NOTES

EMF REGULATION: IS CONGRESS RIDING THE WAVE OF PARANOIA?

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I. Introduction

The public has recently become increasingly concerned that exposure to electric and magnetic fields (EMF) pose a health threat to humans.[1] EMF are present wherever there is an electric

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[1] *See* H.R. REP. No. 1026, 101st Cong., 2d Sess. 252 (1990) [hereinafter H.R. REP. No. 1026]. A number of studies regarding the effect EMF has on human health yielded effects "ranging from no measurable effect to increased cases of leukemia." *Id. See also* H.R. REP. No. 664, 102d Cong., 2d Sess. 1 (1992) [hereinafter H.R. REP. No. 664]; DEPARTMENT OF ENG'G & PUB. POLICY, CARNEGIE MELLON UNIV., ELECTRIC AND MAGNETIC FIELDS FROM 60 HERTZ ELECTRIC POWER: WHAT DO WE KNOW ABOUT POSSIBLE HEALTH RISKS? 13-28 (1989) (discussing possible cancer risks posed by EMF and precautions that could be taken) [hereinafter DEPARTMENT of ENG'G]; PUBLIC SERV. ELEC. & GAS CO., ELECTRIC AND MAGNETIC FIELDS (EMF): A SUMMARY OVERVIEW (1992) [hereinafter PSE&G SUMMARY OVERVIEW] (discussing the possible health risks posed by EMF based on current studies). Carter A. Prescott, *Public Service Electric & Gas Co., EMF: The Controversy*, MGMT. Q. (PSE&G/Corp. Communications Dep't), Summer 1993, at 3; Michael Freeman, *The Court and Electromagnetic Fields*, PUB. UTIL. FORT., July 19, 1990, at 20 (asserting that public perception of the risk connected with living near transmission lines plays a larger role in shaping the EMF issue than actual studies). It has been stated that "[i]t is not so much that the studies' conclusions have changed dramatically in the last decade; it's that many more people are studying [EMF] now—and that newspapers, magazines, and television have paid a lot of attention." *Id.* Scientific studies have attributed EMF to numerous health effects, including depressed protein levels, changes in white blood cells and releases of calcium from brain tissue. *See* Kristopher D. Brown, Note, *Electromagnetic Field Injury Claims: Judicial Reaction to an Emerging Public Health Issue*, 72 B.U. L. REV. 325 (1992) (citing Jon F. Merz, *Scientific Uncertainty in the Courtroom*, APPLIANCE ENGINEERING, June 1990, at 94). It has also been asserted that exposure to EMF may cause miscarriages and birth defects. Leonard A. Sagan, *Epidemiological and Laboratory Studies of Power Frequency Electric and Magnetic Fields*, JAMA, Aug. 5, 1992, at 625. Some studies suggest a correlation between exposure to EMF and an increase in the incidence of breast, brain and prostate cancer. Sharon Tomecek, *EMFs: Charged with Controversy*, REAL EST. TODAY, Nov.-Dec. 1992, at 16. In Long Island, N.Y., where the rate of breast cancer is considered to be above average, a group of women afflicted with breast cancer called "One in Nine: The Long Island Breast Cancer Action Coalition," are concerned that

current,[2] including power lines, computers and common household appliances.[3] Hence, people living near electric power lines, working in close proximity to machinery generating EMF radiation, and using electric equipment and appliances, are very concerned about the potential health effects of these exposures.[4] Understanding this issue, however, is extremely difficult due to the inconclusivity of scientific evidence, the ambiguity of medical literature and the excessive involvement of numerous and varying agencies at the federal and state levels, as well as the private sector.[5]

EMF may have contributed to their condition. Beth Whitehouse & Michelle Slatalla, *Breast Cancer: A Special Report,* NEWSDAY (Nassau and Suffolk County, N.Y.), Oct. 4, 1993, at 7. As a result, "One in Nine" hosted a conference in November 1993, with two dozen scientists, to discuss environmental factors, including EMF, that may contribute to the above average rate of breast cancer among women in Long Island. *Id.* In October 1993, the National Cancer Institute decided to conduct an expansive environmental study of breast cancer in Long Island's Nassau and Suffolk counties, despite Congressional refusal to authorize the project. *See* Dan Fagin, *Seeking Causes: U.S. Proceeding With Breast Cancer Probe on Long Island,* NEWSDAY (Nassau and Suffolk County, N.Y.), Oct. 10, 1993, at 3. The study would specifically investigate whether the existence of EMF and pesticides are partially or totally accountable for Long Island's high breast cancer rate. *Id. See also* Susan Ferraro, *The Anguished Politics of Breast Cancer,* N.Y. TIMES, Aug. 15, 1993, § 6 (Magazine), at 25.

[2] Electric fields are produced by the electric pressure or voltage in a conductor, and the higher the voltage, the greater the electric field. PSE&G SUMMARY OVERVIEW, *supra* note 1, at 1. Current, however, need not be present for an electric field to exist. *Id.* As long as voltage is present (a wire is energized), an electric field is present. *Id.* For example, "wiring in a home that is energized, but not being used to operate an appliance that is plugged in, will still produce an electric field." *Id.*

[3] H.R. REP. No. 664, *supra* note 1, at 19. *See* H.R. REP. No. 1026, *supra* note 1, at 251; Stephen A. Booth, *Invisible Ray, Hidden Hazards,* POPULAR MECHANICS, May 1993, at 33, 35; Ted Sherman, *Fears Over Electrical Fields Health Hazards,* SUNDAY STAR-LEDGER (Newark), May 9, 1993, at 20. *See* John Weiss, Note, *The Power Line Controversy: Legal Responses to Potential Electromagnetic Fields Health Hazards,* 15 COLUM. J. ENVTL. L. 359 (1990). Many microcomputers in the US emit over 100 Milligauss (mG). Paul Saffo, *The Threat of Electromagnetic Fields: Are Our Computers Killing Us?,* PC-COMPUTING, Dec. 1992, at 126.

[4] *See* 137 CONG. REC. E4181 (daily ed. Nov. 26, 1991) (statement of Rep. Brown). Increasingly, scientists, regulators and lay people are asking whether EMF produce adverse health effects to humans and the environment. *See* DEPARTMENT of ENG'G, *supra* note 1, at 1. Electric fields can be shielded to a great extent by the average house, which shields about 90%. Prescott, *supra* note 1, at 4. Magnetic fields, however, penetrate almost every element, and these, as opposed to electric fields, are the fields that are currently producing the most concern. *Id.*

[5] 137 CONG. REC. E4181, (daily ed. Nov. 26, 1991) (statement of Rep. Brown). The private sector is generally composed of utility companies. Brown, *supra* note 1, at 325. It has not yet been conclusively determined whether electric and magnetic fields pose health risks. *See* DEPARTMENT of ENG'G, *supra* note 1, at 10. State employees in

This heightened concern over EMF has prompted the recent proposal of Congressional legislation addressing the issue. Specifically, the Children's Electromagnetic Field Risk Reduction Act, H.R. 1494,[6] and the Electromagnetic Labeling Act of 1993, H.R. 1665 have been introduced in the House of Representatives.[7] Though each bill deals with different aspects of this problem, both attempt to respond to the general public's fear over EMF, despite the scientific uncertainty surrounding EMF's potential adverse human health effects.[8]

This note will trace the development of these two congressional bills, as well as other federal and state legislation proposed and passed to address EMF. Part II chronicles the history of EMF and the surrounding public concern giving rise to the current legislation. Part III details the various locations that EMF can be found on a daily basis. Part IV analyzes the evolution of the current congressional bills, highlighting prior federal legislation that similarly sought to confront the public's outcry for EMF information. Part V delineates Congress' current EMF legislation, H.R. 1494 and H.R. 1665, detailing their provisions and objectives. Finally, Part VI discusses significant steps taken by states and the private sector to confront the EMF issue, including research studies and regulatory measures which, in many instances, outmeasure the federal government response.

II. Background on EMF

Electromagnetic fields are produced by any object carrying electricity.[9] Electric and magnetic fields are a combination of elec-

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Montana met with experts on EMF to voice their concern that EMF may be linked to a high incidence of cancer among workers in the state capitol building. *Montana: EMF Debate Yields No Answers*, American Political Network, Inc., Sept. 24, 1993, *available in* LEXIS, Nexis Library, Greenwire File. However, experts found there was no conclusive evidence to prove that EMF cause cancer. *Id.*

6 H.R. 1494, 103d Cong., 1st Sess. (1993) [hereinafter H.R. 1494].

7 H.R. 1665, 103d Cong., 1st Sess. (1993) [hereinafter H.R. 1665].

8 *See generally* 139 CONG. REC. No. E781-01, 103d Cong., 1st Sess. (Mar. 25, 1993); H.R. REP. No. 664, *supra* note 1.

9 H.R. REP. No. 664, *supra* note 1, at 19. Electric charges produce two kinds of fields: electric fields, which result just from the strength of the charge; and magnetic fields, which result from the motion of the charge. DEPARTMENT of ENG'G, *supra* note 1, at 3. Electric fields represent the forces that electric charges exert on other charges at a distance, because they are charged. *Id.* Magnetic fields are created by the current or flow of electricity through a conductor. *Id.* They represent the forces that a mov-

tric fields that are voltage dependent and arise from the strength of the charge in a line, and magnetic fields, which are the result of the motion of that charge.[10] In the United States, power fields have a frequency of 60 hertz, that is, they alternate back and forth at 60 times per second.[11]

Public concern over electric power fields commenced in the late 1960s when utility companies switched to extra high voltage transmission lines to handle the large increases in electricity use.[12] In 1972, the Soviet Union issued the first report attributing adverse health effects among power line workers to electromagnetic radiation.[13] Since that report, there have been a number of research

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ing charge exerts on other moving charges because they are in motion. *Id.* The magnetic field strength increases as current increases and the fields are only created when the current is flowing. *Id.* A group of charges all moving in roughly the same direction is called an electric current, and all current produces magnetic fields. *Id.* "Living cells maintain natural electric fields across their surface that are at least 100 times more intense than those that can be induced by exposure to power frequency (60 hertz) fields." H.R. REP. No. 1026, *supra* note 1, at 252. Unlike ionizing radiation (x-rays), power fields do not break chemical bonds in molecules, or cause heating in bodily tissues leading to extreme biochemical changes in the body's hormone levels or likewise cause a disruption of DNA synthesis. *Id.*

10 H.R. REP. No. 1026, *supra* note 1, at 251. *See Re* Commonwealth Elec. Co., 117 Pub. Util. Rep. 4th (PUR) 37, 46 (Sept. 28, 1990). As the voltage of a power line increases, the strength of the electric charge increases. *Id.* The strength of an electric field is measured in units of volts per meter (V/M) or thousand volts per meter (KV/M). *Id.* On the other hand, a magnetic field results from the motion of the charge and is therefore current dependent. *Id.* Magnetic fields form "closed continuous loops around currents," and as the current of a power line increases, the strength of its magnetic field increases. *Id.* The strength of a magnetic field is measured in units of Gauss (G) or thousandths of Gauss (mG; mG is a measurement of EMF on a gauss-meter instrument). *Id.*

11 H.R. REP. No. 1026, *supra* note 1, at 251. *See Re* Commonwealth Elec. Co., 117 Pub. Util. Rep. 4th at 46. In North America, electric power that is used in our homes, offices and factories uses alternating current that is produced at a frequency of 60 hertz (Hz). *See* DEPARTMENT OF ENG'G, *supra* note 1, at 1. In Europe and some other parts of the world, the frequency of electric power is 50 Hz rather than 60 Hz. *Id.* Frequencies in the 30 to 300 Hz range, which includes power lines, are referred to as extremely low frequency [hereinafter ELF]. *Id.*

12 *Id. See* Sherman, *supra* note 3, at 20. Since the 1970s, researchers have been investigating whether EMF, particularly the magnetic field component, might be a factor in human diseases such as leukemia and some other cancers. *See* PUBLIC SERV. ELEC. & GAS CO., SWEDISH STUDIES 1 (1993) (discussing various Swedish studies conducted on EMF). Questions regarding EMF have been studied intensively over the past 20 years through studies conducted by government, university and industry researchers. *See* PSE&G SUMMARY OVERVIEW, *supra* note 1, at 1.

