

Who Makes N.C.'s Energy Policy?

by Joyce Anderson and Bill Finger

Ten years ago, most North Carolinians never thought twice about their electric or gas bills. Few people questioned the charge or wondered who set the rates. But the times have changed. Since the first major oil embargo in 1973, energy has become a household word. Energy officials in North Carolina have become important public officials. The Utility Commission is viewed as one of the most critical regulatory bodies in the state. The setting of energy policy is now a continuing governmental concern and the passage of energy legislation has become a perennial issue in the General Assembly.

The background, competence, and initiative of the officials who determine energy policy in North Carolina seems more important today than ever before. Yet the average citizen knows very little about "who's who" in energy. Moreover, because energy is such a new arena for governmental attention, policy *Joyce Anderson is Energy Director, League of Women Voters of North Carolina. Bill Finger, a freelance writer, edited this issue of N.C. Insight.*

questions are in constant flux. Officials, often appointed for political reasons, have to achieve an instant sophistication in an area that has grown extremely complicated — and critical. Finally, the matter of "turf" and who works for whom has been a sticky issue under the Hunt administration's reorganization, in energy agencies as well as others. The evolution of the various energy departments has sometimes been a painful process.

The interviews and sketches that follow are an attempt to introduce the major energy policymakers to the public and to provide brief descriptions of the various energy agencies that now dot the landscape of state government. But this is only an introduction, an effort to focus more attention on the way energy policy is made and on the people who make it in North Carolina. Increased public awareness of the actions of these officials is vitally important, not only because of escalating energy costs but also because close scrutiny is critical during a time when policy and agency interaction is changing so rapidly. □

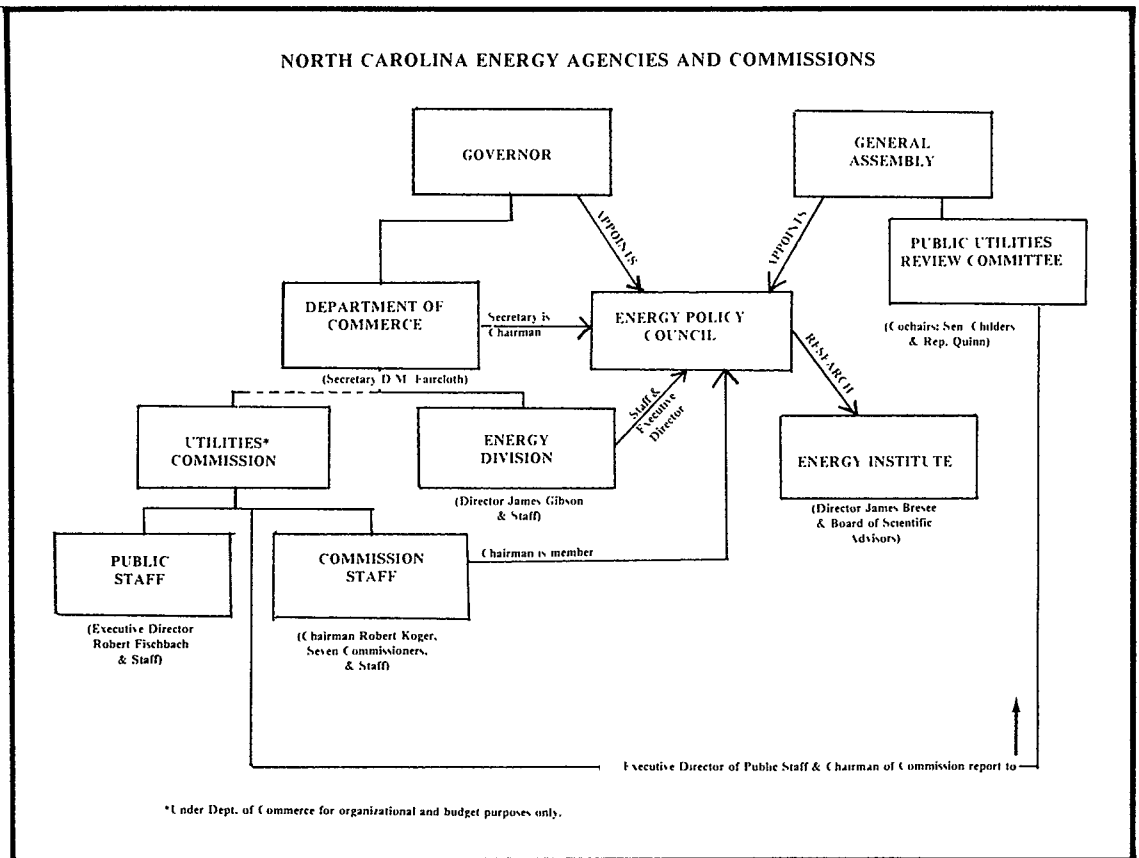


Chart by Joyce Anderson

Energy Policy Council

In 1975, the North Carolina Energy Policy Act established the Energy Policy Council to make recommendations to the Governor and the General Assembly. The Energy Division was designated to serve as the Council's staff. The Council has the job of establishing a state energy policy and emergency planning procedures. It is an umbrella organ composed of representatives of state agencies, the General Assembly, the private sector, and the public.

