on such indebtedness as it falls due, and also to constitute a sinking fund for the payment of the principal thereof within twenty-five years from the time of contracting the same.[32]

In summary, this provision allows cities and towns to exceed the debt limit for public utility purposes if a different electorate--the property tax paying voters--approves by a simple majority. Like the previous section, this one also

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[32] *Ibid.*, Art. 10, sec. 27.

calls for the levy of a tax to repay the indebtedness.

A legal student of these two debt-limiting provisions has written that "it is conceded that Article 10, Section 27 is an exception to the debt limit imposed by Section 26, and that Section 27 together with Article 18, Section 6 provide the general grant of power to municipalities for engaging in business through ownership or construction of public utilities."[33] Warren perceived a conflict in decisions regarding the application of the debt limit in Article 10, Section 26 to expenses of proprietary functions already established under Article 18, Section 6, and Article 10, Section 27.[34] He found three different approaches in the decisions. In commenting upon the first, he explained:

> In the Walters case [Busch-Sulzer Bros. Diesel Engine Co. v. City of Walters, 133 F. 2d 651], the court held that a contract entered into for the purchase of a diesel engine was a proprietary undertaking and that the debt limit of the municipality could be exceeded even though the city had not complied with Article 10, Section 27, and that the city could use the profits from the sale of the electricity generated by the engine to retire the debt created by such

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[33]Robert Warren, Jr., "Taxation: Municipal Operation of Public Utilities: Sources of Municipal Revenues in Oklahoma," Oklahoma Law Review, I (1948), 102.

[34]Proprietary functions of government include enterprises such as municipal electric systems, operated on a business basis in selling services and commodities.

contracts.[35]

Note that this decision was rendered in a federal court. Another approach, this writer claimed, is that "Article 10, Sections 26 and 27, must be read together and that the limitation of Section 26 applies to any indebtedness, unless incurred in the manner provided by Section 27."[36] A third approach seen by Warren seems to be somewhat similar to the first. "If the cost of repair or replacement . . . ," he wrote, "exceeds the debt limit and is a direct burden upon the taxpayers of the city the contract is void; but if the transaction involved is clearly severable and is self-liquidating, the debt limit does not apply."[37]

Examination of some of the decisions in cases where municipal governing boards attempted to avoid the debt limitation reveals that the Oklahoma Supreme Court has been insistent in its refusal to approve the "special fund" doctrine in municipal utility financing. On the other hand,

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[35]Warren, op. cit., p. 103.

[36]Ibid. This approach is represented by the court's decision in Zachary v. City of Wagoner, 146 Okla. 268, 202 P. 345 (1930), to be discussed later.

[37]Ibid. Warren found this approach embodied in decisions in the following two cases, among others: Perrine v. Bonaparte, 140 Okla. 165, 282 P. 332 (1929), and Sharp v. Hall, 198 Okla. 678, 181 P. 2d 972 (1947).

the federal appellate court has appeared much more willing to approve contracts for long-term installment financing, without prior approval by voters. A series of cases involving the municipal electric system in the City of Wagoner illustrates this difference between the courts, as well as the case cited parenthetically on the previous page.

Wagoner city officials and Fairbanks, Morse & Company agreed in 1927 to the installation of two new diesel engines and generators to replace an inefficient obsolete steam engine. The new generating unit was to be paid for from the net earnings of the unit--that is, the saving in the cost of operation of the diesel plant over the old steam plant. Payments were to be in installments payable over a period of 52 to 120 months. An injunction was secured forbidding city officials from carrying out the contract, on the grounds that the contract created a debt which bound the city's funds beyond the fiscal year. Such debts, it was claimed, are forbidden under Section 26, Article 10, unless authorized by a vote of the people. The appeal was carried to the Oklahoma Supreme Court.

In commenting upon the city's contention that "the purchase of property does not create an indebtedness if the purchase price is to be paid out of the income therefrom," the court held:

> In our opinion, this is but another attempt to nullify and evade the wholesome constitutional limitations upon the power of municipalities to create indebtedness and to usurp powers never intended to be granted to municipal officers. The reasoning in support thereof is the ingenious argument by which such attempts have ever been supported.[38]

Wagoner city officials, the court continued, are without authority to bind the city's funds beyond the fiscal year. "If they could create a charge against the light plant profits for longer than the current year," the opinion stated, "they could do so for a hundred years. They have no such authority under our law."[39] An affirmative vote of the people, in the manner prescribed by Section 27, Article 10, was necessary to make the debt a valid one. The injunction was upheld.[40]

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[38] Zachary v. City of Wagoner, 146 Okla. 268, 202 P. 345 (1930).

[39] Ibid.

[40] A similar decision was rendered the following year in City of Tecumseh v. Butler, 148 Okla. 151, 298 P. 256 (1931). Under an agreement with an individual, the city was to operate, repair, pay expenses, and pay a monthly rental to the individual for a new $120,490 electric power and ice plant until the plant was paid for. The city was to issue "pledge notes" evidencing the debt, and in event of default the individual might take over the operation of the plant. This contract was held to constitute a debt creation without a vote of the people, in violation of Sections 26 and 27 of

Although the recital of facts in the decisions does not make this clear, it appears that Wagoner voters approved another installment contract[41] after the original injunction was issued. For in 1931 Fairbanks, Morse & Company entered the federal district court asking for the appointment of a receiver to operate the municipal electric utility. The application was granted, and after July 13, 1931, the utility was operated continuously by a receiver until the receivership was ordered terminated in 1936.

The facts established by the trial in the district court explain how the utility was thrown into receivership, and provide some insight into the technical and managerial problems confronting the utility at that time. In the words of the appellate court:

> The facts established by the evidence and found by trial court are these:
>
> In 1912, the City acquired a privately owned electric light plant and distributing system. From the day of its acquisition to September 27, 1927, the electric utility was operated by the City without

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Article 10. The provision for operation during default was also invalid, the court said, in that it was an illegal grant of franchise without the approval of the voters.

[41]This contract is reproduced in full in Fairbanks, Morse & Co. v. City of Wagoner, 81 F. 2d 209 (January 9, 1936).

resort to taxation and the income therefrom was sufficient to maintain the plant, pay all operating expenses and yield a profit to the City.

. . . .

On March 16, 1928, the city commenced the use of the new power plant . . . . Until May 7, 1928, the electric utility was in charge of an experienced and competent engineer who operated the new power plant properly, efficiently and economically. . . . On May 7, 1928, a new Water and Light Commissioner took office. He immediately discharged the engineer in charge of the electric utility, and placed it in charge of an inexperienced and incompetent engineer. The new commissioner was opposed to the purchase of the new power plant and favored buying electric energy from the Public Service Company of Oklahoma; and he placed the incompetent engineer in charge of the electric utility with the deliberate purpose of creating the impression upon the inhabitants of the City that the Diesel engines were inefficient, expensive to operate, and not capable of carrying the rated capacity load specified in the contract. The new engineer operated the new power plant until October 17, 1930, when the engines were disconnected and their use discontinued. After the new engineer took charge, the Diesel engines were negligently, unskilfully and improperly cared for and operated. A water softener was not used, scale collected in the cooling system, the engines were overheated, nine cylinder heads were cracked, water was permitted to escape into the cylinders and dilute the lubricating oil, and the pistons and cylinders were scored.[42]

In accordance with the city commissioner's design, Wagoner subsequently contracted with Public Service Company for its electricity supply. Service from the new generating

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[42] Ibid. Municipal records examined by the writer indicated the plant was acquired in 1910.

plant was restored the following year, however, when the receivership was ordered and Fairbanks, Morse & Company repaired the engines.

In the original suit contesting the receivership, the trial court had held the installment purchase contract "void because it made no provision for a depreciation reserve and, therefore, cast an incidental tax burden on the taxpayers of the city."[43] Fairbanks, Morse & Company was awarded the accumulated payments and interest under the contract, however, and the used generating units and equipment. Wagoner was awarded the net proceeds during receivership. Both parties appealed.

On the appeal, the circuit court rendered an opinion that "the contract does not create a debt within the meaning of section 26, art. 10 . . . and the provisions of the city's charter, and that it is valid and enforceable."[44] The appellate court ordered the cause reversed and remanded,

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[43]Ibid.

[44]In this, it depended heavily upon the case of Baker v. Carter, 165 Okla. 116, 25 P. 2d 747 (1933), in which the Oklahoma Supreme Court expressly approved the special fund doctrine for state college revenue bond financing. The courts have since then distinguished the Baker v. Carter ruling from that of Zachary v. City of Wagoner.

> . . . with instructions to enter a decree directing the receiver to pay over to Fairbanks Morse from funds on hand or available to the receiver, the net earnings of the new power plant, computed as provided in the contract, that have accrued, during the receivership, and to continue to operate the electric utility and to pay Fairbanks Morse the future net earnings of the new power plant so computed until the remaining notes with accumulated interest have been paid therefrom in full.[45]

Later in 1936, a rehearing was granted to the city, at which attorneys for the municipality presented the contention that cities in Oklahoma are not authorized to enter into "special fund" contracts such as that detailed in the earlier case. After quoting applicable parts of decisions in _Baker_ v. _Carter_,[46] _Graham_ v. _Childers_,[47] and _Zachary_ v. _City of Wagoner_,[48] the court said:

> We conclude that section 27, art. 10, of the Oklahoma Constitution . . . provides the _exclusive_ [italics mine] method by which a city may finance the cost of an electric power plant, other than from current funds on hand or presently to be available from lawful tax levies already made from current earnings, or from the proceeds of a bond issue authorized in accordance with section 26, art. 10, of the Oklahoma Constitution.

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[45] _Fairbanks, Morse & Co._ v. _City of Wagoner_, 81 F 2d 209.

[46] 165 Okla. 116, 25 P. 2d 747, 756.

[47] 114 Okla. 38, 241 P. 178 (1926).

[48] 146 Okla. 268, 202 P. 345, 349.

> It follows that the City was unauthorized to enter into the special fund contract involved herein.[49]

Thus, although not a debt and not prohibited by Section 26, Article 10, or by Wagoner's city charter, the contract was unauthorized, and Fairbanks, Morse & Company was not entitled to the relief granted in the decision handed down the January before. Still, since Wagoner was clearly authorized to purchase the power plant, the City must make restitution to the company. This is so because "the illegality in the contract related not to its substance but only to a specific mode of performance by the City," and "Fairbanks Morse acted in good faith."[50]

The court instructed the trial court to determine the present value of the power plant. The City should then, the court said, be given the option of paying Fairbanks, Morse & Company this amount and retaining the power plant, or returning the plant and equipment to Fairbanks, Morse & Company and paying in addition a reasonable allowance for depreciation out of the still-existing special fund, and receiving credit for payments already made. "The receiver-

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[49] *Fairbanks, Morse & Co. v. City of Wagoner*, 86 F. 2d 288 (November 10, 1936).

[50] *Ibid*.

ship should be speedily terminated," the court added.[51]

In order to avoid the restrictions on incurring an indebtedness beyond the current fiscal year contained in Sections 26 and 27, Article 10, an act was passed in 1945 providing for much the equivalent of a cash depreciation reserve fund in cities and towns operating utility systems. A municipality may withhold from surplus revenues earned from utility operations in any year not more than one-half of that surplus, and may place these retained earnings in an emergency repair and replacement fund. The fund may be increased to an amount sufficient to replace or repair any municipal utility item or items that may reasonably be expected to break down or go out in operation. Once transferred to this fund, however, the money cannot be used for any other purpose other than repair or replacement of "existing and necessary" utility facilities. This provision may prevent a "cash raid" on the fund by a governing board anxious to further other non-utility projects or to reduce taxes. One of the advantages of this fund is that it is "nonfiscal," and cannot be considered as a part of the

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[51] Ibid. This is the only instance discovered of an Oklahoma municipal electric utility operating under a receiver.

municipality's cash balance on hand when the county excise board computes the necessary city tax levy.[52] Thus a city may anticipate its needs for cash to repair and replace electric equipment, and may avoid the necessity of issuing bonds to finance their needs, or of contracting for purchases under an installment contract.

Although the grant of power to issue electric utility bonds under the provisions of Section 27, Article 10 is self-executing,[53] the statutes carefully prescribe the procedure for a municipal governing board to follow in issuing bonds. In addition, certain restrictions are placed on the maximum interest allowable, size of the installments, length of maturity, and net sales price.

Bonds issued by cities for public utility purposes may bear interest at no more than six per cent per year.[54] They must be made to mature in equal annual installments, beginning not less than two nor more than five years after

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[52] Oklahoma Statutes (1951), Title 11, secs. 448.1-448.3. The statute has not yet been tested in the courts, probably because so few cities utilize the fund.

[53] Williams v. City of Norman, 85 Okla. 230, 205 P. 144 (1921).

[54] Oklahoma Statutes (1951), Title 11, sec. 563.

the date of issue. The last installment, however, may be greater or less than any of the others, but no greater than two of the equal annual installments, and only if this is necessary to complete the full issue of the bonds. The bonds must be issued in multiples of $100 but not more than $1,000, except that the last numbered bond of an issue may be for any odd amount less than $1,000 that may be necessary to complete the full issue.[55] Sales of bonds must be for net par value plus accrued interest.[56]

A detailed outline of the procedures to be followed in issuing public utility bonds, together with explanatory notes, sample forms, and advisory comments, may be found in a pamphlet issued by the State Attorney General, who is the *ex officio* bond commissioner of the state.[57] Generally, a complete transcript of the proceedings leading to the bond issue must be prepared and submitted for approval in accordance with the attorney general's instructions. The transcript must include documents establishing the following:

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[55] *Ibid.*, Title 62, sec. 353.

[56] *Ibid.*, sec. 351.

[57] State of Oklahoma, *Public Utility Bonds* (Oklahoma City: State Attorney General, 1945). A new edition of this pamphlet was being prepared late in 1956, but had not been completed by May 1, 1957.

1. Proof of form of government (charter or proclamation).

2. That all relevant ordinances, rules, and regulations governing the calling and holding of the meetings of the governing board have been strictly followed in the transaction of business at the meetings.

3. Proof of the qualifications and signatures of the city officials connected in almost any manner with the bond proceedings.

4. Assessed valuation of the property in the city, as shown by the last assessments for state and county purposes.

5. Total outstanding indebtedness of the city, including the proposed issue, and the balance in the sinking fund to pay the principal of the outstanding indebtedness.

6. Procedures and forms used in adopting the ordinance calling the bond election, and proof of publication of the ordinance.

7. Form of the election proclamation and proof of its publication.

8. Form of the ballot.

9. Returns from each voting place.

10. Canvass of the vote by the county election board.

11. Advertisement of the sale.

12. Publication of notice of the sale.

13. Record of the sale, if the issue aggregates $5,000 or more.

14. Proper adoption of the ordinance authorizing issuance of the bonds, fixing the form of bonds, and providing the tax levy, and proof of the ordinance's publication.

15. That there is no pending or threatened litigation involving the legality of the bonds.

In addition to these documents, which must be included in the bond transcript, certain other affidavits from the mayor, the city clerk, and the purchaser of the bonds must be furnished with the transcript. The bonds themselves, together with instructions for their delivery by the attorney general after approval, must also be delivered with the transcript.[58]

Before selling a bond issue of more than $5,000, the city clerk must invite bids by publication. The sale may not be less than ten days after the first publication. The bonds must be sold to the bidder who will pay par and accrued interest, and who stipulates in his bid the lowest

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[58] Ibid., pp. 1-36.

rate of interest which the bonds will bear. Each bidder must deposit two per cent of the amount of his bid, which is returned to him if his bid is unsuccessful. The successful bidder's deposit is credited on the purchase price, provided he agrees to pay the balance within five days after the expiration of the period of incontestability, or thirty days after the sale is approved by the bond commissioner. If the city is dissatisfied, all bids may be rejected and the bonds readvertised for sale.

The United States government is exempt from these requirements if it bids on a sale of municipal utility bonds. Municipal authorities are allowed to negotiate a private sale at not less than par with accrued interest, and at an interest rate not in excess of that stipulated in the bond election.[59] This provision was included in the statute in 1935 after an attempt was made to invalidate the sale of Cushing municipal electric plant bonds to the Public Works Administration. City officials had not required the federal agency to submit a deposit. The court held that such deposit was meant "to protect the municipality against loss and expense because of improvident, reckless, unscrupulous,

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[59] Oklahoma Statutes (1951), Title 62, sec. 354.

or dishonest bidders, and may be waived."[60] The next legislative session saw the exemption written into the statute.

A 1933 amendment permitted city governing boards to sell bonds already authorized by election in such amounts as the governing boards might choose. This permits city officials to separate a large bond issue into two or more series, selling them individually as construction funds may be needed. In the case of a large issue, interest savings may be substantial where construction may require more than a year. Stillwater officials utilized this provision in selling $1,170,000 in electric light and power bonds in 1954 and $530,000 in bonds in 1955. Both were authorized in the same election.[61] Although city treasurers were authorized to invest the proceeds of bond issues in United States bonds during the World War II emergency when the funds could not be used for the purpose voted because of the emergency, this authority has presumably expired.[62]

Bonds may be cancelled and burned before sale if it

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[60] Hughes v. City of Cushing, 170 Okla. 118, 39 P. 2d 13 (1934).

[61] Interest on $530,000 for one year, at two and a half per cent, for example, is $13,250.

[62] Oklahoma Statutes (1951), Title 62, sec. 348.1-348.3.

is determined that the purpose for which the bonds were issued has ceased to exist.[63] Bonds issued by the city council of Pryor were destroyed in this fashion after an equivalent amount of funds was given to the city, making the issue unnecessary.[64]

An unsuccessful attempt was made by the state legislature in 1947 at providing legal means by which the requirement of securing voter approval for utility bond issues could be avoided by cities.[65] The Oklahoma Supreme Court declared the act unconstitutional the following year.[66] Most recently, the same court refused to approve the issue of natural gas revenue bonds in the amount of $1,200,000 proposed to be issued by the City of Tahlequah, under authority of a statute adopted in 1953.[67] The bonds had been

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[63] Ibid., Title 62, sec. 291.

[64] W. A. Graham, wealthy citizen of Pryor, gave $280,000 to the city with which to buy the electric system from Public Service Company of Oklahoma.

[65] Oklahoma Statutes (1947 Suppl.), Title 11, secs. 211-218.

[66] Burch v. City of Pauls Valley, 201 Okla. 78, 201 P. 2d 247 (1948).

[67] Oklahoma Statutes (1953 Suppl.), Title 11, secs. 449.1-449.18.

approved by a majority of the tax-paying voters, and other requirements of the statute had been met. Because the bonds were designed to be revenue bonds, they were not general obligations of the community and were payable only from the income from operation of the natural gas utility system by the city. Thus no provisions were made at any time for the levy of an ad valorem tax to pay the bonds or the interest, nor had the statute required that any such action be taken. Citing the language of Article 10, Section 27, which requires an annual tax sufficient to pay principal and interest within twenty-five years, and the early case of Town of Walters v. Orth,[68] the court held that the bonds were in contravention of the constitution and therefore void.[69] By implication, it appears, the statute is inoperative as well.

Thus both attempts to argue the "special fund" doctrine in court and attempts to permit revenue bond financing by statute have fallen before the insistence of the Oklahoma Supreme Court that neither is a valid method of incurring municipal debt.

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[68] 59 Okla. 99, 158 P. 352 (1916).

[69] Application of the City Council of the City of Tahlequah, 285 P. 2d 418 (1955).

The Trust for Governmental Purposes

It may be, however, that a more recent statute will permit a devious path by which city officials can win the privilege of financing municipal electric utilities without suffering the annoying provisions of the Constitution. The court has approved a 1951 statute, amended in 1953, by which a municipality may use the trust device to provide funds for the furtherance of any authorized or proper function of the municipality.[70]

In 1955 a trust was formed, known as The Oklahoma County Utilities Services Authority, to provide water and fire protection to unincorporated areas of the county. The trust, it was declared, was formed under the laws of the state, including the Oklahoma Trust Act and the statutes passed in 1951 and amended in 1953. The trust agreement provided for acquisition and disposition of property by the trustees and for borrowing money to provide funds. Any funds remaining after payment of operating expenses and indebtedness were to be paid to the beneficiary, Oklahoma County, or to its successors. The trust, however, would have no authority to obligate the beneficiary in any manner.

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[70] Oklahoma Statutes (1951, 1953 Suppl.), Title 60, secs. 176-180.

Further, the trust could not be terminated unless all the indebtedness were either paid or waived by its debtors.

After organizing, the trustees contracted to purchase two privately owned water systems, and arranged for the issue of $166,000 in revenue bonds to provide the cash down payment required. Suit was brought testing the validity of the trust and the trustees' actions.

In the decision on appeal, the Oklahoma Supreme Court held that this trust was a valid charitable trust, and that the trustees had the power to issue revenue bonds and debentures secured by mortgages on the property in trust and the revenues accruing to it. This debt, the court held, was not of the sort forbidden by the constitution without assent of the voters, as it was expressly provided that no debt created by the trustees would ever become an obligation of the county. Further, such trusts are exempt from all forms of taxation, in the same fashion as other governmental subdivisions.[71]

The position of the court in _Board of Oklahoma County Commissioners_ v. _Warram_ was further extended in a five-to-four decision rendered in 1956 in _Morris_ v. _City of_

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[71] _Board of Oklahoma County Commissioners_ v. _Warram_, 285 P. 2d 1034 (1955).

Oklahoma City.[72] A trust for governmental purposes, labeled the Oklahoma City Airport Trust, was formed to furnish and to provide financing for buildings and improvements at Will Rogers Airport, a municipal utility operated by the city. The buildings and improvements were to be leased to the General Services Administration of the United States. A revenue bond issue amounting to $12,000,000 was proposed by the trustees, who included the city manager of Oklahoma City. A non-profit group had given the trust a tract of land adjoining the airport, upon which the construction would take place. The city leased to the trust for twenty-seven years all three of its municipal airports, and agreed to include in the lease any airports acquired in the future. The lease also provided that the city would continue to pay the cost of maintenance, insurance, and personal injury and property damage. Rental income from the United States government, plus any other income the airport properties might produce, were pledged to pay the bonds.

The principal argument presented against the validity of the device was that the lease of the airports and income arising from them constituted creation of an indebtedness of

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[72] 299 P. 2d 131.

the city, in violation of Sections 26 and 27, Article 10, of the state constitution. The court disposed swiftly of this contention by pointing out that the bonded indebtedness could never become obligations of either the state or city, and any income resulting from the leased property is "only incidental to and a necessary part of the authority to lease the property" to the trustees.[73] Other less vital contentions of the plaintiff taxpayer were also decided against him by the court's majority.

Separate dissenting opinions were written by three of the four dissenting justices. The first, by Justice Jackson, argued that the city's agreement to pay operating and maintenance expenses, insurance premiums, and cost of constructing additional hangar space constituted creation of a debt in violation of Section 26, Article 10, in that there is no legal requirement that a city own an airport. He found no distinction between this case and another involving a long-term contract to furnish water to the state prison, in which the contract was voided.[74]

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[73] Ibid., p. 137.

[74] City of McAlester v. State ex rel. State Board of Public Affairs, 195 Okla. 1, 154 P. 2d 579 (1944).

More eloquent in his dissenting opinion was Justice Blackbird. He stated:

> I believe all would agree that under the proposed plan . . . the City, through a Trust, is attempting to do indirectly what it, itself, cannot do directly under our Constitution; and, by such circumvention, the spirit, if not the letter, of that document's provisions is violated. . . . When debt limit is fixed in terms of equality of revenue to indebtedness, it makes no difference whether the indebtedness is increased, or the revenue is decreased, the result is the same--the indebtedness becomes greater than the revenue and the taxpayer must foot the bill for the difference.
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> In the past, this Court has consistently struck down devises to circumvent these provisions of the Constitution . . . steadfastly applying the rule that where the Constitution provides the means and manner of [exceeding the debt limit], such means and manner is exclusive, and must be strictly followed.[75]

The third dissenting opinion, by Justice Davison, is similar in reasoning. As has happened with the United States Supreme Court, future members of the Oklahoma Supreme Court may agree with the minority in holding such trusts invalid. But for the time being, such trusts as the Oklahoma City Airport Trust apparently provide a method by which municipal electric system revenue bonds may be issued without the assent of the voters.[76]

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[75] Ibid., pp. 140-41.

[76] This is clearly explained by Ted J. Davis in his note, "Trusts: Charitable Trusts: Method of Financing Public Utilities," Oklahoma Law Review, IX (1956), 222-25.

Only one municipal electric system in the state, that of Wynnewood, was included in 1956 within properties leased to a trust for governmental purposes. The Wynnewood Utility Authority, a trust similar to the two discussed in the above cases, was created in 1955 to provide funds for the extension and improvement of the water and sewer systems in that city. Although the municipal electric system is operated by trustees of the authority, who are also members of the city council, its revenues from sale of electric service are not pledged for retirement of the revenue bond issue, nor have any bonds been issued to improve or extend the municipal electric distribution system.[77]

Sale, Lease, or Abandonment of a Municipal Electric Utility

Provisions for sale, lease, or other disposal of a municipally-owned public utility are contained in the statutes. Generally, any such disposition must be approved by at least half of the qualified voters of the municipality, voting at a special election held for the purpose. The procedure calls for the governing body to advertise for bids

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[77]Interview, Nov. 14, 1956, with O. D. McLaughlin, Wynnewood city clerk.

first, then call an election submitting the sale or lease proposition of the highest and best bidder to the electorate. The question of granting a franchise to that bidder must be submitted at the same election. In order for the proposal to be effective, both the sale or lease and the franchise must be approved. The sale must be for cash, or acceptable securities paid in full before any transfer is accomplished. If the highest and best bidder is a competing utility already operating under a franchise, only the sale or lease question must be submitted to a vote. Only if the governing body of a city of the first class is authorized by a special charter to sell or lease any public utility owned by the municipality may the transaction be completed without the calling of an election.[78]

At least three of the eighty-four known abandonments of municipal electric systems in the state have resulted in legal contests. Before the statutory requirements outlined in the preceding paragraph were first adopted in 1927, Durant disposed of its municipal electric system by sale in 1916 to a private firm, Durant Ice & Light Company. All that was required to sell under the law at that time was

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[78]Oklahoma Statutes (1951, 1953 Suppl.), Title 11, secs. 441-446.

affirmative action by the city council. Durant citizens initiated a petition calling for a referendum election on the question, which the mayor refused to call. A writ of mandamus was sought, but the Oklahoma Supreme Court dismissed the action, holding that the initiative and referendum statute was confined to operate on municipal legislation only. The resolution providing for sale of the electric system was not a legislative function, but was only administrative and not subject to referendum.[79]

Municipal authorities in Okemah were permitted to abandon the town's generating plant and contract with Oklahoma Power Company to purchase energy for the town's distribution system under a 1923 Oklahoma Supreme Court decision. No election was required, the court held, even though an election had been held to approve issue of bonds for construction of the electric plant.[80]

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[79] Yarbrough v. Donaldson, 67 Okla. 318, 170 P. 1165 (1918).

[80] Moomaw v. Sions, 96 Okla. 202, 220 P. 865 (1923). In an earlier decision, in First National Bank of Fort Smith, Arkansas, v. Incorporated Town of Kiowa, 104 Okla. 161, 230 P. 894 (1924), the court held that the city could not sell its water and light plant unconditionally, unless the property had become useless and was abandoned. "The public policy of this state forbids that public utilities shall be wilfully destroyed . . .," the court said.

The 1927 act which required an election before sale, lease or other disposal further required that approval must be indicated by at least sixty per cent of those voting. In 1928, Western Light & Power Company bid on the Woodward municipal electric system. At the election called for the purpose, 749 voted for the sale while 654 voted against it. A franchise was approved by a similar majority. An injunction was sought on the grounds that sixty per cent had not approved the sale. Despite the statutory requirement, the Oklahoma Supreme Court approved the sale on the basis of the majority vote holding that the sixty per cent majority requirement was violative of the spirit of the Oklahoma Constitution and inoperative. The court's reasoning was that Section 27, Article 10, required only a fifty per cent majority approval for the issue of public utility bonds to acquire, say, a municipal electric system. Therefore, a greater majority should not be necessary to dispose of such a system.[81] Otherwise, the procedure was held valid, and the law was later amended to conform with this decision.

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[81] Thomas v. Reid, 142 Okla. 38, 285 P. 92 (1930).

Taxation of Municipal Electric Systems

Although the Oklahoma Constitution exempts all properties of municipalities from taxation,[82] gross receipts from sales of natural or artificial gas, electricity, ice, steam, or any other utility or public service, except water, are subject to an excise tax of two per cent.[83] Before 1941, sale of electric power to state agencies, municipal subdivisions, churches, and other tax exempt organizations was not exempt under the Sales Tax Law of 1933, which imposed the tax on all sales of electricity to either domestic or industrial consumers. That is, municipalities were responsible for the collection of the tax from consumers of power from their systems and were also required to pay the tax on purchases of electricity for distribution over their own lines.[84] Today, however, sales to the United States government, the state, or any of its political subdivisions are exempt from the sales tax.[85] Municipal electric systems are

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[82] Oklahoma, _Constitution_, Art. 10, sec. 6.

[83] _Oklahoma Statutes_ (1951), Title 68, sec. 1251 c (b).

[84] _Oklahoma Gas & Electric Company_ v. _Oklahoma Tax Commission_, 177 Okla. 179, 58 P. 2d 124 (1936).

[85] _Oklahoma Statutes_ (1951), Title 68, sec. 1241 d (j).

not required to pay tax on purchases of electricity for resale, nor are they required to collect the sales tax on electricity sales to manufacturing firms.[86]

Accounting and Disposal of Surplus Funds

Although the state constitution provides for a uniform system of accounting for all state agencies and local subdivisions, there is little uniformity among the accounts prepared by municipalities operating their own electric systems. The constitutional provision relating to accounting provides that:

> The Legislature shall require all money collected by taxation, or by fees, fines, and public charges of every kind, to be accounted for by a system of accounting that shall be uniform for each class of accounts, State and local, which shall be prescribed and audited by authority of the State.[87]

Nevertheless, the State Examiner and Inspector, who is empowered to conduct audits of state agencies and county funds, is practically barred from auditing the records of a municipality by stringent statutory requirements and construction of the statutes by the state attorney general. Without the

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[86] *Ibid.*, Title 68, secs. 1251 d (p)(1), 1251 d (p)(2)(b).

[87] Oklahoma, *Constitution*, Art. 10, sec. 30.

power of audit, there is little likelihood that a uniform system of accounting can be enforced even if prescribed.

In the law specifying the powers of the State Examiner and Inspector, provision is made for audit of books of cities and towns. The handicaps, both practical and legal, have been described by the State Examiner and Inspector as more "than can be surmounted in nearly all cases."[88] Before the audit may be undertaken by the state, twenty-five per cent of the voters of the municipality, as determined by the highest number of votes cast for any office in the last general election for city or town office, must present a petition to the municipal governing board asking that the State Examiner and Inspector conduct the audit. The cost of the audit must be determined before petitioning for the audit, and that amount must be named in the petition. Further, the cost of the audit may be borne by none other than the city or town, which for its part must order and request the audit from the State Examiner and Inspector. One or more of the petitioners cannot finance the audit, nor can any other person do so on their behalf, or on the municipality's behalf. While the law provides for payment for the audit upon

[88]Bulletin No. 47-47, Office of the State Examiner and Inspector, Oklahoma City, dated July 14, 1947.

completion, from funds appropriated by the governing board for the purpose, there is no provision for interim financing of the audit, and the deputies of the State Examiner and Inspector conducting the audit must pay their own personal and business expenses until reimbursed.[89]

The practical and legal handicaps in this procedure should be apparent. First, citizens desiring an audit must secure a firm estimate of the cost of the audit from the State Examiner and Inspector. Not knowing the extent to which his deputies will have to search in order to complete a valid audit, the State Examiner and Inspector will likely pad his estimate well to care for unexpected additional time and expenses, thus increasing the cost beyond the capacity or willingness to pay of many cities and towns. The high cost of such an audit, expressed in the petition, might dissuade otherwise willing voters from signing. Second, the practical difficulties of securing signatures of twenty-five per cent of the voters in a community to a petition of this nature would appear insuperable unless public interest and indignation are near a fever pitch. Third, once the petition is secured and presented to the governing board, the

[89] Ibid., and Oklahoma Statutes (1951), Title 74, sec. 212.

audit must be ordered by the same governing board. As the audit might reflect unfavorably upon the board's conduct of municipal affairs, the board might be understandably reluctant to order an investigation into their own alleged or suspected misdeeds, or the illegal or irregular actions of employees chosen by the board. Fourth, the presumably high cost of the audit must be met by appropriation from funds "not otherwise specifically appropriated or allocated."[90] It is unlikely that such funds would be available in the necessary amount, particularly if the municipality's financial condition is such that an audit appears warranted to one-fourth of the voters. Fifth, if the governing board refused to act on the petition, the only recourse of the petitioners is a mandamus action, filed privately by one or more of the petitioners. At least some delays and expense would result during the ensuing legal struggle.[91]

It is not surprising, then, that only one city operating a municipal electric system had been audited in

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[90] Ibid.

