BEAUFORT, SOUTH CAROLINA

AD HOC COMMITTEE ON ELECTRIC UTILITIES

REPORT TO CITY COUNCIL
JUNE 4, 2007

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Background

South Carolina Gas and Electric[1] has proposed to replace the electric transmission lines presently in the northern part of the City of Beaufort ("City") by removing the existing 46 kilovolt lines[2] and replacing them with 115 kilovolt capacity lines. The proposed lines would follow the existing transmission line right of way, as follows[3]:

- Beginning at a structure at the intersection of North Street and Fraser Drive
- Following North Street to Meritta Avenue
- Following Meritta Avenue to the Parkview apartment complex
- Behind the apartment complex to Duke Street
- Following Duke Street to North Ribaut Road
- Following Ribaut Road to Green Street
- Following Green Street to Wilmington Street
- Following Wilmington Street and crossing Boundary Street onto Rogers Street to Calhoun Street
- Following Calhoun Street to Pigeon Point Road
- Following Pigeon Point road to an overhead/underground transition structure located in Pigeon Point Park
- Then underground from Pigeon Point Park under Godfrey Street and the Beaufort River to Marsh Harbor Apartments to an underground/overhead transition structure
- Following Colony Gardens Road to Brickyard Point Road to the switch termination structure on Brickyard Point Road near SCE&G's Lady's Island substation.

The total distance from North Street to Pigeon Point Park is approximately two miles. The existing 46kv transmission line is carried by 58 transmission poles. There are presently also 21 intermediate distribution poles along that route that carry electric distribution, telephone and cable wires on a path parallel to the distribution lines. The poles vary in height from 35 feet to 75 feet[4].

[1] South Carolina Electric and Gas provides electric and gas services to the City of Beaufort pursuant to a franchise agreement dated July 1, 1999. See Exhibit 1.
[2] The distinction between transmission lines and distribution lines involves the function and purpose of the line. Transmission lines carry bulk power at higher voltages over longer distances. Distribution lines carry lower voltages appropriate to household and commercial use. The lower voltages are achieved by use of a substation transformer to step down the higher voltages of the transmission line to consumer voltages.
[3] For a schematic diagram of this route, see Exhibit 2 .
[4] Email of Keller Kissam to David Lott, March 26, 2007

The top three wires on the transmission poles are the transmission cables. Below that are the electric distribution, telephone and cable lines[5].

[5] SCE&G is required by federal law to permit telephone and cable service providers to use its poles. They are paid rent for such usage.

The proposed upgrade is the final stage of a broader project by SCE&G to upgrade its power transmission capacity to Beaufort, Lady's Island and adjacent areas. In answer to a written question regarding benefit of the project to the City of Beaufort SCE&G said: [6]

> As the transmission lines in the area are converted to 115kv, there will be improved ability to move power around the Beaufort area. In the event of a transmission failure, electric outages will be reduced in length of duration. The new transmission line will significantly improve electric reliability to all customers in Beaufort and outlying areas. Without these improvements the future reliability to Beaufort and the surrounding area is threatened.

In essence SCE&G asserts that while citizens and taxpayers make distinctions between political subdivisions like Beaufort and Ladys' Island, electricity does not. The grid serving Beaufort and surrounding areas is an integrated system, and if the capacity or reliability of that system is impaired in one part, it is endangered in all parts.

In response to public concern about the proposal, Beaufort City Council took two major steps.

First, the council unanimously passed a first reading of an ordinance that would prohibit any further[7] transmission lines with a capacity in excess of 46kv. The proposed ordinance also prohibits electric poles with a height exceeding 45 feet on residential streets, roadways or rights of way.[8]

Second, the council appointed an ad hoc citizens committee ("Committee") to investigate the issue and report.

The Committee held its first formal meeting on October 30, 2006 and has held a total of 11 public meetings. Additionally the Committee chair has met with neighborhood groups on five occasions. Committee members and Beaufort officials have held three private formal meetings with SCE&G representatives, and have had scores of additional informal requests for information and clarification from SCE&G. The Committee has had the benefit of information supplied by City of Beaufort staff, SCE&G, private citizens, the South Carolina Public Service Commission, internet and other researches, the Beaufort

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[6] Letter of SCE&G dated November 20, 2006. See Exhibit 4 for the complete letter. "The voltage of electric transmission lines has increased over the years due to the need to transfer larger and larger amounts of power over longer and longer distances. Higher voltages reduce line losses and increase the efficiency of electricity transmission. Typical nominal voltages of transmission lines are 69 thousand volts (kV), 138 kV, 230 kV, 345 kV, 500 kV, and 765 kV. The first 765 kilovolt line . . . was activated in the 1970s." http://www.nrcce.wvu.edu/special/electricity/elecpaper5.htm. 69kv transmission lines are gradually being phased out in many parts of the country, particularly those experiencing increased electric loads and usage.

[7] 115kv upgrades were recently installed in parts of City of Beaufort without objection.

[8] Exhibit 3.

City Attorney, officials and staff of other municipalities and of the South Carolina League of Municipalities.

At the commencement of discussions the Committee made two specific requests of SCE&G.

