North Carolina

In 1881, the first electric power generation in North Carolina took place in Salem. On October 19, 1885, the Thomson-Houston Electric Light Company began operations in Raleigh. The first lights were turned on in Raleigh on December 3, 1885. By as early as 1908, Carolina Power and Light had two hydroelectric plants, a one-megawatt steam plant, and a three-quarter-megawatt steam plant.[1]

North Carolina had the eleventh largest population and utility generating capability in the Nation in 1996. Most of the electricity in the State is generated at coal-fired plants. Most of the coal (62.8 percent) delivered to electric utilities in North Carolina was shipped by rail from Kentucky. Another 32 percent came from West Virginia and 5.2 percent from Virginia, mostly by rail.[2] North Carolina is also very reliant on nuclear power and the nuclear facilities in the State are considered some of the best run in the country. Three of the five largest plants in the State, including the largest, Roxboro, are coal-fired. The other two are the McGuire and Brunswick nuclear plants. The largest utility in the State is the Duke Power Company, which is the fourth largest utility in the country and the largest utility presence in South Carolina as well.

While concentrations of sulfur dioxide (SO_2), nitrogen oxides (NO_x), and carbon dioxide (CO_2) per square mile were rather high compared to the other States, no generators within North Carolina were targeted by the Clean Air Act Amendments of 1990 to reduce their emissions. SO_2 totals declined slightly from 1986 to 1991 and then rose in 1996. NO_x emission totals increased in 1986 and 1991 but decreased in 1996. CO_2 emissions rose over both time frames. It is likely that North Carolina will need to design a State implementation plan for reducing ground-level ozone in response to a proposal released by the Environmental Protection Agency (EPA) in October 1998. The EPA proposal does not mandate which sources must reduce pollution. However, EPA states that utilities would be one of the most likely sources of NO_x emissions reductions.

In 1996, the average price of electricity in North Carolina, 6.53 cents per kilowatthour, was just under the average price of 6.86 for the Nation. The average price in North Carolina for the residential sector was 8.05, for the commercial sector was 6.39, for the industrial sector was 4.79, and for the "other" sector was 7.02. (The other sector includes public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.)[3] As is typical of a southern State due mainly to the frequent use of air conditioning, North Carolina's residential sector use of electricity is very high. The average annual growth rate in utility retail sales to all sectors was 3.4 percent during the period 1986 to 1996 with the commercial sector having the highest annual growth rate of 4.7 percent.

Both coal-fired generating capability and net generation decreased during the period 1986 to 1996 while nuclear generating capability and net generation increased. The nonutility share of electricity generated in North Carolina rose from 4.8 percent of the total in 1986 to 8.5 percent in 1996. The State is the tenth largest in the Nation in terms of nonutility capability.