[91] The Oklahoma Supreme Court has held that a county excise board cannot order an audit by the State Examiner and Inspector of a city's books and cannot levy a tax and appropriate funds for this purpose on the board's initiative. Kay County Excise Board v. Davis, 187 Okla. 494, 103 P. 2d 939 (1940).

recent times by a deputy of the State Examiner and Inspector. The audit was accomplished in 1943 in Wetumka, two years after the statute discussed above was passed but four years before the State Attorney General rendered an opinion construing the statute at the request of the State Examiner and Inspector. All other audit reports consulted in visits to the seventy-one municipal electric systems in the state had been compiled by practicing public accountants employed by the municipality for the purpose of conducting the audit. The audits accomplished by public accountants were of varying intensity, to judge by the reports filed with city officials.[92]

The statutes require the president of a town board of trustees to appoint a light commissioner with the advice and consent of the board. The light commissioner is the general manager of the utility, receiving all utility payments. He is also required to make a quarterly report to the board of trustees, showing the condition of the system and recommending needed improvements, repairs, extensions, and additional machinery, together with cost estimates. The commissioner collects receipts in the manner stipulated by

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[92]A discussion of the contents of these audit reports may be found in Chapter V, below.

the board and is required to maintain receipt records and deliver them to his successor. All revenue from the utility must be turned over to the town treasurer, who credits a separate fund to be used for the operation, maintenance, repair, and extension of the utility system. The board of trustees may vote to transfer all or any part of the fund to the general fund.[93]

Although these requirements are written in the statutes, little compliance with the law was observed during visits to towns operating municipal electric systems. As a rule, the collection of accounts and the management of funds are entrusted to the town clerk or the town treasurer, or both. Quarterly reports, if rendered by light commissioners and if light commissioners had in fact been appointed, must have been oral reports, as no files of reports were discovered in any of the towns' records.

Accounting for Meter Deposits

Meter deposits may be invested in United States bonds, State of Oklahoma bonds, or bonds of the municipality making the investment. This investment is subject to certain

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[93]Oklahoma Statutes (1951), Title 11, secs. 1011-1013.

other restrictions. The municipal governing board must first approve in writing the securities in which the funds are to be invested, the amount of money to be invested, and the price to be paid for the bonds, which cannot be more than the prevailing market price. In addition, investment of meter deposits must be so calculated as to leave a cash balance equal to an amount at least five per cent greater than the total number of meter deposit rebates paid customers within the year preceding the date of investment. Bonds so purchased may be sold, after public notice, to the highest and best bidder, unless the bid is less than the cost of the bond to the city plus any accrued interest. Such securities may not be sold for less than the prevailing price. After a sale, an amount exactly equal to the amount invested must be immediately placed in the fund from which the investment was made. Any excess is considered "profit," and must be placed in the fund from which the operation and maintenance expenses of the utility are paid.[94]

Budget Estimates and Taxation Powers

Technically, Oklahoma municipalities do not levy any

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[94] Oklahoma Statutes (1951), Title 11, secs. 10-12.

property taxes. Instead, they submit financial statements of the previous fiscal year and estimates of revenues and expenditures for the coming fiscal year, in a single document, to the county excise board. This board then examines each item in the budgets for conformity with the law and levies a tax sufficient to meet all the obligations of the city not covered by other sources of revenue. Copies of these documents, prepared on standard forms supplied by the State Examiner and Inspector, are then transmitted to the State Auditor, who files them so that they are available for public inspection.

The county excise board, in levying the taxes on property, is severely restricted in the total rate of taxation that may be applied to the existing taxable valuation in raising money for operation of local government units within the county. Since 1933, when Article 10, Section 9 of the constitution was amended in an "economy-in-government" campaign, the total tax which can be levied by the county excise board (without special elections) for the operation of the county, school districts, and cities and towns has been only fifteen mills for each one dollar valuation. This millage is apportioned among the three units by the excise board, but at least five of the fifteen mills must be allocated to school districts.[95] Counties, not empowered to operate public utilities, necessarily require a tax levy to provide operating funds. The remainder--if there is any--may then be allocated to cities, but in most cases this remainder is insufficient to provide the necessary funds for operation. Thus, Oklahoma cities have been forced to depend upon their public utilities to provide operating funds.

The fifteen mill limit does not apply, however, to tax levies for capital improvements. Thus, the sinking fund levy for general indebtedness incurred under Section 26, Article 10, may be as high as necessary, as long as the total indebtedness does not exceed five per cent of the taxable valuation. Completely unlimited, however, is the sinking fund levy for public utility capital improvements, which may include the variety of public enterprises pointed out early in the chapter.

The sinking fund levy for public utility capital improvements financed under the provisions of Section 27, Article 10, may be an indirect means of financing the general fund. If utility earnings are transferred to the general fund, and none of the utility earnings are used to retire

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[95] Oklahoma Statutes (1951), Title 70, sec. 4.39.

public utility bonds, then the sinking fund levy is indirectly providing the funds necessary for utility establishment and operation, which in turn provides the funds needed for the city's operating expenses.[96]

In submitting budgets to the county excise board, cities are not required to include the appropriation for their utility departments when these departments are self-supporting.[97] In addition, the governing board of a municipality can decide whether to place the earnings of its municipal utility in the general fund tax levy or the sinking fund tax levy. The excise board cannot order that surplus utility earnings be used to retire the debt created by the establishment of the utility.[98]

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[96]This practice is discussed further in Chapter V, below.

[97]City of Pawhuska v. Pawhuska Oil and Gas Co., 118 Okla. 201, 248 P. 336 (1926).

[98]In re Tax Levies of City of Woodward, 143 Okla. 204 (1930). Despite this decision, twenty-one of thirty-three excise board members queried by an investigator five years later as to their power to tell a city how it shall spend the earnings of a public utility enterprise claimed they had such power, and "thought they had the same power over this part of a city budget as any other. Only two of the entire group stated that since the Supreme Court had limited the excise board, they were powerless in this respect." Robert K. Carr, State Control of Local Finance in Oklahoma (Norman: University of Oklahoma Press, 1937), pp. 132-33.

Thus it is clear that cities raising general operating revenue through municipal utilities enjoy a much greater independence than other municipalities. Governing boards may place surplus earnings of the utilities in the sinking fund to retire utility bonds or in the general fund for the ordinary expenses of city government, in which case the utility bonds are retired by means of a sinking fund tax levy. The county excise board has no power to reverse the decision of the governing board in this matter and cannot reduce the appropriations. There can be no question of balancing total appropriations against revenue anticipated from the general fund property tax, since there is no such tax. Even if the utilities furnish all the funds necessary for operating the city government, however, the budget program must still be submitted to the excise board.[99]

[99]Robert K. Carr, "Budgetary Procedures in Oklahoma Cities," Oklahoma Municipal Review, IX (May, 1935), 18-79. Also, for a more recent discussion, see Maurice H. Merrill, "Constitutional Home Rule for Cities: Oklahoma Version," Oklahoma Law Review, V (1952), 139-203, and particularly pp. 179-96.

CHAPTER IV

GENERATION AND WHOLESALE PURCHASES OF ELECTRIC ENERGY

Electricity: Energy in a New Form

Electricity is not a new source of energy such as wood, coal, falling water, petroleum, natural gas, and the atomic nucleus were to their first users. Instead, it is a new form of energy, flexible and divisible to a degree unknown before the late nineteenth century. As Zimmermann has pointed out, although electricity "is not an addition to man's repertoire of energies, it has made tremendous contributions to his available supply of energy."[1] Its unique properties have revolutionized industry and altered the patterns of industrial culture.

Most electric energy is produced by the conversion

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[1]Erich W. Zimmermann, *World Resources and Industries*, revised edition (New York: Harper, 1951), p. 595. Portions of the following analysis are based on this work, particularly pp. 595-612.

of chemical energy into mechanical energy, which is then converted into electricity by ingenious application of the laws of electromagentism. In hydroelectric generation, the sun provides the energy to raise water high above sea level and the falling water, when harnessed, can provide the necessary motion for generation of electricity. Energy in the atomic nucleus, it appears, will be utilized in electrical generation in much the same way as the chemical fuels. Heat is produced by both nuclear fission and chemical combustion and this heat will vaporize water as steam. Steam under pressure will drive the electrical generators. A less important use of chemical fuels in the electric utility industry is the production of mechanical energy in the internal combustion engine directly connected to electrical generating apparatus.

In the functional sense, our energy supplies have been increasing at an increasing rate since the nineteenth century. Most of this rise has been in inanimate energy resources, particularly the chemical fuels. Although our utilization of water power resources has reached about half its ultimate potential in North America, we are not nearly so close to full use of chemical energy resources. Coal, petroleum, and natural gas, the chief fuels used today in generating electricity, are available in known quantities sufficient to generate electricity for at least a hundred years. But the nuclear fuels may well supplant the chemicals, primarily on the basis of cost, long before our chemical resources are near exhaustion. It is difficult to conceive of a real shortage of nuclear fuels. In other words, no shortage of energy resources should prevent electrical generation capacity and output from growing apace with society's rising demands for this new form of energy.

It would be outside the scope of this study to relate all the far-reaching effects of electricity on human society. Perhaps enough to say is that its uses are manifold today, but scientists and engineers are ever finding new ways to use electricity in industrial production, in the home, on the farm, and elsewhere. At a vast number of tasks ranging from lighting, heating, and refrigeration to driving intricate machinery, controlling industrial processes, and providing instantaneous communication, electricity provides the motive force.

With all its advantages, electrical energy has one major defect. It is almost instantaneously perishable, and cannot be "stored" economically except in very small amounts, usually by reconversion to chemical energy. This unique quality of electricity provokes a number of economic problems in electrical generation.

The Economics of Power Plant Operation

Many of the difficulties connected with power plant operation would diminish or disappear and the cost of electricity could be substantially reduced if electricity could only be stored in large amounts. It cannot, however, and the problems remain. Electrical generation and distribution require heavy fixed investments in plant and equipment. The high fixed costs resulting from the heavy investment in prime movers, generators, dams, buildings, and transmission and distribution systems strongly influence the unit cost of production. Labor costs in production are quite low; the electric power industry was one of the first to introduce automation.

The ideal cost situation for an electric power plant would involve continuous full utilization of the installed capacity. Unfortunately, this ideal can seldom be realized. The demand for electricity varies with the hour of the day and the day of the week. It varies with the weather and with the cyclical variation of general economic activity. These variations are of a violent nature at times and are not always predictable with accuracy. Consequently, capacity cannot be fully and regularly utilized. Efforts have been made toward achieving the ideal, however, with significant advances registered in the past forty years.

Utilization of capacity is measured by a number of ratios or factors. Three such ratios in common use in industry analysis are the capacity factor, the plant factor, and the load factor. The first two are quite similar. The capacity factor is the ratio of the average work done by, or load on, a machine or equipment for a certain period of time to the rated capacity of the machine or equipment.[2] For a definition of plant factor, simply substitute plant for machine or equipment in the preceding sentence, since the second definition refers to a group of machines. Capacity and load are usually expressed in kilowatts and kilowatt-hours. A capacity rating of 1,000 kilowatts means that a generator is capable of generating at a rate of 1,000 kilowatt-hours per hour for one year, or a total of 8,760,000 kilowatt-hours a year. If the generator produces only half that number of kilowatt-hours during the year, then its capacity factor is 50 per cent. Likewise, if the

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[2]Federal Power Commission, _Glossary of Important Power and Rate Terms_, p. 2.

single 1,000 kilowatt generator is the only such machine in a plant, then the plant factor is also 50 per cent.

The definition of load factor differs from the plant and capacity factor in that the denominator of the ratio is the peak load carried by the machine or plant rather than the rated capacity. Load factor is the ratio of the average load over a designated period to the sustained fifteen or thirty minute peak load in that period. As electric generating systems usually expand in capacity somewhat in advance of expected future needs, it is not unusual that peak loads are customarily below installed capacity. This means, then, that the load factor will usually be higher than the plant factor for a given system. In addition, it should be noticed that while the load factor measures the extent to which the used capacity of a plant is utilized, it has less relevance for cost analysis than plant factor in most cases. An overbuilt plant may have a desirably high load factor while its plant factor may be undesirably low and its cost per kilowatt-hour undesirably high. A low load factor may indicate wide gaps in the daily load which might be filled by adding new customers with diversified power requirements.

Because of the vital significance of the plant factor for the economics of the electric power industry, this measure has received a great deal of attention in statistical studies. Plant factors of all utility generating plants in the United States increased from 35 in 1920 to 41 in 1940, to about 55 in 1950, and dropped slightly to about 52 in 1954.[3] Although the trend has been upward, cyclical fluctuations have occurred due to business recessions. There was a particularly noteworthy increase during World War II, when reserve capacity dwindled to practically nothing. The upward trend in plant factor is one reason why generation costs have remained so low in the face of a rising price level.

Interconnection of power systems with varying load factors and various types of power plants contributed to the twenty-point increase in plant factor of utility generating plants between 1920 and 1950. A number of beneficial effects occur through an interchange of power between systems. The larger market area encompasses a greater diversity of demand, which tends to raise the load factor and reduce unit costs. Reserve requirements may be lower, which means higher plant factors in the area. Interconnection of

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[3]Calculated from data in U. S., Federal Power Commission, Production of Electric Energy and Capacity of Generating Plants: 1954. (Washington: Federal Power Commission, 1955), pp. x, xi.

hydroelectric plants can even out the effects of inter-regional differences in water supply. Furthermore, the different types of power plants can specialize in such a way as to make better use of the individual plants within a coordinated system.

There are several different types of power plants. Within the hydroelectric or hydro category, there are two broad classifications: high-head and low-head. High-head hydro plants, such as Hoover Dam on the Colorado River, are best suited to use of huge turbogenerators carrying a continuous load. Low-head hydro plants, such as those in the Arkansas-Red-White River basins in and near Oklahoma, are best suited to use a number of smaller turbogenerators carrying only peak loads.[4] After the installation of the turbines, capacity depends upon stream flow. As stream flow is erratic both seasonally and cyclically as a rule where low-head dams are located, this means that dependable year-

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[4]For an interesting and convincing discussion of this point, see the testimony of Frank M. Wilkes, chairman of the board of the Southwestern Gas & Electric Company, in U. S., Congress, Senate, Committee on Public Works, <u>Hearings on Investigation of Electric Power Rates Relating to Southwestern Power Administration</u>, 84th Cong., 2nd Sess., 1956, pp. 179-94.

round capacity is low.[5] The capacity that can be counted upon, year after year, can be sold as primary or "firm" power. The primary energy output commands a considerably higher price than that of secondary or "dump" power, which is sold only on a basis of when and if available.

Giant steam turbine plants are best suited to carrying the base load, the sustained core of consumer demand. And unlike stream flow, fuel supply for the large steam turbine plants is usually not erratic at all. But differences in costs of fuels available may make the peaking operations of some large steam plants more economical than others. Generally speaking, the smaller steam turbine plants are more flexible and are better used for peaking capacity.

Stand-by steam plants to firm up hydro in periods of low stream flow are practical in some areas such as the Tennessee Valley. And where conditions permit it, off-peak hydro power can be used to pump water back into the power pool, where it can again be used for generation during off-

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[5]For an extensive analysis of the waterpower resources of these basins, see U. S. Arkansas-White-Red River Basins Interagency Committee, Hydroelectric Power Development and Utilization, Part II, Section 7 (mimeographed, 1955), on file at the Regional Office of the Federal Power Commission in Ft. Worth, Texas. The hydroelectricity entering the Oklahoma transmission grid comes from dams in these basins.

peak periods. Reversible pump-turbines recently became available for this purpose.[6]

Best results, as far as electricity costs are concerned, can be achieved by interconnecting the different types of power plants. Hydro base load, hydro peak load, fuel base load, and fuel peak load plants may all be coordinated for the best use of the installed capacity, increasing plant factors considerably and reducing costs significantly.

The Small Isolated Generating Plant

Most municipal generating systems operate small isolated generating plants and therefore are not in a position to enjoy the benefits of interconnection. Both their small size and their isolation have put them at a disadvantage, making many of them technological anachronisms.[7] It

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[6] *Ibid.*, p. 78.

[7] Pawhuska suffered a severe power shortage when its main internal combustion engine caught fire on July 12, 1957. Business places in the city, unable to operate air-conditioning equipment, closed each day at 1 p.m. because of the severe heat. Operation of home air-conditioners was also suspended, as well as other power use. After a two-week delay, during which a purchase contract was approved at a special election and a substation was installed, the system was interconnected with Public Service Company. *The Daily Oklahoman* (Oklahoma City), July 13, July 23, 1957.

is sometimes asked how and why so many small isolated plants have continued to survive into the age of interconnection. The explanation for continued survival lies to a large extent in the internal economies the small plants have achieved. These internal economies have been secured primarily by cutting generating costs through installation of more efficient prime movers rather than improved dynamos. The design of electrical generators makes them almost inherently thrifty; little of the mechanical energy input is lost through heat escape. Prime movers, on the other hand, have never been able to convert as high a proportion of fuel input into mechanical output.

The steam engine, for instance, had reached a peak of mechanical efficiency by 1882, but coal-burning and auxiliary equipment were still quite inefficient. Steam pressures were low and mechanical stokers had just been developed. Small isolated plants using steam engines to drive direct-current dynamos furnished service to limited, narrow markets. As improvements were developed, they were aimed at increasing generating efficiency. Exploitation of local markets was also intensive rather than extensive. The development of alternating current generators and voltage transformers expanded the market concept tremendously, but the economic limits of the steam engine's capacity had about been reached at around 5,000 kilowatts.

The break-through came in 1903 with the first practical installation of a 5,000-kilowatt steam turbine generator at the Harrison Street station of the Chicago municipal electric system. The pattern following was the establishment of large generating stations by the larger municipal and private systems and extension of the market through a network of high-voltage transmission lines. The outlook for small isolated generating plants, both municipal and private, appeared dark. The integrated private systems found it economically possible to buy such plants, abandon them, centralize generation at one point, and feed the distributing systems from substations along the transmission network.

The principal method for the salvation of the small isolated municipal generating plant lay in reducing generating costs. The steam engine had about reached its limit in thermal efficiency. In its place, the smaller municipal systems began installing the new internal combustion oil engine, usually called the diesel engine. After the original patents on this design expired in 1912, "the rate of increase of oil engine plants was more rapid than that for any other type of prime mover" between 1912 and 1921 in the West

North Central states.[8] In this region, Raver found that only the steam turbine and the diesel engine plants increased their percentage of total plants between 1920 and 1930. He also detected a significant resistance to private acquisition among municipal steam turbine and oil engine systems. "Municipalities seem to be responding to the economic appeal made by these new developments in technology," Raver wrote in 1930.[9] His analysis, he concluded:

> . . . indicates that the internal combustion engine, particularly the oil engine after 1912, added new life to the municipal ownership movement just at the same time when the steam engine was contributing to its demise. The new technology was not moving westward rapidly enough to satisfy the desire of all small communities for electric service. The internal combustion engine offered them the possibility of that service and many of them accepted it. Furthermore, as obsolescence crept upon the steam-engine plant, the oil engine presented an alternative to complete abandonment. In many cases it eventually supplanted the steam equipment entirely.[10]

Much the same development took place among Oklahoma municipal electric systems. Thirty-six of the existing municipal systems in Oklahoma installed steam engines as

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[8]Paul J. Raver, "Municipal Ownership and the Changing Technology of the Electric Industry: Trends in the Use of Prime Movers," Journal of Land and Public Utility Economics, VI (1930), 241-57.

[9]Ibid., p. 251.

[10]Ibid., p. 257.

prime movers upon origination. Twenty-three of these had installed oil engines and eight others had shifted to purchasing power by December 31, 1930.[11] By 1940 all municipal generating systems but one had ceased generating with steam engines, and by 1947 this one engine of 192 kilowatt capacity had been scrapped.[12]

The impact of the changing technology of the industry on the small isolated municipal generating plant in Oklahoma is well illustrated in Table 17. As may be seen, the trend in the past thirty-five years has been away from operation of municipal generating facilities. Two periods of numerous abandonments of generation facilities stand out prominently in the table. According to these data, the number of municipal generating systems in Oklahoma declined most sharply between 1922 and 1927. In 1922, ninety-three of 100 systems were generating. By 1927 the number generating had dropped to only forty-nine. Simultaneously, the number of purchasing-only systems rose by thirty, from seven

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[11]Raver, "Municipally Owned Generating Plants in Existence in the United States as of December 31, 1932," _ibid._, IX (1933), 306-13; and "Municipally Owned Establishments Which Were in Existence in the United States on December 31, 1932, and Which Were Purchasing All Current Distributed on December 31, 1930," _ibid._, pp. 410-17.

[12]Table 23.

TABLE 17.--Number of municipal electric systems in Oklahoma generating and distributing-only, at five year intervals, 1902-1937 and 1945-1955

Year	Total[a]	Generating	Distributing-only
1902	2	2	0
1907	14	14	0
1912	63	63	0
1917	106	106	0
1922	100	93	7
1927	86	49	37
1932	69	39	30
1937	71	42	29
1945	73	40	33
1950	69	31	38
1955	71	19	52

[a]This series is the same as that used in Table 20. For an explanation of its derivation and the reason for its variation from Table 9, see footnotes to Table 20.

Source: Table 20.

in 1922 to thirty-seven in 1927. Of course, as explained in Chapter II, much of this decline on the one hand and increase on the other represents the shift of municipal systems from the generating to the distributing-only category.

The change between 1945 and 1955 is more striking than that of the 1920's. During this time over 52 per cent of the generating systems halted their production by either disposing of their generators or relegating them to standby status. In 1945 the number of generating systems still exceeded the number of purchasing systems, just as they had since 1902. By 1950, the ratio of one to the other had been reversed from the 1945 status. By 1955 only nineteen of the seventy-one, or 23 per cent, of the municipal systems were still generating energy. Of these nineteen, the systems at Anadarko and Hominy were supplanting their generation with purchases from Southwestern Power Administration, while the Cushing system halted its purchases from Grand River Dam Authority in 1956 after installing additional capacity.

The number, type, and source of current of municipal electric systems in Oklahoma, as of December 31, 1956, are outlined in Table 18. This table clearly shows the predominance of internal combustion engines as prime movers for municipal generators. Of the seventeen systems generating

TABLE 18.--Number of municipal electric systems in Oklahoma, by type of system and source of power, December 31, 1956

Type of system and source of power	Number of systems
Municipal generating systems:	
Steam turbine	2
Internal combustion	14
Steam turbine and internal combustion	1
Total	17
Municipal purchasing systems:	
Oklahoma Gas & Electric Co.	12
Public Service Co.	11
Grand River Dam Authority	10
Southwestern Power Administration	9
Other municipal systems	5
Rural electric cooperatives	3
Southwestern Power Administration and Oklahoma Gas & Electric Co.	2
Total	52
Municipal generating-purchasing systems:	
Internal combustion and Southwestern Power Administration	2
Total, all types	71

Source: Data collected in personal visits to all municipal systems, Southwestern Power Administration, and Grand River Dam Authority.

but not purchasing any power, fourteen utilized only internal combustion engines as prime movers while only two depended solely on steam turbines. One, the Kingfisher plant, carried its load with a small steam turbine and two internal combustion engines. Two other systems were generating with internal combustion units but supplemented their output with purchases from Southwestern Power Administration.

Among the fifty-two distributing systems, Oklahoma Gas & Electric Company was the sole supplier for twelve systems and Public Service Company furnished power to eleven others. Southwestern Power Administration furnished all the requirements of nine distributing systems and teamed with Oklahoma Gas & Electric Company to supply two other systems under an arrangement known as "split-billing."[13] Ten municipal systems, all in the eastern half of the state, secured power from Grand River Dam Authority. Five systems, all serving communities of less than 600 population, bought

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[13]Because of its limited capacity, Southwestern Power Administration has been unable to increase the contract demand of all its customers to conform to their peak loads. In these cases the private company wheeling the energy has undertaken to supply requirements above the contract demand, billing the municipalities for the excess portion of the total demand and energy supplied.

power wholesale from other municipal systems. Three others purchased all their requirements from rural electric cooperatives.

Changes in Generating Capacity and Output

Energy output of municipal generating systems in Oklahoma has risen steadily since 1902, sometimes but not always keeping pace with the increase in output of all electric utility systems in the state. The number of municipal generating stations increased at an even greater rate than energy output until 1917, after which the decreases previously mentioned began. Table 19 portrays this rise and decline in total number of systems and number of generating systems. It also shows the steady increase in total energy output and in the arithmetic mean output per generating system.

The most noteworthy feature of the data shown in Table 19 is the continued increase in both total generation and average generation after 1917. As may be seen, these increases continued despite the sometimes sharp decline in number of generating systems from the end of one five-year period to the next. For example, total generation jumped 181 per cent from 1917 to 1922 while the number of municipal

TABLE 19.--Number of municipal electric systems, number of municipal systems generating, and generation of electric energy in Oklahoma, at five-year intervals, 1902-1937 and 1945-1955

Year	Number of systems	Number of systems generating	Generation (Kwh)	Average generation (Kwh)
1902	2	2	216,080	108,040
1907	14	14	1,928,343	137,739
1912	63	63	6,233,556	98,945
1917	106	106[b]	13,753,211	129,747
1922	100	93	38,620,601	415,275
1927	86[c]	49	49,932,980	1,019,040
1932	69	39	56,434,035	1,447,027
1937	71	42	79,754,536	1,898,918
1945	73	40	127,232,027[e]	3,180,801
1950	69	31	160,330,592	5,171,955
1955	71	19[d]	196,718,573	10,353,609

[a]This series is based on Census of Electrical Industries data from 1902 to 1937 (except as indicated in 1927) because data on generation were available only from that source. For this reason, it is not the same as that presented in Ch. II, above.

[b]This is the figure given for total number of central electric light and power stations in Oklahoma in Census of Electrical Industries: 1917, pp. 162, 168, 174. But see also ibid., p. 162, which shows an expense item of $11,502 for "electric current and electric power purchased." This indicates that perhaps a few of the 106 systems were distributing-only systems.

[c]Census of Electrical Industries: 1927, p. 69, shows only the number of generating systems in Oklahoma. The figure shown in this table for total number of systems was calculated by the writer from data presented in Ch. II, above.

TABLE 19.--Continued

[d]This number does not include Comanche and Cordell, whose plants produced 14,100 and 19,100 kilowatt-hours respectively in test runs during the year while the systems were purchasing all the rest of their requirements. The generation, however, is included in the total for the year.

[e]Does not include output by the municipal plant at Duncan, which failed to file a report with the Federal Power Commission in that year. An attempt was made to secure this information during the visit to Duncan, but no records could be found on production in this year. Duncan probably generated about 2 million kilowatt-hours in 1945.

Sources: Census of Electrical Industries: 1902-1937 and data gathered by the writer from power system statements filed by municipal electric systems with the Federal Power Commission and checked against logs in municipal generating plants.

generating systems dropped from 106 to 93. In the same period, average generation climbed rapidly from 129,747 to 415,275 kilowatt-hours per station, an increase of 220 per cent. The continued rise of total and average output between 1922 and 1927 is even more remarkable in that it took place despite the precipitate decline in number of generating systems from ninety-three to forty-nine. The same development is evident in the 1945-1955 decade, when the number of generating systems fell from forty to nineteen while output continued steadily upward from 127,232,027 to 196,718,573 kilowatt-hours. The conclusion is readily reached that the surviving municipal generating systems have been growing rapidly in output. It may be inferred, too, that most abandonments of generating facilities occurred among the smaller systems.

Between 1932 and 1955 output of generators driven by steam prime movers increased proportionately more than output by internal combustion prime movers. This more rapid advance experienced by the two large steam-driven plants may be seen in Table 20. While total output was increasing by 249 per cent, internal combustion output rose 229 per cent as compared with a 310 per cent increase in steam output. As may be seen, waterpower has never been a significant

TABLE 20.--Production of energy in kilowatt-hours by type of prime mover in municipal generating plants in Oklahoma in selected years, 1932-1955

Year	Total energy produced	Steam	Internal combustion	Waterpower
1932	56,434,035	16,329,440	39,439,421	665,174
1937	79,754,536	27,464,683	51,659,765	630,088
1945	127,232,027	32,669,541	94,562,486	NA[a]
1950	160,330,592	48,339,700	111,990,892	NA[a]
1955	196,718,573	66,949,787[b]	129,768,786	....

[a]Output of hydroturbines at Anardarko not reported separately; plant superintendent said turbines had not been used since before 1945.

[b]Kingfisher steam generation was not reported separately, but was estimated by multiplying plant output by proportion of steam to total plant capacity.

Source: Census of Electrical Industries: 1932, 1937, and data gathered by the writer from Federal Power Commission reports and from municipal systems.

source of mechanical energy for electrical generation by municipal systems in the state.

Generating capacity has continued to increase in much the same fashion as output since 1902. Individual generating units have grown larger through the years as new capacity was installed. Steam engines, which in 1912 accounted for almost all the generating capacity, lost their importance as the more efficient internal combustion engines and steam turbines were installed. These developments from 1902 to 1956 are illustrated in Table 21. After a meteoric rise in number and capacity of municipal generating units in the fifteen years from 1902 to 1917, capacity continued to grow while the number of units rose and fell under diverse influences. The most severe loss in number of generating units took place between 1922 and 1932. In this period, the number of units dropped from its peak of 178 to 117, the low point since 1912. It may be noted that the number of generating systems also declined sharply during this period, falling from ninety-three in 1922 to thirty-nine in 1932. Thus, at least fifty-four of the sixty-one losses in generating units can be accounted for among systems abandoning their generating stations. This further confirms the inference that most abandonments of generating facilities took

TABLE 21.--Number and capacity of generating units installed in municipal electric generating systems in Oklahoma, by type of prime mover, at five-year intervals 1902-1937 and 1940-1955, and in 1956

Year	Generating units Number	Generating units Kilowatts	Total No.	Total Kw	Steam Turbines No.	Steam Turbines Kw	Engines No.	Engines Kw	Internal combustion engines No.	Internal combustion engines Kw	Hydro turbines No.	Hydro turbines Kw
1902	2	164	0	0	0	0	2	164	0	0	0	0
1907	17	1,385	17	1,385	0	0	17	1,385	0	0	0	0
1912	101	8,935	87	8,230	3	209	84	8,021	12	482	2	224
1917	167	13,582	108	10,533	5	1,018	103	9,515	57	2,819	2	230
1922	178	19,810	89	12,028	4	1,983	85	10,045	85	7,340	4	442
1927	NA	26,204[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1932	117	30,527	22	8,989	8	6,602	14	2,387	93	21,114	2	424
1937	125	39,985	18	12,371	9	11,000	9	1,371	105	27,190	2	424
1940	137	50,464	9	13,192	8	13,000	1	192	126	36,848	2	424
1945	142	53,892	9	13,192	8	13,000	1	192	132	40,276	2	424
1950	152	72,945	8	17,500	8	17,500	0	0	142	55,021	2	424
1955	129	94,612	9	24,750	9	24,750	0	0	120	69,862	0	0
1956	132	113,144	10	34,750	10	34,750	0	0	122	78,394	0	0

[a]Total capacity for this year taken from U. S., Federal Power Commission, Electric Power Statistics, 1920-1940 (Washington: Federal Power Commission, 1941). Census data were not given in 1927.

Sources: Data for 1902 through 1937, except for 1927, are taken directly or derived from Census of Electrical Industries: 1902-1937; where capacity figures are given only in horsepower, they have been converted to kilowatts by multiplying horsepower given by .7457. Capacity data for 1940, 1945, 1950, 1955, and 1956 were collected by the writer during inspections of generating plants; kilowatt capacity was taken directly from nameplates. This writer's data differ slightly from data published by the Federal Power Commission.

place among the smaller generating systems.

Also visible in Table 21 is the shift from steam engines to steam turbines and internal combustion engines. In 1917, for instance, the steam engine provided most of the generating capacity; 103 units could produce 9,515 kilowatts of power. There were only fifty-seven internal combustion engines with a capacity of 2,819 kilowatts and five steam turbines with a capacity of 1,018 kilowatts. By 1922 the capacity of internal combustion units had more than doubled. By 1932 the internal combustion engine had completed its virtual conquest of the majority of municipal generating stations by furnishing 21,114 kilowatts of a total capacity of 30,527 kilowatts. The steam turbine had increased in importance also, but the steam engine had dropped to a distinctly minor position and continued to fade until its disappearance, along with the hydroturbine, after World War II. Since 1937 steam turbines have accounted for somewhat less than one-third of total capacity while their number has been less than one-twelfth of the total number. In 1956 the average size of the ten steam turbines was 3,475 kilowatts; average size of 122 internal combustion engines was about 643 kilowatts.

More than half the generating capacity in municipal generating systems has been installed since 1945. According to Table 22, fifty units with a capacity of 66,238 kilowatts began operation in municipal generating systems from 1945 through 1956. The greatest number of units were installed in 1948, when eight generators with a capacity of 6,435 kilowatts were connected to load. Possibly because of the exigencies of the Korean War, no units were installed in 1951, but in 1952 five units totaling 13,400 kilowatts of capacity began generating. The three most recent years, 1954, 1955, and 1956, saw large additions of capacity to the lessening number of generating systems. Fifteen units with a total capacity of 32,795 kilowatts went into operation in those three years.

In the same twelve year period, twenty-nine units with a capacity of 18,364 kilowatts were shifted to standby status. The shifts are concentrated in three years: 1947, 1951, and 1956. The first of these years coincides with the expansion of sales to municipalities by Grand River Dam Authority. In 1951 the shifts to standby coincide with the beginning of sales to municipalities by Southwestern Power Administration. In 1956 the three steam turbine units at Stillwater were relegated to standby as that system's new 10,000-kilowatt steam turbine plant went on line.