First, it was requested to negotiate with the individual who has final decision making authority on this project. SCE&G responded by making its Vice President—Electrical Distribution (a senior executive responsible for electrical transmission and distribution throughout the utility's system) a participant in all meetings. In addition to participating in meetings, this individual was readily available to the Committee at all reasonable times.[9]

Second, SCE&G was requested to cease work on the upgrade project in Beaufort neighborhoods pending discussions. SCE&G has done so.[10] This undertaking has prevented the parties from having to take legal action to protect their positions, thus reducing cost to the city and improving the climate for constructive discussions.

The initial meeting with SCE&G focused on three primary issues: (1) the need for the proposed upgrade; (2) health and safety and (3) cost, feasibility and financial responsibility for placing the proposed transmission lines underground.

SCE&G asserted that the increased transmission capacity is necessary to serve increased demand in the Beaufort area arising out of population growth and increasing per capita consumption of electric energy. This increased demand is occurring both in Beaufort and Lady's Island. The utility explains that the increased transmission capacity will enhance the reliability of service to both Beaufort and Lady's Island by completing the partially built 115kv loop, thereby creating a more reliable and robust redundancy capacity in the event of an interruption of flow anywhere along the loop[11]. Indeed they assert that they are *required* to provide this additional transmission capacity by their statutory obligation to provide adequate, efficient and reasonable service.[12]

The utility also took the position that no public health risks are associated with the presence of the upgraded transmission lines.[13]

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[9] His continued active participation has streamlined discussion and improved the quality of our understanding of SCE&G's position. Indeed we have been impressed with and are grateful for the responsiveness of all SCE&G personnel involved in this matter. We also are very grateful for the support of City Manager Scott Dadson and his staff. Scott was a participant in all of our meetings, and he and his staff have been highly responsive to all requests for information and guidance.

[10] With City of Beaufort approval, SCE&G has continued its work in Pigeon Point Park relating to placing a new cable under the Beaufort River. This approval was given based on SCE&G's representations that the new cable was necessary regardless of whether there was a transmission voltage upgrade because of damage to the existing cable, and that the cost of demobilizing and then remobilizing the existing construction site in the park would be unreasonable.

[11] Redundancy is a crucial aspect of an electric transmission and distribution system. Utilities plan based on the assumption that key aspects of the system will fail from time to time, and to the fullest extent possible design redundant or flexible systems to assure continued service.

[12] "Every electrical utility shall furnish adequate, efficient and reasonable service." S.C. Laws Section 58-27-1510.

[13] Letter of SCE&G dated November 20, 2006. See pages 11 to 14 for a further discussion of health and safety issues.

At the initial meeting, SCE&G also indicated that they would be willing to place the proposed new transmission lines underground[14]. However they were adamant that the cost of burying the transmission lines must be borne by the City of Beaufort. They state that there is no legal obligation to place the transmission facilities underground and indeed believe they are legally obligated to place the lines above ground as it is the lowest cost alternative. Industry studies have calculated the cost of underground transmission lines at approximately eight times that of above ground transmission.[15] SCE&G gave a preliminary estimate that the added cost of placing this segment of the transmission lines was $4.5 million.

The cost concern is not frivolous[16]. After the damaging 2004 hurricanes, considerable public discussion arose in Florida about legislating a requirement that utility lines be buried in the state. The Public Service Commission of the State of Florida was asked by the state legislature to report on the cost and feasibility on burying the transmission and distribution system in Florida. The Florida PSC's preliminary cost estimate for burying transmission and distribution lines for the 78% of the Florida system it regulates was $146 billion[17]. As of the time of the report (2005), Florida investor owned utilities had 14,566 miles of transmission lines. Only 183 miles of these lines were underground. The transmission lines were valued[18] at $2.4 billion. The estimated cost of placing the lines underground was $52 billion.

We are not aware of any similar study of South Carolina. However, while the absolute numbers would vary, the order of magnitude of investment compared with current value would no doubt be similar. The project would require a huge investment, which the utilities would be certain to oppose with likely success.[19] and which probably could not legally be imposed on them without an increase in rates to pay the cost. Alternatively, it could be financed by a significant rise in rates, which is equally likely to be unacceptable to both consumers and industry in the state[20].

Goals

In presenting Council with alternatives, we first wished to define appropriate goals for the City of Beaufort in connection with its electrical system and its relationship with SCE&G.

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[14] SCE&G says that placing transmission lines underground along the existing right of way is not a viable alternative because of the number of turns the right of way makes.

[15] Johnson, Bradley W., *A Study of the Cost and Benefits of Undergrounding Electric Power Lines* (Edison Electric Institute, July 2006) For SCANA's take on this issue, see http://www.scana.com/NR/rdonlyres/465E6534-2FFB-4069-BF84-81465AEEF887/0/Undergroundvs.pdf. See also Florida Public Service Commission, *Preliminary Analysis of Placing Investor-Owned Electric Utility Transmission and Distribution Facilities Underground in Florida* (March 2005)

[16] http://www.psc.state.fl.us/publications/consumer/bulletin/Aug05baez.pdf

[17] The Florida PSC provided estimates for the systems served by the five investor owned public utilities subject to the jurisdiction of the PSC. These utilities supplied about 78% of the electric energy to customers in the state. Thus the estimates exclude costs that would be incurred by electrical cooperatives and municipal owned utilities.

[18] Value was apparently determined as the depreciated cost of the facilities.

[19] This assessment is based on the fact that no other state considering the issue has imposed such a requirement, because of costs involved.

[20] A state wide rise in rates would place South Carolina at a competitive disadvantage in attracting business. Localities like Beaufort of course can choose to pay this cost themselves. This alternative is discussed later in this report.