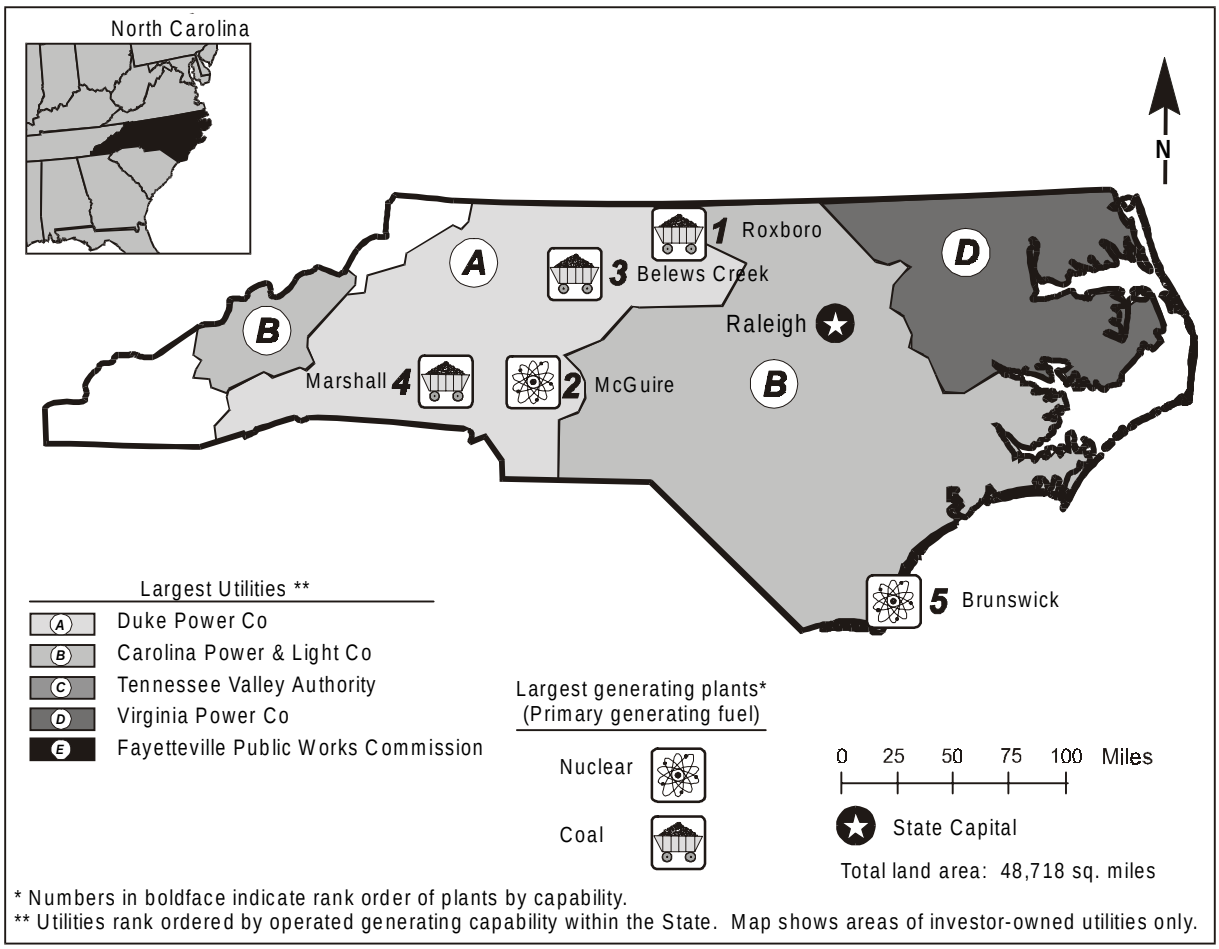
North Carolina has not been as aggressive as a lot of other States in moving to restructure its electricity industry. In April of 1997, a bill was passed that established a 23-member commission on restructuring which is to deliver a report by 1999 to the State legislature. In order to protect the economy of North Carolina and its cities, mayors and city officials have urged the legislature to pass restructuring legislation to prevent large industrial users from relocating to other States in order to attain lower electricity prices.[4]

[1] Jack Riley, *Carolina Power and Light Company, 1908-1958*, Edwards and Broughton (Raleigh, NC, 1958), p. 63.

[2] Energy Information Administration, *Coal Distribution January-December 1996*, DOE/EIA-0125(96/4Q) (Washington, DC), Table 34.

[3] Energy Information Administration, *Electric Power Annual 1996 Volume II*, DOE/EIA-0348(96)/2 (Washington, DC, December 1997), Table 7.

[4] Energy Information Administration, Status of State Electric Utility Deregulation Activity, http://www.eia.doe.gov/cneaf/electricity/chg_str/tab5rev.html.



* Numbers in boldface indicate rank order of plants by capability.
** Utilities rank ordered by operated generating capability within the State. Map shows areas of investor-owned utilities only.

