

PROPERTY DEVALUATION CAUSED BY FEAR OF ELECTROMAGNETIC FIELDS: USING DAMAGES TO ENCOURAGE UTILITIES TO ACT EFFICIENTLY

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INTRODUCTION

LoCal, a local electric utility company, plans to expand its service into the newly developed outskirts of Anytown. To effectuate this plan, it must build new electric transmission and distribution lines through several existing neighborhoods. Despite vigorous opposition from homeowners groups, the public utility commission approves the placement and construction of the new power lines. Within a few months, LoCal acquires the necessary property through eminent domain, and condemnation proceedings begin.¹

Following the advice of its appraiser, LoCal offers each homeowner several thousand dollars to compensate for its taking of the land on which the lines will be erected. In addition, LoCal offers each homeowner several hundred dollars for "consequential damages" to the remaining property resulting from the installation of the power lines.² This payment is intended to compensate for noise made by the power lines, the nuisance of having electric utility workers on the property inspecting the wires, and any devaluation of the remaining land due to loss of aesthetics or loss of view.

Having watched news reports on the potentially dangerous effects of electromagnetic fields emanating from power lines, Hilda Homeowner questions whether LoCal's offer is sufficient compensation. She realizes that the uncertainty regarding the health effects of electromagnetic fields fuels the public's fear of these fields, and that this fear will significantly devalue her property. Hilda therefore believes that the utility company should compensate her for this diminution in

* I am indebted to Professor Mark Geistfeld, Robert Steinman, and the entire production staff of the *New York University Law Review* for their thoughtful critiques and unflinching encouragement throughout the preparation of this Note.

¹ Electric utility companies may avoid using their power of eminent domain by first negotiating with the individual landowners affected by the power lines. This hypothetical assumes that any such negotiations have failed.

² When an electric utility condemns property for a power line, it must pay the property owner "just compensation" for both the land taken and any loss in value to the remaining land. See *infra* text accompanying notes 33-37.

property value that results from the newly installed power lines in her backyard. After voicing her concern and failing to reach agreement with the utility company, she turns to the courts to challenge the condemnation award.³

Hilda has a good chance of recovering for the devaluation of her property resulting from the public's fear of electromagnetic fields. The majority rule, followed by many courts, compensates landowners for loss of value due to public fear—regardless of the reasonableness of the fear—if the plaintiff demonstrates that the fear reduced the property's value.⁴ Hilda can easily demonstrate that the public's fear of electromagnetic fields did in fact devalue her property and therefore she will be compensated for this loss.

Hilda believes she has achieved a double victory in her lawsuit. Not only has she been justly compensated, but she also believes that her damage award, and others like hers, will force LoCal to deal efficiently with the uncertainty surrounding the potentially dangerous health effects of electromagnetic fields. Hilda is confident that, because LoCal has been affected economically by this uncertainty, it will have an incentive to determine the most cost-efficient way to deal with it.

Unfortunately for Hilda, LoCal is not particularly concerned about the economic ramifications of the public's fear. Even if the court allows recovery, LoCal knows that these damage awards will be recouped through its rates. LoCal operates as a state-sanctioned monopoly⁵ and is therefore subject to rate regulation. Under current rate

³ In addition to her challenge of the condemnation award, Hilda may assert that she should be compensated for "cancerphobia," a term used by courts and commentators to describe the emotional distress caused by the fear of developing cancer. See Dr. Sharlene A. McEvoy, *Double-Edged Sword of Damocles: Utility Companies' Liability for Diminution of Property Values Due to Electromagnetic Fields*, 23 *Real Est. L.J.* 109, 112 n.18 (1994) (describing "cancerphobia" as "a phobic reaction or apprehension . . . due to fear of contracting cancer in the future"). A full discussion of such a claim is beyond the scope of this Note. This Note deals primarily with compensating the landowner for all property devaluation and forcing the utility company to engage in an efficiency analysis. Cancerphobia is relevant to this consideration only because it fuels the decline in value of property near power lines.

⁴ See, e.g., *San Diego Gas & Elec. Co. v. Daley*, 253 *Cal. Rptr.* 144, 151-52 (Ct. App. 1988) (applying majority rule).

⁵ This Note assumes that the public utility is functioning as a state-sanctioned monopoly. Recently, the public utility commissions in several states, including New York, California, Massachusetts, Maine, and New Hampshire, have approved plans providing for direct competition in the utility market by 1998. See James Dao, *Plan Approved to Let Power Users Pick Suppliers of Their Electricity*, *N.Y. Times*, May 17, 1996, at B1. The plan advocated in this Note will be unnecessary in such situations because competition presumably will force utilities to make efficient decisions. However, it most likely will take many years for the electric utility industry to become fully subject to competition. See Benjamin A. Holden, *Con Edison, Other New York Utilities Expected to Seek Gradual Deregulation*,

regulation procedures, LoCal is guaranteed recovery of its "cost of service" plus a reasonable rate of return.⁶ Since a utility's "cost of service" includes the cost of acquiring land on which to build new power lines, all the money paid to Hilda will be returned to LoCal via a slight increase in utility rates.⁷ The additional cost resulting from the public's fear of electromagnetic fields does not factor into the utility's calculus and therefore does not affect its behavior.

This system affords no incentive to make cost-efficient decisions regarding the underlying issue—the uncertainty about the health effects of electromagnetic fields. Utilities have little reason to engage in a cost-benefit analysis to determine the most cost-effective strategy for dealing with the uncertainty if they are insulated from its economic effects. As a result, utilities make inefficient decisions and consumers are left holding the tab.

By failing to deter such inefficiency, rate-setting procedures facilitate wasteful allocation of resources and the economic exploitation of consumers. Because consumers ultimately will bear the cost resulting from the uncertainty (i.e., the increased condemnation awards) via increased rates, utilities have no incentive to be concerned about these costs. This Note argues that to protect the consumer from unfair and unnecessary rate increases, public utility commissions should employ a regulatory strategy that encourages utilities to address the uncertainty in the most cost-effective manner.

Part I of this Note provides a general overview of electromagnetic fields and outlines their effect on the value of property situated adjacent to power lines. It then sets forth the "majority rule"—the rule of compensation employed by the majority of courts dealing with condemnation and property devaluation in the electric utility context. Additionally, Part I describes the public utilities' right of eminent domain and the rate-setting procedures currently employed by most public utility commissions that enable electric utilities to pass on to ratepayers the cost of condemnation awards.

Part II argues that under this regulatory system, efficiency will be achieved by pairing the majority rule with a regulatory structure that encourages utilities to determine and implement the most cost-

Wall St. J., Oct. 1, 1996, at C16 (noting that Con Edison proposed "opening up only about 1% of its electric revenues to competition in 1998" and that full phase-in will take 6 to 10 years).

⁶ See *infra* text accompanying notes 53-62.

⁷ To be eligible for increased rates, utilities must show that their expenditures are "reasonable." Charles F. Phillips, Jr., *The Regulation of Public Utilities* 258 (1993). For this reason, utilities are deterred from offering extraordinary condemnation payments or automatically agreeing to increase payments when challenged by homeowners.

effective strategy for dealing with the uncertainty surrounding electromagnetic fields. This strategy may take one of two forms: (1) the utility will continue to pay out consequential damages until some other agency resolves the uncertainty or (2) the utility will resolve the uncertainty itself. Either way, the utility must have an incentive to choose the most cost-effective option. To this end, Part II offers two regulatory responses that, if coupled with the majority rule, would encourage the utility to adopt the most cost-effective alternative. First, the state public utility commissions could undertake an ad hoc efficiency analysis to determine which option—continuing to pay out consequential damages or attempting to resolve the uncertainty—is most cost effective. Second, state public utility commissions could deny utilities recovery through rates for damage awards resulting from the effect of fear of electromagnetic fields. By forcing the utility to internalize these costs, the utility commissions would encourage efficient behavior.⁸ Implementation of either response, in conjunction with the majority rule, will encourage utilities to follow a cost-efficient approach toward the uncertainty regarding the effects of electromagnetic fields.

