



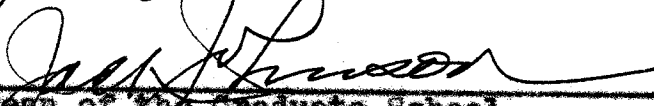
THE DEVELOPMENT OF THE RIVER RESOURCES
OF THE UNITED STATES IS A
PUBLIC FUNCTION

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THE DEVELOPMENT OF THE RIVER RESOURCES
OF THE UNITED STATES IS A
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CHAPTER I

INTRODUCTION

Nature of the Study

This investigation is an analysis of the social or economic effects of TVA electricity. It is the purpose of this endeavor to present a well-documented case supporting the thesis that the development of our water resources is a public function.

While this study will deal primarily with the power aspect of the TVA, it is necessary that the other phases of the multiple purpose project be given a brief analysis. The problem of power distribution will be given a historical approach, and it will be demonstrated that the numerous other state and federal attempts at regulation of the utility field have been inadequate.

Subsequently it will be shown that the TVA is a most effective means of regulating the distribution of electric energy. The commendable purpose of regulation is to provide a fair return on investment to the utility companies, and at the same time to provide abundant electricity to the public at a reasonable rate.

The various complicated problems which confront the TVA administration officials will be given detailed consideration. Special attention will be given to the problem of

allocating costs to the various phases of the multiple purpose project and to rate making. First the general nature of the allocation problem will be discussed, and the merits and faults of the method of allocation used by TVA will be analyzed.

It seems that the justification or condemnation of the entire TVA program hinges on the problem of rate making. The theory on which TVA rates are based is that the demand is elastic; fixed charges are relatively high; hence up to a certain point, profits can be maximized by reducing rates. The reduction in rates increases the net revenue because of increased consumption. Working on this theory, TVA reduced rates far below the previous rate schedules for electricity in the Tennessee Valley area. The multitudinous consumer benefits of these lower rates will be shown. At the same time it will be shown that the Federal Government received a very profitable rate of return on its investment.

Justification for the Study

At the present time plans are being drawn for multiple purpose development of virtually every major river network in our nation. The desirability of these new endeavors depends to a large extent on whether or not the TVA has been a success from an economic and social viewpoint. Hence by exhibiting the unquestionable benefits of the TVA, support will be given to the movement toward more universal scientific development of our river resources.

Furthermore, much confusion and misunderstanding of the facts about the TVA have been given to the public by newspaper editorials and other periodicals. It is hoped that this study will correct and clarify the issues involved.

Sources

The material and information for this study have been gathered from a variety of sources. Most of the material came from books; however, a considerable portion of it was taken from the annual reports and other publications of the Tennessee Valley Authority, articles and arguments in the Congressional Record, Public Documents, Moody's and Poor's Utility Manuals, and numerous periodicals. In addition to these sources, the author made a hurried trip through the Tennessee Valley region. On this trip he interviewed Mr. Sturdevant, Director of Information, and Mr. Dean, Assistant to the Director of the Power Development Program. The specific benefits of these interviews were to give a clearer understanding of the general problems and an appreciation of the endeavors of the TVA.

CHAPTER II

TENNESSEE VALLEY AUTHORITY, A MULTIPLE PURPOSE PROJECT

In 1933 our democratic society was beset with depression. Twelve to sixteen million¹ unemployed meant that the flow of income in our society was so decelerated that the purchasing power in our society was insufficient to permit consumption of the products of industry; prospective yield was so small, or in complete absence, that little or no new investments were forthcoming and menacing doubts as to the merits of our capitalistic economy were growing at an accelerated pace.

Indeed, numerous sources seemed to believe that some type of revolutionary changes were imperative. J. M. Keynes, in speaking of unemployment, said:

It is certain that the world will not much longer tolerate the unemployment which, apart from brief intervals of excitement, is associated--and, in my opinion, inevitably,² associated--with present day capitalistic individualism.

¹The number unemployed in the U. S. during the depression is apparently an indefinite quantity because numerous so-called reliable sources have given varied estimates. This difference is partially justifiable on the grounds that the number of unemployed was constantly changing and the fact that estimates were made during different years from 1930 to 1934. In a study made for the National Bureau of Economic Research by F. C. Mills and Simon Kuznets the following statement is found: "The number of unemployed was reliably estimated as 14,400,000 in 1932." Because of these varying estimates the author chose to say twelve to sixteen million rather than give specific figures.

²J. M. Keynes, The General Theory of Employment Interest and Money, p. 381.

Keynes does not speak dogmatically of the imminence of revolution, but there is reason to believe that this is what he meant by "the world will not tolerate."

C. E. Ayres is even more forceful on this point when he states that

Absolute capitalism is doomed. It is doomed because its sole justification is a myth, and because the consequences of the myth are known to be calamitous. People will tolerate a myth that does nobody any harm. They will not long tolerate a myth which has been discovered to be the prime cause of general and severe distress.³

Thus we observe that in the years from 1930 to 1933 our capitalistic economy had reached an impasse, our choice was between abolition of certain of the myths of capitalism for a more rational planning of our economy to modify the flow of income, or permitting capitalism to die a violent death by revolution. Under the leadership of Franklin D. Roosevelt, we chose social reform. While it is doubtful if the multifarious public "spending projects" actually got at the heart of the problem of redirecting the flow of income, it is apparent that such government spending did place enough purchasing power in the hands of our unemployed to stay the hand of revolution long enough for us to work out a more plausible solution.

³C. E. Ayres, The Divine Right of Capital, p. 55.

However, a review of the past five years leaves some doubt as to whether or not we are using this time to work out a "more plausible solution." Indeed, it seems likely that the myths of capitalism were so invigorated by the artificial and temporary stimulus of war production that the unpleasant lessons of the past have been forgotten and again we are enroute to destruction. Most of the New Deal's endeavors have been abandoned, however there is one project which is conspicuously beneficial, and instead of being abandoned it continues to expand. Reference is being made to the TVA. To say the TVA was, in itself, an economic necessity in 1933 would be an overstatement; however we can say, without doubt, that it was one of the most commendable phases of an overall recovery program which was imperative.

At the outset the TVA served a dual purpose. It provided a large outlay of public funds; thus giving stimulus to our sick economy, and perhaps more important, it provided the people of the Tennessee Valley area with the physical benefits of a scientific river development. The physical benefits will be given detailed consideration below.

Flood Control

Now, let us consider the general nature of our water resources. Water, like fire, is a source of vast utility for mankind if prudently applied. However, if left to the whims

of nature it can be an agent of devastation. To illustrate; a few million tons of water, if "left to the whims of nature" can be the flood waters which destroy, or, if properly harnessed by a river development project, this same element can be the water which generates electricity, thus bringing light into the very homes which, otherwise, it might have destroyed.

In reviewing our history, it seems that we have cause for chagrin. The simple truth is that we have, and are still, permitting a large portion of this most valuable resource to be destructive. The following facts concerning the disastrous flood of 1937 will give an indication of just how destructive raging waters can be.

From West Virginia to Louisiana one hundred and ninety-six counties in twelve states were affected. (An additional one hundred and forty-four counties were included in the sheltering of refugees.) Of the 50,597,120 total acres in the affected counties, sixteen percent were flooded, and of the 30,032,688 agricultural acres, 15.8 percent were inundated. In regard to the property and livestock losses, the report read as follows:

'It is virtually impossible to estimate in dollars the total losses of the affected regions, and of the entire nation. Trains stopped moving. Highways were closed. Immense quantities of commercial goods were stranded in transit. Utilities, factories, stores and offices were forced to shut down. Banks could not function. All of the normal processes of economic life were disrupted. Homes, barns, and other structures destroyed totalled 12,860 and 60,792 more were damaged. Losses of household goods were reported by 102,738 urban families. Livestock losses included 1,968 work animals, 3,354 cattle, 31,516 hogs, and 243,282 chickens--and in addition, 11,425 animals of other kinds. Wild life also suffered extensively.

Conservative guesses place the flood cost to the area affected at not less than \$300,000,000.⁴

⁴"The Ohio and Mississippi Valley Flood Disaster of 1937," Report of Relief Operations of the American Red Cross, p. 30.

This is not to imply that no flood would have occurred on this date if the Ohio and Mississippi Rivers had been developed to the same degree to which the Tennessee River is now developed. But there is no doubt that such flood control development could have materially reduced the flood level.

This point is given factual support by a statement recently made by Mr. Dean, Associate Director of Power Development Division of TVA. Mr. Dean stated: "In the recent flood along the river (March 1948) it was estimated by our department that the TVA Flood Control Projects reduced the flood level at Chattanooga ten feet."⁵ Obviously, ten feet of flood water could have meant tremendous additional damage. It is not to be assumed that the Tennessee River is developed to the highest possible degree, for it is not. It is quite possible that when our democracy has advanced far enough to permit complete development of our rivers, the damage and loss due to floods can be completely eliminated.

Figures on the total saving due to flood control sponsored by TVA are unavailable. However, when we consider that the net cost of TVA to the Federal Government as of June 30, 1947, totals \$791,325,000⁶ and that the savings in just four years to the city of Chattanooga is \$23,000,000⁷ it is logical to assume that the entire cost of TVA has paid for itself

⁵Personal Interview, April 5, 1948.

⁶"TVA, A World Model After Fifteen Years," Congressional Record, Appendix A, p. 1167, March 15, 1948.

⁷Ibid., p. 1667.

a great many times in the savings from flood damages alone.

Thus far, consideration has been given only to the benefits derived directly from the flood control, and the facts presented indicate that if the entire development was for the sole purpose of flood control that it would have been a sound investment, however, the most convincing argument for public river control projects is that they lend themselves to multiple purpose development. These other purposes will be discussed below.

Navigation

Prior to 1933 the Tennessee, Clinch and Hiwassee Rivers were what might be termed "wild rivers." Their flow was inconsistent and unpredictable, therefore, no organized system of transportation had been developed. However, the unified development of the Tennessee River system under the direction of the TVA provides for large scale navigation of the Tennessee River. The total value of such navigation is difficult to compute because of the numerous intangible benefits such as providing water facilities for pleasure cruises,⁸ fishing waters, etc. However, some of its more tangible merits will be analyzed herein. Only a small amount of dredging and raising of Hales Bar Dam, together with some incidental work, are

⁸"Tennessee River Cruise," Look Magazine, X, April 27, 1948, pp. 47-50.

required to complete the nine-foot navigation channel from the mouth of the Tennessee River to Knoxville--a distance of approximately six hundred and fifty miles.⁹ Through the seven multiple river control structures which make possible this channel, a superior transportation artery is provided which connects the Southeast with industrial centers such as Pittsburg on the Ohio River and Chicago on the Great Lakes, with Minneapolis, St. Paul, and St. Louis on the Mississippi, with the grain fields of the Midwest, and with New Orleans and other port cities along the Gulf Coast,

The prime significance of this channel is that it contributes materially, by providing cheaper transportation, to the agricultural and industrial development of the Southeast. For example, the system provides cheap transportation for large-scale movements of grain from the Midwest to the Tennessee River Ports. Such importations of grain have a stimulating effect upon the whole economy of the region. It fosters expansion of dairying and stock raising, and the attendant improvement of soil fertilizer and erosion control; it provides employment opportunities in milling and transportation of grains from the river-front elevators; it provides opportunities for investment in bulk storage and handling facilities for grain, and numerous other allied benefits. *stop*

⁹C. H. Pritchett, The TVA, pp. 98-100.

This opportunity for investments is of considerable importance as will be observed by the following statement: "Approximately \$2,000,000 of private capital has already been invested in river terminals and component bulk storage and handling facilities for grain, petroleum, and coal traffic."¹⁰

There seems to be some inconsistency in the estimation or computation of the total amount of ton-miles of goods moving up and down the channel. For example, one source says: "Traffic now moving on the waterway amounts to about 250 million ton-miles annually, approximately seven times what it was in 1933."¹¹ Other sources stated that "last year more than 340,000,000 ton-miles of freight was handled on this channel."¹² Since these two figures were given approximately for the same period, the difference is probably in the terms used. In the first instance, the phrase "traffic is now moving" is used, while in the second quotation the phrase is "were handled." Whether the total tonnage was 250 million ton-miles or 340 million ton-miles is not important. The important fact is that a vast volume of freight is being moved, and this volume is continuously increasing.

¹⁰The Tennessee Valley Authority, TVA Resources, Their Development and Use, A report prepared by the Department of Research and Publication, Dec., 1, 1947, p. 18.

¹¹Ibid., p. 18.

¹²"TVA, A World Model After Fifteen Years," Congressional Record, Appendix A, p. A1667.

In addition to providing the water way, TVA has fostered more extensive use of water transportation facilities by (1) preparing navigation charts, (2) cooperating with other governmental agencies in the installation of channel markers, (3) publication of traffic estimates and comparative studies of railway and water freight rates, (4) providing for public use terminals on the Tennessee River, (5) and numerous other services which stimulate water transportation.

Thus we observe that the TVA has not only provided waterways for cheaper transportation, but has also made universal use of these waterways more feasible. However, the development of water transportation is still in its infancy, and even through last year approximately 250 million ton-miles of freight moved up and down the river channel, this is only a small portion of what is anticipated for the future. "From the experience on other improved rivers, it was estimated conservatively by TVA that after 15 years, traffic on the Tennessee should reach 700,000,000 tons annually, with corresponding savings of \$9,000,000 annually.¹³

Start Recreation

As business, federal agencies, colleges and universities, and all phases of our economic life realize more and more the

¹³Tennessee Valley Authority, TVA 1948, A report prepared by the Department of Research and Publications, p. 14.

necessity of adequate recreation, the importance of TVA's facilities for outdoor sports is becoming a matter of increasing concern. Prior to the TVA there were few provisions in the Tennessee Valley area for outdoor public recreation. But today TVA's "million square miles of lakes"¹⁴ and 10,000 miles of shore line provide extensive opportunities for fishing, swimming, boating and yachting, picnicking and sightseeing.¹⁵

In 1947 the State of Alabama completed negotiations for the "establishment of Little Mountain State Park, making a total of six state parks on lakeshore lands. There were already nineteen county and municipal parks and twenty group camps. TVA was operating five demonstration parks."¹⁶

TVA not only provides the physical requirements, lakes and parks for outdoor activity, it actively encourages more extensive use of these facilities.

The Authority, in public ownership, retains a sufficient amount of the shorelands it acquired in connection with reservoir development to provide sites adequate in number, acreage, and types to meet most of the anticipated needs for recreation areas on TVA lakes. These lands are leased to states, cities, and groups such as 4-H Clubs, Scouts, fraternities, etc., for

¹⁴William Mosafsky, "Human Beings and the TVA," Social Education, XII (November, 1947), 310.

¹⁵Tennessee Valley Authority, TVA 1948, A report prepared by the Department of Research and Publications, p. 14.