Table 1. 1996 Summary Statistics

Item	Value	U.S. Rank
NERC Region(s)		SERC
Net Exporter or Importer		Importer
State Primary Generating Fuel		Coal
Population (as of 7/96)	7,309,055	11
Average Revenue (cents/kWh)	6.53	[a]31
Industry		
Capability (MWe)	22,776	[b]11
Generation (MWh)	112,358,955	[b]11
Capability/person (KWe/person)	3.12	[b]19
Generation/person (MWh/person)	15.37	[b]18
Sulfur Dioxide Emissions (Thousand Short Tons)	454	12
Nitrogen Oxide Emissions (Thousand Short Tons)	225	12
Carbon Dioxide Emissions (Thousand Short Tons)	74,527	12
Sulfur Dioxide/sq. mile (Tons)	9.32	14
Nitrogen Oxides/sq. mile (Tons)	4.61	17
Carbon Dioxide/sq. mile (Tons)	1,529.77	17

Item	Value	U.S. Rank
Utility		
Capability (MWe)	20,923	11
Generation (MWh)	102,786,590	11
Average Age of Coal Plants	28 years	
Average Age of Oil-fired Plants	26 years	
Average Age of Gas-fired Plants	4 years	
Average Age of Nuclear Plants	15 years	
Average Age of Hydroelectric Plants	48 years	
Average Age of Other Plants	--	
Nonutility[c]		
Capability (MWe)	1,853	10
Percentage Share of Capability	8.1	19
Generation (MWh)	9,572,365	11
Percentage Share of Generation	8.5	21

-- = Not applicable.

Table 2. Five Largest Utility Plants, 1996

Plant Name	Type	Operating Utility	Net Capability (MWe)
1. Roxboro	Coal	Carolina Power & Light Co	2,477
2. McGuire	Nuclear	Duke Power Co	2,258
3. Belews Creek	Coal	Duke Power Co	2,240
4. Marshall	Coal	Duke Power Co	2,090
5. Brunswick	Nuclear	Carolina Power & Light Co	1,521

Table 3. Top Five Utilities with Largest Generating Capability, and Type, Within the State, 1996
(Megawatts Electric)

Utility	Net Summer Capability	Net Coal Capability	Net Oil Capability	Net Gas Capability	Net Nuclear Capability	Net Hydro/Other Capability
A. Duke Power Co	11,587	7,329	298	1,200	2,258	502
B. Carolina Power & Light Co	8,169	5,111	431	28	2,381	218
C. Tennessee Valley Authority	406	--	--	--	--	406
D. Virginia Power Co	365	--	44	--	--	321
E. Fayetteville Public Works Comm	286	--	--	286	--	--
Total	20,813	12,440	773	1,514	4,639	1,447
Percentage of Industry Capability	91.4	--	--	--	--	--

-- = Not applicable.