13 H.R. REP. No. 1026, *supra* note 1, at 252. These studies focused on Soviet utility workers at stations where higher voltages are transformed to lower voltages. *See*

studies conducted regarding the effects of electromagnetic fields on human health, with results ranging from findings of no measurable effect to those of increased cases of childhood leukemia correlated with proximity to power lines.[14]

As a result of these findings, EMF have been the focus of numerous biological, epidemiological and toxicological studies, with results that are indefinite and sometimes contradictory.[15] The

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Sagan, *supra* note 1, at 627 (citing V. Korobkova et al., Influence of the Electric Field in 500 and 750kv Switchyards on Maintenance Staff and Means for its Protection (Presented at the International Conference on Large High-Tension Electric System in Paris, France, Aug. 28-Sept. 6, 1972)). The employees were found to have symptoms of sleeplessness, headaches and upper respiratory tract symptoms. *Id.* However, a recent study by Southern California Edison found no cancer link whatsoever among its utility workers exposed to EMF. *See* Prescott, *supra* note 1, at 8. The United States has become the first nation in the world outside the Soviet Union to adopt standards regulating emissions from EMF. *See* Bob Boyle, *Florida Adopts EMF Emissions Standards*, PUB. UTIL. FORT., June 22, 1989, at 49. The Soviet Union's standard on magnetic field emissions limits exposure to an individual in a room to no more than 18,000 mG. *Id.* Outside of the U.S., there are significant research programs underway in Sweden, the United Kingdom, Germany, Canada, Japan, Italy, France, Finland and Norway, as well as China and Eastern Europe. *See* DEPARTMENT OF ENG'G, *supra* note 1, at 36. The Swedish government has taken the most dramatic stance on minimizing EMF exposure. *See Maybe the Swedes are Right*, FORTUNE, Mar. 8, 1993, at 89. The government has started to provide "electrical and magnetic sanitation" in government offices through removal of unnecessary electrical equipment and the design of work areas to minimize exposure. *Id.* In addition, by the summer of 1993, Swedish regulators were to have proposed a "ban on construction of houses within about 330 feet of high tension wires." *Id.* Sweden began moving toward requiring lower Video Display Terminal emissions in the 1980s, before any other country, due to pressure from its labor unions. *Id.*

14 H.R. REP. NO. 1026, *supra* note 1, at 252. *See* Prescott, *supra* note 1, at 5. The Soviet scientific paper, *see supra* note 13, was later found to be based on flawed research. *Id.* At a Massachusetts hearing, epidemiologists testified that the record does not establish that there are no adverse health effects associated with EMF; however, the large amount of evidence available fails to indicate that there is such an adverse effect. *See Re* Commonwealth Elec. Co., 117 Pub. Util. Rep. 4th at 49. *See infra* notes 19-20. Many credit New Yorker writer, Paul Brodeur, for drawing the public's attention to EMF through his series of articles in the *New Yorker* in 1989 and 1990 linking cancer to EMF exposure, although his work has been highly criticized. *See* Frederic Golden, *Official Static, Are the Powers-That-Be Hiding the Dangers of Electromagnetic Fields*, SAN FRANCISCO CHRON. (Sunday Review Section), Sept. 19, 1993, at 1. Brodeur's two books, the *Currents of Death* and the recent sequel *The Great Power-Line Coverup*, assert that the nation's utilities, conspiring with compliant government officials, are endangering Americans by not relocating power lines and other strong EMF sources from densely populated sources. *Id.*

15 John W. Gulliver & Christine C. Vito, *EMF and Transmission Line Siting: The Emerging State Regulatory Framework and Implications for Utilities*, NAT. RESOURCES & ENV'T, Winter 1992, at 12. *See* DEPARTMENT OF ENG'G, *supra* note 1, at 13.

studies are based upon experiments that involve laboratory research which expose single cells of tissues to fields under various conditions and look for certain effects;[16] laboratory studies that expose animals or humans to fields and examine for effects in body functions, chemistry disease or behavior; and epidemiological[17] studies of diverse human populations that look for correlations between EMF exposure to 60 hertz fields and various diseases.[18]

The studies to date indicate that EMF has demonstrable biological effects, however, it is unclear how extensive these effects adversely impact on human health.[19] In addition, even if exposure

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16 H.R. REP. No. 1026, *supra* note 1, at 252. Two basic kinds of biological effects have been observed: strong electric fields can stimulate the skin of animals by vibrating hairs or by triggering various sensors in the skin. *See* DEPARTMENT OF ENG'G, *supra* note 1, at 13. For example, a person standing in an electric field of more than 20 KV/m will likely feel a slight tingling sensation. *Id.* In addition, more important biological effects result from experiments that show that under certain circumstances, fields can interact with the surfaces of cells and trigger changes inside these cells. *Id.* A variety of experiments have shown that fields, even weak fields, "can interact with the cell surface or with some of the receptor molecules in that surface, and produce changes in how the cell operates." *Id.* These changes include: changes in the production of various chemical messengers, such as melatonin, an important chemical utilized in daily biological cycles called circadian rhythms, and neurotransmitters, which send signals between nerves; changes in the rate at which the DNA is made and in the rate of errors in the process of RNA copying; alterations in the amount of calcium found on the surface of or inside of cells; and changes in the rate of cell division and growth of some cells. *Id.* All these functions play a role in how the cell operates and in signaling to other cells and tissues. *Id.*

17 Epidemiological studies are investigations of people in their normal environment that compare some estimate of exposures of those who have the disease with individuals who do not have the disease. *See* Antonio Sastre & William H. Bailey, *The Science Behind the Issue*, MGMT. Q., (PSE&G/Corp. Communications Dept.), Summer 1993, at 20. There have been two types of epidemiological studies that have searched for a correlation between EMF exposure to 60 Hz fields and cancer. *Id.* One set of studies compares at death rates from different diseases for people employed in electrically related occupations with death from the same diseases for all other people. *Id.* The other study compares the magnetic field exposures of people with specific cancers, such as leukemia, with the exposures received by other similar people who did not have cancer. *Id.*

18 H.R. REP. No. 1026, *supra* note 1, at 253. *See* DEPARTMENT of ENG'G, *supra* note 1, at 13.

19 H.R. REP. No. 1026, *supra* note 1, at 254. For instance, in 1991, the Electric Power Research Institute, a non-profit research organization funded by the nation's electric utilities for research on EMF, *see* DEPARTMENT OF ENG'G, *supra* note 1, at 36, conducted a study which "supported an association between wiring configuration and childhood leukemia risk," but did not support "a clear association with measured magnetic or electric fields." Gulliver & Vito, *supra* note 15, at 23 (citing S.J. London et al., *Exposure to Residential Electric and Magnetic Fields and Risk of Childhood Leukemia*, 134 AM. J. EPIDEMIOLOGY 923, 937 (1991)). Alternatively, a more recent Swedish study

to power frequency fields is shown to lead to health risks, there is no clear evidence to suggest that exposure to or exposure for longer periods of time is worse than exposure to weaker fields or brief periods.[20] This inability to find concrete cellular level effects

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concluded that there is a statistically significant correlation between calculated magnetic field levels and childhood leukemia. *See* M. Feychling et al., Magnetic Fields and Cancer in People Residing Near High Voltage Lines, Karolinska Institute, Sweden (1992). Critics of this study, *see* Sastre & Bailey, *supra* note 17, contend that the epidemiological studies are susceptible to error because they may not indicate a direct causal association. *Id.* at 20. Critics of epidemiological studies contend that these studies simply represent a statistical association between the fields and cancer, but do not prove that fields are involved in causing cancer. *See* DEPARTMENT. OF ENG'G, *supra* note 1, at 17. In addition to this statistical uncertainty, critics tend to feel that these studies may not be truly representative of the population, in that the groups they represent are a very small sample of the entire population. *Id.* Critics argue that the Karolinska study is faulty for all those reasons set forth above. *Id.* In addition, they argue that there are internal inconsistencies in the data. *Id.* For example, "the association with leukemia was found for children who lived in single-family dwellings, but not found for children living in apartments." *Id.* In addition, the association with leukemia was found with respect to those children living outside of Stockholm, but not for children who lived in Stockholm. *Id.* This article also points out that a British medical journal concluded that the Karolinska study did not contribute to "clarification of whether proximity to high-tension installations . . . increase the risk for cancers in children." *Id. See* Sagan, *supra* note 1, at 626. To further clarify discrepancies in the measures of EMF exposure, this article points to a study conducted that incorporated the use of a newly developed exposure meter that could be left in place for 24 hours or more and could gather more exposure information than was possible with earlier studies. Sagan, *supra* note 1, at 627. In addition, the study included 233 cases of leukemia, which was a larger group than those utilized in prior studies. *Id.* However, the studies found no relationship between the EMF's measured and cancer risks. *Id.* While a number of biological effects have been observed, they have not been easy to locate, and some of the experiments involve conditions that are very different from those that occur when people are exposed to fields. *See* DEPARTMENT OF ENG'G, *supra* note 1, at 13.

[20] H.R. REP. NO. 1026, *supra* note 1, at 253. There is not enough evidence to suggest that weaker fields are safer than stronger fields. *See* DEPARTMENT OF ENG'G, *supra* note 1, at 21-22. Some experiments show no effect with a strong field; however, when the field strength is slightly reduced, the effect appears. *Id.* There are other experiments where biological effects are seen only after being in the field for a very long time. *Id.* Effects can also be observed above a certain field strength, but then show no additional changes as field strength further increases. *Id.* Additionally, biological experiment results are hard to interpret because so many different factors may have contributed to the result, such as lighting or power supplies in the laboratory, as well as wavelength, intensity, duration of exposure, time of day and interaction with the earth's magnetic field. *See* David Kirkpatrick, *Do Cellular Phones Cause Cancer?*, FORTUNE, Mar. 8, 1993, at 82, 85. In 1989, a study compiled by the Federal Office of Technology and Assessment states that for many years, EMF were considered incapable of causing biological effects because the fields were too weak to break chemical bonds or to heat body tissue. *See* H.R. REP. NO. 664, *supra* note 1, at 19. However, 'a

to predict the existence of possible public health effects, as well as the absence of any large scale public health effects associated with electrification, and the lack of a statistically certain correlation between 60 Hz fields and cancer, are the main arguments prompted by various groups, including utilities, to sustain the claim that there is no need for concern about exposure to power-frequency fields.[21]

These ambiguous, yet disturbing, studies have prompted a heightened concern among the public and the utility industry.[22] Pressure to reduce or avoid public exposure to high levels of EMF has been building.[23] As a result, electric utilities face the most se-

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number of positive findings have now clearly demonstrated that under specific circumstances even weak low-frequency EMF can produce substantial changes at the cellular level, and in a few experimental settings, effects have also been demonstrated at the level of the whole animal.' H.R. REP. No. 1049, 102d Cong., 2d Sess. at 2 (1992) [hereinafter H.R. REP. No. 1049]. For instance, a number of biological effects have been observed on early studies of fields exposed to rats, mice and other animals, as well as individual cells. *See supra*, note 15. *See also* DEPARTMENT. OF ENG'G, *supra* note 1, at 15. Most biological studies have been conducted on individual cells or animals, but there have been a few that used people. *Id.* Studies of people exposed to strong fields in special exposure rooms have reported effects on heart rate and on reaction time. *Id.* However, there is also some indication that some people respond more readily than others and the effects may be more pronounced when the fields are turned on and off repeatedly rather than left on continuously. *Id.* In addition, some studies that sent weak currents through volunteers with electrodes attached to their skin reported no observed effects after exposures of several hours. *Id.*

21 H.R. REP. No. 1026, *supra* note 1, at 253. *See* Sastre and Bailey, *supra* note 17, at 20.

22 Gulliver & Vito, *supra* note 15, at 12. *See* PSE&G SUMMARY OVERVIEW, *supra* note 1, at 1. *See* Sherman, *supra* note 3, at 21. As a result of the Swedish study possibly linking leukemia to EMF, *see supra* note 19, the New Jersey Board of Regulatory Commissioners has organized a six month study of EMF at all primary and secondary schools in the state that are near transmission lines which operate at 69 kilovolts or higher. *Id.* In addition, three years ago, the uncertainty surrounding EMF forced Jersey Central Power and Light Company to abandon its plans to build a 10-mile long, 230 kilovolt transmission line in Monmouth County, N.J., because of surmounting resident opposition over possible EMF exposure. *Id.* Additionally, due to residential opposition, Public Service Electric and Gas Company [hereinafter PSE&G], went through protracted hearings, before it was authorized to build an electrical substation in Hopewell Township, N.J., in May of 1993. *Id.*

23 H.R. REP. No. 1049, *supra* note 20, at 294. In Chicago, the Wilmette Village Board fought a cellular communication company's proposition to build a cellular communication tower because of their concerns about the possible health effect of EMF. Kate Griffin, *Wilmette Chooses Middle Ground on Towers*, CHI. TRIB., Sept. 30, 1993, at 5. Consequently, the board approved a resolution prohibiting the installation of cellular communications transmitters within 500 feet of schools and day care centers. *Id.* In addition, the same cellular communication company was also forced to withdraw its petition to erect a cellular tower in North Barrington, Illinois, because of the village zoning board's fear of adverse health effects relating to EMF. *Id.* In New York,

vere public pressure and conclude that concern over health effects, combined with traditional aesthetic issues, have made it increasingly expensive and difficult to site and upgrade power lines and stations.[24] The costs are manifested in delays in siting power lines,