1. A system that assures public safety in both day to day operations and emergencies.
2. A system of highest reliability that assures the present and future electric energy needs of the city.
3. A system consistent with the goals of intergovernmental cooperation and planning embodied in the Northern Regional Plan for Beaufort County.
4. A system that furthers City of Beaufort's goals of historic and neighborhood preservation and renewal. Specifically, these goals should include:
    a. A plan for removal of electric transmission facilities from residential neighborhoods.
    b. A plan for placing electric distribution lines underground over a period of time, and a sustainable program for financing this effort.
5. A system of cooperation and planning between SCE&G, city staff and council that will avoid future surprises and be a model for the state.
6. Cost containment and fair allocation of costs for any initiatives.

Alternatives

We believe the Council has three basic alternatives:

1. Accept above ground transmission lines temporarily[21], but only pursuant to a written agreement containing negotiated terms and conditions acceptable to Council.
2. Accept the proposed transmission lines permanently, but locate them underground at city expense pursuant to a written agreement with other conditions acceptable to council.
3. Adopt a version of the proposed ordinance and try to prevent any upgrade of the transmission lines along the existing right of way through the ordinance and other legal means.

When it became clear that SCE&G would not voluntarily incur the cost of placing the transmission lines underground, we concentrated a significant portion of our effort on defining what SCE&G would be willing to concede if permitted to upgrade the transmission lines above ground. We felt that only specific knowledge of what neighborhood enhancements SCE&G would do as part of the project would enable Council to make its best decision.

[21] For reasons of simplicity, this report focuses on transmission lines that would traverse the existing right of way. The Committee has considered two alternative routes, one involving Boundary Street and the other involving Rogers and Godfrey Streets. Neither impressed the Committee as being a clearly superior alternative to the present route. If after considering the information contained in this report Council wishes more information on these alternatives, we will submit it.

Recommendations

The Committee recommends that the City of Beaufort enter into a written agreement with SCE&G that would permit above ground 115 kilovolt transmission lines along the existing right of way, but only in exchange for certain undertakings by SCE&G that are described in more detail in this report.

A crucial undertaking by SCE&G would be written agreement to relocate the transmission lines to a proposed utility corridor established in the Northern Regional Plan of Beaufort County when such corridor is created and available for such purpose. The relocation to the new corridor would be entirely at SCE&G's expense. Upon such relocation, SCE&G would deactivate and remove the transmission lines in the existing right of way.

The reasons for these recommendations can be summarized as follows:

- SCE&G would contest the right of the City of Beaufort to prohibit the transmission line upgrade.
- The outcome of litigation to determine whether Beaufort has the legal authority to prohibit the proposed transmission lines is subject to substantial uncertainty.
- The monetary cost of litigation would be high. SCE&G would utilize all available resources to oppose the city[22], and Beaufort would require specialized counsel. Cost could easily reach $500,000 and perhaps significantly more.
- Litigation would involve a large amount of staff time. Beaufort runs on lean staffing, and the distraction would affect staff ability to address other issues adequately.
- Victory on the principal issue in the litigation—the power of the city to regulate the lines—would involve no monetary recovery and thus no recoupment of the substantial cost involved.
- Victory in litigation on the principal issue does not automatically result in SCE&G placing the lines underground. “Victory” could result in SCE&G pursuing other means (legislation, Public Service Commission action, political pressure that would adversely affect Beaufort, condemnation) to achieve the same result.
- If litigation did result in SCE&G placing the transmission lines underground in the city, they would likely be there forever. Under these circumstances SCE&G is highly unlikely to remove the lines when an alternative utility corridor is established.

[22] We have been asked by numerous individuals whether SCE&G is bluffing in its refusal to pay the cost of undergrounding the transmission lines. We do not believe that they are. The reasons for this belief include (1) the clear and unambiguous nature of their statement of position, (2) the fact that they have sustained this position through all discussions, (3) the monetary cost of placing the lines underground and (4) the fact that agreeing to place the lines underground (or acquiescing in Beaufort’s power to enforce the proposed ordinance) would have system wide repercussions for SCE&G that are critical to their financial condition and their ability to execute their corporate mission. These are classic circumstances that cause a company to pursue litigation if needed.

- SCE&G has agreed to remove the transmission lines from residential neighborhoods at its own expense when a utility corridor is established that will accommodate them.
- SCE&G has agreed to community enhancements along the proposed route with a estimated value to the city of about $750,000 to $1,000,000. These include:
    - Placing all distribution lines underground along the route at SCE&G expense.
    - Running distribution lines underground to individual homes and businesses along the route exclusively at SCE&G expense.
    - SCE&G contribution to cost of curbs, sidewalks and extensive landscaping along the route.
    - 24 hour per day security during construction if requested by the city at SCE&G expense.
- These enhancements would not be available in the event of litigation, win or lose.