I

POWER LINES, ELECTROMAGNETIC FIELDS, AND PROPERTY VALUES: THE PROBLEM

Electric power is supplied to consumers via overhead distribution and transmission lines.⁹ Transmission lines carry electricity at high voltages, moving electricity from power generators located in rural areas to “urban load centers” where the power will be used.¹⁰ Substations near the load centers use power transformers to “step down” the voltage to a level that is safely useable for consumers.¹¹ The electric power is then sent to consumers over local distribution lines.¹²

A web of approximately 642,000 miles of power transmission lines and two million miles of power distribution lines covers the United States.¹³ Both types of power lines create and emit electro-

⁸ Some have argued that denial of cost recovery by public utility commissions will not affect utility behavior. For an outline of this argument and this Note's response, see *infra* Part II.B.2.c.

⁹ See Christopher A. Wilson, Note, *Power Line EMF: A Proposed State Utility Regulatory Response*, 10 *J. Contemp. Health L. & Pol'y* 469, 469 n.1 (1993).

¹⁰ See *id.*

¹¹ *Id.*

¹² See *id.*

¹³ See Sean T. Murray, Note, *Comparative Approaches to the Regulation of Electromagnetic Fields in the Workplace*, 5 *Transnat'l L. & Contemp. Probs.* 177, 178 (1995); see also Eileen N. Abt, *Coping with the Risk of Cancer in Children Living Near Power Lines*, 5

magnetic fields.¹⁴ To understand the issues surrounding these power lines, a brief technical overview of electromagnetic fields is necessary.

A. *Electromagnetic Fields: The Science and the Studies*

Electricity in motion creates electric and magnetic fields, referred to as electromagnetic fields (EMFs). Electric currents, and therefore EMFs, exist almost everywhere—around power lines, appliances, electric blankets, home and office wiring, computers, automobiles, cellular telephones—even the earth itself creates an electromagnetic field.¹⁵

Historically, researchers focused primarily on the health effects of the electric-field component of EMFs.¹⁶ Recently, however, researchers have come to believe that magnetic fields are potentially more dangerous.¹⁷ This is due in part to the fact that although electric fields may be blocked by trees, walls, and other physical objects, magnetic fields “penetrate most substances and are virtually impossible to shield.”¹⁸

A significant amount of controversy surrounds the health effects of EMFs. While some researchers believe exposure to EMFs leads to an increased risk of developing certain forms of cancer, others deny the existence of any negative effects associated with EMFs.¹⁹ Although several dozen epidemiological studies and numerous in vi-

Risk: Health, Safety & Env't 65, 67 (1994) (citing existence of 350,000 miles of transmission lines and two million miles of distribution lines); Thomas E. Riley & Steven L. Vollins, *Electromagnetic Field Property Damage Claims: Why Class Actions Are Not Appropriate*, *Inside Litig.*, Jan. 1994, at 23 (“There are enough overhead high-voltage transmission lines in the United States to stretch back and forth between New York and Los Angeles more than 200 times.”).

¹⁴ See Cindy Sage & Joseph G. Johns, *Electromagnetic Radiation: A Case for Relevance in Real Estate Transactions and Eminent Domain*, 20 *Real Est. L.J.* 193, 194 (1991).

¹⁵ See Kenneth R. Foster, *Weak Magnetic Fields: A Cancer Connection?*, in *Phantom Risk: Scientific Inference and the Law* 47, 47 (Kenneth R. Foster et al. eds., 1993); John Weiss, Note, *The Power Line Controversy: Legal Responses to Potential Electromagnetic Field Health Hazards*, 15 *Colum. J. Envtl. L.* 359, 361 (1990); Wilson, *supra* note 9, at 473.

¹⁶ See C. Michelle Depew, Comment, *Challenging the Fields: The Case for Electromagnetic Field Injury Tort Remedies Against Utilities*, 56 *U. Pitt. L. Rev.* 441, 446 (1994). The strongest electric fields are associated with power lines. See Foster, *supra* note 15, at 48-49 fig. 3.1. Power lines can emit electric fields 100 to 1000 times stronger than those generated within a foot of home appliances, and up to 10,000 times stronger than those extending a foot or more away from home appliances. See *id.*

¹⁷ See Depew, *supra* note 16, at 446.

¹⁸ *Id.* at 446-47.

¹⁹ See generally Foster, *supra* note 15, at 51-65, 75-76 (surveying opinions of researchers).

tro and animal studies have been undertaken,²⁰ no scientific consensus has yet emerged.

The epidemiological studies have been criticized on several fronts. Methodologically, researchers made assumptions regarding EMF exposure based on the subject's occupation or the proximity of the subject's home to power lines instead of measuring actual EMF exposure.²¹ Other criticisms target the interpretation of the evidence and the technical limitations of the various studies.²² Further, results from the studies vary widely and are often contradictory.²³ The conflicting evidence and the relative lack of sophistication of the studies thus far have led most scientists and commentators to agree that the evidence on the health effects of EMFs is generally inconclusive.²⁴

This uncertainty about the health effects of EMFs has impacted the real estate market. Absent conclusive evidence to the contrary, it remains possible that EMFs do in fact cause cancer. This possibility has resulted in decreased market value of homes situated near power

²⁰ For an exhaustive bibliography cataloguing the various review articles, consensus and group reports, and individual studies relating to the health effects of EMFs, see *id.* at 79-85.

²¹ See *id.* at 68-70. Critics contend that focusing solely on occupational title or power-line proximity fails to take into account EMFs generated by home appliances (i.e., microwaves, hair dryers, and electric blankets). See *id.*

²² See *id.* at 65-68.

²³ See *id.* at 51-65, 75-76 (outlining procedures and results of major studies on health effects of EMFs); see also Margo R. Stoffel, Comment, *Electromagnetic Fields and Cancer: A Legitimate Cause of Action or a Result of Media Influenced Fear?*, 21 *Ohio N.U. L. Rev.* 551, 551 (1994) ("The major problem is that although there are a number of studies linking adverse health effects to EMF[s], there are an equal number of studies that do exactly the opposite.").

²⁴ See Matthew G. Parisi, *Cancerphobia: The Fear and the Decision*, N.Y. St. B.J., Mar./Apr. 1995, at 30, 33 ("[A] causal relation is difficult to make due to the lack of consistency among published studies and the absence of an accepted biological explanation for such a relation."); Rufus C. Young, Jr. & Craig S. Gunther, *Electromagnetic Fields: Invisible Hazard?*, C930 ALI-ABA 189, 193 (1994), available in Westlaw, ALI-ABA database ("[E]xisting evidence is insufficient to provide a basis for concluding with certainty that adverse health effects will in fact result from exposure to EMF radiation . . ."); Sherry Young, *Regulatory and Judicial Responses to the Possibility of Biological Hazards from Electromagnetic Fields Generated by Power Lines*, 36 *Vill. L. Rev.* 129, 150 (1991) ("At present, the scientific evidence regarding the possibility of adverse biological effects from exposure to power-frequency fields . . . is inconclusive."); Lara M. Vukelic, Note, *A Prudent Regulatory Response to the Potential Health Hazards of Electromagnetic Fields*, 19 *Wm. & Mary Envtl. L. & Pol'y Rev.* 105, 108-113 (1994) (noting conflicting results of studies investigating health risks posed by EMFs); Wilson, *supra* note 9, at 474 ("[M]ost of the studies and experiments to date are inconclusive in determining whether there is a definite link between EMF[s] and certain diseases."); John Simpson, *\$10 Billion a Year Could End EMF Exposure*, Panel Told, *Pub. Util. Fort.*, May 15, 1993, at 45, 45-46 (reporting that scientists were years away from definitive answers to question of EMFs' effects).

lines.²⁵ For example, in one Illinois home market, homes located near power lines sold for at least 10% less than similar homes away from the lines.²⁶ A study completed by a real estate appraiser in Houston produced similar results: properties bordering transmission lines sold for 13% to 30% less than comparable properties in the same neighborhood but away from transmission lines.²⁷ Additionally, according to one real estate broker, while the average time a home remains on the market is 140 days, homes near power lines often remain on the market for an average of one year.²⁸

If this loss in property value is linked to the public's fear of EMFs, the following questions arise: Is compensation for the public's fear of EMFs warranted? Will requiring such compensation encourage utilities to make cost-efficient decisions regarding the uncertainty surrounding the health effects of EMFs? Addressing these larger issues requires an understanding of the unique position of public utilities and some background on the approaches courts take when confronted with the compensation issue.

