BROADBAND OVER POWER LINES CRISSCROSSING THE NATION: RETHINKING CROSS-SUBSIDIZATION

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1. INTRODUCTION

On a damp suburban afternoon, neighborhood noises can be heard: children laughing, dogs barking, and cars passing. Buried in the soundtrack, an almost imperceptible buzz from the power lines originates from towering wood poles. In this neighborhood, one homeowner’s hope for a new residence away from power lines looming in the backyard where his or her children play may be another’s hope for connecting with the digital world.¹

In today’s digitally driven society, broadband matters² and “has the potential to transform the Internet—both what it offers and how it is used.”³ Defined as

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¹ In re Carrier Current Systems, including Broadband over Power Line Systems; Amendment of Part 15 regarding new requirements and measurement guidelines for Access Broadband over Power Line Systems, Notice of Proposed Rule Making, 19 F.C.C.R. 3335, 3368 (Feb. 12, 2004) [hereinafter Notice of Proposed Rule Making] (statement of Chairman Michael K. Powell stating that “[d]espite increasing access to broadband services, significant areas of the country still lack any type of broadband access or competition among broadband service providers.”); see also PATRICIA MOLONEY FIGLIOLA, CRS REPORT FOR CONGRESS, BROADBAND OVER POWERLINES: REGULATORY AND POLICY ISSUES 4 n.15 (2006), available at http://openocr.cdt.org/rpts/RL32421_20060804.pdf (terming the “gap between those who can effectively use new information and communication tools, such as the Internet, and those who cannot” as the “Digital Divide.”).

² FCC Chairman Kevin J. Martin commented that “[b]roadband access is essential to an expanding Internet-based information economy. Creating a policy environment that speeds the deployment of broadband throughout the U.S. is my highest priority as the new chairman of the FCC.” Kevin Martin, United States of Broadband, WALL ST. J., July 7, 2005, at A12.

³ ANGELE A. GILROY & LENNARD G. KRUGER, CRS REPORT FOR CONGRESS,
“any circuit significantly faster than a dial-up phone line,” broadband is the mustang of Internet access technology.\(^4\) Given its faster speed and voluminous data transmission capabilities, broadband allows the Internet to be used in new, life-altering ways. For example, broadband provides consumers access to distance learning and telemedicine services,\(^6\) as well as the potential to enhance home security networks and utilize home automation by its “always-on” status.\(^7\) From an economic perspective, “broadband technology is a key driver of economic growth” as it “increases productivity, facilitates commerce, and

\(^4\) **NEWTON’S TELECOM DICTIONARY** 180 (23d ed. 2007). “Dial-up” is the conventional means of accessing the Internet via the home telephone line. Typically, an Internet user outfits a personal computer with a modem that enables the computer to connect to the Internet. An Internet service provider, or ISP, then provides the dial-up connection “for a fee.” **GILROY & KRUGER, supra note 3, at 1.**

\(^5\) See **GILROY & KRUGER, supra note 3, at 1–2** (stating that a broadband connection has data transmission rates “many times faster” than the “highest speed modem used with a traditional telephone line.”).

\(^6\) Distance learning is “[a] form of instruction in which video and audio technologies are used so as to allow students to attend classes in a location distant from where the course is being presented.” **NEWTON’S TELECOM DICTIONARY, supra note 4, at 319.** Learning via the Internet is best achieved by high-speed connection rather than “dial-up.” See Michael J. Copps, *America’s Internet Disconnect*, WASH. POST, Nov. 8, 2006, at A27. Telemedicine is “[t]he provision of health-care services from a distance using networks supporting audio, video, and computer data transmissions.” **NEWTON’S TELECOM DICTIONARY, supra note 4, at 910.** Though conventionally used to diagnose and treat patients via videoconferencing, it may also be used to teach medical procedures and administer care to prisoners as well as members of rural communities where the needed services may not be readily available. *Id.* Furthermore, telemedicine has a significant role to play in disaster management, for it has “great potential in minimizing the loss of human life when a disaster occurs.” Aijaz Qadir Patoli, *Role of Telemedicine in Disaster Management*, EHEALTH INT’L, DEC. 2005, at 34, available at http://www.ehealthinternational.org/vol2num2/Vol2Num2p34.pdf.

\(^7\) **GILROY & KRUGER, supra note 3, at 1.** Home automation is described as “anything that gives you remote or automatic control of things around the home.” **CNET, Take Control of your Digital Home**, http://www.cnet.com/4520-10389_1-6224211-1.html (last visited Nov. 5, 2007). It continues to develop with the aid of new technologies such as broadband. *Id.* “Always-on” describes broadband’s constant connection to the Internet unlike analog service where the user must “dial-up” each time he or she wishes to connect to the Internet. **NEWTON’S TELECOM DICTIONARY, supra note 4, at 107.** Typically, home security systems are supported by either a dial-up connection to the homeowner’s security company or police. Though using the Internet for home security purposes is not particularly new, broadband provides a new edge to home security. Namely, because broadband is “always on,” it is less vulnerable than dial-up connections. Furthermore, broadband allows homeowners to be more flexible in customizing their home security systems because of the additional ease in accessing “closed circuit televisions” or “streaming video.” Shirley Brady, *Broadband Sees Key to Home Security*, CABLE WORLD, Jan. 29, 2001, available at http://www.findarticles.com/p/articles/mi_m0DIZ/is_5_13/ai_80191634.
drives innovation." Finally, increased access to broadband allows citizens in rural areas with limited or no Internet access to connect to the digital community."

Because broadband matters, America is on a quest to bring a swift, sustained, and reasonably-priced Internet connection into every home. In March of 2004, President Bush described the quest:

This country needs a national goal for . . . the spread of broadband technology. We ought to have . . . universal, affordable access for broadband technology by the year 2007, and then we ought to make sure as soon as possible thereafter, consumers have got plenty of choices when it comes to [their] broadband carrier."

It is difficult to say with certainty whether this goal has been achieved. Reports and comments by global participants in the telecommunications industry relating to the penetration of broadband access in United States appear to conflict. The International Telecommunications Union ranked the United States sixteenth in the world in 2005 for "global broadband [penetration] per 100 inhabitants," falling from the thirteenth position in 2004. Likewise, according to the Organization for Economic Co-operation and Development’s statistical reports, the United States ranks fifteenth in the world for "broadband subscribers per 100 inhabitants." Despite such middle-of-the-road rankings, it is suggested that they are not true indicators of the United States' achievement in broadband penetration as compared to other global broadband participants. To make this point, the Federal Communications Commission ("FCC") has commented that should a United States region be compared to another highly-

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9 Id. ("Broadband is particularly critical in rural areas, where advanced communications can shrink the distances that isolate remote communities.").
ranked nation with comparable population density, the United States "is doing exceptionally well." Furthermore, in its Fourth Report to Congress on the availability of advanced telecommunications capability in the United States, the FCC concluded that the goal of section 706 of the Telecommunications Act of 1996 ("1996 Act") "is being met, and that advanced telecommunications capability is indeed being deployed on a reasonable and timely basis to all Americans.