SCE&G Statement on Background of Phasing Out 69 Kilovolt Transmission Wires

Both 46KV and 69KV are commonly referred to as sub-transmission voltages. Like 115KV lines, they also serve regional load and do so in a very reliable fashion. There are thousands of miles of sub-transmission lines in service across the country. There is no industry-wide intentional or active effort to dismantle these lines in favor of higher voltage lines as long as the sub-transmission lines can deliver the needed electric power to any given area. It is true that very little new sub-transmission is being installed today. Most new transmission line construction is at the 115KV level, and higher. However, once the capacity of any line is maxed out, regardless of voltage, there are only a couple of options available to increase the transmission capacity serving any region. Basically, a utility can install an additional transmission line in a new corridor or they can increase the operating voltage of an existing line. The higher operating voltage allows the transfer of more electric power without a corresponding increase in current flow, therefore yielding more efficient power transfer. Given the difficulty, and in some cases, the impossibility of opening new corridors into an area, a utility will typically choose to increase the operating voltage up to the next increment rather than attempting to site new lines. This is especially true in developed areas. Of course, over time this action

will result in a net reduction of the number of miles of sub-transmission lines in service and this may be perceived as an intentional effort to reduce and eventually eliminate sub-transmission lines. But unless there are capacity driven reasons to replace them, sub-transmission lines will remain a viable utility asset for many years to come.[23]

Health Issues

The location of electric power lines consistently involves question about whether proximity to power transmission or distribution lines is a hazard to human health. The primary worry expressed is one of the health effects of the magnetic and electric fields that emanate from power lines. This issue is part of the larger question of the health impact of the pervasive electromagnetic devices that permeate our modern life.

This concern has resulted in extensive study of health effects of magnetic and electric fields. The principal body collecting this research has been The World Heath Organization. [24] A main committee consisting of public health officials from more than 60 nations meets annually on this subject, and numerous subcommittees meet more frequently. Through this body WHO collects and disseminates information regarding research on the impact of electromagnetic fields ("EMFs") and extremely low frequency fields ("ELFs"),[25] which are the type of field emitted by power lines. The WHO also annually summarizes the state of regulatory actions, if any, of various types of EMFs.

The extensive research has resulted in very limited regulatory limitation of ELF exposure, either in the United States or abroad. South Carolina has adopted no limitations on EMF or ELF exposure. To our knowledge no other state has adopted standards. The United States Occupational Safety and Health Administration has no occupational limits.

The most credible concern about health effects is the possible impact of ELF exposure on development of cancer, particularly childhood leukemia. However, after a 1999 study, the U.S. National Institute of Environmental Health Sciences (NIEHS) report to Congress declined to list ELF exposure as a "possible carcinogen."[26]

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[23] Email of Keller Kissam to David Lott, March 26, 2007

[24] http://www.who.int/peh-emf/publications/reports/en/index.html

[25] For a definition of the various types of electric and magnetic fields and a discussion of the differences between them see http://www.who.int/peh-emf/about/WhatisEMF/en/

26 This report did generate some controversy because NIEHS declined to adopt a recommendation by a majority of a working group on the issue that ELFs were "possible carcinogens." Assessment of Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields: Working Group Report, National Institutes of Health, Research Triangle Park, NC, 1998 (http://www.niehs.nih.gov/emfrapid/html/WGReport/PDF_Page.html) For a commentary on this report by Dr. John Moulder, Phd., see Moulder, Power Lines and Cancer. http://www.mcw.edu/gcrc/cop/powerlines-cancer-FAQ/toc.html Dr. Moulder states that

"The "working group" unanimously concluded that the power-frequency fields were not an IARC class 1 or class 2A agent; that is, that they were not a "known human carcinogen" or a "probable human carcinogen" (see Table below). The majority of the "working group" concluded that power-frequency fields should be classified as IARC class 2B; that is that they were a "possible human carcinogen". Other agents similarly classified by the IARC as "possible human carcinogens" include coffee, automobile exhaust, gasoline and pickled vegetables. A substantial minority of the "working group" concluded that the evidence was not even sufficient to place power-frequency fields in IARC class 2B.

> The NIEHS concludes that [power-frequency electromagnetic field] exposure cannot be recognized as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard. In our opinion, this finding is insufficient to warrant aggressive regulatory concern. However, because virtually everyone in the United States uses electricity and therefore is routinely exposed to [power-frequency electromagnetic fields], passive regulatory action is warranted such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures.

Consistent with this statement, the NIEHS did not recommend specific regulatory action or power line exposure standards:[27]

In 2002 NIEHS elaborated on this subject, stating[28]

> The overall scientific evidence for human health risk from [exposure to power-frequency fields] is weak. No consistent pattern of biological effects from exposure to [power-frequency fields] has emerged from laboratory studies with animals or with cells. However, epidemiological studies . . . had shown a fairly consistent pattern that associated potential [exposure to power-frequency fields] with a small increased risk of leukemia in children and chronic lymphocytic leukemia in adults. . . . For both childhood and adult leukemias interpretation of the epidemiological findings has been difficult due to the absence of supporting laboratory evidence or a scientific explanation linking [exposure to power-frequency fields] with leukemia.

The following quotation from the WHO emphasizes the difficulty of establishing as a scientific certainty that no harm can arise from electromagnetic fields:

According to the report of the "working group", the classification in IARC class 2B was based on "limited epidemiological evidence" that residential exposure to power-frequency fields was associated with childhood leukemia. "Limited epidemiological evidence", in the IARC scheme means: "A positive association has been observed between exposure... and cancer for which a causal interpretation is considered credible, but chance, bias or confounding could not be ruled out with reasonable confidence."

The "working group" concluded that the epidemiological and experimental evidence was "inadequate" (see Table below) to suggest that exposure to power-frequency fields was a "possible" cause of any type of cancer other than leukemia. The "working group" also concluded that the epidemiological and experimental evidence was "inadequate" (see Table below) to suggest that exposure to power-frequency fields was a "possible" cause of adverse human health effects other than cancer."