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North Bellmore and East Hills residential opposition, as well as protests by U.S. Senator Alfonse D'Amato, defeated the construction of two radar towers planned by the Federal Aviation Administration, due to apprehension surrounding EMF. Alexander C. Kafka, *Deeper Agenda for Tower's Opponents? FAA Plan May Be a Campaign Issue*, NEWSDAY (Nassau and Suffolk County, N.Y.), June 25, 1993, at 33. The towers, which were also rejected by New York Governor Mario Cuomo, would have monitored hazardous weather conditions at Kennedy Airport. *Id.* At the federal level, several U.S. Senators have proposed legislation entitled The Extremely Low Frequency Communication System Termination and Deficit Reduction Act of 1993, S. 1247, which would terminate the ELF project, based on EMF as well as budgetary concerns. *See* 139 CONG. REC. S8828 (daily ed. June 30, 1993) (statement of Sen. Feingold). The ELF project, a U.S. Navy Communication System, is used as a device to communicate with the Trident submarine using electromagnetic waves. *Id.* Wisconsin residents have been opposed to it for years because of environmental and public health hazards, including EMF concerns, that are associated with the project. *Id.* In addition, various Senators have also proposed an amendment to the National Defense Authorization Act for Fiscal Year 1994 called the Termination of Ground Wave Emergency Network [hereinafter GWEN] Program, which would terminate the Air Force's GWEN program due to the EMF issue, as well as budgetary concerns. *See* 139 CONG. REC. S11,333 (daily ed. Sept. 10, 1993) (statement of Sen. Reid). The GWEN program is a system that started out with 250 300 foot-high towers across the country, which were designed to provide military communications after a nuclear attack on the United States by the Soviet Union. *Id.* Fifty-four of these towers have already been built. *Id.* Construction on the project had already been halted in 1990 because of possible health concerns because for six seconds of every hour, the towers emit 150 to 175 kilohertz test signals. *Id.* Public fear has also prompted several computer manufacturers and at least one electric blanket manufacturer to respond to public concern by marketing products with reduced EMF emissions despite the lack of information about what levels and types of exposures, if any, are unsafe. *Id.* Additionally, the subject of EMF has arisen in five out of seven substation hearings that have occurred in three years at PSE&G. *See* Prescott, *supra* note 1, at 9.

[24] *See* Fred Cicetti, *The Legal Battleground*, MGMT. Q., (PSE&G/Corp. Communications Dept.), Summer 1993, at 11. It has been stated that electric utilities are in a costly and painful position. *Id.* Attorneys for defendants and plaintiffs agree that electric utilities throughout the country will face a proliferation of litigation in the coming years based on the EMF issue. *Id.* As a result, utility defense attorneys have seen their workload triple within the last five years. *Id.* This year, a California jury ruled in favor of San Diego Gas & Electric and against a couple who alleged that their five-year old daughter developed kidney cancer from EMF exposure. *Id.* Another case in California involves 27 healthy people who live near transmission lines and want a utility to pay for periodic testing for any signs of EMF-related illness. *See* Prescott, *supra* note 1, at 9. The District of Columbia has suspended applications by Georgetown University to build a co-generator power plant on the campus because of five years of plant opposition due to apprehension surrounding health risks resulting from EMF. *District of Columbia: EMF Fears Derail Power Plant*, American Political Net-

in personal injury lawsuits from EMF exposure, in losses in property value near transmission lines, and in the utilities' efforts to decrease emissions from power lines.[25] Utilities also face conflicting and varying EMF regulations prompted by various states in response to public concern.[26]

Although there has been some pressure to regulate EMF expo-

work, Inc., Oct. 15, 1993, *available in* LEXIS, Nexis Library, Greenwire File. In St. Louis, residents rallied to preclude a utility company from building a 12 mile, 138,000 volt power line based on fears of potential EMF health hazards. Stephen A. Martin, *Perceived Threat of Power Line Promotes Rally*, ST. LOUIS POST DISPATCH, Oct. 7, 1993, at 1. However, the residents could not stop the project because it had already been approved by the state. Mark Shimabukuro, *Residents Complain Power Lines Pose a Health Hazard for City*, ST. LOUIS POST DISPATCH, Oct. 11, 1993, at 1. Nevertheless, to mitigate the public's fear, New Jersey's PSE&G has provided field measurements of customer's property at their request; since 1986 PSE&G has made 2,400 of such field measurements. Prescott, *supra* note 1, at 9. The company also conducts meetings with all local and appointed officials in towns when the company begins a major pole line construction project. *Id.* In addition, PSE&G has stated that it will avoid siting future substations near schools. *Id.*

[25] H.R. REP. No. 1049, *supra* note 20, at 295. *See* 137 CONG. REC. E4181 (daily ed. Nov. 26, 1991) (statement of Rep. Brown). The first personal injury case, also a property condemnation case where the property owner sought compensation from utilities on the ground that EMF from power lines lowered his property value, was filed in 1987 against Houston Lighting Company. *See* Brown, *supra* note 1, at 332. In the personal injury case, Scott v. Houston Lighting & Power Co., No. 87-58967, slip op. (189th Jud. Dist., Harris County, Tex. 1987), the plaintiff alleged that the utility's 345-kilovolt transmission line located near his home caused or exacerbated his brain tumor. *Id.* The suit was dropped in 1990 due to the plaintiff's death. *Id.* In the property condemnation case, Houston Lighting & Power Co. v. Klein Indep. Sch. Dist., 739 S.W.2d 508 (Tex. Ct. App. 1987), the utility desired to build a high voltage transmission line on a piece of land that it took by eminent domain from the school district. *Id.* at 331. The parents of the school children who would be exposed to the EMF emitted by this power line brought suit and the jury assessed a punitive damage award of $25 million against the utility. *Id.* Additionally, the utility had to spend over $8 million to move less than one mile of power lines a little more than 2500 feet from the backyard of the elementary school. *See* Prescott, *supra* note 1, at 4. Consumers have also become increasingly reluctant to purchase homes near transmission lines. *Id. See also* Tomecek, supra note 1, at 18. For instance, in a Florida home market, the sales price of homes located near power lines are at least 10% lower than those of homes that are not located near these lines. *Id.* The average time for selling a house is estimated to be approximately 140 days; this should be compared to the same house located near a transmission line which may take up to a year. *Id.* In some cases, angry consumers have filed claims against real estate developers who failed to tell them that a high voltage line was to be built nearby. *See* Patricia Thomas, *Power Struggle*, HARV. HEALTH LETTER, July 1993, at 1.

[26] Thomas, *supra* note 25, at 3. "In the absence of uniform national standards, power companies . . . are left to comply with various state standards or, when they see fit, to police themselves." *Id.* For three years, New Jersey's Commission on Radiation Protection has tried unsuccessfully to set maximum EMF exposure limits; however,

sure, many would disagree with this current regulation given the scientific uncertainty concerning safety.[27] It has been maintained that such regulatory measures could prove to be not only costly, but counterproductive.[28] However, due to publicity that has been weighted towards research that concludes there is a genuine cause for concern, the courts and state public utilities are being forced to take action.[29] To satisfy all parties concerned, including computer manufacturers, utilities, landowners and the general public, Congress passed the Electric and Magnetic Field Research and Public Information and Dissemination Act,[30] which includes a comprehensive research and public information policy for credible, high-quality research that focuses on the health effects of EMF.[31] This legislation, which paved the way for the current Congressional bills, is the subject of this note.

III. EMF All Around Us

Although EMF are most notably associated with transmission

due to the conflicting data, there has been no agreement as to what this limit should be. *See* Sherman, *supra* note 3, at 1. *See* H.R. REP. No. 1049, *supra* note 20, at 2.

27 *See* DEPARTMENT OF ENG'G, *supra* note 1, at 28.

28 *Id.* It has been asserted that taking more drastic measures will be more costly and create a large amount of disruption. *Id.* Given the current uncertainty surrounding the allegation that 60 Hz fields pose a serious risk, and the fact that our understanding of this problem is still fragmentary, it has been stated that there is a good chance that some or maybe all of the expense and work will be ineffective, in that the result could be that there are no health risks from these fields, or that any risks are very minute. *See generally* H.R. REP. No. 474, 102d Cong., 2d Sess. 118 (1992) [hereinafter H.R. REP. No. 474]. On the other hand, it has been maintained that the outcome could be that there are risks and that the wrong steps have been taken to control them, which have obtained minimal or no improvement for the money that has been spent. *See* DEPARTMENT OF ENG'G, *supra* note 1, at 28.

29 Freeman, *supra* note 1, at 20. Many U.S. courts have become scientific tribunals on whether power transmission lines promote cancer. *Id. See supra* notes 22-24. New Jersey's electric utilities have been responding to thousands of calls from customers who are requesting EMF readings of their homes free of charge. *See* Sherman, *supra* note 3, at 1. However, the utilities do not have sufficiently conclusive data to explain what these readings mean. *Id.*

30 42 U.S.C.A. § 13478 (West Supp. 1993). The Electric and Magnetic Field Research and Public Information and Dissemination Act [hereinafter EMF Research Act] was incorporated in the Energy Policy Act of 1992, 42 U.S.C.A. §§ 13201-556 (West Supp. 1993) [hereinafter Energy Policy Act].

31 *See* EMF Research Act, *supra* note 30. The EMF Research Act includes a $65 million, five year EMF research and development program that is being co-funded by industry and the federal government. *Id.* § j(1), f(2).

lines, they are actually generated by all electrical devices.[32] From the moment you wake up until you go to bed, chances are you have come in contact with an EMF.[33] Standing near some household appliances may subject a person to the same or stronger strength magnetic fields, and in some instances, ten times greater EMF levels than power lines.[34] Household appliances, however, are usually on for only short periods of time, resulting in limited exposure to a portion of a person's body, as opposed to power line EMF exposure, which is to the entire body.[35] EMF from appliances also drop off very quickly. Thus, being just a few feet away from an appliance usually places a person out of an appliance's EMF.[36] Standing away from an appliance, or moving it, will usually place a person out of the range of EMF exposure.[37]

Common electrical devices such as hair dryers, baby monitors, pencil sharpeners, dishwashers, clocks, microwaves, vacuum cleaners, household wiring and cellular phones emit EMF, some at lower levels than others.[38] In the workplace, computers, video display

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32 *See* Sherman, *supra* note 3, at 20.

33 *Id.*

34 *Id.* It has been stated that electric blankets, mattress pads and waterbed heaters made before 1990 can emit EMF comparable to power lines. Thomas, *supra* note 25, at 1. For example, a hair dryer can produce EMF levels of 100 mG. *Id. See* Weiss, *supra* note 3, at 361.

35 *See* Weiss, *supra* note 3, at 361.

36 *Id. See also* Winifred Conkling, *Shocking Charges*, AM. HEALTH, May 1993, at 50-51. By standing six feet away from the television, at arm's length from the computer screen and a few feet away from household appliances when they are on, it has been stated that EMF exposure could potentially be minimized. *Id.* In addition, to minimize EMF exposure, it has been suggested that an individual could move his alarm clock away from the head while sleeping and purchase a low-emission electric blanket that cost from $10 more than the older models. *Id.*

37 *Id. See* Conkling, *supra* note 36, at 56 (one can minimize exposure to EMF by staying clear of appliances). According to the EPA, the magnetic field emitted by a color video screen is approximately one-seventh as strong at a distance of two feet as it is at six inches. *Id. See* Kirkpatrick, *supra* note 20, which advises that to minimize EMF exposure, your air conditioner should be at least three feet away from you avoid the backs of Video Display Terminals [hereinafter VDTs] should be avoided, where EMF fields are more intense. *Id.* In addition, the article recommends that one purchase a wireless baby monitor and use a lap-top computer instead of a VDT to reduce exposure. *Id.*

38 *See* Booth, *supra* note 3, at 33. TVs and VDTs are designed at very low frequency [hereinafter VLF], while other household appliances are designated extra low frequency [hereinafter ELF]. *Id.* ELF measures from 5 to 2000 cps (100 to 200 mG), while VLF measures from 2000 to 400,000 cps. *Id.* Household electricity has a low frequency of 60 cps. *Id.* However, in one case, an in-wall wiring at the head of a bed

terminals, fans and lighting fixtures are among the common sources of EMF.[39] Even walking down the street without a utility pole in sight could potentially result in increasing EMF levels.[40]

Despite worldwide scientific investigations, all these EMF exposure readings are indeterminate at this point because there is no basis for interpreting this information.[41] Thus, the debate continues as to how EMF exposure affects the body and whether it is harmful.[42]

IV. Prior Federal Legislation Concerning EMF

Since 1978, the Department of Energy's (DOE) Office of Energy Conservation has traditionally administered the EMF research program, with expenditures totalling some $435.6 million.[43] The