While the United States continues to expand the breadth of broadband access in America, it is important to note that success may be measured by not only broadband penetration, but also affordability and choice. The broadband market continues to exist as a duopoly such that consumers essentially have a limited choice between two competitors: cable modem and digital subscriber line ("DSL"). Where consumers, at best, must choose between two dominant

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14 Kevin J. Martin, Comment, Why Every American Should Have Broadband Access, FIN. TIMES, Apr. 2, 2006, http://www.ft.com (search "why every American should have broadband access"). Commissioner Martin provided the following comparison: [I]n Belgium, ranked eighth in broadband penetration by the OECD, there are about 343 inhabitants per sq km and 18 out of 100 people are broadband subscribers. In Japan, ranked 11th by the OECD, there are 350 inhabitants per sq km and 16 out of 100 people have broadband. These countries are comparable to Massachusetts where there are 317 people per sq km and 19 out of 100 people subscribe to broadband. Alaska, with less then one person per sq km, has a higher broadband penetration rate than France.


16 Availability of Advanced Telecommunications Capability in the United States, Fourth Report to Congress, FCC 04-208, GN Docket No. 04-54, at 8 (Sept. 9, 2004), http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-04-208A1.pdf. But see id. at 5 ("Our economy and our future will be driven by how quickly and completely we deploy broadband. That is why Congress charged the FCC with promoting broadband deployment for all Americans. ... But we are not making acceptable progress toward that goal.

17 See supra text accompanying note 10 (stating that broadband access must be “universal,” “affordable,” and provided such that consumers have a choice of broadband platforms).

18 Angel M. Cartagena, Jr., Broadband Over Powerlines, ELECTRIC PERSP., Mar./Apr. 2004, at 45, available at http://www.eei.org/magazine/editorial_content/nonav_stories/2004-03-01-Broadband.htm. Broadband connection via cable modem is achieved when the end-user connects to the Internet via already existing television cable networks. Broadband connection via DSL “converts existing copper telephone lines into two-way high speed data conduits.” GILROY & KRUGER, supra note 3, at 2–3. Although cable and DSL represent the major broadband service technologies, other mediums are commercially available such as wireless, fiber, and satellite. Wireless technology is available in two forms: fixed wireless and mobile wireless systems. In a fixed wireless setting, data is transmitted “over the airwaves from towers or antennas to a receiver.” Id. at 3. Mobile wireless provides broadband Internet connection via mobile devices such as PDAs, cellular phones, and laptops with wireless capabilities. Fiber broadband connection is achieved by connecting the end user’s home by an optical fiber,
high-speed Internet access competitors, achievement in broadband may be marred with doubt. 19 FCC Commissioner Michael J. Copps highlighted this doubt:

We are behind the game in putting high-speed, high value bandwidth to work for all our citizens. You know something is wrong when the best case scenario is that a consumer has a choice between two broadband connections, both of which are more expensive and considerably slower than what consumers in other industrialized nations enjoy. And that's how it works in our wealthy metropolitan areas. Over much of the rest of America, it just gets worse. Customers in rural, and even some urban, areas often cannot get broadband connection at all. Or their only option is so expensive as to be unattainable as a practical matter.

With such doubts in mind, the quest to extend broadband into every American home continues, and in the near future, success may rest with the emergent technology, broadband over power lines ("BPL").

This Comment examines the most recent state efforts to regulate BPL deployment, paying particular attention to how states are attempting to resolve the issue of cross-subsidization. First, this Comment will explore BPL technology by answering these foundational questions: what is BPL; how is BPL achieved; why should BPL be deployed; and finally, why should BPL not be deployed? Next, this Comment will trace the relatively short history of the FCC's efforts to foster the deployment of BPL from a technical and regulatory perspective. Third, this Comment will present the challenges of cross-subsidization as they relate to BPL and examine how four states in particular addressed the issue of cross-subsidization in their respective policies and enabling legislation. Additionally, this Comment recognizes and approves the emerging trend of safeguarding against cross-subsidization by creating a boundary distinguishing which costs may be allocated to electric ratepayers and which may not. While the boundary is clear and appropriate, states have fallen short of providing a suitable standard of review for suspected cross-subsidization occurrences. Thus, to conclude, this Comment will take a nuanced approach to propose a standard of review that will serve BPL well.

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19 Cartagena, supra note 18, at 45 (stating that "[s]ome believe a duopoly does not provide consumers the opportunity to get the best combination of rates and services.").

II. THE WHAT, HOW, AND WHYS OF BROADBAND OVER POWER LINES

A. The What

BPL is a means by which an ordinary electrical outlet becomes a conduit for broadband Internet access. Utility companies have always used power lines to transmit data. The technology, however, limits power line use to managing electrical grid operations as opposed to providing commercial Internet access. Now that technology is available "allowing high-speed, long-distance data transmission," and managing the innate "noise" impediments of transmitting data over power lines is available, BPL is on the rise.

The operation of BPL may be divided into two categories based on the location of transmission activity. First, "Access BPL systems" are described by the FCC as "systems [that] carry high-speed data and voice signals outdoors over the medium voltage line from a point where there is a connection to a telecommunications network." "In-House BPL systems" are defined by the FCC as "systems [that] carry data and voice signals between the wiring and electrical outlets inside of a building." Consequently, just as there are two different forms of BPL, there are differing means to achieve each.

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23 2006 NARUC REPORT, supra note 22, at 18. Beyond electric power grids, school campuses employing AM radio and homeowners utilizing home automation devices such as intercoms and remote controlled electrical appliances have used power lines for communications. In re Inquiry Regarding Carrier Current Systems, including Broadband over Power Line Systems, Notice of Inquiry, 18 F.C.C.R. 8498, ¶ 4 (Apr. 23, 2003) [hereinafter Notice of Inquiry].
24 2006 NARUC REPORT, supra note 22, at 18.
25 Notice of Proposed Rule Making, supra note 1, ¶ 2 (stating that new designs can overcome the "inherent impedance and attenuation variations of power lines and noise from devices.").
26 Id. ¶ 3.
27 Id. ¶ 4.
28 Notice of Inquiry, supra note 23, ¶ 16. The FCC further notes that "In-House BPL systems are aimed at home networking and sharing of resources between devices, such as
B. The How

1. Access Broadband Over Power Line Systems

Unlike cable and DSL, BPL does not require constructing a separate infrastructure or breaking ground to run new cable lines. Instead, BPL is an enabling technology that "piggy back[s]" on already-existing electric power grid infrastructures. Because electric grids were designed primarily as current carriers rather than data and voice carriers, BPL technology is, in essence, a combination of methods aimed at bypassing obstacles resulting from this reality via specialized attachments and transmission redirection.