[27] Moulder, *Power Lines and Cancer*, Paragraph 27G.

[28] : http://www.niehs.nih.gov/emfrapid/booklet/home.htm For the full NIH report see http://www.niehs.nih.gov/emfrapid/html/EMF_DIR_RPT/Report_18f.htm

DIFFICULTIES IN RULING OUT THE POSSIBILITY OF VERY SMALL RISKS

"The absence of evidence of detrimental effects does not seem to suffice in modern society. The evidence of their absence is demanded more and more instead". (Quoting Barnabas Kunsch, Austrian Research Centre Seibersdorf)

"There is no convincing evidence for an adverse health effect of electromagnetic fields" or "A cause-effect link between electromagnetic fields and cancer has not been confirmed" are typical of the conclusions that have been reached by expert committees that have examined the issue. This sounds as if science wanted to avoid giving an answer. Then why should research continue if scientists have already shown that there is no effect?

The answer is simple: Human health studies are very good at identifying large effects, such as a connection between smoking and cancer. Unfortunately, they are less able to distinguish a small effect from no effect at all. If electromagnetic fields at typical environmental levels were strong carcinogens, then it would have been easy to have shown that by now. By contrast, if low level electromagnetic fields are a weak carcinogen, or even a strong carcinogen to a small group of people in the larger population, that would be far more difficult to demonstrate. In fact, even if a large study shows no association we can never be entirely sure that there is no relationship. The absence of an effect could mean that there really is none. But just as well it could mean that the effect is simply undetectable with our method of measurement. Therefore, negative results are generally less convincing than strong positive ones.

The most difficult situation of all, which unfortunately has developed with epidemiology studies involving electromagnetic fields, is a collection of studies with weak positive results, which however are inconsistent among each other. In that situation, scientists themselves are likely to be divided about the significance of the data. However, for the reasons explained above, most scientists and clinicians agree that any health effects of low level electromagnetic fields, if they exist at all, are likely to be very small compared to other health risks that people face in everyday life.

It is important to keep in mind the meaning of the term "weak evidence" in this context. Weak evidence does not mean that there is a weakly proven association between power line proximity and childhood leukemia. It means that the evidence of cause and effect is weak and unpersuasive, but of sufficient magnitude that the question requires further information gathering and study. The "weakness" of the evidence for any link between power lines and cancer includes the following elements:

1. The evidence of risk is exclusively epidemiological. That is, evidence comes entirely from certain studies showing that, for a particular location and group, there was a higher than expected incidence of childhood leukemia. Because the disease is relatively rare and the increased incidence was at low relative levels, the greater incidence shown in these studies is subject to numerous alternative explanations, or can be the result of inherently unreliable test data or methodology. Because of alternative explanations and methodological limitations, epidemiological evidence by itself is not a reliable source of conclusion of risk in this circumstance. [29]
2. The majority of epidemiological studies have found no link between childhood leukemia and power line exposure. This further weakens the evidentiary value of the studies showing positive linkage, but it should be remembered that studies finding no link are subject to the same methodological limitations as studies finding a positive link.
3. Where evidence of risk is exclusively weak epidemiological evidence, scientists generally look to laboratory confirmation of adverse results. In the case of power lines and childhood leukemia, numerous studies have been made to determine whether power line emissions have genotoxic[30] effect or could result in the promotion[31] of cellular abnormalities. While the field of study is massive, complex and difficult to summarize, any laboratory evidence for real world power fields having genotoxic, promotional and similar effects is tentative and remote.[32] None of these findings have lead any cognizant health or safety authority to impose regulation. There have been no reported effects on cell proliferation or tumor progression that suggest a potential for carcinogenesis, and there have been no reports of effects at all for fields below about 50 microT."[33]

As a Committee, we of course have no capacity to review all of the available data, nor do we claim the expertise to conduct a scientific evaluation of the data we have seen. However, extensive review of this data by numerous potential regulators, both in the

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[29] In some circumstances, like the link between smoking and lung cancer, the incidence of disease is so high, and the correlation between diseased individuals and smokers is so strong, the epidemiological evidence alone is sufficient.

30 "Our current understanding of cancer is that it is initiated by damage to the genetic information of a cell (the DNA). Agents which cause such injury are called genotoxins. It is extremely unlikely that a single genetic injury to a cell will result in cancer; rather it appears that a series of genetic injuries are required. Genotoxic carcinogens may not have thresholds for their effect; so as the dose of the genotoxin is lowered the risk of cancer induction gets smaller, but it may never reach zero. Genotoxins may affect many types of cells, and may cause more than one kind of cancer. Thus, evidence for genotoxicity of an agent at any exposure level, in any recognized test for genotoxicity, is relevant to assessing carcinogenic potential in humans." Moulder, *Power Lines and Canc*er (Chapter 16)

[31]"Promotion" refers to the possibility that electric fields, while not causing cancer in cells, could promote cancerous development of cells that already have some cancerous tendancies. Moulder, *Power Lines and Cancer (Chapter 16)*

[32] Moulder, *Power Lines and Cancer (Chapter 23)*

[33]Quoting Moulder, *Power Lines and Cancer (Chapter 16)*

United States or abroad, has resulted in virtually no ELF exposure standards or limitations. In light of this background, we do not believe that we should recommend against the proposed project on the basis of a health risk. We do, however, encourage Council to review this issue on a de novo basis if it chooses, and we have told SCE&G representatives that they should be prepared to meet with Council on this issue if Council so requests.