TABLE 22.--Generating capacity installed, shifted to standby status, and sold or otherwise disposed of by municipal generating systems in Oklahoma, by number of generating units and capacity in kilowatts, 1945-1956

Year	Installed		Shifted to standby		Sold or otherwise disposed of	
	No.	Kw	No.	Kw	No.	Kw
1945	2	516	0	0	1	60
1946	6	2,555	0	0	3	230
1947	5	4,395	2	2,740	7	1,709
1948	8	6,435	0	0	14	4,105
1949	3	2,530	0	0	0	0
1950	5	2,772	2	300	0	0
1951	0	0	18	6,328	11	1,602
1952	5	13,400	4	996	9	2,600
1953	1	840	0	0	8	1,382
1954	4	7,920	0	0	3	840
1955	6	6,245	0	0	5	1,026
1956	5	18,630	3	8,000	2	98
Total	50	66,238	29	18,364	63	13,652

Source: Data collected by the writer from municipal systems.

Some of the capacity shown as shifted to standby in Table 22 was later sold or otherwise disposed of, while other units were sold or otherwise disposed of soon after being taken out of service. In all, sixty-three units with a capacity of 13,652 kilowatts were removed from service by municipal generating stations during the period from 1945 to 1956. The concentration of disposal is similar to that seen among the shifts to standby; some twenty-one units were taken out of service in 1947 and 1948 and another twenty units were disposed of in 1951 and 1952.[14] The series shows clearly that the units disposed of had an average capacity considerably below the average of those installed. While the new additions to capacity averaged 1,325 kilowatts each, those disposed of averaged only 217 kilowatts.

As more and more municipal systems have abandoned their generating facilities, the larger generating systems have increased their predominance in generation output. Ponca City, Blackwell, Stillwater, and Cushing are the four largest municipal generating systems in Oklahoma. Their shares in total energy production in the 1945-1955 period

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[14]Table 22 does not reveal the net additions to total capacity because some units were shifted to standby in one year and then later sold or otherwise disposed of.

are shown in Table 23. In 1945 the four systems accounted for slightly more than 41 per cent of all municipal generation, with Blackwell producing more than any other system. By 1950 Ponca City had outstripped Blackwell for first place as all four substantially increased their absolute production. Proportionately, the four generated slightly more than half the total, rising more than ten percentage points from their 1945 performance. In 1955 the four systems, representing about one-fifth of the total generating systems, produced 63 per cent of all electricity generated by municipal systems. As all but Blackwell installed new capacity in 1955 and 1956, the dominance of the group should be even greater in the next few years.

Ponca City, Blackwell, and Cushing are fortunate in having large industrial loads to service. Ponca City and Cushing both furnish power to oil refineries located nearby, while Blackwell sells power to a zinc smelter near that city. Stillwater lacks equivalent industrial loads, but its 1950 population was the largest of any of the Oklahoma municipalities under study.[15]

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[15]Oklahoma State University, located at Stillwater, has its own generating plant. The municipal plant and the university plant interchange power, the only such instance of interconnection between an Oklahoma municipal generating plant and another small isolated generating plant.

TABLE 23.--Generation of electric energy, in kilowatt-hours, by the four largest municipal generating systems in Oklahoma, and percentage share of each in total generation by all municipal generating systems in Oklahoma, in 1945, 1950, and 1955

System	1945 Generation (Kwh)	1945 Per cent of total	1950 Generation (Kwh)	1950 Per cent of total	1955 Generation (Kwh)	1955 Per cent of total
Ponca City	16,553,400	13.0	28,058,205	17.5	47,278,270	24.0
Blackwell	21,165,471	16.6	26,223,900	16.4	40,466,600	20.6
Stillwater	8,317,600	6.5	18,087,800	11.3	24,426,530	12.4
Cushing	6,306,430	5.0	9,809,423	6.1	11,861,971[a]	6.0
Total, four systems	52,342,901	41.1	82,179,328	51.3	124,033,371	63.0
Total, all systems	127,232,027	100.0	160,330,592	100.0	196,718,573	100.0

[a]Cushing also purchased 10,536,400 kilowatt-hours from Grand River Dam Authority during the year.

Source: Municipal power system statements filed in the Federal Power Commission Regional Office, Ft. Worth, Texas.

The Shift from Generation to Purchased Power

The shift away from generating towards purchasing energy requirements may be seen in Tables 24 and 25. As was shown in the previous discussion, generation output has been climbing steadily even as the number of generating systems has declined since 1945. More spectacular, however, has been the tremendous increase in power purchases since 1945. In growing from less than 33,000,000 kilowatt-hours in 1945 to more than 185,500,000 kilowatt-hours in 1955, purchases have registered a lusty 467 per cent increase. At the same time, sales of energy produced in municipal generating plants to other electric systems,[16] a significant item in 1945, had fallen to only slightly more than one million kilowatt-hours by 1955. As the percentage calculation in Table 25 shows, purchases accounted for about 22 per cent of the electricity input of municipal systems in 1945. Five years later over 35 per cent of the input was purchased energy. By 1955 the proportion had risen to about 49 per cent, almost equal to the output of generating plants less their sales to other systems for resale.

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[16]All such sales were either to other municipal systems or to rural electric cooperatives.

TABLE 24.--Net energy for systems, generation, sales for resale, and purchases, in kilowatt-hours, for municipal electric systems in Oklahoma, 1945, 1950, and 1955

	1945	1950	1955
Net energy for systems	148,487,749	243,885,556	381,111,184
System net generation	127,232,027	160,330,592	196,718,573
Sales for resale	11,440,951	3,044,706	1,142,351
Purchases	32,696,673	86,599,670	185,534,962

Source: Municipal power system statements filed in the Federal Power Commission Regional Office, Ft. Worth, Texas.

TABLE 25.--Percentage of total net energy for systems accounted for by generation and purchases of energy by Oklahoma municipal electric systems in 1945, 1950, and 1955

	1945	1950	1955
System net generation, less sales for resale	77.98	64.49	51.31
Purchases	22.02	35.51	48.69
Net energy for systems	100.00	100.00	100.00

Source: Table 24.

This significant change in the pattern of electric power supply is explainable in economic terms. The two chief reasons for the change, apparently, are the relative inefficiency of the small isolated municipal generating plant and the availability of power on attractive terms from government generating facilities.

Without becoming too deeply involved in cost comparisons, the relative inefficiency of the small municipal generating plant can be studied by an analysis of plant factors. As mentioned earlier in the chapter, the plant factor is a significant ratio in the determination of unit costs in electrical generation. For the electric power industry in the United States, plant factor was about 55 in 1950 and about 52 in 1954. In contrast, the average plant factor of all municipal generating systems in Oklahoma was slightly less than 25 in 1950 and had dropped more than a point to 23.4 in 1955. In other words, municipal generating systems in Oklahoma have been utilizing their installed capacity at less than one-half the rate of all generating systems in the United States. If everything else were equal, this would mean about twice the fixed charges allocable to each kilowatt-hour of energy generated by Oklahoma municipal systems as might be allocated for all systems in the nation.

This is particularly significant in view of the fact that fixed charges on investments are the largest single cost item in power plant operation.

Table 26 is a presentation of plant factors calculated for all municipal generating systems in Oklahoma for the years 1945, 1950, and 1955.[17] The median plant factor in 1945 was 27.8, with the range extending from a low of 17.9 at Tonkawa to 46.3 at Newkirk. In 1950, the median plant factor dropped to 24.3 and the range of plant factors among generating-only systems increased somewhat. The lowest factor in 1950 was 12.9 at the Carmen plant, while the highest was 46.7 at Sallisaw. Both Carmen and Sallisaw had ceased to generate by 1955; either an extremely high or an extremely low plant factor may militate against continued generation when other sources of power are available. An extremely high plant factor among the Oklahoma municipal systems usually indicates severely overloaded generating equipment. Most of the municipal loads are not as diverse as those of the integrated private systems because of the

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[17]The ratios were calculated on the basis of capacity installed at the end of each year and could not be adjusted for installations during the year. This inability to adjust for installations during the year affected the plant factors of only two systems in 1945, three systems in 1950, and four systems in 1955.

TABLE 26.--Plant factors of Oklahoma municipal systems with installed generating capacity, 1945, 1950, and 1955

System	Plant factor 1945	1950	1955
Altus	21.0	....[a]	....
Anadarko	21.3	25.0	28.6[b]
Blackwell	31.2	38.6	29.3
Carmen	22.0	12.9	....[a]
Cherokee	19.3	18.2[c]	17.1[c]
Claremore	....[d]	....[d]	....[d]
Comanche	20.5[c]	7.6[b]	....[a]
Cordell	35.6	26.9[b]	....[d]
Cushing	31.3	33.9	29.1[b]
Duncan	NA	24.0[b]	....[d]
Fairview	29.9	14.9	20.4
Hominy	32.2	23.5	22.7[c]
Kaw City	27.6[b]	....[a]	....
Kingfisher	29.1	26.3	23.5
Laverne	19.7	10.5[c]	19.4
Lindsay	29.9	32.9	38.2
Mangum	38.4	19.2	28.7
Marlow	33.2	20.1	15.3[c]

TABLE 26.--Continued

System	Plant factor 1945	1950	1955
Miami	27.8	....[d]	....[d]
Mooreland	28.4	9.2[b]	....[d]
Newkirk	46.3	25.1	23.2
Okeene	30.1[c]	24.4	29.8
Pawhuska	26.6	22.6	22.3
Pawnee	22.7	28.9	....[d]
Perry	31.6	24.3[c]	25.6[c]
Ponca City	37.8	37.2	35.6
Purcell	24.2	26.9	....[d]
Ryan	20.2	....[a]	....
Sallisaw	37.8	46.7	....[d]
Spiro	22.6	25.9	....[d]
Stillwater	23.7	25.8	34.9
Stilwell	38.6	42.3[b]	....[d]
Stroud	23.2	21.4	....[a]
Tahlequah	25.8	....[d]	....[d]
Tonkawa	17.9	30.9	23.9
Wagoner	25.2	....[a]	....

TABLE 26.--Continued

System	Plant factor 1945	1950	1955
Walters	27.2	9.1[b]	....[a]
Waynoka	37.4	22.8	16.8
Wetumka	23.3	35.5	....[a]
Wynnewood	35.8	....[d]	....[a]
Yale	23.8	21.3	....[ad]
Median	27.8	24.3	23.9

[a]Generating equipment leased, sold, or junked.

[b]System also purchasing power during the year.

[c]Unadjusted for installations during the year.

[d]Generating equipment on standby and not operating except for tests and emergencies.

Source: Capacity data collected by the writer; output as reported by systems.

lack of heavy industrial customers with high load factors. Municipal capacity must be maintained, however, to meet the peak loads of the daylight hours and the early evening. Hence, Sallisaw's plant factor of 46.7 in 1950--an extremely high factor among municipal systems--indicated severe overload even though the United States average plant factor in that year was 55.

In 1955 the median plant factor of 23.9 was only slightly lower than it had been in 1950, but the upper extreme had dropped to 38.2 at Lindsay and the lower extreme had risen to 16.8 at Waynoka.[18] It may be noted that the range between the highest and lowest plant factors varied from about 28 points in 1945, up to about 34 in 1950, and then back down below the 1945 range to about 21 in 1955. This decrease in range of plant factors indicates two developments. For one, many of the systems with quite high plant factors and many others with quite low plant factors have been eliminated from the array by shifting to the purchasing category and abandoning generation. For another, the more progressive generating systems have added capacity

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[18]Marlow's plant factor of 15.3 is lower, but it could not be adjusted for the effect of capacity additions during the year.

in order to handle higher peak loads, but in doing so they have sacrificed some of their cost advantage by reducing their plant factors.

Theoretically, plant factor should have a rather strong influence upon the choice of whether to continue generating all power requirements or to begin purchasing power. As a low plant factor indicates higher unit costs of generation, one would expect those plants with low plant factors to begin purchasing power if other sources were available to them at attractive price levels. To test this hypothesis, the systems operating generating equipment were ranked according to plant factor in 1945. After the array was divided into quartiles, each quartile was further divided into two categories: those systems which continued to generate only through 1955, and those systems which began purchasing power by 1955. The results of the tally are shown in Table 27.

It may be seen that eleven of the twenty systems with above-median plant factors in 1945 continued to generate all their requirements through 1955. On the other hand, fifteen of the twenty systems with below-median plant factors had begun purchasing all or part of their requirements by 1955. The results would probably have been more

TABLE 27.--Number of municipal generating systems in Oklahoma, ranked by quartiles in 1945 according to plant factor, continuing to generate only through 1955 and purchasing all or part of their power requirements by 1955

Category	Numbers, by quartiles					
	Q_1	Q_2	Q_1+Q_2	Q_3	Q_4	Q_3+Q_4
Continued to generate only	5	6	11	2	3	5
Began purchasing power	5	4	9	8	7	15
Total	10	10	20	10	10	20

Source: Table 26.

significant had it been possible to show that some of the systems which later became customers of Grand River Dam Authority were anticipating this connection and were delaying capacity additions for this reason, thus increasing their plant factors and perhaps overloading their equipment during on-peak periods. For example, Sallisaw ranked fourth in plant factor in 1945 and first in 1950; by 1952 it had begun to purchase all its requirements from Grand River Dam Authority. Likewise, Stilwell ranked second in 1945 and 1950; it became a Grand River Dam Authority customer in late 1950. If such influences could be established, the proof outlined in Table 27 would be even more conclusive. Even so, the evidence appears to indicate clearly that low plant factor was among the significant reasons for the shift from generating to purchasing power in the 1945-1955 period.[19]

The availability of power on attractive terms from government electric power agencies appears to be the other of the chief reasons for the shift between 1945 and 1955 from generating to purchasing energy. Long before 1945, however, Oklahoma municipal systems were purchasing power for distribution over their own lines. Census data fail to reveal much about the growing trend toward energy purchases, the earliest item showing that in 1912 the municipal electric systems in Oklahoma spent $600 for "electric current and electric power purchased."[20] By 1917, the expense item had increased to $11,502 paid for 1,720,290 kilowatt-hours.[21]

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[19] In contrast to the low plant factors experienced by Oklahoma municipal generating plants, the plant factors of several private generating stations in Oklahoma are quite high. Oklahoma Gas & Electric Company's Arbuckle Station, for example, operated at a plant factor of 76.9 in 1954. Moody's Investors Service, Moody's Public Utility Manual: 1955 (New York: Moody's Investors Service, 1955), p. 1284.

[20] Census of Electrical Industries: 1912, p. 96.

[21] Census of Electrical Industries: 1917, pp. 162, 175.

In 1922 it was recorded that Oklahoma municipal systems purchased 1,148,958 kilowatt-hours of electricity at a cost of $48,179.[22] Not again until 1937 did the Census of Electrical Industries present data on wholesale purchases, and then only for the West South Central States as a whole. Part of a table shows that forty-one municipal distributing systems in the West South Central states bought 26,527,461 kilowatt-hours for $385,611, or slightly less than 1.5 cents per kilowatt-hour.[23] The same Census reported twenty-nine municipal distributing systems in Oklahoma, five in Louisiana, and one in Texas, or a total of thirty-five in the West South Central division. Thus, six of the forty-one purchasers of energy must have also operated generating equipment. If it is assumed that the twenty-nine distributing-only systems in Oklahoma purchased a pro rata share of the total, then it can be estimated that they purchased 21,979,885 kilowatt-hours in 1937.[24] If this estimate is

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[22] Census of Electrical Industries: 1922, pp. 109, 156.

[23] Census of Electrical Industries: 1937, p. 32.

[24] This estimate was calculated by dividing the number of distributing-only systems in the three states (35) into the number of distributing-only systems reported in Oklahoma (29). The resulting decimal fraction (.828571) was then multiplied by the total energy purchased (26,527,461 kilowatt-hours).

near correct, then it represents a striking increase in energy purchases in the fifteen years since 1922. But even greater absolute increases are seen in the data presented in Table 25 for the years 1945, 1950, and 1955, when the impact of government sales to municipalities first began to be felt.

Table 28 shows the sources and amounts of electric energy purchased by Oklahoma municipal electric systems in 1945, 1950, and 1955. Even in 1945 Grand River Dam Authority was the largest single wholesaler of energy to municipal systems, furnishing over 14.5 million kilowatt-hours. The two major private systems in the state supplied their municipal customers with almost identical amounts of energy, somewhat more than eight million kilowatt-hours. Four other municipal systems, including one in Kansas, supplied relatively small amounts of energy in that year, as did a private electric system in Kansas.

In 1950 the two major private systems together supplied slightly more energy to municipal systems than Grand River Dam Authority, just as they had in 1945. But Public Service Company had increased its sales substantially more than Oklahoma Gas & Electric Company. The state authority continued to be the leading supplier, its sales

TABLE 28.--Electric energy, in kilowatt-hours, purchased for resale by municipal electric systems in Oklahoma, by source of energy, in 1945, 1950, and 1955

Source of energy	1945 (Kwh)	1950 (Kwh)	1955 (Kwh)
Private systems:			
Oklahoma Gas & Electric Co.	8,366,030	18,084,130	28,641,156
Public Service Co.	8,523,570	25,461,430	47,069,500
Caneyville, Kansas, Electric Co.	144,060	...	...
Public power agencies:			
Southwestern Power Administration	...	...	21,745,425
Grand River Dam Authority	14,585,885	40,873,600	84,209,810
Other municipal systems:			
Blackwell	217,423	400,566	602,400
Cherokee	254,420	407,740	539,951
Coffeyville, Kansas	274,085	354,864	612,000
Purcell	331,200	480,000	...
Rural electric cooperatives:			
Alfalfa Electric Cooperative	...	...	960,000
Northwest Electric Cooperative	...	537,340	1,154,720
Total	32,696,673	86,599,670	185,534,962

Sources: Power system statements filed by Oklahoma municipal electric systems at the Federal Power Commission Regional Office, Ft. Worth, Texas.

rising to about 47 per cent of the total energy purchased for resale in that year.

By 1955, after the entry of Southwestern Power Administration upon the power-marketing scene, the public power agencies had far outrun the private systems in energy sold to municipal systems. Grand River Dam Authority in that year sold over 84 million kilowatt-hours, 45 per cent of total purchases. Southwestern Power Administration supplied almost 22 million kilowatt-hours, bringing the total furnished by public power agencies to more than 57 per cent of all purchases. The two private systems in that year accounted for about 41 per cent of the sales to municipalities. Two rural electric cooperatives and three other municipal systems accounted for the remaining energy sold to municipal systems.

Grand River Dam Authority, in expanding its sales to municipalities almost sixfold between 1945 and 1955, increased its customers from three cities in 1945 to eleven cities in 1955.[25] All of the Authority's municipal customers

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[25]Completed during World War II, the hydro station at Grand Lake was administered by Southwestern Power Administration in 1944 and 1945, after which the properties were returned to state control. The report to the Federal Power Commission for the year ending December 31, 1945, was

are located in the eastern half of the state. They are serviced over transmission lines owned by the Authority or through wheeling arrangements with KAMO Electric Cooperative and Public Service Company. Electric energy is produced by the Authority at its 86,400-kilowatt hydro station on Grand Lake and at its 40,000-kilowatt steam turbine at Choteau. In addition, the Authority and Public Service Company are interconnected under the terms of a power exchange contract. Under the monthly basic resale rate, municipal customers pay $.90 per kilowatt of billing demand,[26] plus an energy charge of four mills for the first 100,000 kilowatt-hours, three mills for the next 200,000 kilowatt-hours, and all energy in excess at two and a half mills per kilowatt-hour. During periods when the water level is low at Grand Lake the Authority may add a drouth surcharge to all bills. Without the surcharge, the rate averages about six mills per kilowatt-hour. In 1955, because of the inclusion of the drouth surcharge, the rate per kilowatt-hour paid by

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submitted by Southwestern Power Administration for the "Grand River Dam Project" and listed the sales to municipalities for that year shown in Table 30.

[26]Billing demand is either the contract demand or the average number of kilowatts supplied during the thirty-minute period of maximum use during the month, whichever is the greater.

municipal customers ranged from 6.27 mills to 8.07 mills. Average revenue of the Authority on its sales of 84,215,706 kilowatt-hours to municipal systems in 1955 was 6.75 mills per kilowatt-hour.[27]

Table 29 shows the growth in number of municipal customers and in energy sales by Grand River Dam Authority from 1945 to 1955. Of the eleven municipal systems listed in the table, Cushing is the only one which did not purchase all its requirements from the Authority. The ten others were dependent upon the Authority for all electric energy they used.

Purchases from Grand River Dam Authority by eleven Oklahoma municipal systems in 1955 are given in Table 30, together with the total cost of energy and the cost per kilowatt-hour. As might be expected, the highest average rate was paid by the smallest user. The progression between the two extremes is not smooth, however, because of differences in billing demand.

Southwestern Power Administration, the federal power

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[27]Power system statement and annual report of Grand River Dam Authority for the year ending December 31, 1955, on file at the Federal Power Commission Regional Office, Ft. Worth, Texas. Sales to municipalities constituted about 15 per cent of the Authority's energy sales in 1955.

TABLE 29.--Municipal electric systems in Oklahoma purchasing power from Grand River Dam Authority, with energy purchases in kilowatt-hours, for calendar years ending December 31, 1945-1955

Systems	1945	1946	1947	1948	1949	1950
Chelsea	936,920	1,177,920	1,411,680	1,489,440	1,732,340	1,863,300
Claremore	12,515,200	11,526,400	11,916,800	14,438,200	14,246,000	15,488,000
Collinsville	1,196,640	1,741,440	1,994,400	2,277,120	2,526,600	2,611,062
Miami	...	...	6,850,800	11,705,600	12,353,600	12,472,000
Tahlequah	...	...	2,574,000	4,407,600	4,992,000	5,460,000
Wagoner	...	...	1,401,600	2,745,200	2,948,400	2,995,200
Stilwell	...	...	...	...	...	254,400
Sallisaw	...	...	...	...	...	...
Pryor	...	...	...	...	...	...
Pawnee	...	...	...	...	...	...
Cushing[a]	...	...	...	...	...	...
Total	14,648,760	14,445,760	26,149,280	37,063,160	38,798,940	41,143,962

TABLE 29.--Continued

Systems	1951	1952	1953	1954	1955
Chelsea	1,790,650	1,792,000	2,052,500	2,279,750	2,433,750
Claremore	14,749,000	15,492,000	15,633,000	16,866,800	12,819,600[b]
Collinsville	2,949,000	3,022,000	3,308,000	3,836,000	4,185,466
Miami	13,116,000	14,716,000	16,032,000	18,608,640	20,205,690
Tahlequah	5,707,200	6,134,400	6,009,600	7,052,800	7,387,200[b]
Wagoner	3,477,600	3,793,200	4,263,600	5,188,800	5,023,200[b]
Stilwell	1,872,000	2,236,800	2,718,400	2,798,400	3,164,800[b]
Sallisaw	...	2,009,000	3,850,800	4,161,600	4,814,400
Pryor	...	6,458,400	7,574,400	9,197,400	9,867,600
Pawnee	...	...	48,000	3,583,200	3,777,600
Cushing[a]	...	...	...	8,285,300	10,536,400
Total	43,661,450	55,653,800	61,490,300	81,858,690	84,215,706

TABLE 29.--Continued

[a]Supplemental contract for needs beyond generating capacity; system stopped purchasing from the Authority in 1956.

[b]Systems reported slightly different totals for energy purchases.

Source: Power system statements filed by Grand River Dam Authority in Federal Power Commission Regional Office, Ft. Worth, Texas.

TABLE 30.--Municipal electric systems purchasing power from Grand River Dam Authority, with energy purchased, cost of energy, and cost per kilowatt-hour, for the year ending December 31, 1955

System	Energy purchased (Kwh)	Energy cost (dollars)	Cost per kilowatt-hour (mills)
Miami	20,205,690	126,625	6.27
Claremore	12,819,600	86,311	6.73
Cushing	10,536,400	69,887	6.63
Pryor	9,867,600	63,189	6.40
Tahlequah	7,387,200	51,138	6.92
Wagoner	5,023,200	36,322	7.23
Sallisaw	4,814,400	32,706	6.79
Collinsville	4,185,466	32,503	7.77
Pawnee	3,777,600	25,734	6.81
Stilwell	3,164,800	24,674	7.80
Chelsea	2,433,750	19,633	8.07

Source: Annual report of Grand River Dam Authority to the Federal Power Commission, for the year ended December 31, 1955, on file at the Federal Power Commission Regional Office, Ft. Worth, Texas.

marketing agency for Oklahoma and other states in the area, first began selling power to municipalities in Oklahoma in 1951. Created in 1943 by the Secretary of the Interior, it first marketed power from the Grand River Dam Project in 1944, and from Denison Dam and Norfork Dam in 1945. It was not, however, until 1950 that a satisfactory arrangement could be worked out for delivery of electric energy to municipal customers. This arrangement took the form of a triparty power exchange contract between the Administration, Oklahoma Gas & Electric Company, and Public Service Company.[28] Under this contract, which went into effect in 1951, the Administration delivers peaking power to the companies at a rate of 1.65 kilowatts for each kilowatt of maximum firm power demand which the companies are obligated to deliver to municipal systems and other preference customers. The exchange, then, involves use of the companies' transmission and generating facilities to deliver firm power to municipal systems. For this service, the companies may schedule the

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[28]The essential elements of this contract may be found in U. S., Congress, Senate, Committee on Public Works, Hearings on Investigation of Electric Power Rates Relating to Southwestern Power Administration, 84th Cong., 2nd Sess., 1956, pp. 362-65. Similar contracts have been negotiated with other private systems in Arkansas, Louisiana, and Texas, and with rural electric generation and transmission cooperatives.

valuable peaking power output from the federal government's hydroelectric stations in the area. Since the electricity in the integrated system is a homogeneous product, it matters little to municipal customers of Southwestern Power Administration where the particular energy they purchase is produced.

Billing and accounting is performed by the Administration, meter-reading is performed by the companies, and payments are made by the municipal systems directly to the Administration. Without construction of duplicating transmission lines, municipal preference customers may be served immediately anywhere within the companies' service areas, which extend to most of the state. Thus the Oklahoma municipal customers of Southwestern Power Administration are scattered from Eldorado in the southwest, to Purcell in the center, to Goltry in the north-center, to Spiro in the east, and to Skiatook in the northeast. Both Public Service Company and Oklahoma Gas & Electric Company serve municipal customers of the Administration.

Southwestern Power Administration's wholesale rate for firm power service, in effect on an interim basis since 1947, is usually designated as "rate schedule A." This schedule provides for a demand charge of $1.35 per kilowatt of billing demand per month. Included in the demand charge is the use of 200 kilowatt-hours per month for each kilowatt of billing demand. An energy charge of four mills for each additional kilowatt-hour metered completes the schedule. The demand charge plus the energy charge results in an average rate of 5.5 mills per kilowatt-hour at 50 per cent load factor use.

A heated public controversy arose in 1956 over a proposed revision of rate schedule A which would have raised the average cost of energy to preference customers by 40 per cent to 7.7 mills per kilowatt-hour.[29] Subsequently the proposed revision was amended to lower the average rate to 6.7 mills per kilowatt-hour.[30] The 6.7 mill rate schedule had not yet been approved by the Federal Power Commission on June 1, 1957.

After two years of contract negotiation, the Administration by 1953 had secured the thirteen customers listed in Table 31. Eleven municipal systems purchase all

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[29]For a succinct outline of the A rate's history and the controversy surrounding its revision, see the testimony of Fred G. Aandahl, Assistant Secretary of the Interior, _ibid_., pp. 45-167.

[30]Interview with Sam Scales, contract representative, Southwestern Power Administration, in Tulsa, Oklahoma, on Feb. 14, 1957.

TABLE 31.--Municipal electric systems in Oklahoma purchasing power from Southwestern Power Administration, with energy purchases in kilowatt-hours for fiscal years ending June 30, 1951-1956

Systems	1951	1952	1953	1954	1955	1956
Wetumka	160,000	1,443,200	1,557,600	1,741,600	1,957,600	1,982,487
Spiro	186,400	1,189,600	1,286,400	1,344,800	1,465,778	1,425,361
Skiatook	...	1,671,686	2,003,000	2,257,600	2,698,709	3,013,823
Crescent	...	865,200	1,261,200	1,295,890	1,391,400	1,338,358
Purcell	...	663,600	3,340,000	4,638,400	5,385,527	4,640,932
Yale	...	594,400	1,588,800	1,717,600	1,894,400	1,690,876
Lexington	...	172,800	613,600	692,400	710,411	669,134
Eldorado	...	135,200	661,000	631,300	790,000	865,000
Ryan	...	215,400	997,800	1,115,000	1,147,200	1,130,261
Goltry	...	...	151,230	322,510	376,800	421,600
Granite	...	...	259,600	795,200	845,100	880,200
Anadarko[a]	...	...	294,800	127,067	2,582,176	2,153,830
Hominy[a]	...	...	58,400	866,400	1,058,400	571,200
Total	346,400	6,951,086	14,073,430	17,545,767	22,303,501	20,783,062

[a]Supplemental contracts for needs beyond generating capabilities.

Source: Municipal system ledger accounts on file at Southwestern Power Administration, Tulsa, Okla.

requirements from the Administration, while the two systems last added purchase energy needs beyond their generating capabilities, the amount varying sharply from month to month. All thirteen customers increased their purchases between 1953 and 1956 as total energy sales of the Administration to this group climbed from slightly over 14 million kilowatt-hours to over 20.7 million kilowatt-hours. Energy purchases would probably have gone even higher and additional customers would have been added if the Administration had been able to commit more of its capacity to its municipal preference customers.[31]

Table 32 is an analysis of power purchases by municipal systems buying from Southwestern Power Administration and is similar to that presented in Table 31 concerning municipal customers of Grand River Dam Authority. As was the case before, lower average rates are paid by the larger users while higher average rates are paid by the smaller systems purchasing from Southwestern Power Administration,

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[31]Municipalities have sometimes not been able to increase their contract demand, forcing them into "split-billing" with the private companies. Prospective municipal customers have not been sought by Southwestern Power Administration for the last three years. Interview with Sam Scales, contract representative, Southwestern Power Administration, in Tulsa, Okla., on Oct. 3, 1956.

TABLE 32.--Municipal electric systems purchasing power from Southwestern Power Administration, with energy purchased, cost of energy, and cost per kilowatt-hour, for the year ending June 30, 1956

System	Energy purchased (Kwh)	Energy cost (dollars)	Cost per kilowatt-hour (mills)
Purcell	4,640,932	25,989	5.60
Skiatook	3,013,823	16,539	5.49
Anadarko[a]	2,153,830	12,577	5.84
Wetumka	1,982,487	11,113	5.61
Yale	1,690,876	9,404	5.56
Spiro	1,425,361	8,396	5.89
Crescent	1,338,358	7,993	5.97
Ryan	1,130,261	6,369	5.64
Granite	880,200	5,108	5.80
Eldorado	865,000	7,881	9.11[b]
Lexington	669,134	3,909	5.84
Hominy[a]	571,200	5,802	10.15[c]
Goltry	421,600	2,687	6.37

[a]System has supplemental contract for needs beyond generating capacity.

[b]In order to furnish power to a local cotton gin, which operates primarily in the months of October and November, Eldorado has contracted for an abnormally high demand. The demand charge pushes the average rate per kilowatt-hour far higher than it would otherwise be. The effect of the cotton gin load may be seen in the peak use of 149,600 kilowatt-hours used in November, 1955, in contrast to the lowest monthly use of 42,800 kilowatt-hours in March, 1956.

[c]While maintaining a contract demand of 300 kilowatts in 1956, Hominy substantially reduced its energy purchases. In 1955 the cost per kilowatt-hour was only 5.93 mills.

Source: Data extracted from records of the Southwestern Power Administration, Tulsa, Okla.

although the progression again is not smooth because of differences in billing demand. With the exception of the two special cases explained in footnotes to Table 32, the average cost ranged from 5.49 mills to 6.37 mills per kilowatt-hour. The 6.37 mills paid by Goltry, it should be noted, is only one-tenth of a mill more than the lowest average cost paid by the largest Grand River Dam Authority customer, Miami. In all other cases except Goltry, Eldorado, and Hominy, the average cost of Southwestern Power Administration electric service was less than that of Grand River Dam Authority. It should be noted, too, that all but four of Grand River Dam Authority's municipal customers were larger users than the thirteen municipal systems supplied by Southwestern Power Administration.

In general, it may be said that Southwestern Power Administration supplies more of the smaller municipal systems with less energy at lower rates than Grand River Dam Authority. The average cost per kilowatt-hour sold by Southwestern Power Administration to its municipal customers was 5.96 mills in 1956, about 12 per cent below the cost of energy from Grand River Dam Authority in 1955. The pending revision of Southwestern Power Administration's rate schedule may eliminate this difference in comparative cost of energy.

CHAPTER V

ELECTRIC REVENUES, BOND FINANCING, AND PROPERTY TAXATION

Revenues collected by municipal electric systems in Oklahoma have exceeded 10 per cent of all electric utility revenues collected in the state since 1912. They rose as high as 21 per cent in 1917, but have varied only slightly between 10 and 12 per cent since 1927.[1] In revenue terms, then, the municipal systems have grown about as fast since 1927 as the rest of the electric utility industry in the state. As they have grown, the municipal electric systems have begun to play a role quite different from that which predicated their establishment. Rather than functioning simply as purveyors of a necessary public service, they have begun to be used by municipalities as tax-gathering devices. It is difficult to determine just when this extension of role occurred, but by 1956 all seventy-one

[1]See above, Table 5, p. 49.

municipalities apparently looked upon their municipal electric systems as useful substitutes for ad valorem taxation. One purpose of this chapter is to explain why, how, and to what extent the Oklahoma municipal electric systems function as substitutes for ad valorem taxation.

Another purpose of the chapter is to explain the role of public utility bond financing in the establishment and expansion of the existing municipal electric systems. It will be shown, through analysis of several quantitative series, that municipal electric revenues, property taxation, and issuance of bonds to be retired through tax levies all combine to shape the financial character of the municipal electric systems in the state.