¹⁶Ibid., p. 21

campsites. In addition to providing sites for recreational developments, TVA provides and maintains craft channels and harbors on all reservoirs and makes suitable provisions for visitors at all dams, powerhouses and other points of interest.

See There appears to be only one important conflict between recreation and the other objectives of stream control. This conflict lies in the fact that for recreation it is most desirable to have permanent beaches and shorelines, while it is necessary, in order to produce electricity, to materially reduce the quantity of water in the lakes from time to time. However, in several instances, this problem has been solved by the construction of cut-off dams across the mouth of inlets or other indentations to the shore line of the main pools. The resulting small pond can then be held constant. The total benefits of such recreational development cannot be accurately computed. To attempt computation would be like trying to estimate the value of an afternoon of fishing and relaxation to a tired businessman. Research in business has conclusively proven that such an afternoon of relaxation will materially increase the overall efficiency of a worker. Increase in efficiency is important. However, the most important value lies in the genuine pleasure enjoyed by the sportsmen.

These provisions for recreation not only provide enjoyment for the sportsmen, and efficiency in his business responsibilities, but they make a substantial contribution to the

general economic status of the region. This stimulant to business is manifest in two ways: (1) the boom to the sporting goods industry and (2) the tremendous amount of money brought into the region by tourists. For example:

A survey conducted in 1941 jointly with the Tennessee Department of Conservation and the WPA disclosed that in the year nearly eight million out-of-state visitors to Tennessee spent an estimated one hundred and four million dollars.¹⁷

It might be pointed out that this sizable figure of one hundred and four million was for the year of 1941. For the following reasons, it is believed that tourists in more recent years have spent far in excess of one hundred and four million: (1) since 1941 there have been many new recreational facilities constructed, (2) the people of the entire nation are just now beginning to look to Tennessee as a scenic vacation land, and (3) the overall increase in our national income makes more vacations financially feasible.

At the outset, this recreational aspect of TVA was considered insignificant; however, "it is very possible that in years to come this objective, of which Congress scarcely dreamed when it enacted the original TVA legislation, may well prove itself one of the most important contributions of TVA."¹⁸

¹⁷ Tennessee Valley Authority, Tennessee Valley Resources: Their Development and Use, Report prepared by the Department of Research and Publications., p. 47.

¹⁸ Rasmeir, op. cit., p. 123.

Start
More Prudent Use of the Soil

TVA's role in fostering more efficient use of the soil of the Tennessee Valley area is of major significance. The Authority was introduced into this field somewhat timidly, through the production of nitrogen fertilizer. However, it became so enthusiastic in its endeavors to aid farmers that today virtually every phase of farming in the region is directly affected by TVA. By way of classification, the activities of TVA logically fall into two categories, (1) the maintenance and restoration of the soil and (2) acquiring maximum farm production without "burning out" or depleting the mineral content of the soil.

Since these two categories are so closely related, they will be discussed as one. Prior to the development of TVA, many of the hillsides in the area were "gutted" due to erosion. Such erosion can be attributed to two causes: (1) improper control of the water flow in the region and (2) improper use of the soil. As a precaution against these two causes of erosion, the TVA, in cooperation with other administrative agencies, has encouraged terracing and covering the hillsides with forests or grasses which have tangled roots so that the soil can be held together instead of being carried down the rivers as silt. In addition, a unified system of dam control has minimized the eroding effects of floods.

Other means of maintaining the productivity of the soil are by replacing the nitrogen in the soil by the use of

fertilizer and by proving to the farmers, as TVA has done, that the fertility and structure of their soil can be sustained by planting certain leguminous cover crops, such as alfalfa and lespedeza. *stop*

Congress directed the Authority to devote a part of its attention to the improvement of plant foods and to reducing the cost of fertilizer to the farmers. At first it was intended that nitrogen plants used in war-time production of munitions would be used to produce nitrogen fertilizer. However, after considerable research it was conclusively proven that phosphate rather than nitrogen was the key to soil sustenance. In view of this research, TVA directed its attention to the development of plant facilities to manufacture phosphate fertilizer. A requisite for the production of phosphate fertilizer is the acquisition of phosphate rock. Hence the TVA has purchased the fee title or the mineral rights on some two thousand and nine hundred acres of phosphate lands containing an estimated 16,000,000 tons of matrix.¹⁹

Thus we see that TVA first proved the desirability of phosphate fertilizer and then acquired the facilities for mass production of this soil sustaining compound, but it was still faced with the problem of distribution of the product. The statute provides that fertilizer could be sold or given away for demonstration and soil erosion control purposes. In the interest of providing maximum benefit to the people of the region, the Authority worked out cooperative agreements with

¹⁹TVA Annual Report 1941, pp. 4-84.

the land-grant colleges whereby their agricultural extension services would supervise a program of test demonstration farms throughout the Valley States. On the farms selected for this purpose TVA provided sufficient fertilizer to stimulate the growth of such soil-conserving crops as alfalfa and other leguminous plants. The farmers in return agreed to the following (1) Permit mapping and inventory of their farms by TVA, home demonstration agent, or representatives of the cooperative land-grant colleges, (2) Adopt a five-year farm-management program and keep records on the results, and (3) pay the freight on the fertilizer they used. Since all farmers in an area were invited and encouraged to witness the results of this test-demonstration farm, the process became in effect a farmer education scheme.

In addition to these demonstrations on individual farms, in some cases whole areas were designated for demonstration purposes. Both of these methods of demonstration grew rapidly until in 1941 over 28,000 tons of phosphate were furnished by the TVA for the demonstration work.²⁰

The latest report on the expansion of farm demonstration activities shows the following:

On June 30, 1947, there were 4,075 active unit test-demonstration farms in the one hundred and twenty-five Valley counties. They contained 716,495 acres. There were also 624 active test demonstration areas, with 27,957 farms containing 2,666,528 acres participating

²⁰TVA Annual Report 1941, pp. 4-84.

in the activities. In counties of the Tennessee Valley States, outside the watershed of the Tennessee, there were 4,117 unit farms with a total of 978,814 acres.²¹

Thus it is apparent that through the educational influence of the test-farm and whole area demonstration the more productive farming methods became common knowledge, and then, common practice to virtually all farmers in the entire region. The more productive farming techniques included terracing, planting of grasses with entangling roots, reforestration, rotation of crops, prudent use of fertilizer, proper use of new farm machinery, the use of electricity to increase farm incomes and numerous other valuable knowledge. As can be observed, most of these techniques directly or indirectly prevent erosion of the soil. The progress toward guarding our soil against erosion was very aptly described as follows: "American agriculture is still sliding down hill, but it is beginning to put on the brakes."²²

In concluding this treatise on the development of the land resources, it seems pertinent to take a look at the results of these activities. The following figures taken from TVA Annual Report for 1937 gives a statistical picture of the increase in productivity of the region's soil.

²¹Tennessee Valley Authority, TVA 1948, Report prepared by the Department of Research and Publications, p. 38.

²²Tennessee Valley Authority, To Keep the Water in the Rivers and the Soil On the Land, Report prepared by the Department of Research and Publications, p. 38.

In Alabama, for example, a study of 31-test demonstration farms showed that bushels of corn to the acre had increased from 27 to 33, and hay yields had increased from 1.7 to three tons between 1942 and 1945, although cotton production had remained constant--458 pounds per acre. More than half the farms had alfalfa, as compared with fifteen per cent in 1942.

In Georgia the 68 unit test-demonstration farms previously referred to show a 100 per cent increase in corn production, from 20 to 40 bushels per acre. Cotton yield went from 268 to 491 pounds per acre; wheat doubled from 11 to 22 bushels per acre, and oats went from 12 to 43 bushels per acre, an increase of 175 per cent. Hay yield increased by more than 45 per cent.

In North Carolina, 15 representative test-demonstration farms increased their corn yield from 27 to 55 bushels per acre, tobacco from 1,400 to 1,900 pounds per acre, and oats from 27 to 34 bushels per acre. A study of 468 farms in the Valley Area of North Carolina showed yields of 46 bushels of corn, 1762 pounds of tobacco, and 1.2 tons of hay per acre--all well above the state average for all farms.²³

Thus we have conclusive evidence showing an appreciable increase in the productivity of the soil, which means increase in farm incomes and increase in the value of the land. This increase in farm income is significantly presented as follows:

" . . . during the period from 1933 to 1939, the last year before the effects of the war were felt, . . . cash farm income . . . increased forty-nine per cent during that period as compared with thirty-two per cent for the national average.²⁴

Other Functions of the Tennessee Valley Authority

The major objectives of TVA, with the exception of power

²³TVA Annual Report, 1947, p. 40.

²⁴Tennessee Valley Authority, TVA Resources, Their Development and Use, A report prepared by the Department of Research and Publications. December 1, 1947. p. 139.

distribution, have been briefly analyzed herein; however, TVA's activities are constantly spreading. The following are a few of TVA's incidental endeavors which are worthy of mention: (1) development of the region's fish and game resources, (2) restoration of the forest resources, (3) development of the region's mineral resources, (4) providing industry with factual information, and numerous other services which contribute to the general prosperity of the region.

The salient role of TVA power has been significantly omitted in this general discussion, because its social and economic effects will be analyzed in detail in the following chapters.

This chapter has dealt with the problem of giving a very general picture of the overall purposes and activities of the Tennessee Valley Authority. It was pointed out that the TVA at the time of its origin served dual benefits. It was perhaps the most commendable part of a recovery program which was imperative; it provided a stimulant to the consumer purchasing power and gave the people of the Tennessee Valley region the multifarious benefits of flood control, navigation, cheaper electricity, and recreation facilities. Each of these benefits were briefly evaluated. Hence we are brought to the prime problem in the thesis, to show the social and economic benefits of TVA electricity.

CHAPTER III

HISTORY OF CONGRESSIONAL ACTION ON THE TENNESSEE RIVER VALLEY AUTHORITY

Background of Legislation Dealing With Flood Control

It seems lamentable that the Tennessee Valley Authority Act of 1933 did not have the name of Senator Norris incorporated into its title, because probably never before in Congressional history has one man worked so courageously for the enactment of a law. Finally, after seven unsuccessful proposals, on May 18, 1933, Congress passed a bill authorizing the Tennessee Valley Authority. This bill, as sponsored by Senator Norris, consisted of the following eight proposals:

(1) That the objectives of the proposed law should be flood control, national defense, promotion of agricultural and industrial development, improvement of navigation, development of hydroelectric power, reforestation and the proper use of marginal lands.

(2) That the Act should be administered by a Tennessee Valley Authority to consist of three members appointed by the President with the advice and consent of the Senate.

(3) That the Authority should carry on experiments in the production of fixed nitrogen and other fertilizer ingredients.

(4) That the Cover Creek Dam on the Clinch River in Tennessee should be completed and interconnected with Dam Number 2.

(5) That the Authority should have power to construct additional dams, reservoirs and power works in the Tennessee Valley.

(6) That the Authority should have power to produce and sell surplus electrical energy, that in sales of energy preference should be given to publicly owned organizations and that to facilitate energy sales the Authority might construct power transmission lines.

(7) That the Authority should pay to Tennessee and Alabama five per cent of its gross revenues derived from sales of power generated in each state.

(8) That the President might conduct surveys and demonstrations, and formulate plans for the general improvement of the resources of the Tennessee Valley Region.¹

This proposal was a direct follow-up of a message from President Roosevelt requesting such legislation. At one place in the President's speech he says:

I, therefore, suggest to the Congress legislation to create a Tennessee Valley Authority It should be charged with the broadest duties of planning for the proper use, conservation, and development of the natural resources of the Tennessee River drainage basin. Many hard lessons have taught us the human waste that results from lack of planning. It is time to extend planning to a wider field, in this instance comprehending in one great project many states directly concerned with the basin of one of our greatest rivers.

If we are successful here we can march on, step by step, in a like development of other great territorial units within our borders.²

Hence, through the persistence of Senator Norris and the sanction of President Roosevelt, the Tennessee Valley Authority development program got underway.

The above proposals of Senator Norris were, with one slight modification, incorporated into the law. This modification was in the third proposal. The Norris proposal provided for "experimentation in fertilizer," while the final act provides for "increasing the production" of fertilizer.

¹S. 1272 and Senate Report 23, 73rd. Cong., 1st. Sess., 1503.

²House Document 15, 73rd. Cong., 1st. Sess., 206.

As will be seen later in this report, this was a significant change.

The effects of this bill were far-reaching. In order to understand them and their implication for both the Government and the people, it is necessary to make a background study of how such legislation was initiated, and the steps it followed in the long struggle before it became law.

There was no precedent for the bill. Flood control, national defense, promotion of agriculture and industrial development, improvement of navigation, development of hydroelectric power, reforestation and proper use of marginal lands were new to the field of legislative action. In the early days of the United States the only legislation passed by Congress pertaining to streams concerned navigation. As a consequence of the Mississippi Valley flood in 1874, a law was passed by Congress in 1879 establishing a seven-man "Mississippi River Commission" to prepare:

. . . A plan or plans and estimate as will correct, permanently locate, and deepen the channel and protect the banks of the Mississippi River, improve and give safety and ease to the navigation thereof, prevent destructive floods and promote and facilitate commerce, trade, and the postal service.³

Thus, for the first time, Congress invaded the field of flood control. Levees were the only things constructed under the new legislation, and much argument developed in Congress

³Act of June 28, 1879, Ch. 43, 21 Stat., 38,33 U.S.C.A., 647.

over the appropriate Federal role in the development of stream resources. One school of thought held that the United States should undertake a comprehensive program for improvements of streams subject to Federal jurisdiction; another school of thought maintained that private enterprise, subject to appropriate regulation, should take the lead in this improvement. The beginning of hydro-electric distribution in 1882 complicated the problem.⁴ This energy was created from river falls, and it soon became apparent that artificial barriers in streams would serve the same purpose. These artificial barriers or dams, however, under existing laws, would have to be built by private enterprise. In the meantime, the Federal Government was engaged in the task of improving the streams for navigation. To forestall any conflict here, the government took jurisdiction over the construction and maintenance of all obstructions upon navigable streams in 1890.⁵ Power rights then had to be obtained from the government, and Congress had to affirm the approval. Rights, when granted, were in fee simple and perpetuity, and no provision was made for the assessment of charges against the grantee. This provision aroused opposition; a group, who came to be known as the "conservationists" protested that the

⁴J.S. Ransmeier, op. cit., p. 11.

⁵River and Harbor Act of January 27, 1890, Ch. 907, 26 Stat.

government had poorly administered its trusteeship of public assets, and that the grants were conducive to the development of a monopoly in the water power industry.