Should City of Beaufort Pay to Place the Transmission Lines Underground?

Some have suggested in public meetings that City of Beaufort should agree to pay for the cost of placing the proposed transmission lines underground. The basis for this argument seems to be that the cost would be minimal[34] to each individual household, and the benefits great.

At an assumed cost of $4,500,000 to bury the transmission lines, and an assumed payment by borrowing at 6% interest amortized over 15 years, the annual cost to the city would be $405,051.24. Aggregate interest cost would be $2,075,769.16.[35]

We decline to endorse this suggestion for the following reasons.

- The cost would be greater than the asserted ten cents per day ($36.50 per year) per family.
- The proposed fee to finance the cost could be paid for only by either an increase in the franchise fee or by an increase in property taxes. The franchise fee in Beaufort is already at the maximum 5% level permitted by state law, and thus could not be increased.[36] The cost would therefore have to be funded by tax levies.
- The ability of Beaufort to raise property tax rates is constrained by new property tax caps under state law. [37]
- The decision to raise taxes or fees is a political one, to be made by elected representatives of the voters, not an appointed committee that has no political accountability.

[34] This was referred to by some at the "10 cent solution," based on the (incorrect) assertion that the cost per household would be only 10 cents per day.
[35] See Exhibit 12 for a 10 year and 15 year amortization table of such cost. The assumed cost of $4,500,000 is a very rough estimate and the actual cost would vary, perhaps significantly.
[36] An amendment of state law would be required to allow a higher franchise fee. A portion of the existing fee could be diverted for payment of this cost. However, franchise fees are already part of the city's anticipated general revenues, and thus other services would have to be cut, or other sources of income found, to make up for the diverted funds. A 11 year history of franchise fees collected on electric energy sales is attached as Exhibit 11.
[37] The cap does not apply to taxes to fund capital projects, so perhaps Council could find a way to legally raise taxes to fund the undergrounding of the transmission lines. However, in light of the existing capital expenditures already anticipated by the city, an additional $4.5 million dollar expenditure may be difficult to sell both to taxpayers and lenders.

- We believe that the goal of having power transmission lines removed from residential neighborhoods is more likely to be achieved by the course of action recommended by the Committee. This removal, when achieved, would be paid for by SCE&G, not City of Beaufort.

Aesthetic Concerns

Power poles are not objects of beauty, but are ubiquitous in modern life. We wish we had a easy suggestion to make this and all other ugliness in our world go away, but we do not. One of the issues facing council is whether the aesthetic concerns are sufficient to justify the proposed ordinance, and the cost and uncertainty of the litigation we believe would ensue. While our conclusion on this issue is implicit in our recommendation, we know that Council and the public will want to explore this issue fully. We offer the following facts for consideration in this discussion.

- The new transmission poles would be between 65' and 95' in height. Within this range the City and its residents would have a choice. These poles would be higher than most current poles, the tallest of which are 75' in height along Greene Street.
- Though the transmission poles would be higher than present poles, visual tests conducted by the City and SCE&G indicate that they could be placed so they would not be visible above the present tree line of the city from most vantage points, including Woods Bridge and the Beaufort River.[38]
- The poles could be either wood or steel. Steel poles would be designed to oxidize to a brown color. Because they are stronger, steel poles would be smaller at the base.[39]
- Because the transmission poles would be taller and all other wires would be placed underground, the total number of poles along the route would be reduced from 79 to approximately 35.
- All existing power distribution lines, both in the street and from street to houses, would be buried at the utility's expense. Telephone and cable lines would also be buried, all at the expense of SCE&G.
- SCE&G would provide new curbs where needed along the route, and would contribute to the cost for the city to plant trees and shrubs along the route. The

[38] Although most trees are shorter than the poles, the lines of sight are such that shorter trees closer to the observer would make the poles not visible. An observer at treetop level would, of course, see the tops of the poles.

[39] SCE&G has supplied the following estimates for diameters of steel poles.

Maximum and Minimum Pole Heights and Diameters		
(tangent is in-line, angle is on corners)		
Pole Height	**Base Diameter**	**Top Diameter**
65' Tangent	20" – 25"	10" - 12"
95' Tangent	24" – 36"	10" - 12"
65' Angle	36" – 42"	12" - 15"
95' Angle	36" – 48"	12" - 15"

intent would be to provide a tree canopy that would grow under the transmission lines and largely block them from view.

- If the poles were sufficiently tall (65' might be too short for this), tree canopy would grow up under the transmission wires, removing the necessity for unsightly periodic pruning.
- Upon establishment of a utility corridor at the proposed northern crossing (or elsewhere) the transmission lines and poles would be removed by SCE&G at its expense.

Elements of An Agreement between SCE&G and City of Beaufort

We recommend that the city embody its understandings with SCE&G in a legally binding written agreement[40]. We believe that the agreement should contain the following elements.

1. An acknowledgement by the City that SCE&G will be permitted to construct and maintain power transmission facilities along the proposed route with a maximum capacity of 115 kilovolts.
2. An undertaking by SCE&G that the capacity of these lines (and of the other 115kv lines recently installed in the City) shall never exceed 115 kilovolts[41].
3. An undertaking by SCE&G to replace the upgraded transmission lines along the proposed route with lines that are located within any utility corridor established in Northern Beaufort County that serves Lady's Island when the corridor becomes established and available for use.[42] As part of this undertaking, SCE&G would agree to
    a. Use its best reasonable efforts to gain approvals of an electric utility transmission corridor that would accommodate the proposed transmission lines.
    b. Promptly after approval of such a corridor, and to use its best reasonable efforts to obtain all permits and approvals for relocating the transmission lines to the corridor.