Energy Policy Council Members

D.M. (Lauch) Faircloth, Secretary of the Department of Commerce, Council Chairman*

Robert Koger, Chairman, N.C. Utilities Commission*

Jim Graham, Commissioner of Agriculture*

Jane Patterson, Acting Secretary, Department of Administration*

Charlie Webb, representing Secretary Howard Lee, Department of Natural Resources and Community Development*

William S. Lee, President, Duke Power

Company, electric power industry representative

Donald McCoy, attorney, natural gas industry representative

Robert Mattocks, President, Jenkins Gas Company, petroleum marketing industry representative

John Neufeld, Professor of Economics, UNC-Greensboro, represents person experienced in economic analysis of energy requirements

John Curry, attorney, represents person experienced in environmental protection

George Norman, retired Vice-President of Burlington Industries, representative of industrial energy consumption

Robert Cole, Professor of Physics, UNC-Asheville, represents person knowledgeable in alternative sources of energy

Senator Henson P. Barnes

Senator Russell Walker

Representative Allen Adams

Representative Louise S. Brennan

*These five are *ex officio* members. The Lt. Governor appoints the state senators. The Speaker of the House of Representatives appoints the state representatives. The Governor appoints all other positions. □

Interview with Lauch Faircloth

D.M. (Lauch) Faircloth, 52, is Secretary of the Department of Commerce. A native of Clinton, Faircloth owns a variety of businesses in farm equipment, commercial real estate, construction, and farming. A long-time political adviser, he was appointed by Governor Hunt in 1977.

Secretary Faircloth, you are chairman of the Energy Policy Council (EPC). What is it doing and what should it be doing?

The Council is an extremely competent group. Its purpose when it was formed was to set policy in event of an emergency. The state's Emergency Plan was developed as a result.

We have some new members on the Council and we now have Jim Gibson as director of the Energy Division. I believe we will move positively toward developing a comprehensive energy policy for the state. However, we need to have flexibility — in establishing such a policy. It should be able to move with the situation. Until now, the council has had to lurch from one crisis to another and hasn't had the

opportunity to give its full attention to policy development except in a fragmented way.

Who is in charge of the policy development effort?

The initial stages of development are being handled by the Management Committee of the Council under Donald McCoy from Fayetteville. (McCoy represents the natural gas industry on the EPC.) Tom Moffitt working with the Energy Division is doing a lot of the leg work, and of course Jim Gibson and the Energy Division staff are working hard on putting this thing together.

What format do you see the energy policy taking?

I think a set of generally flexible guidelines should be developed: e.g., increase price — limit consumption.

How do you and the Energy Division relate to the other energy agencies in state government?

It is clear that there is the need for more coordination. I feel all grant requests should be made through Gibson's office. He is clearly going to be "Head of Energy" in this state. Some of our previous programs have operated independently. We cannot continue to ignore each other. □

* N.C. Energy Division

The North Carolina General Assembly created the Energy Division in 1974 as a part of the old Department of Military and Veteran Affairs. For several years, it occupied an old house on Lane Street. The Energy Division was then placed under the Department of Commerce and in 1977 moved to its current offices in the basement of the new Dobbs Building. The Energy Division is slowly spreading through the bowels of the building, occupying more space each year, in much the same way that energy issues have begun to occupy more and more of the attention and time of state government officials.

In 1976, the Division had an eleven member staff working in three major areas: allocations and plans, conservation, and research and development. Today that staff has more than doubled, adding an energy information section, a technical section, an accountant, a staff attorney, an energy conservation volunteer coordinator, and an assistant to the director.

The Energy Division serves as the staff for the Energy Policy Council. The individual sections also have other functions. The conservation section administers the state energy conservation plan and the energy extension service. The technical section advances alternatives such as cogeneration, wood, and solar and administers the state's conservation program for schools, hospitals, and public buildings. The allocations and energy planning section administers the set-aside of petroleum products for emergency needs and the state's energy emergency plan developed with the Energy Policy Council. The information section serves as a clearinghouse for projects, programs, meetings, and other energy activities in the state; it also publishes a monthly newsletter, *Energy Issues*, and mans an energy hotline (1-800-662-7131). □



Photo courtesy of N.C. Energy Division

James E. Gibson Jr., 53, became director of the State Energy Division in September, 1979. A native of Blowing Rock, Gibson graduated from Duke University in business administration. He was a textile executive with J.P. Stevens, Duplan Corp., Hanes Corp. and Wilkes Hosiery before becoming director of the division of medical assistance in the state's Department of Human Resources (DHR). He left the DHR job to join the Energy Division.

* North Carolina Energy Institute

In 1978, the Energy Policy Council established, through an executive order of the Governor, the North Carolina Energy Institute. The General Assembly passed a \$600,000 annual budget, 85% of which the Energy Institute distributes to outside consultants for developing energy resources unique to the state. The Research Triangle Institute, for example, has investigated hydroelectricity sources while

others have worked to develop solar, peat, and wood projects. Dr. James Bresee, formerly with the U.S. Department of Energy, heads the four-person administrative staff. Dr. Bresee recently testified before the Utilities Commission that it might be appropriate for the Energy Institute to merge with the proposed Alternative Energy Corporation. □



Interview with James Gibson

What is the main job of the Energy Division?

The Energy Division is the major authority on energy matters for the state. We serve as the staff for the Energy Policy Council (EPC) and we work closely with the Energy Institute. Our mission, as mandated, is four-fold: to develop and administer emergency allocation plans, to promote conservation programs, to provide public information and education, and to provide technical assistance.

What is your number one priority?

To fill the need for a formal state energy policy. The EPC has been misused to some extent. It has had to contend with numerous brush fires. We have real talent and capability on the Council and on our staff. We are going to put it together.

At the November 8 (1979) meeting of the Energy Policy Council, of which I am the Executive Director, I urged that a comprehensive energy policy be formulated as soon as possible. I see two aspects of that policy: 1) petroleum use in home heating, in transportation, and by utilities; and 2) utilities' sources of energy: nuclear, gas, coal.

What role will the public play in the development of the state's energy policy?