B. The Utility Model

Public utility companies are in a unique market position. As state-sanctioned monopolies, they have different rights and obligations than firms which operate in competitive markets. States require utilities, as common carriers, to provide safe and adequate service to all who apply, to serve all customers on equal terms, and to charge only a "just and reasonable" rate for service.²⁹ In consideration for these obligations, states allow utilities to operate free of competition. To safeguard against the tendency of monopolists to overcharge con-

²⁵ See generally Peter F. Colwell, *Power Lines and Land Value*, 5 J. Real Est. Res. 117, 126 (1990) (concluding that "proximity to a power line is associated with diminished selling prices"); Lita Furby et al., *Electric Power Transmission Lines, Property Values, and Compensation*, 27 J. Envtl. Mgmt. 69, 72-78 (1988) (reviewing empirical studies regarding effect of transmission lines on property values); Elizabeth Thomas & Jill Hanson Reinmuth, *EMFs: The Newest Real Estate Hobgoblin?*, Prob. & Prop., Nov./Dec. 1993, at 19, 20 ("Public fears of the potential health hazards of human exposure to EMFs generated by power lines frequently affect the marketability of property near power lines."); Jay Romano, *Warning to Sellers: Let the Buyer Be Aware*, N.Y. Times, Sept. 1, 1996, § 9, at 1 (noting that power lines "greatly affect real estate values").

²⁶ See Sharon Tomecek, *EMFs: Charged with Controversy*, Real Est. Today, Nov./Dec. 1992, at 18, 20 (reporting experiences of Illinois real estate broker).

²⁷ See Alix M. Freedman, *Power Lines Short Circuit Sales, Homeowners Claim*, Wall St. J., Dec. 8, 1993, at B1 (reporting appraiser's 1993 study). Although the unsightliness of the power line and loss of view may account for some of this decline in value, fear of EMFs emanating from the power lines also has an effect. See Furby et al., *supra* note 25, at 71 (listing fear of adverse health effects as one reason individuals may pay less for property).

²⁸ See Tomecek, *supra* note 26, at 20 (citing broker's estimation).

²⁹ See Phillips, *supra* note 7, at 120.

sumers, however, utilities must submit to price regulation by the public utility commission. Further, utilities are granted the right of eminent domain.³⁰ The two distinguishing characteristics of public utilities most relevant to this Note are their right of eminent domain and the rate-setting procedures utilized by public utility commissions in determining a “just and reasonable” rate for service.

1. *Public Utilities’ Right of Eminent Domain*

Most states grant public utilities the right of eminent domain, thereby allowing them to condemn private property “when necessary to the proper conduct of their business.”³¹ Consequently, electric utilities are able to take land for power-line sitings³² so long as they pay “just compensation” to the aggrieved landowners.³³ Just compensation includes compensation for direct damages (the cost of the land taken) as well as consequential damages (the damage to the remaining property).³⁴ Direct damages are measured by the “fair market value”³⁵ of the taken land; damage to the remaining property usually is measured by the depreciation in value of that property as a result of

³⁰ See *id.* at 119-20.

³¹ *Id.* at 120. The power of eminent domain is usually reserved to the government. Nevertheless, state legislatures have conferred this power upon utilities to enhance their ability to acquire land and thus to provide better and cheaper service to their customers. See *id.*

³² See, e.g., Kan. Stat. Ann. § 12-895 (1991) (authorizing condemnation of property for electric power lines); N.C. Gen. Stat. § 40A-3 (1984) (same).

³³ See Peggi A. Whitmore, Note, Property Owners in Condemnation Actions May Receive Compensation for Diminution in Value to Their Property Caused by Public Perception: *City of Santa Fe v. Komis*, 24 N.M. L. Rev. 535, 536 (1994) (“The Fifth Amendment of the U.S. Constitution . . . provide[s] for ‘just compensation’ for those whose private property is taken for public use.”).

³⁴ See *id.* (“An obvious taking occurs when the Government condemns private property for its own use, but a taking also occurs when a condemnation case causes a significant diminution in the value of neighboring land.” (citing *Pennsylvania Coal Co. v. Mahon*, 260 U.S. 393, 413 (1922))).

Although there is no set formula to determine whether a taking has occurred, courts generally consider “the character of the governmental action including economic impact—particularly the extent to which the action substantially interferes with property owners’ ‘reasonable investment-backed expectations.’” Linda J. Orel, *Perceived Risks of EMFs and Landowner Compensation*, 6 Risk: Health, Safety & Env’t 79, 81 (1995) (citing *Penn Cent. Transp. Co. v. New York City*, 438 U.S. 104, 120 (1978)). A question may exist of whether diminution in value of land is a taking. The case law relevant to this Note assumes that such diminution in value constitutes a taking; therefore, this Note will proceed under the same assumption.

³⁵ “Fair market value” is defined as “the amount of money which, as of the date of valuation, an informed and knowledgeable purchaser willing, but not obligated, to buy property would pay to an informed and knowledgeable owner willing, but not obliged, to sell it . . . [taking into consideration] all uses for which the land is suited and might be applied.” Julius L. Sackman, 4 *Nichols On Eminent Domain*, § 12.02[1], at 12-75 (rev. 3d ed. 1996) (footnote omitted).

the taking.³⁶ Thus, when an electric utility condemns land, it pays not only for the land actually used for the power line but also for the reduction in value to the remaining land.³⁷

This latter category of damages has been the subject of numerous disputes since the proliferation of studies on the effects of EMFs. Property owners have claimed that the land surrounding their condemned land has been devalued as a result of the uncertainty about the effects of EMFs.³⁸ Because prospective buyers would be less likely to purchase the property, and the landowners would therefore receive less for the property than they would have prior to the condemnation, the landowners have expected the utility to compensate them for this diminution in property value.³⁹ When utilities have refused to compensate for this devaluation, the landowners have turned to the courts to challenge the condemnation award.

2. *Condemnation Actions and the Judicial Approach to Damages Resulting from the Public's Fear of EMFs*

In the past, courts have applied one of three rules to handle disputes regarding consequential damages resulting from the public's fear of EMFs.⁴⁰ These three rules, referred to as the "majority," "minority," and "intermediate" rules, are as follows: The majority rule compensates landowners for loss of value due to public fear—regardless of the reasonableness of the fear—if the plaintiff demonstrates that such fear reduced the property's value.⁴¹ The minority rule holds

³⁶ See 4A id. § 14.02[1].

³⁷ Loss of view, loss of aesthetics, and loss of land use often form the basis for consequential damages. See, e.g., *La Plata Elec. Ass'n v. Cummins*, 728 P.2d 696, 700 (Colo. 1986) (en banc) (awarding landowner compensation for diminution of property value resulting from unsightliness of power line); *Central Ill. Pub. Serv. Co. v. Westervelt*, 367 N.E.2d 661, 663 (Ill. 1977) (deeming unsightliness of power line relevant in determining damages).

³⁸ See, e.g., *Criscuola v. Power Auth.*, 621 N.E.2d 1195, 1195 (N.Y. 1993) (plaintiffs claimed that "public's perception of a health risk from exposure to electromagnetic emissions from power lines negatively impact[ed] upon the market value of their property").

³⁹ See, e.g., *Ryan v. Kansas Power & Light Co.*, 815 P.2d 528, 531-32 (Kan. 1991) (upholding recovery for loss in property value resulting from public's fear of EMFs); *Criscuola*, 621 N.E.2d at 1195 (same).

⁴⁰ This Part will discuss cases arising in the direct-condemnation context. Plaintiffs also have asserted claims for "inverse condemnation," which occurs when the proximity of a power line decreases property values although none of the plaintiff's property is physically taken for the erection of the power line. A full discussion of such claims is outside the scope of this Note.