In 1908 the Inland Waterways Commission recommended that:

Hereafter plans for the improvement of navigation in inland waterways or for any use of these waterways in connection with interstate commerce, shall take account of the purification of the waters, the development of power, the control of floods, the reclamation of lands by irrigation and drainage, and all other uses of the waters or benefits to be derived from their control.⁷

Thus it is apparent that the federal government was widening its control over the use of streams. In 1908 the National Conservation Commission appointed by President Theodore Roosevelt to study conservation problems concluded that "All uses of the waters and all portions of each waterway should be treated as interrelated."⁸

Congress, however, was slow to grant additional powers. A majority steadfastly rejected the idea of direct federal prosecution of a multiple-purpose program for the development of stream resources. Instead, they favored private enterprise as the motivating and administrative agent. Two "General Dam" Acts were passed in 1906 and 1910, but they did little to clarify the situation. The matter continued to be debated in Congress but nothing was done until the Federal Water Power Act was passed in 1920.⁹

⁷Ibid., p. 13.

⁸Senate Document 676, Report of the National Conservation Commission, 60th. Cong., 2nd. Sess., p. 27.

⁹Act of June 10, 1920, Ch. 285, 41.Stat.1063, 16 U.S.C.A. 823.

This Act authorized stream surveys and comprehensive river investigations and gave the government power to assess charges for granting power rights.¹⁰ The Weymouth Report for the Colorado River basin development in the 1920's recommended a project at the lower Black Canyon site to raise the water surface 605 feet and store 34,000,000 acre feet of water.¹¹ Benefits cited were: flood control, electric power output, silt control, water supply, and recreation. Multiple service benefits were apparently being considered more as time went on. The Boulder Canyon Project when authorized in 1928 did not differ materially in its provisions from the Weymouth recommendations.

By the middle of the 1920's the Bureau of Reclamation began to do its planning on a multiple-purpose scale. It began to formulate recommendations for comprehensive projects in several other great river valleys. One of the most ambitious of these was the plan for the Tennessee Valley Project.

The Muscle Shoals Development Program

The Tennessee River, the fourth largest stream in the United States, drains four states, is more than 600 miles long, and is broken, especially in Alabama, by shoals and rapids. As early as 1881 steamboat traffic began on the river but a

¹⁰Ibid., p. 824.

¹¹Ransmeir, op. cit., p. 21.

natural barrier at Muscle Shoals in Alabama prevented through navigation. Federal funds were provided for a canal around the shoals in 1828 but the finished project was never satisfactory. In 1890 a second canal was completed but it also proved unsatisfactory.¹² Growing interest in the infant power industry soon directed attention to this phase of development at Muscle Shoals where the waters were so swift, thus making it adaptable to electric power development.

There were two different angles to the struggle for power rights that developed at Muscle Shoals. One plan envisaged small channel works which would block main river navigation and not interfere with the canal; the other proposed high dams across the entire gorge which would flood out the canal. Locks would be built to insure the safety of navigation. From 1899 to 1906 a number of bills to authorize works according to the first plan were introduced and passed, but no construction was undertaken. In 1907 the Muscle Shoals Hydro-Electric Power Company took over the old Muscle Shoals Company, and announced that it was interested in building high dams.¹³

The plan proposed by the company called for three high dams with locks to facilitate navigation. The United States was requested to pay for the locks and fifty per cent of the

¹²Ibid., p. 35.

¹³Ibid., p. 43.

cost of the dams and spillways. When a bill was introduced into Congress authorizing such a plan, the matter was referred to the Committee on Rivers and Harbors. This Committee, feeling the need of expert advice, forwarded the plan to the Board of Engineers and Harbors. "Thus came the first contact of the United States Engineers with private proposals for power development at Muscle Shoals."¹⁴

The Board of Engineers disapproved the bill as drawn, because adequate provision was not made for navigation, and no cost estimates were made. This cost, it held, might be more than that required for completing the canal system entirely around the Muscle Shoals Rapids. The company persisted in its efforts to get favorable legislation through Congress. Therefore, the matter was again referred to the Board of Engineers and Harbors, and it was asked to estimate the cost of the undertaking. The Board, instead of giving the desired estimates, presented a revised power company plan. In the report the Board pointed out that the National Defense Act of 1916 included a provision under which the President was authorized to set aside hydro-electric power sites on navigable streams for federal development and use in the production of nitrates for munitions. It suggested that final action upon the proposed contract with the power company be delayed until

¹⁴Act of June 3, 1916, Ch. 134, 39 Stat. 215, 50 U.S.C.A. 79.

the United States determined whether it would use the Muscle Shoals site for this purpose. In 1917 President Wilson ordered the creation of a public hydro-electric center there. The following provision concerning the power of the Federal Government was included in the National Defense Act of 1916:

The President of the United States is hereby authorized and empowered to make, or cause to be made, such investigation as in his judgment is necessary to determine the best, cheapest, and most available means for the production of nitrates and other products for munitions of war and useful in the manufacture of fertilizers and other products by water power or any other power as in his judgment is the best and cheapest to use; and is also authorized . . . to designate . . . sites upon any navigable or non-navigable river or rivers . . . and is further authorized to construct, maintain, and operate dams, locks, improvements to navigation, power houses, and other plants and equipment, for the generation of electrical or other power and for the production of nitrates . . .

The plant or plants provided for under this Act shall be constructed and operated solely by the Government and not in conjunction with any other industry or enterprise carried on by private capital.¹⁵

Under the authority of Section 124 (quoted above) President Wilson established a federal reservation at Muscle Shoals and ordered construction of an experimental harbor process plant. Later, a large cyanamid process nitrate plant, steam power stations, a railroad and quarry, workers' village, transmission line to a temporary power source at the Alabama Power Company's Warrior River Plant, and a large hydro-electric project for a long term power source were started. The war ended before much of the project was completed and the work stopped. Congress refused new appropriations to continue the project.

¹⁵Ibid., p. 46.

Dam Number Two on the Tennessee River

The Wilson Dam, however, was completed in 1925. In the discussions that arose over the final disposition of the project, two viewpoints developed in Congress. The first advocated federal lease of Muscle Shoals to private industrial interests; the second favored direct federal operation of its power and nitrate plants. The second viewpoint was manifest by the introduction into Congress of the Glasgow Bill of 1919 which proposed operation of the properties by a government-owned corporation. However, this bill met sudden death due to the powerful opposition of the power and chemical companies. An effort was made by the Harding administration to encourage privately owned power utilities to bid for the prospective power to be made available at Wilson Dam. When this attempt also failed, Congress abandoned appropriation for Muscle Shoals.

The project lay idle for the next two years. Then on July 8, 1921, Henry Ford submitted the first private bid for the Muscle Shoals properties.¹⁶ The Alabama Power Company hitherto had disclaimed any interest in the project, but spurred by the possibility of losing the development to a competitor, it submitted a counter offer.

The Ford bid consisted of two parts: first, an offer to purchase the nitrate plants and all materials and properties

¹⁶Ibid., p. 53.

constructed or owned and stored by the United States at the Muscle Shoals Reservation together with its interest in the Warrior River steam plant of the Alabama Power Company and the transmission line thereto; and second, an offer to lease for one hundred years Dam Number Two (then under construction) and Dam Number Three (which Ford proposed that the United States construct upstream from the Wilson project). Ford also planned to use the Nitrate Plant Number Two for the commercial production of nitrate fertilizers.¹⁷

Opposition to Ford's proposals soon developed. Charges were made that the offer violated the Federal Water Power Act, that the payments were not commensurate with the value, that a huge monopoly would be created, and that there were no provisions compelling Ford to carry out his promise of making nitrate fertilizer. Supporters of the bill claimed that it would reduce the cost of fertilizer fifty per cent, that river navigation would be improved at no cost to the Federal Government, and that the economical development, which would accompany the development, would bring an upsurge of activity to the whole section. The chemical and power companies united with the advocates of public operation and the bill authorizing the sale of the property to Ford failed to pass. Ford withdrew his offer in 1924.

¹⁷ Ibid., p. 47.

Later, the bill which had received an adverse committee vote in the Senate was amended by Senator Underwood to permit private power companies to lease the Muscle Shoals properties to private companies for producing low-cost fertilizer. President Coolidge favored this bill. Since Ford had withdrawn his bid, it was evident that the bill, as drawn, favored the power companies. It was finally passed, sent to the House for conference but was forced out of order by Senator Norris on the grounds that substantial changes had been made in the Senate. The legislation failed to pass.¹⁸

When it was apparent that the bill would fail, supporters of the power companies passed a resolution empowering the President to appoint a commission "to determine the most favorable conditions under which this property may be leased . . . to secure nitrates." ¹⁹ The President appointed a five-man commission, all of whom were known to be opposed to public ownership of the project. The Commission, as expected, recommended that a lease be negotiated with private enterprise.

Acting on this report, Congress set up a "Joint Committee on Muscle Shoals" to receive bids and recommend a lease. The Committee endorsed a bid of the Associated Power Companies. But opposition arose and the concerted action of the farm bloc, the liberals, and the friends of the chemical companies was powerful enough to defeat this bid. This was the last

¹⁸Ibid., p. 49

¹⁹Ibid., p. 51.

serious effort made to turn Muscle Shoals over to the power companies. However another bid for the Muscle Shoals project was made by the American Cyanamid and the Union Carbide Chemical Companies. They offered an annual payment to the United States of four per cent on federal investment for power at the Shoals site and pledged an annual production of 20,000 tons of fixed nitrogen for fertilizer. The companies, however, inserted a clause providing that if the manufacture and sale of fertilizer "proved competitively impractical or commercially uneconomical" production might be abandoned. No provision was made returning the property to the government under such a contingency.²⁰

No more major bids were made by private companies for the Muscle Shoals plant. In 1931 a bill was passed by Congress providing for public operation of the plant, but President Hoover vetoed the bill. In his veto message, Hoover stated his opposition to government competition with private enterprise and urged that Congress authorize the States of Alabama and Tennessee to set up a joint commission to study the disposition of the properties "in the interest of the local community and agriculture generally." A commission was appointed by the move was unsuccessful.²¹

²⁰ Ibid., p. 53.

²¹ Ibid., p. 54.

In the meantime, supporters of public ownership had been introducing bills in Congress. Senator Norris, leading proponent of the public ownership theory, introduced seven bills during the time between 1919 and 1932. One of these President Coolidge killed with a pocket veto and another was vetoed by Hoover, and the others were defeated in Congress. Legislation authorizing the Tennessee Valley Act was not passed until after President Roosevelt lent his powerful support to public operation of the Muscle Shoals Project.

President Roosevelt brought new conceptions of the part the government should play in society. In his message to Congress on April 10, 1933, he said in part:

It is clear that the Muscle Shoals development is but a small part of the potential public usefulness of the entire Tennessee River. Such use, if envisioned in its entirety, transcends mere power development; it enters wide fields of flood control, soil erosion, reforestation, elimination from agricultural use of marginal lands, and distribution and diversification of industry. In short, this power development of war days leads logically to national planning for a complete river water-shed involving many states and the future lives and welfare of millions. It touches and gives life to all forms of human concern.

I, therefore, suggest to the Congress legislation to create a Tennessee Valley Authority---a corporation clothed with the power of government but possessed of the flexibility and initiative of a private enterprise. It should be charged with the broadest duty of planning for the proper use, conservation, and development of the Tennessee River drainage basin and its adjoining territory for the general social and economic welfare of the Nation. This Authority should also be clothed with the power to carry these plans into effect. Its duty should be the rehabilitation of the Muscle Shoals development and the coordination of it with a wider plan.²²

²²House Document 15, 73rd. Cong., 1st. Sess., p. 10.

The provisions of the Norris bill, as outlined in the beginning of this chapter, may now be better understood when discussed in the light of the previous contentions and efforts to pass such legislation. By the terms of the Act, a corporation was created which was directed to take over the Muscle Shoals properties, to utilize the nitrate plants in a commercial or experimental fertilizer program, and to dispose of the surplus power generated at Wilson Dam over the corporation's own transmission lines. These provisions had been previously offered in various legislation proposed, but two new provisions were then added. First, the corporation was authorized to construct dams, powerhouses, and navigation projects on the Tennessee River and its tributaries. Second, two "planning" sections were included to furnish the basis for a program of regional planning and development, with the general aim of "fostering an orderly and proper physical, economic, and social development" of the area. In his address to the Congress, the President had stressed the value of such planning:

Many hard lessons have taught us the human waste that results from lack of planning . . . It is time to extend planning to a wider field, in this instance comprehending in one great project many states directly concerned with the basin of one of our greatest rivers.

If we are successful here we can march on, step by step, in a like development of other great territorial units in our borders.²³

²³Ibid., p. 12.

It is evident that in the mind of the President, the Tennessee Valley Authority was to be a yardstick for future development of the river basin and areas. The fact that he linked the welfare of the people of the area with the development makes his contentions more important to the people as a whole.

When the infant public authority undertook its power-marketing program, there already existed within the valley numerous privately owned power utilities. Preference was expressed in the Act for sale of the surplus power to "publicly owned organizations" and the corporation was also empowered to build its own transmission lines. The major power company, in hearings on the proposed Norris Bill, had endorsed the measure but urged that the power activities be limited to sale of electricity at the switch-board; they wanted the distribution system. Congress rejected any such plan, but after the Act passed, the private companies approached the Authority directly with its proposal that it sell to them at the switchboard all its available energy. The Authority, believing that such a policy would be contrary to the spirit of the plan if not the plain language of the Bill, refused, and proceeded to set up its own power program. Controversy led to legal action. Other phases of the development project proceeded without any hindrance, but injunctions and court proceedings hindered the power program.

Legal Controversy

The provisions in the act authorizing the generation and distribution of electric power were somewhat timid. The Tennessee Valley Act was authorized to

. . . sell the surplus power not used in its operations . . . and in the sale of such current by the board, it shall give preference to state, counties, municipalities, and cooperatives of citizens and farmers, not organized or doing business for profit. . . . "24

Private power companies seized upon this weakness and maintained that it was not the intent of Congress for the Tennessee Valley Act to actually generate electricity for distribution, but that it could sell whatever electricity it might, through error in calculation, produce more than was necessary to operate the nitrate plants and other development activities. This contention was, in essence, sustained in the George Ashwander Case. The following quotation from the judge's opinion is the gist of the decision which warranted the amendment of 1935 which will be given in more detail below:

It [the TVA] has a right to sell the surplus energy defined to be the energy over and above what the Tennessee Valley Authority creates for the use of some one of its granted constitutional powers, and used for that purpose, for instance, actuating the locks with reference to navigation, the lighting of villages, or many other things of that kind, that give it the right to use electrical energy. It there is a surplus, recognizing the impossibility of making the exact amount of electric power

²⁴H. Pritchett, The Tennessee Valley Authority, A Study in Public Administration, p. 62.

to cover the needs, it has an implied right to sell any power created, that is, created in the exercise of a bona fide effort to only make such power as is needed to carry on the Constitutional power, either national defense, or navigation, or perhaps others.²⁵

The virtue or evil in such a "narrow" interpretation of the Tennessee Valley Authority Act is of no consequence herein; the important fact is that the entire operation of the electric distribution system was on precarious grounds. Hence it became necessary for Congress to more specifically define its intent with regard to power development and distribution. This was done in the Amendments of 1935. The Authority was authorized:

. . . . Whenever an opportunity is afforded, to provide and operate facilities for the generation of electric energy in order to avoid the waste of water power, to transmit and market such power as in this Act provided, and thereby, so far as may be practicable, to assist in liquidating the cost or aid in the maintenance of the projects of the Authority.²⁶

At another place in the Amendment the language is again quite definite:

The Tennessee Valley Authority . . . shall have power to acquire or construct power houses; power structures, transmissional lines . . . and to unite the various power installations into one or more systems by transmission lines.²⁷

²⁵George Ashwander, et al. VS Tennessee Valley Authority, et al., 9 F Supp. 965 (1935).