We are making a real effort to involve the public. We have been meeting with a group in Asheville and will meet with other groups in the state, asking for help with the policy development process. We feel that the process is as important as the policy if it is to be one which the people of North Carolina will accept. For the formulation process, we will work initially through the EPC's Management Committee. There will be at least four public hearing meetings at which we hope to hear regional concerns expressed.

What will be the format of the state energy policy?

We have no clear idea of that at the present time. It certainly will contain renewed statements of certain principles which we have already developed. It will state goals and objectives and attempt a realistic assessment of needs. It will ideally reflect a balance of concerns.

What is the relationship of the Energy Division with the Public Staff of the Utilities Commission?

Its responsibility is to confront the utilities and the Commission in matters pertaining to the consumer, the rate-payer. We probably need more communication with the Public Staff. They are doing excellent studies. We should explore ways in which we can work together.

What is your "energy philosophy?"

Efficiency in energy usage is of prime importance. And our biggest source of energy is conservation. I see the prime responsibility of this Energy Division as promoting and implementing measures and programs which increase efficiency and result in conservation.

How do you view the Energy Extension Service?

It will certainly be good as an interim program, especially as a means to further the conservation effort. There is not a great deal of money — only \$580,000 for all of North Carolina, but it is an opportunity for one-on-one contact at the grass-roots level.

How much dependence on nuclear power do you anticipate the state having in the future?

That must be determined by a state energy policy. If there is to be continued expansion and growth in North Carolina's economy, I think we will need nuclear power for the short term. My practical judgment is that we will have difficulty doing much more about nuclear in the long run. Other fuels and processes will come forth, but I think it will be awhile before we can use much more coal. If we are to use it, there will have to be modifications in the Clean Air Act, and I think these will come.

How did your work in the Department of Human Resources (DHR) prepare you to head the Energy Division?

Before I worked for DHR, I had considerable management experience in the private sector. These skills are transferable. In Human Resources, I worked in the area of management consultation and coordination and was able to use innovative techniques to solve some management problems. When the Energy Division job became available, I was interested because I felt it called for strong management capabilities: how to relate to different sets of people, how to make things happen. I am very goal-oriented. □

North Carolina Utilities Commission

Since the state's first utilities regulatory body, the Railroad Commission, was created in 1891, everything from street railways to canals to telephone companies to motor carriers has been regulated. In 1941, the present Utilities Commission was established with three full-time members serving six year terms. In 1977, the General Assembly, at Governor Hunt's urging, reorganized the Commission, creating an independent Public Staff within the entire Commission. This reorganization divided the resources between the Commission Staff and the Public Staff. The 1979-80 budgets for the Commission Staff (\$2.1 million, 81 positions) and the Public Staff (\$2.2 million, 88 positions) are among the largest in the country for such agencies. Only Ohio has a larger budget for its public staff and many states do not even have such a body. Moreover, *Electric Week* recently reported that "North Carolina Leads DOE Grant Parade With Awards Totaling \$1,045,859 for a variety of rate-reform projects." California followed North Carolina with \$952,500.

The Utilities Commission acts as an arm of the

Legislature but plays both an administrative and judicial role in regulating the rates and services of about 1000 utility and common carrier companies in the state. These include electric, telephone, natural gas, water, and sewer utilities, radio common carriers, and rail and motor carriers of passengers and/or freight. The Commission follows court procedures since its decisions can be appealed into the courts. But unlike trials, commission hearings have often been used as a public forum for policy debates.

The Public Staff is mandated to represent the consuming public before the Commission on matters concerning rates and regulations. The Public Staff has also taken over much of the work once performed by the Commission, such as forecasting the state's future energy demands.

The Governor appoints the seven Utilities Commissioners (8-year terms) and the Executive Director of the Public Staff (6-year term), all of whom are Democrats and make \$41,500 (except the Commission Chairman who makes \$42,500).

The North Carolina Utilities Commissioners

Robert Koger, Chairman (see interview with him on pages 35-37 for biographical information)

Leigh Hammond, 50, is an economist (Ph.D., North Carolina State University). A South Carolina native, Hammond taught economics at North Carolina State (1964-69 and 73-77) and served as Vice-Chancellor there. From 1970-73, Hammond was Deputy Secretary of the state Department of Administration. Appointed in 1977, his term ends in 1985.

Sarah Lindsay Tate, 52, is an attorney (LLB, University of North Carolina), formerly an associate with the Raleigh firm of Sanford, Adams, McCullough, and Beard. Originally from Charlotte, she has been an associate counsel for insurance companies. Appointed in 1977, her term expires in 1985.

John Winters, Sr., 60, is a Raleigh native and graduate of Virginia State College. A real estate broker and builder, Winters has been on the Raleigh City Council (1961-67), in the State Senate (1974-77), on the University of North Carolina Board of Governors (1972-74), and active in Raleigh's business com-

munity. Appointed in 1977, his term expires in 1985.

Edward Hipp, 58, is an attorney (J.D., University of North Carolina), originally from Charlotte. He was special counsel for the North Carolina General Statutes Commission Utility Law Revision (1962-63) and General Counsel for the Utilities Commission (1963-77) before being appointed Commissioner. Appointed in 1977, his term ends in 1981.

A. Hartwell Campbell, 63, was a minister (B.D., Yale) (1941-46) before managing radio and television stations (1946-79) in eastern North Carolina. He served in the General Assembly (1969-79) before being appointed Commissioner. Appointed in 1979, his term ends in 1987.

Douglas P. Leary, 44, graduated from East Carolina University in business administration. He worked for the Four County Electric Membership Corporation (1961-72) and was General Manager of the Wake Electric Membership Corporation (1972-79) before being appointed Commissioner. Appointed in 1979, his term expires in 1985.

