THE HISTORY OF POWER GENERATION AND DISTRIBUTION IN THE GREENVILLE AREA

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Introduction

The story of Greenville, like the story of electricity, began on the river. And, the history of electric power generation and distribution in Greenville County is primarily concerned with the growth of textiles and the ensuing birth of electricity made possible by the Reedy and Saluda Rivers.

First, this paper will discuss the beginnings of isolated uses for electricity and the early electric power generating facilities of the Greenville Area. Information such as dates, site location, and other obtainable data will be included.

Second, events ocurring outside the county but having a significant impact on the overall development of electric power generation and its use are also considered; for example, the forming of Southern Power Company, the predecessor to Duke Power Company, and also the work of early pioneers in power generation such as Thomas Edison.

The ultimate purpose of this paper is to bring together a comprehensive record of electric power generation and its use in the Greenville Area. This information leads to the conclusion that Greenville is perhaps the best example of the successful relationship between textiles, electricity and economic growth.

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Even before electricity, life on the river was thriving in Greenville County. Giant water wheels churned through frothing waters and seemed in almost perpetual motion. The river was an artery which carried the lifeblood of every mill. Two such arteries, the Reedy and Saluda Rivers, nourished the beginnings of a growning region.

A glimpse of business on the river can be seen from the recollections of the late Milton A. Sullivan who grew up on the

Reedy River in southern Greenville County at a point called Tumbling Shoals.

"To a little fellow there were many interesting things going on down there on the far bank of the river; the cotton ginning, saw milling, corn being turned into hominy or meal, wheat turned into flour, bran, shorts and middlings, people hoisting up bags of wheat and corn to the second floor of the mill house from two horse wagons, others leaving with eight or ten barrels filled with flour or with cloth bags of meal, occasionally some fellow on a mule with only a little sack of grain ahead of him on the mule's shoulders, and very rarely when someone showed up with a yolk of oxen pulling a wagon filled with logs to be sawed or a load of grain to be ground. There were no automobiles or trucks in those days. Some older person would take me on tours to see various machines in operation and to keep me a good distance from the whirring and humming cotton gins, the whining big circular saw eating its way through an oak and the 'swish' of the big round mill stones crushing the grain."

But it was not long before small mills like these would give way to larger ones as the textile industry began to move south with the aid of Northern captial. In 1875, Camperdown Mills became Greenville's first textile plant. The town's people then supported the efforts of a few local businessmen to erect Piedmont Mills on the Saluda to show that Southern capital could produce as well. Spurred by this mill activity and the coming Atlanta and Charlotte Airline Railroad in 1872, the city's population grew to over 6,000 persons.[1] Larger turbines replaced water wheels. Spinning frames replaced mill stones. Industrial growth in Greenville County was just beginning.

Farther north, developments were taking place that would increase industrial productivity, changing the pace of growth forever. Thomas Edison, George Westinghouse and Charles P. Steinmetz were in fierce competition for developing ways to generate and use electricity. An electric motor connected to textile machinery could do ten times more work than water or steam.[2] However, the first use for electricity was lighting, as Edison successfully developed direct current generation for powering his newly perfected incandescant light bulb. The

world's first electric power generating station was established in New York by Edison in September, 1882.

It took only six years for Edison's impact to reach Greenville. An 1888 Greenville City Directory declared that "the city council has decided to light the city with electricity, and arrangements are being made to establish a complete system of electrical machinery and apparatus to furnish arc lights for the street and incandescent lights for inside lighting. The next steps in the line of progress will be the paving of the streets and the establishment of water works . . ."

To carry out this proclamation, the city of Greenville entered into a contract on May 3, 1888 with Brush Electric Company of Cleveland, Ohio who would provide brush-arc generators. On the same day, the city acquired Ball Engine Company of Erie, Pennsylvania to provide a coal-fueled, steam-powered engine for driving the DC generators that would power eleven arc lights for the streets. The powerhouse, located on the banks of the Reedy at 211 Broad Street, is still intact and listed on the National Register of Historic Places. Now owned by Duke Power Co., it is no longer in operation.