Data and voice transmissions via Access BPL Systems involve overcoming two primary obstacles along the electric grid infrastructure. The first obstacle BPL must overcome is attenuation, otherwise described as the breakdown of BPL data and voice transmissions after they have traveled for some distance along medium-voltage lines. Attenuation is problematic because the transmissions will not reach the end-user, typically located farther away, due to the fact that they begin to break down within approximately "1,000 feet to a mile" of its origin. To prevent attenuation, a repeater is attached to medium-voltage

multiple computers, printers and smart appliances." Id. 29


30 Shockingly Slow, ECONOMIST TECH. Q., Dec. 2, 2006, at 6; see also Amanda J. Frazier & Myles F. Reynolds, Expanding the Use of Power Lines: A Review of the Regulatory Implications of Deploying Broadband over Power Line Technology in Texas, 7 TEx. TECH. ADMIN. L.J. 265, 266 (2006) ("In contrast to accessing the internet through infrastructure such as cable lines or telephone fiber optics, BPL systems employ electric utility infrastructure to achieve the same goal.").

31 Notice of Inquiry, supra note 23, ¶ 13.

32 Because power lines primarily were designed to deliver current between fifty and sixty MHz, broadband data will be transmitted at different frequencies in order to allow the lines to be used simultaneously for current data and voice transmissions. The overarching obstacle of transmitting data and voice over power lines is "noise" generated by "energy consuming devices and appliances when the equipment is used—or by atmospheric conditions such as sunspots, by arcing and discharge at dirty insulators or faulty connections, by switching, by other nearby powerlines, and often by power sources as well." CLARK W. GELLINGS & KAREN GEORGE, BROADBAND OVER POWERLINE 2004: TECHNOLOGY AND PROSPECTS 5 (2004), available at http://www.epriweb.com/public/00000000001011264.pdf. Furthermore, because electric power lines act as "receiving antennas" they may attract "noise" from surrounding radio stations. Id.

33 Id.

34 Id.
The repeater, as its name suggests, repeats the transmission before the breakdown occurs by gathering the data and retransmitting it with amplification as if it were a new transmission. Depending on the distance to the end-user, an electric utility may equip the power lines with more than one repeater stationed at appropriate intervals to prevent any transmission breakdown.

Normally, electricity would then pass from medium-voltage lines to low-voltage distribution transformers that decrease the traveling voltage to a standard level appropriate for at-home use. Unlike electricity, which passes through transformers at low frequencies—typically fifty to sixty MHz—BPL transmissions are high-frequency signals vulnerable to transformer related attenuation. Thus, the final obstacle to achieving Access BPL is facilitating data and voice transmissions when they reach the distribution transformers.

There are generally three system architectures BPL providers employ to prevent transformer-related attenuation. These architectures ultimately bring the BPL transmission to the end-user, otherwise known as achieving the "last-mile." The first option is to transmit the data and voice from a wireless fidelity ("Wi-Fi") system on the medium-voltage line to a Wi-Fi receiver in the end-user’s residence, thereby avoiding the distribution transformer altogether. A second system architecture that is available uses line-attachments called couplers and routers that “route and convert data between the medium-voltage line and the low-voltage lines.” Finally, the third option allows the data and voice transmission to pass safely through the distribution transformer. Couplers and repeaters work in tandem to convert the transmission from medium-voltage lines to the low-voltage lines and amplify the transmission to “make up for signal losses through the distribution transformer” respectively.

From the end-user's perspective, Access BPL systems are far simpler than suggested above. Access BPL systems are often described as "plug and play"
Broadband Over Power Lines technology. The end-user only needs to connect the appliance he or she wishes to network to a small BPL modem that plugs directly into an electrical outlet. The consumer benefits from Access BPL systems in a number of ways. For example, while Access BPL systems provide typical services such as the Internet, e-mail, and online chat, they also conveniently offer "the ability to host VoIP (Voice over Internet Protocol), streaming high-definition TV and better access to gaming." Additionally, the end-user is able to network residences or offices with considerable ease because no additional wires or cable connections are necessary. Rather than creating a new network, the end-user merely taps into an already existing network.

2. In-House Broadband Over Power Line Systems

Unlike Access BPL systems, In-House BPL systems do not involve the transmission of data and voice over electrical power lines. However, an electrical outlet is still used as a conduit for broadband Internet access. In-House BPL connection is achieved when the end-user connects each device desired to be networked to a BPL adaptor module by either a USB connection or an Ethernet port connection. After the connection is established, "the BPL adaptor module plugs into a power outlet and communicates over the electrical wiring with other similar BPL adaptor modules in the home, thus forming a peer-to-peer local area network between these devices." A particularly unique aspect about In-house BPL is that it does not need to directly "interface" with Access BPL. Instead, In-House BPL allows the user to establish a network via electrical outlets that interfaces with any other method of broadband connection already in use, such as "dial-up," cable, or DSL. Because In-House

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47 Id. at 1. If the end-user is using a Wi-Fi system architecture, then the end-user does not need to use a BPL modem. Rather, the end-user only needs to set-up a Wi-Fi receiver in their home that connects with the Wi-Fi attachment on the medium-voltage line. Tom Michol, How It Works: Plugging Into the Net, Through the Humble Wall Outlet, N.Y. TIMES, Oct. 28, 2004, at G7.

48 UPLC White Paper, supra note 46, at 1.

49 Id. at 1–2.

50 See Notice of Inquiry, supra note 23, ¶ 16 ("In-House BPL systems carry data and voice signals between the wiring and electrical outlets inside of a building.").

51 NEWTON'S TELECOM DICTIONARY, supra note 4, at 176 (definition of "BPL").

52 Notice of Inquiry, supra note 23, ¶ 16.

53 Id.

54 Id.

55 Id.
BPL can stand alone as a networking technology, the FCC recognizes its potential to "encourage the growth of smart appliances and other consumer electronics equipment, facilitating the sharing of resources between various devices and increasing productivity."\(^{56}\) Presently, companies are moving forward by standardizing In-House BPL applications and marketing devices for commercial sale.\(^ {57} \)

C. The Whys

1. Why should Broadband Over Power Lines be deployed?

There are a number of reasons why BPL is one of the FCC's "top priorities."\(^ {58} \) Foremost, BPL potentially could alter the broadband market to better serve consumers through greater choice, innovation, and increased broadband access throughout the country.\(^ {59} \) The FCC describes BPL "as a ubiquitous broadband solution that could offer a viable alternative to cable, digital subscriber line, fiber, and wireless broadband solutions."\(^ {60} \) Because BPL can provide broadband Internet access to any home in America that has electricity, it enhances competition in a market currently dominated by cable and DSL. In particular, Access BPL has the potential to "bring valuable new services to consumers, stimulate economic activity, improve national productivity, and advance economic opportunity for the American public."\(^ {61} \) Thus, BPL carries with it the prospect of nation-wide, competitive broadband service at a low cost.