Interview with Robert Koger

Robert Koger, 43, is chairman of the North Carolina Utilities Commission. He holds a Ph.D. in industrial engineering and a M.A. in economics from North Carolina State University. Before joining the Utilities Commission as an engineer in 1967, he worked for the U.S. Rural Electrification Administration (1961-67). Governor Hunt appointed Koger a Commissioner in 1977.

What do you see as the primary mandate of the North Carolina Utilities Commission?

To see that the utilities and transportation industries which have been granted exclusive service franchises by the state provide adequate, reliable, and safe services at the lowest possible rates to their consumers.

How are the Commission Staff and the Public Staff related?

Even though they are both part of the North Carolina Utilities Commission, they are independent of each other. Each has its own budget, and neither

has any managerial or decision-making authority over the other. The Public Staff has a legal mandate to be the public's advocate in proceedings before the Commission while the Commission, by law, must take a judicial, objective position in its decision. The Public Staff can appeal Commission decisions to the North Carolina Court of Appeals.

Are there any disadvantages to having a separate Public Staff?

It is working very well for the most part. The Commission lost most of its staff when the Public Staff was formed. We could use one or two more good engineers on our staff. Most of the attorneys are now with the Public Staff where they can be much more independent in their representation of the rate-payer.

The main disadvantage was the loss of informal communication I had with the people who went to the Public Staff. Contrary to what the public may think, the law prohibits informal discussion between the Commission and any other parties — including the Public Staff — in pending cases. And, of course, this is right and in the best public interest. No "deals" can be made outside the hearing room — with the utilities or with the Public Staff.

How much dependence on nuclear power do you anticipate the State having in the future?

Interview with Robert Fischbach

Robert Fischbach, 40, is executive director of the Public Staff of the North Carolina Utilities Commission. He holds a Ph.D. in physics from the University of Virginia (1969). He worked as a research scientist for Fiber Industries Inc. (1969-77) in Charlotte where he was active in local civic and political activities. In 1977, Governor Hunt named him a Utilities Commissioner and in 1979 appointed him to head the Public Staff.

As Director of the Utilities Commission Public Staff, what is your goal? What would you like to accomplish?

A lot of our work is "reaction work" to utility filings with the Commission. We want to continue to keep rate increases at a minimum, certainly. In addition, I would like to see some timely resolution to the Vepco situation.* We should be able to get lower rates for those people in North Carolina who are served by Vepco. We need to be bolder in pushing conservation. It disturbs me that fully 15% of the homes in NC have no insulation!

* The Vepco rates are currently much higher than CP&L and Duke Power rates.

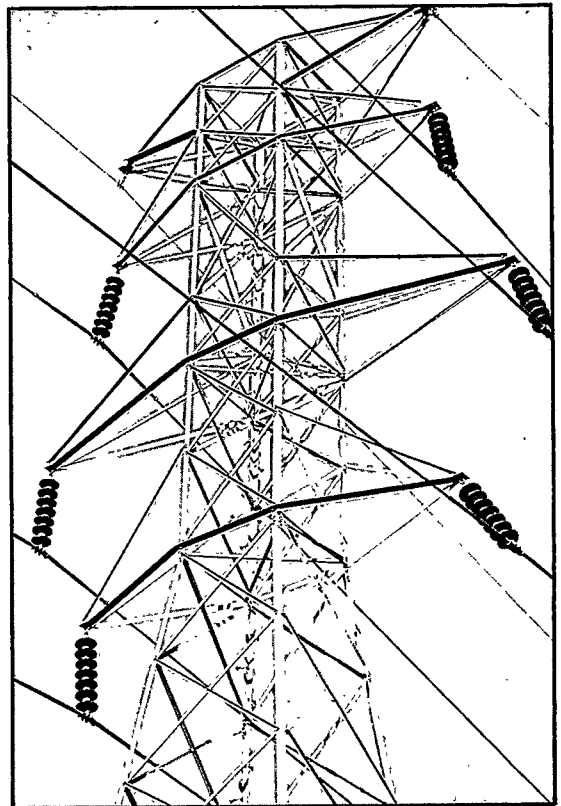


Photo by Jackson Hill

(Koger interview continued)

The utilities made a large commitment to nuclear power in the late 1960's and early 1970's. Duke and CP&L are now generating about 35% of their power with nuclear and project 50% dependence by the mid to late 1980's. The recent freeze on operating licenses by the Nuclear Regulatory Commission is affecting Vepco's North Anna II unit and could affect Duke's McGuire Unit I scheduled for operation in the fall of 1980.

What is your position on Construction Work in Progress (CWIP)?

I took no position on the matter when it came before the Legislature during the 1977 Session. As I see it, it comes down primarily to a decision which may adversely impact one generation while helping other generations. Up to 1986, it will mean higher rates than if we didn't have it. After 1986, the rates will be lower.

Some critics have said CWIP will encourage excess construction of generating plants by the utilities. I don't think this is valid. Utilities must still prove need and be granted a Certificate of Public Convenience and Necessity before they can build new plants.

What is the status of rate-reform measures such as interruptible rates and load-leveling rates in North Carolina?

In December, 1979, the Commission issued an order to the utilities to develop plans for certain rate-reform measures and to file them by the fall of '79. Duke and CP&L both now have special rates for solar with thermal storage. Interruptible rates will be initiated soon in several areas on an experimental basis, and the equipment has been ordered to implement time-of-day rates. Industrial customers will soon be able to opt for a lower cost interruptible service.

What has the Commission done to promote energy conservation?