[40] The City Attorney should advise on the proper form and procedures for adopting such an agreement and on other substantive issues that should be addressed.

[41] SCE&G has stated that it is willing to enter into such an agreement. Email of Keller Kissam to David Lott dated May 24, 2007, stating "South Carolina Electric and Gas Company confirms and commits that the existing 115 kv system serving south of the Burton Transmission Substation will not be converted to any voltage exceeding 115kv. In the event that unanticipated loads materialize in the future, such loads could only be served through the proposed Northern Corridor or similar corridors to be determined by a formal siting study involving public input."

[42] Tentative discussions of the new Northern Regional Plan contemplate a utility corridor that would contiguous to or near the proposed Northern Crossing bridge to Lady's Island. The commitment of SCE&G to replace the transmission lines would apply to this proposed corridor, or any other corridor established in the future.

   c. Promptly upon receipt of all necessary permits and approvals, remove the replaced transmission poles and lines at its own expense.[43]

4. An undertaking by SCE&G at its own expense to do the following with respect to construction along the proposed route
   a. Construct all transmission poles and lines and all other work in conformance with established national safety standards.
   b. Cause to be buried all distribution lines along the proposed route[44]. This undertaking would include distribution lines running from the right of way to the homes and businesses of consumers, and of any upgraded circuit breakers, fuse boxes or other connections in the homes and businesses.
   c. Remove all distribution poles and all of the replaced transmission poles along the proposed route.
   d. Provide upgraded trees, shrubbery, landscaping, curbs and sidewalks along the proposed route to the reasonable requirements of the City.
   e. Consult with the City about need for permanent safety fences and barriers and install items reasonably required by the City.
   f. Reveal exact proposed locations of all proposed transmission poles and give residents and city officials opportunity for comment.
   g. Provide residents and city officials with choices as to height of transmission poles and the composition of the poles.[45]
   h. Establish a construction plan, schedule and safety plan in consultation with the City.
   i. Conduct a weekly construction progress and safety review and report weekly in writing to the City on that review.
   j. Provide construction security of up to 24 hours per day as required by the City.
5. An undertaking by SCE&G that the it will not use the presence of the transmission lines along the proposed route to object to the improvement, addition to, repair or reconstruction ("Improvements") of any owner's property along the route, as long as the Improvements are in compliance with City ordinances. A further undertaking by SCE&G to move or relocate the lines and poles if any state or other regulatory authority would require it (or any other body) to object to Improvements. An agreement by SCE&G that the foregoing undertakings are for the benefit of property owners and may be enforced by property owners.
6. An undertaking by SCE&G to conduct a review of the vulnerability of the underground portions of its local transmission grid to flood or storm surge, and to report to the City in writing on the results of that review. The review should be repeated every three years, and SCE&G should undertake to upgrade the protection to best available standards. A similar undertaking should be required with respect to wind vulnerability of transmission poles and lines.
7. An undertaking by SCE&G to provide the City with an annual written assessment of the state of the electrical grid in the City, and to provide responsible officials to

[43] Because of the need for the transmission lines to form a loop through Beaufort and Lady's Island, this undertaking could apply only to the new transmission lines along the proposed route, not to the 115kv lines already installed elsewhere in the City.
[44] This undertaking would also include existing telephone and cable lines.
[45] As noted previously, the height of the poles could range between approximately 65' to 95' and they could be made of wood or steel.

be available annually for a presentation to Council of the results of such assessment. This annual assessment should also include an update on research and regulatory action with respect to the health effects of ELFs and EMFs. SCE&G should agree to undertake immediate corrective action should any federal or state regulatory standard be established that would be violated by the existing transmission facilities in the City.

8. Any other provisions consistent with the spirit of the overall agreement that Council or its legal advisors may deem appropriate.

The foregoing elements of an agreement have been discussed with SCE&G representatives and we believe they are accepted in principle by these representatives.

Long Term Planning to Place City of Beaufort Distribution Lines Underground

A consistent theme of every public comment opportunity has been that all electric lines in the City should be placed underground. Before the realities of cost and the uncertainties of litigation intervened, this was the goal of our Committee for the proposed transmission lines. After study, we came to believe that the goal of removing transmission lines from close proximity to residential neighborhoods is a more useful statement of an achievable goal, and that the course of action recommended in this report is the best path to reaching this goal.

Nevertheless we believe that City of Beaufort should establish a long term goal of placing all electrical distribution underground. This is an agreeable result for aesthetic reasons, and on balance is better for safety and reliability.[46] Cost is again the major hurdle.

There are 30 miles of single phase above ground electric distribution lines and 41 miles of multiphase lines in Beaufort. Upon request by the Committee, SCE&G provided a very rough estimate that the cost of placing the lines underground would be approximately $50,000,000. This works out to about $710,000 per mile.[47]

A number of interested citizens have commented that Beaufort should follow the example of Hilton Head and commit its annual franchise fees to the cost of placing distribution lines underground.[48]

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[46] Industry data shows that in normal operations underground distribution lines have fewer faults, but that the faults are slower and more expensive to repair when they occur. While obviously less vulnerable to wind, underground utilities are susceptible to damage by flood and storm surge in the event of hurricane. Storm damage to underground utilities is more difficult to locate, and can take considerably longer to repair and get back in service.