²⁶Act of August 31, 1935, Ch. 836, Sec. 5, 49 Stat. 1076, USCA 831 h-1.

²⁷Ibid., p. 831c.

Thus by the time this case reached the Supreme Court in February, 1936, Congress had so amended the Act that the Supreme Court decision on the "surplus power problem" was a foregone conclusion. However, the general question of the constitutionality of the entire Tennessee Valley Authority program was not dealt with by the Court.

The refusal of the Supreme Court to deal with the various questions on the constitutionality of the Act invited further legal entanglements. In May, 1936, nineteen public utility companies, operating in the nine states, brought suit against the Tennessee Valley Authority, alleging that the managerial practices as well as the Act itself was unconstitutional. An injunction was sought which would have prevented the power development of all TVA projects except the Wilson Dam project.

The temperature of this legal controversy grew increasingly hot for about a year and a half before the case was finally brought to trial before a special three-judge district court in November, 1937.²⁸

In this case the four major contentions of the power companies were disposed of as follows: (1) in answer to the complaint by private power companies that TVA dams could not and would not be operated within the terms of the provisions directing such operation primarily for the purpose

²⁸Pritchett, op. cit., p. 63.

of promoting navigation and controlling floods, the courts, after carefully analyzing the evidence relating to TVA's operation, stated that navigation and flood control had been given primary consideration, and the statute had been neither violated nor exceeded.

(2) In the second place, the utilities contended that it was enacted primarily for power purposes, and that such matters as flood control, navigation and national defense were merely disguises for the real purpose of interfering with private enterprise in the utility field.

(3) The utilities contended further that the sale of electricity on the scale proposed by TVA would deprive the private companies of their property without due process of law. On this point the court held that although the power companies might suffer by the competition of the Tennessee Valley Authority program, this program had not been shown to be in violation of any of their constitutional rights.

(4) The final major contention was that the Act amounted to an unlawful interference with the police powers of the states without being subject to their control. This allegation was dealt with by simply stating that the question was not properly before the court. If such violation of states rights was in existence, the question could not be considered unless the suit was brought by the state or local governments being offended.²⁹

²⁹Ransmeier, op. cit., p. 80.

After this decision, the case was carried to the Supreme Court, but there it was disposed of by a ruling that the utilities had no legal standing to bring the suit, thus making unnecessary any holding on the major constitutional questions presented in the Tennessee Valley Authority Act.³⁰

Certainly, these are not the only two cases which inhibited the operations of the Tennessee Valley Authority; however, these are the most significant cases, because herein the major issues involving the constitutionality of the Act were dissolved.

Amendments

The 1935 amendments of the Act have been adequately considered in the subsequent discussion on the legal entanglements; however, the gist of the legislation was that in both the operation and control of the water control system the Authority was to give primary consideration to the requirements of navigation and flood control but that, in so far as it might be consistent with those objectives, hydro-electric power should be generated in order to help defray the cost of the undertaking.

A second amendment concerned the power rate policy. In the beginning the Authority prescribed unusually low resale rate schedules in its contracts with publicly owned

³⁰Pritchett, op. cit., p. 65.

distribution agencies. Opponents of the plan declared that these rates were too low to cover the cost of the investment. They argued that TVA should be put under a rigid cost-accounting system, that it should file its rates with the Federal Power Commission, that these rates should be non-discriminatory as among classes of customers, that all receipts and expenditures should be reported to the General Accounting Office, and that no power sales should be permitted which would not be adequate to return revenues at least equivalent to cost.³¹ The Authority saw in these demands a further effort to hamper the development with red tape and a lack of understanding of the nature of a "developmental period" in a business requiring a large capital investment. The differences were settled by an amendment which expanded the Authority's functions of cost finding and cost reporting and which stated further:

It is hereby declared to be the policy of this Act that, in order as soon as practicable to make the power projects self-supporting and self-liquidating, the surplus power shall be sold at rates which, in the opinion of the Board, when applied to the normal capacity of the Authority's power facilities, will produce gross revenues in excess of the cost of production of said power and in addition to the statement of the cost of power at each power station . . . the board shall file with each annual report, a statement of the total cost of all power generated by its stations during each year, the average cost of such power per kilowatt hour, the rates at which sold, and to whom sold, and copies of all contracts for

³¹Ransmeier, op. cit., p. 69.

the sale of power.³²

Other clauses also modified or extended the Act of 1933. The Authority was empowered to prescribe resale rate schedules in its contracts with power distributors, to assist, by grants of credit, states, counties, municipalities, and other non-profit organizations in buying distribution facilities in order to contract for TVA power, and to have veto power over the construction of similar projects upon the Tennessee River or any of its tributaries. By these amendments, the Authority considerably extended its scope of work, especially in its authority to assist organizations in obtaining facilities for distribution of TVA power.

In the period that followed, TVA took over many small privately owned power companies at negotiated prices, but little progress was made on terms for the major power lines serving the heart of the TVA "natural" service area. After the power companies lost the attempt to declare TVA unconstitutional, negotiations were begun for the sale of their lines to TVA. An agreement was reached which permitted TVA to buy the power facilities of the Alabama and Georgia power companies for \$78,600,000.³³ The Authority had been given the power to issue bonds and had an adequate amount for the

³²Act of August 31, 1935, Ch. 836, Sec. 8, 49 Stat. 1077, 16 USCA 831m.

³³Pritchett, op. cit., p. 69.

purchase, but the purchase of steam generating stations or of hydro-electric stations outside of the Tennessee watershed were felt to be unauthorized. Since the power properties included such facilities and were to be bought as a unit, the Authority requested Congress to amend its bond power to permit these otherwise unauthorized uses of borrowed funds. Permission was finally secured after much bitter debate in Congress.³⁴ The TVA was now alone in the power field in the Tennessee Valley.

Serious problems in the field of taxation next plagued the Authority. Private enterprise charged that TVA was effectively tax-free. This notion or idea arose from several sources. In many instances, municipalities with their own distribution systems, contracted for TVA power. States and counties usually refrain from taxing municipal enterprise; hence, the project, in this sense would be tax-free. TVA contracts, too, require cooperative distributors to assess taxes against taxes at going rates; TVA rates were lower; hence the tax on cooperatives was lower.

The above were tax problems in the distribution on field. Those in the generation and transmission field were more complicated, especially where properties had been turned over to the Tennessee Valley Authority. The only provision for tax payments in the 1933 Act was for five per cent

³⁴Act of July 26, 1939, Ch. 366, 53 Stat. 1083, 16 USCA 831 n-3.

of the gross revenues from power sales to the states in which the marketed energy was generated.³⁵ No consideration was given to relative assessment values of TVA properties within states or to relative revenues contributed to TVA by consumers in the different states. No authority either was granted for payments to counties or local governments. In many instances this worked hardships because power lines, as a usual thing, are a lucrative source of revenue to a county or municipal district.

Realizing the need for tax revision, the Authority worked out a suggested plan whereby larger total payments in the place of taxes would be apportioned according to a carefully stated formula among the different states and counties affected by TVA operation. In 1939 a bill was passed by Congress with these features: For the first year of operation, the total TVA payments in the place of taxes were more than the taxes paid by the private concerns taken over by the TVA.³⁶ Taxes and tax equivalents provided by municipalities and cooperative distributing power further boosted the taxable income of the states and counties until there was an excess over the entire amount usually paid in by private

³⁵Ransmeier, op. cit., p. 74.

³⁶Ibid., p. 75.

enterprise in all fields.³⁷ Thus, another objection to TVA lost its vigor, because under the TVA the states were receiving more revenue from power than they had previously received. During the period from 1939 to 1948 there were numerous acts which affected the operation of the TVA. The most common of these amendments were annual appropriations for its operation and expansion; however, it was not until 1948 that there were any major changes in the TVA administration.

The first part of this act provided \$18,700,000, together with the unexpended balance of funds heretofore appropriated, for the operation of the TVA in the fiscal year of 1948. This was in cadence with previous appropriation bills; however the second part of the Act made significant changes in the financial policy of TVA. The section provided that:

Not later than June 30, 1948, and not later than June 30 of each calendar year thereafter, until a total of \$348,239,240 has been paid as herein provided, the Board of Directors of the Tennessee Valley Authority shall pay from net income derived the immediately preceding fiscal year from power operations (such net income to be determined by deducting power operating expenses, allocated common expense, and interest on funded debt from total power operating revenue) not less than \$2,500,000 of its outstanding bonded indebtedness to the Treasury of the United States exclusive of interest, and such a portion of the remainder of such net income into the Treasury of the United States as miscellaneous receipts as will in the ten-year period ending June 30, 1958, and in each succeeding ten-year period until the aforesaid total of \$348,239,240 shall have been paid, equal to not less than a total of

³⁷ Ibid., p. 75.

\$87,059,810 including payment of bonded indebtedness exclusive of interest on such bonded indebtedness. Total payments of not less than \$10,500,000 shall be made not later than June 30, 1948.

Amounts equal to the total of all appropriations herein and hereafter made to the TVA for power facilities shall be paid by the Board of Directors thereof, in addition to the total of 348,239,240 specified in the foregoing paragraph, to the Treasury of the United States as miscellaneous receipts, such payments to be amortized over a period of not to exceed forty years after the year in which such facilities go into operation.

None of the power revenues of the TVA shall be used for the construction of new power producing projects (except for replacement purposes) unless and until approved by act of Congress.³⁸

The significance of this amendment which limits the administrative authority, and demands that the amount of appropriation be repaid, is somewhat obscure. However, it does seem that it has the following disadvantages: (1) By compelling the Tennessee Valley Authority to repay the amount of appropriation it is in effect imposing a form of regressive taxation on the people of the Tennessee Valley area. By way of explanation, everyone in the Valley uses the electricity, the wealthy as a general rule use no more, or very little more, than the poorer consumers; therefore, if the proceeds of the sale of electricity must be paid into the Federal Treasury, then the poorer consumers are paying as much as the more prosperous consumers. The economic effects of such a law are identical to the effects of a sales tax.

(2) Another criticism lies in the fact that it is taking

³⁸"Appropriations for the TVA", Congressional Record, Appendix A, p. 1205, 1948.

the administrative powers of the Tennessee Valley Authority away from the expert management and placing it in the hands of Congress, which is so burdened with other programs that it has neither the time nor the technical knowledge to administer properly the financial activities of the Tennessee Valley Authority.

Thus we observe that our conservative Congress has made a noteworthy move toward curbing the activities of the Tennessee Valley Authority.

This chapter has been concerned with the three phases in the development of the Tennessee Valley Authority Act; its legal controversy which ensued, and the more significant amendments.

CHAPTER IV

GENERAL NATURE OF THE ALLOCATION PROBLEM

The problem of cost allocation is not only an issue of major concern to TVA authorities but it is a complex problem even to private business. Direct costs are those costs which contribute to the production of a particular unit of output, while joint costs are the costs which contribute to the production of several different units. For example, the cost of lighting a factory which produces a number of commodities would present a problem in cost allocation. The problem would be to determine how much of the cost of the lighting should be charged to each commodity produced. This would be a problem of some complexity; however in comparison with the problem of allocation of TVA costs it is quite simple.

The problem of allocating TVA cost to its various purposes, navigation, flood control, power, fertilizer production, and national defense, is made more complicated by the following factors: (1) at the onset there was no precedent to follow, (2) the problem of estimating the value of navigation, (3) the private power companies would be critical of the allocation regardless of its merits, and (4) the allocation of TVA costs is subject to various political pressures. Because of these

factors any allocation of costs made by TVA officials is essentially arbitrary, and as such it invites criticisms from numerous sources.

In a statement of policy the TVA Act, in effect, requires the TVA power program to pay its own way. In order to determine whether the power program is self supporting, the authority must first know what portion of its total investment, much of which is in multi-purpose facilities, is chargeable to power. The costs of powerhouses, generators and turbines offer no particular problem. They are chargeable to power. On the other hand; the cost of navigation locks, channel markers, and dredging are charged entirely to navigation and likewise the costs of flood gates and other special features, designed solely for flood protection are charged entirely to flood control. Finally, the costs of dams, reservoir lands, and other properties that serve several purposes, including power, should be distributed among the several programs served. Hence the question is, by what rule shall common costs be distributed?

Logically, the allocation of costs falls into two categories; (1) the allocation of original or investment cost in order to determine what portion of the fixed charges should be assigned to each purpose, and (2) the allocation of operation and maintenance expenses. The latter problem is discretely solved by simply considering all of these costs equal, but the problem of apportioning total joint investment is intriguing.

This latter puzzle will be analyzed herein.

The TVA Act directs the Authority to allocate costs as follows:

The Board shall make a thorough investigation as to the present value of Dam #2, and the steam plants, nitrate plant #1, and the nitrate plant #2, and as to the cost of the Cove Creek Dam, for the purpose of ascertaining how much of the value or the cost of said properties shall be allocated and charged up to (1) flood control, (2) navigation, (3) fertilizer, (4) national defense, and (5) the development of power. The findings thus made by the Board, when approved by the President of the United States, shall be final, and such findings shall thereafter be used in all allocations of value for the purpose of keeping the book value of said properties. In like manner, the cost and book value of any dams, steam plants, or other similar improvements hereafter constructed and turned over to said Board for the purpose of control and management shall be ascertained and allocated.

The Board shall, on or before January 1, 1937, file with Congress a statement of its allocation of the value of all such properties turned over to said Board and which have been completed prior to the end of the preceding fiscal year, and shall thereafter in its annual report to Congress file a statement of its allocation of the value of such properties as have been completed during the preceding fiscal year.¹

Objectives of Allocation

Thus far the objectives of allocation have been somewhat vaguely implied, now let us analyze these objectives more specifically. The principle of allocation is almost universally accepted; however there are a few fanatical opponents of public power projects who maintain that all of the costs of multiple

¹Act of May 18, 1933. Ch. 32, sec. 14, 48 Stat. 66.

purpose projects should be charged to power. This absurd viewpoint is becoming more and more in disrepute. Even at the outset most of the friends of private power companies supported allocation on the grounds that a fair proration of costs would validate the existing rates of private power companies; friends of public power projects, on the other hand, supported allocation for an exactly opposite reason, they were confident that proper allocation would show the rates of the private power companies to be too high.