Municipal Electric Systems as Taxing Devices

Theoretically, the general policy of the municipal governing authority toward its electric system might take note of three possible alternatives. The municipal electric system might be so managed and its rates so set that each year's operation would result in a planned profit, a planned loss, or an equation of revenues and expenses. A planned loss would mean that ratepayers were being subsidized at the expense of taxpayers. Simply breaking even on the operation would reflect a desire to furnish a necessary public service at cost. A planned profit, especially one that constitutes more than a "normal" return on the city's investment, usually is nothing less than a means of bolstering the city's budget --an alternate or addition to other means of taxation.[2]

City officials in each Oklahoma municipality operating an electric system were asked in interviews what the governing authority's electric rate policies were. All answered that the primary fiscal aim of policy applied to the electric system was providing revenue in lieu of taxation. That is, the aim was to make a profit which could be transferred to the general fund to be spent as the governing authority saw fit. In no case did the city officials express the thought that they might operate the system at a loss. Neither did they state that they desired only to break even on the electric system, although they frequently commented that no profits were sought on the municipal water system.

A number of reasons may be adduced for this unanimity of attitude toward the municipal electric system as a

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[2]Part of a planned profit, however, might be reinvested in the electric plant to cover expansion costs.

tax-gathering device. Perhaps the most important of all is the limitation on municipal taxation contained in the Oklahoma Constitution.[3] This limitation has forced practically all Oklahoma towns and cities to depend heavily upon either a municipal water system or electric system, or both, for sufficient funds to provide essential city services. In the year 1948-1949, for instance, municipal public utilities (electricity, water, gas, and sewer) were the largest producers of municipal revenue in the forty-four Oklahoma cities between 3,000 and 40,000 population, providing 59 per cent of the total revenue. In contrast, property tax sources produced only 18 per cent. No other source of revenue produced as much as four per cent of the composite total revenue for the forty-four cities.[4]

Ownership of two or more utilities apparently encouraged independence from the property tax, as the utility revenue of twelve cities owning two utilities was 83.3 per cent of the total revenue received by those cities, and six of the cities had no property tax at all. On the other hand,

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[3]Oklahoma, Constitution, Art. 10, sec. 9. See also Chapter III above, pp. 164-68.

[4]Joseph Lee Rodgers, Jr., "Financing Small Cities in Oklahoma" (unpublished Master's thesis, University of Oklahoma, 1953), p. 31.

utility revenue was only 48.2 per cent of total revenue received by the thirty-two cities owning only a water system.[5]

Coupled with the constitutional limit on ad valorem taxation is the lack of any statute regulating the rates that a municipal utility system can charge. Free of statutory limitations in this respect, a municipality may boost its rates as high as necessary to balance its municipal budget. The only limits are the common-law test of reasonableness[6] and the possibility of provoking cutbacks in use which might lower revenues. Since demand is considered somewhat inelastic[7] for such services as electricity, gas, and water, an increase in rates would probably have to be quite sharp before it caused a reduction in revenue.

Even without the constitutional limit on taxation and with some form of state regulation of rates, municipal electric systems would probably continue to be operated by Oklahoma cities. Certainly this has been the case in such states as Wisconsin, New York, and Massachusetts, where municipal electric systems have continued to operate under

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[5]*Ibid.*, pp. 67-69.

[6]See Chapter III above, pp. 120-21.

[7]At least at the lower levels of use and in the short run.

stringent state controls.[8] From the standpoint of the municipal political administrator in Oklahoma, continuation may be expected since an electric system is an almost ideal means of collecting revenue.

Administratively speaking, income from the electric system is highly predictable and is less subject to cyclical variations than property tax collections. A number of Oklahoma cities have seen their electric revenues double or triple since 1945 even though their rates have not been changed since before that year. Increasing usage of electricity may cause a significant rise in revenue if rates are increased only slightly. Indeed, the increasing use of electricity has caused increases in electric revenue in at least one system even though rates were reduced.[9]

From the political standpoint, collection of funds for general government through a municipal electric system is similarly advantageous. Influential owners of extensive real estate are undoubtedly pleased that their property is

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[8]Twentieth Century Fund, op. cit., pp. 425-29. In 1941, twenty-four state regulatory commissions had authority over municipal systems.

[9]Ponca City reduced its rates in 1955; revenues continued to increase in the ensuing year. Interview with Frank Winstead, city manager of Ponca City, Okla., on Nov. 8, 1956.

not taxed as heavily as it might otherwise be. The residential landlord's share of the city's government expense may be shifted directly to the tenant of a dwelling place, who pays the electricity bill monthly.[10] The land speculator who holds vacant property is also relieved of a certain amount of tax liability. In addition, tenants who might otherwise escape paying city taxes directly are required to pay an indirect levy through their utility bills; there is no chance that they can escape through a frictional circumstance in which the landlord has not passed on the property tax. In this respect, the benefit theory of taxation may be called upon to justify the inclusion of a city tax in the utility bill. Similarly, city utility customers living outside the corporate limits but enjoying the use of streets and other municipal facilities are required to pay for those benefits through their utility bills.[11]

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[10]This is not meant to imply that the general property tax cannot be shifted to the tenant by including it in the rent required by the landlord. It is well-known, however, that short-run conditions may not allow this shifting.

[11]"City councils in control of municipal plants are often sensitive to the interests of large landowners and taxpayers, and therefore maintain the policy of transferring surplus revenues from power to the general fund, in order to reduce the real-estate taxes." Twentieth Century Fund, _op. cit._, p. 428.

In line with the somewhat Machiavellian reasoning cited above, it is probable that most of the citizens served by a municipal electric system are quite neutral in their attitudes toward their electric service and the rates they pay as long as the service is adequate and the rates are not unreasonably high. The homeowner might well prefer to pay his municipal taxes as a part of his monthly electric bill, rather than paying a yearly lump sum as a property tax.

The evidence presented in Chapter II tends to indicate that the prospect of lower electric rates was not as important as other factors, such as better service, in persuading the municipality to abandon its system and substitute service by a private system.[12] In a like fashion, the prospect of lower municipal rates does not seem to have influenced the acquisition of private systems in 1951 by Skiatook and Pryor, for the two systems are still charging rates identical to those charged by the displaced private systems.[13] Even if he becomes concerned about the rates he pays the consumer will ordinarily find it difficult to compute the proportion of his electric bill equivalent to a

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[12] Above, pp. 109-13.

[13] An exception to the situation in Skiatook and Pryor is that in Cushing in 1935.

municipal tax.[14]

Comparison of Electric Revenues and Property Taxation

Although the individual consumer may find it difficult to compute the tax in his electric bill, the available data do permit estimates of the contribution to city governments by municipal electric systems in Oklahoma. The estimates must be made under a number of qualifying assumptions, however, and are not nearly so accurate as might be desirable. The inaccuracy arises primarily from the inadequacies of the financial data available. None of the systems maintains the financial records or prepares the financial analyses that would be legally required if they were not municipally-owned enterprises, although the larger and more expertly managed systems more nearly approach adequacy in their record-keeping. Many of the smaller systems' business methods, on the other hand, leave a great deal to be desired, from the standpoints of public administration and economic research alike. The many shortcomings of the municipal electric systems' accounting and management procedures,

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[14]Impartial investigators of the question have also experienced this difficulty.

however, will be discussed only as they relate directly to the problem of estimating the proportion of municipal taxes included in electric system revenue.

At the outset of this research, it was hoped that firm, accurate information could be gathered concerning the net income of municipal electric systems in the state. Preliminary investigation revealed, however, that this could not be accomplished satisfactorily on the basis of available data. As will be seen, determination of such basic data as gross revenue from electric sales for each system in one recent year was a lengthy, tedious task that could not be accomplished without interpolations.

Because of the close state control of local taxation, tax rates and anticipated revenues could be determined with accuracy. Municipalities are required by law to submit a financial statement and budget estimate each year. In these documents may be found the tax levies approved by the county excise boards and the anticipated tax revenues.

Revenues from Electric Sales

As shown in Table 33, revenues from sales of electric service by municipal electric systems in Oklahoma grew rapidly from 1902 to 1922, increasing from $15,927 to

TABLE 33.--Revenue from sales of electric service by municipal electric systems in Oklahoma, at five-year intervals, 1902-1937 and 1945-1955

Year	Revenue (dollars)	Increase or decrease from preceding year (dollars)	(per cent)
1902	$ 15,927	$	...
1907	59,459[a]	43,532	273
1912	321,101[b]	261,642	440
1917	714,800[c]	393,699	123
1922	1,765,604[d]	1,050,804	147
1927	2,581,085	815,481	46
1932	2,232,975	- 348,110	- 13
1937	2,677,468	444,493	20
1945	3,954,035	1,276,567	...[f]
1950	6,660,651	2,706,616	68
1955	10,286,953	3,626,302	54

[a]Gross revenues were reported as $86,371, but this included $26,912 as income from "public lighting."

[b]Gross revenues were reported as $423,424, but this included $102,323 as "estimated value of free services."

[c]Gross revenues were reported as $938,022, but this included $223,222 as "estimated value of free services."

[d]Gross revenues were reported as $2,013,431, but this included $247,827 as "estimated value of free services."

[e]The total for this and for later years is for the fiscal year ending June 30.

[f]The increase calculated was 48 per cent, but it is not shown in the body of the table because the eight-year intervening period from 1937 to 1945 is not comparable with the other intervals.

Sources: Census of Electrical Industries: 1902-1937, and Table 34.

$1,765,604 during the twenty-year span. By 1927, however, the rate of increase had slowed considerably, with revenues in that year registering a rise of only 46 per cent over 1922. The upward trend was reversed in 1932 as revenues declined by 13 per cent from the level of 1927. This dip occurred partially as a result of the severe economic depression of the early 1930's but also because of the decline in number of municipal systems. By 1937 total revenues had once again moved upward by a modest 20 per cent but they were still only $96,383 above the level of a decade before. From 1937 to 1945, revenues jumped sharply, in an absolute sense, to almost $4 million. The increase from 1932 to 1945 represents internal growth of the municipal electric systems, as there were few distortions of the series caused by establishments and abandonments.[15]

Increases during the post-World War II decade are more significant than the earlier ones. Total sales of electric service soared far beyond their prewar levels as electricity usage by municipal customers hit record heights. To show how each of the municipal electric systems shared in

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[15] No municipal systems were abandoned and only three systems were established during the period.

this increase in revenues, revenue data were collected from each of the seventy-one systems for 1945, 1950, and 1955. Unfortunately, total revenues for all municipal electric systems in the state were not available from any source, although such totals had been published in the _Census of Electrical Industries_ at five-year intervals from 1902 to 1937. While Federal Power Commission reporting procedure requires the submission of revenue data by all systems, the Commission published financial reports from only four of the largest municipal systems in the state.[16] Commission representatives at the Fort Worth Regional Office pointed out that financial reports were extremely difficult to secure from the municipal systems, particularly the smaller ones. Because of this difficulty and the fact that the Commission exercises no regulatory function over municipal systems, no strong effort is made by the Commission to enforce financial reporting.[17]

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[16]These reports were summarized briefly for Blackwell, Cushing, Miami, and Ponca City in U. S., Federal Power Commission, _Statistics of Electrical Utilities in the United States: 1952, 1953, 1954; Classes A and B Publicly Owned Systems_ (Washington: Federal Power Commission, n. d.), pp. 26A, 27, 27A.

[17]Interviews with R. G. Frankenberg and Don H. Martin, electrical engineers, Federal Power Commission Regional Office, Ft. Worth, Texas, on October 22-25, 1956.

In the absence of published or collected data, gross revenues of the Oklahoma municipal electric systems had to be determined by a variety of means. The two chief methods utilized were examination of documents and records during personal visits to each system and consultation of municipal financial statements and budget estimates filed in the State Auditor's office. Certain defects, arising from the lack of uniformity in record-keeping by the municipal systems, were found to be inherent in both methods. Oklahoma law permits municipalities to maintain either separate funds for each municipal utility or a combined utility fund for all. Where the same fund was used for deposit of both water and electric system receipts, the problem arose of separating out that portion of the revenue arising from the electric system. To confuse the problem further, municipalities are permitted to operate their utility systems either within or outside the general fund. If accounted for within the general fund, utility receipts from the electric, water, and sewer systems are sometimes entered on municipal financial statements as a single sum. In some cases, transfers of surplus funds from the utility fund to the general fund were indicated on municipal financial statements without a mention of total utility receipts. These irregularities, together with the inadequacy or absence of municipal records on file at the city or town hall, prevented completely accurate determination of revenues in the years selected and forced an approximation of revenues at times.

To provide a double-check of all revenue data, an attempt was first made to secure the yearly totals from each of the systems during personal visits. One of the best sources at the system level was the file of annual audit reports. Usually covering an entire fiscal year, the audit reports frequently contained operating statements showing annual revenue for either the electric system alone or for both water and electric systems together. Where water and electric receipts were lumped together, the next available recourse was the cash collection register. At times the collection register might reveal separate monthly totals for water and electric system revenues even though the two were combined into one total in the annual report. If a collection register was not maintained, the file of monthly sales tax returns to the Oklahoma Tax Commission was examined. These returns are in such form that total sales of electricity, both taxable and tax-exempt, may be entered. Some clerks, however, have entered only taxable sales and have computed the two per cent tax from this. Other clerks said that tax collections were computed from billing cards and then the total taxable sales--a required entry--was figured by multiplying the tax collected by fifty. Where only the taxable sales were entered, tax-exempt sales could not be determined. But sales tax returns, when available, at least provided a reliable minimum figure for electric revenues.

Unfortunately, not all clerks maintained a file of sales tax returns. Sometimes the returns were filed along with all other monthly claim reports. In these cases, it was sometimes possible to determine the sales tax paid by examining council minutes for the record of claims paid. Perhaps because of the mandatory nature of the payments, tax claims paid to the Oklahoma Tax Commission were not always entered in the minutes.[18]

As a last resort, city officials were asked to estimate the proportion of annual utility revenue arising from electric sales. Of course, it would have been possible in some cases to add together the charges for electricity on each customer's bill for the month preceding the writer's visit to the system. But the proportion of water to

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[18]The writer sought permission to examine the sales tax files of the Oklahoma Tax Commission in order to firm up the revenue data, but was refused access on the grounds that the sales tax returns were not public records.

electricity charges varies from month to month. It is doubtful that any single month could be considered representative of an entire year. Estimates of the proportion by officials working closely with the utility during the entire year were accepted as more likely to approach the true proportion.

Methods of Estimation

Estimation procedures were used more frequently for the years 1945 and 1950 than for 1955 because of the difficulties in finding municipal records for the earlier years. Three general methods were utilized: estimation from sales tax paid, estimation from the proportion of electric revenue to water and electric revenue, and estimation utilizing a combination of sales tax data and the proportion of electric to total water and electric revenues.

When sales tax paid during a year was known, the tax paid was multiplied by fifty. No allowance was made for sales to manufacturing establishments, churches, schools, state and federal agencies, and other tax-exempt organizations. In the cases where this method was used, sales to tax-exempt customers appeared to be rather small and no benchmark percentage for tax-exempt sales could be determined.

The largest revenue figures estimated by this method were $52,465 in 1945, $85,955 in 1950, and $75,678 in 1955. While it is likely that some of the estimates by this method are lower than the true figure, in no case are they higher.

In estimating by attempting to determine the proportion of electric revenue to water and electric revenue, an effort was made to establish this proportion by securing separate totals for electric revenue and water revenue in years other than the one to be estimated. In some cases this could be done for earlier or later years because of a change in accounting methods. Often it was possible to determine the proportion for 1955 but not for earlier years; the 1955 ratio was then applied to the total of water and electric revenues secured from audit reports or from municipal financial statements for 1945 or 1950. When impossible to compute any other way, the ratio offered by municipal officials was accepted and applied against the total utility revenue. Usually the ratio of electric to water revenues were 65 to 75 per cent of water and electric revenues together.

In some cases, it was possible to use sales tax data to determine the proportion of electric to total utility revenue in one year. This occurred in those systems for which sales tax paid and total utility revenue were known for one year, but only total utility revenue was known for the year to be estimated.

Again, with one exception, relatively small amounts of revenue were estimated by the latter two methods. The largest amount estimated by this method was Stillwater's revenue in 1945, which was computed to be $260,877 on the basis that 70 per cent of $372,681 in total utility revenues was electricity sales. (In 1955 electric revenues in Stillwater were 69.3 per cent of total utility revenues.) Otherwise, in 1950 the largest estimate by this method was $47,034 and in 1955 the largest was $69,476.

Despite the necessity for some estimation, reliability of the total revenue figures appears to be high. In 1945 about 17.5 per cent of the total, or $691,801, was secured through estimation procedures. Of the total, 4.4 per cent was estimated by use of sales tax payments. Reliability of the 1950 data is far better. Only 6.9 per cent or $461,082 was estimated for 1950, of which $318,356 was estimated from sales taxes paid. In 1955 only 4.3 per cent of the total was estimated, an amount of $445,018. The necessity for estimation arose for seventeen systems in 1945, twelve systems in 1950, and eleven systems in 1955.

Results of the efforts to collect and estimate electric revenues for all municipal electric systems are shown in Table 34. It may be noted that all systems except Skiatook and Pryor increased their revenues from 1945 to 1955. Revenues more than quadrupled at Collinsville and Lindsay. They multiplied by more than three in fourteen other communities: Cashion, Claremore, Comanche, Copan, Cushing, Edmond, Laverne, Okeene, Perry, Sallisaw, South Coffeyville, Stilwell, Stroud, and Wynnewood. Forty other communities may be found where revenues from electric sales increased less proportionately but at least doubled between 1945 and 1955. In all, fifty-six of sixty-nine systems more than doubled electric revenues during the period.

How much of this total revenue from electric sales by municipal electric systems in Oklahoma might be considered net profits or substitutes for other taxation? Necessarily, the answer must again be an estimate based on certain assumptions.

As mentioned before, the greatest problem besetting one attempting to determine electric system contributions to Oklahoma municipal governments is the lack of uniform accounting data. Municipal authorities tend to look upon the electric system as a continuing source of funds

TABLE 34.--Total revenue from electric sales by municipal electric systems in Oklahoma, in 1945, 1950, and 1955

System	1945	1950	1955
Altus	$ 214,955	$ 296,691	$ 499,714
Amorita	2,269	2,979	3,900
Anadarko	114,285	198,258	214,063
Blackwell	282,938	420,438	659,807
Braman	8,075	11,508	16,844
Burlington	4,865	7,763	11,528
Byron	2,784	2,581	3,207
Carmen	20,328	33,191	28,869
Cashion	5,443	10,042	18,090
Chelsea	16,912[a]	25,473	46,064
Cherokee	66,265	117,655	153,923
Claremore	112,414	181,975	351,657
Collinsville	26,848	61,655	110,353
Comanche	24,237[a]	47,034[a]	75,678[b]
Copan	5,362[b]	8,330[a]	20,341[b]
Cordell	60,265	92,818	110,008
Crescent	17,071[a]	36,957[b]	45,274[b]
Cushing	147,776	321,386	565,526
Dacoma	4,760	7,010	7,635

TABLE 34.--Continued

System	1945	1950	1955
Duncan	$ 127,542	$ 176,071	$ 264,377
Edmond	87,588	149,926	269,836
Eldorado	11,406	25,043	31,029
Fairview	51,101	65,255	108,726
Fort Supply	2,820[b]	6,140[b]	8,415[a]
Frederick	142,484	197,079	269,592
Geary	25,892[b]	47,370[b]	58,135
Goltry	6,130	10,318	13,353
Granite	15,177	28,625	29,707
Hominy	59,620	89,894	145,201
Kaw City	9,541	16,796	20,834
Kingfisher	79,536	126,864	166,119
Laverne	14,800	37,611	44,648
Lexington	13,008[a]	18,848[a]	24,598
Lindsay	30,863	93,000	124,066
Manchester	4,499	6,574	8,953
Mangum	79,281	136,406	151,796
Manitou	3,299	6,403	8,920[a]
Marlow	53,650	92,835	128,976

TABLE 34.--Continued

System	1945	1950	1955
Miami	$ 241,933	$ 384,085	$ 583,534
Mooreland	12,472	22,712	31,694
Newkirk	39,752	63,186	95,673
Okeene	32,137[b]	53,123[b]	69,476[a]
Olustee	8,890	14,614	15,696
Orlando	2,822[d]	4,466[d]	5,935[d]
Pawhuska	116,390	181,222	262,977
Pawnee	49,459	76,766	104,778
Perry	72,847[a]	151,852	240,760
Ponca City	436,452	774,641	1,260,199
Pond Creek	20,194[a]	31,708[a]	45,851[a]
Prague	31,370	50,179	68,661[a]
Pryor	......[e]	......[e]	259,849
Purcell	90,000[a]	94,194	145,056
Ryan	15,705[b]	24,588[b]	27,416[a]
Sallisaw	35,944	66,680	109,420
Skiatook	......[e]	......[e]	79,328
S. Coffeyville	6,731[b]	11,363[b]	22,987[a]
Spiro	24,421	32,340[a]	56,176
Stillwater	260,877[a]	515,183	690,680

TABLE 34.--Continued

System	1945	1950	1955
Stilwell	$ 23,681	$ 46,934	$ 78,984
Stroud	32,451[b]	64,223[b]	103,065
Tahlequah	56,358	106,890	162,880
Tecumseh	31,162	52,581	80,230
Tonkawa	65,576	113,560	148,555
Wagoner	52,000	88,177	144,432
Walters	44,977	81,453	115,281
Watonga	52,465[b]	85,955[b]	113,056[c]
Waynoka	32,341	59,422	76,667
Weleetka	20,770	36,194	45,025
Wetumka	29,869	45,706	64,464
Wynnewood	29,513	57,897	95,719
Yale	28,405	53,955	62,651
Total	$ 3,954,035	$ 6,660,651	$10,286,953

[a]Estimated from budget data.

[b]Estimated from sales tax payments.

[c]Calendar year 1955.

[d]Estimated on the basis of an average revenue per kilowatt-hour of net energy for system of $.028591. Average

TABLE 34.--Continued

revenue was calculated from use of 129,480 kilowatt-hours and revenue of $3,702 reported in 1948, as found in Federal Power Commission, Directory of Electric and Gas Utilities: 1948, p. 373.

[e]System not municipal until 1951.

Sources: Municipal budgets on file at State Auditor's Office and data collected in personal interviews.

available for general municipal purposes. They make no particular attempt to maintain the financial integrity of the municipal utility system as a separate business enterprise. Thus, transfers from the municipal electric fund to the general fund may bear no particular relation to the surplus revenue produced by the utility above its costs.

Fixed costs, as will be seen, are frequently met through property taxes deposited in the bond sinking fund. In addition, the utility fund may contribute some of its operating surplus to the bond sinking fund, either substituting for or supplementing the property tax. Rather than financing additional generating capacity from retained earnings of the system, municipal authorities usually depend upon voters approving tax bond issues for the purpose. In order to secure approval, some municipal governing boards have promised voters that the new tax bond issue would be amortized through the transfer of utility earnings to the sinking fund account rather than by sinking fund tax levies. There is no regularity to these practices, however, and municipal budgets and financial statements are a maze of interfund transfers. To compound these difficulties, capital accounts are only rarely maintained by municipal accountants; hence, there are no reliable means for determining the book value of fixed assets. In the face of these aberrations in conventional accounting procedures, it is perhaps understandable why annual fixed charges against the municipal electric system are not readily determinable.

Operating costs may be determined more easily than fixed cost, but here again complications arise. Customarily, there is no allocation of certain joint municipal costs between the general fund and the utility fund. Although accounting procedure would condone it, no part of the city's general administrative expenses are allocated to the utilities. In a similar fashion, the joint costs of the water and electric systems are not split among the two on the basis of rational choice. Thus, where an employee is superintendent of the water and light systems, no allocation of his salary is made between the two. Other joint costs are also left unallocated. In addition, depreciation of fixed assets is not charged against gross revenue as an operating expense.[19]

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[19]Professor Dewey L. Barnes, chairman of the Department of Accounting at the University of Oklahoma and auditor for several Oklahoma municipalities, has told the writer that depreciation reserves should not be accumulated by municipal electric systems. He believes that doing so saddles a community with the cost of paying for the electric system's equipment by retirement of bond issues plus accumulating a reserve for equipment to be purchased in the future. Future equipment, he thinks, should be purchased by those who will use it after its acquisition.

Because of these and other deficiencies, statements of operating income, even when prepared, are still subject to a number of changes required by a reasonable cost accounting procedure.

Since full costs could not be determined in a uniform fashion for all municipal electric systems in the state, income statements for each system were not prepared.[20] A reasonable alternative was sought, however, in the experience of the two major private utility systems of the state, both of which prepare the financial statements required by law. Obviously, the problem of comparability is the most serious one confronting the investigator in this instance. None of the municipal electric systems approaches the size of either Oklahoma Gas and Electric Company or Public Service Company. Because of this size difference alone, operating costs are undoubtedly less per kilowatt-hour for the private systems. In addition, the two types of systems differ in that private systems are subject to federal, state, and local income and property taxes while municipal systems are not. Interest rates are generally lower on municipal

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[20]An attempt to accomplish this objective might produce useful benchmark data for future studies of this nature. In any event, the project could conceivably be of dissertation length in itself.

utility bonds. Another difference lies in the fact that electric rates charged by the private systems are subject to state regulation. Since municipal rates, however, are generally higher than the private systems' rates, this factor may offset some of the difference in cost.

Despite these and other factors of noncomparability, the accounts of the private systems were recast slightly in an attempt to determine the proportion of total costs to total revenue from electric sales in 1955. As may be seen in Table 35, the proportion of total costs to revenue was remarkably similar for the two companies and varied only slightly among the individual cost items. In both cases, net income after taxes was 19 to 20 per cent of operating revenue. General taxes were about 8 per cent of revenue. Thus, net income plus income and general taxes amounted to 44.5 per cent of revenue in one case and 45.1 per cent of revenue in the other.

If the ratio of costs to revenue for all municipal electric systems in the state is assumed to be similar to that for the two private systems, then it is possible to estimate the proportion of revenues collected in 1955 that might be considered municipal electric system profits. The estimate is only as good, however, as the comparability of

TABLE 35.--Analysis of 1955 income statements of the two major private electric utility systems in Oklahoma

	Oklahoma Gas & Electric Co.		Public Service Co.	
	Dollars	Per cent	Dollars	Per cent
Operating revenue	$ 44,045,636	100.0	$ 33,917,235	100.0
Operating expense	$ 14,049,684	31.9	$ 11,094,638	32.7
Maintenance	3,178,020	7.2	2,675,956	7.9
Depreciation	4,801,814	10.9	3,090,738	9.1
Income taxes[a]	7,686,000	17.5	5,825,000	17.2
General taxes	3,538,827	8.0	2,848,635	8.4
Income deductions	2,406,855	5.5	1,947,935	5.7
Other adjustments	17,181[b]	...	- 181,000[c]	- .5
Net income	8,367,255	19.0	6,615,471	19.6
Net income, plus income and general taxes	$ 19,592,082	44.5	$ 15,289,106	45.1

[a]Includes both federal and state income taxes, and deferred federal income taxes.

[b]Amortization of limited-term investment.

[c]Other income.

Source: Federal Power Commission reports, as shown in Moody's Investors Service, *Moody's Public Utility Manual: 1956* (New York: Moody's Investors Service, 1956), pp. 754, 1011-12.

the two types of systems.

Assuming that 45 per cent of municipal electric revenues are net profits of the systems, the estimate would amount to $4,629,129 of total municipal revenues of $10,286,953. This estimate, however, may be arrived at only upon the assumption that the municipal electric systems should not bear any taxes other than the state sales tax. Inasmuch as many municipal electric systems in other states make payments to local and state governments in lieu of taxation, it might be reasonable to include general taxes as part of the Oklahoma municipal systems' cost structure.[21] Certainly if the electric systems were privately owned they would contribute ad valorem taxes to the governmental units, including the municipality, in which they are located.

Thus, if an allowance of 8 per cent of revenues is made for general taxes, the estimate of net profits for 1955 would be based upon a ratio of 37 per cent. Application of this ratio to 1955 revenues produces a profit estimate of $3,806,173.

It might be argued that municipal electric systems

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[21]"Municipal electric plants are ordinarily taxable by state and municipal governments." Twentieth Century Fund, _op_. _cit_., p. 412, n. 102.

should pay a portion of their revenues to the federal government as income taxes. According to supporters of this argument, municipal electric systems are business enterprises and should be required to pay income taxes like any other profitable business.[22] Since corporations are subject to state income taxes in Oklahoma, the argument would apply by extension to Oklahoma municipal electric systems. It does not appear reasonable, however, to include foregone state and federal income taxes as a cost to municipalities operating electric systems. Even if the additional state and federal income taxes were collected from municipal systems and government expenditures were held constant, only infinitesimal reductions in the local citizens' tax bills could result. It seems much more likely that tax bills would remain the same, and the increased tax income would be used by the two levels of government to expand their budgets.

If the 37 per cent estimating percentage is considered excessively high, it might be noted that no allowance has been made in the computations for the estimated

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[22]"Further expansion of local public power distribution will emphasize the need for requiring such systems to shoulder their full share of the cost of government, including the federal government (to which they do not now contribute directly)." Ibid., p. 431.

value of the free services rendered communities by their municipal electric systems. Typically, in Oklahoma and elsewhere, municipal electric systems furnish electric service for street-lighting, water-pumping, municipal offices, parks, playgrounds, and other municipal activities without making a cash charge. These services are usually called "free services." Among Oklahoma municipal systems, it is relatively rare that all the electricity for such services is metered; it is even more rare that interdepartmental charges are provided for in the municipal budget. Nevertheless, free services rendered by Oklahoma municipal electric systems were estimated to be about 47.1 million kilowatt-hours in 1955, amounting to about 12 per cent of the electric energy output of the systems.[23] If valued at one cent per kilowatt-hour, these free services would be worth about $471,000 to the communities concerned.

Further confirming evidence that the 37 per cent profit estimate is near reality can be found in the experience of the Cushing system. Operating statements for the

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[23]Because of the lack of meters on municipal consumption circuits, this figure is probably wide of the true mark. It was tabulated from reports filed by Oklahoma systems with the Federal Power Commission Regional Office, Ft. Worth, Texas. In nearly all cases, the entries were marked as estimates.

four years from 1952 through 1955 show ratios of net gain to revenue of 59.6, 57.4, 54.1, and 54.8 per cent.[24] If the 1955 ratio of 54.8 per cent were reduced by 10 per cent for depreciation and 8 per cent for general taxes foregone, in line with the 1955 experience of the two Oklahoma private systems, then the assumed net profit of the system would be 37 per cent.

Data published by the Federal Power Commission in 1939 also appear to confirm the appropriateness of the 37 per cent estimating percentage. According to the Commission, transfers of taxes, cash contributions and free services by municipal electric systems in the United States between 1935 and 1937 were 25.8 per cent of gross revenue. In the West South Central region, which includes Oklahoma, publicly-owned plants transferred 42.4 per cent of their gross revenues to government, slightly less than the 49.1 per cent transferred by plants in the South Atlantic region.[25]

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[24]Net gain was computed by deducting direct operating expenses and fixed charges for bond accruals and interest from total revenue. Operating statements prepared by the city auditor were the sources of the financial information.

[25]Federal Power Commission, _Rates, Taxes, and Consumer Savings, 1935-1937_ (Washington: Federal Power Commission, 1939), cited in Twentieth Century Fund, _op. cit._, p. 421.

Property Tax Levies

Tax levy rates and anticipated tax revenues for the fiscal year ending June 30, 1956, for communities in Oklahoma operating electric systems are presented in Table 36. The arrangement of municipalities is by county, since the excise boards levy municipal property taxes for all local governmental units within the county.

The dependence of these communities upon their utility systems is strikingly revealed in the fact that fifty-nine of the seventy-one communities, or 83 per cent, collect no property tax to support the general fund. Among the twelve cities collecting a general fund tax, the range of tax rates is quite low, varying from 0.5 mills to 3.75 mills. The concentration of these rates is at 2.0 mills.