⁴¹ See, e.g., *Ryan*, 815 P.2d at 532 (applying majority rule and affirming jury award that included compensation for reduction in property value resulting from public's fear). The two federal appellate courts that have considered the issue adhere to the majority rule. Additionally, of approximately 10 lower jurisdictions that have dealt with this issue, 7 of them adhere to the majority rule. See *infra* note 44.

that a "fear in the marketplace" is too speculative to justify damages and awards damages only where there is some traditional decline in value, such as loss of aesthetics or loss of use.⁴² The intermediate rule allows recovery if the fear is reasonable and affects the value of the property.⁴³

As its name suggests, a majority of courts follow the first rule and find that the impact of public fear on market value is compensable, regardless of the reasonableness of the fear.⁴⁴ This is the best rule because, in the current situation, the reasonableness of the fear should

⁴² See, e.g., *Alabama Power Co. v. Keystone Lime Co.*, 67 So. 833, 837 (Ala. 1914) (denying landowner's claim for compensation because the law "cannot allow any compensation on account of any claimed depreciation of such remaining land which is due to the mere fears of some of the people"). The minority rule was last applied in 1962, before the controversy over EMFs began. See *Central Ill. Light Co. v. Nierstheimer*, 185 N.E.2d 841 (Ill. 1962). With the progression of scientific knowledge and the proliferation of studies on the effects of power-line-frequency EMFs, it is doubtful that courts in jurisdictions previously applying the minority rule would continue to do so. In fact, Florida recently abandoned the minority rule in favor of the majority position. See *Florida Power & Light Co. v. Jennings*, 518 So. 2d 895, 899 (Fla. 1987). Accordingly, the minority rule does not merit significant discussion.

⁴³ See, e.g., *Dunlap v. Loup River Pub. Power Dist.*, 284 N.W. 742, 745 (Neb. 1939) (holding that if fear was "reasonable, not speculative [or] ill-defined," the resulting property devaluation would be compensable). The intermediate rule was applied most recently in 1989. The jurisdiction applying it at that time, however, has since adopted the majority rule. See *Criscuola*, 621 N.E.2d at 1196-97. Prior to its application in 1989, the intermediate rule was articulated in *Willsey v. Kansas City Power & Light*, 631 P.2d 268 (Kan. 1981). However, there is some question of whether the *Willsey* court indeed adopted the intermediate rule. See *Ryan*, 815 P.2d at 533 ("[T]he Court of Appeals [in *Willsey*] found admission of testimony concerning fear in the marketplace was proper without definitively deciding whether it was adopting the intermediate rule or the [majority] rule."). Nonetheless, this jurisdiction recently explicitly adopted the majority rule. See *id.* at 534-35. At best, the intermediate rule's status as a rule governing compensation is uncertain.

In addition to the questionable status of this rule, there are independent reasons to reject the intermediate rule and its reasonableness requirement as a rule governing compensation. See *infra* notes 45-47 and accompanying text.

⁴⁴ See, e.g., *United States ex rel. T.V.A. v. Easement & Right of Way*, 405 F.2d 305, 309 (6th Cir. 1968) (noting that public fear of high voltage lines may offset market value and should be compensable); *United States ex rel. T.V.A. v. Robertson*, 354 F.2d 877, 881 (5th Cir. 1966) (finding it proper to consider diminution of value resulting from public's fear of power lines); *Selective Resources v. Superior Court*, 700 P.2d 849, 852 (Ariz. Ct. App. 1984) (determining that evidence of alleged health hazards was highly relevant to assessing damages); *San Diego Gas & Elec. Co. v. Daley*, 253 Cal. Rptr. 144, 151-52 (Ct. App. 1988) (finding just compensation could include damages associated with public fear of EMFs); *Ryan*, 815 P.2d at 534-35 (holding evidence of fear in marketplace admissible on question of decline in property value); *Jennings*, 518 So. 2d at 898 ("[T]he impact of public fear on the market value of the property is admissible without independent proof of the reasonableness of the fear."); *Louisiana Power & Light Co. v. Mobley*, 482 So. 2d 706, 714 (La. Ct. App. 1985) ("[F]ear [of power-line effects] is certainly a factor which may be considered in fixing damages."); *Criscuola*, 621 N.E.2d at 1196 (holding that landowners could recover based on public's fear of health risks, regardless of whether fear was reasonable); *Basin Elec. Power Coop., Inc. v. Cutler*, 217 N.W.2d 798, 800 (S.D. 1974) (stating that witnesses may testify to conjectural damages such as danger of fire from high voltage power lines).

not be a factor in assessing damages. A reasonableness requirement forces the court to determine whether the current scientific data is sufficient to establish a link between EMFs and cancer⁴⁵—a judgment the scientific community is unable to make at this time.⁴⁶ Absent scientific consensus, courts are unable and ill-equipped to make a reasonableness determination and therefore are not in a position to condition recovery on the reasonableness of the public's fear.⁴⁷

On the other hand, courts *are* able to determine the market response to the uncertainty regarding the risks associated with living near power lines. As detailed in Part I.A, the unknown, potentially dangerous effects of EMFs translate into lowered property values for homes near power lines.⁴⁸ This is an empirically verifiable and legitimate response to the uncertainty and, therefore, is an effect of the condemnation action that should be recognized by the courts and compensated.⁴⁹ The majority rule, by removing the reasonableness requirement, compensates for this loss resulting from the market's response to uncertainty.

⁴⁵ See Parisi, *supra* note 24, at 36 (“A reasonableness requirement subjects the trier of fact to a scientific and medical battle between parties relying on inconclusive studies being undertaken in an attempt to determine whether there is a causal connection between electromagnetic field exposure and disease.”).

⁴⁶ See *supra* notes 19-24.

⁴⁷ Indeed, it is precisely the lack of a definitive answer regarding the risk of living near power lines that fuels the public's fear and results in the decline in property value. By definition, then, in the current circumstances, the public's fear cannot be reasonable or unreasonable—it is simply a response to this uncertainty. The majority rule accounts for this by removing the reasonableness requirement altogether.

⁴⁸ For a detailed analysis of the effects of uncertainty on property values, see generally David Zachary Kaufman, Comment, *Efficient Compensation for Lost Market Value Due to Fear of Electric Transmission Lines*, 12 *Geo. Mason U. L. Rev.* 711, 732-34 (1990).

⁴⁹ We can look at other market examples to see the same effect in the face of uncertainty. For instance, insurance companies increase premiums to compensate for a particular kind of uncertainty called ambiguity. See W. Kip Viscusi, *The Risky Business of Insurance Pricing*, 7 *J. Risk & Uncertainty* 117, 118-20 (1993). When an insurance company faces this kind of uncertainty, it will increase the price of the policy to compensate for the additional risk. See Howard Kunreuther & Robin M. Hogarth, *How Does Ambiguity Affect Insurance Decisions?*, in *Contributions to Insurance Economics* 307, 321 (Georges Dionne ed., 1992) (“A principal conclusion emerging from surveys of actuaries and underwriters is that they will add an ambiguity premium in pricing a given risk whenever there is uncertainty regarding either the probability or losses.”). The effect of uncertainty is reflected in investment strategy as well. Investors demand high returns on risky investments. See Zvi Bodie et al., *Essentials of Investments* 114 (2d ed. 1995). The “risk premium” (the amount of expected return in excess of the amount that could be earned on risk-free securities) must be sufficiently high to justify the risk taken by the investor. See *id.* at 113-14. In other words, investors require compensation for uncertainty about the actual rate of return in the form of higher expected returns. The real estate market, by requiring some form of compensation to face the uncertainty associated with the health effects of EMFs, is acting just as any other market does in the face of uncertainty.

Application of the majority rule requires the utility to fully compensate the property owner for damages caused by the condemnation. As the following discussion demonstrates, however, it ultimately achieves only a transfer of wealth from electricity consumers to the affected landowner. This is a result of the cost-of-service regulatory scheme and the rate-setting procedures employed by public utility commissions.

3. *Public Utilities' Rate-Setting Procedures*

Absent rate regulation, utility companies would be able to exact "monopoly prices" for their services.⁵⁰ Moreover, as electricity is considered a "necessity," consumer demand is relatively inelastic. That is, regardless of the good's price, consumers will demand approximately the same amount.⁵¹ Therefore, without rate regulation, the utility could charge relatively high prices without having to endure a corresponding reduction in demand. Consumers would then be forced to pay the monopoly price for electricity or have no electricity at all.