Whereever the problem of allocation is in controversy we find that rate making is involved. Hence we can say that the prime objective of allocation is to show the cost revenue relationship, and since rates are the determinant of revenue, the objective can be more specifically stated as follows: one of the main objectives of allocation is to provide a basis for rate making.

Another objective of allocation is that it will facilitate optimum proportionment of multiple use investment of new appropriations.

Thus far we have observed the manner in which Congress authorized allocation, and a few of the major objectives of allocation have been viewed. The prime objective was as related above, to set up a cost revenue relationship. The costs are to a great extent determined by fixed charges on initial investment which were allocated to power, and the revenue

depending largely on the rates charged for electricity.

Criteria of Good Allocation Procedure

Thus the general objectives have been stated; now let us consider the factors which are requisite to a "fair" allocation of costs. These factors have been listed by TVA's leading authority on cost allocation, J. S. Rasmeier, as follows:

The method should have a reasonably logical basis. It should not result in charging any objective with a greater investment than the fair capitalized value of the annual benefit of this objective to the consumer. It should not result in charging any objective with a greater amount of investment than would suffice for its development at an alternate single purpose site. Finally, it should not charge any two or more objectives with a greater investment than would suffice for alternate dual purpose or multiple purpose improvement.

The method should not be unduly complex. In a democracy public agencies should be subject to the understanding scrutiny of the citizen body to the maximum possible extent. The goal should always be presentation of problems and programs for public consideration in clear and simple terms.

The method should be workable. It should not be dependent upon estimates which are difficult to prepare, and it should not require the use of data as to actual operation of the project which will not become available until after the passage of a considerable period of time.

The method should be flexible. It should be equally applicable to an isolated project or to a co-ordinated system. In the case of a system it should be applicable to both the initial and ultimate stages of development. It should be readily adaptable to changing conditions over a plant or system life.

A final criterion which sometimes has been suggested but which we put forward here only for the sake of discussion is:

The method should apportion to all purposes present at a multiple purpose enterprise a share in the overall economy of the operation. This point has two implications.

First, no purpose should be assessed costs as great as would suffice for alternate single purpose steam improvements. Second, no purpose should be assessed costs as great as its capitalized benefit value.²

All of these criteria are valid in substance; however it seems that as a general rule they are too optimistic. For example the third objective states: "It should not be dependent upon estimates which are difficult to prepare."³ In the following analysis the extreme difficulty of making certain necessary estimates will be pointed out. Indeed, it might be said that the merits of the entire allocation procedure are based upon the accuracy of certain complicated estimates.

Theories of Allocation

Allocation is an arbitrary and controversial issue; Congress appointed numerous boards and committees to work out a desirable method of allocation, and the theories of allocation are as plentiful as were the allocation committees. Or, it seemed that every board or committee, after detailed analysis, came up with a revised or new theory of allocation. Because these theories are so numerous it will be our purpose here to analyze only the two most significant theories; namely (1) the relative benefit theory method of allocation and (2) the alternate justifiable expenditure theory. The first of these

²Rasmeir, op. cit. pp. 220-221.

³Ibid., p. 220.

theories will be studied because, in the opinion of the writer, it has considerable merit and the second because it is the theory which was most nearly followed by the TVA Financial Policy Committee.⁴

First let us consider the relative benefit method of allocation. A report on the investment of Wilson, Norris, and Wheeler Projects has the following to say about the theory of allocation:

This theory of allocation draws its chief protagonists from the ranks of the flood-control engineers. It has been suggested by the National Resources Board and its subcommittees, by the Mississippi Valley Committee, and by the various regional planning committees.⁵

As the name implies, this theory suggests that the costs of the multiple purpose project will be allocated according to the relative benefit values of the various purposes served by the multiple purpose system.

The following analogy is made in the interest of clarity. Suppose TVA was a private corporation engaged in making rain, and that for \$100.00 it had contracted to make two inches of water fall equally over an area of four square miles. The

⁴The committee began investigations on July 12, 1937; its membership was composed of regular staff members.

⁵Report of the Investment in Wilson, Norris, and Wheeler Projects and the Allocation of the Investment Among the Several Purposes of the Tennessee Valley Authority Act, Sen. Doc., 75th Cong., 1st Sess., No. 709, p. 9.

first mile was owned by the Jones who grew corn, the second by the Browns who grew cotton, and the third by the Smiths who grew peanuts, and the fourth by the Johnsons who grew potatoes. Now suppose that the \$100.00 worth of rain increased the income from corn by \$60.00, the income from cotton by \$45.00, the income from peanuts by \$30.00, and the income from potatoes by \$20.00. Now, just how much should each family pay for the rain? The total benefits to all four equals \$155.00, so would it not be plausible to charge the Jones with $60/155$ of the \$100.00; the Browns with $45/155$ --and so on.

Obviously this is a simplification of the relative benefit method of allocation, and by simplification the merits of the principle are manifest. However, closer scrutiny of the problem will reveal certain difficulties. The prime difficulty is in the estimation of the benefits. By simply comparing the income figure over a period of years the Jones could, with a high degree of certainty, conclude that the two inches of rain would increase their income by \$60.00; but when we attempt to evaluate the benefits of a flood control project; a navigation channel, or a power plant, we are confronted with complex problems.

This theory was given considerable stimulus by Dr. A. E. Morgan who made the following statement in a letter to his co-directors:

A theoretically proper and reasonable method of allocating costs between the various types of benefits would be to allocate the common cost among the various uses in proportion to the benefit received by each from the common

expenditure and to charge to each type of benefit the total cost incurred specifically and solely for that particular use or benefit.⁶

Hence it seems that the relative benefit method of allocation is, in theory, the most desirable of all theories of allocation; however the application of this theory is so difficult that the merits of the theory are questionable.

Briefly, let us consider the problem of evaluating benefits. The beneficial effects of any one project are multitudinous. They are gains to the individual property owner, profits to the businessmen, advantages to the social and governmental nature; some are easily recognized and evaluated, while others are intangible and difficult of evaluation; some are local, while many are to be found remote from the Tennessee Valley; some will be immediately effective, while others will benefit future generations. Obviously the problem is too complex and intangible to predict accurate measurement but it is still susceptible of reasonable appraisal within useable limits. Thus, the critics of this theory who point out the impossibility of accurate measurement of the benefits are without logic, because any method of allocation is essentially arbitrary and built upon estimates. It was never the intent of the Morgan Committee to make an accurate appraisal; their intent was to make an appraisal within "usable limits."

⁶Ibid., p. 10.

The estimation of these benefits is a problem for engineers and business research analysts, however the problem will seem more feasible to the ordinary observer if he will follow the analysis given below.

Benefits attending the Authority's navigation program are numerous and far reaching. The amount of estimated savings to shippers in the matter of freight rates is sometimes proposed as a measure of benefits under similar circumstances. Such a figure is inadequate. Satisfactory navigation will effect not only benefits which are definite and easily recognizable, but will encourage development of the valley and will induce nation-wide developments which are not readily susceptible to evaluation. An enumeration of some of the sources from which benefits may spring serves to indicate the broad scope of the field.

There may be direct savings (a) on freight shipped by water at rates lower than those available from land carriers, and (b) on freight shipped by rail or truck at rates influenced by the existence of water competition.

There may be market extensions by (a) opening markets for raw materials which cannot move more profitably under existing rates and (b) extension of markets for raw and finished products now limited by freight rates.

Industrial growth may be encouraged through (a) growth of established industries in the area as markets are extended;

(b) establishment of new industries based upon the conversion of native resources which are not profitable under existing freight rate structures, (c) development of industries whose selection of sites is influenced by availability of water transportation, (d) stimulation of the building industry by reason of the general development of the region. Increased recreational activities will inevitably follow the development of the waterways. All of the suggested industrial, commercial, and recreational growth may result in increases in value of property in the various governmental units.

A significant result of any study of this project would be a determination as to whether or not the value of the benefits resulting from navigation will exceed the cost of obtaining that navigation by the cheapest method which could be adopted to the proposal.

An estimate of the total amount of benefits, tangible and intangible, would be highly desirable, but it will be sufficient for the immediate objective if it is found that the value of the benefits appear to be in excess of the cost of a single-purpose navigation development, even though the estimate of benefits be not carried to full completion.

The cost of the cheapest single-purpose development which could be built and operated to provide navigation roughly equivalent to that contemplated by the Authority is estimated to be approximately \$150,000,000,000.⁷ Records of the traffic

⁷Ibid., p. 15.

conditions on the river are available. Estimates of savings in transportation costs which are expected to develop as a result of an increase in traffic have been made by the United States Army Engineers and by the Tennessee Valley Authority. The Army estimates are in excess of those prepared by the Authority. However the more conservative estimate of the Authority will be considered in the following comparison.

The following estimates of the tonnage of freight which will be moved on the Tennessee River is significant.

In a study by the Transportation Economics Division of the Authority it is predicted that nearly 5,000,000 tons of freight will move on the Tennessee River in 1943, and that there will be a movement of 10,000,000 tons in 1953, an increase of about 160,000 tons per year beyond that point expected for a number of years. It is reasonable to base the present computation on an assumed movement of 8,000,000 tons, a figure which should be reached in 1946 shortly after completion of the Gilbertsville project. The estimated saving in transportation costs for that amount of freight is \$1.25 per ton which results in a total annual saving of \$10,000,000.⁸

But this is only one phase of the many benefits. If appraisal were made of the other benefits enumerated the mounting value for navigation would far exceed the cost of a single purpose navigation development. Thus we have a general picture of the factors which would be considered in an evaluation of the navigation benefits; and it seems that some workable solution could be devised.

The relative benefit theory is quite feasible but it

⁸Ibid., p. 15

appears that the modification of this theory as used by the TVA, the alternative justifiable expenditure theory, possesses a greater degree of certainty while at the same time takes into consideration the relative benefits. This modification is based on the obvious proposition that the TVA dams permit the achieving of several purposes on a more economical basis than would prevail if the same purposes were sought independently. For example, the following table shows the alternate cost of obtaining navigation, flood control, and power equivalent to that available from Norris, Wheeler, and Wilson system of projects at a single use development.

TABLE 1

SUMMARY OF ALTERNATIVE COST NORRIS-WHEELER-
WILSON SYSTEM

Purpose	Cost
Navigation	\$ 48,334,000
Flood Control	33,210,000
Power	79,230,000
Total	\$160,774,000
*Investment of TVA, H. Doc. 709, 75th. Cong., 3rd. Sess.	

By way of comparison the multiple purpose development of these systems reveals that \$160,000,000 worth of flood control, navigation, and power was bought for the amount of actual multiple purpose investment which was \$94,000,000.⁹

⁹C. H. Pritchett, The TVA, A Study of Public Administration, p. 40.

The alternate justifiable expenditure theory called for the distribution of common costs among the three purposes in proportion to the cost of obtaining the equivalent results by the three single use projects. For example we would take the total alternate cost for navigation, \$48,334,000 and deduct the direct investment in navigation of \$4,408,807 and get the remaining alternate cost or \$43,925,000. After the direct costs are deducted from each alternate cost the total alternate cost is \$127,705,858. We can then compute the portion of common costs allocated to navigation by taking 43,925,193/127,705,858 of the total common cost of \$65,832,434 and we find that \$22,643,459 of the common costs are allocated to navigation.

TABLE 2

ALLOCATION OF SYSTEM COST OF THE
NORRIS-WHEELER-WILSON SYSTEM

Purpose	Total Alternate Cost (1)	Direct Investment (2)	Remaining Alternate Costs (3)	Percent	Allocation Common Costs (4)
N--	\$ 48,334,000	\$ 4,408,807	\$ 43,925,193	34.4	\$ 22,643,439
FC--	33,210,000	2,600,000	30,610,000	24.0	15,779,470
P--	79,230,000	26,059,335	53,170,665	41.6	27,409,505
Total	\$160,774,000	\$33,068,142	\$127,705,858	100	\$ 65,832,434

N-Navigation, FC-Flood Control, P-Power

*Investment of the TVA, H. Doc. 709, 75th Cong. 3rd. Sess., p. 40.

Although TVA has never officially adopted any single basis of cost allocation, it has been primarily influenced by this formula for allocating costs. This process was devised in 1938 by the TVA Financial Policy Committee. Now let us see how this initial computation compares with the allocation for the overall investment in TVA up to June 30, 1946. The total investment in TVA was \$755,935,373; the allocation of this investment was \$149,116,375 to navigation, \$152,817,804 to flood control, \$454,001,194 to power.¹⁰ Hence simple arithmetic shows us that in 1938 about 54% of the total costs were allocated to power while in 1946 about 60% of these costs were chargeable to power.

This overall increase of only 6% from 1938 to 1946 is a compliment to the 1938 allocation. Six percent is an insignificant increase and at least part of this is attributable to an increase in the percentage of direct costs assigned to power in more recent years.

Obviously, the value of this theory hinges squarely on the accuracy of the computation of the alternate costs of single purpose projects. A valid investigation into the accuracy of TVA alternate figures could be carried out only by a staff of expert engineers and cost analysts; however, it seems that the

¹⁰U. S. Congress, Senate, Appropriation for TVA, 80th. Cong., 2nd. Sess., p. 1205.

estimates are generally acceptable. For example, while J. S. Rasmeir points out many weaknesses of the allocation method he makes this statement about the flood control program:

" . . . the alternate cost of the TVA flood control program seems less than any probably fair valuation of the benefit of this objective. Appraised in this manner, the alternate flood control system is 'justified.'

Then a few paragraphs later he says, "We may conclude that for the purposes of allocation none of the alternate cost estimates which we have summarized above are demonstrably 'unjustifiable.'"¹¹

In appraising the alternative justifiable expenditure method we observe the following weaknesses:

(1) The uncertainty of alternate costs is a weakness common to all benefit theories of allocation. However, it seems that the TVA left itself open for specific criticism on this score because it did not in every instance, particularly in computing alternate navigation costs, chose an alternate scheme of development which was identical to the actual development program. For example, TVA estimated the costs of a navigation channel with low dams while the TVA dams were of intermediate height. The inferiority of a low dam system is so obvious that it could scarcely be considered as an alternate for the regular TVA dams.

¹¹Rasmeir, op. cit., p. 327.

(2) The plan fails to consider the annual operation and maintenance costs of alternate systems. This simply means that TVA has ignored one of the prime factors, because the reality of costs lies, not simply in their total investment figures, but in their annual burden. Hence two projects which are in other respects identical are unsuited as alternate if their annual operating costs are not equal. To illustrate, suppose power generating facilities could be erected on a single purpose project for \$1,000,000 with an annual operating expense of \$150,000.00, then suppose facilities for the generation of the same volume of electricity at a multiple purpose project would cost \$1,000,000 with an annual operating expense of \$200,000.00. True enough the initial costs are identical but the multiple purpose project would be economically unsound because of higher operating costs. It should be pointed out that this is just an illustration and bears no relation to the actual relative operating costs of single purpose and multiple purpose projects. The purpose of the illustration is simply to demonstrate that as long as operating costs are ignored errors are possible.