The number of municipalities collecting a sinking fund tax is considerably greater. Fifty-three of the seventy-one governmental units, or 75 per cent, secure funds to retire municipal bonds by this method. The range of sinking fund tax rates is far wider than the range of general fund tax rates, varying from 1.0 mills to 55.7 mills. The median sinking fund rate is 11.44 mills; the unweighted arithmetic mean rate is 16.09 mills. The distribution is skewed, of course, because of the effect of the higher levies

TABLE 36.--Tax levies for general fund and sinking funds and anticipated tax revenues for municipalities operating municipal electric systems, for the 1956 fiscal year

County and municipality	Tax levy rate General (mills per dollar)	Tax levy rate Sinking (mills per dollar)	Anticipated tax revenue (dollars)
Adair			
Stilwell	...	2.66	2,087.54
Alfalfa			
Amorita	...	...	...
Burlington	...	...	...
Byron	...	...	...
Carmen	...	9.95	3,570.46
Cherokee	...	20.0	32,256.80
Goltry	2.5	...	460.79
Blaine			
Geary	...	8.56	4,599.23
Okeene	.5	19.25	15,120.54
Watonga	...	9.6	13,103.97
Caddo			
Anadarko	...	11.0	23,019.58
Cherokee			
Tahlequah	...	19.4	38,199.33
Cleveland			
Lexington	...	...	...
Cotton			
Walters	...	...	...
Garvin			
Lindsay	...	7.0	9,398.65
Wynnewood	1.5	6.34	6,042.74

TABLE 36.--Continued

County and municipality	Tax levy rate General (mills per dollar)	Sinking	Anticipated tax revenue (dollars)
Grant			
Manchester	3.0	5.0	875.72
Pond Creek	...	5.75	3,760.66
Greer			
Granite	...	...	...
Mangum	...	11.44	18,558.12
Harper			
Laverne	...	16.22	5,421.62
Hughes			
Wetumka	...	11.37	7,092.66
Jackson			
Altus	...	9.5	44,127.69
Eldorado	...	4.5	1,421.40
Olustee	...	27.79	2,593.93
Jefferson			
Ryan	...	15.5	3,398.08
Kay			
Blackwell	...	4.75	30,414.63
Braman	...	11.8	1,830.42
Kaw City	...	10.47	1,925.40
Newkirk	...	16.51	13,344.56
Ponca City	...	11.83	132,007.29
Tonkawa	...	...	...
Kingfisher			
Cashion	...	...	...
Kingfisher	3.75	1.0	12,636.71

TABLE 36.--Continued

County and municipality	Tax levy rate General (mills per dollar)	Sinking	Anticipated tax revenue (dollars)
LeFlore			
Spiro	...	...	...
Lincoln			
Prague	...	11.26	6,110.00
Stroud	...	6.30	4,969.65
Logan			
Crescent	...	6.20	3,096.21
Orlando	...	...	...
McLain			
Purcell	...	...	...
Major			
Fairview	...	8.38	11,190.93
Mayes			
Pryor	...	23.24	39,022.97
Noble			
Perry	...	26.94	67,846.16
Nowata			
S. Coffeyville	...	26.55	4,822.48
Okfuskee			
Weleetka	...	38.86	10,366.48
Oklahoma			
Edmond	...	15.88	41,835.73
Osage			
Hominy	...	...	...
Pawhuska	...	10.24	27,352.14

TABLE 36.--Continued

County and municipality	Tax levy rate General (mills per dollar)	Tax levy rate Sinking (mills per dollar)	Anticipated tax revenue (dollars)
Ottawa			
Miami	1.0	2.24	33,483.22
Pawnee			
Pawnee	1.0	18.4	16,815.38
Payne			
Cushing	...	...	...
Stillwater	...	4.0	36,914.01
Yale	...	34.35	13,448.14
Pottawatomie			
Tecumseh	...	30.0	12,972.78
Rogers			
Chelsea	...	9.50	4,586.94
Claremore	...	25.00	64,900.00
Sequoyah			
Sallisaw	...	23.12	24,456.76
Stephens			
Comanche	2.0	29.96	21,808.96
Duncan	2.0	34.0	295,271.33
Marlow	...	38.0	47,684.11
Tillman			
Frederick	...	18.23	49,983.78
Manitou	...	...	...
Tulsa			
Collinsville	2.57	27.40	24,471.41
Skiatook	3.0	4.61	6,685.07

TABLE 36.--Continued

County and municipality	Tax levy rate: General (mills per dollar)	Tax levy rate: Sinking (mills per dollar)	Anticipated tax revenue (dollars)
Wagoner			
Wagoner	...	12.50	20,070.46
Washington			
Copan	...	...	...
Washita			
Cordell	...	27.23	30,087.76
Woods			
Dacoma	2.0	...	260.68
Waynoka	...	55.70	32,184.33
Woodward			
Fort Supply	...	...	...
Mooreland	...	7.3	2,584.84
Total			1,382,556.23

Source: Municipal budgets on file in the State Auditor's Office, Oklahoma City, Okla.

at the upper extreme.

Sixteen of the cities, it may be noted, have neither a general fund tax nor a sinking fund tax. Two others collect a small general fund tax but no sinking fund tax. Forty-three cities have a sinking fund tax but no general fund tax.

The total anticipated tax revenue for 1956 was \$1,382,556, most of which was destined for the bond sinking fund accounts. About 31 per cent of this total is accounted for by the significantly larger anticipated tax revenues of two relatively large cities, Ponca City and Duncan. The remaining 69 per cent is distributed among the fifty-three other cities collecting one or the other type of tax.

With these tax data at hand, it is possible to compare property tax revenues with estimated net profits from municipal electric system operation. Estimating net profits at the 37 per cent level resulted in an estimate for 1955 of \$3,806,173. This estimate is 175 per cent higher than the anticipated tax revenues budgeted at the close of the 1955 fiscal year. Thus it may be seen that cities operating electric systems depend far more heavily upon surplus electric revenues than they do upon property taxation to meet the ordinary expenses of government.

Financing of Municipal Electric Systems

Municipal electric systems in Oklahoma have been financed by three principal methods: tax bond issues, reinvested earnings, and lease-purchase agreements. Of the three methods, it appears today that bond issues and reinvested earnings are the most important sources of funds for replacement of equipment and expansion of the systems.

Lease-purchase agreements, under which a municipality may buy electric system equipment in installments, have been severely restricted by court decisions written in the 1930's. While cities may negotiate lease-purchase agreements, municipal authorities may not bind funds beyond the end of the fiscal year. This necessitates renewal of the contract each year until the annual "lease" payments have amortized the purchase price of the equipment, whereupon title passes to the city. Equipment manufacturers supplying the Oklahoma municipal electric systems during the period from 1925 to 1940 apparently sold a number of generating units by this method.

As far as could be determined, the lease-purchase agreement has been used in only one instance since 1945. The Ryan town council agreed in December, 1945, to the installation of a 255-kilowatt diesel engine and generator by the Universal Supply and Machinery Company of Tulsa. According to the contract, the town paid $1,050 down and agreed to pay $400 a month for the remainder of the fiscal year. The contract was renewed twice, but the council ordered the engine removed in March, 1948, after paying only a portion of the purchase price. Ryan then purchased power from Public Service Company until the town became a customer of Southwestern Power Administration in 1951.[26]

Municipal Electric System Bond Issues

The fading importance of installment buying can perhaps be explained as much by the post-1945 public acceptance of bond issues and the increased revenues of the municipal electric systems as by the legal restrictions laid on by the courts.

To provide evidence for assessing the importance of bond financing in the establishment and expansion of the municipal electric systems in Oklahoma, data on bonded indebtedness were gathered from all the existing municipal systems in the state. Alternate sources were consulted when

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[26] Interview with Mrs. Mallie Ryan, town treasurer, in Ryan, on Nov. 21, 1956. Council minutes contained a copy of the lease-purchase contract mentioned.

municipal records were incomplete. The results of this study are shown in part in Table 37.

As may be seen, all systems but Lexington have secured funds through bond issues. Only eight systems were established without the aid of bond issues: Lexington, Marlow, Pawnee, Pryor, Sallisaw, Stillwater, and Wetumka.[27] Once established, the systems' dependence upon bond funds ceased in fifteen cases; Amorita, Braman, Burlington, Byron, Cashion, Cordell, Crescent, Dacoma, Eldorado, Manchester, Olustee, Orlando, Skiatook, South Coffeyville, and Tahlequah issued bonds only in coincidence with their beginning operations. It should be noted that these fifteen systems are all purchasing power today; all except Tahlequah are relatively small systems.

Nine of the systems have issued no bonds since 1920. Twenty-one others have not issued bonds since 1930. Another seven systems issued no bonds between 1945 and 1956. Thirty-eight municipal electric systems--all except two of them purchasing systems--have issued no bonds from 1945 or before through 1956. This is especially noteworthy in view of the expanding sales of municipal electric systems in the post-

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[27] See above, Table 10, pp. 64-67.

TABLE 37.--Municipal electric system bond issues, by existing system, year of issue, principal amount, maximum years to maturity, and range of interest rates payable on the issue, for the period from establishment to December 31, 1956

System	Year of issue	Principal amount	Maximum years to maturity	Range of interest rates payable
Altus	1906	$ 4,000	20	5
	1910	35,000	25	6
	1922	115,000	20	6
	1947	609,000[a]	20	2.25 - 2.5
	1953	390,000	20	2.25 - 4.75
		1,153,000		
Amorita	1921	15,000	25	6
Anadarko	1904	10,400	20	6
	1909	14,000	20	5.5
	1920	65,000	20	6
	1926	40,000	20	6
	1946	200,000	11	1.5 - 1.75
	1955	72,000	8	1.75 - 2.5
		401,400		
Blackwell	1909	20,000	20	6
	1916	10,000	25	6
	1918	82,500	25	6
	1937	300,000	10	2.0 - 3.0
	1947	300,000	12	1.25 - 1.6
	1949	1,250,000	19	1.5 - 3.25
		1,962,500		
Braman	1924	15,000	25	6
Burlington	1936	4,500	11	6
Byron	1921	15,000	25	6
Carmen	1909	20,000	25	6
	1910	4,000	25	6

TABLE 37.--Continued

System	Year of issue	Principal amount	Maximum years to maturity	Range of interest rates payable
Carmen (cont'd)	1917	$ 25,000	15	6
	1947	60,000	22	2.0 - 3.25
		109,000		
Cashion	1921	25,000	25	6
Chelsea	1913	10,000	25	6
	1919	30,000	25	...
	1932	12,000	20	...
	1947	52,000	15	2.25 - 2.75
		104,000		
Cherokee	1909	25,000	25	6
	1920	21,000	..	...
	1925	35,000	5	4
	1926	37,500	10	4
	1938	73,200	14	1.0 - 3.25
	1945	110,000	20	1.5
	1949	135,000	20	1.25 - 2.25
	1954	145,000	15	2.5 - 2.75
		581,700		
Claremore	1906	85,000	20	5
	1920	75,000	25	6
	1946	50,000	19	1.25
		210,000		
Collinsville	1911	45,000	25	6
	1913	20,000	25	6
		65,000		
Comanche	1911	8,000	20	6
	1920	10,000	..	...
	1921	25,000	25	6
	1947	40,000[b]	15	3.0 - 3.5
		83,000		

TABLE 37.--Continued

System	Year of issue	Principal amount	Maximum years to maturity	Range of interest rates payable
Copan	1921	$ 12,000	..	...
	1940	10,000[c]	12	6
		22,000		
Cordell	1909	10,000	25	6
Crescent	1921	30,000	25	6
Cushing	1928	25,000[d]	25	4
	1934	280,000	15	4
	1938	38,500	10	1.0 - 3.0
	1938	8,250	15	2.75 - 3.0
	1939	31,500	15	2.0 - 3.0
	1948	175,000	8	1.5
	1948	85,000	19	2.0 - 2.5
	1952	250,000	15	1.5 - 2.5
	1955	1,400,000	25	1.0 - 1.5
		2,293,250		
Dacoma	1925	15,000	20	6
Duncan	1916	5,000	25	6
	1918	30,000	25	6
	1921	300,000	25	6
	1945	125,000	20	1.25 - 1.5
		460,000		
Edmond	1908	45,000	25	5
	1916	9,000	..	...
		54,000		
Eldorado	1922	42,500	23	6
Fairview	1908	15,000	25	6
	1909	15,000	25	6
	1929	30,000	5	3

TABLE 37.--Continued

System	Year of issue	Principal amount	Maximum years to maturity	Range of interest rates payable
Fairview (cont'd.)	1938	$ 60,000	10	3.5
	1945	85,000	11	1.0 - 1.5
	1948	20,000	10	2.25
		225,000		
Fort Supply	1917	6,000	20	6
	1924	5,000	20	6
		11,000		
Frederick	1917	35,000	20	6
	1919	15,000	25	6
	1946	34,000	13	1.0 - 1.25
		84,000		
Geary	1922	65,000	25	5.75 - 6.0
	1948	28,000	12	2.25 - 2.75
		93,000		
Goltry	1916	8,500	12	6
	1922	15,000	25	6
		23,500		
Granite	1909	15,000	20	5
	1929	7,000	15	6
		22,000		
Hominy	1934	124,000	20	4
	1948	50,000	7	...
	1954	180,000	20	2.0 - 3.5
		354,000		
Kaw City	1916	10,000	25	6
	1921	25,000	25	6
		35,000		

TABLE 37.--Continued

System	Year of issue	Principal amount	Maximum years to maturity	Range of interest rates payable
Kingfisher	1901	$ 16,000	20	5
	1926	40,000	10	5.5
	1945	50,000	9	1.0 - 1.125
	1953	250,000	15	2.25 - 3.75
		356,000		
Laverne	1918	13,000	5	6
	1920	10,000	..	...
	1944	10,000	10	4
		33,000		
Lexington	none			
Lindsay	1910	Unknown		
	1919	25,000	25	6
	1935	12,500	14	5
	1940	45,000	20	4.75 - 5.0
	1945	85,000	20	1.5 - 1.75
	1948	50,000	20	2.75 - 3.75
	1948	6,000	8	2.75 - 3.25
	1951	145,000	23	2.75 - 3.25
	1954	125,000	13	1.5 - 2.25
		493,500		
Manchester	1922	17,000	20	5
Mangum	1917	75,000	20	6
	1924	8,000	25	6
	1945	100,000	12	1.0 - 1.25
	1950	100,000	10	2.0 - 2.5
	1956	200,000	20	2.25 - 3.0
		483,000		
Manitou	1921	10,000	25	6
	1925	5,000	25	6
		15,000		

TABLE 37.--Continued

System	Year of issue	Principal amount	Maximum years to maturity	Range of interest rates payable
Marlow	1938	$ 55,000	20	2.25 - 4.5
	1948	100,000	20	1.75 - 3.0
	1954	255,000	18	2.25 - 2.625
		410,000		
Miami	1910	80,000	25	5
	1916	12,000	..	...
	1917	45,000	..	...
	1929	25,000	..	...
	1947	80,000	15	1.5 - 1.75
		230,000		
Mooreland	1916	10,000	20	6
	1935	12,500	15	2.5 - 4.0
	1936	4,000	5	4
	1947	25,000	9	2.0 - 2.75
		51,500		
Newkirk	1910	30,000	25	5
	1919	110,000	5	6
	1946	85,000	15	1.25 - 1.5
	1947	15,000	10	1.5 - 1.75
	1954	100,000	11	2
		340,000		
Okeene	1916	15,000	25	6
	1922	40,000	25	6
		55,000		
Olustee	1923	25,000	20	6
Orlando	1928	12,000	14	5.75
Pawhuska	1907	60,000	30	6
	1911	10,000	30	6
	1919	67,567	25	6
	1921	113,000	25	6

TABLE 37.--Continued

System	Year of issue	Principal amount	Maximum years to maturity	Range of interest rates payable
Pawhuska (cont'd.)	1936	$ 37,000	10	3
	1948	150,000	10	2
	1954	290,000	19	2.0 - 2.625
		727,567		
Pawnee	1921	44,000	24	6
	1934	47,000	18	4
	1940	65,000	20	3.75 - 4.0
		156,000		
Perry	1903	50,000	20	5.5
	1919	84,000	25	6
	1923	3,000	5	5.5
	1938	45,000	3	2
	1946	33,000	10	2
	1949	190,000	23	2.25 - 4.0
	1954	200,000	15	2.25 - 4.25
		605,000		
Ponca City	1912	30,000	25	5
	1918	40,000	25	6
	1919	25,000	25	6
	1923	140,000	25	5.5
	1931	6,000	..	...
	1937	175,000	25	1.0 - 3.0
	1950	510,000	25	1.125 - 2.75
	1952	550,000	25	2.25 - 3.0
	1955	1,163,000	25	0.5 - 4.75
		2,639,000		
Pond Creek	1906	10,000	20	6
	1951	35,000	12	3
		45,000		

TABLE 37.--Continued

System	Year of issue	Principal amount	Maximum years to maturity	Range of interest rates payable
Prague	1909	$ 47,500	20	6
	1918	30,000	20	6
		77,500		
Pryor	1942	5,000	7	2.125
	1950	180,000[e]	13	1
		185,000		
Purcell	1912	25,000	25	5
	1927	80,000	12	4.6
	1929	6,000	12	5
	1938	65,500	12	2.0 - 3.0
		176,500		
Ryan	1909	6,000	20	6
	1947	18,500	10	2.25 - 2.5
		24,500		
Sallisaw	1919	34,000	25	6
Skiatook	1948	49,600	17	3.25 - 3.75
South Coffeyville	1924	4,000	..	...
Spiro	1909	10,000	25	6
	1926	40,000	25	6
	1946	45,000	18	3
		95,000		
Stillwater	1917	6,000	10	5
	1918	30,000	20	5
	1936	80,000	..	1.5
	1946	388,000	20	1.5 - 1.75
	1949	148,000	20	1.75 - 2.5
	1949	290,000	20	1.75 - 2.5

TABLE 37.--Continued

System	Year of issue	Principal amount	Maximum years to maturity	Range of interest rates payable
Stillwater (cont'd.)	1954	$ 1,170,000	20	1.75 - 3.0
	1955	530,000	..	2.375 - 2.75
		2,642,000		
Stilwell	1911	5,000	25	6
	1949	20,000	22	2.5 - 4.0
		25,000		
Stroud	1906	18,000	20	5
	1916	20,000	20	6
	1919	16,000	25	6
		54,000		
Tahlequah	1919	140,000	25	5.5
Tecumseh	1906	60,000	30	5
	1930	15,000	20	6
		75,000		
Tonkawa	1910[f]	......	..	...
	1919	15,000	25	6
	1922	10,000	25	6
	1923	20,000	24	6
	1925	10,000	..	...
	1926	15,000[g]	25	5
	1946	106,000	23	1.75 - 2.0
	1953	160,000	15	3.5 - 3.75
		336,000		
Wagoner	1909	50,000	25	5
	1942	25,000	15	1.75 - 2.25
		75,000		
Walters	1909	7,000	20	6
	1919	15,000	25	6

TABLE 37.--Continued

System	Year of issue	Principal amount	Maximum years to maturity	Range of interest rates payable
Walters (cont'd.)	1920	$ 20,000	25	6
		42,000		
Watonga	1905	6,000	25	6
	1922	60,000	25	6
		66,000		
Waynoka	1911	3,000	15	6
	1916	26,000	25	6
	1924	28,000	25	6
	1946	85,000	15	1.25 - 1.50
	1950	50,000	21	3.0 - 4.0
	1954	126,000	20	2.25 - 4.25
		318,000		
Weleetka	1911	6,650	20	6
	1921	57,000	20	6
	1928	10,000	..	...
		73,650		
Wetumka	1916	4,000	25	6
	1924	63,000	10	5.5
		67,000		
Wynnewood	1906	28,000	20	5
	1909	14,000	25	6
	1923	50,400	25	5.5
	1935	46,300	13	4
		138,700		
Yale	1915	7,000	25	6
	1916	25,000	25	6
	1919	100,000	25	6
	1947	45,000	10	3.5 - 3.75
		177,000		
Grand total		$20,087,367		

TABLE 37.--Continued

[a]Although the issue was designated "Municipal Power Plant Bonds," the funds were not used for expanding the plant. Instead, funds derived from the sale were invested in U. S. Government "J" Bonds after a satisfactory agreement for purchasing power was concluded with Public Service Company.

[b]A general refunding bond issue of $71,000 in 1946 is not included as it did not lead directly to the municipal system's expansion.

[c]The municipal budget filed by Copan in 1945 showed this issue as part of its outstanding bonded indebtedness, but no title description was entered for the issue.

[d]This issue was for construction of a new city street lighting system. The municipal electric system was not established, however, until 1935.

[e]Funds from the issue were not used for the purpose intended. See Ch. II above, p. 145.

[f]The amount of the bond issue in 1909 or 1910 could not be determined; the apparent purpose was the purchase of generating engines.

[g]The municipal bond register shows the issue as given. The municipal budget submitted in 1945 includes an issue of $10,000 entitled "Electric Light Extension Bonds of 1925," but does not include the $15,000 issue in 1926. No record of a 1925 issue was found in the municipal bond register. It is possible that the entry in the budget was an erroneous one.

Sources: Municipal council minutes, ordinance books, bond registers, and auditors' reports; municipal budgets on file at the State Auditor's Office, Capitol Building, Oklahoma City, Oklahoma; and bond transcripts on file at the State Attorney General's Office, Capitol Building, Oklahoma City, Oklahoma.

1945 period. In these cases, obviously, necessary expansion was financed by reinvested earnings.

More than half of the grand total of $20,087,367 in electric system bonds was issued by five of the larger municipal generating systems. Blackwell, with almost $2 million in bonds; Cushing, with almost $2.3 million; Pawhuska, with slightly more than $700,000; Ponca City, with over $2.6 million; and Stillwater, with over $2.6 million, together account for slightly more than 51 per cent of all bonds issued.

Generating systems, because of their larger capital requirements, account for most of the issues since 1945. Seventeen of nineteen systems still operating generating equipment in 1955 issued $12,262,000 in electric system bonds from 1945 through 1956. This amount is 86.7 per cent of the $14,148,100 in municipal electric bonds issued during the period.

As may be seen in Table 37, interest rates became increasingly favorable for municipal borrowers in the period after 1945. This factor may have influenced the heavy bond financing encountered during this time. Whereas interest rates were practically always 4 per cent or higher in the earlier periods, some rates dropped as low as 1 per cent between 1945 and 1950. After 1952 the cost of borrowing began to rise somewhat, but the average interest rate on serial bonds issued as late as 1956 was still about half the rate prevailing before 1930.

The maximum number of years to maturity of issues also decreased below the twenty and twenty-five year levels generally prevailing before 1930. Since 1935, municipal electric bond issues have generally been retired serially on schedules calling for a complete repayment in a lesser number of years than the twenty-five year legal maximum. This development has been made possible by the increasing earning capacity of the municipal electric systems. In addition, it reflects a more realistic view of the rapid technological obsolescence of municipal generating equipment.

In Table 38, a period analysis of municipal electric system bond issues is presented. The data reveal that 163 of the 229 issues enumerated took place before 1945, but they accounted for less than 30 per cent of the total.[27]

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[27]Bond issues before 1945 were comparatively small; it was not until 1919 that any one of them exceeded $100,000. The largest during the 1920's was the $300,000 issue by Duncan in connection with the establishment of its system. The size of the Duncan issue was not matched until 1937, when Blackwell issued a like amount. Blackwell, Cushing, Ponca City, and Stillwater are the only systems ever to issue more than $1 million in bonds at any one time; all four did so between 1949 and 1955.

TABLE 38.--Electric system bonds issued by municipalities operating electric systems in 1956, by five-year periods, 1900-1956

Period	Issues	Principal	Per cent of total principal	Cumulative per cent
1900-04	3	$ 76,400	0.38	0.38
1905-09	23	584,500	2.91	3.29
1910-14	16	311,650	1.55	4.84
1915-19	38	1,255,567	6.25	11.09
1920-24	37	1,597,900	7.95	19.04
1925-29	17	432,500	2.15	21.19
1930-34	6	484,000	2.41	23.60
1935-39	17	1,048,750	5.22	28.82
1940-44	6	160,000	0.80	29.62
1945-49	41	5,572,100	27.72	57.34
1950-54	20	5,211,000	25.93	83.27
1955-56[a]	5	3,365,000	16.74	100.00
	229	$ 20,099,367	100.00	

[a]Period includes only two years.

Source: Table 37.

After reaching a pre-1945 peak of $1,597,900 in the 1920-24 period, electric bond issues were small and infrequent until after 1934. In the 1935-1939 period, more than $1 million in bonds were sold in seventeen separate issues. But between 1940 and 1944 the number of issues fell to six, aggregating only $160,000.

A flurry of bond issues following World War II financed expansion and improvement that had been postponed during the war. In 1949 alone, $2,033,000 in bonds were issued, more than had been sold in any previous five-year period. The annual totals exceeded $1 million in both 1946 and 1947. The number and average size of the issues between 1945 and 1949 reached an all-time peak as forty-one issues amounting to more than $5.5 million were marketed.

The pace of bond financing slackened slightly between 1950 and 1954. The average size of the twenty issues almost doubled, however, and the total for the period still exceeded $5.2 million. The trend toward fewer but larger issues continued into 1955 and 1956.[28]

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[28]Surprisingly, only one issue for $200,000 was sold in 1956. The year-to-year movement of the annual total series, however, has been quite erratic since 1900; in five years, no bonds were issued at all.

As might be expected because of the tremendously greater issues since 1945, outstanding bonded indebtedness was quite as high at the end of the 1956 fiscal year. Sixty-two of the 229 issues still remained to be retired at that time, only slightly fewer than the sixty-six issued since 1945. Table 39 shows the total amount of electric system bonds outstanding on June 30, 1956, for each of thirty-three municipal systems. The remaining thirty-eight communities had no outstanding debt on their municipal electric systems.

As the table shows, most of the outstanding debt occurs within the seventeen generating systems. These systems had $9,888,900 in electric bonds outstanding, almost 89 per cent of the total. Blackwell, Cushing, Ponca City, and Stillwater together accounted for $6,893,900, almost 62 per cent of the total bonds outstanding. Average debt outstanding among the thirteen other generating systems was only $230,385.

Among the sixteen distributing systems with outstanding bonded indebtedness, debt ranged from a low of $5,000 at Wagoner and Mooreland to a high of $849,000 at Altus.[29]

[29]According to the Altus budget, $459,000 remained to be paid on the 1947 issue of $609,000, proceeds of which were invested in government bonds.

TABLE 39.--Municipal electric system bonded indebtedness outstanding as of June 30, 1956, by municipalities and type of electric system

System	Type of system Generating	Purchasing	System total
Altus		X	$ 849,000
Anadarko	X	X	122,000
Blackwell	X		1,151,000
Carmen		X	42,000
Chelsea		X	32,000
Cherokee	X		313,000
Cushing	X		1,705,000
Duncan		X	76,000
Fairview	X		16,000
Frederick		X	13,000
Geary		X	16,000
Hominy	X	X	180,000
Kingfisher	X		250,000
Lindsay	X		356,500
Mangum	X		295,000
Marlow	X		345,000
Miami		X	50,000
Mooreland		X	5,000

TABLE 39.--Continued

System	Type of system Generating	Purchasing	System total
Newkirk	X		$ 148,000
Pawhuska	X		332,000
Pawnee		X	21,000
Perry	X		363,000
Ponca City	X		2,234,000
Pond Creek		X	26,000
Ryan		X	7,500
Skiatook		X	37,600
Spiro		X	24,000
Stillwater	X		1,803,900
Stilwell		X	16,000
Tonkawa	X		231,000
Wagoner		X	5,000
Waynoka	X		43,000
Yale		X	15,000
Total	17	16	$ 11,124,000

Source: Municipal budgets on file in the State Auditor's Office, Capitol Building, Oklahoma City, Okla.

The total debt outstanding for this group was $1,235,100; the average was only $77,194.

It should be noted, too, that four of the systems with outstanding bonded indebtedness on their electric systems collected no sinking fund tax in 1956. In Cushing, Hominy, Spiro, and Tonkawa, bond retirement depended upon transfer of surplus utility funds to the bond sinking account.

A comparison of Table 39 with Table 36 reveals that twenty-four of the fifty-three municipalities collecting a sinking fund tax had no electric bonds outstanding. In these cases, the sinking fund tax was levied for retirement of other types of municipal bonds. About 28 per cent of anticipated tax revenues were to be collected by the municipalities having no electric bonds outstanding.

CHAPTER VI

THE RATES OF OKLAHOMA MUNICIPAL ELECTRIC SYSTEMS

Introduction

Rate systems employed by the Oklahoma municipalities that operate electric utilities display a great deal of uniformity. All are promotional rate systems under which the unit price of electricity declines as customer use increases. In all cases, successive "blocks" of electric energy are billed at prices which are uniform within the blocks but drop gradually as consumption increases. A minimum bill, designed to cover some portion of customer costs, is also a part of the rate system. In using the block rate system, Oklahoma municipal systems are similar to most electric utilities, public and private, in the United States. Because of this uniformity in rate schedules, some comparisons of rates among the municipal systems and between municipal systems and private systems are facilitated.

Residential rate schedules are the most uniform in character, among both private and public systems, even though the size of and charges for successive blocks of energy vary widely. Typically, the municipal residential rate calls for a $1.00 minimum monthly charge which includes the use of a small amount of energy ranging from eight to sixteen kilowatt-hours. The second block of energy continues to carry a rather high unit price, usually from four to six cents per kilowatt-hour, and spans a relatively small amount of energy. Thereafter, the blocks become larger and the unit prices smaller until a final open-ended block is entered where a rate of two to three cents per kilowatt-hour remains constant for the balance of the energy consumed during the month.

All but twelve of the smaller municipal electric systems divide their market for electricity into classes. Twenty systems have established only two classes of consumers, while twenty-two systems have three class-rate schedules. Thirteen systems separate the market into four classes but only three systems have five classes of customers. One system, which still utilizes the rate structure of the former private system, has seven class-rate schedules.

The usual designations encountered among municipal systems with two class rates are simple; residential and commercial are the typical classifications. When a third class rate is established, it usually is called a power rate. A fourth classification may be either for industrial use or for residential use of an electric range, water heater, or air-conditioner. A number of alternate, optional, and special rates are also in use.

Table 40 shows the designation and number of class rate schedules in effect among the Oklahoma municipal systems in 1956. As may be seen, the most common designations encompass residential use, commercial light and power, and industrial power. In some cases the classes overlap; a consumer may be subject to one rate until his use passes a certain level, whereupon his classification changes and he becomes subject to a lower rate.

Pricing is discriminatory among the classes, customarily favoring the larger commercial and industrial users with lower unit prices for the final billing blocks. The schedules become increasingly complex for the larger consumers. Power and industrial rate schedules applicable to municipal systems' customers usually provide for a demand charge for committed capacity and an energy charge for all kilowatt-hours utilized during the month.

The demand charge may be computed on the basis of

TABLE 40.--Designation and number of class rate schedules in effect in Oklahoma municipal electric systems, as of January 1, 1957

Designation		Number
All customers		11
Residential and commercial		13
Residential:		
Residential use	47	
Rural residential	7	
Electric range	12	
Water heating or air-conditioning ..	6	
Heat pump	1	
Residential large use	1	74
Commercial:		
Commercial light	39	
Commercial power	15	
Special light	1	
Air-conditioning	1	
Refrigeration	2	
Hatchery	1	
General service	1	60
Industrial or power:		
Industrial	11	
Power	25	
Grain elevator and gin	1	
Ice plant	1	
Garment manufacturing	1	39
Total		197

Source: Appendix C.

the horsepower or kilowatt capacity of electric motors connected to load. At times this demand charge is stated as a minimum charge computed on the basis of capacity connected to load. In such cases the minimum monthly charge is in actuality a demand charge, but the bill is computed in a different manner.

More billing blocks are typically included in the schedules for larger use and the rate for the final blocks is below the residential schedule. In some of the larger municipal systems and in the major private systems, rate schedules for the larger commercial and industrial customers specify adjustments for such things as power factor, fuel costs, tax payments, billing demand, and discounts for primary metering, transformer ownership, and prompt payment.

Rate schedules were collected from each of the municipal electric systems in Oklahoma and were adjusted to a comparable net basis by deducting discounts, penalties, and sales tax payments. The schedules are summarized for each system in Appendix C. Rate schedules of the four private systems operating in Oklahoma are published periodically by the Federal Power Commission along with the schedules of municipal systems serving communities of more than 2,500 population.[1]

Number of Electric Customers

Before examining the rate schedules, it is worthwhile to see how many customers are served by the municipal electric systems and how they are divided among the various classes of users. Table 41 reveals how the number of customers served by Oklahoma municipal systems has increased since 1907. Although the rate of growth slackened after 1927, the absolute number of customers has increased steadily between each successive year for which data were available. It is noteworthy also that the number of customers increased about six times as much in the decade from 1945 to 1955 as in the decade from 1927 to 1937.

The structure of the customer market is shown in Table 42, which covers the only three recent years for which data are available: 1945, 1950, and 1955. As may be seen, all classes of customers increased in number except the customers purchasing power for resale. Residential consumers represented about 80 per cent of the total number in each of

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[1]U. S., Federal Power Commission, National Electric Rate Book: Oklahoma (Washington: Federal Power Commission, October 5, 1956), pp. 1-19.

TABLE 41.--Number of electric customers, all classes, of Oklahoma municipal electric systems, in selected years, 1907-1955

Year	Number
1907	2,060
1912	10,492
1917	25,017
1927	44,965
1932	46,420
1937	51,171
1945	63,762
1950	82,871
1955	100,080

Sources: Census of Electrical Industries: 1907-1937; and power system statements filed by municipal electric systems with the Federal Power Commission Regional Office, Ft. Worth, Texas.

the three years. In 1950 the ratio of residential customers to population was 1 to 3.4. Commercial customers declined from a percentage standpoint although they increased in number from 10,197 to 13,923. Rural customers, principally representing homes slightly outside the municipalities' corporate limits, increased only slightly. The number of industrial consumers almost doubled during the period but still represented less than one per cent of the total in 1955. Of course, the commercial, industrial, and resale customers accounted for a larger percentage of municipal

TABLE 42.--Number of customers of municipal electric systems in Oklahoma, by type of customer, in 1945, 1950, and 1955

Year	Total	Residential	Rural	Commercial	Industrial
1945	63,762[a]	50,505	2,596	10,197	453
	Per cent	79.2	4.1	16.0	0.7
1950	82,871[b]	65,635	3,709	12,990	531
	Per cent	79.2	4.5	15.7	0.6
1955	100,080[c]	81,485	3,803	13,923	865
	Per cent	81.4	3.8	13.9	0.9

[a]Includes 11 utility customers purchasing for resale.

[b]Includes 6 utility customers purchasing for resale.

[c]Includes 4 utility customers purchasing for resale.

Source: Power system statements filed by municipal electric systems with the Federal Power Commission Regional Office, Ft. Worth, Texas.

energy and dollar sales than their percentages of the total number of customers.