First of all, the only advertising we approve as a recoverable operating expense for electric utilities is that associated with conservation. Secondly, we encourage all gas and electric utilities to promote conservation offering energy audits to their customers and assistance in finding financing and contractors to insulate their homes. Each year at our annual electric load forecast hearings, we ask the utilities and the Public Staff to forecast the percentage reduction estimated to come from conservation and load management programs. We have approved a conservation rate for Duke Power which provides that customers meeting certain stringent insulation requirements are eligible for a lower rate. A similar rate proposal is pending for CP&L.

(Fischbach interview continued)

What do you see as the role of the Public Staff in influencing state energy policy?

We play a major role in setting it. For example, in the annual load-forecast hearings the Commission reviews the Public Staff work. We pioneered the economic forecaster. The utilities are now doing their own, Vepco for the first time this year. We are not simply respondents, as in rate cases. We can instigate proceedings as we have done for the May, 1980, hearings to review the PURPA (Public Utility Regulatory Policies Act) rate-making and rate-reform measures.

How can public-interest and consumer-interest groups best work with the Public Staff?

It is our responsibility to represent the public at rate-increase hearings and in other proceedings before the Commission. When groups make statements at hearings and make demands that we do this or that, they should have the data to back up their contentions. For example, a lot of claims are made for the potential of solar energy. We need facts and figures to back up these claims. Our research has not been able to substantiate some of the claims which are being made. Furthermore, we hear over and over that

the Commission and the Public Staff should put more emphasis on conservation. I would like to know, specifically, what the Commission should do that it is not already doing in the area of conservation. As a regulatory agency, we have to be extremely conscious of how heavy our hand can be. When you push something down the public's throat, you'd better be sure it's a proper pill.

How much dependence on nuclear power do you anticipate the state having in the future?

For the next 10-15 years, our dependence will be considerable. For the calendar year 1978, CP&L generated 47% of its electricity from nuclear plant operation. The NRC freeze on operating licenses could certainly affect our short-term dependence. The McGuire Unit I is scheduled to begin operating in August of 1980.

I consider myself a "nuclear realist." We have to look at what is here now. Whether we like it or not, at least 40% of our electricity today comes from nuclear generation. I don't know where we could get another 40% to replace it in the short term. Replacement or phasing out of nuclear would have to be long-term for other sources to have that much impact.

How effective is the Energy Policy Council?

It has a major role in recommending energy legislation to the General Assembly such as tax credits for insulation and solar installations. It also played a part in the establishment of the state's Energy Institute. Preparing detailed emergency plans for use in times of energy shortages has been a major contribution. Presently, we are reacting to federal guidelines on possible gasoline reduction targets for the state and the possibility of having to administer federally mandated rationing.

How does the Utilities Commission interact with the General Assembly?

While we are independent in our decision-making role, the Utilities Commission is by law an arm of the Legislature. In 1975, the joint Senate-House Utilities Review Committee was established. I meet with the Committee frequently to keep the Legislature informed of our major activities and to consult with them on any needed changes in laws affecting public utility regulation.

How do you feel about your job as Commission chairman?

I feel my job is an important one and one in which I can make a worthwhile contribution to the people



Photo by Jo Perry

During Alternative Energy Corporation hearing, Robert Fischbach (left) and Robert Koger (right) listen to Conservation Council attorney Tom Erwin (front).

of North Carolina. I was on the Commission staff for 10 years and was chief of the electric division before Governor Hunt appointed me to the Commission. Now I have the opportunity to participate in the decisions and use the experience that I have. I am especially proud of the fact that since July, 1977, the percent of annual increase in electric rates has been held down considerably over that of the three prior years. So far, we have averaged only a seven percent annual increase (since 1977) compared to a 21 percent average annual increase from 1974-77. □

What is your position on Construction Work in Progress (CWIP)? Did you support the state legislation creating CWIP last spring? Is it fair to the consumers?

I did not favor the bill although I did not get involved in the legislation. I would just as soon we didn't have the law, though there is certainly some justification for it. There is no doubt that the total cost to the consumer, over the life of the plant, is less. However, it does violate a cornerstone principle of utility rate-setting: that the consumer should pay only for services received, when he or she receives them.

What rate-related reforms do you favor? What are the utilities in North Carolina doing?

Interruptible rates are now offered to large industrial users. Experiments with peak-load pricing, time-of-day rates, and interruptible rates for residential customers are now or soon will be underway. Hearings will be held in May, 1980, to assess the progress and results of these experiments. I feel that we have already gone deeply into rate reform. I can't think of any contemporary rate reform concepts that we haven't already confronted, begun to implement or discarded. We are moving toward a

flat rate. The declining block rate (more use gets cheaper rates) is definitely on its way out, but it can't be changed overnight.

Do you see any conflicts of interest in your former position as a Commissioner and your present position?

No. My experience as Commissioner has given me a helpful perspective. The Commission is in the *decision-making* business; the Public Staff is a *decision-advocating* outfit. Before reorganization and the formation of the Public Staff, there was no separate voice to advocate the "good of the public."

What do you like best about your job as Director of the Public Staff?

We are right in the middle of things. We have the most professional staff of any Commission in the country. For example, we have three Ph.D. economists on our staff; our Electric Section I would put up against any in the country, and I could make similar comments about our other divisions. I have a staff to be proud of. □

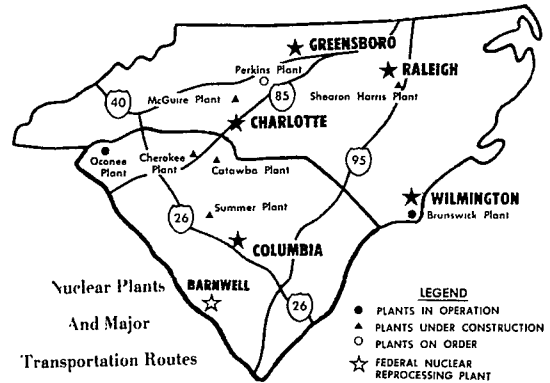
* Nuclear Waste Control

by Tom Dillon

Growing amounts of nuclear waste, and a limited number of depositories, are presenting North Carolina with the prospect of handling more of its waste than in the past. A state task force has been considering a nuclear waste depository in as rural a section of the state as can be found. "Ten miles from nowhere" is the location suggested by one staff member in the Department of Human Resources.