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produced a 15-mG field. *Id.* An electric shaver and a blowdryer emit 100 mG. *Id.* Microwave ovens and toasters combined can generate EMF readings of 10 mG. *See* Sherman, *supra* note 3, at 20. In addition, other electrical appliances, such as desk lamps, VDTs (200 mG), and almost anything with an electric motor, such as coffee grinders, clocks (10 mG), air conditioners and dishwashers, produce low level electromagnetic radiation. *See* Kirkpatrick, supra note 20, at 82, 85. Cellular phones generate between 840 to 880 megahertz of electromagnetic radiation. *Id.* In January 1993, CNN's Larry King Live publicized a lawsuit in which a Florida man alleged that a cellular phone caused his wife's fatal brain cancer. *Id.* As a result, cellular stocks dropped 20%. *Id.*

39 Thomas, *supra* note 33, at 35. *See* Booth, *supra* note 3, at 37. A computer screen emits 10 mG and 200 mG is emitted around the sides of the VDT. *Id.*

40 Sherman, *supra* note 3, at 20. In this article, the author detailed numerous measurements he made with a computerized gaussmeter that automatically recorded EMF measurements every five seconds through a 12-hour period. *Id.* Walking down a street where a PSE&G distribution line was located resulted in EMF levels of more than 20 mG. *Id.* Two high voltage lines resulted in readings of more than 50 mG. *Id.* A ride on the PATH train to the World Trade Center in New York City generated EMF levels of 20 mG, while the highest readings came on a New Jersey Transit train from Penn Station in New York, to Newark, New Jersey, which ranged between 100 to 200 mG. *Id.*

41 *Id.*

42 *Id.*

43 H.R. REP. No. 1026, *supra* note 1, at 254. The DOE's authority to conduct biological research is derived from the Atomic Energy Act of 1946, which specified "research and development efforts on the use of radiation and radionucleides for medical diagnosis and treatment of human disease." *Id.* at 253. This authority has led to the consolidation of numerous biological research projects within the Office of Health and Environmental Research, including the current EMF research. *Id.* The DOE was also the first federal agency to recognize the importance of undertaking a large scale research project to decipher human genetic codes. *Id.* It also establishes the DOE EMF working group in October 1991 to develop a Draft Strategic Overview Document for EMF research. *See* DOREEN HILL, ENERGETICS, INC., THE NATIONAL EN-

focus of this research has been in the form of physiological studies seeking to determine whether EMF compromises health to the point of becoming an issue worth investigating.[44] The Department of Energy's Office of Health and Environmental Research also supports epidemiological projects, which seek to provide an assessment of developmental effects and disorders associated with EMF.[45] In addition, the National Institute of Environmental Health Sciences (NIEHS), through the National Toxicology Program (NTP), undertook a large epidemiologic investigation of possible adverse health effects of exposure to EMF in 1991.[46] The NTP estimated that numerous studies would be needed to survey the separate and combined effects of electric and magnetic fields and to ascertain the range of field strengths that may be hazardous.[47] Because several studies indicate that EMF may cause or promote cancer, while others indicate that such fields have no effects, the federal government needed to play a role in evaluating the data to give citizens the information necessary to make informed decisions under these present conditions of extreme uncertainty.[48]

Accordingly, to aid the government in its task, and coordinate the combined research of the various federal and state agencies, H.R. 3953, The National Electromagnetic Fields Research and Public Information Dissemination Act,[49] was introduced in Congress.[50]

ERGY POLICY ACT OF 1992—FEDERAL IMPLEMENTATION AND ACTIVITIES (1992) (on file with the *Seton Hall Legislative Journal*). Health and exposure data necessary for epidemiological monitoring are also collected by programs located under the authority of the Assistant Secretary for Environment, Safety and Health, with the focus on improving dose measurement instrumentation and technology. H.R. REP. NO. 1026, *supra* note 1, at 255.

44 H.R. REP. NO. 1026, *supra* note 1, at 254.

45 *Id.*

46 *Id.* at 255. Currently, the NIEHS, pursuant to the EMF Research Act, *supra* note 30, § d(2)(a), is responsible for research on possible health effects, including brain cancer epidemiology studies, large scale animal studies and public information dissemination on possible health effects. *See* Hill, *supra* note 43.

47 H.R. REP. NO. 1026, *supra* note 1, at 255.

48 H.R. REP. NO. 459, 102d Cong., 2d Sess. 547 (1992).

49 H.R. 3953, 102d Cong., 1st Sess. § 1 (1991) [hereinafter H.R. 3953]. *See* 137 CONG. REC. E4181-01 (daily ed. Nov. 26, 1991) (statement of Rep. George Brown). H.R. 4801, 101st Cong., 2d Sess. (1990), the Electric and Magnetic Field Research and Public Information Dissemination Act of 1990 is the original version of H.R. 3953. *Id.* The bill was introduced by Representative Frank Pallone (D-N.J.). *Id.* *See* H.R. REP. NO. 1026, *supra* note 1, at 2. H.R. 4801, referred to the Committee on Science, Space and Technology Subcommittee on Natural Resources, Agriculture Research and Environment, directed the DOE, along with the EPA and NIEHS, to administer a research

Representative George E. Brown, Jr. (D-Cal.) and Representative James Scheuer (D-NY) first proposed H.R. 3953 to the Subcommittee on the Environment on November 26, 1991.[51]

Congress proposed H.R. 3953 to: (1) establish an interagency committee to develop a comprehensive agenda for conducting research on EMF; (2) provide a framework for coordinating activities among all organizations; (3) conduct the research in partnership with non-governmental and non-federal entities; and (4) establish a program within the DOE's Office of Health to provide information to the public regarding EMF.[52]

This legislation combines private and public funds into a common pool to be used to fund the research in a partnership among the federal government, the states and the private sector, without the appearance of one agency controlling the research results.[53] The taxpayer would gain the additional resources of the private sector and an information program that would address his or her concerns and the private sector would obtain a comprehensive research program.[54] In addition, the DOE, EPA and NIEHS would provide an annual report to Congress on the status of this research, and determine whether additional regulations were needed to pro-

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program on EMF. *Id.* The original bill was introduced to authorize certain research and risk committee programs within the DEP. *Id.*

50 137 CONG. REC. E4181 (daily ed. Nov. 26, 1991) (statement of Rep. George Brown). H.R. 3953, renamed the Electric and Magnetic Fields Research and Public Information Dissemination Act, was incorporated within the Energy Policy Act of 1992, 42 U.S.C.A. § 13478 (West Supp. 1993). *See generally* EMF Research Act, *supra* note 30.

51 *See* H.R. REP. No. 1095, 102d Cong., 2d Sess. 225 (1992) [hereinafter H.R. REP. No. 1095].

52 *Id.* at 225. Representative George Brown was chairman of the Committee on Science, Space and Technology when he introduced H.R. 3953. *See* H.R. REP. No. 664, *supra* note 1, at 1.

53 H.R. REP. No. 664, *supra* note 1, at 31. Proponents of H.R. 3953 were concerned with keeping the program as free of bias and conflict of interest as possible. *Id.* Thus, conflict of interest provisions were included in any grant or other funding provided or contract entered into to avoid this research bias. *See* H.R. 3953, § 5. These provisions require researchers to disclose all funds received for consulting work and for related research and prohibits researchers from testifying in court on research they are performing for the EMF Research Program. *See id.*

54 H.R. REP. No. 474, *supra,* note 28, at 119. *See* H.R. 3953, § 6. H.R. 3953 mandated all research program results be made available to the public and especially encourages researchers to publish their results in scientific literature. *See* H.R. REP. No. 664, *supra* note 1, at 30.

tect human health.[55]

This coordinated research effort would avoid expenditures on research that may not be perceived as credible.[56] Because, the federal government is sponsoring the research program with appropriate peer review,[57] the public's perception of the credibility of the research would increase, while industry and state co-funding would enable an accelerated research program designed to answer the questions surrounding EMF as soon as possible.[58] Furthermore, the program attempts to address the lack of coordination within the federal government and between the states and industry.[59]

H.R. 3953 would establish a National Electromagnetic Fields Advisory Committee (Advisory Committee) under the direction of the Secretary of Energy.[60] This committee would consist of eleven

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55 H.R. REP. No. 664, *supra* note 1.

56 *Id.* The issue of credibility has been particularly important as related to the public's confidence in health matters, due to serious credibility problems with an asbestos research program sponsored by the EPA and industry and conducted by the Health Effects Institute. *See* H.R. REP. No. 664, *supra* note 1, at 31. Many of the scientists involved in this research program were testifying as expert witnesses on behalf of the asbestos companies, which led to widespread criticism. *Id.*

57 *Id.* at 11. After the Secretary of Energy or the Director of the NIEHS receives recommendations on research priorities from a committee set up under H.R. 3953, he/she must submit the proposals to a peer review panel before the program can be selected. H.R. 3953, § 5(b)(2)(A)(iii). The peer review panel will then evaluate each proposal on its scientific and technical merit and consider whether the proposal is consistent with the research priorities established by the Advisory Committee. H.R. 3953, § 5(b)(2)(A)(iv). Each proposal will then get a priority score according to the order in which it should be funded. *Id.*

58 *See id.* at 23.

59 *See* H.R. REP. No. 1049, *supra* note 20, at 297. Overall federal funding lags behind that of the private sector and utilities. *See* H.R. REP. No. 474, *supra* note 28, at 118. The Electric Power Research Institute [hereinafter EPRI], a non-profit research organization funded by the nation's electric utilities, planned to spend $15 million in research in 1992, while the DOE received $ 5 million for EMF research in 1992, and is scheduled to obtain $7.5 million in fiscal year 1993. *Id.* EPRI funding of EMF studies currently totals $6 million per year and, since the 1970s, EPRI has spent more than $50 million on EMF research. *See* Prescott, *supra* note 1, at 8. EPRI is also currently conducting the most exhaustive program in the world on research of EMF, with results of at least 30 studies to be obtained by the end of 1993. *See generally* PSE&G SUMMARY OVERVIEW, *supra* note 1. PSE&G is also contributing to funding these studies and promises to inform its customers of EPRI's results when they are available. *Id.* In addition, states such as New York and California have sponsored EMF research, but lack the resources to fund a comprehensive program and the efforts remain piecemeal. *See* H.R. REP. No. 474, *supra* note 28, at 118.

60 *See* H.R. 3953, § 4. Under the EMF Research Act, the renamed National Elec-

members,[61] representing state and federal government, academe, scientific and professional organizations and environmental and public interest groups, who would review the research conducted under this program and recommend priorities to an Interagency Committee.[62] Because these groups directly confront concerns about EMF health effects in their interaction with customers and citizens, they would have a significant role in ensuring that the research was focused on pertinent issues that directly concern the public.[63] The Advisory Committee would research the biological mechanisms by which EMF interact with biological systems, as well as conduct epidemiological studies to manage EMF exposure, and investigate and develop technologies to improve the measurement and characterization of EMF.[64] In addition, the Advisory Committee would determine the most appropriate methods to allocate funds to conduct research for projects that it decided were a priority.[65]

The bill would also create an EMF Interagency Committee, led by the DOE acting through its Office of Health, that would consist of sixteen members.[66] This committee would coordinate the re-

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tric and Magnetic Fields Advisory Committee would be established by the Secretary of Health and Human Services and the Secretary of Energy. *See* EMF Research Act, *supra* note 30, § (e)(1).

61 *See* H.R. REP. No. 664, *supra* note 1, at 7. H.R. 4801, the original bill, had proposed a 12 member Advisory Committee. Eventually, when H.R. 3953 was codified within the Energy Policy Act, the Advisory Committee contained ten members. *See* EMF Research Act, *supra* note 30, § (e)(3). These members would be chosen from experts in possible human health effects; experts in measurement and characterization; experts in field assessment and management; state regulatory and health agencies; electrical utilities; electrical equipment and manufacturers; labor unions; and members of the public. *Id.*

62 Hill, *supra* note 43. In addition, the Advisory Committee would provide advice on design and implementation of the program, including solicitations for proposals. *Id.*

63 *See* H.R. REP. No. 664, *supra* note 1, at 27.

64 *Id.* In addition, the Advisory Committee would develop a comprehensive research and development agenda that would monitor, review and periodically update the program, and develop recommendations for mechanisms for public communication of the results. *See* H.R. 3953, § 3.

65 *Id.* at 28. The DOE and NIEHS would select the proposals to conduct activities under the program, and these proposals must be reviewed by selected panels. *Id.* In addition, the DOE would solicit non-federal contributions to offset at least 50% of the total funding, and communicate with the National Academy of Sciences to evaluate research activities. *See* H.R. 3953, § 4(b)(2).