While numerous criticisms have been leveled at TVA's method of allocation it seems that the two above possess some degree of validity; however this does not mean that the alternate justifiable expenditure technique is undesirable; on the contrary, it appears to be most desirable. The explanation

for these criticisms is that cost allocation is essentially an arbitrary endeavor and it cannot follow an iron-clad formula because every project presents different problems in allocation. The only thing definite about the present or any future allocation methods is that they will have critics.

In this chapter the general nature of the problem is presented. The difficulties of the problem of allocating TVA costs are pointed out.

The most important objective of allocation, that of determining a cost-revenue relationship to aid in rate making, was analyzed. Then criteria for a satisfactory allocation procedure were pointed out, and criticized.

The theories of allocation were narrowed to two prime theories, the relative benefit theory and the alternate justifiable expenditure theory. After a detailed discussion of the relative benefit theory, it was concluded that in principle it was the most desirable method of allocation; however it had certain difficulties in application which rendered it impractical. The prime problem in application is in the estimation of benefits; analysis of this problem reveal unsurmountable complexities.

Then the alternate justifiable expenditure theory was considered and it was shown how this theory was applied in the actual allocation procedure adopted by TVA. This theory like all others has certain technical shortcomings; however it seems

more feasible than other methods of allocation which have been devised.

In conclusion; allocation of TVA costs is by nature an arbitrary problem because it is based on estimates; hence it is and will continue to be criticized by certain, ordinarily biased, groups, namely, private power interests.

CHAPTER V

ELECTRIC RATES

General Nature of Rate Making

In 1941 the average domestic consumer in the Tennessee Valley region used sixty per cent more electricity in his home and paid sixteen per cent less for it than the average residential consumer in the United States.¹ This statement is significant because it gives factual support to the TVA theory of rate making. The principal reason for this use of sixty per cent more electricity is cheaper rates. The primary assumption underlying TVA rate making is that the demand for electricity is "elastic" and the greater portion of the costs is fixed; hence the maximum revenue return can be achieved by increasing the volume of the sales. This can be done by reducing the rates the consumer is required to pay for his electricity. In many phases of business this decreasing cost characteristic is apparent; however it is particularly important in the field of electric distribution.

Table 3 presents conclusive evidence showing the diminishing cost relationship of electricity production and distribution; for example, the power revenues increased from 35,796,545 in 1946 to 44,144,089 in 1947, or an increase of about twenty per cent over 1946; while costs increased by only nine per cent.

¹TVA Annual Report 1941, p. 61.

TABLE 3

THE COST-REVENUE RELATIONSHIP OF THE TVA

	1947	1946	Ave. 1943-1947
Power Revenues	\$44,144,089	\$35,264,545	\$37,179,926
Prod. Expense	5,798,804	2,796,162	5,673,928
Trans. Expense	3,131,829	2,588,122	2,416,544
Other Op. Expense	2,989,881	3,499,273	2,345,632
Tax Equivalents	1,668,416	1,992,257	1,985,485
Depreciation	8,716,410	8,605,731	7,604,450
Total	\$20,305,340	\$18,481,545	\$20,026,037
Net inc. before interest (return to Fed. Govt. from power program)	\$21,838,749	\$16,783,000	\$17,153,087
Ave. net plant in service assigned to power	400,000,000	400,000,000	368,000,000
Annual return	5.5	4.2	4.7

*Source: Annual Report of 1947, p. 61.

Statistical reports on TVA electricity rates are replete with additional evidence showing that costs in electricity distribution are relatively fixed; hence, within reasonable limits, profits can be maximized by increasing gross revenues.

The limit to increasing profits, by lowering rates, is reached when the price is so low that the increase in gross or aggregate income due to increased sales is not in excess of the increment to costs. In addition to this theoretical limit there are practical limits to the expansion of electricity production. For example, say that at a given locality we have plant facilities capable of producing 1,000,000 KWH's of this electricity at \$0.0317 per KWH. Now suppose that by

reducing the price to \$0.300 per KWH the demand would increase to 1,100,000 KWH per year. It is unlikely that this would be a practical move from a business viewpoint because it would necessitate an expansion of plant facilities that is ordinarily extremely costly. However, this change might be desirable in a publicly owned utility setup where the social benefits of increased use of electricity are given consideration along with the influence on profits. This matter will be given more detailed analysis in the final chapter. Another factor which places practical limits on the process of increasing price and increasing profits is that the demand would ultimately become less and less elastic. Or, it is conceivable, for instance, that a rural family would have all electrical appliances available and be using them to such an extent that there would be no increase in use even if the rates were reduced to zero. Such a situation is indeed remote from the facts in the TVA area, where there is still room for increases in the consumption of electricity in two ways: (1) by increasing the use of electricity by present consumers, and (2) by increasing the number of consumers.

The history of TVA rates shows conclusively that a decrease in rates stimulates consumption. The relationship of rate reduction and increased consumption is shown by Table 4. This table shows the initial effects of TVA rates only in certain localities; however these localities are typical and the overall effects are identical.

TABLE 4

DISPOSITION OF SAVINGS TO RESIDENTIAL CONSUMERS
ILLUSTRATING EXTENT OF REINVESTMENT IN
GREATER USE OF ELECTRICITY

Location	Former Bill	Bill at TVA Rates	% Decrease in Rates	Greater Use	% Increase in Use	Other Purp.
Tupelo	\$43.17	\$16.54	62%	\$11.21	65%	\$15.48
New Albany	34.58	15.13	56%	12.96	43%	12.96
Pulaski	34.45	16.86	51%	6.48	39%	11.11
Athens	33.72	16.79	50%	12.44	50%	4.49

Source: Economics of Electric Distribution, p. 11

The table shows that in every case the use of electricity increased as the rates decreased, while, as stated above, this was the initial result, subsequent statistics show that the trend toward greater use of electricity due to lower rates is continuous. In 1946 the average residential consumer of TVA power used nearly fifty per cent more electric energy and his bills were twenty per cent less than the typical consumer in the nation.²

The overall increase in TVA sales and revenues from 1934 through 1947 is clearly shown by Table 5. In this table we witness a tremendous increase in sales of electric energy by TVA. The increase has been manifest in two forms: (1) the increase in the number of consumers and (2) the increase in the use of power by each consumer. Thus far it has been shown that lower rates stimulate consumption; evidence of this fact is shown by Table 5, which follows:

²TVA Annual Report 1945, p. 57.

TABLE 5

TVA POWER SALES AND REVENUE 1934-1947

Year	Billions of Kilowatt Hours	Millions of Dollars of Revenue
1934	1/3	1 1/2
1935	1/6	1
1936	1/2	1 3/4
1937	3/4	2 1/2
1938	5/4	2 3/4
1939	1 3/4	6 1/2
1940	3 1/2	15
1941	5	21
1942	6	25
1943	8 1/3	31 1/2
1944	9 1/4	35
1945	10 1/2	38
1946	9	35 1/4
1947	11 1/2	43 3/4

*Source: Annual Reports of TVA, 1938-1947.

When we consider the economic and social significance of the increased use of electricity, Table 5 above shows that the individual domestic consumer pays less for electricity than he did prior to the installation of TVA rates, even though he uses more electricity. For example, the table shows that in Tupelo the former power bill of \$43.17 has been reduced to \$27.75, or that the average consumer has \$15.42 to spend for other purposes, while at the same time he uses sixty-five per cent more electricity. These figures are for individual consumers in given localities. Now let us look at the overall savings to domestic consumers in the TVA area for a fiscal year. The year 1947 is typical; similar savings are reported in every annual report since 1938.

In addition to the reduction of \$650,000 annually resulting from the application of TVA rates to consumers in the East Tennessee Light and Power acquisition, annual savings of about \$700,000 were provided by rate reductions adopted by municipalities which have been distributing TVA power.³

Rate reductions by some of the other distributors have been deferred because of the war, but financial conditions of many of them make such reductions probable within a relatively short period of time.

Annual savings totaling more than \$11,250,000 have resulted from initiation of TVA rates throughout the TVA power distribution area since 1933.⁴ The savings are based on the levels of consumption at the time the rates were introduced. For example, since 1945 TVA has reported:

In 1946 a number of municipal and cooperative systems adopted lower rates or removed developmental surcharges during the year. The rate changes netted the consumers about \$880,000 in annual savings.⁵

. . . and in 1947, a number of distributors made rate reductions during the year or planned to place reduced rates in effect shortly after the close of the fiscal year. . . Deductions during the year totaled \$157,000 annually.⁶

Thus we observe that the savings of TVA consumers based on the latest reductions in 1947 were \$11,250,000 plus \$880,000, plus \$157,000; or a total of \$12,287,000 per year.

³TVA Annual Report 1946, p. 67. ⁴TVA Annual Report 1945, p. 70.

⁵Ibid., p. 81

⁶TVA Annual Report 1947, pp. 68-69.

This simply means that the domestic consumers, to say nothing of the industrial and federal agency consumers, have this much more money to spend for other consumer commodities; thus the consumers in the Tennessee Valley area have gained greater purchasing power since the advent of TVA.

It is significant to note at this point that not only have the people of the region saved millions of dollars but that even at these lower rates, the TVA power program has reaped attractive returns for the U. S. Treasury, the municipalities, and the cooperatives, and to other industrial concerns using TVA electricity. For example, the municipalities and cooperatives, as of June 30, 1947, showed an accumulated earning of \$46,392,399, while at the same time, as of June 30, 1947, accumulated earnings by the Federal Government on TVA power amounted to \$98,000,000 or nearly twenty-five per cent of the net depreciated value of power facilities.⁷ The growth of accumulated earnings as related to plant investment was reported in TVA's 1947 annual report. By the year 1947, accumulated TVA earnings amounted to ninety-eight million dollars; of this amount TVA had reinvested all but about fifteen million dollars. The relationship between investment and accumulated earnings is clearly shown by Table 6 which follows:

⁷TVA Annual Report 1947, p. 62.

TABLE 6

THE RELATIONSHIP BETWEEN INVESTMENT AND
ACCUMULATED EARNINGS OF TVA
PROPERTIES

As of June 30-	Net Plant in Service	Accumulated Earnings ¹	
		Amount	Per Cent of Net Plant
	Million dollars	Million dollars	
1940	179	6	3.3
1941	187	13	7.0
1942	264	17	6.4
1943	319	29	9.1
1944	359	41	11.4
1945	391	59	15.1
1946	396	76	19.2
1947	397	98	24.7

¹Before interest paid; after write-offs of acquisition adjustments.

*Source: Annual Report of 1947, p. 62.

To summarize the monetary effects of TVA power rates we observe the following direct financial increments:

Savings to the domestic consumer	\$ 12,287,000
Profits of municipal and cooperative distributors	46,392,399
Profits to Federal Government	98,000,000
Total financial savings and profits . .	\$156,679,399

This \$156,679,399 of actual cash increment to these three classes of benefactors is indeed a tribute to TVA; however there are numerous other classes of benefactors which have not been mentioned: some of these are (1) industrial users of TVA electricity, (2) interdepartmental users of TVA power, and (3) federal agency users of TVA power. Definite

savings to consumers, profits to public cooperatives and municipalities, and substantial returns to the Federal Government have been manifest herein.

In order to determine the desirability of such monetary increment, we must consider what would have happened in the absence of the TVA. In the first place, if generation and distribution of power in this area had remained in the hands of private utilities, the net profits would have been materially less. This assertion has been given factual support in preceding paragraphs dealing with the nature of the utility industry. There it was shown that, because of high fixed costs and a very elastic demand, profits could be, within limits, maximized by lowering rates. These diminished profits to the utility companies due to high prices for electricity would have meant a considerable decrease in consumption of electricity, thus depriving the people of the TVA area of many of the conveniences afforded by electricity.

While the profits to private utility companies would have been materially less than the monetary benefits to the Federal Government under the TVA set-up, they would have been, in terms of the public interest, exorbitant. Not only does the rate of profits warrant criticism, but the disposition of these profits is even more susceptible to ridicule. The numerous "milking" devices whereby holding company management and/or control confiscate the earnings of subsidiary corporations have been repeatedly exposed by Senate investigations and the

activities of the Federal Power Commission, the Interstate Commerce Commission, and the Securities Exchange Commission. One of the leading critics of utility holding companies has said:

But these earnings for investors disappear while consumers were being charged high rates. Investors have found their securities shrink in value and have received few or no dividends. They are the victims of managerial exploitation, not of low rates.⁸

The simple fact is that exorbitant profits of the holding companies would have been channeled into the hands of a few powerful businessmen, who would have added it to their private fortunes, thereby taking it out of circulation. On the other hand, the savings to the consumers, afforded by the TVA rates, is a stimulant to the purchasing power in the Tennessee Valley area. And savings on electricity bills can be used as stimulants for many businesses. Of necessity, the profits of the municipalities and cooperatives are reinvested or returned to the consumers; the profits to the Federal Government are reinvested or go into the United States Treasury. Until 1947, of the \$98,600,000 TVA profits, all but about \$15,000,000 was reinvested. This reinvestment of profits affords dual benefits to our economy. In the first place, it serves as a stimulant to business in general because of the increased purchasing power, and it provides multitudinous benefits through expansion of power facilities. Hence the desirability of the profits of power generation to assure the

⁸Bernard Osbroberk, Electricity: for Use or for Profit, p. 40.

benefits of the program to the people, the municipalities and the cooperatives, and the Federal Government, instead of to a few men in control of private utility holding companies, is unquestionable.

Thus far, convincing arguments have been presented to show that the general welfare is served in a better manner by allowing utility profits to be disposed of according to the TVA setup; however, cheaper electricity affords several other equally important benefits: stimulation of business and industry, facilitation of more productive farming, provision of a more comfortable living for all the people of the Tennessee Valley.

Specific Benefits of TVA Rates

Consideration will be given to the premise that cheap electricity will stimulate business and industry. The preceding discussion has shown that cheap rates will provide the general public with a large volume of purchasing power that would, with high rates, be taken out of the economy by private utilities. According to the estimates, this increment to the general purchasing power of the consumers in the Tennessee Valley is about \$12,287,000 annually. This factor alone is, indeed, a stimulant to business.

Now let us observe how cheaper rates and TVA promotional schemes have built up certain old businesses and inaugurated

new ones. Perhaps the most significant business boom was in the electrical appliance field. In 1934, immediately after the TVA rates became effective, the Tennessee Electric Power Company, in comparison with other utility companies of the nation, ranked first in the total number of electric ranges sold; second in the number of electric refrigerators sold; and third in the number of electric water heaters sold. In dollar volume of appliances the company ranked second.⁹ All of the companies engaged in selling electric appliances in the Tennessee Valley area reported similar increments to sales when rates were reduced. Above, it has been shown that the sales of certain appliance companies showed substantial gains. Now let us look at the overall increase in the use of electric appliances.

In January, 1935, 38 out of every 100 residential consumers in the TVA service area had electric refrigerators, as compared with 28 for the U.S. By January 1, 1936, the number of installations in the area had increased to 56 per 100 residential consumers as compared with 34 for the U.S.