On June 20, 1890, the city sold the plant to R. R. Asbury and his son A. D. Asbury who had already obtained the city's gas company in 1875. This new contract with Asbury & Son required 40 arc lights of 1,200 candle power each to be operated according to "Moon Schedule" for a period of 15 years. The city agreed to pay Asbury & Son 100 dollars per arc light per year, payable in equal monthly installments. On the same day, city council passed an ordinance making it illegal for anyone to tamper with or damage any electric wires or poles. The fine for such a violation was no less than five and no more than fifty dollars, half of which would be paid to anyone turning in such a person. The violator could also spend up to thirty days in jail.

Asbury & Son converted to a stock company valued at $54,000 on March 29, 1891 and became the Greenville Gas, Electric Light and Power Company., They are reputed to have operated an additional power plant on Whitmire Street which was similiar though slightly smaller than the Broad Street facility.[4]

The earliest use of electricity by industry in the Greenville Area was in 1894 by a Pelzer Manufacturing Company textile mill near the town of Pelzer. Built on the Saluda River, this was one of the South's earliest hydroelectric facilities, preceeding the more celebrated Portman Shoals dam (7,700kw) near Anderson by three years. Charles P. Steinmetz, the founding father of General Electric Company, personally installed the dam's 2,750kw alternating current generator 3.7 miles from the mill. It is reported that, at that time, this was the farthest a generating source had ever operated from the machinery it powered. Why did Steinmetz choose to perform such an important test on this far away textile mill in rural South Carolina? It is important to note that, at the time, there was a great deal of debate over the use of Edison's DC as opposed to Westinghouse's AC. The important advantage of AC was that it could travel greater distances than its DC counterpart. But, there was a great deal of public controversy over the dangers of AC. So, it is believed that Steinmetz felt that public acceptance of AC in a rural area with relatively little industrial development would be easy. Also, any mishaps here away from the industrial North would diffuse or eliminate any repercussions to other potential customers.

The AC generator worked efficiently and safely over the distance, and news of this achievement traveled fast. It is said that an engineer from London took an interest in this news and traveled first to New York by ship, then by train to Virginia, and the rest of the way by a rented horse and buggy just to see for himself that it worked.[5] Also of significance, this hydroelectric facility enabled this textile plant to be one of the earliest to provide inside electric lighting. In 1896, Pelzer Manufacturing Co. built a second hydroelectric unit and accompanying plant a few miles upstream. Today, both plants are owned and operated by Kendall Company and the original equipment at both plants still produces a combined 5,250kw making up 40 to 50 percent of all their needed electricity requirements.[6]

In addition to lighting and the textile industry, electricity became valuable to transportation. In 1898, the horsedrawn

railway system that had operated in Greenville for 25 years would give way to the electric railway. George M. Bunting of Philadelphia bought the Greenville Gas, Electric Light and Power Co. from the Asburys and secured a franchise for the city's new transportation system.[7] The first streetcar ran on January 12, 1901 as the Greenville Traction Company.[8] The railway ran from the Southern Railroad Depot to the city limits on Pendleton Street and near the city limits on Augusta Street. Four years later, the beltline was added and the DC electricity was supplied by three, 300kw rotary-converters at the Broad Street station.