66 *Id.* at 5. Two members will be from the DOE, the EPA, the Department of Health and Human Services, the Department of Defense, the Department of Trans-

search efforts of all federal agencies involved in EMF issues, focusing on possible human health effects of EMF and ensuring it is not duplicative of other research activities.[67] Moreover, the committee would study technologies to improve EMF measurements and would in turn be responsible for researching techniques to manage exposure to EMF.[68]

In addition, H.R. 3953 would create the National EMF Research Program.[69] This program would focus on researching possible human health effects of EMF's of the 60 hertz frequency.[70] The Secretary of Energy would solicit proposals for research projects to be reviewed by a panel of scientific and technical experts and then evaluated to determine their consistency with the priorities set up by the Advisory Committee.[71]

Finally, H.R. 3953 would establish the EMF Public Information Dissemination Program within the Office of Health of the DOE.[72] This program would ensure that the public receives the most current information about 'health effects, exposures in various occupational and residential settings, measurement technologies and mitigation strategies.'[73] Additionally, the program would encourage the agencies to collectively develop comprehensive and consistent public information on EMF.[74]

With respect to funding, Congress proposed appropriating

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portation, the Occupational Safety and Health Administration [hereinafter OSHA], the Rural Electrification Administration and the National Institute of Standards and Technology. *Id.* at 5. The EMF Research Act established an Interagency Committee consisting of nine members: One member would be appointed from each of the following: DOE; NIEHS; EPA; Department of Defense; OSHA; National Institute of Standards and Technology; Department of Transportation; Rural Electrification Administration; Federal Energy Regulatory Commission. The EMF Research Act, *supra* note 30, § d(2)(A).

67 H.R. REP. No. 664, *supra* note 1, at 23-25.

68 *Id.*

69 *Id.* at 29. This program would have been run by the Secretary of Energy, acting through the Office of Health. Instead, the Interagency Committee incorporated these responsibilities within its authority. *See* EMF Research Act, *supra* note 30, § d. As a result, the Interagency Committee is responsible for researching EMF, particularly of the 60 hertz frequency, and developing mechanisms for communication of the EMF Research and Public Information Dissemination Program to the public. *Id.*

70 H.R. REP. No. 664, *supra* note 1, at 45.

71 *See* H.R. 3953, 102d Cong., 1st Sess. § 5 (1991).

72 *See* H.R. 3953, § 6.

73 *Id. See* EMF Research Act *supra* note 30, § b(1).

74 H.R. REP. No. 664, *supra* note 1, at 34-35. *See* 137 CONG. REC. E4181-01 (daily ed. Nov. 26, 1991) (statement of Rep. Brown).

$60 million for fiscal years 1993-97, with an additional $1 million annually appropriated to the EMF Public Information Dissemination Program.[75] The Secretary of Energy would also solicit contributions from non-federal sources, such as utilities, to offset almost 50% of the total costs of conducting this research.[76] Thus, $30 million of the amount appropriated would be reimbursed from non-federal sources.[77]

After introduction to the Subcommittee of the Environment in 1991, H.R. 3953 was referred jointly to the Committee on Science, Space, and Technology and the Committee on Energy and Commerce.[78] The Environmental Subcommittee considered H.R. 3953, and the bill was reported amended to the Full Committee on March 26, 1992.[79] The bill was subsequently incorporated into the Energy and Commerce Committee's report on H.R. 776, the comprehensive National Energy Policy Act, which was ordered reported on April 2, 1992.[80] Then, following negotiations with the other committees, the Committee on Energy and Commerce agreed on including a modified version of H.R. 3953 in the text of H.R. 776, which the House of Representatives approved.[81] Accordingly, after further modifications, H.R. 3953 was retained in the

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75 H.R. REP. No. 664, *supra* note 1, at 35. *See* EMF Research Act, *supra* note 30, §j(1). The final version of the EMF Research Act appropriated $65 million towards the Electric and Magnetic Fields Research and Public Information Dissemination Program, with $1 million going to the EMF Public Dissemination Program annually. *Id.*

76 H.R. REP. No. 664, *supra* note 1, at 35. The provision is included to eliminate the possibility that industry could exert influence over the research program through selectively funding projects that have been scientifically peer reviewed and recommended for funding. *Id.*

77 *Id.*

78 *Id.* at 1. *See also* H.R. REP. No. 1049, *supra* note 20, at 208.

79 H.R. REP. No. 1095, *supra* note 51, at 226. On March 10, 1992, the Environmental Subcommittee held hearings on H.R. 3953. *Id.* Representatives of industry, academia, the states, unions and the Administration testified. *Id.* The witnesses stressed the importance of maintaining credibility in the research program, the need for continued federal support and commitment to research funding, and the importance of having a health agency involved. *Id.* Girard Anderson testified on behalf of the Edison Electric Institute and endorsed the Congressional effort to create a national research program for EMF, 'an adequate, long term federal commitment to the necessary research.' *See Industry Supports EMF Research Bill,* PUB. UTIL. FORT., May 1, 1992, at 10.

80 H.R. REP. No. 1095, *supra* note 51, at 227. H.R. 776 was codified in 42 U.S.C.A. §§ 13201-556 (West Supp. 1993), the Energy Policy Act.

81 H.R. REP. No. 1095, *supra* note 51, at 227. The primary difference between H.R. 3953 and the provision passed by the House is that the NIEHS obtained lead agency status rather than the DOE. *See* H.R. REP. No. 664, *supra* note 1, at 11.

conference report and was considered and was passed by the House on October 5, 1992, and by the Senate on October 8, 1992.[82]

Subsequently, in October 1992, the Senate and the House each passed the bill called the Energy Policy Act of 1992, which incorporated the EMF provisions of H.R. 3953.[83] On October 24, 1992, President George Bush signed the bill into law.[84]

V. Current Bills

In addition to the Energy Policy Act, Congress has proposed two supplementary acts to further address the public's concerns: The Children's Electromagnetic Field Risk Reduction Act and The Electromagnetic Field Labeling Act.

A. *Children's Electromagnetic Field Risk Reduction Act - H.R. 1494*

In March 1993, Representative George Miller (D-Ca.) intro-

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82 H.R. REP. No. 1095, *supra* note 51, at 227. The modification provisions to H.R. 3953 gave the DOE lead agency responsibility for the overall EMF program but give NIEHS authority to conduct and report on the health effects. *Id.*

83 S. REP. No. 32, 103d Cong., 1st Sess. § 7 (1993) [hereinafter S. REP. No. 32]. The provisions of H.R. 3953 were included in Section 13478 of the Energy Policy Act. Section 13478, the EMF Research Act, was enacted to establish the Electric and Magnetic Fields Research and Public Information Dissemination Program, as introduced by H.R. 3953 and H.R. 4801. *See* EMF Research Act, *supra* note 30. The EMF Research Act was created to establish a comprehensive program to: (1) determine whether exposure to EMF produced by transmission, generation and use of electric energy does affect human health; (2) carry out research, demonstration and development with respect to technologies for the purpose of mitigating any adverse human health effects; (3) to provide for the dissemination of information through compilation, collection, dissemination and publication of scientifically valid data on possible health effects; and (4) discover methods in order to manage and assess exposure to electric and magnetic fields. *Id.*

84 S. REP. No. 32, *supra* note 83, at 7. *See* EMF Research Act, *supra* note 30. Funding for this EMF program, including non-federal funding, was authorized at $65 million over a five-year period including fiscal years 1993-97. *Id.* §§ f(2), h. 50% of this amount will be co-funded by the private sector and states. *Id.* In 1993, the Committee on Appropriations received a budget request of an additional $10 million in research funds for EMF. H.R. REP. No. 135, 103d Cong., 1st Sess. 33 (1993) [hereinafter H.R. REP. No. 135]. The $4 million increase in 1993 funding applies directing to the Public Dissemination Act component of the Energy Policy Act. *Id.* Pursuant to this act, the DOE has leading responsibility for the overall EMF program, concentrating mainly on EMF biological and engineering research. Hill, *supra* note 43. The DOE became the lead agency because it has the largest and most stable program of research on EMF. *Id.*

duced the Children's Electromagnetic Field Risk Reduction Act of 1993 (H.R. 1494) to Congress.[85] This legislation was proposed as a step toward protecting children's health until such time as the federal government and the scientific community decide that EMF emitted by transmission lines do not create adverse health effects in humans.[86] This bill addresses the public's profound fear of a possible connection between childhood cancer and the proximity of children's schools presently located near power lines.[87]

For many years, researchers have feared that a dangerous correlation existed between childhood cancer and EMF exposure.[88] In response to these studies, local communities, and states have begun to make policy changes affecting the proximity of transmis-

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85 139 CONG. REC. No. E781-01 (daily ed. Mar. 25, 1993) (statement of Rep. Miller). This legislation was referred to the House Committee on Education and Labor on March 25, 1993. 139 CONG. REC. H1641 (daily ed. Mar. 25, 1993) (statement of Rep. Miller).

86 139 CONG. REC. E781 (daily ed. Mar. 25, 1993) (statement of Rep. Miller).

87 *Id.*

88 139 CONG. REC. E781 (daily ed. Mar. 25, 1993) (statement of Rep. Miller). A 1979 epidemiologic study by Wertheimer and Leeper found a more than two-fold increase in the childhood leukemia rate for children having prolonged exposure to EMF associated with transmission lines. *Re* Commonwealth Elec. Co., 117 Pub. Util. Rep. 4th (PUR) 37, at 47 (Sept. 28, 1990). This study linking power lines and childhood leukemia published in the American Journal of Epidemiology, made EMF a national issue. *See* Harold R. Piety, *What We Don't Know About EMF*, PUB. UTIL. FORT., Nov. 15, 1991, at 15. In addition, the 1986 Tomenius study found significantly more cancer among children and a two-fold increase in the risk of all cancers among persons living in close proximity to 200 KV power lines. *Re* Commonwealth Elec. Co., Pub. Util. Rep. at 47-48. In this case, David Carpenter of the New York State Power Lines Project estimated that approximately 30% of all childhood cancer in the United States may be associated with power-line magnetic fields. *Id.* at 48. Most recently, the Karolinska Institute in Stockholm found that children exposed to 1 mG over long periods of time have twice the average risk of developing leukemia, and those exposed to 3 mG had four times the normal risk. 139 CONG. REC. E781, *supra* note 85, at 2. Three other recent identical Scandinavian studies have also reported an association between EMF levels and certain forms of cancer. *See generally* Gulliver & Vito, *supra* note 15, at 12 (citing Robert S. Banks, *Danish Study Follows on Heels of Swedish Report*, EMF Information Project (Robert S. Banks Assoc., Inc. Oct. 16, 1992), at 1; D. McConnon, *Norwegian Occupational Study Reports Leukemia Link to EMF*, EMF Information Project (Robert S. Banks Assoc., Inc. Oct. 21, 1992), at 1; B. Floderus et al., Electromagnetic Fields in Relation to Leukemia and Brain Tumors: A Case Controlled Study, National Institute of Occupational Health (Soma, Sweden 1992)). Furthermore, in 1991 an epidemiological study conducted by the Electric Power Research Institute 'support[ed] an association between wiring configuration and childhood leukemia.' Gulliver & Vito, *supra* note 15, at 12 (citing S.J. London et al., *Exposure to Residential Electric and Magnetic Fields and Risk of Childhood Leukemia*, 134 AM. J. EPIDEMIOLOGY 923, 937 (1991)).

sion lines to schools.[89]

In contrast to these local efforts, it had been asserted that the federal government has neither kept pace financially nor provided the necessary research.[90] Thus, the federal government decided to take prudent steps, mirroring those efforts that other states have taken to reduce EMF exposure to children, by introducing H.R. 1494, which prohibits construction of any school near an area where the EMF levels are more than two mG.[91]

The Children's Electromagnetic Field Risk Reduction Act, (H.R. 1494) provides that any public school or child care facility constructed, accredited, or opened after the date of the enactment of the act shall be located on real property where the EMF is less than an average 2 mG per day.[92] Furthermore, H.R. 1494 directs

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89 *See* Sherman, *supra* note 3, at 20. Public concern over EMF has prompted the New Jersey Board of Regulatory Commissioners to require identification of all public and private elementary and secondary schools in the state within 100 feet of a power line of 69 KV or more by June 1, 1993. *See* Prescott, *supra* note 1, at 9. In Maine, the legislature has proposed a bill that would prohibit the construction or expansion of a school facility at a site that experiences average annual EMF of 2 mG or more. *See* H. 999, 116th Me. Leg., 1st Sess. (1993). In California, the Department of Education plans to announce regulations restricting the location of transmission lines adjacent to property for new schools. 139 CONG. REC. E781 (daily ed. Mar. 25, 1993) (statement of Rep. Miller). Approximately 600 schools under construction in California will be built in compliance with these new regulations. *Id.* The new regulations require that new schools be located 100 feet from the edge of the easement of the school property line for 50-133 KV lines and 150 feet from the edge of the easement of the school property line for 500-550 KV lines. *Id.* In New York, officials, including Attorney General Robert Abrams, requested that utilities undertake a comprehensive survey of the location and the strength of power lines near schools. *Id.* at 2. In 1989, a judge in Boca Raton, Florida, declared that students at the Sandpiper Elementary School could not play in parts of the school yard because of resident's fears regarding surrounding power lines. *See* Tomecek, *supra* note 1, at 17. Two California communities, Irvine and Fremont, have also implemented regulations concerning EMF with respect to construction of buildings near transmission lines. 139 CONG. REC. E781-01 (daily ed. Mar. 25, 1993) (statement of Rep. Miller). In Irvine, residential construction is prohibited on properties where the EMF exceeds 4 mG. *Id.* In Fremont, the City Planning Commission required property owners, including residential developers, to disclose to potential buyers the proximity of transmission lines to the property. *Id.* In addition, property owners must disclose that the magnetic field from the transmission lines running throughout the subdivision may cause cancer. *See* Tomecek, *supra* note 1, at 17.