Residential Electric Rates

Residential consumers are the most numerous of all types of electricity customers. Almost all the urban dwelling places of the nation have been wired for electricity. Whereas electricity was at first used only for lighting purposes, its uses in the home have been extended to cooking, heating, air-conditioning, household appliances, and electronic devices. As this usage has increased, average rates have declined. This decline has taken place for two reasons. In the first place, overall rate reductions have reduced the general level of electric rates. In addition, the promotional block rate schedules call for decreasing unit costs as monthly use grows larger.

According to the Federal Power Commission, average typical residential electric bills for the nation were at their lowest in history in 1947 and 1948. Slight increases occurred between 1948 and 1951, but since that time moderate rate increases have been offset, in part, by rate decreases in other areas of the nation.[2]

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[2]U. S., Federal Power Commission, *Typical Residential Electric Bills, Cities of 2,500 population and More, January 1, 1956* (Washington: Federal Power Commission, 1956), p. 1.

As might be expected, the Federal Power Commission data show a great deal of variation in state average bills for 250 kilowatt-hour residential service as of January 1, 1956. While the United States average bill was $7.21, the state averages ranged from $4.56 in Washington to $8.90 in Vermont. Generally speaking, the lowest average bills were found among states in the Tennessee Valley and on the Pacific Coast, while the highest average bills were in the New England states.[3]

Oklahoma, with an average bill of $8.08, was eleventh in rank among the states.[4] Among cities in the West South Central states, Stillwater had the highest bill for 250 kilowatt-hours in the 10,000 to 50,000 population class. Marlow shared this distinction for cities in the 2,500 to 10,000 population class.[5]

In order to provide a basis for comparisons, typical electric bills were computed for all municipal electric systems in Oklahoma. The bills, which are presented in Table 43, were computed on a net monthly basis at the lowest

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[3] Ibid.

[4] Ibid.

[5] Ibid., p. 7.

TABLE 43.--Typical net monthly electric bills for residential service by municipal electric systems in Oklahoma as of January 1, 1957

Community	Population (1950)	Minimum Bill Amount	Minimum Bill Kwh Inc.	Kilowatt-hours consumed 25	40	100	250	500
Altus	9,735	$ 1.00	11	$ 1.71	$ 2.48	$ 4.49	$ 8.74	$ 14.99
Amorita[b]	125	1.00	10	1.85	2.30	4.10	8.60	16.10
Anadarko	6,184	1.00	11	1.70	2.45	4.95	7.95	12.95
Blackwell	9,199	1.00	10	2.50	3.70	6.70	9.83	12.95
Braman[b]	392	1.20	10	3.00	3.90	7.50	15.75	24.00
Burlington[b]	181	1.20	10	2.50	3.50	6.10	10.60	18.10
Byron[b]	131	1.00	10	1.80	2.10	3.30	6.30	11.30
Carman[b]	654	2.00	25	2.00	3.05	5.75	10.75	18.25
Cashion	182	1.50	10	3.00	3.75	6.25	12.25	22.25
Chelsea	1,437	1.00	15	1.40	2.00	3.70	6.70	11.70
Cherokee	2,635	1.00	12	2.00	2.83	5.25	8.25	13.25
Claremore	5,494	.90	12	1.80	2.48	5.18	9.68	16.43
Collinsville	2,011	2.00	29	1.75	2.80	5.78	11.03	19.78
Comanche	2,083	1.00	9	2.56	2.61	6.61	11.05[e]	18.05[e]
Copan[b]	459	1.00	10	2.09	3.23	6.84	13.49	22.99
Cordell	2,920	1.00	13	1.88	2.72	5.02	10.27	19.02
Crescent[b]	1,341	1.40	15	2.08	2.53	4.32	8.78	16.22
Cushing	8,414	1.00	16	1.50	2.40	5.50	11.00	18.50
Dacoma[b]	256	1.25	12	2.29	3.19	5.79	11.04	19.79
Duncan[c]	15,325	1.00	12	1.68	2.45	4.46	8.71	11.21
Edmond	6,086	1.00	14	1.77	2.82	5.65	9.77	14.77

TABLE 43.--Continued

Community	Population (1950)	Minimum Bill Amount	Minimum Bill Kwh Inc.	Kilowatt-hours consumed 25	40	100	250	500
Eldorado	732	$ 1.00	10	$ 2.75	$ 3.80	$ 7.00	$ 12.50	$ 20.00
Fairview	2,411	2.00	25	2.00	2.90	6.50	10.00	15.00
Fort Supply[b]	293	1.40	10	2.45	3.50	5.60	10.85	19.60
Frederick	5,467	1.00	11	2.25	3.30	5.50	8.75[e]	13.75[e]
Geary	1,614	1.00	8	2.79	3.84	5.04	9.04	15.29
Goltry	277	3.50	40	....	3.50	5.60	9.10	14.10
Granite	1,096	1.00	10	1.80	2.60	6.19	10.47	16.09
Hominy	2,702	1.00	15	1.63	2.60	6.00	10.38	17.00
Kaw City	561	1.00	10	2.20	3.40	6.20	11.70	19.20
Kingfisher	3,345	1.00	12	2.00	3.20	5.00	8.75	15.00
Laverne	1,269	1.00	10	2.18	3.28	6.83	15.08	28.83
Lexington	1,176	1.00	12	1.65	2.40	4.20	7.60	12.60[a]
Lindsay	3,021	1.00	12	1.84	2.74	5.84	10.34	15.34
Manchester[b]	190	1.00	9	2.44	3.79	7.69	13.19	20.69
Mangum	4,271	1.00	13	1.80	2.52	4.68	9.99	17.86
Manitou	293	1.00	10	2.50	3.40	6.00	12.00	22.00
Marlow	3,399	1.50	17	2.19	3.13	5.93	11.53	18.78
Miami	11,801	1.00	13	1.84	2.75	5.45	12.20	23.45
Mooreland	867	1.00	11	2.19	3.24	5.24	9.74	17.24
Newkirk	2,201	.75	9	2.03	3.11	5.89	10.39	17.89
Okeene	1,170	2.50	33	....	2.58	5.55	10.36	15.42
Olustee[b]	455	1.00	9	2.75	3.80	7.00	14.50	27.00

TABLE 43.--Continued

Community	Population (1950)	Minimum Bill Amount	Minimum Bill Kwh Inc.	Kilowatt-hours consumed 25	40	100	250	500
Orlando	262	$ 1.00	10	$ 1.52	$ 2.00	$ 3.44	$ 7.04	$ 15.04
Pawhuska	5,331	1.00	13	1.88	3.00	6.25	9.25	13.00
Pawnee	2,861	1.00	12	1.90	2.80	5.20	9.70	14.70
Perry	5,137	1.00	16	1.50	2.40	5.50	11.50	21.50
Ponca City	20,180	1.00	14	1.61	2.43	4.83	9.33	15.58
Pond Creek	1,066	1.00	9	2.25	3.30	6.10	11.10	18.60
Prague	1,546	1.00	12	1.85	2.82	4.62	10.02	15.02
Pryor[c]	4,486	1.00	12	1.57	2.23	4.17	8.30[e]	13.30[e]
Purcell	3,546	1.50	16	2.15	3.35	6.55	10.55	15.55
Ryan	1,019	1.00	10	1.85	2.77	4.88	9.13	15.38
Sallisaw	2,885	.90	11	1.84	2.52	4.47	8.22	13.85
Skiatook	1,734	1.00	11	1.74	2.54	3.87	8.90[e]	13.90[e]
S. Coffeyville	527	2.00	28	....	2.70	5.90	9.75[e]	17.25[e]
Spiro[b]	1,365	1.00	10	2.30	3.20	5.60	11.60	21.60
Stillwater	20,238	1.00	16	1.50	2.40	5.50	11.00	17.50
Stilwell	1,813	1.00	10	2.25	3.00	5.50	10.00	16.50
Stroud	2,450	1.00	12	1.91	2.96	5.06	8.77	14.02
Tahlequah	4,750	1.00	16	1.50	2.20	3.80	6.80	11.80
Tecumseh	2,275	1.00	12	1.88	2.87	5.92	10.20	17.32
Tonkawa	3,643	1.00	12	2.03	3.11	5.63	8.78	13.28
Wagoner	4,395	1.00	12	1.78	2.68	5.28	8.78	12.28
Walters	2,743	1.00	9	2.56	3.61	6.61	11.41	17.91

TABLE 43.--Continued

Community	Population (1950)	Minimum Bill Amount	Minimum Bill Kwh Inc.	Kilowatt-hours consumed 25	40	100	250	500
Watonga	3,249	$ 1.00	12	$ 2.00	$ 2.90	$ 5.25	$ 9.75	$ 15.25
Waynoka	2,018	1.75	11	2.87	3.77	6.37	12.37	22.37
Weleetka[d]	1,548	1.50	12	2.80	4.30	9.30	11.00	19.00
Wetumka	2,025	1.00	10	1.90	2.80	6.10	11.50	19.00
Wynnewood	2,423	1.00	12	2.04	3.09	6.29	8.13[e]	13.13[e]
Yale	1,359	1.00	12	2.00	3.20	6.50	10.50	15.50

[a]Not used.

[b]Same rate schedule for all users.

[c]Rates are the same as Public Service Company.

[d]Users of 250 kilowatt-hours or more are billed at the lower commercial rate.

[e]Electric stove rate applies for usage at this level.

Sources: U. S., Federal Power Commission, National Electric Rate Book: Oklahoma (Washington: Federal Power Commission, October 5, 1956), pp. 10-18; and Appendix C.

applicable rate for single-meter service. Discounts allowed for prompt payment and sales tax due were deducted from the gross bill in order to arrive at the net figure. Where a lower rate was offered for single-meter service when an electric range was connected, the lower rate was used only in computing the 250 and 500 kilowatt-hour bills.[6]

The municipalities operating electric systems were grouped according to population size and average typical monthly residential electric bills for 100 and 250 kilowatt-hours were computed for each population class. These average bills, together with the range limits of bills in each population class, are presented in Table 44.

As this table reveals, the only readily discernible relationship between population size and average bills for 100 kilowatt-hours is that the bills in the communities over 2,500 population are somewhat below those in the smaller communities. Nevertheless, the lowest bill for 100 kilowatt-hours, $3.30, is found in the smallest population group.

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[6]Because errors in calculation were discovered in some of the bills calculated for Oklahoma communities by the Federal Power Commission, all typical electric bills for Oklahoma communities served by municipal or private systems were calculated independently. Certain corrections were also made to enhance comparability. For these reasons, this writer's data sometimes differ substantially from those of the Federal Power Commission publications.

TABLE 44.--Range and average of typical net monthly residential electric bills for 100 and 250 kilowatt-hours in Oklahoma communities operating electric systems, by population group, in 1956

Population (1950)	Number of systems	100 kilowatt-hours: Range Highest	100 kilowatt-hours: Range Lowest	100 kilowatt-hours: Average[a] bill	250 kilowatt-hours: Range Highest	250 kilowatt-hours: Range Lowest	250 kilowatt-hours: Average[a] bill
1- 499	13	$ 7.69	$ 3.30	$ 5.79	$ 15.75	$ 6.30	$ 11.13
500- 999	5	7.00	5.24	6.02	12.50	9.74	10.89
1,000- 1,499	10	6.83	3.70	5.39	15.08	6.70	10.13
1,500- 1,999	5	9.30	3.87	5.67	11.00	8.90	9.79
2,000- 2,499	9	6.61	5.06	6.06	12.37	8.13	10.50
2,500- 4,999	16	6.61	3.80	5.29	11.53	6.80	9.49
5,000-25,000	13	6.70	4.46	5.38	12.20	7.95	9.82
All systems	71	$ 9.30	$ 3.30	$ 5.59	$ 15.75	$ 6.30	$ 10.17

[a]Unweighted arithmetic mean.

Source: Table 43.

The highest bill for the same amount of energy is $9.30, an amount charged by one of five cities of 1,500 to 1,999 population. The nine cities in the 2,000 to 2,499 population class have the highest average bill, $6.06. In each class, the difference between the highest and the lowest bill in the class is substantial, varying from $1.55 in the 2,000 to 2,499 population class to $5.43 in the next smaller class.

By reducing the 100-kilowatt-hour bills to a basis of average cost per kilowatt-hour, one may see that the average cost of energy at this level is 5.59 cents per kilowatt-hour. Further, one system charges as little as 3.3 cents while another charges as much as 9.3 per kilowatt-hour.

The results of similar computations at the 250 kilowatt-hour level are also shown in Table 44. At this level, the average bills decline gradually as the size of the population class increases through 1,999. Just as in the case of the 100 kilowatt-hour bills, the nine cities of 2,000 to 2,499 population have a larger average bill than the two classes above and the two classes below. Similarly, the lowest average rate is found in the class containing the sixteen communities between 2,500 and 4,999 population. Here again the lowest bill for 250 kilowatt-hours is charged by a town in the smallest class, but the highest bill is also found in the smallest class. The range between the highest and lowest bills charged within each class remains high, varying from $2.10 in one class to $9.45 in another.

After being divided into population-size groups, the systems were then placed into categories according to their sources of power. Those generating all or part of their requirements were placed into a single category. Average 250 kilowatt-hour bills were then computed for each of the categories. The 1950 population of each community was used as a weight in computing the average in order to render the averages more comparable. The results are summarized in Table 45.

As the data in Table 45 show, generating systems generally charge more than purchasing systems for 250 kilowatt-hours of residential usage. The weighted average bill for nineteen generating systems was computed to be $10.13 in contrast to the $9.74 average bill computed from those charged by the fifty-two purchasing systems.

Among the purchasing systems, the twenty-three buying power from the two major private systems charged less, on the average, than the twenty-nine others buying from cooperative and publicly-owned power sources. The difference

TABLE 45.--Average net monthly residential electric bills for 250 kilowatt-hours, weighted by population, by source of power, for Oklahoma municipal electric systems, 1956

Source of power	Number of systems utilizing source		Weighted average bill
Municipal systems	5		$ 11.16
Rural electric cooperatives	3		10.28
Southwestern Power Administration	11		10.17
Grand River Dam Authority	10		9.70
Oklahoma Gas and Electric Company	12		9.65
Public Service Company	11		9.57
All purchasing systems		52	9.74
Generating systems		19	10.13
All systems		71	9.93

Source: Table 43.

between the average bill charged by Grand River Dam Authority's customers and Oklahoma Gas and Electric Company's customers is slight, however, and may not be significant.

It should be noted, too, that the weighted average bill for 250 kilowatt-hours is $1.85 above the average Oklahoma bill of $8.08 computed by the Federal Power Commission for 1956. In other words, average rates charged by Oklahoma municipal systems at this level of consumption are considerably higher than the average rates charged by the private systems in the state. Furthermore, the weighted average bill for 250 kilowatt-hours charged by Oklahoma municipal systems is $1.13 above the highest state average bill ($8.90 in Vermont) computed by the Federal Power Commission for 1956.

To illustrate the difference between rates charged by municipal systems and private systems in Oklahoma, typical electric bills were computed for twelve cities served by either Oklahoma Gas and Electric Company or Public Service Company. These communities and their typical bills were then paired according to population with twelve cities of more than 5,000 population that operate municipal electric systems.[7] These comparisons may be seen in Table 46.

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[7]Duncan is omitted from the pairings because the municipal system and Public Service Company are in competition in that city, both charging identical rates for similar service.

TABLE 46.--Typical net monthly residential electric bills in twelve Oklahoma cities of more than 5,000 population served by municipal electric systems and in twelve cities of comparable population served by private electric systems, as of January 1, 1957

Paired cities	Population (1950)	Kilowatt-hours consumed each month 25	40	100	250	500
Stillwater	20,238	$ 1.50	$ 2.40	$ 5.50	$ 11.00	$ 17.50
Norman	27,006	1.35	1.94	3.92	7.34	12.59
Difference		.15	.46	1.58	3.66	4.91
Ponca City	20,180	1.61	2.43	4.83	9.33	15.58
Bartlesville	19,228	1.47	2.05	3.94	7.94	14.19
Difference		.14	.38	.89	1.39	1.39
Miami	11,801	1.84	2.75	5.45	12.20	23.45
Seminole	11,863	1.48	2.14	4.12	7.54	12.79
Difference		.36	.61	1.33	4.66	10.66
Altus	9,735	1.71	2.48	4.49	8.74	14.99
El Reno	10,991	1.35	1.94	3.92	7.34	12.59
Difference		.36	.54	.57	1.40	2.40

TABLE 46.--Continued

Paired cities	Population (1950)	Kilowatt-hours consumed each month 25	40	100	250	500
Blackwell	9,199	$ 2.50	$ 3.70	$ 6.70	$ 9.83	$ 12.95
Guthrie	10,113	1.48	2.14	4.12	7.54	12.79
Difference		1.02	1.56	2.58	2.29	.16
Cushing	8,414	1.50	2.40	5.50	11.00	18.50
Henryetta	7,987	1.47	2.05	3.94	7.94	14.19
Difference		.03	.35	1.56	3.06	4.31
Anadarko	6,184	1.70	2.45	4.95	7.95	12.95
Holdenville	6,192	1.48	2.14	4.12	7.54	12.79
Difference		.22	.31	.83	.41	.16
Edmond	6,086	1.77	2.82	5.65	9.77	14.77
Wewoka	6,747	1.48	2.14	4.12	7.54	12.79
Difference		.29	.68	1.53	2.23	1.98
Claremore	5,494	1.80	2.48	5.18	9.68	16.43
Vinita	5,518	1.57	2.23	4.17	8.17	14.42
Difference		.23	.25	1.01	1.51	2.01

TABLE 46.--Continued

Paired cities	Population (1950)	Kilowatt-hours consumed each month 25	40	100	250	500
Frederick	5,467	$ 2.25	$ 3.30	$ 5.50	$ 8.75[a]	$ 13.75[a]
Hugo	5,984	1.67	2.39	4.37	8.37	14.62
Difference		.58	.91	1.13	.38	- .87
Pawhuska	5,331	1.88	3.00	6.25	9.25[a]	13.00[a]
Hobart	5,380	1.71	2.48	4.49	8.74	14.99
Difference		.17	.52	1.76	.51	- 1.99
Perry	5,137	1.50	2.40	5.50	11.50	21.50
Drumright	5,028	1.48	2.14	4.12	7.54	12.79
Difference		.02	.26	1.38	3.96	8.71
Average difference		.30	.57	1.34	2.12	2.82

[a]A lower rate applies to these consumptions when an electric range is connected to load.

Note: All bills are computed on the basis of lowest single-meter service. The first city in each pair is served by a municipal electric system.

Sources: Table 43 for municipal system typical bills; private system bills calculated from: U. S., Federal Power Commission, National Electric Rate Book: Oklahoma (Washington: Federal Power Commission, October 5, 1956), pp. 2-18. All bills were calculated in accordance with the instructions accompanying Federal Power Commission Form 3, Schedule 1.

As the pairings reveal, no municipal system in any Oklahoma city of more than 5,000 population charges less for equivalent amounts of energy than the private systems serving a community of comparable size, except in two cases where municipal customers receive a special rate for an electric range. The lowest municipal bill is exceeded by private bills in three cases at the 25 kilowatt-hour level, in one case each at the 40 and 100 kilowatt-hour levels, in three cases at the 250 kilowatt-hour level, and in five cases at the 500 kilowatt-hour level. In all other instances, the lowest municipal bill is higher than any other private bill at the same consumption.

The average differences observed between the paired bills increase as consumption rises. At 25, 40, and 100 kilowatt-hours, municipal bills exceed private bills by more than one cent per kilowatt-hour. At 250 and 500 kilowatt-hours, the average differences are less than one cent per kilowatt-hour but are still substantial in an absolute sense, being $2.12 at 250 kilowatt-hours and $2.82 at 500 kilowatt-hours.

Commercial Electric Rates

Typical net monthly commercial electric bills were also computed for all municipal systems in Oklahoma and are presented in Table 47. These bills were computed at the lowest rate available for commercial lighting purposes which did not require payment of a monthly demand charge plus a separate energy charge. Bills were computed for 250 and 500 kilowatt-hours to show the cost of typical amounts of electricity to the small business using little power equipment and to provide a means of comparing the cost of identical blocks of energy to residential and commercial users.

It was discovered that commercial bills at the 250 and 500 kilowatt-hour levels were generally higher or the same as residential bills at the same use levels. At 250 kilowatt-hours, commercial customers paid higher bills than residential customers in forty systems. Both classes paid the same bills in twenty-three communities. In only eight systems--Cashion, Laverne, Marlow, Miami, Newkirk, Prague, Stillwater, and Waynoka--were typical commercial bills for 250 kilowatt-hours less than typical residential bills.

At 500 kilowatt-hours, typical commercial bills were higher in forty-three systems, the same in twenty-three systems, and lower in only five systems--Cashion, Laverne, Marlow, Miami, and Waynoka.

Typical commercial bills, like typical residential

TABLE 47.--Typical net monthly bills for commercial service furnished by municipal electric systems in Oklahoma, January 1, 1957

Community	Rate designation	Kilowatt-hours consumed 250	500	1,000	2,500
Altus	Commercial Light	$ 14.15	$ 24.15	$ 39.90	$ 81.90
Amorita	All	8.60	16.10	31.10	76.10
Anadarko	Commercial Light[abc]	16.00	23.50	38.50	83.50
Blackwell	Commercial Light[bcd]	14.50	20.75	40.75	85.75
Braman	All	15.75	24.00	33.00	55.50
Burlington	All	10.60	18.10	33.10	78.10
Byron	All	6.30	11.30	21.30	51.30
Carmen	Residential and Commercial[b]	10.75	18.25	33.25	68.25
Cashion	Commercial	11.00	20.00	35.50	80.50
Chelsea	Commercial	8.30	14.30	24.30	47.30
Cherokee	Commercial	12.00	21.00	36.00	73.50
Claremore	Residential and Commercial[bc]	9.68	16.43	29.93	70.43
Collinsville	Commercial	13.75	22.50	35.00	69.50
Comanche	Commercial	12.16	21.87	36.87	81.87
Copan	Residential and Commercial	13.49	22.99	41.99	98.99
Cordell	Commercial	12.75	21.50	37.25	82.25
Crescent	Residential and Commercial	8.78	16.22	31.10	59.15
Cushing	General Lighting Service[b]	13.50	26.00	46.00	96.00
Dacoma	Residential and Commercial	11.04	19.79	37.29	74.79
Duncan	Commercial[bc]	12.64	22.64	37.64	82.64
Edmond	Commercial	11.52	21.52	41.52	71.52
Eldorado	Residential and Commercial[d]	12.50	20.00	38.25	83.25
Fairview	General Service[bc]	13.00	23.00	39.00	78.00

TABLE 47.--Continued

Community	Rate designation	Kilowatt-hours consumed 250	500	1,000	2,500
Fort Supply	Residential and Commercial[b]	$ 10.85	$ 19.60	$ 35.30	$ 80.30
Frederick	Commercial[b]	14.10	24.10	38.30	83.30
Geary	Commercial[b]	15.41	22.91	37.91	82.91
Goltry	Commercial[d]	14.10	20.40	27.90	58.45
Granite	Commercial	11.40	19.26	30.51	61.56
Hominy	Commercial[d]	16.50	26.50	41.50	79.00
Kaw City	Residential and Commercial	11.70	19.20	34.20	79.20
Kingfisher	General Lighting[b]	19.50	34.00	59.00	134.00
Laverne	Commercial Power	11.83	20.93	39.13	80.08
Lexington	Commercial	10.65	19.40	34.40	71.90
Lindsay	Commercial[b]	14.25	24.25	39.25	74.25
Manchester	Residential and Commercial	13.19	20.69	35.69	80.69
Mangum	Commercial[c]	16.55	30.60	51.98	96.98
Manitou	All	12.00	22.00	42.00	102.00
Marlow	Power	10.25	18.75	33.60	75.25
Miami	Residential and Commercial Light[bd]	11.53	18.78	41.28	87.18
Mooreland	Residential and Commercial[b]	9.74	17.24	32.24	77.24
Newkirk	Power[a]	10.00	20.00	35.00	80.00
Okeene	Commercial Lighting[bcf]	17.47	27.37	37.50	67.88
Olustee	All	14.50	20.75	45.75	120.75
Orlando	All	7.04	15.04	21.04	57.04
Pawhuska	Commercial[b]	18.00	29.50	49.50	102.00

TABLE 47.--Continued

Community	Rate designation	Kilowatt-hours consumed 250	500	1,000	2,500
Pawnee	Commercial[b]	$ 12.00	$ 22.00	$ 37.00	$ 79.00
Perry	Commercial[bc]	14.50	24.50	37.00	74.50
Ponca City	Commercial[bc]	12.50	23.00	41.00	86.00
Pond Creek	Residential and Commercial[c]	11.10	18.60	33.60	63.60
Prague	Commercial[b]	9.57	17.92	32.92	77.92
Pryor	Commercial[bc]	11.27	17.27	32.27	77.27
Purcell	Commercial[c]	12.45	18.55	28.25	58.25
Ryan	All	9.13	15.38	24.88	47.38
Sallisaw	Commercial[bd]	13.83	22.16	38.81	78.76
Skiatook	Commercial[b]	11.87	19.92	34.92	79.92
S. Coffeyville	Power[e]	11.90	21.90	36.25	68.75
Spiro	All	11.60	21.60	36.60	66.60
Stillwater	Commercial[b]	10.90	17.60	27.60	57.60
Stilwell	Commercial	12.30	20.30	32.80	68.30
Stroud	Commercial	13.91	25.16	45.16	90.16
Tahlequah	Commercial[b]	9.50	14.50	24.50	54.50
Tecumseh	Commercial[c]	13.11	22.61	39.24	73.15
Tonkawa	Commercial[a]	9.90	18.00	31.05	60.30
Wagoner	Commercial	13.50	22.00	37.00	72.00
Walters	Commercial	12.60	22.60	42.60	65.19
Watonga	Commercial[bc]	11.89	19.39	34.39	69.51
Waynoka	Power	9.29	16.79	30.79	68.29
Weleetka	Commercial	11.00	19.00	34.00	79.00

TABLE 47.--Continued

Community	Rate designation	Kilowatt-hours consumed 250	500	1,000	2,500
Wetumka	All	$ 11.50	$ 19.00	$ 34.00	$ 79.00
Wynnewood	Residential and Commercial[b]	13.79	26.29	41.29	86.29
Yale	Commercial and Power	15.50	25.00	40.00	80.00

[a]Other commercial light rate available.

[b]Commercial power rate also available.

[c]Industrial power rate also available.

[d]Other special commercial rate or rates also available.

[e]Minimum bill is $30.00. Lesser bills are computed at the residential rate.

[f]All over the minimum charge is allowed a 10 per cent discount.

Source: Appendix C.

bills, vary greatly from one system to another. At 250 kilowatt-hours, the range is from $6.30 to $15.75; at 500 kilowatt-hours, $11.30 to $34.00; at 1,000 kilowatt-hours, $21.04 to $59.00; and at 2,500 kilowatt-hours, $47.30 to $134.00.

Typical commercial bills in cities of 5,000 population and more served by municipal and private systems are compared in Table 48 in a manner similar to the presentation in Table 46. The same cities are used in all comparisons. In only one pair, Claremore and Vinita, is the municipal bill consistently below the private bill. In the Stillwater-Norman pair, the municipal bill is lower than the private bill at levels above 250 kilowatt-hours. In Miami the municipal bill is lower than the private bill in Seminole only at 500 kilowatt-hours. In Perry and Edmond, the 2,500 kilowatt-hour bills are less than the private bills in the paired cities, but the private bills are less at the lower levels of consumption.

The average difference in typical commercial bills is greatest at the 1,000 kilowatt-hour level. The average difference per kilowatt-hour consumed declines, however, from 1.1 cents at 250 kilowatt-hours, to 0.51 cents at 500 kilowatt-hours, to 0.35 cents at 1,000 kilowatt-hours, and

TABLE 48.--Typical net monthly commercial electric bills in twelve Oklahoma cities of more than 5,000 population served by municipal electric systems and in twelve cities of comparable population served by private electric systems, as of January 1, 1957

Paired cities	Population (1950)	Kilowatt-hours consumed each month 250	500	1,000	2,500
Altus	9,735	$ 14.15	$ 24.15	$ 39.90	$ 81.90
El Reno	10,991	10.01	19.63	36.13	77.38
Difference		4.14	4.52	3.77	4.52
Anadarko	6,184	16.00	23.50	38.50	83.50
Holdenville	6,192	10.56	20.18	36.68	77.93
Difference		5.44	3.32	1.82	5.57
Blackwell	9,199	14.50	20.75	40.75	85.75
Guthrie	10,113	10.56	20.18	36.68	77.93
Difference		3.94	.57	4.07	7.82
Claremore	5,494	9.68	16.43	29.93	70.43
Vinita	5,518	11.27	19.27	34.27	79.27
Difference		-1.59	-2.84	-4.34	-8.84

TABLE 48.--Continued

Paired cities	Population (1950)	Kilowatt-hours consumed each month 250	500	1,000	2,500
Cushing	8,414	$ 13.50	$ 26.00	$ 46.00	$ 96.00
Henryetta	7,987	10.83	18.83	33.83	78.83
Difference		2.67	7.17	12.17	17.17
Edmond	6,086	11.52	21.52	41.52	71.52
Wewoka	6,747	10.56	20.18	36.68	77.93
Difference		.96	1.34	4.84	-6.41
Frederick	5,467	14.10	24.10	38.30	83.30
Hugo	5,984	11.45	19.45	34.45	79.45
Difference		2.65	4.65	3.85	3.85
Miami	11,801	11.53	18.78	41.28	87.18
Seminole	11,863	10.56	20.18	36.68	77.93
Difference		.97	-1.40	4.60	9.25
Pawhuska	5,331	18.00	29.50	49.50	102.00
Hobart	5,380	12.64	22.64	37.64	82.64
Difference		5.36	6.86	11.86	19.36

TABLE 48.--Continued

Paired cities	Population (1950)	250	500	1,000	2,500
		Kilowatt-hours consumed each month			
Perry	5,137	$ 14.50	$ 24.50	$ 37.00	$ 74.50
Drumright	5,028	10.56	20.18	36.68	77.93
Difference		3.94	4.32	.32	-3.43
Ponca City	20,180	12.50	23.00	41.00	86.00
Bartlesville	19,228	10.83	18.83	33.83	78.83
Difference		1.67	4.17	7.17	7.17
Stillwater	20,238	10.90	17.60	27.60	57.60
Norman	27,006	10.01	19.63	36.13	77.38
Difference		.89	-2.03	-8.53	-19.78
Total difference		31.04	30.65	41.60	36.25
Average difference		2.59	2.55	3.47	3.02

Note: All bills are computed on the basis of lowest single-meter service. The first city in each pair is served by a municipal electric system.

Sources: Table 47 for municipal system typical bills; private system bills calculated from: U. S., Federal Power Commission, National Electric Rate Book: Oklahoma (Washington: Federal Power Commission, October 5, 1956), pp. 2-18.

to 0.12 cents at 2,500 kilowatt-hours.

Industrial or Power Rates

Industrial or commercial power rates may be found in the rate schedules of forty municipal systems in Oklahoma. Very few industrial loads, however, are served by municipal systems. These few instances include the Blackwell system, which furnishes power to a nearby zinc smelter; the Cushing system, which furnishes requirements for two oil refineries; and the Ponca City system, which supplies a large oil refinery. In other instances, the industrial or power rates are extended to smaller light and power users, such as cotton gins, feed mills, grain elevators, small factories, industrial service shops, ice plants, and retail stores.

Only twenty-seven municipal systems reported industrial customers in 1955. Of these systems, only ten reported having ten or more industrial customers in that year. These systems included the following: Anadarko, 130; Mangum, 196; Miami, 34; Newkirk, 80; Pawhuska, 193; Sallisaw, 39; Stillwater, 60; Tahlequah, 38; Tonkawa, 10; and Wagoner, 32. These accounted for almost 94 per cent of the 865 industrial customers reported.

Where offered, industrial or power rates call for the lowest unit price for energy in the rate structures. The monthly minimum charge is usually based on kilowatts of billing demand, kilowatt capacity of power units connected to load, or horsepower capacity of installed motors. Energy charges are typically by blocks, with the unit price declining as consumption rises. The blocks are usually larger than those encountered in residential and commercial lighting rate schedules and the unit price declines to exceptionally low levels.

Blackwell's commercial and industrial power rate, for example, calls for a minimum payment of $0.50 per horsepower for the first five horsepower of connected load, plus $0.25 for each additional horsepower. The energy charge declines from five cents per kilowatt-hour for the first 100 kilowatt-hours to one cent for consumption between 5,000 and 50,000 kilowatt-hours per month. For any excess, the unit price is only seven and a half mills.

In most cases, incidental lighting is permitted under the commercial power or industrial power rates. This permits retail stores, theaters, and similar customers to qualify for the lower rates if they have heavy air-conditioning or other power equipment.

The circumstances that lead to a business establishment securing service at the power rate rather than the commercial lighting rate, when both rates are available, are not always clear in the rate specifications. This factor, the many special features of the industrial or power rate schedule, and the wide variations in consumption make meaningful rate comparisons difficult.

CHAPTER VII

SUMMARY AND CONCLUSIONS

Introduction

The data presented in the foregoing chapters lead inevitably to the conclusion that the municipal electric systems in Oklahoma have been steadily expanding since about 1930. This growth has enabled the municipal systems to maintain a relatively constant share of the state's expanding electric utility business. In other words, the municipal systems have become neither more nor less important than the private electric systems since 1930, displaying a remarkable stability following the setbacks of the 1920's.