BPL also may benefit consumers given its potentially low deployment cost as compared with DSL and cable.\(^ {62} \) In the case of DSL, the end-user must be "within 18,000 feet of a central office unless expensive remote equipment is placed close to the customer."\(^ {63} \) Such high overhead costs may discourage DSL providers from reaching out to new customers, especially those in remote loca-

\(^ {56} \) Id. ¶ 17.

\(^ {57} \) Id. Along with HomePlug Alliance, which "released its HomePlug 1.0 standard based on Intellon and Cogency chip sets in 2001," a number of other companies have joined in the efforts to commercially offer In-House BPL networking devices. Id. at 8505 & n.27.

\(^ {58} \) BPL Memorandum Opinion and Order, supra note 20, at 9340 (statement of Chairman Kevin J. Martin).

\(^ {59} \) Notice of Proposed Rule Making, supra note 1, ¶ 10.

\(^ {60} \) BPL Memorandum Opinion and Order, supra note 20, at 9340 (statement of Chairman Kevin J. Martin).

\(^ {61} \) Id.

\(^ {62} \) FIGLIOLOA, supra note 1, at 2.

\(^ {63} \) Id.
tions where central stations are likely scarce. Likewise, cable modem service providers also face deployment cost disincentives, namely upgrades not only to the cable plant, but also at their “head end[s].” BPL, on the other hand, is considered less costly to deploy. CURRENT Group, a leading BPL provider, advertises that its BPL system “is easy to provision, operate and maintain” because it does not require new installation tools, exhaustive training, or the creation of a new network. Such ease of deployment is particularly meaningful for prospective broadband customers in rural or underserved areas. For example, according to the American Public Power Association, approximately “three-fourths of [its] members serve communities with less than 10,000 residents.” If, as suggested, BPL is a ubiquitous source of broadband seemingly unhampered by similar deployment disincentives as its competitors, it has the potential to contribute to solving the “Digital Divide” by allowing more Americans to “participate and compete in the Information Age.”

[64] Current Technologies, a BPL provider, asserts that “technical and economic considerations limit the two most widespread broadband technologies [cable and DSL] to the urban-suburban core.” In re Carrier Current Systems, including Broadband over Power Line Systems; Amendment of Part 15 regarding new requirements and measurement guidelines for Access Broadband over Power Line systems, Comments of Current Technologies, LLC, ET Docket No. 04-37, at 7 (July 7, 2003) (accessible via FCC Electronic Comment Filing System).

[65] FIGLIOLA, supra note 1, at 2–3. The head end is “the originating point of a signal in a cable television system. Head-end equipment receives satellite and local broadcast TV signals and converts them to a form that can travel down coaxial cable to subscribers.” CNET Glossary, http://reviews.cnet.com/4520-6029_7-6207586-1.html (last visited Nov. 5, 2007).

[66] FIGLIOLA, supra note 1, at 2. See also supra Part II.B (discussing how electrical power grids support broadband Internet access).


All power line components are installed using existing utility line crew tools and techniques. This means that minimal training is required for line crews to install the CURRENT BPL solution. CURRENT BPL takes advantage of existing power lines, greatly reducing the cost of building a broadband network. Using “smart build” roll-out methodology, the system can be deployed in stages. Additionally, CURRENT BPL scales to millions of users and was designed from the ground up to scale across complete operating regions.


[70] GILROY & KRUGER, supra note 3, at 5; see also FIGLIOLA, supra note 1 (describing the “Digital Divide”).

[71] Notice of Proposed Rule Making, supra note 1, ¶ 12.
Beyond broadband market considerations, electric utility companies and their electricity customers also stand to gain from BPL. BPL technology provides the necessary platform for enhancing electric grid management and operation via the sought after "smart grid" capabilities. Smart grid enhancements offer "real-time intelligence in order to save both operational and capital costs, improve network performance and enable new services." These new services include "outage and restoration detection, network security and monitoring, automated meter reading, and transformer overload detection." Application of smart grid enhancements not only provides incentives for electric utility companies to improve service reliability through BPL, but also offers incentives for government entities and consumers given the concurrent benefits of lowering electricity rates and enhancing the efficiency of electric grid management and operation.

2. Why should Broadband Over Power Lines not be deployed?

Despite BPL's numerous benefits, there are significant concerns regarding the emission of harmful radio frequencies ("RF") from the use of BPL. Such emissions arguably compromise the quality of spectrum that BPL shares with other licensed spectrum users. Interference from BPL is a cause for concern because power lines are not "shielded," thereby allowing RF energy from the lines to be "radiated." Without measures to alleviate such "signal leakage," radio signals transmitting over the same bandwidth as BPL transmissions may be subject to harmful interference. Generally, BPL functions within the 1.7

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72 See In re Carrier Current Systems, including Broadband over Power Line Systems; Amendment of Part 15 regarding new requirements and measurement guidelines for Access Broadband over Power Line Systems, Report and Order, 19 F.C.C.R. 21,265, ¶ 15 (Oct. 14, 2004) [hereinafter Report and Order] (stating several infrastructural benefits that electric utilities are likely to realize if they deploy BPL technology).
73 CURRENT Group, supra note 67 ("Utilities have been searching for decades for ways to improve their power network efficiency and functionality, but have yet to deploy service territory-wide platforms to accomplish this in a cost-effective manner."); see also Paula W. Foley, Untangling the Third Wire: Broadband Over Power Lines, Open Access and Net Neutrality, 6 J. HIGH TECH. L. 194, 198-99 (2006).
74 CURRENT Group, supra note 67.
75 Tom Baker, Chairman of TXU Electric Utility, commented on automated meter reading stating "[t]he technology used in the delivery business—the meter on your house—is 75 years old." Shockingly Slow, supra note 30.
76 Foley, supra note 73, at 198.
77 Id. at 198-99; see also Notice of Proposed Rule Making, supra note 1, ¶ 13.
78 Notice of Proposed Rule Making, supra note 1, ¶ 5.
79 Report and Order, supra note 72, ¶ 7.
80 Id.
MHz to 80 MHz range; however, at present most BPL deployments transmit data and voice between 2 and 50 MHz. The frequencies below 50 MHz are already utilized by a number of parties, including “fixed, land mobile, aeronautical mobile, maritime mobile, radiolocation, broadcast radio, amateur radio terrestrial and satellite, and radio-astronomy.” Furthermore, within the 1.7 to 80 MHz range, federal entities have approximately 59,000 frequency dedications where “[a]llocations for the fixed and mobile services accommodate communications for homeland security, distress and safety, and other critical functions.”