90 *See* H.R. REP. NO. 1049, *supra* note 20, at 297. In fiscal year 1992, the federal government spent approximately $11 million for research on the biological effects of EMF, whereas the private sector spent almost $15 million in research conducted by the Electric Power Research Institute. *Id.*

91 H.R. 1494, 103d Cong., 1st Sess. (1993) [hereinafter H.R. 1494].

92 *Id.* § 3.

the Secretary of Education to develop and distribute advisory medical and scientific information concerning the potential health risk to children of EMF to state and local educational agencies.[93]

The bill would prevent communities and governments from wasting scarce resources on the construction of buildings that may inevitably be closed or destroyed if studies support a connection between EMF exposure and cancer.[94] It could also effectively reduce legal costs for lawsuits involving claims of EMF.[95]

Currently, it is suggested that odds are in favor that the House Committee on Education and Labor will favorably report the bill.[96] However, it is still early to determine whether it will pass in the House and Senate.[97] Nevertheless, given the gravity of public concern on EMF exposure and childhood leukemia and the economic benefits of prohibiting construction near transmission lines, the Children's EMF Risk Reduction Act will likely pass through both houses of Congress and eventually become law.

B. *Electromagnetic Labeling Act of 1993 - H.R. 1665*

The Electromagnetic Labeling Act of 1993 (H.R. 1665),[98] was introduced by Representative Byrne (D-Va.) on April 1, 1993 and referred to the House Committee on Energy and Commerce.[99] This bill establishes uniform labeling requirements for certain

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93 *Id.* § 4.

94 139 CONG. REC. E781 (daily ed. Mar. 25, 1993) (statement of Rep. Miller). Representative Miller highlighted the reasoning behind this legislation, stating that '[g]iven the rising body of evidence suggesting a link between EMF exposure above 2 mG and cancer in children, why take the risk of building new schools and childcare facilities in areas where children risk dangerous exposure?' *Id.*

95 H.R. REP. NO. 474, *supra* note 28, at 117. Dr. J. Keith Florig, of Resources for the Future, testified at a legislative hearing on H.R. 3953 on March 10, 1992, that legal costs, diminished property values adjacent to transmission lines, as well as efforts presently undertaken by utilities to retrofit lines to reduce EMF exposure roughly exceed $1 billion a year and will increase in the future. *Id.*

96 *H.R. 1494*, Billcast, Sept. 1, 1993, *available in* WESTLAW, Federal library, Billcast File. The actual breakdown with respect to likelihood of H.R. 1494's passage is 52% chance in favor of passage in the House Committee on Education and Labor; 21% chance in favor of passage in the Senate Committee; 25% chance of passage on the House Floor; and 20% chance in the Senate. *Id.*

97 *See id.* The bill is currently being considered by the Subcommittee on Human Resources and the Subcommittee on Elementary and Vocational Schools, where it was introduced on April 16, 1993. Telephone Interview with Representative Frank Pallone Jr. (D-N.J.), (July 15, 1993).

98 H.R. 1665, 103d Cong., 1st Sess. (1993).

99 *See* 139 CONG. REC. H1880 (daily ed. Apr. 2, 1993) (statement of Rep. Byrne).

products that emit EMF[100] as determined by the Secretary of Energy in conjunction with the Federal Trade Commission, the Secretary of Commerce, leaders of the affected industries and consumer organizations.[101]

Pursuant to H.R. 1665, the labeling required for the covered products must contain information regarding the strength of the low-frequency[102] EMF emitted by the product.[103] In addition, the labeling must be 'simple' and placed outside the product, to reasonably enable the purchaser and user of the product to make choices and comparisons among products.[104] Manufacturers of products covered under this bill would also be required to maintain data from tests conducted on the product with relation to EMF, and submit this data annually.[105] If the manufacturer fails to comply with the label and data requirements, the Secretary of Energy may impose a civil penalty.[106]

Likelihood of the bill's passage appears to be dim.[107] Should the bill pass, however, it is believed that it will likely address the current consumer concern with purchasing products that emit low frequency EMF and aid them in making sensible choices through guidelines found directly on the product.

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100 *See id.* The products covered by this legislation include those that emit EMF of which the strength is more than 100 millivolts per meter and one gauss when measured one inch from the product, as well any other products the Secretary classifies as a covered product. H.R. 1494 § 2(B)(1).

101 *Id.* Various industries, such as the electric bedding and VDT industries, have voluntarily attempted to reduce the EMF emitted by their products. In addition, some manufacturers have rearranged wiring, so that exposure is about one tenth what it previously was. *Id. See* Thomas, *supra* note 25, at 3-4.

102 *See supra* note 11. 'Low frequency' means a frequency of 60 cycles per second, or 60 hertz. *Id.*

103 H.R. 1665 § 2(B)(1). Similarly, the Pennsylvania legislature has proposed H.B. 1610, requiring retailers to post the level of EMF surrounding a host of household appliances. *See Legislation*, LEGAL INTELLIGENCER, (Harrisburg, Pa.) Sept. 27, 1993, at 13.

104 H.R. 1665 § 2(c)(3).

105 *Id.* § 3(3). The data must be submitted to the Secretary of Energy, at a time specified by the Secretary. *Id.* § 3.

106 *Id.* § 4. The amount of civil penalties may not exceed $100 for each violation described or $100 for each day during which a violation occurs. *Id.*

107 *H.R. 1665*, Billcast, Sept. 1, 1993, *available in* WESTLAW, Federal library, Billcast File. As of September 1, 1993, the chances of passage of H.R. 1665 were 3% in the Senate Committee, 4% on the House floor and 2% in the Senate. *Id.*

VI. State & Private Sector EMF Remedies

A. *State Remedies*

The EMF dilemma has received an overwhelming response from state governments and the private sector, both of which have contributed a vast amount of resources and funding towards research and policy making. In 1989, only Minnesota, Montana, New Jersey, New York, North Dakota and Oregon had any type of rules limiting emissions of electric fields.[108] However, today approximately nineteen states, either through their public utility commission, special task forces, legislatures or other agencies have addressed the EMF issue.[109] Many of these states have devoted substantial resources to compile a comprehensive review of available biological, epidemiological, and other scientific data, and to regulate utilities based on these results.[110]

Although the states are working with identical EMF data bases, the range of regulatory responses is diverse.[111] Some state regulators have opted for the status quo regarding construction of transmission lines, while others have resisted demands that they set standards due to the lack of scientific basis for such action.[112] In addition, lawsuits involving EMF have emerged in several states,

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108 Boyle, *supra* note 13, at 49. Minnesota allows eight kilovolts/m at peak periods. *See id.* Montana allows one kV/m in residential and subdivided areas, although landowners can waive that requirement to a utility. *Id.* New Jersey has a three kV/m limit but only as a means of evaluating public complaints. *Id.* Additionally, New Jersey is currently in the process of proposing a bill the would require communication tower facilities on the Garden State Parkway to be located at least 300 feet from a residential area. *See* A. 1118, 205th N.J. Leg., 2d Sess. (1992). New York has set an interim limit of 1.6 kV per meter of right of way for 345 kV-lines. North Dakota has an informal limit of nine kV/m. *Id.* Finally, Oregon has a formal rule limiting emissions to nine kV/m in public access areas. *Id.* Oregon's legislature introduced a bill requiring that public utilities take appropriate action to protect people on school grounds from EMF. H. 3608, 67th Or. Leg. (1993).

109 Gulliver & Vito, *supra* note 15, at 12. The following states have addressed the EMF issue: Wisconsin, Colorado, New York, New Jersey, Connecticut, California, Texas, Rhode Island, Montana, Minnesota, Florida, Delaware, Maryland, Massachusetts, Pennsylvania, North Dakota, Hawaii, Iowa and Kansas. *Id.*

110 *Id.*

111 *Id.* The states are determining EMF policy and in some cases promulgating regulations, based upon the conflicting and inconclusive evidence resulting from research that is being conducted. *Id.*

112 Piety, *supra* note 88, at 18. Florida and New York have opted for the status quo, representing those standards which society has lived since the beginning of electricity use. *Id.* Maryland, on the other hand, has resisted attempts to set standards because of the inconclusive research findings. *Id.*

prompting a wide range of legislative and judicial action.[113] Thus,

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[113] *See* Weiss, *supra* note 3, at 360. The majority of these cases are condemnation cases in where power line EMF are at issue, while several are personal injury suits and a few environmental damage suits. *Id.* at 363-64. Property condemnation cases involving EMF are based on a potential buyer's fear of EMF. *See* Freeman, *supra* note 1, at 3. For decades, state and federal courts have dealt with claims that electric transmission lines diminish property values because people are afraid of high voltage or feel that the lines are unsightly. *Id.* at 1. In San Diego Gas and Elec. v. Daley, 253 Cal. Rptr. 144 (Cal. Ct. App. 1988), the court affirmed a lower court ruling that a landowner did not have to show an objectively reasonable basis for fear. *Id.* Thus, the utility had to compensate the landowners for diminished property value. *Id.* Moreover, in Houston Lighting & Power Co. v. Klein Indep. Sch. Dist., 739 S.W.2d 508 (Tx. Ct. App. 1987), a jury decided against the Houston utility, forcing them to spend over $8 million to move less than a mile of power lines 2500 feet away from the backyard of an elementary school. *Id. See* Prescott, *supra* note 1, at 4. Furthermore, in Florida Power & Light Co. v. Lively, 456 So. 2d 1270, 1274 (Fla. Dist. Ct. App. 1985) the utility offered $30,000 for an easement over the property and no severance damages, and the plaintiff settled for $119,000. Freeman, *supra* note 1, at 1. *But see Pennsylvania: Judge Rules In Favor of Utilities on EMF*, American Political Network, Inc., July 27, 1993, *available in* LEXIS, Nexis Library, Greenwire File (ruling by Public Utilities Commission judge that studies on EMF did not support a conclusive link between power lines and adverse health effects, therefore the Philadelphia Electric Company was authorized to begin construction on a 13 mile power line that would carry 230,000 volts of electricity). In California, a court ruled that possible health impacts of EMF could not be introduced as evidence in a case involving a transmission line right-of-way. *See* TANC v. Westlake, No. 99499, slip op. (Cal. Super. Ct., Shasta County 1993). *See also California ALJ: Utilities Not Required To Alter Lines To Reduce EMF Exposure,* UTIL. ENV'T REPORT 1 (July 23, 1993) (ruling of administrative law judge at the California Public Utilities Commission which held that utilities should not be required to alter existing power lines to reduce exposure to EMF). The judge concluded that for new projects, investor owned utilities should allocate no more than 4% of the total costs to mitigating EMF. *Id.* Additionally, the judge suggested reducing current levels by implementing programs such as relocating lines, widening paths or using higher voltages. *Id.* The California Public Utilities Commission also received a petition from a group of homeowners in Del Mar to stop San Diego Gas and Electric from continuing construction on a new substation because of fear that EMF would endanger the lives of surrounding residents. *California Homeowners Petition Public Utilities Commission to Stop San Diego Gas and Electric Substation, Citing EMF Concerns,* UTIL. ENV'T REPORT 8 (Sept. 3, 1993). The homeowners filed a complaint to stop the $5.9 million project, contending that it would increase EMF in the neighborhood by 20% to over 2 mG the neighborhood, as well as in the vicinity of the nearby high school both of which are located 200 feet from the proposed site. *Id.* However, due to lack of funds, the homeowners were forced to drop the lawsuit. *Id.* These homeowners subsequently filed a petition with the California Public Utilities Commission to stop the project without court action. Harry J. Fotinos, *Carmel Valley Homeowners Drop Suit to Block SDG&E Substation,* SAN DIEGO UNION TRIB., Oct. 2, 1993, at B9. Some landowners have utilized scientific experts to establish that the public has developed a fear of power lines in order to prevail in lawsuits claiming that electric transmission lines have diminished their property value. PUB. UTIL. FORT., July, 19, 1990, at 20. These landowners contend that EMF fear causes the hypothetical buyer to pay less for a property that is in

courts in various states have adopted disparate positions on the same EMF exposure issue, often to the detriment of public utilities which must adjust to each state's divergent policy.[114] These assorted state strategies and remedies all fall into one of four general categories: (1) prudent avoidance; (2) moratoria on new transmission line construction; (3) adoption of numerical field strength standards; and (4) preservation of the status quo.[115]