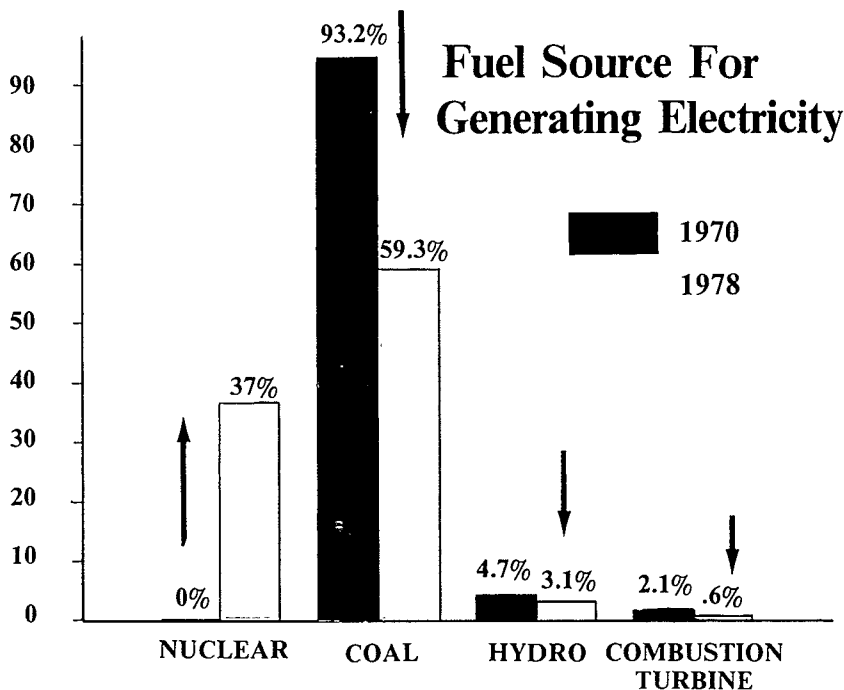
But the state officials are rapidly finding that a spot 10 miles from nowhere does not exist. When Ralph Ely, a scientist with Research Triangle Institute, suggested the upper Dan River valley in the northwest as one possible site, boards of county commissioners in the area responded by passing local ordinances which, in one county's language, make it illegal to "process, store, bury, receive or acquire radioactive waste..." When state authorities looked at the possibility of storing waste temporarily in an old warehouse at the small Granville County town of Butner, inspectors from the state property insurance division found the building unsafe. And when a waste processing plant was suggested for the City of Burlington, the city council said no.

A deputy attorney general, William F. Briley, has since told the task force chairman who is also the Governor's science advisor, Dr. Quentin Lindsey, that he thinks the local ordinances should not affect state



licensing for a nuclear waste facility. But the situation still seems charged with chances for state-local conflict. If the state goes ahead and licenses waste handling in one of the counties or towns which has objected, a long legal argument could ensue.

Straightening all this out is the job of the task force and the state's radiation protection division, the ultimate arbiter on questions of radiological health in North Carolina. But the division director, Dayne H. Brown, has said his office does not have the money to do a proper job. □



Which Fuels Does N.C. Use?

Presenting a concise, statistical view of North Carolina energy uses is difficult if not impossible. Unlike many census indices (population, wage, place of residence, etc.), energy sources and uses have not been measured extensively over the years, and hence, collection systems are not well developed. (The exceptions are heavily regulated sectors such as electricity and gasoline.) The federal Department of Energy has recently introduced the Federal Energy Data System (FEDS) and the North Carolina Energy Division and Utilities Commission Public Staff are undertaking more sophisticated data analysis every year. But much of the primary data remains with the energy industry itself: oil companies, utilities, and even individual oil jobbers.

Complicating the difficulties in collecting information are several factors unique to energy. For example, the FEDS system is geared to traditional fuels, but does not contain data for sources such as solar, wood, and wind. Marketing systems for wood (buying from a local woodcutter) and measuring techniques for solar (discounting the cost of solar collectors on "free" energy) add difficulties to data collecting which have not been overcome. As the North Carolina Energy Division puts it: "The result is that while the data given...for traditional fuels may be relatively good, as alternative fuels make more of a contribution, the divergence between FEDS data and a more comprehensive estimate of energy consumption will grow larger."

Another problem unique to energy data is measuring "gross" energy as opposed to "net" energy. That is, does one measure the total amount of fuel that goes into the economy or only the energy actually delivered to the consumer. The major difference comes in fuel losses inherent in generating electricity. Of the coal delivered to a power plant, for example, only about one-third of the coal's energy is available to the end-user. The other two-thirds of power is lost either as waste heat at the power plant or in transmission and distribution.