The saturation as of this date in the TVA service area was 65% greater than the average for the U.S. Despite the fact that even in 1935, saturation in the TVA service area was greater than for the U.S., the percentage increase from 1935 to 1936 was 49% in the former, as compared with 17% in the country as a whole.

Statistics for electric ranges indicate a similar difference between the TVA service area and the U.S. As of January 1, 1935, only 6.1% of the residential consumers had electric ranges in the country at large, as compared with 17% in the TVA service area. By January 1, 1936, the

⁹Ostrobeck, op. cit., p. 93.

the range saturation for the country had increased 11 per cent, while the saturation in the TVA service area had increased 22 per cent. As of January 1, 1936, the saturation in the service area of 20.6 per cent was approximately three times the saturation in the United States of 6.8 per cent.¹⁰

Detailed analysis of the electrical appliance business shows that these figures are typical of all types of electric appliances. This industry, like all others, which uses critical metals, reached a period of recess during the war years, and little increase in percentage of sales was reported; however, full production is just now being resumed, and again sales are soaring.

Obviously the most salient reasons for the vast increases in sales is lower electricity rates; however, such vast increases could not have been attained without the general educational and promotional work sponsored by TVA.

The benefits of this boom to the electrical appliance industry are manifold. Some of the more important benefits are: (1) increase in the profits of the manufacturers, (2) stimulant to the small retail businesses engaged in selling these products, and (3) increase in use of these appliances means more abundant living for the people of the region.

Not only has cheaper electricity stimulated sales in the established lines of electrical appliances, but it has fostered new types of business. For example, a large food freezing and locker industry has been built up. In 1947 the

¹⁰Edward Falck, Economics of Electric Distribution, p. 14.

Tennessee Valley area boasted of:

Sixteen plants devoted to freezing and preparation for freezing where there were none in 1933. In 1946 their output was about \$4,000,000 . . . and they paid \$2,830,000 to farmers for raw materials. The number of locker plants has grown from none in 1933 to 166 in 1947; in 1945 they handled products with a farm price estimated at \$4,500,000 and a retail value of almost \$14,000,000.¹¹

Another new business which has grown up in the Tennessee Valley region is the electric house heating industry. The latest development in this line is the installation of reverse cycle, or heat pump, units which provide year round air conditioning. These units operate on the principle of refrigeration which draws heat into the house from the earth or from the outside air; in warm weather the process is reversed, heat being removed from the house and dissipated in the earth or outside air. This process of year round air conditioning is cheaper than other temperature regulating devices; hence it should become a major industry in a few years. The process is so new that it has not as yet become universally accepted; however, it is growing. For example, it was estimated that by the end of June, 1947, more than four thousand houses were equipped for electric heat, while in 1945 only fifteen hundred houses were heated by electricity.¹² Other new processes and inventions using electric energy in the

¹¹Annual Report 1947, p. 47.

¹²Ibid., p. 68.

TVA service area are briefly as follows: (1) electric enameling oven, (2) electrified abattoir, (3) electric furnace method of producing phosphate rock, and (4) electric dehydration plants.

Thus far the discussion has been limited only to the ways in which the cheaper TVA electricity has stimulated business and industry; however, acknowledgement should be made that certain other activities of TVA have materially enhanced the growth of business and industry in the TVA area. Briefly these are as follows: (1) cheaper transportation due to water navigation, (2) technical assistance rendered by TVA research and business specialists, and (3) the greater degree of security afforded by flood control.

Thus far we have not considered the appliances which are especially adapted to farm use. TVA has expanded its distribution system into vast new areas, which private utilities considered impractical from a business viewpoint. However, the expansions have, without exception, proved profitable. The magnitude of this movement toward electricity for everyone is shown by the following figures: In the TVA region one farm in twenty-eight had electric service in 1933, while in 1947 the proportion had reached one in three.¹³ With the end of the war TVA has set up plans for vast expansion; according to plans already accepted, the number of rural users of electricity will be doubled in a few years.¹⁴

¹³TVA Annual Report of 1947, p. 56.

¹⁴Ibid., p. 75.

The expansion of power into the rural areas forecasts vast increases in sales of these new electrical appliances designed for farm use. Some of these new devices are barn hay driers, grain driers, sweet-potato curing and storing houses, farm water systems, farm wiring and lighting systems, sprinkler irrigation systems, electrical kitchens, more economical methods of heating hot beds, and other modern developments.

All of these appliances and techniques add to the convenience and comfort of farm living; but more significant, they add to the overall productivity of farming. Take for example the sweet-potato curing device:

Tests showed that electric curing and storage keeps the expected shrinkage as low as 7 to 15 per cent as compared with a 50 per cent loss often experienced in pit and cellar storage.¹⁵

Vast progress has been made toward universal use of electricity; however, a great deal remains to be done before it can be said that the region is receiving full benefits of electricity.

The general contribution which electricity makes to more comfortable living is obvious; however, only those without electric power can realize the full benefits of an electrified home.

Another indirect but important benefit of TVA rates is that they have led to a considerable reduction in the power

¹⁵TVA Annual Report of 1944, p. 18.

rates of private utility companies. This rate reduction is not necessarily because the Federal Power Commission or State Commission brought pressure of the private utilities, but primarily because TVA led the way and proved that lower rates could maximize profits due to the elasticity of the demand for power. The "yardstick" principle did receive national attention at first, and probably did serve as a means of forcing private utilities to reduce rates; but the real motivating force behind cheaper rates was the fact that profits could be enlarged. In more recent years the yardstick principle has fallen into disrepute because public utilities do have distinct advantages over private companies. TVA costs could not furnish a basis for comparison with any other hydro-electric plant or system, and certainly not with steam generation. Some features in the TVA system tended to lower its costs, such as the efficiency in the use of water, made possible by a controlled river system, and its ability to charge off part of its capital costs to purposes other than power. Other features tended to increase its power costs, particularly the necessity of operating the dams primarily for navigation and flood control purposes. Consequently, in some respects TVA costs were more, and in some, less. The simple facts are that they were of an entirely different nature, so that any attempt to compare the costs of a private utility with the TVA costs would be irrational.

But as a general rule, TVA costs are less, not because of

any fraudulent allocation of costs, lower rate of interest, or absence of taxes, but because there are certain inherent advantages to multiple purpose developments which are not present in the single purpose projects of private utilities. By acknowledging this superior position of multiple purpose projects, the yardstick principle, as originally conceived, is abandoned. In its place we have a very powerful argument in support of federal control of river development projects. However, while the cost of single and multiple purpose projects is of a different nature, the yardstick principle has provided a powerful influence tending toward cheaper rates, because even though the advantages of multiple purpose lower costs are acknowledged, a general pattern for lower rates is set. This point will be given more detailed attention in the subsequent chapter.

In this chapter the theory of TVA rate making was analyzed, and statistical evidence was presented showing; first, that electric generation and power is an industry of very high fixed costs, and second, that the demand for electric power is "elastic." Hence, the logical conclusion to be drawn from these two facts is that profits can be maximized by increasing volume of output, and that this can be attained by reducing rates. Certain theoretical and practical limitations to this theory were discussed.

After the theory on TVA rates had been given factual affirmation, the social and economic benefits of cheaper electricity in the Tennessee Valley area were discussed under the

following classifications: (1) savings to domestic consumers, (2) the stimulating effect on business and industry, (3) the increase in productivity of farms, and (4) the contribution of more electricity to more abundant living.

In the concluding paragraph the "yardstick" principle was analyzed and found to be beneficial as a means of drawing very general comparisons of rates. But because of certain inherent advantages of public power over private power distribution, it would be erroneous to expect the rates of private power companies to be as low as TVA rates. However, such a yardstick, even though public projects have conspicuous advantages, is valuable because it is a powerful influence toward overall cheaper rates.

CHAPTER VI

PUBLIC UTILITY REGULATION AND THE TVA

The Significance of Electric Power in Our Economy

It will be shown that electric power is of such major significance in our economy that regulation is warranted. The inadequacy of the various regulatory devices will be exhibited, thus presenting the need for more rigid regulatory measures. Such need resulted in the creation of the TVA. By analyzing the consequences of TVA power, the benefits of federal development of our water resources will be manifest.

The development of the power industry in America is perhaps the greatest single factor in our march toward more abundant living. "Electric light and power," says the Federal Power Commission, "has come to be almost as essential in our daily lives as the bread we eat and the water we drink."¹

Use of electricity has become fundamental practically to all phases of modern living, and the "Power Age" is only in its infancy. The use and benefits of electric energy will be far greater in the next two decades than in the past two,

¹Federal Power Commission, Interim Report No. 1, p. 11.

provided there is scientific and efficient organization of the power generating and distributing system. The following table gives a good picture of how the power industry has grown since 1902:

TABLE 7

Year	Installed generating capacity - kilowatts	Kilowatt hours generated
1902	2,112,000	4,708,000,000
1912	7,670,000	17,572,000,000
1922	15,971,000	47,654,000,000
1929	31,952,000	97,352,000,000
1932	36,061,000	83,153,000,000
1935	36,133,000	99,398,000,000
1936	36,597,000	113,600,000,000

Source: Bouer and Gold, The Electric Power Industry, p. 4.

Since 1936, the last year given above, there has been a vast expansion in the use of electricity. The above table shows how the consumption of electric energy has grown from 4,708,000,000 KWH in 1902 to 113,600,000,000 KWH in 1936; the following statement shows another measure of its growth:

For the century as a whole, domestic consumers of the electric light industry rose from eight million in 1920 to twenty million in 1930. Despite an increase of only twenty-five per cent in the number of domestic consumers between 1930 and 1940, the amount of electricity consumed by them almost doubled.²

Literature on the power industry is replete with factual data showing the vast increase in utilization of electric

²J. Frederick Deuhurst, America's Needs and Resources, p. 147.

energy. Since 1902 it has grown until today it occupies a dominant role in our economic arrangement, and it looks to the future with plans for vast expansion. This expansion will take many forms, but there is considerable evidence available to indicate that the greatest expansion will be in the development of the nation's rivers. According to recent estimates, complete development of our nation's river resources could be accomplished with a cost of \$12,000,000,000 or \$300,000,000 per year over a period of forty years.³

Such potential expansion makes suitable planning and development even more important than it has been in the past. Thus, regulation of public utilities in the power industry is justified, because any business which accrues such a concentration of economic power and is so vital to our economy warrants governmental supervision; and the very nature of the electric utility business, relatively high fixed charges, facilitates monopoly, thereby precluding the protection of consumers usually afforded by competition.

Anti-social Practices of Private Power Companies

In a capitalistic economy the concentration of economic power does not necessarily mean that the people in control of such power will abuse the public; however, our history is replete with instances where such power was used to deprive the public of certain conveniences while those in control added

³Ibid., p. 446.

to their fortunes. The private power companies are no exception. The most common device which invites such anti-social practices is the holding company arrangement. At the onset, holding companies held the securities because they wanted interest and dividends rather than managerial authority. However, as holding companies developed, numerous techniques were invented to "milk" away the profits of the operating companies.

These companies often acquired property and firms wherever they could find them, charged exorbitant management fees to operating systems, drained off the earnings, distorted accounting systems to get dividends, inflated the capitalizations of companies and the book values of properties, pyramided corporate structure so that small investments controlled much operating property, and sold securities with fictitious values to foolish investors. The charges for management fees during the period of 1920 to 1930 was about four per cent of the gross revenue of the operating company.⁴ A clearer concept of just what such charges can amount to can be gained by analyzing the following example. In the case of the Standard Gas and Electric System, between 1919 and 1929, the service company collected \$36,990,000 from the operating companies, and had a net profit of more than \$17,000,000.⁵ Such exorbitant service charges were significant because they meant

⁴Emery Traxel, Economics of Public Utilities, p. 104.

⁵Ibid., p. 104.

that the consumers of electricity and gas were compelled to pay higher rates, and that the ordinary security holders in the operating company were deprived of adequate dividends. Such practices of charging exorbitant service fees were not uncommon; hence the necessity of some type of regulation was obvious.

Before the regulating techniques are discussed, it seems pertinent to point out that the purpose of any regulation is to protect the consumer from inferior service and unreasonable rates, and to protect the utility from destructive and predatory practices.

Nature of Regulation

The first type of federal control of power was handled directly by Congress. Every time a city or company wanted to build a hydro-electric dam on a navigable stream, Congress had to pass a special act. The conspicuous defects in this type of regulation is that private companies would scramble for the dam sites, even if they did not intend to build a dam. This invited monopolistic practices because one company could eliminate competition simply by gaining control of the most desirable sites.

Thus, by 1905 the private companies were rushing to obtain dam sites, even if they were not yet ready to build dams. Foreseeing private control of all good locations for hydro-electric plants, some congressmen and President Theodore Roosevelt became alarmed.⁶

⁶Ibid., p. 90.

Anxiety over the trend in utility development mounted until in 1920 Congress passed an act creating the Federal Power Commission. Thus, the first attempt to regulate electric utilities by a federal administrative commission was inaugurated. Prior to that time, and since, many states have made attempts at regulation by setting up commissions. This type of regulation has certain inherent weaknesses which private companies were not disposed to overlook.

These weaknesses are classified as follows: (1) The commission will essentially operate in an atmosphere of antagonism; (2) the principle of judicial review has hampered the work of the commissions; (3) the problem of jurisdictional limitations has inhibited effective regulation; and (5) the division of responsibility has complicated the problem.

The basic objectives of any regulatory commission are to supervise the commercial operations of private utilities. Such a setup essentially fosters subterfuge, evasion, and animosity, because the prime objective of the commission and of the management is in conflict. On the one hand, the regulatory commission is charged with the primary duty of securing efficient, widespread services for the consumers. On the other hand, the management of the public utilities are, by business ethics, forced to concern themselves chiefly with securing the highest possible return to the owners of the industry. While these two motives are generally deemed incompatible, it seems that such conflicting objectives are more

frequently spawned by animosity rather than reason. History is replete with instances where violently opposed commission orders turned out to be the means of increasing utility profits. The most classic example of this situation is the time when the private utilities yielded to pressure and reduced their rates. With a reduction of rates the objective of the commission--to provide cheaper and more widespread use of electricity--was served, and at the same time the profits of the power companies were increased. However, regardless of whether or not such antagonism is justifiable, it has persisted throughout the history of regulatory commissions.