The American Radio Relay League (“ARRL”), a national association for amateur radio operators, has commented on BPL deployment. ARRL supports the expansion of broadband access in America by means other than BPL. ARRL’s position on BPL can be summarized by the following equation: “Broadband + Power Lines = Interference.” Specifically, ARRL contends not only that “potential interference from Access BPL would be so severe as to warrant its exclusion from all bands allocated for amateur use,” but also “that high-powered amateur operations could interfere with Access BPL.” While the ARRL’s position on BPL deployment is perhaps extreme, concerns about interference carry great weight since Hurricane Katrina, where amateur radio stations substantially participated in emergency communications. In light of their assistance, the Department of Homeland Security now

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81 Notice of Inquiry, supra note 23, at 8501 n.10.
82 Report and Order, supra note 72, ¶ 8.
83 Notice of Proposed Rule Making, supra note 1, ¶ 5.
87 Id.
88 Notice of Proposed Rule Making, supra note 1, ¶ 15.
89 See Notice of Proposed Rule Making, supra note 1, ¶ 14 (explaining that other amateur radioists and organizations have opted for requiring lower power line emission limits).
90 FCC Commissioner Michael J. Copps commented that: Even as [the FCC] seek[s] to encourage BPL . . . [the FCC] must also ensure that its providers protect existing spectrum users from interference. This applies with special force to amateur radio operators whose skills and dedication once again proved so valuable in the aftermath of Hurricane Katrina. Amateur radio serves the public interest in so many ways that [the FCC] must be always mindful of its needs.
91 BPL Memorandum Opinion and Order, supra note 20, at 9341.
requires Regional Emergency Communications Coordination Working Groups to coordinate their activities with amateur radio operators. The FCC takes such interference concerns seriously, due in large part to the important role amateur radio has played in emergency communications. Recent regulatory efforts establishing BPL technical parameters to prevent and mitigate interference exemplify the FCC’s acknowledgement of such concerns.

Federal entities also have expressed concern over the viability of BPL coexisting on spectrum that is already allocated to licensed federal government users. In particular, the National Telecommunications and Information Association ("NTIA") has been particularly involved in the BPL interference issue. In its Phase I study, the NTIA concluded that alterations to measurement standards are necessary because the current emission standards applicable to BPL do not account for the unique nature of power line communications technology. Consequently, the NTIA offered techniques and suggestions to mitigate BPL interference with licensed spectrum users, and encouraged the continued efforts to deploy BPL guided by these refined technical parameters.

92 See BPL Memorandum Opinion and Order, supra note 20, at 9341 (statement of Commissioner Michael J. Copps).
93 See discussion infra Part III.A.
94 Notice of Proposed Rule Making, supra note 1, ¶ 16. For example, the FCC noted that:

[The Federal Emergency Management Agency (FEMA) is supportive of our national goals of extensively deployed broadband facilities and of a more robust electrical utility infrastructure and states that it appreciates that BPL could be a major factor in achieving these objectives. FEMA indicates, however, that it has become aware that certain distinct approaches to BPL may have the potential to cause interference to its high frequency radio emergency communications system although it has not concluded at this time that there is a material interference problem or that all of the distinct technological approaches to BPL pose a risk to interference. FEMA states that it expects that there may be ways to provide the public with the benefits of BPL without compromising emergency communications.

Id.
95 FIGLIOLE, supra note 1, at 9 (explaining how NTIA issued a technical study on BPL interference with government spectrum use for homeland security, emergency response, and defense).
96 Id. at vi.
97 NTIA REPORT, supra note 84, at vii. NTIA’s suggestions included: Mandatory registration of certain parameters of planned and deployed BPL systems would enable radio operators to advise BPL operators of anticipated interference problems and suspected actual interference; thus, registration could substantially facilitate prevention and mitigation of interference. BPL devices should be capable of frequency agility (notching and/or retuning) and power reduction for elimination of interference. NTIA further recommends that BPL developers consider several interference prevention and mitigation measures, including: routine use of the minimum output power needed from each BPL device; avoidance of locally used radio frequencies; differen-
In addition to federal entities and members of the amateur radio community, private organizations such as the Telecommunications for the Deaf, Inc. have expressed reservations regarding BPL deployment. In its comments to the FCC, Telecommunications for the Deaf posited that the FCC must act diligently to protect the interests of its members despite the potential benefits of BPL. Namely, BPL systems must not "interfere with hearing aids, telecommunications equipment, and visual signaling technology commonly used by the deaf and hard-of-hearing people." In light of the concerns regarding spectrum interference offered by a number of public and private organizations and interested parties, the FCC faces the difficult task of balancing the benefits of BPL as a broadband technology with its potential for creating harmful interference with other incumbent members of the telecommunications community. As will be seen in the following discussion, the FCC has taken a proactive step in solving the technical barriers to BPL deployment.

III. TRACING FCC EFFORTS TO PROMOTE BROADBAND OVER POWER LINE DEPLOYMENT

A. FCC Regulates Technical Aspects of Broadband Over Power Line Deployment

Only a few short years ago, the FCC initiated proceedings to facilitate the deployment of BPL as a new competitor in the "broadband market landscape." In April 2003, a Notice of Inquiry was released by the FCC in order to introduce BPL as a prospective broadband service competitor and to "obtain information on a variety of issues related to Broadband over Power Lines (BPL) systems." The FCC's main objective was to assess advancements in BPL technology and to determine whether any alterations to the applicable rules governing unlicensed radio frequency devices such as BPL were necessary to alleviate the risk of RF interference to licensed users.
The Notice of Inquiry clarified that BPL is subject to the Part 15 Rules regulating the operation of unlicensed radio frequency devices.\footnote{104} BPL comes under the purview of Part 15 because it is a “new type of carrier current system,”\footnote{105} and is not subject to licensing requirements.\footnote{106} Pursuant to the Part 15 Rules, unlicensed RF devices such as BPL must not be a source of “harmful interference.”\footnote{107} When the Commission notifies a user that a particular device is the

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\footnote{104} Notice of Inquiry, supra note 23, ¶ 3. The scope of the Part 15 Rules states:
(a) This part sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of part 15 devices.
(b) The operation of an intentional or unintentional radiator that is not in accordance with the regulations in this part must be licensed pursuant to the provisions of section 301 of the Communications Act of 1934, as amended, unless otherwise exempted from the licensing requirements elsewhere in this chapter.
(c) Unless specifically exempted, the operation or marketing of an intentional or unintentional radiator that is not in compliance with the administrative and technical provisions in this part, including prior Commission authorization or verification, as appropriate, is prohibited under section 302 of the Communications Act of 1934, as amended, and subpart 1 and part 2 of this chapter. The equipment authorization and verification procedures are detailed in subpart J or part 2 of this chapter.
\footnote{47 C.F.R. § 15.1 (2006)}

\footnote{105} Part 15 Rules govern two different versions of power line apparatuses, carrier current systems, and power line carrier systems. Notice of Inquiry, supra note 23, ¶ 6. A “carrier current system” is defined as:

A system, or part of a system, that transmits radio frequency energy by conduction over the electric power lines. A carrier current system can be designed such that the signals are received by conduction directly from connection to the electric power lines (unintentional radiator) or the signals are received over-the-air due to radiation of the radio frequency signals from the electric power lines.
\footnote{47 C.F.R. § 15.3(f). Power line carrier systems, which operate within the 9 to 490 kHz frequency band are “carrier current system[s] used by an electric power utility entity on transmission lines for protective relaying, telemetry, etc. for general supervision of the power system.” 47 C.F.R. §15.3(f). Unlike carrier current systems, this power line system does not need to comply with RF emission standards and is governed by only one provision of Part 15, namely, § 15.113. Notice of Inquiry, supra note 23, ¶ 6.}

\footnote{106} Notice of Inquiry, supra note 23, ¶ 2.