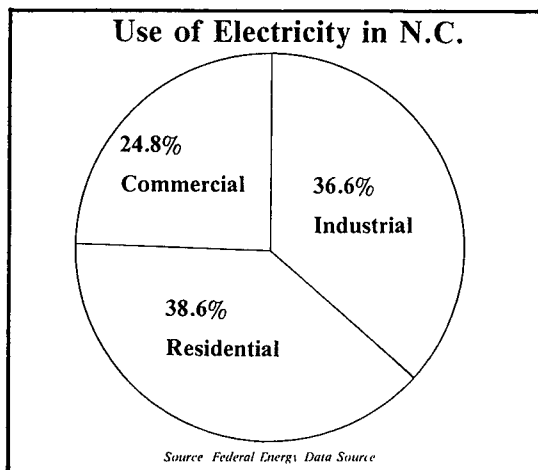
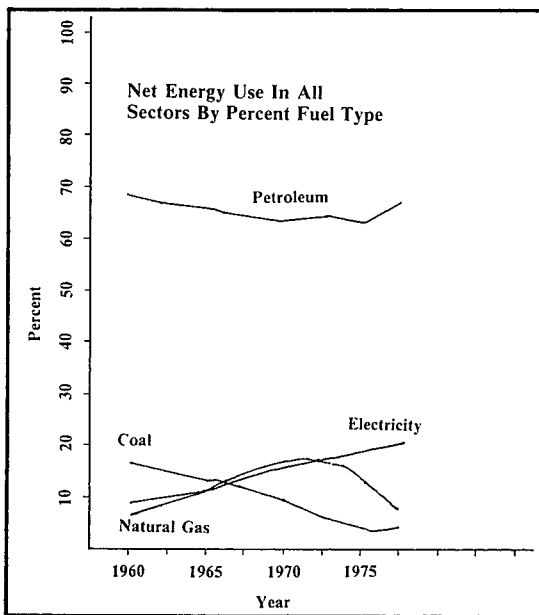
Given these various limitations, the charts below present as concise a view of the state's energy uses as possible.

"The Type of Energy Used in Each Sector" shows the relative dependence on different fuel sources for end uses of power. In the residential sector then — from lighting to space heating to cooking — consumers depend upon electricity for 65.9% of their needs, petroleum for 24.2%, natural gas for 9.4%, and coal for .6%. We used "gross" electricity for our calculations, (not "net"), feeling that the total amount of fuel necessary for producing electricity is the proper

amount to measure proportionately with other fuels.

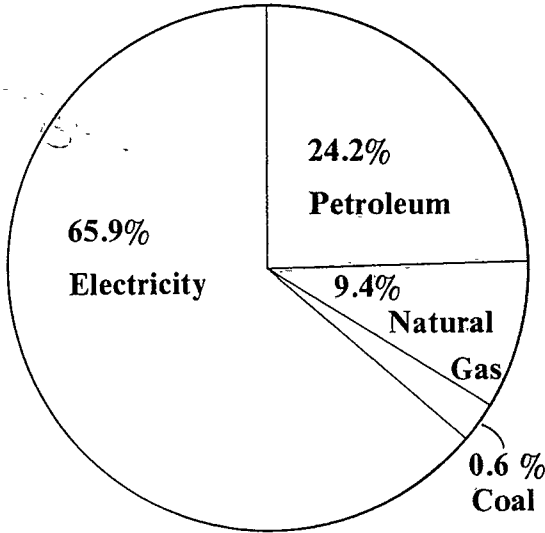
The bar graph, "Fuel Sources for Generating North Carolina's Electricity," highlights the change in fuel-source mix that the electric utilities made from 1970 to 1978, including an increase in nuclear power from 0% to 37%. "Use of Electricity in North Carolina" breaks down aggregate electricity-use by sector.

Finally, "Net Energy Use in All Sectors by Percent Fuel Type" shows the relative dependence on various fuels from 1960 to 1977. Because of the FEDS reporting system, we used "net" electricity here. While the net figure somewhat skews the graph ("gross" would give electricity significantly higher figures), the percentage for petroleum would still be very large. □