While this growth has been taking place, however, the municipal electric systems have undertaken a number of internal adjustments which have profoundly altered their character as a group. In the period since 1945, the most significant of these adjustments has been the sharp decline in number of generating stations operated by municipalities and the increasing dependence upon electric power generated in large central stations, both publicly and privately owned.

Most spectacular has been the rapidly rising share of two publicly-owned power sources in sales of electricity to municipal systems for resale. Grand River Dam Authority, a state agency, and Southwestern Power Administration, a federal agency, now supply more than half of the wholesale power to municipal systems in the state. Twenty years ago the only sources of wholesale power--other than the municipal systems themselves--were the major private systems.

In the same period of growing dependence on purchased power, most of the remaining municipal generating systems have been expanding their capacity and modernizing their plant. Even though municipal generation is not as important as it once was, the absolute amount of energy generated each year has grown steadily. And this increase has occurred despite the reduction in number of generating stations.

Faced with the increasing demand for electricity since 1945, the municipal electric systems have financed the necessary expansion of plant and equipment by issuing bonds and reinvesting surplus earnings. Citizens of many of these municipalities, apparently convinced of the need for replacement and expansion and desiring to extend support to their municipal electric enterprises, have voted bond issues in record amounts. Because of their larger capital requirements, municipal generating systems have been responsible for a disproportionate share of the bond financing.

The setting for these and other major developments among the municipal electric systems in Oklahoma will be summarized in this chapter. In addition, the status and role of the municipal electric systems in the Oklahoma economy and governmental system will be critically examined. Finally, the outlook for future developments among the municipal systems will be discussed.

Major Developments

Seventy-one municipal electric systems were operating in Oklahoma in 1956. Most of these systems were established in the early years of statehood but particularly during the two decades from 1905 through 1924. During those years, fifty-eight of the systems operating today were founded. Two systems began operating as early as 1901, and two other systems were established as late as 1951. The systems are scattered throughout the state in forty-one of the seventy-one counties.

Eighty-four other Oklahoma communities once operated municipal electric utilities but now secure service from private or cooperative electric systems. Of these abandoned systems, 84 per cent were operating generating equipment at the time service from another system was substituted. About 79 per cent of the systems were abandoned between 1920 and 1929, a period in which private transmission lines were rapidly extended throughout the state. About 81 per cent of the abandonments took place in communities of less than 1,500 population. In these respects, this development in Oklahoma was similar to the national trend away from small isolated generating plants which were rendered uneconomic by ready accessibility to power transmitted from central generating stations. It should be noted, however, that until the latter part of 1927 a municipal electric system could be sold to a private system without an election, simply by affirmative action of the council. The laxity of the law in this respect may have contributed in great measure to the number of abandonments before 1928.

As far as could be determined, the principal motive of municipalities in establishing electric systems was that of providing a necessary public service at reasonable cost. In thirty-nine of the seventy-one existing systems, no other source of electricity was available to the community. In twelve other instances, unsatisfactory service by a private system strongly contributed to the municipality's decision to establish an electric power enterprise. Eight other cities negotiated the purchase of small private electric systems in conjunction with the establishment of municipal water systems, thus taking advantage of the economies in dual operation of utilities. In only one case, at Cushing in 1935, was the question of the private system's excessive rates found to be a significant factor in the establishment of a municipal plant. The two most recent acquisitions of private systems by Pryor and Skiatook in 1951 were aimed at the augmentation of municipal revenues.

About four-fifths of the municipal systems serve communities of less than 5,000 population. The largest cities operating electric systems, Stillwater and Ponca City, had populations of less than 21,000 in 1950. Generally, the larger cities operate generating plants while the smaller municipalities purchase power for distribution through their own lines. Nevertheless, Okeene, a city of only 1,170 population, generates all of its requirements; while Miami, with a population of 11,801, purchases all of its power needs.

No generating stations were found among the eighteen systems serving towns of less than 1,000 population, and only nineteen of the remaining fifty-three cities operated generating stations in 1956. Those not operating generators purchased electric power from other sources, particularly Public Service Company of Oklahoma, Oklahoma Gas and Electric Company, Grand River Dam Authority, and Southwestern Power Administration. Other municipal electric systems and rural electric cooperatives also supplied a minor part of the wholesale power to municipal purchasing systems in the state.

In response to the changing technology of the industry, the municipal systems had replaced most of their obsolete reciprocating steam engines with diesel engines by 1930. At the same time, other municipal systems ceased generating and began purchasing power. Between 1922 and 1927, the number of generating systems dropped sharply from ninety-three to forty-seven, while the number of distributing-only systems rose from only seven to thirty-seven. In the ten years between 1922 and 1932, internal combustion engine capacity climbed from 7,340 to 21,114 kilowatts while steam engine capacity fell from 10,045 to 2,387 kilowatts. The introduction of the diesel engine served to strengthen the remaining generating systems and the shift to purchased power undoubtedly permitted continuation of municipal ownership among those smaller systems where generation was obviously impractical.

The next such startling shift in the composition of the municipal electric systems occurred in the decade from 1945 to 1955. Generating systems once more began a precipitate decline in number, falling from forty in 1945 to nineteen in 1955. Conversely, the number of distributing-only systems increased from thirty-three to fifty-two. Almost all of this shift can be accounted for by the increased sales of relatively inexpensive wholesale power from the state and federal agencies marketing electricity to municipal systems. Grand River Dam Authority increased its municipal customers from three in 1946 to ten by 1953. Southwestern Power Administration, which first sold power to Oklahoma municipal systems in 1951, was furnishing full requirements to eleven systems by 1953.

This most recent shift, however, involved no such significant change in the technological composition of municipal generating capacity as transpired between 1922 and 1932. Generally, it was the more inefficient systems, in terms of plant factors, that began purchasing all their requirements from other sources. As the number of generating systems decreased, the total generated output came to be more heavily dominated by the four largest of the generating systems. By 1955, Ponca City, Blackwell, Stillwater, and Cushing together accounted for 63 per cent of municipal generation.

In addition to their role as suppliers of electricity, municipal electric systems in Oklahoma function as taxing devices. Although the available data are somewhat inadequate, it is possible to show that about 37 per cent of the municipal electric systems' revenue of more than $10 million in 1955 was net profit to the municipalities operating them. In contrast, anticipated property tax revenues for the following fiscal year were only $1.4 million. Sixteen of the cities levied no property tax. Fifty-nine of the municipalities secured no property tax support for the general fund, and among those collecting such a tax the rate was quite low, averaging only two mills on each dollar of property valuation. Most of the property tax revenues were earmarked for municipal bond sinking funds.

From their inception through 1956, seventy of the seventy-one municipalities operating electric systems issued over $20 million in general obligation tax bonds for electric system purposes. More than 70 per cent of this amount was issued in the years following 1944. Nevertheless, thirty-eight municipalities issued no electric system bonds between 1944 and 1956.

As might be expected, most of the bond funds were used by generating systems. Only two of the cities operating generating systems in 1956 issued no bonds during the postwar period. The other seventeen systems accounted for about 87 per cent of all electric system issues. Five of the larger generating systems together received 51 per cent of the bond funds. Similarly, the seventeen generating systems accounted for 89 per cent of the outstanding electric system bonded indebtedness on June 30, 1956. The average debt outstanding among generating systems was $581,700; among sixteen distributing systems the average was only $77,194.

At the close of the 1956 fiscal year, four cities were retiring electric system bonds solely with surplus utility earnings. Only twenty-nine of fifty-three cities collecting a sinking fund tax had electric system bonds outstanding.

The price of electricity supplied to residential customers by municipal electric systems in Oklahoma was found to be considerably higher than the average for the state and nation. The weighted average bill for 250 kilowatt-hours as of January 1, 1956, according to the Federal Power Commission, was $8.08 for Oklahoma and $7.21 for the nation. For the Oklahoma municipal electric systems, however, the weighted average bill was $9.93, or 23 per cent above the state average and 38 per cent above the national average. In fact, the weighted average bill for the Oklahoma municipal systems was more than a dollar higher than the weighted average bill in the state with the highest average.

In addition, the average residential bill for 250 kilowatt-hours in Oklahoma cities served by municipal generating systems was found to be higher than the average bill in communities served by municipal purchasing systems. For the nineteen generating systems, the weighted average bill was $10.13; for fifty-two purchasing systems, the bill was $9.74. Among the purchasing systems, weighted average bills were less for the twenty-three systems buying power from the two major private systems than for the twenty-nine others purchasing from cooperative and publicly-owned sources.

The fact that municipal electricity is generally priced higher than energy supplied by private systems in

Oklahoma was further confirmed by comparing typical bills in cities of comparable population served by the two types of systems. Municipal system bills in twelve cities of more than 5,000 population were paired with typical bills in cities of comparable size served by private systems. These pairings revealed that the municipal residential bills were higher at 25, 40, 100, and 250 kilowatt-hours in all the pairings. At 500 kilowatt-hours, the municipal bills were lower in only two pairings because of a special rate allowed by the municipal systems for electric stove use. Commercial bills were also generally higher in the communities served by municipal systems.

Although most of the municipal systems follow a discriminatory pricing policy, the practice is by no means universal. Twelve of the smaller systems bill all customers under the same rate schedule. In eleven other systems, there is no discrimination between commercial and residential users. A comparison of typical residential and commercial bills for 250 and 500 kilowatt-hours revealed that the municipal systems usually discriminate against commercial users at these levels. At 250 kilowatt-hours, commercial customers paid higher bills than residential customers in forty systems. Both classes paid the same bill in twenty-three communities, and in only eight systems were commercial bills lower than residential bills. At 500 kilowatt-hours, commercial bills were higher than residential bills in forty-three systems, the same in twenty-three systems, and lower in only five systems.

Wide differences were noted among the typical electric bills, both residential and commercial, computed from municipal rate schedules. At the 250 kilowatt-hour level, for example, the lowest residential bill was $6.30 while the highest was $15.75. Among commercial bills for 1,000 kilowatt-hours, the range was from $21.04 to $59.00. Such extreme variations were frequently found within the same population-size groups. Clearly, these variations cannot be explained solely on the basis of cost differences. In many of these cases, experiments aimed at lowering rates might result in substantially greater use in the high-rate systems without loss of revenue. Analysis of rate-revenue relationships is quite subtle, however, and municipalities desiring to revise their rate schedules would do well to seek expert advice.

Generally speaking, the Oklahoma municipal electric systems are almost free of legal restrictions. The municipality is granted ample powers to acquire and operate an electric system. A municipal system may compete with a private system. It may extend its radius of service beyond the corporate limits. It is free of taxation, except for a nominal sales tax it must levy upon most of its customers. Its rates are free from regulation. The legal requirements for accounting, auditing, and budgeting are quite flexible. The proceeds from the sale of electricity may be devoted to any legitimate municipal purpose: to defray any or all general governmental expenses, to retire electric system bonds or other obligations, or to build up a fund for repair and replacement of electric system equipment. And while the sale, lease, or abandonment of a municipal electric system requires the approval of a majority of the electorate, this restriction is doubtless a wise one.

The most severe legal limitation placed upon municipal electric systems is a rigidly interpreted constitutional requirement regarding municipal indebtedness. A debt for public utility purposes extending beyond the fiscal year must be approved by the qualified property tax paying voters of the community and may be secured only by tax revenues. This, the Oklahoma Supreme Court has decided, is the exclusive method by which a city may incur debt to finance an electric plant, other than under an even more restrictive constitutional requirement limiting bond issues to 5 per cent of taxable valuation.

The effect of the Oklahoma Supreme Court's decisions in this regard has been to strike down the efforts of municipalities to finance their electric systems from electric revenues. Thus, a municipality may not buy equipment from manufacturers under an installment plan, pledging electric revenues in a special fund for the retirement of the debt. Likewise, revenue bonds secured only by anticipated income from the electric system may not be issued. Statutes permitting revenue bond financing of municipal utilities have been declared unconstitutional. Thus a municipality must not only secure voter approval of all electric system bond issues but must also make provision for an annual property tax to insure payment of the debt.

Although the device has not been used for municipal electric system purposes since its initial approval by the Oklahoma Supreme Court in 1955, a trust for governmental purposes may issue municipal electric system revenue bonds. Under the provisions of a statute adopted in 1951 and amended in 1953, a municipal electric system may be leased in its entirety to a charitable trust which assumes the character of a state agency. City council members may be trustees and the trustee-councilmen may then operate the property with the municipality continuing to be the sole beneficiary of surplus revenues. A part of the electric revenues may be pledged by the trustees as security for the repayment of a revenue bond issue. The trust cannot be dissolved until all its debts are discharged and such debts may not become a liability of the "parent" municipality. When all bond issues have been retired, control of the property may revert to the municipality.

The Status and Role of Municipal Electric Systems

It would be an exaggeration to infer from the data presented earlier that Oklahoma municipal electric systems have ever occupied more than a minor place among the state's electric utilities. Despite the additions of such cities as Cushing, Hominy, Pryor, and Skiatook to their numbers, the municipal systems have not exhibited any signs of a resurgence to the relatively more important position they occupied before the middle 1920's. Nevertheless, the systems are of vital importance to the seventy-one municipalities in which they operate and to the 100,000 customers they serve. As resource monopolists and collectors of more than $10 million in electric revenues each year (about 37 per cent of it net profit), the systems exercise a material influence over the economies of their parent cities.

Although all of the municipal systems in the state appear to be surviving--even thriving--under their present modes of operation, a number of recommendations for their improvement can be made. Perhaps the most important criticism that may be leveled at the group involves its lack of positive unity. No single organization links the personnel connected with the systems. Perhaps it is too much to expect that the system managers might function as a professional group, for there is little uniformity in the pattern of administrative control. Except in those cities where utility boards or authorities exercise policy control, the systems are seldom under a distinct and unified utility management. The "water and light superintendent" frequently appears to be no more than a foreman. Nevertheless, it would be possible, it seems, for the group to establish a closer community of interest. No more would be required, probably, than an active, enthusiastic leader and some cooperation by officials responsible for the systems.

The primary function of such an association should be the exchange of information. Data on comparative costs of generation and purchase of electric power could be consolidated and disseminated to the group. Surely this is the sort of information city councils should have before them as they ponder whether to continue generation or to begin purchasing power at wholesale. Cost data of this nature might enhance the systems' bargaining positions in negotiating for power purchases from the major private systems. Since rate policies of both Southwestern Power Administration and Grand River Dam Authority are the result, at least in part, of political pressures, there is no reason why the Oklahoma municipal electric systems should not make their political weight felt. Without a standing organization, armed with facts and prepared to enlist widespread citizen support of its position, the joint problems of the municipal systems are likely to go unnoticed.

In this respect, the efforts of the Statewide Rural Electric Cooperative, Incorporated, might serve as a guide. Unfortunately, the Oklahoma Municipal League does not fulfill this function, although it well might at some future time.

An association of municipal electric systems might also exchange information internally within the group regarding technical, financial, and managerial problems. As demand continues to grow, the systems will be constantly faced with new types of problems in these areas. And as the systems move into larger size categories, they will undoubtedly inherit problems solved only shortly before by other systems. These experiences should not be wasted because of a failure to communicate the newly-found knowledge.

If the system policy-makers could see the astonishing diversity of the electric rates charged by other systems, they might be led to closer examination of their pricing systems. There appears to be no particular reason why the rates should be identical, but rate revisions in a number of systems might have salutary effects upon both consumption and revenues. Favorable results of such rate experimentation should be quickly and accurately reported to the group.

The success of such an information exchange would depend primarily upon an accurate, uniform reporting system. This, too, would depend upon adoption of a uniform accounting system with enough flexibility to accommodate the differences between generating and purchasing systems. The essential features of the accounting system might be borrowed from any of a number of standard systems used in other jurisdictions.

Without an adequate flow of information to the electorate, democratic decisions are difficult. Citizens of a municipality can hardly be expected to vote intelligently on issues concerning the electric system unless they are adequately informed. The flow of information should be constant and not restricted to those few times when a bond issue or a sale proposition are to be voted upon. Electric system financial reports should be published in the local newspaper at least once every three months. Financial statements should be made a part of the municipality's annual financial statement and budget estimate and should be filed with the State Auditor.

The objectives outlined above could, of course, be accomplished by statutory direction and vigorous administrative action. This has occurred, for example, in such states as Wisconsin, Massachusetts, and New York. In this respect alone, state regulation of municipal electric systems might be a desirable innovation if successfully carried out. There is always the possibility, however, that state regulation might lead to obliteration of the municipal electric systems. In view of this possibility, the parent municipalities would undoubtedly resist firmly any move to extend state control. Besides the possibility of extinction, state regulation would be viewed as encroachment upon the municipality's "right" to frame its own financial policy through manipulation of its utility system.

It appears quite inconsistent, however, for the state to exercise such close control over ad valorem taxation for municipal purposes while allowing a free rein to management of municipal utility systems. The state constitution, statutes, and supreme court decisions ignore the obvious aspects of utility revenues. The state's attitude seems to be Janus-faced, frowning severely on municipal ad valorem taxation while smiling serenely upon the spectacle of seventy-one municipal electric systems busily gathering millions of dollars in tax revenues annually through monthly billings. Apparently, if a community is clever enough to finance its municipal operations through one or more public utilities, it may go its independent way, free of bothersome state restrictions. The criticism is not wholly that communities should be forbidden to operate their utilities at a profit, but partly that other less fortunate or less "enterprising" cities should be forced to curtail municipal expenditures from lack of property tax funds. Further, the state's ambivalent attitude appears to ignore the possibility that a municipality may exploit its ratepayers through an oppressive rate schedule just as it may exploit property owners through an ad valorem levy.

Unfortunately, we know little about the incidence of taxation through a municipal electric system. This study has not explored this knotty theoretical problem. Too often, however, economists are inclined to look with disfavor upon the indirect tax involved in a profitable municipal utility's operation, labelling it "regressive" and "inequitable." Careful study might show that this manner of taxation is at least as "equitable" as the Oklahoma property tax. Value judgments on this point must await the results of careful empirical-theoretical investigation.

Given the constitutional limitations upon the right of cities to a part of the general property tax levies, it is probable that financing municipal services in the small cities of Oklahoma through municipal utility systems is the most satisfactory solution possible. Further, it may be that the selection of the electric system rather than the water system to carry the financial load is the choice most socially desirable.

Little doubt exists, however, that inexorable economic forces have been proving the impracticability of small isolated municipal generating systems. It appears unlikely that the trend toward purchasing power will halt until only a small, hard core of municipal generating systems remains in the state. The progress of the trend will undoubtedly be slowed by several obstinate barriers.

The pecuniary calculations involved in a comparison of generating versus purchasing costs constitute a formidable barrier in themselves because of the primitive accounting systems maintained by many of the systems. But the calculations can be made if proper records are maintained for comparing costs. Where the pecuniary difference appears only slight to those charged with making the decision, however, other considerations may tip the balance toward retention of the generating plant.

Thus the city might choose to continue generating in order to continue recovery of its sunk costs in the plant, rather than to sell the equipment at salvage prices. Plant employees with vested interests in their jobs might plead for continuance, overstating the trustworthiness of machinery they tend. Manufacturers' representatives are likely to understate generating costs when urging the installation of replacements for outmoded or worn prime movers. A certain civic pride in the continued operation of the generating plant may manifest itself. The city council may fear that abandonment of the generating plant will place the system at the mercy of its power supplier; if wholesale rates are increased, the installation of a new plant might be the only alternative to acquiescence. Southwestern Power Administration has been unable to assure its customers that firm capacity will be available if load growth continues; it is almost inevitable that the agency will increase its rates as increased power costs are allocated to federal hydro-electric projects.

Still, there are powerful arguments in favor of purchasing power from an integrated transmission network. The possibility of power failure is ever-present in the isolated generating system and the cost of maintaining an adequate reserve capacity is prohibitive to the small plant. A complete breakdown or even a mild power shortage not only affects the municipal system revenues but may severely disrupt the local economy. Pawhuska's experience in the summer of 1957 is an outstanding example of this disadvantage.

Contract demand under a purchase contract may be increased--or decreased, if the situation ever should arise--without capital expenditure or loss. In fact, the whole problem of debt management recedes to the background in a purchasing system. Bond issues may become necessary to rebuild an overloaded distribution system or to extend service to new areas, but a conservatively managed repair and replacement fund or even current operating revenues can provide means of financing these improvements.

General management problems are fewer in the purchasing system. Fewer personnel are required to operate the system, maintenance costs are reduced, and supplies such as fuel and lubricating oil need no longer be purchased. Accounting costs can be reduced and fewer cash disbursements are necessary. Management may turn more of its attention to improvement of service and internal administration.

Despite all the barriers to technological and managerial progress, the municipal electric systems of Oklahoma will probably continue to grow in the next few years, in size if not in numbers. It is unlikely that any of the technological innovations now under consideration will force abandonments comparable to those of the 1920's. The experience of those systems existing today suggests that they will continue to approximate the national pattern in their development. But if the small cities of Oklahoma again begin acquiring municipal electric systems, they will do so principally because of an urgent need for funds to expand municipal services.

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Newspapers

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Kuhlman, C. E. "Comparative Operating Costs of Municipally Owned Power Plants in North Carolina." Unpublished Ph. D. dissertation, University of North Carolina, 1941.

Malott, Edward O. "A Study of Municipal Ownership in Wisconsin." Unpublished Ph. D. dissertation, Northwestern University, 1930.

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Other Sources

________. Personal interviews with R. G. Frankenburg and Don H. Martin, electrical engineers, Federal Power Commission Regional Office, Ft. Worth, Texas, October 22-25, 1956.

________. Personal interview with O. D. McLaughlin, Wynnewood, Oklahoma, city clerk, November 14, 1956.

________. Personal interview with Mrs. Mallie Ryan, town treasurer, in Ryan, Oklahoma, November 21, 1956.

________. Personal interviews with Sam Scales, contract representative, Southwestern Power Administration, Tulsa, Oklahoma, October 3, 1956, and February 14, 1957.

________. Personal interview with Frank Winstead, City manager of Ponca City, Oklahoma, November 8, 1956.

Guthrie, J. H., Secretary, Federal Power Commission, Washington, D. C. Letter, dated March 27, 1957.

APPENDICES

APPENDIX A

1. MUNICIPAL ELECTRIC SYSTEM DATA SHEET

2. MAIL QUESTIONNAIRE: ABANDONED SYSTEMS

CITY	COUNTY

MUNICIPAL ELECTRIC SYSTEM DATA SHEET

A. GENERAL

1. Officials interviewed: <u>TITLE</u> <u>DATE</u>

   a.

   b.

   c.

2. 1950 population:
   1956 population estimates, by:

3. Administrative Control:

4. Other city utilities: Water ( )
   Gas ( )

5. Generating ( ); Distributing Only ( );
   Standby generators ( )

B. HISTORICAL

1. Date established in operation:
2. Brief circumstances of establishment:
3. Reasons for starting municipal ownership:

   a. Poor service by plant then in existence:
   b. Municipality encouraged by state power project:
   c. Municipality encouraged by federal power project:
   d. Excessive rates charged by private plant:
   e. Only source of electricity:
   f. Adjunct to water system:
   g. Source of revenue:
   h. Other (specify):

4. Initial financing arrangements:

C. GENERATION

1. Present generators: (Check against FPC data)

a. In operation

b. Standby or idle

D. CURRENT PURCHASED

1. Sources:

2. Current purchased, by source & average rate, in Kwh:

	Kwh	Average Rate	Source
1945			
1946			
1947			
1948			
1949			
1950			
1951			
1952			
1953			
1954			
1955			
1956			

3. Terms of present contract:

E. FREE SERVICES

1. List Kwh furnished in FY 1956 to following:

a. City offices :
b. Street lighting :
c. Water pumping :
d. Schools :
e. Churches :
f. Other :

2. Metered ( ); Estimated ( ); Interdepartment Charge ( ).

F. Use of emergency repair & replacement fund: (OS 11, 448.1-448.3)

Yes ( ); No ( ).

Balance, end of FY 1956:

G. CONTRIBUTIONS TO CITY BUDGET:

1. Utility operated (within) (outside) budget.

2. Contribution to budget, general fund:

1945:

1950:

1955:

H. TAXATION: Fiscal Year 1956

General Fund:

Sinking Fund:

I. ELECTRIC UTILITY BOND ISSUES (List by year of issue)

Year	Principal	Purpose	Maturity	Interest

J. Review financing of plant improvements by methods other than bond issues (lease-purchase, special fund, etc.)

K. RATE POLICIES AND SCHEDULES

1. General policy of governing authority:
   ( ) Revenue in lieu of taxation.
   ( ) Other (specify):

2. Present rate schedule: (attach or use back of sheet)

L. RELATIONS WITH SOURCE OF PURCHASED CURRENT
(See contracts; obtain comment.)

M. PROPOSALS TO BUY OR LEASE, 1946-1956:

N. FRANCHISE OR SALE ELECTIONS, 1946-1956:

O. GENERAL COMMENTS
(Council minutes, bond register, oral comment)

Box 413 Faculty Exchange
University of Oklahoma
Norman, Oklahoma
November 21, 1956

City Clerk
_______________, Oklahoma

Dear Sir [or Madam]:

Your city is reported to have had a municipally-owned electric generating system at some time before 1928. In order to bring the historical record up to date in connection with a research project I am conducting, would you please answer the following questions as accurately as you can?

If you do not know the answers, or old council minutes fail to reveal answers, perhaps some long-time resident of your city might remember.

Just check the appropriate box or fill in the blanks below:

1. Did this city once operate a city-owned electric system?

( ) Yes ( ) No ( ) Unknown

2. If "Yes," please supply the following information:

Year system established by city: _______

Did the system generate electricity: ( ) Yes ( ) No

Year system sold or abandoned: _______

Reason(s) for sale or abandonment: _________

____

City Clerk
Page two
November 21, 1956

3. If the answer to the first question is "Unknown," would you please supply the name and address of a city resident who might remember details of the plant's establishment?

Thank you for your help and courtesy in this matter. Feel free to write any comments on the back of this letter. After answering questions, just fold up this letter and place it in the enclosed stamped envelope before mailing.

Sincerely yours,

Stanley A. Self

Please sign your name below:

____

APPENDIX B

CONSUMPTION, GENERATION, PURCHASES, SALES AND

FREE SERVICES FURNISHED IN OKLAHOMA

MUNICIPAL ELECTRIC SYSTEMS

1945, 1950, 1955

APPENDIX TABLE 1.--Net energy for system, system net generation, energy purchased, energy sold for resale, and free services furnished, for seventy-one municipal electric systems in Oklahoma, in kilowatt-hours, in 1945

System	Net energy for system	System net generation	Energy purchased	Energy sold for resale	Free services
Altus	5,627,300	4,761,000	2,388,600	1,552,300	1,001,367
Amorita	60,000	......	60,000	......	8,000
Anadarko	2,226,879	2,226,879	......	......	600,000
Blackwell	17,706,318	21,165,741	......	3,459,423	1,635,272
Braman	217,423	......	217,423	......	75,000
Burlington	137,300	......	137,300	......	19,700
Byron	57,120	......	57,120	......	10,000
Carmen	463,726	639,530	......	175,804	105,000
Cashion	143,520	......	143,520	......	35,000
Chelsea	974,445	......	974,445	......	130,000
Cherokee	1,939,263	2,213,690	......	274,427	196,000
Claremore	12,414,800	......	12,414,800	......	1,053,500
Collinsville	1,196,640	......	1,196,640	......	170,000
Comanche	1,319,002	1,319,002	......	......	400,000
Copan	144,060	......	144,060	......	14,760
Cordell	1,993,633	3,550,933	......	1,557,300	200,000
Crescent	662,400	......	662,400	......	170,000
Cushing	6,306,430	6,306,430	......	......	1,258,691
Dacoma	101,760	......	101,760	......	5,000
Duncan	NA	NA	NA	NA	NA
Edmond	2,974,200	......	2,974,200	......	367,369
Eldorado	NA	NA	NA	NA	NA
Fairview	1,493,629	2,208,717	......	715,088	295,000

APPENDIX TABLE 1.--Continued

System	Net energy for system	System net generation	Energy purchased	Energy sold for resale	Free services
Fort Supply	44,200	......	44,200	......	5,000
Frederick	4,895,000	......	4,895,000	......	1,037,997
Geary	779,300	......	779,300	......	190,300
Goltry	NA	NA	NA	NA	NA
Granite	320,400	......	320,400	......	25,834
Hominy	1,690,000	1,690,000	......	......	120,000
Kaw City	420,000	314,460	105,540	......	50,200
Kingfisher	3,186,200	3,186,200	......	......	128,000
Laverne	545,616	589,890	......	44,274	120,000
Lexington	331,200	......	331,200	......	42,000
Lindsay	1,001,295	1,489,380	......	488,085	265,000
Manchester	79,260	......	79,260	......	15,160
Mangum	2,617,361	3,970,511	......	1,353,150	736,224
Manitou	64,000	......	64,000	......	4,000
Marlow	1,710,000	2,638,000	......	928,000	235,000
Miami	8,460,000	8,460,000	......	......	1,098,612
Mooreland	383,000	383,000	......	......	85,000
Newkirk	1,217,300	1,217,300	......	......	283,800
Okeene	2,175,026	2,175,026	......	......	315,797
Olustee	150,030	......	150,030	......	15,000
Orlando	98,690	......	98,690	......	8,000
Pawhuska	4,092,133	4,092,133	......	......	938,330
Pawnee	2,190,000	2,190,000	......	......	341,000
Perry	4,376,900	4,376,900	......	......	809,000

APPENDIX TABLE 1.--Continued

System	Net energy for system	System net generation	Energy purchased	Energy sold for resale	Free services
Ponca City	16,553,400	16,553,400	......	......	2,742,191
Pond Creek	618,400	......	618,400	......	95,000
Prague	816,500	......	816,500	......	35,000
Pryor	......	......	......	......	......
Purcell	2,595,500	2,900,900	......	305,400	277,500
Ryan	390,000	390,000	......	......	90,000
Sallisaw	1,796,320	1,796,320	......	......	385,000
Skiatook	......	......	......	......	......
South Coffeyville	274,085	......	274,085	......	4,800
Spiro	480,000	480,000	......	......	50,000
Stillwater	8,317,600	8,317,600	......	......	577,478
Stilwell	1,014,230	1,014,230	......	......	319,230
Stroud	867,210	867,210	......	......	176,890
Tahlequah	2,659,270	2,659,270	......	......	497,000
Tecumseh	707,400	......	707,400	......	135,000
Tonkawa	2,652,446	2,652,446	......	......	184,000
Wagoner	1,865,414	1,865,414	......	......	594,063
Walters	980,810	1,598,510	......	617,700	235,000
Watonga	1,340,400	......	1,340,400	......	157,175
Waynoka	1,800,000	1,800,000	......	......	268,000
Weleetka	600,000	......	600,000	......	148,000
Wetumka	897,400	897,400	......	......	229,770

APPENDIX TABLE 1.--Continued

System	Net energy for system	System net generation	Energy purchased	Energy sold for resale	Free services
Wynnewood	1,233,600	1,233,600	......	......	124,400
Yale	1,041,005	1,041,005	......	......	140,000
Total	148,487,749	127,232,027	32,696,673	11,440,951	22,084,410

Source: Municipal power system statements filed in the Federal Power Commission Regional Office, Ft. Worth, Texas.