Figure 1. Utility Generating Capability by Primary Energy Source, 1996

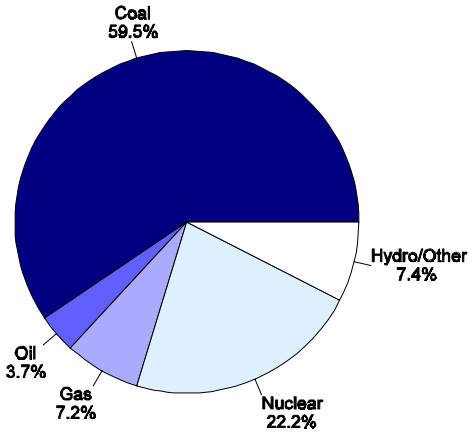


Figure 2. Utility Generation by Primary Energy Source, 1996

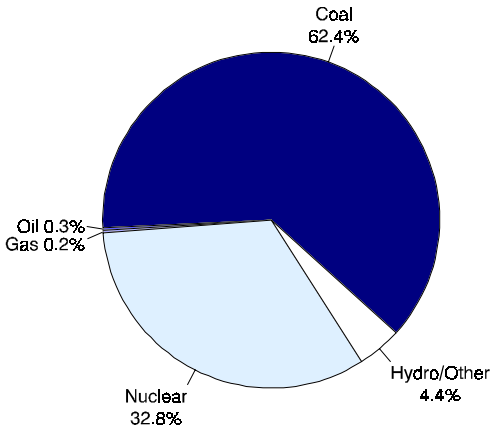


Figure 3. Energy Consumed at Electric Utilities by Primary Energy Source, 1996

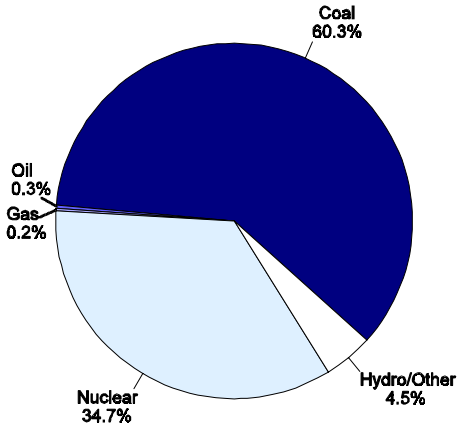


Table 4. Electric Power Industry Generating Capability by Primary Energy Source, 1986, 1991, and 1996
(Megawatts Electric)

Fuel	1986	1991	1996	Percentage Share 1986	Percentage Share 1991	Percentage Share 1996
Coal	12,366	12,500	12,440	62.8	58.9	54.6
Oil	574	773	776	2.9	3.6	3.4
Gas	390	257	1,514	2.0	1.2	6.6
Nuclear	3,880	4,639	4,639	19.7	21.9	20.4
Hydro/Other	1,862	1,962	1,554	9.5	9.2	6.8
Total Utility	19,072	20,131	20,923	96.8	94.9	91.9
Total Nonutility	626	1,088	1,853	3.2	5.1	8.1
Industry	19,698	21,219	22,776	100.0	100.0	100.0

Table 5. Electric Power Industry Generation of Electricity by Primary Energy Source, 1986, 1991, and 1996
(Thousand Kilowatthours)

Fuel	1986	1991	1996	Percentage Share 1986	Percentage Share 1991	Percentage Share 1996
Coal	53,757,897	46,762,330	64,097,781	66.6	52.4	57.0
Oil	171,277	174,136	259,252	0.2	0.2	0.2
Gas	64,136	247,496	194,555	0.1	0.3	0.2
Nuclear	20,286,433	30,312,425	33,718,182	25.1	33.9	30.0
Hydro/Other	2,517,538	6,023,676	4,516,820	3.1	6.7	4.0
Total Utility	76,797,281	83,520,063	102,786,590	95.2	93.5	91.5
Total Nonutility	3,866,568	5,766,820	9,572,365	4.8	6.5	8.5
Industry	80,663,849	89,286,883	112,358,955	100.0	100.0	100.0

Table 6. Electric Power Industry Consumption by Primary Energy Source, 1986, 1991, and 1996
(Quadrillion Btu)

Fuel	1986	1991	1996	Percentage Share 1986	Percentage Share 1991	Percentage Share 1996
Coal	0.515	0.451	0.623	55.5	45.9	50.7
Oil	0.002	0.002	0.003	0.2	0.2	0.3
Gas	0.001	0.003	0.002	0.1	0.3	0.2
Nuclear	0.219	0.326	0.358	23.6	33.2	29.2
Hydro/Other	0.026	0.062	0.047	2.8	6.4	3.8
Total Utility	0.764	0.844	1.034	82.3	86.0	84.2
Total Nonutility	0.166	0.138	0.195	17.7	14.0	15.8
Industry	0.928	0.982	1.228	100.0	100.0	100.0

Figure 4. Utility Generation of Electricity by Primary Energy Source, 1986-1996

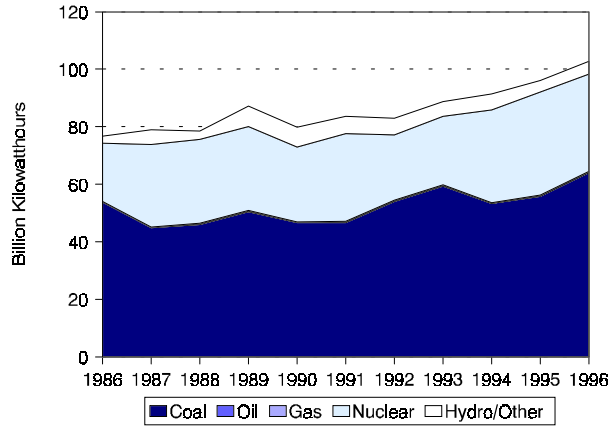


Figure 5. Utility Delivered Fuel Prices for Coal, Oil, and Gas, 1986-1996
(1996 Dollars)