To guard against potential exploitation of this monopoly status, states require that utilities submit to price regulation by the public utility commission.⁵² This process, referred to as "cost-of-service ratemaking," requires the public utility commission to set a "just and reasonable" rate for service. To determine the "just and reasonable" rate that the utility may charge, the public utility commission follows a uniform procedure. First, it determines the utility's "cost of service" for a particular year.⁵³ It selects a recent representative year and computes the utility's total cost of service.⁵⁴ Included in this total cost are

⁵⁰ Utilities are generally not subject to competition within their regions because the government regulates entry to the industry. When a utility is granted entry, it becomes a state-sanctioned monopoly, and the state protects the utility from competition. A monopolist would normally have the ability to set prices higher than it would if it were subject to competition. See Thomas D. Morgan, *Economic Regulation of Business* 213 (1976). Rate regulation purports to combat this possibility by attempting to set prices at a level close to those that would be realized in a competitive marketplace. See *id.*

⁵¹ See Robert S. Pindyck & Daniel L. Rubinfeld, *Microeconomics* 109 (3d ed. 1995) ("When demand is inelastic . . . the quantity demanded is relatively unresponsive to changes in price.").

⁵² All 50 states and the District of Columbia have public utility commissions with jurisdiction over electric utilities. See Phillips, *supra* note 7, at 133. Although their authority differs from jurisdiction to jurisdiction, most commissions have broad legislative grants of power, allowing for significant discretion. See *id.* at 147. Most importantly, the majority of commissions have the authority "to require prior authorization of rate changes, to suspend proposed rate changes, to prescribe interim rates and to initiate rate investigations." *Id.* at 136.

⁵³ See Richard A. Posner, *An Economic Analysis of Law* 347 (4th ed. 1992).

⁵⁴ See *id.*

“operating costs,” which include the cost of condemnation awards.⁵⁵ To this total cost of providing service is added a “reasonable return on invested capital.”⁵⁶ The cost-of-service amount plus the amount of return equals the firm’s “revenue requirements”—the total amount the company will be allowed to make for that year.⁵⁷

Condemnation awards, as operating costs, are recovered by utilities through rate increases. In effect, what the utility pays the landowner to compensate for the decrease in value of her property, it later recoups from consumers via higher rates. Thus, condemnation awards are effectively a transfer of wealth: from electricity consumers to aggrieved landowners.

The utility’s ability to pass on 100% of the cost of damage awards to consumers is unique. In a competitive market an increase in cost will be borne by the producer, except to the extent it can pass on some of the cost to the consumer.⁵⁸ Consider the effect of imposing a specific tax of one dollar per unit sold. Each unit thus effectively costs one dollar more to produce, shifting the entire supply curve upward by one dollar. This shift will cause the market price to rise until it reaches the point where supply and demand become equal. Where demand is elastic, the increase in price will always be less than the increase in cost.⁵⁹ In the electric power market, however, where supply is elastic and demand is relatively inelastic, consumers will bear the majority of an increase in cost.⁶⁰ Only a relatively large increase

⁵⁵ See Lisa M. Bogardus, *Recovery and Allocation of Electromagnetic Field Mitigation Costs in Electric Utility Rates*, 62 *Fordham L. Rev.* 1705, 1725 (1994). “Operating costs” also include the legal fees incurred defending and challenging condemnation awards. See *id.*

⁵⁶ [A “reasonable return” is] determined by multiplying the company’s rate base—an estimate of the value of the capital assets used by the company to render the regulated service—by the company’s reasonable rate of return. The latter is a weighted average of the long-term interest rate plus the rate of return to the equity shareholders that the agency considers appropriate in light of the risk of the investment and the rate of return enjoyed by shareholders in comparable firms.

Posner, *supra* note 53, at 347.

⁵⁷ See *id.* This entire process is represented by the following equation: $R = O + (V - D)r$, where R is the total revenue the utility may earn, O represents operating costs, V is the value of tangible and intangible property, D is accrued depreciation on tangible and reproducible property, and r is the allowed rate of return. See Phillips, *supra* note 7, at 177.

⁵⁸ See Pindyck & Rubinfeld, *supra* note 51, at 305 (noting share of cost borne by consumers “depends on the shapes of the supply and demand curves, and in particular on the relative elasticities of supply and demand”).

⁵⁹ See Richard Craswell, *Passing on the Costs of Legal Rules: Efficiency and Distribution in Buyer-Seller Relationships*, 43 *Stan. L. Rev.* 361, 366-67 (1991) (examining the relationship between elasticity of demand and ability to pass on costs).

⁶⁰ See *id.*

in price would significantly affect demand.⁶¹ Thus, the producer is able to increase price without a significant decrease in demand and will elect to do so, thereby passing on most of the increased costs to consumers.

This would be the result if electric utilities were granted monopoly status and allowed to set rates according to market forces. To safeguard against such abuse of power, the regulatory process attempts to simulate a competitive market. However, because rates are based on the amount needed to adequately cover operating costs and ensure a reasonable rate of return, utilities are able to pass on to the consumer all of the increased costs associated with consequential damages. Therefore, no "sharing" of costs occurs under this system; the utility is able to recover the entire amount of damages paid to landowners.⁶²

In summary, EMFs emanate from power transmission and distribution lines. Although the scientific evidence regarding the effect of EMFs is inconclusive, some studies suggest that exposure to EMFs may result in an increased risk of cancer. This uncertainty about the health effects of EMFs impacts landowners and utilities in the eminent domain context. When an electric utility condemns a strip of land to install a power line, it must pay just compensation to the landowner. Some landowners have successfully asserted that these condemnation awards should include compensation for the decrease in value of the remainder property due to the public's fear of EMFs. The rate-setting formulas used by public utility commissions ensure that the utility will recover, through rates, the cost of all condemnation awards paid out. Therefore, the utility has no incentive to minimize the costs associated with these condemnation awards. Part II explains the importance of efficiency and suggests two regulatory strategies that, when combined with the imposition of condemnation awards, will encourage the utility to make efficient decisions regarding this issue.

II EFFICIENCY PROPOSAL

The present regulatory system does not encourage utilities to act efficiently. Under the present system a utility is able to make inefficient decisions leading to increased costs—costs that are then reimbursed by the consumer. To ensure that consumers are not held captive to such abuse, the present regulatory system must be altered.

⁶¹ See *id.*

⁶² See Murray, *supra* note 13, at 183-84 (contrasting utility sector with private business sector regarding ability to pass on costs from EMF liability).

A. *Efficiency Ought to Matter*

In a competitive market consumers would be able to shop around for the lowest-cost electricity.⁶³ Electricity providers would need to minimize costs to remain competitive in such a market because consumers would purchase electricity from the supplier that offered the maximum benefits at the lowest cost.⁶⁴ The market thus provides the incentive for efficiency—the firms that can maximize benefits at the lowest cost are rewarded by high consumer demand. The desire to sell the product is sufficient to encourage the manufacturer to make efficient choices.

Regulation attempts to simulate, as closely as possible, the outcome that would be reached in a perfectly competitive market.⁶⁵ Because the outcome in a perfectly competitive market is by definition efficient, this is just another way of saying that regulators are striving for efficiency. Thus, although utilities are regulated monopolies, efficiency concerns remain important.⁶⁶ Efficiency is valuable in the public utility context for the same reasons it is lauded elsewhere—it maximizes benefits while minimizing costs.

Unfortunately, the current regulatory system is not an effective way to simulate competition and achieve efficient outcomes.⁶⁷ One reason for this is that public utility commissions are unable to access and internalize the vast amount of information necessary to make effi-

⁶³ "Cost" is not necessarily equivalent to retail price. The term "cost" encompasses all of the costs associated with a product that would be borne by the consumer. For an example of the kinds of considerations that enter into the calculation of full cost, see Mark Geistfeld, *The Political Economy of Neocontractual Proposals for Products Liability Reform*, 72 *Tex. L. Rev.* 803, 809-10 (1994).

⁶⁴ This assumes that consumers are perfectly informed and can make accurate determinations regarding the full cost associated with the product.

⁶⁵ See Phillips, *supra* note 7, at 173 (noting that "regulation is a substitute for competition and should attempt to put the utility sector under the same restraints competition places on the industrial sector").