1. Prudent Avoidance

Prudent avoidance[116] and is defined as the 'balancing of strategies designed to minimize human exposure to EMF while expending only an appropriate level of costs to achieve such minimization'.[117] Prudent avoidance does not mean the removal, relocation, or reconstruction of existing transmission lines, but may consist of rerouting proposed lines only if the cost is reasonable.[118]

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close proximity of transmission lines or to not buy at all, thus justifying their claims for compensation. *Id.* Additionally, there are a handful of personal injury suits originating from exposure to EMF, however they are few in number because proving causation is most difficult. *See* Brown, *supra* note 4, at 5. The plaintiff must show a reasonable causal connection between exposure to EMF and the harm that the plaintiff has suffered. *Id.* However, due to inconclusive findings on biological effects, many plaintiffs fail to meet this causation requirement. *Id.*

114 The most liberal view of the state judicial opinions is embodied in San Diego Gas & Elec. v. Daley, 253 Cal. Rptr. 144, (Cal. Ct. App. 1988) which required that public fear of power line EMF is admissible to show such fear might depress property values even though there is no conclusive proof of these hazards. *Id.* at 365. An intermediate position is represented by Zappavigna v. State, 588 N.Y.S.2d 585 (N.Y. App. Div. 1992), where the Appellate Division required that there must be reasonable grounds for the 'potential purchaser's fears and a proven drop in market value.' *Id.* The strictest, minority view is that fears over power lines are too speculative and can not be considered in awarding compensation. *See* Weiss, *supra* note 3, at 372-73.

115 Gulliver & Vito, *supra* note 15, at 12.

116 *Id.* (citing OFFICE OF TECHNOLOGY ASSESSMENT REPORT, BIOLOGICAL EFFECTS OF POWER FREQUENCY ELECTRIC & MAGNETIC FIELDS (1989)). *See* DEPARTMENT OF ENG'G, *supra* note 1, at 31. The concept of prudent avoidance was originated by Dr. Granger Morgan and his colleagues at Carnegie Mellon University and explicated in the U.S. Congressional Office of Technology Assessment report. *See id.* Dr. Morgan is the Chairman of the Department of Engineering and Public Policy at Carnegie Mellon University and has done considerable research on the EMF issue. *Id.*

117 Gulliver & Vito, *supra* note 15, at 13.

118 *Id.* It has been articulated that '[t]aking more drastic action than indicated by prudent avoidance will cost a lot of money and create a fair amount of disruption. It is hard to justify spending more than a few thousand dollars per person exposed in order to reduce exposure.' DEPARTMENT OF ENG'G, *supra* note 1, at 28. 'Spending a few thousand dollars per exposure avoided amounts to spending millions of dollars or

Three states, Wisconsin, Colorado, and California, have recently adopted some form of prudent avoidance; however, these different strategies may produce a variety of results.[119] For example, Wisconsin's Public Service Commission has articulated one of the most comprehensive EMF regulatory policies, ordering that Wisconsin's utilities take several reasonable actions prior to proposing new or expanded transmission lines to mitigate EMF exposure.[120]

On the other hand, Colorado's prudent avoidance plan focuses on striking a balance between avoiding potential harm and the attendant costs and risks.[121] The Colorado plan defines prudent avoidance in economic terms with restraint on expenditures, where the cost of mitigation strategies must be rationally related to

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more per possible health effect avoided.' *Id.* A Milwaukee defense attorney who represented Wisconsin's 13 major utilities in hearings before the state's public service commission has stated that utilities should be taking prudent avoidance steps when possible, 'with modest expense, to reroute transmission, or configure transmission to reduce EMF. However, it would, for example, be imprudent to spend double the amount necessary to do that.' *Id.* *See* Cicetti, *supra* note 24, at 15.

119 Gulliver & Vito, *supra* note 15, at 13. For Wisconsin, prudent avoidance meant a proactive EMF regulatory policy focusing on mandated dialogues and additional research. *Re* Advance Plans for Constr. of Facilities, 132 Pub. Util. Rep. 4th (PUR) 193, 199 (1992). For Colorado, prudent avoidance means 'striking the balance of a reasonable balance between avoiding potential harm and attendant costs and risks.' Gulliver & Vito, *supra* note 15, at 13. Thus, Colorado's Public Utility Commission rejected burying transmission lines at a cost of $13.5 million to reduce the EMF risk to 390 people. *Id.* However, Colorado recently proposed a rule that contains more active mitigation strategies. *See id.* (citing *In re* Rules for Electric Utilities Commission Concerning Electric & Magnetic Fields, 4 COLO. CODE REGS. § 723-3, Decision No. C92-600 (Apr. 29, 1992)). *See also 'Prudent Avoidance' Adopted for EMF Health Issue,* PUB. UTIL. FORT., Dec. 15, 1992, at 40 (Colorado finally adopts prudent avoidance for planning, siting, constructing and operating electric transmission facilities).

120 Gulliver & Vito, *supra* note 15, at 13. Some of these actions include taking into consideration the extent, intensity and duration of EMF exposure along the proposed route and providing enough information so staff can analyze how the utility factored this criteria into its transmission line route selection, utilizing a 'low-EMF design provided that costs, safety, or efficiency do not render use of the least-EMF design unreasonable,' working with the WPSC staff to create a uniform 'measurement protocol' to document EMF levels at customer's residence, and accounting for EMF in demand-site management programs and funding more EMF research, that is not industry sponsored. *Id.* A three-year moratorium on construction was opposed because it was considered too severe a measure, in light of the conflicting evidence of adverse health effects caused by EMF. *Id.* Thus, the Wisconsin plan focuses on mandated dialogues and additional research. *Id.* Critics of the Wisconsin plan say that it is not specific enough because it does not give the utility guidance as to how EMF decisions are either credited or debited. *Id.*

121 *Id.* at 14. *See* PUB. UTIL. FORT. *supra* note 119, at 40.

the number of persons potentially exposed.[122] However, Colorado has recently proposed more active mitigation strategies, including the creation of magnetic field strength standards due to the increase in public concern.[123] If Colorado decides to adopt field strength standards, it will join Florida and New York as the only states to propose such regulations at this time.[124]

California has also adopted a prudent avoidance policy that is even less precise than Colorado and Wisconsin, in that its policy simply recommends that the California Public Utilities Commission require utilities to take public concern into account when siting transmission lines.[125] How this will be done is unarticulated, which is a problem many public utility commissions confront when they adopt a prudent avoidance policy.[126]

2. Construction Moratoria

Proposing construction moratoria is another strategy several states have adopted to confront the EMF issue.[127] Rhode Island was the first state to adopt a construction moratorium on transmission lines that prohibits, for three years, the construction of high voltage lines greater than 60 k/v.[128] The plan requires a utility to

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122 *See* Gulliver & Vito, *supra* note 15, at 13.

123 *Id.* at 14. Colorado's Public Utilities Commission has envisioned two approaches to EMF: a more stringent 'prudent avoidance scheme' that is not determined in cost-benefit terms, but as in accepting higher project costs to address potential risks, and development of magnetic field strength standards for new or upgraded facilities. *Id.*

124 *Id.* at 15, 48. Florida and New York's field strength standard is 200 mG. *Id.*

125 *Id.* at 15 (citations omitted).

126 *See* Gulliver & Vito, *supra* note 15, at 15.

127 *Id.* at 12. Construction moratoria is the prohibition of the construction, in this case, of power lines. *Id.*

128 *See id.* at 15 (citing 1992 R.I. Pub. Laws 92-439). Despite the lack of definite evidence linking EMF with health risks, Rhode Island decided that the data is sufficient to warrant an approach of prudent avoidance. *Id.* In addition, the Rhode Island plan for EMF provides rules and regulations governing construction of high voltage transmission lines. *Id.* Specifically, it requires that utility applications contain certain criteria including, 'an assessment of the potential health risks associated with EMF exposure.' *Id.* Additionally, Illinois, Indiana, South Carolina, Tennessee and Michigan have proposed similar moratoriums in their legislatures to respond to constituent concern with EMF. *See* H. 2863, 87th Ill. Gen. Ass. (1991) (imposing a three year moratorium on constructing electric transmission lines that operate at greater than 60 k/v); S. 1436, 87th Ill. Gen. Ass. (1991) (providing that no overhead electrical power line may produce a magnetic field of more than 2 mG anywhere on residential property and prohibits high voltage transmission lines 500 feet of any elementary or

assess potential health risks and consult the public at hearings where all can participate in the decision-making process.[129] Critics of construction moratoria suggest that promulgating such measures actually increases risks rather than safeguarding the public because 'the current flowing in existing lines is purportedly increased to meet customer demands, thereby increasing EMF emissions'.[130] Advocates, however, feel it is an appropriate response because it compels a utility to commit time and effort to resolving the EMF issue and allaying public fear.[131]

3. Field Strength Standards

Various states, including New York and Florida, have implemented field strength standards as a method of addressing the EMF exposure issue.[132] The only difference between Florida's and

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secondary school); S. 224, 108th Ind. Leg. Sess. (1992) (prohibiting the construction of high voltage electric transmission lines unless the electric utility can prove that exposure to EMF emitted by the is not harmful); H. 4087, Mich. 86th Leg. (1992) (establishing a two-year moratorium on certain electric transmission lines); H. 556, 97th Tenn. Gen. Ass. (1992) (placing moratorium on certain high voltage electric power lines); H. 4570, 1992 S.C. Statewide Sess. (1992) (providing that no electrical light and power wires, transmission lines, or systems capable of transmitting more than fifty k/v of electricity may be placed within 250 yards of any public or private school).

129 *See* Gulliver & Vito, *supra* note 15, at 14. The siting board sets up the public hearings and determines who will participate in them. *Id.*

130 *Id.* Moratoriums may be unsatisfactory to utilities because they fail to resolve policy issues. *Id.* at 14, 47. Critics argue that moratoriums do not contribute to curing the growing demand to serve customer's electrical needs. *Id.* at 14.

131 *Id.* at 46.

132 *See id.* at 14. *See also* S. 394, 204th N.J. Leg., 2d Sess. (1990) (proposing adoption of regulations that would establish maximum electromagnetic field strengths). The new Florida rules agree that existing lines will be able to continue operation without change and proposed lines will have to meet the strict standards proposed by the state. *See* Boyle, *supra* note 14, at 1. The new rules will cost utilities an additional $100 million to $5 billion during the next 30 years in additional construction costs for 500-k/v lines. *Id.* New York has studied EMF exposure issues for many years and, in 1990, the New York Public Commission announced interim field strength standards. *See* Gulliver & Vito, *supra* note 15, at 47 (citing STATE OF N.Y. PUBLIC SERVICE COMM'N, STATEMENT OF INTERIM POLICY ON MAGNETIC FIELDS OF MAJOR ELECTRIC TRANSMISSION FACILITIES (Sept. 1990)). This policy establishes that '[supporting] an interim standard that would avoid unnecessary increases in existing levels of exposure to magnetic fields[ ] . . . would restrict the design choices for future transmission facilities; designs which could produce higher magnetic fields than typical 345 kv lines are to be avoided.' *Id.* (citing STATE OF N.Y. PUBLIC SERVICE COMM'N, STATEMENT OF INTERIM POLICY ON MAGNETIC FIELDS OF MAJOR ELECTRIC TRANSMISSION FACILITIES 5-6 (Sept. 1990)). The commission's strategy would create a design standard for new facilities,

New York standards is that Florida has adopted permanent binding fields strength standards, while New York utilities operate under an interim policy.[133]

Critics of field strength standards contend there is no basis for establishing a reasonable exposure level because scientific evidence is inconclusive in determining whether weaker fields are safer than stronger field strengths.[134] In addition, it is contended that these standards may deter utilities from seeking solutions to EMF problems because they have already complied with field strength levels.[135] On the other hand, it has been said that field strength standards may benefit utilities because they would supply them with uniform guidelines as opposed to arbitrary regulations.[136]

4. Maintaining the Status Quo

Texas and Connecticut recently adopted similar regulatory responses pursuant to task force reports that recommend that their states maintain the status quo.[137] Although both states concur that scientific evidence on EMF exposure is inconclusive, their responsive status quo approaches to this result are dissimilar.[138] Connecticut, pursuant to an extensive study conducted by the Connecticut Academy of Science and Engineering, recommended that no action be taken, neither prudent avoidance nor field strength standards.[139] On the other hand, Texas' EMF Committee, did

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as opposed to an operational one for existing facilities. *Id.* (citing STATE OF N.Y. PUBLIC SERVICE COMM'N, STATEMENT OF INTERIM POLICY ON MAGNETIC FIELDS OF MAJOR ELECTRIC TRANSMISSION FACILITIES 5 (Sept. 1990)). Pursuant to a magnetic field survey, the commission determined that 200 mG was the appropriate field strength standard. *Id.* Florida was the first state to enact field strength standards which was established in 1989 at a maximum emission of 200 mG. *See* 123 PUB. UTIL. FORT. June 6, 1989, at 49. Both New York's and Florida's standards are technology based rather than health based. *See* H.R. REP. NO. 1049, *supra* note 20, at 295.