\footnote{107} Two general conditions of operation for RF devices state that:
(b) Operation of an intentional, unintentional, or incidental radiator is subject to conditions that no harmful interference is caused and that interference must be accepted that may be caused by the operation of an authorized radio station, by another intentional or unintentional radiator, by industrial, scientific and medical (ISM) equipment, or by an incidental radiator.
(c) The operator of a radio frequency device shall be required to cease operating the device upon notification by a Commission representative that the device is causing harmful interference. Operation shall not resume until the condition causing the harm-
source of interference, the use of that device must be immediately discontinued. Transmissions over power lines prior to the development of commercial BPL devices functioned on frequencies at or below 2 MHz. The latest BPL devices “operate on multiple carriers that are spread over a wide spectrum.” For example, In-House BPL systems typically operate within a range of 4.5 MHz to 21 MHz, while Access BPL systems operate within a range of 1.7 MHz to 80 MHz. Thus, because BPL has expanded the spectrum range beyond the original expectations envisioned when the Part 15 Rules were initially promulgated, the FCC Notice of Inquiry initiated BPL deployment proceedings with the primary focus of determining whether the technical parameters set out in Part 15 must be modified to accommodate BPL.

The FCC continued to guide the deployment of BPL in February 2004 when it released a Notice of Proposed Rule Making. In this notice, the FCC proposed Part 15 Rule alterations to accommodate Access BPL’s unique interference issues and outlined operator and regulator actions to be taken when BPL is in use. In addition to seeking comment on the proposed rules set forth in the Notice of Proposed Rule Making, the FCC sought additional comment on RF measurement standards in an effort to promote consistency in BPL deployment. Incorporated in this release was Commissioner Michael J. Copps’ statement conveying his reservations about the FCC’s technical focus. In summary, Commissioner Copps commended the FCC for its efforts to set technical rules for BPL while taking issue with the lack of consideration given to other regulatory obstacles, such as how BPL will coexist with the Communications and Law Enforcement Act and the Universal Service Fund.
On October 28, 2004, the FCC released a Report and Order ("R&O") adopting rules for BPL deployment. The R&O finalized technical requirements to ensure that BPL does not cause harmful interference to licensed spectrum users. Notably, the FCC set emission limits for BPL and identified suitable mitigation methods. These methods include requiring BPL devices to have the capability to be shut down or modified should interference occur, as well as establishing "excluded frequency bands" and "exclusion zones" that ultimately protect spectrum use for purposes relating to, for example, aeronautical communications and Coast Guard operations. Furthermore, the R&O established measures to manage and enforce the newly adopted technical requirements. Namely, it authorized the creation of a public access database to assist in the identification and resolution of harmful interference. Ultimately, these technical standards and related procedures were guided by the FCC's goal to extend broadband Internet access throughout the United States. By focusing its approach on the technical aspects of BPL deployment, thereby "crafting a minimal regulatory framework," the FCC is promoting a "pro-competitive deregulatory framework." Subsequently, on August 7, 2006, the FCC issued a Memorandum Opinion and Order ("MO&O") reaffirming its commitment to resolve interference issues associated with BPL deployment. Despite receiving seventeen petitions for reconsideration from amateur radio operators and the BPL industry, the

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116 Report and Order, supra note 72.
117 Id. ¶ 1.
118 Id. ¶¶ 33–53.
119 Id. ¶¶ 54–73.
120 FIGLIOLO, supra note 1, at 6. As the name suggests, "excluded frequency bands" are bandwidth in which BPL is precluded from operating. "Exclusion zones" are similar in that BPL may not operate within the zones; however, they are dissimilar in that they buffer bandwidth already used for "sensitive operations." Id.
121 Report and Order, supra note 72, ¶¶ 88–119.
122 Id. ¶¶ 74–87.
123 Id. at 21,344 (joint statement of Chairman Michael K. Powell and Commissioner Kathleen Q. Abernathy) ("A strategic goal of this Commission is to promote the availability of broadband to all Americans irrespective of platform.").
124 Id. Commissioners Powell and Abernathy stated: The benefits and advantages of BPL are just beginning to be recognized. That is why it is important for regulators to exercise restraint and avoid heavy-handed regulations. We must allow the marketplace to develop the full potential of this technology. In the long run, this approach should result in Americans receiving the full benefits of this new technology and the applications it supports.
125 BPL Memorandum Opinion and Order, supra note 20.
FCC, in large part, affirmed the rules set forth in the previous R&O. In doing so, the FCC denied a number of requests by petitioners, including: a request by the television industry to prohibit BPL operation on frequencies above 50 MHz; a request by the amateur radio community to suspend all BPL deployments until additional studies may be conducted and to prohibit BPL operation on frequencies used by amateur radio operators; a request by the aeronautical community to prohibit BPL operation on frequencies already dedicated for aeronautical use; and a request by the gas and petroleum industry to be regarded as a “public safety entity.”

The FCC did, however, adopt some changes. Notably, the Part 15 Rules set forth in the R&O were amended with respect to the allocation of “exclusion zones” protecting radio astronomy stations, and procedures instituted to protect relocated aeronautical stations. Beyond such changes, the MO&O is a reflection of the FCC’s commitment to expanding the breadth of broadband access in America as it continues to “build upon [its] previous efforts to facilitate deployment of broadband over power line (BPL) systems.”

B. FCC Classifies Broadband Over Power Lines as an “Information Service”

Beyond regulating the technical parameters of BPL deployment, the FCC’s most recent foray into BPL regulation is its MO&O classifying BPL as an “information service” under the 1996 Act. This classification illustrates the FCC’s effort to provide a modicum of regulatory certainty for the BPL industry that is consistent with the minimal regulatory framework established for BPL’s potential competitors: cable modem and DSL. Such regulatory certainty is intended to achieve two objectives: advancing the FCC’s goal of achieving the “ubiquitous availability of broadband to all Americans,” and enhancing competition among broadband Internet services by regulating competing providers similarly.

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126 Id. ¶ 1.
127 FIGLIOLO, supra note 1, at 8.
128 Id. at 7–8.
129 BPL Memorandum Opinion and Order, supra note 20, at 9340 (statement of Chairman Kevin J. Martin).
131 Id. ¶ 2.
132 Id.
The 1996 Act differentiates between firms that provide "telecommunications services" and "information services." A "telecommunications service" is defined as a "means [of] transmission, between or among points specified by the user, of information of the user’s choosing, without change in the form or content of the information as sent and received." Comparatively, an "information service" provides the "capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications, and includes electronic publishing, but does not include any use of such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service." In light of this distinction, a high-speed Internet access provider offering telecommunications service would be required to comply with Title II common carrier requirements allowing competing ISPs open access to their facilities.