⁶⁶ In fact, efficiency concerns motivate the just compensation requirement underlying the system of eminent domain. We require the government, or in this case a quasi-public entity, to pay just compensation to ensure that private property is taken only when it is efficient to do so. If a utility could take land without compensating the landowner, that power would likely be abused. See Posner, *supra* note 53, at 58 ("[The requirement of just compensation] prevents the government from overusing the taking power. If there were no such requirement, the government would have an incentive to substitute land for other inputs that were socially cheaper but more costly to the government."); William A. Fischel & Perry Shapiro, *Takings, Insurance, and Michelman: Comments on Economic Interpretations of "Just Compensation" Law*, 17 *J. Legal Stud.* 269, 269-70 (1988) ("The compensation requirement thus serves the dual purpose of offering a substantial measure of protection to private entitlements, while disciplining the power of the state, which would otherwise overexpand unless made to pay for the resources that it consumes.").

⁶⁷ See Morgan, *supra* note 50, at 213 ("Realistically . . . regulation cannot reproduce the structure of incentives for quality, efficiency, or price which are created by competition.").

cient decisions.⁶⁸ Additionally, because public utility commissions generally allow utilities to recoup all “reasonable” costs,⁶⁹ utilities are not under the same kinds of constraints as firms subject to competition.⁷⁰

One function of this latter feature of utility regulation was explored in Part I.B.3. Utilities can pass on costs to consumers, and therefore they lack sufficient incentive to minimize their costs.⁷¹ In the EMF scenario, this means that utility companies presently do not have to internalize the effect of the uncertainty surrounding EMFs because the consequential damages paid out to landowners represent operating costs and can be recouped by the utility through increased rates.⁷² The current regulatory approach to the uncertainty surrounding the effects of EMFs therefore does not encourage efficiency. As a result, consumers may be shouldering unnecessary and inflated costs. To protect the consumer from such unnecessary costs, the regulatory procedures must be altered in a way that encourages utilities to minimize the costs associated with the uncertainty surrounding the effects of EMFs.

B. Proposal: Methods of Encouraging Efficiency

Two potential regulatory approaches address the result of uncertainty surrounding the effects of EMFs. Under one approach, the state public utility commissions would undertake the efficiency analysis and determine which option—continuing to pay out consequential damages or attempting to resolve the uncertainty—is the most cost effective. After making this determination, the commission would require the utility to pursue the most cost-effective option. The other

⁶⁸ See Lee Loevinger, *Regulation and Competition as Alternatives*, 11 *Antitrust Bull.* 101, 125 (1966) (“The difficulty is that no regulatory agency can acquire or utilize effectively the range of data which influence a competitive market.”).

⁶⁹ See Phillips, *supra* note 7, at 258.

⁷⁰ Although public utility commissions attempt to simulate the constraints of competition by requiring that expenditures be reasonable and necessary, see *id.*, most commentators agree that this system fails to reproduce adequately the competitive environment. See Morgan, *supra* note 50, at 213.

⁷¹ See Young, *supra* note 24, at 180 (noting that “utility has little incentive to dispute the amount of money it must pay for a right of way since that cost will simply be passed on to ratepayers”). Admittedly, once a new rate is set, the utility has an incentive to minimize costs for that year in order to achieve the highest allowable rate of return. Yet in contrast to the normal market situation where price determines demand, utilities need not be concerned with the amount rates will increase due to the damage awards. Consumers’ demand for electricity is inelastic—they will purchase it regardless of price. Thus, although the utility may have a short-term incentive to minimize costs, it does not face the same market constraints as other producers.

⁷² See Bogardus, *supra* note 55, at 1725 (noting that utilities can generally recover ancillary costs through increase of rates).

approach requires the state public utility commissions to deny utilities recovery through rates for EMF damage awards. The effect of the uncertainty would thus be borne by the utility company, encouraging the utility to determine the most cost-effective way of addressing it.⁷³

1. Analysis and Resolution by the Public Utility Commission

As noted above, one way to achieve efficiency is to require the state public utility commission to determine the most cost-effective way to deal with the uncertainty surrounding EMFs. If the commission concludes that the most efficient strategy is to continue to pay out damages until some other body resolves the causation question, it need not require any action from utilities. If the commission instead determines that the most cost-effective option is to resolve the causation question, it can mandate an appropriate amount of money to be spent on research, adjusting rates accordingly.

Several difficulties undermine the feasibility of this option. The success of this strategy depends on the commission's ability to make an efficiency analysis and to mandate funding if the commission determines it is cost justified. Addressing the efficiency question requires a significant amount of information about the costs involved in studying the problem, as well as the costs involved with continuing to pay out consequential damages.⁷⁴ Although public utility commissions deal regularly with electric utilities, they may not be in the best position to acquire this information. Furthermore, even with access to such information, they might not have the resources to undertake such an endeavor.⁷⁵ In addition, because each public utility commission is limited by its statutorily granted powers, all commissions may not have the power to address the problem in this manner.

Historically, utility commissions that have addressed the uncertainty about EMFs have not followed this approach. Some placed moratoriums on construction of new power lines, enforced EMF limits on new constructions, or suggested a policy of "prudent avoidance."⁷⁶

⁷³ It has been suggested that denial of cost recovery by public utility commissions will not affect behavior. For an outline of this argument and this Note's response, see *infra* Part II.B.2.c.

⁷⁴ For an in-depth consideration of this analysis, see *infra* text accompanying notes 94-100.

⁷⁵ Utility commissions already have difficulty performing their current responsibilities. See Phillips, *supra* note 7, at 140. The regulatory process is time consuming and plagued with delays caused by the increasing volume and complexity of the work of the commissions, inadequate budgets, lack of defined standards and policies, ineffective personnel, and bureaucratic inertia. See *id.* at 879. Adding to the responsibilities of the commissions may only exacerbate these problems.

⁷⁶ See Bogardus, *supra* note 55, at 1711-19 (examining different approaches). "Prudent avoidance" is defined as an approach that "look[s] systematically for strategies which can

These actions responded to public concern about the health effects of EMFs but failed to address the problem of the decline in property value associated with the uncertainty.

The plausibility of this strategy turns on the power and efficacy of the state utility commission. Skepticism about the power of the commission, or its ability to appropriately conduct an efficiency analysis, suggests that the alternative of leaving the analysis to the utilities themselves is preferred.

2. *Analysis and Resolution by the Utility: Incentive for Efficiency Through Cost Internalization*

When setting rates, utility commissions habitually review the claimed operating costs submitted by the utility.⁷⁷ Utility commissions have the discretion to disallow recovery of an operating expense through rates.⁷⁸ If public utility commissions do not allow utilities to pass on to consumers the expenses resulting from the fear of EMFs, the utility will bear these expenses directly.⁷⁹ The utility will internal-

keep people out of 60 Hz fields arising from all sources but only adopt[s] those which look to be 'prudent' investments given their cost and our current level of scientific understanding about possible risks." *Id.* at 1712 (quoting Office of Technology Assessment, U.S. Congress, *Biological Effects of Power Frequency Electric and Magnetic Fields—Background Paper*, OTA-BP-E-53, at 77 (Washington, D.C., U.S. Gov't Printing Office, May 1989)).

Some commentators have criticized these approaches. A moratorium on construction appears to be an overreaction to inconclusive evidence. See Vukelic, *supra* note 24, at 115 ("[P]utting moratoria on the construction of new lines . . . is premature and overaggressive."). Since a relationship between amount of exposure and effect has not been confirmed by the research currently available, EMF strength limits would be arbitrary. See Young, *supra* note 24, at 182 ("[F]ield strength limits are basically worthless. . . . [I]f there are any hazards associated with exposure to E[M]F fields, there is no reason to believe that field strengths within the regulatory limits are any safer than stronger or weaker fields."). The same objection applies to prudent-avoidance strategies; until we have more information, we do not know what we should be prudently avoiding. See Murray, *supra* note 13, at 208-09 (summarizing arguments against prudent-avoidance approach). Most commentators agree, however, that this strategy is the lesser of the possible evils. See, e.g., Vukelic, *supra* note 24, at 118 (determining that "prudent avoidance approach is the most logical response to the EMF problem, given current uncertainties").

⁷⁷ See Bogardus, *supra* note 55, at 1722 (noting that these expenses are reviewed because utilities "pass these expenses directly on to ratepayers").