[47] Email of David Tempel, March 15, 2007. The estimate does not include the cost to convert communications and cable facilities to underground, the cost to convert residential and commercial customers' services to underground, and the cost to bury transmission facilities.

[48] In 2006 City of Beaufort received a total franchise fee of $779,362.84 Of this amount $646,196.62 related to electric bills and the balance arose from natural gas sales. In 1995, electric franchise fee was $230,795.24. Same year gas franchise fee was $48,418.34. Total franchise fee 1995 was $279,213.58. A small portion of the fee (.5%) is set aside annually for a fund to bury power lines. SE&G is obligated to match this amount when expended by the City.
Recent percentage fee increases (expressed in % of total dollars of fee) have been:
2006--6%

The difficulty facing Beaufort is that, unlike Hilton Head, Beaufort has for many years used nearly all of its annual franchise fees for general fund purposes.[49] For reasons that the Hilton Head city manager told us were "lost in time," for many years Hilton Head received an annual flat franchise fee of $50,000. When Hilton Head revised its franchise arrangement to a more standard percentage arrangement, it had and took the opportunity to earmark these revenues for the cost of placing distribution lines underground. Here is how this project was described in an award Hilton Head received in 2005 from the South Carolina Municipal Association.

> Many natural disasters such as hurricanes, flooding and tornadoes have threatened Hilton Head Island throughout the years. To effectively manage the recovery from such an event, the Town adopted a Comprehensive Emergency Management Plan. The plan recommended burying the power lines to prevent power loss. However, burying the Island's 76 miles of power lines would cost almost $35 million and would take 15 years to complete[50]. An opportunity arose when the Palmetto Electric Cooperative's franchise agreement needed to be renewed. Under the previous agreement, the Town charged a $50,000 annual fee. Most franchise fee agreements range from 3-5 percent. A 3 percent franchise fee represents an annual payment of $1.8 million. The Town decided to dedicate this revenue to pay for costs associated with burying power lines. As part of the renewal agreement, the Cooperative agreed to bury all existing and future lines within 15 years, to assist with the Town's efforts to build pedestrian pathways and redevelopment projects, and work with residents and commercial customers as they hookup to new power lines. The Town adopted an ordinance requiring customers to hookup to the newly buried power lines. Using the proceeds from the franchise fee, the Town decided to reimburse all customers for reasonable hookup costs. With buried power lines, the Island will be less vulnerable to power outages, residents will be able to operate their businesses and reenter their homes soon after a natural disaster, and public service districts will be able to quickly restart their operations. As an added benefit, the aesthetics

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2005-2%
2004-10%
2003-3%

[49] Hilton Head also generates more fees than Beaufort. Its franchise fee rate is 3% rather than 5% but brings in about $1.8 million per year.

[50] The difference between this cost estimate and that supplied by SCE&G for Beaufort is substantial on a cost per mile basis. We have not yet had the chance to explore the reasons for this difference.

> of the Island are improved as the power lines move underground.[51]

Beaufort unfortunately is not in this position because of its reliance on these revenues in the general fund. Thus Beaufort would have to find revenues from other sources to replace this money. The likely source for such amounts would be a tax increase. Even if the tax increase were advisable, state mandated tax limitations would make imposition of the tax difficult. Thus we have concluded that using the existing franchise fee to fund burying of electric distribution is not likely to be feasible at the present time.

However we strongly recommend that Beaufort immediately end its reliance on increases in franchise fee income. The City should earmark all future increases in franchise fees to the cost of burying distribution lines.

This funding alone will not be sufficient to reach the goal of having all distribution lines underground.[52] The diversion of franchise fee increases will require other fiscal adjustments, which may be difficult. However, while difficult, we believe this is a goal Council should no longer ignore.

Conclusion

We all appreciate the opportunity to serve on this Committee. We have had the chance to get to know each other and have had an energetic, thoughtful and respectful dialog over several months.

We want to thank Scott Dadson, City Manager, and his staff for excellent support and helpful counsel.

City Attorney Bill Harvey has been responsive to all our questions. His ability and experience have been very helpful. To the extent that our recommendations involve judgments about what the City's legal strategy should be, we emphasize that the conclusions are our own. We recognize that Mr. Harvey is the City's legal advisor on this matter, and encourage Council to test and challenge our recommendations in light of whatever further advice Mr. Harvey may give.

We also thank SCE&G's representatives, especially Keller Kissam and David Tempel. They have been responsive, informative and forthright in our discussions with them.

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[51] http://masc.sc/misc/achievement_2005.htm#hiltonhead

[52] Given uncertainty about the reliability of present cost estimates, we have not supplied projections at this time. However, these facts should be clarified and projections done. We will assist in this effort if requested. We also have some ideas about additional funding sources that could be incorporated in a more comprehensive report on this issue if Council desires.

Finally, we wish to thank the many citizens who have shown interest by contacting us directly, attending our public meetings and attending community forums. Their comments and questions helped to shape our thinking.

All of these people have improved this report. Its deficiencies are our own.

Respectfully,

Charlotte Brown
John Gadson
David S. Lott, Chair
Steve Tully, Vice Chair
John Trask III