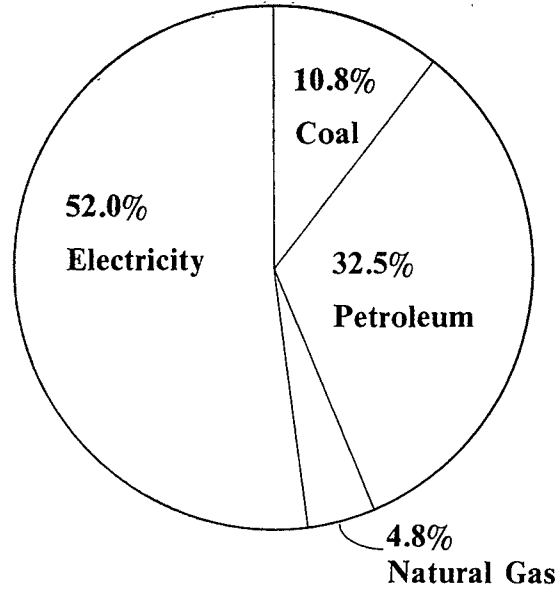


Type Of Energy Used In Each Sector

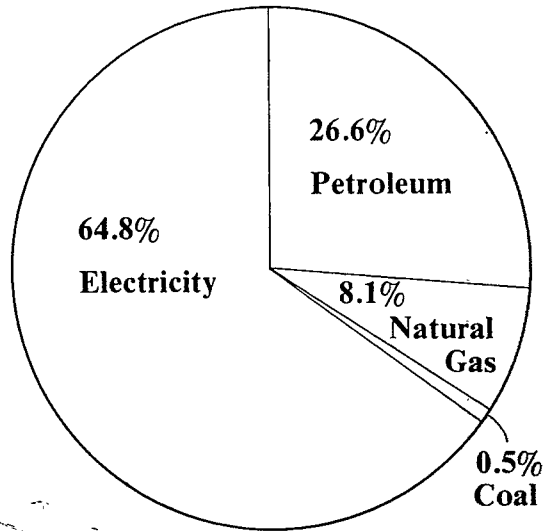
Residential



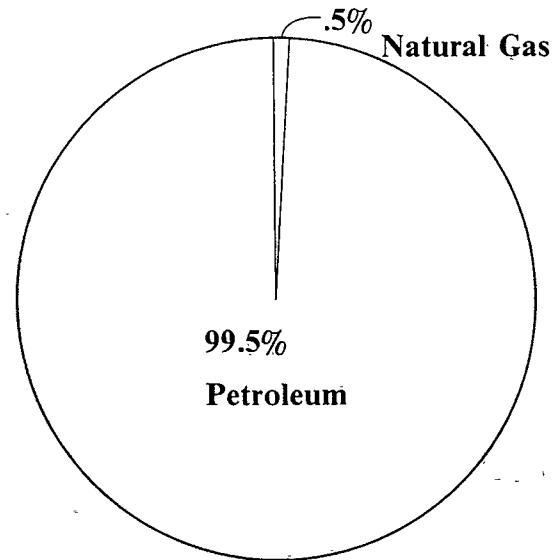
Industrial



Commercial



Transportation



Selected Energy Resources

Analysis of Long Range Needs for Electric Generating Facilities in North Carolina, Report of the Public Staff, North Carolina Utilities Commission 1979. In 1975, the General Assembly mandated the Utilities Commission to undertake such an analysis on a regular basis. Following the Commission reorganization in 1977, the Public Staff took over this function. Using econometric and engineering techniques, the forecast run up to 1995.

Energy Future: A Report of the Energy Project at the Harvard Business School, edited by Robert Stobaugh and Daniel Yergin, Random House, 1979. This study, six years in the making, examines the American dependence on conventional fuels, particularly on imported oil, and places the prestige of the Harvard Business School firmly behind conservation and solar energy.

Energy and Growth Policy in North Carolina, John Lebens, Urban Studies Energy Project, Center for Urban and Regional Studies, University of North Carolina at Chapel Hill, June, 1978. This analysis of evolving state energy and growth policy includes general policy recommendations. Useful overview of energy literature and bibliography included.

Energy in North Carolina, Greensboro Daily News, published as a composite from their September 9, 11, 14, 16, 18, and 21, 1979, issues. A thorough look at the state's energy "at home," "on the road," "on the job," "under control?" (politics), and "alternatives." Extremely useful overview and resource. Combines newspaper readability with state-oriented data.

An Energy Policy Option for North Carolina: Toward Conservation and Renewable Energy Resources, Thomas Gunter, Department of Physics, University of North Carolina at Chapel Hill, October, 1978. Gunter provides an overview of how state energy policy could shift from conventional fuels to alternate sources (conservation, solar, biomass, wind, hydro). It includes a discussion of legislative activity and offers recommendations for moving toward alternative policies.

Energy Technologies and Policies for North Carolina, Environmental Studies Council, University of North Carolina, 1978. This is a compilation of the proceedings — papers presented and recommendations — from a May, 1978, conference attended by 120 people from universities, government, industry, and the public.

Interim Report of the Interagency Task Force on Energy Management for Balanced Growth, December, 1978. This Task Force represented an effort at intergovernmental examination of the energy issue as it relates to growth.

North Carolina Energy Institute Annual Report, 1979. In this first annual report, the Energy Institute details future research needs and lists the various

contractors who have undertaken research projects. For information, contact Energy Institute, P.O. Box 12235, Research Triangle Park, N.C. 27709.

North Carolina Energy Policy Council Annual Report, 1978. Since 1976, the Energy Division, as the staff for the Energy Policy Council, has produced three such reports which serve as a general reference for the developing energy policy in the state. The Energy Division has published a number of other reports on their various activities and puts out a monthly newsletter, *Energy Issues*. For copies or information, contact Information Section, Energy Division, 430 N. Salisbury St., Raleigh, N.C. 27611.

North Carolina Notebook of Renewable Energy Projects, North Carolina Land Trustees of America and the North Carolina Coalition for Renewable Energy Resources (NCCRER), October, 1979. By far the most comprehensive listing of energy resources — agencies, organizations, and individuals. Available from NCCRER, Box 10564, Raleigh, N.C. 27605.

North Carolina Utilities Commission, 1978 Report, Vol. XII, January, 1979. This is the annual report of the Utilities Commission and includes statistical and analytical data through 1976. It is a useful overview of the Commission — its history, legislative mandates, and responsibilities. For information, contact N.C. Utilities Commission, P.O. Box 991, Raleigh, N.C. 27602.

Nuclear Cargo in North Carolina: What Are the Risks? May, 1977, *Radiation on the Roads* May, 1979, *Blind Faith: North Carolina's Nuclear Accident Preparedness*, November, 1979, the North Carolina Public Interest Research Group. This series reports on the state's level of preparedness in case of nuclear accident and the risks in transporting nuclear cargo through the state. For copies, write N.C.P.I.R.G., Box 2901, Durham, N.C. 27705.

A Statement to the Governor by the North Carolina Alternate Energy Task Force, September 14, 1977. Written by three former members of the Jim Hunt Energy Task Force (Daniel Koenigshofer, David Orr, Brad Stuart) and two former presidents of the Conservation Council of North Carolina (John Curry, Wallace Kaufman), this policy proposal to the newly-elected governor critiques nuclear power and proposes alternative paths.

Tower of Babel: A Special Report on the Nuclear Industry, *Southern Exposure*, Vol. VII, No. 4, Winter, 1979. In a 1973 issue, *Southern Exposure* examined the region as an "energy colony." This much-expanded and updated sequel has a wide range of articles and a lengthy research section, which includes "interlocking directorates," charts of the utilities' boards of directors. Copies are \$4.00 from *Southern Exposure*, Box 531, Durham, N.C. 27702. □