In an effort to resolve questions concerning how to classify high-speed Internet access services, the FCC issued an order in March of 2002 classifying cable modem service as an information service. Focusing on the functions that the end-user is offered, the FCC concluded that not only do cable modem services transmit data, but they also provide "computer processing, information provision, and computer interactivity with data transport, enabling end users to run a variety of applications." Essentially, because the cable modem service’s data transmission function is combined with its provision of Internet access, it is not purely a data transmission service and thus, could not be regulated as a telecommunications service.

In response to the FCC’s ruling, Brand X, an ISP, challenged the FCC’s cable modem classification before the United States Court of Appeals for the Ninth Circuit in National Cable & Telecommunications Association v. Brand X. As the principal plaintiff, Brand X argued that cable modem service is a telecommunications service and as such, cable companies must comply with

134 Id. § 153(44).
135 Id. § 153(20).
137 In re Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities; Internet Over Cable Declaratory Ruling; Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities, Declaratory Ruling and Notice of Proposed Rulemaking, 17 F.C.C.R. 4798, ¶¶ 60–69 (Mar. 14, 2002).
138 Information Service Memorandum Opinion and Order, supra note 130, ¶ 9.
139 Id.
Title II common carrier rules requiring them to open their facilities to competing ISPs. Based on the Court’s previous conclusion that cable modem service was a telecommunications service, the Ninth Circuit ruled in favor of Brand X and vacated the FCC’s ruling that cable modem service is an information service. After granting a writ of certiorari, the Supreme Court reversed the Ninth Circuit’s decision, concluding that the FCC was within its discretion to provide its interpretation of the 1996 Act, and in so doing, properly defined cable modem service as an information service.

Shortly after the Supreme Court decided Brand X, the FCC issued the R&O, classifying wireline broadband Internet access service delivered by DSL as an information service. The FCC concluded that wireline broadband Internet access service is exempt from Title II common carrier regulations because it provides the end-user with an integrated service, including a data transmission component as well as an Internet access component. This decision, placing DSL and cable modem services on an “equal-footing,” is consistent with the FCC’s effort to similarly regulate competing broadband service providers with the hope that “all potential investors in broadband network platforms, and not just a particular group of investors, are able to make market-based, rather than regulatory-driven, investment and deployment decisions.”

Unsurprisingly, on November 7, 2006, the FCC issued a MO&O classifying BPL-enabled Internet access as an information service. The FCC concluded that the transmission component of BPL is “telecommunications” and is intertwined with the provision of high-speed Internet access service, including “a host of applications, including email, web-surfing, etc. that provide the ‘capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications.”

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141 Id.
142 Id. at 979 (discussing AT&T Corp. v. Portland, 216 F.3d 871 (9th Cir. 2000)).
143 Id. at 968–69.
145 Id. ¶ 1.
146 Id. ¶ 45.
147 Information Service Memorandum Opinion and Order, supra note 130.
148 Id. ¶ 9 (quoting In re United Power Line Council’s Petition for Declaratory Ruling
BPL is an integrated service like DSL and cable, and must be treated likewise. Such a classification not only supports the FCC's goal of promoting light-handed regulation for all broadband Internet access services, but also encourages BPL deployment. It offers regulatory certainty for BPL deployment and "help[s] ensure technological and competitive neutrality in communications markets." Additionally, this decision furthers the FCC's statutorily driven goals "to preserve the vibrant and competitive free market that presently exists for the Internet" and "to encourage the provision of new technologies and services to the public." While the FCC has taken great strides to guide the deployment of BPL, it has yet to address the specific regulatory issue of cross-subsidization.

IV. BROADBAND OVER POWER LINES AND CROSS-SUBSIDIZATION

A. What is Cross-Subsidization?

Traditionally, states enact and enforce laws or regulations prohibiting electric utilities from engaging in cross-subsidization. Cross-subsidization in the realm of electric utilities transpires when the utility subsidizes its non-regulated services, namely services unrelated to the provision of electricity, with funds collected from ratepayers for their regulated service. Similarly, cross-subsidization concerns apply to BPL. In the case of BPL, unregulated services include the use of BPL for communications services while regulated services include the use of BPL for utility applications such as automated meter reading. BPL cross-subsidization may occur when a utility engages in the use of BPL to provide both non-regulated services and regulated services either by providing BPL services directly to the end-user or through an affiliate. Conceivably, the utility may use ratepayers' funds to subsidize the initial deployment of BPL or even to minimize the impact of an unsuccessful BPL commu-
Communications service venture in order to insulate the "core utility" from suffering a loss. 154

B. What are the Problems Associated with Cross-Subsidization?

The problems arising from cross-subsidization are three-fold. First, cross-subsidization forces electric ratepayers to bear the financial risks of BPL commercial deployment. 155 Where a utility pursues BPL deployment for the purpose of participating in the broadband market, the utility may avoid or at least diminish the financial risk of entering this new market by using funds derived from ratepayers rather than using other financial resources, such as shareholder investment in the case of investor owned utilities. In this way, the utility avoids the financial risk by passing the cost of BPL deployment to ratepayers. The second problem with BPL cross-subsidization is that it constitutes "anti-competitive" behavior. 156 Where a utility is able to subsidize its foray into the broadband market with funds derived from the provision of its regulated service, the electric utility has an unfair advantage over its broadband competitors. 157 Of particular concern for broadband competitors is that not only are electric utilities able to subsidize their BPL communications service, but they are able to do so from a regulated service for which the utility is often a monopoly provider. 158 The third problem posed by cross-subsidization is that diversion of monetary resources from the regulated service to the non-regulated BPL communications service may detract from the quality of the regulated service. 159

C. Approaches to Avoiding Cross-Subsidization

Two theoretical approaches—a structural approach and a functional approach—are suggested to avoid cross-subsidization and its problematic results. The functional approach, in the context of cross-subsidization prevention, involves the application of accounting principles. 160 This method is often referred to as "ring-fencing" or as erecting "firewalls" to guard against cross-subsidization. 161 The structural approach creates literal separation between an

154 Id.
155 Id.
156 Id.
157 Id.
158 Cartagena, supra note 18, at 49.
159 Id.
160 2005 NARUC REPORT, supra note 21, at 21.
161 Id.
electric utility's regulated and unregulated services. Structural separation may be achieved, for example, by precluding electric utilities from participating in the broadband market through an affiliate BPL provider. This approach combats cross-subsidization by infusing transparency in commercial BPL-related transactions so that the funds used for BPL utility applications may be readily distinguished from the funds used for BPL communications services. A weakness of the structural approach is that it may not stand up to the challenge of ensuring that "embedded or marginal costs" associated with the particular services are properly allocated. Furthermore, structural separation may disincentivize electric utilities from deploying BPL commercially due to the added cost of "unnecessary duplication of resources" and loss of any "efficiencies that could otherwise be gained by electric companies providing BPL."