⁷⁸ See Phillips, *supra* note 7, at 258 (noting that utilities cannot "spend freely and expect all expenditures to be included as allowable operating expenses"). Most public utility commissions have statutorily granted discretion in ascertaining which expenses may be included as operating costs. See, e.g., *Tex. Rev. Civ. Stat. Ann. art. 1446c, § 41(c)(3)* (West 1980) (authorizing public utility commission to "promulgate reasonable rules and regulations with respect to the allowance or disallowance of certain expenses for ratemaking purposes").

⁷⁹ See Phillips, *supra* note 7, at 260 (noting that public utility commission may "refus[e] to permit a utility to charge a particular expense to operating expenses. In so doing, the expense is charged to investors.").

ize the costs, giving it an incentive to engage in an efficiency analysis and minimize costs.⁸⁰

At least one public utility commission has recognized that requiring a utility to bear costs provided an incentive to act efficiently. In *In re City Gas Co.*,⁸¹ the Florida Public Service Commission refused to consider \$53,856 of overtime pay as operating expenses because the Commission did not believe that the company was trying to minimize its costs.⁸² The Commission stated: "Regulated utilities should be encouraged to control cost. If the Company does not have the incentive to control cost, then the Commission should provide the incentive."⁸³ This is exactly what requiring internalization of EMF-related damage awards would do.⁸⁴

Under this regulatory strategy, the incentive may flow through one of two channels: through EMF tort damages or through consequential damages after condemnation.⁸⁵ As the following discussion will demonstrate, tort law has not provided landowners with an avenue for recovery; thus, the incentive most likely would come from the condemnation cases involving consequential damages for lost property value due to the public's fear of EMFs.

a. Recovery Through Tort for EMF-Related Damages. To date, no plaintiff has recovered under the tort doctrines of nuisance, trespass, or products liability for EMF-related damages.⁸⁶ Alleged damages from EMFs do not fit into the doctrines as presently applied.⁸⁷

⁸⁰ For the opposing view that cost internalization will not affect utility behavior, and this Note's response, see *infra* Part II.B.2.c.

⁸¹ 120 Pub. Util. Rep. 4th (PUR) 319 (Fla. Pub. Serv. Comm'n 1991).

⁸² See *id.* at 328.

⁸³ *Id.*

⁸⁴ A policy adopted by many public utility commissions also reflects this strategy. This policy requires utility companies and consumers to "share" the expense of bringing rate cases before the commissions as an incentive to minimize the time and expense dedicated to such cases. See, e.g., *id.* at 325-26 ("Commission policy is to remove unamortized rate case expense from working capital thus reducing rate base and the allowable return on that rate base. The objective of this policy is to effect a sharing of costs between ratepayers and stockholders This sharing of costs is supposed to provide an incentive for the Company to minimize rate case expenses." (citations omitted)).

⁸⁵ Under this system, the utility will be unable to recover the cost of EMF-related damages. Direct damages from condemnation, as well as consequential damages that do not involve damages from EMFs, will continue to be classified as operating costs and will be eligible for recovery through increased rates.

⁸⁶ For a review of tort theories that may be applicable in the EMF context, see Roy A. Torres, Causes of Action for EMF Harm, 5 *Fordham Envtl. L.J.* 403 (1994); Depew, *supra* note 16, at 449-56; Philip S. McCune, Note, The Power Line Health Controversy: Legal Problems and Proposals for Reform, 24 *U. Mich. J.L. Ref.* 429, 444-58 (1991).

⁸⁷ See Depew, *supra* note 16, at 482 ("Traditional tort causes of action are not well suited to the EMF context.").

For instance, in order for a landowner to prevail on a nuisance claim, she must show that the defendant's actions have interfered with her right to use and enjoy her property.⁸⁸ A landowner may experience difficulties establishing a prima facie case because EMFs do not, at least in the traditional sense, interfere with the use and enjoyment of property. Additionally, difficulties may arise in proving that the defendant utility acted unreasonably.⁸⁹ For a trespass claim, the plaintiff must show "an actionable invasion of land."⁹⁰ Although courts have upheld an action for trespass when a defendant caused particles or gasses to enter the plaintiff's property,⁹¹ courts may not be willing to extend trespass to include EMFs. The fact that most jurisdictions hold that, until electricity passes through the customer's meter, it is a service and not a product poses a major obstacle for a products liability cause of action.⁹² Thus, electricity is not a product when it surges through power lines and emits EMFs. Consequently, strict products liability claims are inapplicable.⁹³

If property owners lacked an alternate cause of action, an expansion of tort doctrine might be necessary to compensate landowners and provide utilities with an incentive to minimize costs. However, the just compensation requirement affords landowners a legitimate and recognized means of recovery and satisfies the efficiency objective.

b. Eminent Domain Law: The Established Alternative. If public utility commissions require utilities to internalize the cost of EMF-related consequential damages in condemnation actions, the utilities will have an incentive to minimize these costs. These costs are a result of the uncertainty surrounding the health effects of EMFs.⁹⁴ To determine the most efficient course of action, the utility must weigh the cost of resolving this uncertainty⁹⁵ against the cost of continuing to pay out damages resulting from the uncertainty.

⁸⁸ See Restatement (Second) of Torts § 822 (1977).

⁸⁹ See Depew, *supra* note 16, at 455.

⁹⁰ *Martin v. Reynolds Metals Co.*, 342 P.2d 790, 792 (Or. 1959).

⁹¹ See *id.*

⁹² See Mark S. Atterberry, Comment, *The Strict Liability of Power Companies for Cancer Caused by Electromagnetic Fields*, 19 S. Ill. U. L.J. 359, 363 (1995) (noting that courts consider electricity a product only when utility has relinquished exclusive control).

⁹³ In addition, strict products liability actions are not available when the only injury claimed is economic loss. See *East River Steamship Corp. v. Transamerica Delaval*, 476 U.S. 858, 876 (1986) (applying this principle in admiralty context).

⁹⁴ See *supra* Part I.B.

⁹⁵ This proposal assumes that public utility commissions will require utility companies to internalize the cost of studies to determine the effects of EMFs.

This analysis necessarily includes a consideration of many factors that contribute to the cost of either alternative. For instance, the cost of accepting the uncertainty includes not only the actual damage awards, but also the legal fees involved in defending the cases. These litigation expenses can be staggering. One source reports that EMF-related legal expenses cost the New York Power Authority approximately \$1.5 million in fees and expert witness expenses in a single trial.⁹⁶ If utilities elect not to address the causation question themselves, they will continue to incur these costs until some other agency resolves the issue.⁹⁷

On the other hand, resolving the causation question will most likely necessitate a large-scale research project, requiring several years and large amounts of funding. As between the utility, the landowner, and the consumer, however, the utility is clearly in the best position to conduct, or at least fund, the appropriate research. Furthermore, the actual cost to any one utility company could be minimized by a joint study. If each electric utility company contributed to a research fund, perhaps in proportion to its market share, a vast sum of money could be generated. This money could fund a large-scale research project that would be more cost effective than independent research performed by the individual companies. Although most utilities are already spending money on EMF research programs,⁹⁸ the most effective research would result from a coordinated national program. If utilities are forced to absorb the costs associated with the fear of EMFs, they may be more likely to participate in a collective effort to

⁹⁶ See Michael Freeman, *The Courts and Electromagnetic Fields*, *Pub. Util. Fort.*, July 19, 1990, at 20, 21.

⁹⁷ This may take 10 to 15 years. See *id.* at 22. If research reveals that EMFs cause no adverse health effects, a rational market will respond and property will no longer lose value due to fear of EMFs. On the other hand, if research establishes that EMFs are detrimental to one's health, then the utility potentially will be liable for significant property and personal injury damages. The burden of shouldering such costs might force the utility out of the industry. As electricity is a necessary and socially useful product, it would be unwise to force utilities to leave the industry. Therefore, once the uncertainty is resolved, the utility should be allowed to pass on costs associated with EMFs.

If utilities become aware of any health effects associated with EMFs, they would be required to exercise reasonable care to protect the public from these effects. Taking reasonable care may require shielding or burying the wires, or reconfiguring the distribution of power to minimize EMFs. These measures require significant expenditures. The increased costs that may be associated with providing safe electricity are equivalent to the "safety premium" consumers pay for airbags in cars, shields on power saws, etc. Expecting the consumers to pay for such safety features, just as they do for other products, is justifiable.