Many eminent economists believe that the failure of the administrative process to function more successfully is directly due to unwarranted interference by the judiciary. By various discrete maneuvers the courts have subjected the decisions of the regulatory commissions to a supervision which frequently destroys the far reaching advantages of administrative expertness and specialized knowledge presumably possessed by the public officials. The early state commissions were not so closely supervised by court action; however, persistent recourse to the courts, coupled with a changing personnel on the courts, was finally rewarded by the establishment of precedents that opened the way for a judicial consideration of the work of the administrative branches of the government. The following quotation states the grounds

upon which the courts may be called upon to settle the problems:

At present, the grounds upon which appeals may be taken to the courts are numerous. A deprivation of property, a denial of the equal protection of the law, an absence of due process in the regulative process, and interference with rights of contract, a conflict between federal and state regulations, or an interference with interstate commerce.⁷

Hence, it is apparent that virtually any decision by an administrative agency, The Federal Power Commission or the various state commissions, is subject to judicial review. Such judicial meddling means that the judges of the various courts must be experts in the public utility field, or else they will in many instances make errors. With all the other duties of the federal judges, it seems virtually impossible for them to make prudent decisions as to whether a private utility is over capitalized, whether a given rate will result in a fair return, whether a fair valuation of the companies and their properties was made, and the like. Placing such diverse responsibility on the judiciary is unwise. Certainly it would be far better to leave these matters to experts in the field of public utilities. This situation has been aptly stated as follows:

There are few practices more disastrous to the sound functioning of the regulatory process than these frequent excursions by the judiciary into strange fields where their tools are antiquated and their knowledge only partially adequate.⁸

⁷J.R. Barnes, Cases on Public Utility Regulation, p. 64.

⁸Robert M. Cooper, Techniques of Public Control, p. 15.

State and federal commissions have made considerable contributions toward establishing workable precedures for the setting of utility rates; however, again we observe that they have been severely hampered by judicial action. This "workable procedure" is not an end in itself. The merits of the results depend entirely upon the efficiency of the application of the means. The problem of controlling rates, and hence the income, of a utility company is complicated by numerous factors. The most elusive of these is the problem of estimating the effects of an elastic demand upon the income and, in turn, the rate of return. For example, suppose a commission sets up a fair valuation of \$100.00 for a corporation. Based on previous consumption schedules, a reduced rate of three cents per KWH would yield a return of five per cent on the investment. However, suppose with the reduction in rates to three cents, the consumption increased sixty per cent. Then the return would obviously exceed the five per cent, which was deemed a fair return. Hence in determining a rate the commission is compelled to make estimates on the influence which a change in rates will have on the elasticity of demand. The problem of rate making is further complicated by the difficulty in estimating the value of a corporation. The various methods of valuation, historical costs, replacement costs, original costs, and the like, will not be discussed here. However, it seems significant to point out that the courts have placed special emphasis on the reproduction new less

less depreciation cost as a basis for valuation. In cadence with the early decision in Smyth (25) Ames, the administration as well as judicial regulatory endeavors have attempted to fix rates which will yield a "fair return" upon the "fair value." The interference of the courts in the problem of rate making is undesirable for several reasons. In the first place, the judges are not public utility experts and therefore are in no position to deal with these complex problems. In the second place, even if they were as efficient in such matters as the utility experts on the commission, their reviewing actions would still be unjustifiable because their mere presence invites a vast amount of litigation. Such litigation presents a bottleneck in the regulation endeavor, because of the habitual slowness of court proceedings.

In 1933, Milo R. Maltbie of the New York Public Service Commission expressed this problem as follows:

Unless some practical means is found for more promptly dealing with rate complaints--public regulation will have failed and recourse will be had to some system which will be more responsive to economic conditions and public need.⁹

Thus we observe that rate making is complicated by four major factors, (1) the difficulty of estimating the effects of rate changes on the elasticity of demand, (2) the difficulty of ascertaining what percentage would be a fair return, (3) the difficulty in the valuation of property, and (4) the

⁹Bernhard Osterberk, Electricity: for Use or Profit, p. 78.

interference of the commission endeavors by court proceedings. For these reasons commissions, as a rule, have been unable to cope with the problem of fixing rates.

Another inherent defect in the commission type regulation is that there are frequent controversies between the jurisdictional authority of the federal and the state commissions. To some extent these issues are raised by state and federal agencies themselves, but more frequently they are raised by the latter, jealously guarding their "prerogatives" against increased national power. For the most part, however, these questions are raised by the electric and gas companies, anxious to avoid all possible regulation. In more recent years there has been a trend toward more federal power in the regulation of utilities. The theoretical justification of such expansion of federal power lies in the principle that the area of administrative control must coincide with the area of the commercial operation of the enterprise sought to be regulated. Since most utility companies operate in several states, logic dictates that there should be some federal agency with power of supervision so that the federal and various state commissions could pursue unified action.

This principle was manifest in the Federal Powers Act of 1935, which filled the gap in control of interstate electricity movements resulting from the ruling of the United States Supreme Court in 1927 against the constitutionality of state

control of interstate wholesale sales.¹⁰ This act vested the Commission with the authority over the rates, services, securities, accounts, mergers, and other intercorporate affair of all persons owning or operating facilities for the transmission or wholesale sale of electricity in interstate commerce.¹¹ The recent movement toward more federal power is frequently disguised under the socially acceptable label of cooperation of federal and state commissions. Briefly, the techniques of the cooperation have been listed by R. D. Baum as follows:

- (1) Administrative notice of pending matters to other "interested" regulatory bodies with invitation to respond,
- (2) requirement of conformity with the laws of another jurisdiction as a condition to approval of applications;
- (3) joint conferences, (4) joint hearings, (5) joint investigations, (6) joint boards, (7) exchange of information, (8) exchange of experts on a loan basis.¹²

Hence we observe that with justification the Federal Commissions are gradually extending their power over all phases of utility regulation.

Even with such movements toward cooperation, the function of the regulatory commission is still impeded by jurisdictional problems.

¹⁰Public Utility Commission vs. Attleboro Stearns and Electric Company, 350 U.S. 263 (1927).

¹¹R. D. Baum, The Federal Power Commission, p. 2

¹²Ibid., p. 8.

Regulatory commissions have been criticised because their operation tends to divide managerial responsibility. Such a criticism is without significant merit. Ordinarily it shows up when some members of a private corporation wish to shift responsibility for some unwise act onto the commission. However, false the assertion may be, frequently the public and the security holders in the private companies are misguided. Hence the existence of the possibility of such misguidance can be defined as a weakness of the commission type of regulation.

In addition to these inherent administrative weaknesses of the commission type regulation, there are certain shortcomings which might be labeled functional weaknesses. These weaknesses are briefly as follows: (1) inadequate finances and personnel, (2) incompetent personnel due to the technique of selection, and (3) commissions have been polluted by the insidious influence of political activities exercised by the utilities.¹³ For obvious reasons these functional weaknesses, with the exception of the first, are more likely to occur in state than federal commissions.

Commission Type Regulation Inadequate

Commission type regulation is infected with numerous inherent and functional weaknesses. The presence of those

¹³John Bauer, The Electric Power Industry, p. 245.

weaknesses does not necessarily mean that all commissions should be abandoned; but they are convincing evidence showing that more effective regulation is imperative. This point was very aptly stated in 1933 by John S. Gray and Jack Levin as follows:

Viewing the present complete breakdown of public utility regulation, for our own conclusion we would say, it is hard to conceive of any system of legislation that will leave both the law as confused and the consumers as helpless, as the muddled condition that court-made law has left public utility regulation in the U.S. today.¹⁴

The TVA, as a public development of a river control project, was and is an aid to the regulation of a portion of our economy; a portion of our economy in which shady methods had gained such a vast power that other types of regulation had broken down. A casual observer of the prime thesis, that development of our water resources is a public function, is likely to assert that if the development of our water resources is a public function, then the argument that such a project is a means of regulation is without merit, because in a few year, with universal federal development of our river resources, there will be no private companies left to be regulated. However, more detailed analysis of this problem reveals that there is a considerable portion of the United States where, because of the absence of water power, the private companies can continue to generate and to distribute steam power. Or we might even grant the contention

¹⁴John H. Gray and Jack Levin, The Valuation and Regulation of Public Utilities, p. 143.

that at some time in the future there will be no private power companies to be regulated, and still we have not weakened the argument that TVA, as a specimen river development program, is and has been for the past fourteen years a very valuable regulatory device.

TVA as a Supplement to Commission Type Regulation

Now let us analyze the nature and extent of TVA as a supplement to the commission type regulation. In the first place, regulation by the "yardstick" principle goes straight to the heart of the problem of regulation, without cumbersome and prolonged legal proceedings it sets a general pattern for rates. Hence the almost insurmountable problem of evaluating the assets of the private utilities becomes irrelevant; and the new methods infer that private utility rates should be as low, or nearly as low, as TVA rates. If the utility companies are overcapitalized or have over evaluated their assets, they will be chastized by their own sins, for they will not be able to pay a fair return to their investors while charging TVA rates.

Regulation, by the development of TVA, has resulted in substantial decreases in rates, not only in the Tennessee Valley area but throughout the United States.

While the "yardstick" principle is no longer accepted, as was pointed out in Chapter IV, it is significant because the

TVA rate policy proved that the demand for electricity is elastic and that in most cases net returns can be increased by reducing rates. Hence it might be said that the policy of rate making established by TVA resulted in decreased rates and increased consumption because of education rather than regulation--education in the sense that private power companies learned that lower rates could increase profits. The following table shows how the cost per KWH of electricity in the United States has been reduced.

TABLE 8

COMPARISON OF TVA ELECTRICITY RATES WITH VARIOUS
RURAL CONSUMERS IN DIFFERENT SECTIONS
OF THE UNITED STATES

Average Rate per KWH in Cents						
Year	TVA	Ga. Power Co.	Ala. Power Co.	Ohio Power Co.	Cal. Power Co.	Ave. for U.S.
1947	1.66	-	-	-	-	-
1946	1.78	2.14	2.36	3.28	3.32	3.22
1945	1.85	2.40	2.60	3.30	3.43	3.41
1944	1.88	2.27	-	3.44	3.54	3.51
1943	1.96	2.61	2.79	3.47	3.56	3.60
1942	2.02	2.72	2.91	3.53	3.63	3.69
1941	-	2.74	2.98	3.58	3.66	3.73
1940	-	2.74	2.95	3.63	3.69	3.84

*Source: Rates of private power companies--Moody's Public Utility Manual 1947, Rates of TVA--TVA Annual Reports, 1940-1947.

The table above reveals that in every state considered, and in the United States as a whole, the cost of electricity for domestic use has shown a steady decline. The fact that the rate for electricity in Georgia and Alabama, states bordering on the TVA service area, are much cheaper than the

rates in Ohio and California, indicate that the TVA is instrumental in lowering rates. A general survey of the rates for every state in the United States reveals that there is a definite relationship between low rates and public power projects; the lowest rates being in the vicinity of the public power projects.¹⁵

There are two definite reasons for the reduction of rates in areas near the TVA service area, (1) the presence of low TVA rates gives the Federal Power Commission a very potent weapon in its fight for lower rates; and (2) the TVA rates have, as stated above, conclusively proven the elasticity of demand for electricity. Of these two reasons, the latter seems more influential.

In this chapter the problem of regulating the generation and distribution of electricity has been given detailed consideration. The necessity of regulation was established and the types of regulation were analyzed. In the course of the analysis the numerous functional and administrative weaknesses of commission type regulation were pointed out. It was shown that the weaknesses of commission regulation rendered it inadequate as a regulatory agent, unless complemented by TVA. It was found that TVA had done more in a few years to give consumers electricity at a fair rate and to provide attractive returns to the investors at the same time, than the combined efforts of the commissions throughout their history.

¹⁵Moody's Public Utility Manual 1947, Sec. on Public Utilities, p. 132.

CHAPTER VII

CONCLUSION

The purpose of this study, to show that the development of our river resources is a public function, has been substantiated by the data which have been presented in the preceding chapters. Since the TVA is the outstanding public river development program in the United States, material support has been given to our thesis by analyzing its numerous social and economic effects. The obvious and logical conclusion is that since this public river control project is a success, subsequent similar projects will also prove economically and socially beneficial. These benefits were briefly summarized under four general headings: (1) flood control, (2) navigation, (3) more prudent use of the soil, and (4) the generation and distribution of electric energy. While the numerous and noteworthy benefits of the first three purposes were briefly discussed, the burden of this study was primarily concerned with the benefits of the development of our rivers for the generation of electric energy. Such a power program, as demonstrated by the TVA, has numerous social and economic benefits. These benefits were divided into the following general classifications: (1) benefits made possible as a result of cheaper electricity, (2) benefits afforded by

extension of electric service into areas which previously had no electric facilities, and (3) benefits to the nation as a whole due to the effect of TVA rates on regulation of private utility companies.

In our discussion of the significance of cheaper electricity we found that the TVA has been able to sell electricity at a rate far below the average rate in the United States for two reasons: first, its rates are based on the theory that the demand for electricity is elastic; and, second, it can generate and distribute electricity at a lower cost than the private power companies because, as a multiple purpose project, it has certain inherent advantages which are not enjoyed by single purpose projects. This proposition was established in Chapter IV in the discussion of cost allocation.

It has been shown that the benefits of these lower rates are: (1) they provide a means of greatly increasing the productivity of farms; (2) they add to the general convenience of living; (3) they stimulate the sale of electrical appliances; (4) they facilitate industrialization; and (5) they encourage the establishment of new types of business which use electricity. The validity of each of these benefits has been given factual support in previous chapters.

The extension of electricity into areas which previously had no electricity was an endeavor which was looked upon with considerable skepticism by the management of private power companies. However, TVA erected new lines and installations

in remote areas which were, strictly from a business viewpoint, inadvisable. Because of the availability of electric energy, vast new areas were made more productive. For example, as previously stated, in 1930 in the TVA region only one farm in twenty-eight had electricity, while in 1947 one farm in every three had electric service. This expansion of electric service is one of TVA's most daring and successful endeavors.

Facts presented earlier in this study conclusively prove that the TVA has been instrumental in lowering power rates throughout the United States, but the benefits of such lower rates cannot be accurately computed. However, these lower rates in all sections of our nation have the same social and economic effects as those described for the Tennessee Valley area, the only difference being that the TVA benefits are on a much larger scale.

The social and economic effects of TVA in general, and TVA power in particular, have been summarized, and in the body of this study convincing evidence has been presented to prove that the TVA has brought numerous benefits to the Tennessee Valley area. If such a federal project met with unquestionable success in the Tennessee Valley region, is it not logical to assume that federal river developments could render the same benefits to the areas surrounding all of our great rivers?

The numerous benefits of multiple purpose development of our river resources have been shown, and it has also been

shown that private business cannot be as effective in this field as the Federal Government. The basic reason for this is that such an endeavor would not be profitable to private business.

The multiple purpose development of our rivers is unprofitable as a private business endeavor, but when such a project is undertaken by the Federal Government, it may be a very commendable enterprise. The difference in the two, private and public development, is that private business measures its success in terms of monetary gain, while a public project measures its success in terms of economic and social benefits. Therefore, since navigation and flood control projects are not revenue producing and since such development would not reap a profit for private enterprise, the people in river areas would not enjoy the manifold benefits of multiple purpose river control projects without federal development.

The conclusion of this study, therefore, is that the development of our river resources is an inherent function of public authority.

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