After obtaining the transportation system through its purchase of the Greenville distribution system in 1913, Southern Public Utilities promoted night-time use of transportation. One way they did this was by building Dukeland Park in the Sans 'ouci section which was opened in May, 1915. Streetcars were a elcomed form of transportation in the early days, and one can asily see why in this account of street conditions before 1910. "There were no paved streets or sidewalks anywhere. The mud was deep, red and sticky in bad weather. The dust was equally unpleasant on dry, windy days. It was quite a site to see the ladies attempting to hold their long skirts at a decent height while daintily stepping from stone to stone, keeping their balance and dignity at the same time."[9]

The two rail overhead trolley replaced the railway streetcar in the mid 30's while a 1000kw rotary-converter was added to the distribution system at the Monaghan main switching station. The electric transportation system ultimately gave way to diesel buses in 1956.[10]

With the versatility of electricity realized, it is not surprising that many hydroelectric facilites would begin to energy as a profitable undertaking for several area businessmen. Thus were the beginnings of 40 years of domination by hydroelectricity over steam generation.

The Saluda River Power Company was organized in 1905 by Alester G. Furman, Lewis W. Parker, J. I. Westervelt and H. J.

Haynsworth.[11] On the Saluda, five miles northwest of downtown Greenville, they constructed a 496 ft. long concrete dam that impounded 475 acres of water. The powerhouse equipment consisted of five Westinghouse AC generators, one 200kw and four 600kw, with direct-connect turbines. These 2,600kw provided the electricity requirements for the Poinsett Mills, Brandon Mills and the entire city of Greenville. A former employee reported that all the meters could be read in about half a day.[12]

The Saluda River Power Co. was rechartered as Greenville-Carolina Power Co. later that year. This plant was conveyed to Southern Power Co. (Duke Power Co.) in 1910 and is still operating with four of the original generators. The 200kw generator was retired from service in 1964.

Farther down the Saluda, Belton Power Company added Greenville County's next hydroelectric facility in 1906. The plant is reputed to have been designed by J. E. Sirrine and constructed by Gallivan Building Co. The dam was 644 ft. in length and the powerhouse equipment consisted of three 1,000kw General Electric generators with direct-connect turbines. A fourth G. E. generator rated at 500kw with direct-connect turbine was added in 1924. The plant was conveyed to Belton Light and Power Co. in 1963. Four of the original generators are still operating at what is called the Holidays Bridge site.

Also in 1906, W. P. Nesbitt and G. B. Nesbitt organized Cedar Falls Light and Power Co. They built a small hydroelectric facility on the Saluda near Fork Shoals to provide power for the Fork Shoals Manufacturing Co. textile plant and surrounding mill village. In 1908, heavy rains washed the dam away and it was not rebuilt.

The Reedy River Power Co. built a 270 ft. rubble masonry dam on the Reedy, five miles east of the town of Ware Shaols in 1909. The powerhouse equipment consisted of two horizontal shaft turbines, direct-connected to Crocker-Wheeler Electric Manufacturing Co. generators rated at 480kw each. The station, known as Boyd's Mill, was aquired from National

Utilities of South Carolina by Southern Public Utilities in 1932 and is now operated by Duke Power Co.

During all this activity on Greenville area rivers, events in another section of the Piedmont were beginning to shape the growth of textiles and electricity here in the South. James B. "Buck" Duke, Dr. W. Gill Wylie and William States Lee envisioned developing hydroelectricity on a grand scale, and Catawba Power Co., forerunner of Southern Power Co., supplied its first electricity to a cotton mill in Rock Hill on March 30, 1904. They adopted a "mill a mile" concept and set out to industrialize the South with the aid of electricty.[13]

Their vision would only become a reality with long distance, high-voltage transmission of electricity. With this, productivity of textiles could be increased and new industry attracted to the area. However, there were those that were skeptical, since industry was so sparse and public acceptance of alternating current was risky.

Duke's ambition would not be dampened. To encourage the use of electricity by textiles, Buck and his brother Ben Duke had made large investments in mills throughout the Piedmont. As early as 1902, the Dukes, along with Thomas F. Ryan, organized the South's first bleachery and finishing operation. Before the Union Bleachery and Finishing Co. of Greenville, southern textiles shipped their coarse grey goods North for finishing and marketing.[14]

Southern Power Co. (established 1905) had invested heavily in hydroelectric power in the Carolinas before turning to steam generation in 1911. That is the year Southern Power Co. operated its very first steam station on the first day of April in Greenville near Monaghan Mills. The plant contained six hand-fired boilers, and a Westinghouse turbine-generator rated at 6,400kw that operated until 1927.