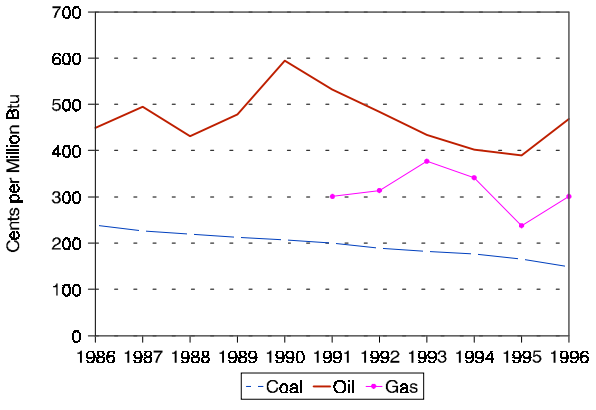


Table 7. Utility Delivered Fuel Prices for Coal, Oil, and Gas, 1986, 1991, and 1996
(Cents per Million Btu, 1996 Dollars)

Fuel	1986	1991	1996	Annual Growth Rate 1986-1996 (Percent)
Coal	238.6	199.9	148.4	-4.6
Oil	449.6	532.2	468.2	0.4
Gas	--	300.7	300.5	--

-- = Not applicable.

Table 8. Electric Power Industry Emissions Estimates, 1986, 1991, and 1996
(Thousand Short Tons)

Emission Type	1986	1991	1996	Annual Growth Rate 1986-1996 (Percent)
Sulfur Dioxide	353	352	454	2.6
Nitrogen Oxides[d] . .	199	188	225	1.2
Carbon Dioxide[d] . . .	52,670	53,509	74,527	3.5