APPENDIX TABLE 2.--Net energy for system, system net generation, energy purchased, energy sold for resale, and free services furnished, for seventy-one municipal electric systems in Oklahoma, in kilowatt-hours, in 1950

System	Net energy for system	System net generation	Energy purchased	Energy sold for resale	Free services
Altus	10,017,800	......	10,017,800	......	2,351,300
Amorita	96,510	......	96,510	......	10,000
Anadarko	4,885,731	4,885,731	......	......	763,616
Blackwell	24,069,734	26,223,900	......	2,154,155	2,035,000
Braman	400,566	......	400,566	......	120,000
Burlington	208,800	......	208,800	......	23,000
Byron	102,430	......	102,430	......	20,000
Carmen	700,000	700,000	......	......	95,000
Cashion	278,700	......	278,700	......	42,740
Chelsea	1,813,400	......	1,813,400	......	130,000
Cherokee	4,489,930	4,900,470	......	410,540	126,000
Claremore	15,488,000	......	15,488,000	......	204,000
Collinsville	2,531,000	......	2,531,000	......	60,000
Comanche	1,615,240	489,940	1,125,300	......	140,000
Copan	241,500	......	241,500	......	35,585
Cordell	3,508,612	2,685,412	823,200	......	574,255
Crescent	988,800	......	988,800	......	120,000
Cushing	9,809,423	9,809,423	......	......	730,339
Dacoma	206,530	......	206,530	......	10,000
Duncan	6,347,730	5,058,130	1,289,600	......	1,279,462
Edmond	5,494,400	......	5,494,400	......	1,200,000

APPENDIX TABLE 2.--Continued

System	Net energy for system	System net generation	Energy purchased	Energy sold for resale	Free services
Eldorado	496,680	......	496,680	......	50,000
Fairview	2,201,123	2,201,123	......	......	450,000
Fort Supply	137,240	......	137,240	......	12,000
Frederick	6,121,950	......	6,121,950	......	1,089,487
Geary	1,503,200	......	1,503,200	......	266,000
Goltry	248,960	......	248,960	......	21,740
Granite	811,000	......	811,000	......	147,000
Hominy	2,631,000	2,631,000	......	......	300,000
Kaw City	493,800	......	493,800	......	70,000
Kingfisher	4,028,000	4,028,000	......	......	NA
Laverne	807,466	807,466	......	......	57,000
Lexington	480,000	......	480,000	......	70,000
Lindsay	2,940,810	2,940,810	......	......	250,000
Manchester	129,630	......	129,630	......	12,880
Mangum	3,882,005	3,882,005	......	......	482,312
Manitou	138,360	......	138,360	......	7,000
Marlow	2,820,000	2,820,000	......	......	380,000
Miami	12,472,000	......	12,472,000	......	261,962
Mooreland	650,220	250,120	400,100	......	82,110
Newkirk	1,872,092	1,872,092	......	......	275,000
Okeene	2,763,820	2,763,820	......	......	485,000
Olustee	283,170	......	283,170	......	32,376
Orlando	156,210	......	156,210	......	10,000

APPENDIX TABLE 2.--Continued

System	Net energy for system	System net generation	Energy purchased	Energy sold for resale	Free services
Pawhuska	5,861,537	5,861,537	......	......	937,932
Pawnee	2,780,700	2,780,700	......	......	350,000
Perry	5,499,300	5,499,300	......	......	465,665
Ponca City	28,058,205	28,058,205	......	......	4,361,902
Pond Creek	934,600	......	934,600	......	100,000
Prague	1,297,600	......	1,297,600	......	200,000
Pryor	......	......	......	......	......
Purcell	2,748,900	3,228,900	......	480,000	231,602
Ryan	824,300	......	824,300	......	284,900
Sallisaw	4,480,800	3,480,000	1,000,800	......	780,000
Skiatook	......	......	......	......	......
South Coffeyville	354,864	......	354,864	......	20,400
Spiro	1,115,095	1,115,095	......	......	216,095
Stillwater	18,087,800	18,087,800	......	......	527,450
Stilwell	1,366,190	1,111,790	254,400	......	290,000
Stroud	1,920,600	1,920,600	......	......	350,000
Tahlequah	5,319,600	......	5,319,600	......	270,000
Tecumseh	1,260,000	......	1,260,000	......	250,000
Tonkawa	4,584,000	4,584,000	......	......	200,000
Wagoner	2,995,200	......	2,995,200	......	896,370
Walters	2,328,870	536,700	1,792,170	......	350,000
Watonga	2,887,200	......	2,887,200	......	228,044
Waynoka	2,196,000	2,196,000	......	......	128,000

APPENDIX TABLE 2.--Continued

System	Net energy for system	System net generation	Energy purchased	Energy sold for resale	Free services
Weleetka	1,002,600	......	1,002,600	......	257,000
Wetumka	1,368,600	1,368,600	......	......	350,000
Wynnewood	1,697,500	......	1,697,500	......	140,000
Yale	1,551,923	1,551,923	......	......	461,724
Total	243,885,556	160,330,592	86,599,670	3,044,706	27,529,248

Source: Municipal power system statements filed in the Federal Power Commission Regional Office, Ft. Worth, Texas.

APPENDIX TABLE 3.--Net energy for system, system net generation, energy purchased, energy sold for resale, and free services furnished, for seventy-one municipal electric systems in Oklahoma, in kilowatt-hours, in 1955

System	Net energy for system	System net generation	Energy purchased	Energy sold for resale	Free services
Altus	18,023,000	......	18,023,000	......	1,720,000
Amorita	142,600	......	142,600	......	22,860
Anadarko	6,879,382	4,541,410	2,337,972	......	1,127,000
Blackwell	29,864,200	40,466,600	......	602,400	2,450,836
Braman	602,400	......	602,400	......	53,640
Burlington	275,600	......	275,600	......	26,000
Byron	121,751	......	121,751	......	16,000
Carmen	960,000	......	960,000	......	175,000
Cashion	798,300	......	798,300	......	80,000
Chelsea	2,433,750	......	2,433,750	......	200,000
Cherokee	5,613,696	6,153,647	......	539,951	555,515
Claremore	12,789,600	......	12,789,600	......	520,000
Collinsville	4,185,466	......	4,185,466	......	348,673
Comanche	2,517,300	14,100	2,503,200	......	300,000
Copan	408,000	......	408,000	......	48,000
Cordell	3,654,800	19,100	3,635,700	......	310,106
Crescent	1,369,200	......	1,269,200	......	150,000
Cushing	22,398,371	11,861,971	10,536,400	......	2,108,820
Dacoma	287,600	......	287,600	......	15,000
Duncan	8,586,600	......	8,586,600	......	NA
Edmond	9,200,000	......	9,200,000	......	370,000
Eldorado	826,700	......	826,700	......	2,400

APPENDIX TABLE 3.--Continued

System	Net energy for system	System net generation	Energy purchased	Energy sold for resale	Free services
Fairview	3,001,800	3,001,800	......	......	550,000
Fort Supply	223,320	......	223,320	......	10,000
Frederick	8,146,970	......	8,146,970	......	1,035,312
Geary	1,698,400	......	1,698,400	......	220,000
Goltry	403,200	......	403,200	......	43,000
Granite	816,200	......	816,200	......	162,000
Hominy	5,592,400	4,534,000	1,058,400	......	800,000
Kaw City	643,040	......	643,040	......	100,000
Kingfisher	5,347,300	5,347,300	......	......	260,000
Laverne	1,485,100	1,485,100	......	......	348,000
Lexington	853,000	......	853,000	......	60,000
Lindsay	5,851,500	5,851,500	......	......	275,000
Manchester	227,700	......	227,700	......	10,380
Mangum	5,190,630	5,190,630	......	......	968,048
Manitou	201,370	......	201,370	......	6,000
Marlow	4,227,000	4,227,000	......	......	412,000
Miami	20,205,694	......	20,205,694	......	2,248,280
Mooreland	931,400	......	931,400	......	102,000
Newkirk	3,146,600	3,146,600	......	......	300,000
Okeene	3,372,575	3,372,575	......	......	439,000
Olustee	292,920	......	292,920	......	34,000
Orlando	207,600	......	207,600	......	10,000
Pawhuska	9,419,000	9,419,000	......	......	1,089,140

APPENDIX TABLE 3.--Continued

System	Net energy for system	System net generation	Energy purchased	Energy sold for resale	Free services
Pawnee	3,788,100	......	3,788,100	......	456,000
Perry	8,433,500	8,433,500	......	......	1,340,000
Ponca City	47,278,270	47,278,270	......	......	8,036,335
Pond Creek	1,500,000	......	1,500,000	......	120,450
Prague	2,308,000	......	2,308,000	......	223,000
Pryor	9,867,600	......	9,867,600	......	170,000
Purcell	5,430,400	......	5,430,400	......	390,330
Ryan	1,066,090	......	1,066,090	......	270,000
Sallisaw	4,814,400	......	4,814,400	......	400,000
Skiatook	2,702,319	......	2,702,319	......	199,894
South Coffeyville	612,000	......	612,000	......	27,800
Spiro	1,488,000	......	1,488,000	......	148,800
Stillwater	24,426,535	24,426,535	......	......	1,136,819
Stilwell	3,164,800	......	3,164,800	......	NA
Stroud	3,163,200	......	3,163,200	......	313,000
Tahlequah	7,452,800	......	7,452,800	......	942,300
Tecumseh	2,242,200	......	2,242,200	......	121,935
Tonkawa	5,300,435	5,300,435	......	......	135,710
Wagoner	4,971,200	......	4,971,200	......	1,020,690
Walters	3,423,500	......	3,423,500	......	220,000
Watonga	4,060,800	......	4,060,800	......	155,660
Waynoka	2,647,500	2,647,500	......	......	241,920
Weleetka	1,205,200	......	1,205,200	......	275,000

APPENDIX TABLE 3.--Continued

System	Net energy for system	System net generation	Energy purchased	Energy sold for resale	Free services
Wetumka	1,741,600	......	1,741,600	......	276,705
Wynnewood	2,640,500	......	2,640,500	......	160,000
Yale	1,959,200	......	1,959,200	......	275,360
Total	381,111,184	196,718,573	185,534,962	1,142,351	47,139,718

Source: Municipal power system statements filed in the Federal Power Commission Regional Office, Ft. Worth, Texas.

APPENDIX C

NET MONTHLY ELECTRIC RATE SCHEDULES OF OKLAHOMA MUNICIPAL ELECTRIC SYSTEMS, AS OF DECEMBER 31, 1956

NET MONTHLY ELECTRIC RATE SCHEDULES OF OKLAHOMA MUNICIPAL ELECTRIC SYSTEMS,

AS OF DECEMBER 31, 1956

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Altus	Domestic	$ 1.00	11	9.1	39	5.1	
					150	3.0	2.5
	Commercial light	1.00	10	10.0	90	6.0	
					100	5.25	
					100	5.0	
					100	4.0	
					100	3.5	
					300	3.25	
					500	3.0	
					4,000	2.75	
					5,000	2.25	
					10,000	1.75	1.0
Amorita	All	1.00	10	10.0	10	7.0	3.0
Anadarko	Residential light	1.00	11	9.1	39	5.0	
					50	4.0	2.0
	Commercial light	1.00	50	10.0	50	7.0	
					100	6.0	3.0

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Anadarko (Continued)	Commercial special light	$	100	6.0	200	5.0	
					300	4.0	
					14,400	2.5	2.0
	Power	....[a]	100	6.0	200	5.0	
					300	4.0	2.0
	Industrial power	....[b]	2,000	3.5	4,000	2.5	
					5,000	1.5	
					10,000	1.25	1.1
Blackwell	Residential light	1.00	25	10.0	25	8.0	
					35	5.0	
					35	3.0	
					120	2.0	1.25
	Commercial light	1.00	25	10.0	25	8.0	
					450	5.0	
					500	4.0	3.0
	Power	....[c]	100	5.0	900	4.0	
					1,000	3.0	
					3,000	2.0	
					45,000	1.0	.75

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Blackwell (Continued)	Commercial air-conditioning	$ ....[c]	100	5.0	500	4.0	1.0
	Commercial hatcheries	1.00	...	...	...	...	2.0
Braman	All	1.20	25	12.0	175	6.0	
					100	4.5	
					200	3.0	
					100	2.5	
					100	2.0	1.5
Burlington	All	1.20	30	10.0	50	5.0	3.0
Byron	All	1.00	10	7.0	...	...	2.0
Carmen	Residential and commercial	2.00	25	8.0	25	7.0	
					100	4.0	
					850	3.0	
					1,000	2.5	2.0
	Power	....[d]	100	4.5	400	3.5	
					500	3.0	
					1,000	2.0	1.75

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Cashion	Residential	$ 1.50	15	10.0	25	5.0	4.0
	Commercial	....[e]	100	5.0	200	4.0	
					300	3.5	3.0
Chelsea	Residential	1.00	15	6.7	50	4.0	
					150	2.0	
					785	2.0	1.5
	Commercial	2.00	40	5.0	310	3.0	
					750	2.0	1.5
	Rural	1.50	17	9.0	63	8.0	
					137	3.0	
					800	2.0	1.5
Cherokee	Residential	1.00	25	8.0	50	5.5	2.0
	Commercial	....[f]	25	8.0	25	6.0	
					50	5.0	
					300	4.0	
					600	3.0	
					2,000	2.5	
					2,000	2.0	1.5

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	@ ¢	Next Kwh	@ ¢	Excess @ ¢
Claremore	Residential and commercial	$ .90	25	7.2	100	4.5	
					4,875	2.7	
					5,000	2.25	
					10,000	1.125	.9
	Power	....[g]	100	5.4	200	3.6	
					700	2.7	
					4,000	2.025	
					5,000	1.575	
					10,000	1.125	.9
	Stove in residence	....	100	3.0	...	...	2.0
	Industrial	....[h]	15,000	1.0	...	...	.7
Collinsville	Residential	2.00	50	7.0	35	5.0	
					415	3.5	2.5
	Commercial	2.00	100	7.0	100	5.0	
					300	3.5	
					500	2.5	
					10,000	2.3	1.7

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Comanche	Residential	$ 1.00	9	11.0	11	11.0	
					20	7.0	
					20	6.0	
					20	5.0	
					50	4.0	3.0
	Commercial	1.00	11	9.0	160	5.0	
					300	4.0	
					2,530	3.0	
					2,000	2.5	2.0
	Range and re-frigerated air	2.50	30	8.3	20	5.0	
					50	4.0	
					45	3.0	
					155	4.0	3.0
Copan	Residential and commercial	1.00	10	9.5	40	7.6	
					50	5.7	
					100	4.75	3.8
	Rural	1.50	10	14.25	40	7.6	
					50	5.7	
					100	4.75	3.8

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Cordell	Residential	$ 1.00	26	7.5	24	5.5	
					500	3.5	3.0
	Commercial	1.00	50	7.5	100	5.5	
					500	3.5	3.0
Crescent	Residential and commercial	1.40	15	9.35	25	6.8	
					1,160	2.975	1.7
Cushing	General lighting service	1.00	100	6.0	400	5.0	
					500	4.0	
					1,000	3.5	
					2,000	3.0	2.5
	Residential (optional)	2.50	50	6.0	50	5.0	
					100	4.0	3.0
	Residential heating and cooking	2.50	200	3.0	300	2.5	2.0
	General power	....[g]	500	4.5	500	4.0	
					1,000	3.0	
					3,000	2.5	
					5,000	2.0	
					10,000	1.5	1.0

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Dacoma	Residential and commercial	$ 1.25	12	10.4	13	8.0	
					25	6.0	
					50	4.0	
					900	3.5	2.5
Duncan	Residential	1.00	14	8.0	150	3.0	
					250	2.5	2.0
	Commercial	1.00	11	9.1	189	5.1	
					300	4.0	3.0
	Large light and power[i]	....[j]	1,000	3.0	4,000	2.0	
					5,000	1.5	
					30,000	1.0	.9
Edmond	Residential	1.00	14	7.1	36	7.0	
					100	4.25	2.0
	Commercial	1.00	14	7.1	36	7.0	
					950	4.0	2.0
Eldorado	Residential and commercial	1.00	25	11.0	25	7.0	
					450	5.0	
					200	4.0	
					250	3.5	
					1,000	3.0	3.0

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Eldorado (Continued)	Gins and elevators	$	..	...	...	...	3.0
Fairview	Residential	2.00	25	8.0	75	6.0	
					50	3.0	2.0
	General service	....[k]	25	8.0	25	8.0	
					50	6.0	
					400	4.0	
					500	3.2	
					2,000	2.6	
					5,000	2.2	1.7
	Large light and power	....[m]	5,000	2.0	5,000	1.4	
					30,000	1.1	.9
	Large industrial service	....[n]	10,000	1.5	30,000	1.1	.8
Fort Supply	Residential and commercial	1.40	10	14.0	30	7.0	
					600	3.5	3.0
	Power	5.00	50	10.0	600	3.5	3.0

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Frederick	Residential	$ 1.00	11	9.0	25	9.0	
					25	7.0	3.0
	Stove	1.00	25	9.0	25	7.0	
					75	3.0	2.0
	Commercial	1.00	10	10.0	25	10.0	
					25	8.0	
					25	7.0	
					25	5.0	
					400	4.0	3.0
	Power	....[o]	1,000	3.0	4,000	2.0	
					5,000	1.5	
					30,000	1.0	.9
Geary	Residential	1.00	8	12.5	17	10.5	
					25	7.0	
					100	3.0	2.5
	Commercial	1.00	8	12.5	42	10.5	
					100	7.0	3.0
	Large power	....[p]	...	...	...	...	1.25

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Goltry	Residential	$ 3.50	40	8.75	40	4.0	
					120	2.5	2.0
	Commercial	4.50	50	9.0	60	4.0	
					200	3.0	
					800	2.5	2.0
	Heat pump	....	...	...	...	...	1.5
	Elevator	....	...	...	...	...	2.6
Granite	Residential	1.00	10	10.0	25	7.2	
					75	5.85	
					100	3.15	2.25
	Commercial	1.00	12	8.5	13	7.2	
					75	6.3	
					400	3.15	
					1,500	2.25	1.71
Hominy	Residential	1.00	75	6.5	50	4.5	
					100	3.0	2.5

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Hominy (Continued)	Commercial[q]	$ 1.00	50	8.0	50	7.0	
					150	6.0	
					250	6.0	
					500	3.0	2.5
	Ice plant	....	...	...	...	...	1.25
Kaw City	Residential and commercial	1.00	10	10.0	50	8.0	
					50	3.0	
					100	4.0	3.0
	Churches and schools	1.00	10	10.0	...	...	4.5
Kingfisher	Residential (four rooms or less)	2.00	14	9.0	14	7.0	
					72	3.0	2.5
	Residential (five rooms or more)	2.00	20	9.0	20	7.0	
					60	3.0	2.5
	General lighting	1.00	200	8.0	100	7.0	
					100	6.0	5.0
	Commercial power	....[r]	50	6.0	50	5.0	
					100	4.0	
					800	3.0	2.0

APPENDIX C--*Continued*

System	Type of service	Minimum bill	First Kwh	@ ¢	Next Kwh	@ ¢	Excess @ ¢
Laverne	Residential	$ 1.00	10	10.0	60	6.37	5.5
	Commercial power	5.00	100	6.37	900	3.64	2.73
Lexington	Residential	1.00	12	8.3	28	5.0	
					100	3.0	2.0
	Commercial	1.00	12	8.3	88	5.0	
					400	3.5	
					500	3.0	2.5
Lindsay	Residential	1.00	12	8.3	3	8.0	
					35	6.0	
					50	5.0	
					100	3.0	
					2,750	2.0	1.5
	Commercial	1.00	50	8.0	50	6.5	
					100	5.0	
					300	4.0	
					1,000	3.0	2.0
	Power	....[g]	100	6.0	200	5.0	
					300	4.0	2.0

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Manchester	Residential and commercial	$ 1.00	9	11.1	41	9.0	
					50	6.0	
					100	4.0	3.0
Mangum	Residential	1.00	30	7.2	200	3.6	
					300	3.15	
					1,000	2.475	
					1,500	2.25	
					2,000	2.025	
					5,000	1.8	1.71
	Commercial	1.00	100	7.2	200	6.3	
					200	5.4	
					500	4.175	
					1,000	3.15	2.7
	Industrial power	1.00	200	3.6	2,000	2.025	
					5,000	1.8	1.71
Manitou	All	1.00	25	10.0	25	6.0	4.0
Marlow	Residential	1.50	17	8.8	30	8.75	
					40	4.5	
					100	3.85	
					100	3.50	
					100	3.0	2.5

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	@ ¢	Next Kwh	@ ¢	Excess @ ¢
Marlow (Continued)	Power	$ 1.50	30	5.0	200	4.0	
					200	3.75	
					200	2.5	
					200	3.25	
					1,000	3.0	
					1,000	2.5	2.0
Miami	Residential and commercial	1.00	20	7.65	20	6.12	
					1,260	4.5	
					3,700	2.7	2.25
	Residential heating and cooking	2.00	30	6.3	30	4.5	2.25
	Commercial power	....[s]	50	5.4	100	4.05	
					300	3.15	
					450	2.25	
					500	1.8	1.75
	Refrigeration service	....[t]	5,000	1.7	15,000	1.0	
					80,000	.8	.75
	Garment manufacturing	....[t]	5.000	1.0	...	...	.75

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Mooreland	Residential and commercial	$ 1.00	11	9.1	14	8.5	
					25	7.0	3.0
	Power	1.00	13	7.6	12	8.0	
					25	7.0	
					50	4.0	3.0
Newkirk	Residential	.75	25	8.0	25	6.0	
					50	4.0	3.0
	Commercial	.75	...	...	...	...	6.5
	Power	.75	500	4.0	2,500	3.0	
					3,000	2.0	1.5
Okeene	Residential combination	2.50	15	9.9	19	5.5	
					81	4.95	
					85	3.6	2.025
	Commercial lighting	1.50	15	9.9	35	8.91	
					50	7.92	
					150	5.94	
					250	3.96	2.025

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Okeene (Continued)	Commercial power[u]	$ ....[r]	50	7.0	200	6.0	
					250	4.0	
					500	3.5	2.25
	Industrial power	....	...	...	...	...	1.0
Olustee	All	1.00	25	11.0	25	7.0	5.0
Orlando	All	1.00	10	8.0	20	4.8	2.4
Pawhuska	Residential	1.00	50	7.5	50	5.0	
					50	3.0	1.5
	Electric range	2.50	100	3.0	...	...	2.0
	Commercial	1.00	50	9.0	50	8.0	
					100	7.0	
					200	5.0	
					1,600	4.0	2.5
	Power	....[r]	100	5.0	200	4.0	
					200	3.0	
					4,500	2.5	
					5,000	2.0	
					5,000	1.5	1.0

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Pawnee	Domestic	$ 1.00	20	8.0	20	6.0	
					60	4.0	
					100	3.5	2.0
	Commercial	1.00	200	5.0	300	4.0	
					800	3.0	2.75
	Power	3.00	100	5.0	200	4.0	
					200	3.0	
					500	2.5	1.75
Perry	Residential and commercial	1.00	50	6.0	50	5.0	
					400	4.0	2.5
	Cooking and heating	2.50	10	9.0	...	...	2.5
	Commercial power	2.50	100	4.0	200	3.5	
					4,500	3.0	
					5,000	2.0	1.5
	Primary power	1.50	1,000	2.25	...	...	1.5
Ponca City	Residential	1.00[v]	14	7.14	26	5.5	
					60	4.0	
					100	3.25	2.5

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Ponca City (Continued)	Commercial	$ 1.00[w]	300	5.0	500	4.0	
					2,500	3.0	
					3,500	2.0	1.5
	Power	3.00[r]	300	5.0	500	4.0	
					2,500	3.0	
					3,500	2.0	
					3,500	1.5	1.0
	Industrial[x]	....	...	...	...	...	1.1
Pond Creek	Residential and commercial	1.00	30	9.0	30	6.0	
					90	4.0	
					850	3.0	
					4,000	2.0	1.1
	Industrial	....[y]	30	9.0	30	6.0	
					90	4.0	
					850	3.0	
					4,000	2.0	1.1
Prague	Residential	1.00	12	8.3	28	6.5	
					100	3.0	2.0

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Prague (Continued)	Commercial	$ 1.00	12	8.3	8	6.5	
					400	3.5	3.0
	Power	1.00	...	...	...	...	3.0
Pryor	Residential service	....[z]	12	8.3	38	4.4	
					100	3.0	
					250	2.5	2.0
	Residential large use	....[aa]	40	6.25	80	4.0	2.0
	Cooking and heating	....[ab]	10	9.0	200	3.0	2.5
	Commercial	....[ac]	12	8.3	188	4.4	
					100	4.0	3.0
	General power	....[r]	100	5.0	200	4.0	3.0
	Large light and power	....[ad]	1,000	2.5	1,000	2.0	
					8,000	1.5	
					40,000	1.0	
					50,000	.75	
					900,000	.6	.5

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Pryor (Continued)	Refrigeration: off-peak	$ ....[ae]	5,000	1.7	15,000	1.0	
					80,000	.8	.7
Purcell	Residential	1.50	16	5.18	24	3.9	
					100	3.3	1.5
	Commercial	1.50	15	9.0	25	8.0	
					50	5.5	
					50	4.5	
					50	4.0	
					100	3.5	
					100	2.5	2.0
	Industrial	....[af]	...	...	...	...	1.5
Ryan	All	1.00	11	9.1	39	6.1	
					150	3.0	
					500	2.5	1.5
Sallisaw	Residential (summer)	1.00	11	9.1	20	8.0	
					30	5.0	
					100	3.0	2.0

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Sallisaw (Continued)	Residential (winter)	$ 1.00	11	9.1	20	9.0	
					30	5.0	
					100	3.33	2.5
	Commercial (summer)	1.00	75	8.0	75	5.0	
					1,850	3.0	1.0
	Commercial (winter)	1.00	75	9.0	75	5.0	
					1,850	3.33	1.33
	Power (summer)	....[r]	200	5.0	2,000	2.5	
					2,800	2.0	
					5,000	1.5	1.0
	Power (winter)	....[r]	200	5.0	2,000	2.5	
					4,800	3.0	
					5,000	2.0	1.5
Skiatook	Residential	1.00	11	9.1	39	5.3	
					100	3.0	2.5
	Commercial	1.00	11	9.1	89	5.3	
					200	4.1	3.0

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Skiatook (Continued)	Electric stove	2.50	30	8.3	100	4.0	2.0
	Power	....[ag]	200	5.4	800	3.5	
					4,000	2.5	2.25
South Coffeyville	Residential	2.00	30	7.0	30	6.0	
					40	5.0	4.0
	Electric range	2.00	50	6.0	25	5.0	
					25	4.0	3.0
	Power	30.00	750	4.0	750	2.5	2.0
Spiro	All	1.00	20	10.0	20	6.0	
					460	4.0	
					500	3.0	2.0
Stillwater	Residential	1.00	16	6.25	50	6.0	
					50	5.0	
					100	4.0	
					200	3.0	2.0

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Stillwater (Continued)	Commercial	$ 1.00	20	5.0	100	5.0	
					100	4.0	
					200	3.0	2.0
	Power	1.00	20	5.0	100	5.0	
					100	4.0	
					200	3.0	
					4,600	2.0	
					5,000	1.5	1.2
Stilwell	Residential	1.00	20	10.0	30	5.0	
					50	4.0	
					200	3.0	2.5
	Commercial	1.00	20	10.0	30	6.0	
					50	5.0	
					200	4.0	
					200	3.0	2.5
Stroud	Residential	1.00	12	8.3	28	7.0	
					100	3.5	
					500	2.1	2.0

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	@ ¢	Next Kwh	@ ¢	Excess @ ¢
Stroud (Continued)	Commercial	$ 1.00	12	8.3	88	7.0	
					400	4.5	
					500	4.0	
					2,000	3.0	2.75
Tahlequah	Residential	1.00	30	6.0	30	4.0	2.0
	Commercial	1.00	100	5.0	100	3.5	2.0
	Power	....[ah]	200	5.0	...	...	2.0
Tecumseh	Residential[ai]	1.00	12	8.3	13	7.5	
					25	7.0	
					50	5.0	3.0
	Commercial[ai]	1.00	10	10.0	45	7.5	
					45	6.5	
					100	4.5	
					300	4.0	
					500	3.5	
					500	3.0	...[aj]
	Industrial	3.00	50	6.0	100	5.0	
					350	4.0	
					9,500	2.75	2.0

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Tonkawa	General lighting (residential and commercial	$ 1.00	25	8.1	25	7.2	
					50	6.3	
					200	5.4	
					200	4.5	2.7
	Residential large use	2.50	25	8.1	25	5.4	
					50	4.5	2.7[ak]
	Commercial	....[am]	100	4.5	200	3.6	
					300	3.15	
					400	2.7	
					500	2.25	
					1,000	1.8	
					2,500	1.35	1.2375
Wagoner	Residential	1.00	12	8.3	38	6.0	
					50	4.0	
					50	3.0	
					150	2.0	1.25
	Commercial	1.00	100	6.0	200	5.0	
					1,200	3.0	
					4,500	2.0	1.0

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Walters	Residential	$ 1.00	9	11.1	11	11.0	
					20	7.0	
					20	6.0	
					20	5.0	
					50	4.0	
					170	3.0	2.5
	Commercial[an]	2.20	20	11.0	20	7.0	
					20	6.0	
					20	5.0	
					920	4.0	
					1,000	2.0	1.5[ao]
Watonga	Residential	1.00	12	8.3	25	8.0	
					25	6.0	
					50	3.5	
					200	3.0	2.0
	Commercial	1.00	12	8.3	50	8.0	
					25	6.0	
					25	5.0	
					900	3.0	
					1,000	2.5	2.0

APPENDIX C--Continued

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Watonga (Continued)	Industrial	$ ....[ap]	1,000	2.2	4,000	1.8	1.4
	Power	....[aq]	100	5.0	900	3.0	
					2,000	2.5	
					2,000	2.0	
					5,000	1.5	1.0
Waynoka	Residential	1.75	11	15.9	14	8.0	
					25	6.0	
					750	4.0	3.0
	Power	3.75	65	5.76	735	3.0	2.5
Weleetka	Residential	1.50	12	12.5	38	10.0	
					50	8.0	
					150	6.0	3.0
	Commercial[ar]	1.50	100	5.0	200	4.0	3.0
Wetumka	All	1.00	10	10.0	60	6.0	
					50	5.0	
					50	4.0	3.0

APPENDIX C--*Continued*

System	Type of service	Minimum bill	First Kwh	First @ ¢	Next Kwh	Next @ ¢	Excess @ ¢
Wynnewood	Residential and commercial	$ 1.00	12	8.3	13	8.0	
					25	7.0	
					450	5.0	3.0
	Electric range	1.00	12	8.3	33	6.0	
					105	3.0	2.0
	Power	1.00	14	7.14	86	4.4	
					400	3.5	
					500	3.0	2.5
Yale	Residential	1.00	50	8.0	50	5.0	
					100	3.0	2.0
	Commercial and power	1.00	100	8.0	250	5.0	
					1,650	3.0	2.0

[a] $1.00 for first horsepower (hp) of connected load; 50¢ for each additional hp or fraction thereof.

[b] $50.00 for 100 hp; 50¢ for each additional hp.

[c] 50¢ per hp for first 5 hp; 25¢ per hp for excess.

APPENDIX C--Continued

[d]$3.00 for 6 hp minimum.

[e]$1.50 for 2 hp or less; 50¢ per hp thereafter.

[f]$2.00 minimum; additional charge of $1.00 for each connected motor for the first hp or fraction thereof and 50¢ for each additional hp or fraction thereof.

[g]$1.00 for first hp plus 50¢ for each additional hp.

[h]$1.20 per kilowatt (kw) maximum demand per month at 85 per cent power factor.

[i]Demand charge in addition to energy charge: $2.00 per kw for first 50 kw demand, but not less than $10.00; $1.75 per kw for next 50 kw; $1.50 for all over 100 kw.

[j]The demand charge, but not less than the charge for the maximum demand established during the 11 preceding months.

[k]Same as residential, pluss $1.00 for first connected hp and 50¢ per connected hp for all additional.

[m]Demand charge: $22.50 for first 10 kw or less; $1.50 per kw demand for all additional. This is the minimum bill.

[n]Demand charge: $37.50 for first 25 kw or less; $1.50 per kw demand for all additional. This is the minimum bill.

[o]Demand charge: \$2.00 per month per kw of maximum demand, but not less than \$10.00; next 50 kw at \$1.75 per kw; all additional at \$1.50 per kw. For elevator, the minimum charge is 50¢ per hp per month.

[p]\$37.50 demand per month.

[q]An optional commercial rate is also offered if use of at least 200,000 kwh per year is guaranteed. The user may pay a flat rate of \$208.33 per month plus 1.25¢ per kwh for all energy purchased beyond 200,000 kwh per year.

[r]\$1.00 for first hp of connected load, plus 50¢ for each additional hp.

[s]\$3.00 for each motor of 5 hp individual capacity or less. For each motor over 5 hp individual capacity, \$3.00 for first 5 hp capacity, plus 25¢ for each hp of rated capacity in excess.

[t]Demand charge: \$1.00 per kw, but not less than \$10.00.

[u]A 10 per cent discount is allowed on all charges over the minimum charge.

[v]Minimum charge for rural consumers is \$3.00; for electric stoves, \$1.50; for hot water heaters, \$2.00; for electric motors, \$1.00 per hp for first hp and 50¢ per additional hp.

[w]Plus hp charge of power rates.

[x]Consumers must use a 12-month average of 30,000 kwh per month with a minimum of 20,000 kwh per month and maintain a power factor of 95.

APPENDIX C--Continued

[y]$1.00 per hp for first 5 hp.

[z]$1.00 for lighting and socket appliances, plus $1.50 for electric range, plus 50¢ per hp of other connected load, plus the highest excess capacity charge for the preceding 11 months.

[aa]$2.50 plus 50¢ per kw or fraction thereof of connected motor load.

[ab]$2.00 for first 6 kw or less of connected load, plus 25¢ for each additional kw or fraction thereof.

[ac]$1.00 for lighting and socket appliances, plus 50¢ per hp of other connected load.

[ad]The demand charge, but not less than that established during the preceding 11 months. Demand charge: $2.00 per kw for first 50 kw, but not less than $10.00; $1.75 per kw for next 50 kw; $1.50 for next 100 kw; $1.25 for all additional kw.

[ae]During on-peak months of March to October, inclusive, minimum bill will be the demand charge, but not less than the maximum demand charge established in an on-peak month during the 11 preceding months, nor less than $25.00. During off-peak months of November to February, inclusive, it will be not less than the maximum demand charge established in an off-peak month during the 11 preceding months nor less than $10.00.

[af]The demand charge, but not less than $100.00 per month.

[ag]50¢ per hp of the total connected load, but not less than $2.00.

[ah]\$2.00 for first two hp; 50¢ for each additional hp.

[ai]Less 5 per cent discount for prompt payment.

[aj]Any use over 1,500 kwh will be computed on industrial rate.

[ak]All over 150 kwh is 1.8¢ per kwh where an electric range and water heater are in use.

[am]\$1.00 for first hp of connected load, plus 25¢ for each additional hp.

[an]No discount shall be allowed for first 1,000 kwh; consumers using between 1,000 and 1,500 kwh shall be given a 5 per cent discount on the total amount; consumers using between 1,500 and 2,000 kwh shall be given a 6 per cent discount on the total amount; consumers using more than 2,000 kwh shall be given a 7 per cent discount on the total amount.

[ao]All use in excess of 2,000 kwh furnished during the months of June, July, August, and September of each year is billed at 1 1/3¢ per kwh.

[ap]The demand charge: \$25.00 for first 10 kw or less; \$2.00 per kw for the next 40 kw; and \$1.50 per kw for all additional demand.

[aq]\$1.00 plus 10¢ per hp of connected load.

[ar]After using 250 kwh per month, consumer is defined as commercial.