One last small hydroelectric station went into operation in Greenville County in 1912 at Tumbling Shoals near the town of Laurens. Senator Nathaniel B. Dial, Joseph H. Sullivan, and Joe Flemming operated the station initially as Sullivan Power

Co. The rubble masonry dam was 141 ft. in length and the powerhouse equipment consisted of one 500 horse power Allis Chalmers turbine generator rated at 300kw. Reedy River Power Co. conveyed the station to National Utilities who in turn deeded the station to Southern Public Utilities (subsidiary of Southern Power Co.) in 1932. Retired in 1968, the dam was leveled and the powerhouse razed in 1970.

Following the proliferation of power generation and the growing numbers of textiles came the residential user of electricity. Electric power was originally intended only for industry, but mill owners would bargain for additional power for lights in their mill village homes. Soon to follow lighting would be electric cooking and water heating and the electric iron. These growing uses for electricity necessitated the Southern Public Utilities, a wholly owned Southern Power Co. subsidiary, for providing electric services to homes and business in 1913.

Later that same year, SPU purchased the entire Greenville distribution system which included electric rail car transportation. As Southern Power Co. and its subsidiaries grew with more capacity and greater transmission capability, the Greenville area became interconnected with one of the largest power networks of its time. In the early 1920's, Southern Power Co. ran high voltage transmission lines (100kv) from its large hydroelectric station at Great Falls, through Greenville, and connected with Georgia Power Co. near Tocoa, Georgia. One of the earliest interconnects between utilities, this would assure constant availability of power for a fast growing Greenville area.

A January 15, 1920 issue of "Southern Public Utilities Magazine" was dedicated to the subject of Greenville and such growth, celebrating the opening of a new branch building. It remarked, "A remarkable record of growth is presented by the city of Greenville of the year 1919. Few cities in the entire country will be able to equal it. An increase in population for the year might conservatively be four or five thousand. During the first ten months of 1919, 143 new concerns were organized, with a total capitalization of $1,615,000." Greenville stood

third among South Carolina counties in wealth. The number of customers in Greenville had increased from 600 in 1910, to 3,100 by 1919.

The Greenville branch boasted the largest display window in town that year, which would effectively market new electric appliances to be used in the home. In those days there were separate meters, one for lighting, and another from cooking and water heating. The average electric bill was between two and eight dollars for the month.

Delivery service of home appliances in those days was made by a single one-horse wagon. The story is handed down that a certain horse, who upon hearing the noon whistle, would immediately break for the company hay barn, as this was also his feeding time. Needless to say, many a delivery man was left stranded due to this horse's punctual eating habits.

In 1925 a severe drought hit the Piedmont, and steam stations such as the 30,000kw Tyger (built in 1924) in neighboring Spartanburg County had to make up for dwindling hydroelectric generation. This encouraged the construction of larger, more centralized steam stations, in addition to consolidated power output facilities and long distance transmisison and distribution services. By 1928, Greenville benefited from a consolidated Duke Power.[15]

On a lighter note, in 1929 Southern Public Utilities provided Furman University's Manly Field with 28 1,000 watt lamps, each with giant metal reflectors. That year South Carolina's first night football game was played between Furman and Erskine. Furman was victorious, 19-6, before an estimated home crowd of 5,000.[16]

However, that same year Greenville and the nation would begin a long, disasterous depression. Industrial growth and demand for electricity fell everywhere, and it was not until after World War II that growth would continue at its pre-depression pace. By 1946 the number of retail customers in the Greenville area had grown to 31,897 and industrial growth accelerated with the availability of an abundant power supply.