Figure 6. Estimated Sulfur Dioxide Emissions, 1986-1996

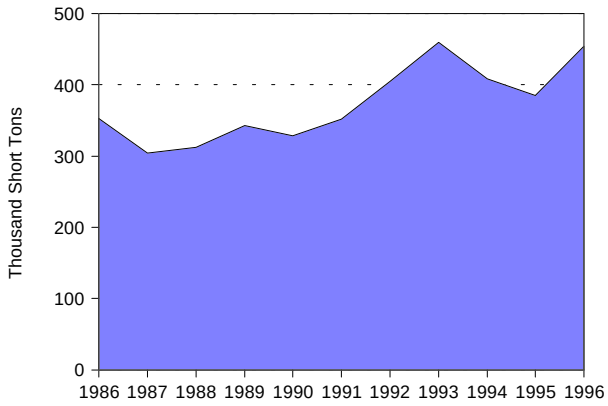


Figure 7. Estimated Nitrogen Oxide Emissions, 1986-1996

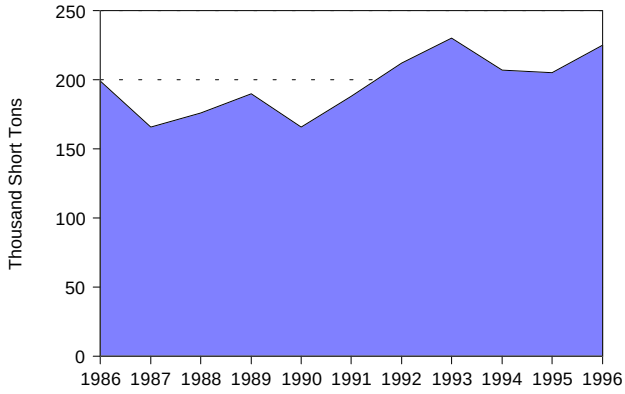


Figure 8. Estimated Carbon Dioxide Emissions, 1986-1996

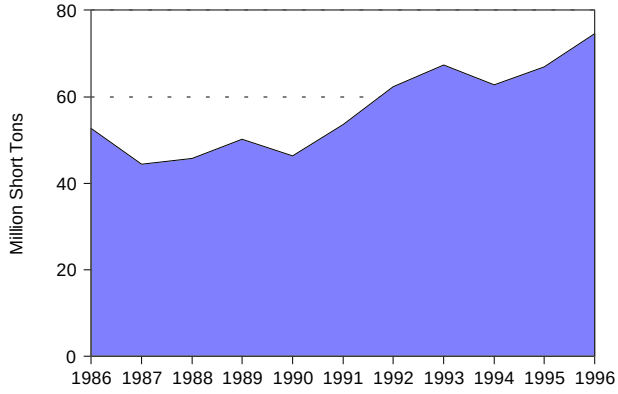


Table 9. Utility Retail Sales by Sector, 1986, 1991, and 1996
(Megawatthours)

Sector	1986	1991	1996	Annual Growth Rate 1986-1996 (Percent)	Percentage Share 1986	Percentage Share 1991	Percentage Share 1996
Residential . .	29,505,698	34,390,834	41,591,843	3.5	38.1	37.3	38.4
Commercial	19,305,737	24,675,721	30,662,155	4.7	24.9	26.7	28.3
Industrial . . .	27,071,812	31,514,220	34,141,749	2.3	35.0	34.1	31.5
Other	1,552,340	1,735,708	1,900,647	2.0	2.0	1.9	1.8
Total	77,435,595	92,316,483	108,296,394	3.4	100.0	100.0	100.0

Figure 9. Nuclear Power Capacity Factor Comparison, 1986-1996

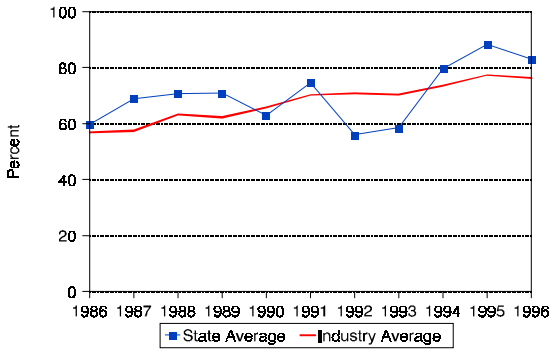


Table 10. Utility Retail Sales Statistics, 1986, 1991, and 1996

Item	Investor-Owned Utility	Public	Federal	Cooperative	Total
			1986		
Number of Utilities	5	72	1	32	110
Number of Retail Customers	1,963,703	415,131	5	539,076	2,917,915
Retail Sales (MWh)	61,095,797	9,544,268	5,038	6,790,492	77,435,595
Percentage of Retail Sales	78.9	12.3	(s)	8.8	100.0
Revenue from Retail Sales (thousand 1996 $)[e]	4,684,529	818,126	249	650,421	6,153,398
Percentage of Revenue	76.1	13.3	(s)	10.6	100.0
			1991		
Number of Utilities	5	72	1	32	110
Number of Retail Customers	2,222,528	451,697	4	627,965	3,302,194
Retail Sales (MWh)	72,627,416	11,187,922	6,023	8,495,122	92,316,483
Percentage of Retail Sales	78.7	12.1	(s)	9.2	100.0
Revenue from Retail Sales (thousand 1996 $)[e]	4,933,590	952,916	319	826,336	6,713,200
Percentage of Revenue	73.5	14.2	(s)	12.3	100.0
			1996		
Number of Utilities	4	72	1	32	109
Number of Retail Customers	2,480,121	485,622	5	728,175	3,693,923
Retail Sales (MWh)	83,955,414	13,048,400	7,840	11,284,740	108,296,394
Percentage of Retail Sales	77.5	12.1	(s)	10.4	100.0
Revenue from Retail Sales (thousand 1996 $)[e]	5,070,291	1,031,452	237	972,571	7,074,551
Percentage of Revenue	71.7	14.6	(s)	13.8	100.0

(s) = Nonzero percentage less than 0.05.