133 Gulliver & Vito, *supra* note 14, at 48. Given the lack of research, New York's Public Service Commission could not adopt a basic permanent standard. *Id.* Florida, however, adopted a permanent binding field strength standard of 200 Mg. at the edge of rights of way. *See* PUB. UTIL. FORT. supra note 132, at 49. *See also* H.R. REP. No.1049, *supra* note 20, at 295.

134 *See* DEPARTMENT OF ENG'G, *supra* note 1, at 21-22.

135 Gulliver & Vito, *supra* note 15, at 47.

136 *Id.*

137 *Id.* at 48. *See* Piety, *supra* note 88, at 14.

138 Gulliver & Vito, *supra* note 15, at 48.

139 *Id.* This study recommended that based on its findings, the state should not engage in further EMF related research. *Id.* (citations omitted). Connecticut's task

recommend that Texas public utilities continue a policy of prudent avoidance and avoid heavily populated areas when siting transmission lines.[140] But the commission did not propose that utilities expand existing route criterion or predictable prudent avoidance strategies.[141]

B. *Private Sector Remedies*

In recent years, there has been mounting pressure on the courts and state public utility commissions to form guidelines or positions on the siting of new transmission lines and on the impact of existing lines due to the public's concern with EMF.[142] Accordingly, the private sector, particularly the utility industry, has invested approximately $6 million per year in EMF research.[143] But this may not be enough. The implications of EMF on utilities and the public have been enormous, affecting regulatory decisions on certifying a new line or upgrading an existing one for increased power, as well as affecting the rate paying public due to eminent domain cases.[144]

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force on EMF and EMF related regulatory strategies conducted extensive review of scientific and medical literature concerning the biological effects of EMF; the findings were inconclusive. *Id.* Therefore, the Connecticut Academy of Science and Engineering recommended that the state take neither action to implement field strength standards nor adopt a 'prudent avoidance' policy. *Id.*

140 *Id.* Texas also had reviewed a task force report on EMF which recommended maintaining the status quo. *See id.* (citing PUBLIC UTIL. COMM'N OF TEX., TEXAS ELECTRO-MAGNETIC HEALTH EFFECTS COMM., HEALTH EFFECTS OF EXPOSURE TO POWER LINE FREQUENCY EMFs (Mar. 1992)). In addition, the Texas EMF Health Effects Committee also found scientific evidence inconclusive; however, it recommended that Texas use 'prudent avoidance' in siting its transmission lines away from populated areas. *Id.*

141 *Id.*

142 *See* Freeman, *supra* note 1, at 20. In a recent survey of utility executives, 81% of those surveyed identified EMF as leading public concern of their companies. Gulliver & Vito, *supra* note 15, at 12. Additionally, Jersey Central Power and Light abandoned plans to build a line in Monmouth County, N.J., due to public protest. Sherman, *supra* note 3, at 21. In addition, due to resident protest, PSE&G went through protracted hearings before it was granted approval in May 1993 to build an electrical substation in Hopewell Township, N.J. *Id.* PSE&G held two public forums and local officials conducted a series of public hearings to discuss land use development issues. *See* Bob Kinkead, *Don't Just Sit There, Do Something!* MGMT. Q., (PSE&G/Corp. Communications Dept.), Summer 1993, at 30.

143 *See* PSE&G SUMMARY OVERVIEW, *supra* note 1, at 1. In addition, some utilities are making an effort to educate customers on EMF. *See* Kinkead, *supra* note 142, at 31.

144 Freeman, *supra* note 1, at 20. *See* Piety, *supra* note 88, at 16. It has been stated that '[i]t is extremely doubtful that the electric industry has ever confronted a more

Given the current circumstances, utilities must take steps to reassure the public that they are taking proactive measures to mitigate EMF exposure and, therefore, it has been stated that a prudent avoidance strategy may prove the most fruitful.[145] For example, Delmarva Power, headquartered in Delaware, voluntarily set standards to limit EMF for both new and existing transmission lines and substations.[146] Despite the utility's belief that EMF do not pose a human health threat, it realized that its customers were concerned and thus it reacted to public demand.[147] This type of reaction to the public, like the prudent avoidance strategy, would be a flexible way of dealing with existing and future EMF problems with transmission line siting and building new substation constructions.[148] Given the current scientific literature, judicial opinions, advisory commentaries and epidemiological studies, it seems apparent that utilities can not afford not to act.[149] Inaction may potentially damage a utility because future juries may hold them negligent for failing to take even the smallest steps towards mitigation in the event scientific evidence conclusively demonstrates that EMF are dangerous.[150] Conducting research on EMF as utilities

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complex, perplexing, and frustrating issue than that of EMF and human health'. *Id.* Should subsequent research prove beyond a doubt that exposure to 60 hz EMF at certain levels does present an identifiable health risk, the potential cost to the utility industry will 'dwarf' by comparison any environmental control measures the industry has ever taken or contemplated. *Id. See* Gulliver & Vito, *supra* note 15, at 49.

145 Gulliver & Vito, *supra* note 15, at 50. 'It has been articulated that '[t]o address public concerns, utilities must make an effort to educate their customers on EMF and to demonstrate that EMF concerns are accorded genuine consideration in the planning process'. *Id.* at 49. For example, Central Maine Power sponsors a newsletter for customers called EMF Keeptrack. *Id.* Because it matters little to the fearful that epidemiological studies are inconclusive and do not show a strong association between EMF and health conditions, educating the customer may be the best way for utilities to satiate the public. *Id.*

146 PUB. UTIL. FORT., Dec. 20, 1990, at 9. *See* Couch v. Delmarva Power & Light Co., 593 A.2d 554 (Del. Ch. 1991).

147 *See* PUBLIC UTIL. FORT., *supra* note 146, at 9.

148 *Id.* In most cases, before increasing the voltage of an overhead transmission line, a utility must consider: 'recommendations of local governing bodies, the need to meet present and future demands for service, the effect on system stability and reliability, economics, aesthetics, historic sites, aviation safety and when applicable the effect on air and water pollution.' *Re* Potomac Edison Co., 83 Pub. Util. Rep. 4th (PUR) 272, 273 (Oct. 6, 1992).

149 Gulliver & Vito, *supra* note 15, at 49.

150 *Id.*

> If someone concludes that drastic action on fields is appropriate today, and does not wish to make safety expenditures for fields which are dramat-

have done, is helpful; however, additional efforts are needed to obtain and disseminate information.[151] The Energy Policy Act of 1992 has also promoted utility goals by integrating federal, state and the private sector in its research directives so as to expedite the search for conclusive information. Hopefully, the coordination of effort between these three sectors, as well as all the other agencies and interests involved, and the current Federal legislation, will result in the acceleration of a solution to this tenuous EMF exposure issue.

VII. Conclusion

The EMF exposure issue remains a thorn in the side of the federal government, utilities, the concerned public, as well as many others affected by its ambiguity. Scientific data remains inconclusive; hence, federal and state governments can only promote legislation based on conjecture. However, to not act at all may prove disastrous for the government as well as utilities if future evidence confirms a correlation between EMF exposure and cancer, or other adverse health conditions. Thus, state governments and utility companies are forced to take action by proposing regulations and EMF guidelines prompted by the public's outcry. As a result, Congress is currently attempting, through its proposed legislation, to get a handle on the EMF issue and allay the public's fear without outright regulating EMF.

The current federal bills, the Children's Electromagnetic Field Reduction Act and the Electromagnetic Field Labeling Act, can be discerned as measures to appease and reassure the public that the federal government has manifested its concern with EMF and is

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ically larger than the expenditures we make against other risks in our society, they must have concluded that the health risks from fields are significantly more common than one in several thousand people exposed.

DEPARTMENT OF ENG'G, *supra* note 1, at 29.

151 H.R. REP NO. 664, *supra* note 1, at 253. Utilities can take extra measures when siting new or upgrading existing lines, such as reverse phasing and increased ground clearances, as well as use of taller suspension structures and use of single towers in a delta configuration rather than a horizontal line to mitigate exposure. *See* Gulliver & Vito, *supra* note 15, at 50. It has also been asserted that utilities could help the public understand EMF by making it easier for people to get their own EMF readings and find out for themselves what their EMF exposure really is. *See* Peter Sandman, *Tips on EMF Risk Communication*, MGMT. Q. (PSE&G/Corp. Communications Dept.), Summer 1993, at 32.

doing as much as is possible with its limited information. The bills Congress has proposed approach EMF from two different angles: the consumer angle, with the EMF Labeling Act, and the concerned parent/public angle, with the Children's EMF Risk Reduction Act. And because Congress appears to be unable to determine how far it should go in regulating any aspect of EMF without over regulating, it has taken a safe position by proposing H.R. 1494 and H.R. 1665. These bills are not overburdensome regulations and yet they exhibit the federal government's penchant to address the public's apprehension.

The Children's EMF Risk Reduction Act appeals to troubled parents of school age children, as well as the general public. After evaluating the bill, it seems implausible that the government could fail with this legislation. First, if a correlation linking EMF exposure with childhood cancer is confirmed, then the government will have acted perceptively and responsibly in the public's eye and parents and all concerned will be pleased. Second, even if scientific evidence concludes that EMF exposure establishes no connection with childhood cancer, the public would remain satisfied because the government took pertinent action on its behalf.

On the other hand, property owners of potential school sites near transmission lines will probably be harmed by this proposed legislation. They are possibly the only group that will be adversely affected. However, they will be harmed only if the correlation with EMF is found to have no scientific basis because at that point, they will have lost the sale of the property to the Board of Education. However, if a conclusive correlation is found between EMF exposure and transmission lines, then other potential property purchasers would have been deterred from buying the site anyway, due to the property's proximity to the power lines, not the proposed legislation. Thus, the Children's EMF Risk Reduction Act would not directly harm the property owners.

The EMF Labeling Act of 1993, in contrast will prove to be a much more costly piece of legislation because it requires manufacturers to spend extra time and money to uniformly label products that emit low-frequency EMF of more than 100 millivolts. This requirement is proposed to respond to the public's need for information by providing guidelines for manufacturers to follow despite the lack of scientific data.

The guidelines that the federal government will set up pursu-

ant to H.R. 1665 will appease the troubled consumer who has sought guidance and information on this tenuous issue. However, this information will not benefit the consumer until there is a better understanding of how to interpret EMF levels. As a result, all this uniform labeling may be a waste of time and money for manufacturers, and futile for the consumer, especially if future studies confirm that EMF exposure does not produce adverse health effects. Consequently, this legislation may be a premature reaction to an issue that is still extremely volatile and burdensome to manufacturers without sufficient justification.

Alternatively, this legislation may prove to be a significant step towards regulating EMF emitting products, particularly if it is conclusively determined that EMF exposure adversely effects human health. If such a result is reached, the federal government will have alleviated its workload in regulating EMF products because it will have already accomplished this task through H.R. 1665. Manufacturers would also benefit as they would have uniform federal guidelines to be followed regarding EMF levels, as opposed to fluctuating data from a variety of sources.

Regardless of what the scientific studies conclude, the consumer will inevitably be pleased at Congress' attempt to confront their need for information concerning this troublesome issue. Hence, as with H.R. 1494, Congress has proposed a safe piece of legislation that addresses the public's fear of EMF exposure, without heavily regulating an issue that is still unsettled. Odds favoring H.R. 1665's passage are still low; however, the bill is still fairly new and may pick up support given the current political climate surrounding the issue.

Presently, the federal government's strategy, which includes introducing these EMF bills, may be enough to placate the public outcry. However, as more people are advised of a decline in their property value due to the proximity of transmission lines, and more are told of the high level of EMF radiation they and their children are exposed to on a daily basis, the demand for more stringent measures may result. How the federal government responds to this dilemma remains to be seen. The public can only anticipate that someday soon a resolution will occur that will confirm either way the danger or innocuous effects of EMF so that it can be confronted accordingly.