By the mid 1950's 80 percent of the nation's textiles was located in the Carolinas and Georgia. One third of all textiles was located within 100 miles of Greenville, making it the "textile center of America."[17]

To help meet the power demands of such industrial growth, Duke Power Co. installed its Lee steam station near Pelzer about 15 miles from Greenville in 1951. At that time the 180,000kw coal-fired plant was the system's largest and most efficient. In 1958, a third generating unit was added to the station for an additional 165,000kw capacity.

Residential and commercial users of electricity in Greenville had increased to over 75,000 by the 1960's with an additional 100 plus industrial customers. The average annual kilowatt-hour usage by Duke Power's Greenville customers in 1961 was 6,140, nearly 50 percent above the national average. The average rate per kilowatt hour was 1.91 cents, more than 20 percent below the national average.[18] From that point, electric rates actually began to drop in Greenville and the rest of the Duke Power Co. service area, falling to an average rate of 1.72 cents per kilowatt hour in 1970 before gradually increasing to 3 cents by 1975. However, the real cost of electricity (measured by the costs of the average bill as a percent of the average customer's income) has remained virtually the same since 1955 at almost four percent.

Another of the area's generating facilities worth noting is Duke Power's Oconee Nuclear Station only 35 miles west of Greenville. At the time of its first operation in July, 1973, Oconee was the world's largest nuclear power plant at 2.58 million kilowatts. Today, the Greenville area is served by Duke Power Company's many generating facilities, from the tiny Saluda hydro to the giant Oconee Nuclear, and is a major member of Duke's 20,000 square mile service area here in the Piedmont.

Conclusion

The development of textiles in the South had provided an impetus for growth in a society otherwise considered agrarian relative to its industrialized counterpart in the North. But, as

the plow shear was gradually replaced by the spinning frame as the major tool for economic development, an even greater force would further diminish the economic polarization between North and South that had occurred during the 19th century. That equitable force was electricity.

And perhaps there is no better example of the successful marriage of textiles and electricity than right here in the Greenville area. The efforts of men like Edison, Steinmetz, and Duke had produced the availability of a new energy that could breathe life into sleeping industrial giant, now considered an integral member of the prosperous Sunbelt.

Even the early Greenville pioneer and entrepreneur, Vardry McBee, could not have envisioned the growth that has been achieved since that first water-powered grist mill on the banks of the Reedy River.

FOOTNOTES

[1]Kenneth Frederick Marsh, *The New South, Greenville, S.C.*, R. L. Bryan Co., Greenville, S. C. (1965)

[2]John Wilbur Jenkins, *James B. Duke, Master Builder*, University of North Carolina Chapel Hill (1971)

[3]City of Greenville Ordinance 1890

[4]Information handed down by Mr. G. Arthur Black of Greenville. He served as Duke's Greenville Area superintendent until his retirement in 1972.

[5]Mr. G. Arthur Black, Old files

[6]Mr. Alfred Blando, Location Engineering Manager, Kendall Co.

[7]Mr. G. Arthur Black, Old files

[8]"Selected Chronology of History of Greenville," Compiled by Penny Forrester, Tinie Freeman, Choice McCoin, and Albert Sanders, Greenville, S. C.

[9]*The Greenville News, Tricentennial Edition*, October 26, 1970 p. 14E.

[10]Mr. G. Arthur Black, Old files

[11]Marsh, *The New South, Greenville, S. C.*

[12]*The Grenville News Special Edition* May, 1960.

[13]Joe Maynor, *Duke Power, The First 75 Years* (1979).

[14]Marsh, *The New South, Greenville, S. C.*

[15]Maynor, *Duke Power, The First 75 Years*

[16]Furman University Sports Information Department

[17]Marsh, *The New South, Greenville, S. C.*

A majority of the information within this paper was obtained from Duke Power Company records unless otherwise footnoted. Word-of-mouth information is footnoted by the individual's name and connection.