⁹⁸ See Bogardus, *supra* note 55, at 1726 ("Almost every utility spends some money on EMF research, both through membership in either electric trade organizations, such as the Edison Electric Institute (EEI) or the Electric Power Research Institute (EPRI), or as part of its own independent research.").

resolve the uncertainty.⁹⁹ At the least, utilities will have an incentive to determine and implement the most cost-efficient strategy.

The question of which alternative is most cost effective—accepting or resolving the uncertainty—is an empirical matter. A utility may find that the cost of research outweighs the costs associated with “fear-of-EMF” property damages. In this case, the utility would choose to continue paying consequential damages until some other agency resolves the causation question. Conversely, if the value of resolving the uncertainty outweighs the cost of acquiring the information, the most cost-effective strategy would be for the utility to undertake a research program designed to resolve the uncertainty.¹⁰⁰

In summary, not allowing utilities to pass on to consumers the cost of EMF-related damages requires the utility to recognize the effect of the uncertainty. A self-interested utility would choose to minimize the cost associated with this effect—a choice that requires a determination of the most cost-efficient strategy to deal with the uncertainty. The utility may choose to continue to pay out damages, or it may decide to fund research to resolve the uncertainty. In either case, the utility would be making this decision based on efficiency considerations.

Each of these regulatory strategies—having the public utility commission make an efficiency analysis or requiring cost internalization by the utilities—will encourage efficiency. The current regulatory

⁹⁹ This analysis may present a free-rider problem. See Susan Rose-Ackerman, *Market-Share Allocations in Tort Law: Strengths and Weaknesses*, 19 *J. Legal Stud.* 739, 745 (1990) (discussing nature of free-rider problem). All electric companies use the same technology to produce and transmit electricity, and all power lines produce the same kind of EMFs. Thus, a company may choose not to fund research, believing that the other companies will address the problem. The “free-rider” company would reap the benefits of the research without having to pay for them.

There is some evidence within the industry that this would not be the response. Almost every utility devotes some funding to EMF research, see Bogardus, *supra* note 55, at 1726, suggesting that a collective project is possible. In fact, many utilities have engaged in just this kind of cooperative endeavor—the largest percentage of funding for EMF research has come from the Electric Power Research Institute, an organization funded solely by utilities. See Weiss, *supra* note 15, at 383.

¹⁰⁰ If the utility produces research that disproves the existence of harmful effects from EMFs, but the market does not respond by restoring property values to their previous levels, it means that there is something unsatisfactory about the research results. When the market is persuaded by the evidence, land values will go back up. Thus, we must assume that although “science cannot prove a negative,” at some point the number and quality of the studies will assure the scientific community and the public that no significant risk exists.

In a normal market situation, manufacturers might have an incentive to hide research results suggesting that EMFs are harmful. The structure outlined above, however, provides no such incentive to utilities. When the uncertainty is resolved, utilities should be eligible to pass EMF-related expenses on to consumers. Utilities, therefore, should have little interest, economically speaking, in the actual research results.

scheme, altered in one of these two ways, offers the best approach to compensation for lost market value due to the fear of EMFs.

c. A Response to Criticisms. One Supreme Court case has suggested that cost internalization will not affect a utility's total return on investment and, therefore, will not affect behavior. In *Duquesne Light Co. v. Barasch*,¹⁰¹ Chief Justice Rehnquist suggested that if certain assets were systematically excluded from the formulation of the rate base, the utility would become a riskier investment and the rate of return on investment would need to increase to attract future investors.¹⁰² Theoretically, the same result could follow from systematic exclusion of costs from the category of operating costs. Cost internalization, as the argument goes, would not affect behavior because exclusion of operating costs would necessitate an increased rate of return, and therefore total revenue would remain the same.

Although theoretically sound, this argument assumes perfect regulation—i.e., regulation that controls and accounts precisely for every variable. Regulation, however, is far from perfect.¹⁰³ Rate-setting procedures utilize information from the past and projections for the future to determine appropriate rates of return on investment.¹⁰⁴ Although the likelihood that all of the relevant information from the past will hold true in the future is minimal, public utility commissions tend to assume that past conditions will continue.¹⁰⁵ Thus, the information on which the rate of return is based is necessarily imprecise. As a result, a direct correlation does not exist between each cost disallowed and an increase in rate of return. Although it is conceivable

¹⁰¹ 488 U.S. 299 (1989).

¹⁰² See *id.* at 310-12, 310 n.7.

¹⁰³ See Conference, Harvard Electricity Policy Group: Regulatory Decisionmaking Reform, 8 Admin. L.J. Am. U. 789, 833 (1995) (quoting Hon. Stephen Breyer describing cost-of-service ratemaking as "a terrible system," and "a system that does not work perfectly"); see also Phillips, *supra* note 7, at 382 (noting that people "'familiar with the actual practice of American rate regulation need no reminder about the uncertain relationship between the supposed 'principles' of rate-of-return determination . . . and the considerations that actually lead commissions to allow whatever rates of return they do allow in specific cases. . . . [S]ome of the decisions lead one to suspect that the commissions have first reached a conclusion as to reasonable revenue requirements in terms of dollars per annum and then have proceeded to translate these requirements into whatever combination of a rate base and a percentage rate of return will be likely to pass muster with the appellate courts or with public sentiment.'" (first alteration in original) (quoting James C. Bonbright, *Principles of Public Utility Rates* 281 (1961))).

¹⁰⁴ See *supra* notes 53-57 and accompanying text.

¹⁰⁵ See, e.g., Morgan, *supra* note 50, at 214 ("[C]ommissions have been hesitant to make future forecasts of consumer demand, often preferring instead to assume that the test period demand conditions will hold in the immediate future." (quoting C.F. Phillips, *The Economics of Regulation* 136-37 (1969))).

that some increase in rate of return may be granted, the utility cannot be confident that it will in fact be compensated for all of its increased costs. Rate setting is an imprecise and unpredictable process, and utilities cannot rely on it alone to compensate for inefficient decisions. Thus, because the utilities are not guaranteed recovery through an increased rate of return for all disallowed costs, such disallowance is likely to have some effect on the utilities' behavior.

On the other hand, because courts generally do not isolate the precise amount of damages awarded for EMF-related claims, it is possible that such damages are *de minimis*. If such is the case, disallowing these costs would not serve as an adequate incentive for the utility to minimize these costs.

There is, however, some reason to believe that the costs associated with EMF damage awards and litigation are significant. One commentator reports that a New York utility spent "two million dollars on attorneys and expert witnesses fees in defending against 140 landowners who claimed \$117 million in property devaluation due to 'cancerphobia' associated with the lines."¹⁰⁶ Although utilities may generate upwards of \$700 million in net income each year,¹⁰⁷ fees and damage awards at this level should be significant enough to affect their behavior.¹⁰⁸

CONCLUSION

The uncertainty surrounding the health effects of EMFs results in a decrease in property value for land on which power lines are sited. A majority of courts allow landowners to recover for this diminution in property value. Although this appropriately compensates the landowner, it does not give the utility an incentive to address the issue underlying this decline in value—the uncertainty regarding the health effects of EMFs.

To encourage efficient behavior regarding this issue, the regulatory scheme must be altered in one of two ways. Either the public utility commission should perform its own efficiency analysis and require that the utility implement the most cost-effective strategy for dealing with the uncertainty, or the commission should not allow the

¹⁰⁶ Bogardus, *supra* note 55, at 1726.

¹⁰⁷ See Consolidated Edison Co., 1994 Annual Report 31 (1995) (reporting \$734 million in net profits).

¹⁰⁸ Notably, Con Edison believed that the threat of EMF-related damages was significant enough to be included in its annual report. See *id.* at 40 (noting that several scientific studies have shown that EMFs may present health risks, disclosing its status as defendant in several suits alleging property damage, and acknowledging that developments in legal or public policy doctrines may have adverse affects on company).

utility to pass on to consumers the cost of EMF litigation and damages. Both alternatives would encourage the utility to make a cost-benefit analysis and choose the most cost-effective option for dealing with the uncertainty surrounding the effects of EMFs. Either approach encourages the utility to minimize its costs, thereby protecting consumers from unnecessary rate increases.