The best understanding of the structural approach comes from example. Cross-subsidization is chiefly a concern in affiliate transactions because of the close business relationship between the electric utility and its affiliate. If the electric utility avoided such close business relationships in favor of more detached, "arm's-length contractual relationships," the issue of cross-subsidization could very well become moot.

An application of the structural approach to BPL deployment is often referred to as the "landlord-tenant model." Under this model, the electric utili-
ity is the landlord of the power lines and a third-party BPL provider is the tenant that pays a negotiated fee in return for use of the power line infrastructure. Contractual negotiations between the electric utility and the independent BPL provider are required to establish an equitable exchange of the value of power line infrastructure use for some fee.

The landlord-tenant model is an attractive option for electric utilities seeking to deploy BPL commercially. Foremost, the landlord-tenant model provides for "true arms-length [sic] contract negotiations," which achieves the structural separation that is helpful in avoiding intentional or unintentional distribution of electric ratepayers' funds to support BPL communications services. Such separation reduces the necessity for regulatory oversight because the electric utility and BPL provider are two entirely separate entities, with their own financial structures and interests to promote.

Though not directly related to cross-subsidization, there are other benefits to the landlord-tenant model. Despite the general enthusiasm for BPL’s commercial prospects, some electric utilities are hesitant to market BPL or are driven by the utility applications rather than the potential to compete in the broadband market. The landlord-tenant model provides a reasonable solution. Where electric utilities are concerned with the risks and added responsibility of marketing BPL, BPL providers, as tenants, may assume that risk and responsibility.

Thus, the landlord-tenant model avoids cross-subsidization concerns and provides added incentives for electric utilities to participate in commercializing BPL by diverting the risks and responsibility to their BPL tenants who are more willing and able to navigate the broadband market.

D. State Efforts to Alleviate Cross-Subsidization Concerns

Beyond addressing BPL technical requirements and classifying BPL as an information service akin to its prospective competitors, the FCC has gone no further in regulating the deployment of BPL. Preferring a "light regulatory touch," the FCC has paved the way for states to take on the important job of

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169 Id.
170 Id. at 14. The fee could be a pole attachment fee, access fee, or some other fee arranged by the utility and the third-party BPL provider.
171 Id.
172 Id.
173 2006 NARUC REPORT, supra note 22, at 22.
174 Id.; see also California Policy on BPL, supra note 168, at 15.
175 Information Service Memorandum Opinion and Order, supra note 130, at 13,298 (statement of Commissioner Deborah Taylor Tate).
providing added regulatory certainty to guide BPL deployment. Accordingly, the FCC has refrained from addressing the issue of cross-subsidization, leaving it up to states to resolve that particular issue.\(^\text{176}\) To date, while a number of states have considered whether to pursue BPL and if so, how to regulate it, four states in particular have greater strides to facilitate BPL deployment. Texas,\(^\text{177}\) California,\(^\text{178}\) New York,\(^\text{179}\) and Arkansas\(^\text{180}\) have proposed or enacted policies and legislation tackling BPL-related regulatory issues, including cross-subsidization.\(^\text{181}\)

1. Texas

In the Fall of 2005, the Seventy-Ninth Texas State Legislature passed Senate Bill 5 ("SB 5"), supporting efforts to deploy BPL in Texas.\(^\text{182}\) The legislature recognized that BPL deployment in Texas has the potential to improve the electric utility service and reliability, as well as to provide Texans with the benefits of enhanced broadband competition and access in underserved regions.\(^\text{183}\) Perhaps more notably, the legislature concluded that the success of BPL deployment in Texas rests solely with the participation of electric util-

\(^{176}\) Commissioner Michael J. Copps had been the sole voice among the commissioners calling attention to other regulatory issues left untouched. In a statement accompanying the order classifying BPL as an information service, Commissioner Jonathan S. Adelstein presented his concern for unanswered regulatory issues, stating, "[w]e also need to advance the discussion of other sensitive issues, like our Truth-in-Billing rules, access for persons with disabilities, and the preservation and advancement of universal service.” Furthermore, on the issue of state involvement he went on to say, “I appreciate the willingness of Chairman Martin and my colleagues to work with me to ensure that this Order does not unnecessarily limit states' ability to address important issues related to the oversight of BPL.” Information Service Memorandum Opinion and Order, supra note 130, at 13,296–97 (concurring statement of Commissioner Jonathan S. Adelstein).

\(^{177}\) See discussion infra Part IV.D.1.

\(^{178}\) See discussion infra Part IV.D.2.

\(^{179}\) See discussion infra Part IV.D.3.

\(^{180}\) See discussion infra Part IV.D.4.

\(^{181}\) In addition to these four states, the Michigan Public Service Commission has ruled in favor of allowing electric utilities to incur costs related to the possible implementation of a BPL pilot program. 2006 NARUC REPORT, supra note 22, at 7. The Louisiana Public Service Commission also opened a general docket on January 13, 2006 to “consider the promulgation of rules for all aspects of BPL.” Id. Furthermore, in June 2005, the Nebraskan Legislature passed a bill, LB 645, that precludes public utilities and its related subdivisions from engaging in “wholesale, or retail broadband services, Internet services, telecommunications services, or video services.” Id. at 8. Although this prohibition expires on December 31, 2007, LB 645 authorized the creation of a broadband task force that was required to submit findings to the Legislature by December 1, 2006. Id. at 7–8.


\(^{183}\) TEX. UTIL. CODE ANN. § 43.001(a)-(c) (Vernon 2006).
This particular finding sets the legislation's tone of flexibility and restrained regulation as it provides a broad regulatory framework to incentivize electric utilities to pursue BPL deployment.

Among the various provisions of SB 5, a few in particular are relevant to the issue of cross-subsidization. Foremost, the legislation offers the electric utility three ownership and operation options. The utility may permit an affiliate, an unaffiliated entity, or any ISP to use the utility's electric infrastructure for the provision of commercial BPL. While SB 5, by omission, does not authorize electric utilities to own or operate BPL directly, it grants utilities the freedom to refuse opening access to their lines. The latitude this bill provides by allowing affiliates to own and operate commercial BPL raises the issue of cross-subsidization.

The Texas legislature addressed cross-subsidization in dual sections of SB 5 when addressing cost and revenue allocation. First, regarding cost allocation, the legislature described which costs may be allocated to electric ratepayers. Specifically, SB 5 permits any capital investment costs or operating expenses incurred by the utility when deploying BPL for the benefit of the utility's core business—namely the provision of electricity—to be allocated to "customer classes directly receiving the services." In other words, the costs of deploying BPL for the purpose of enhancing the electrical infrastructure via smart grid capabilities may be offset by allocating those costs to electric ratepayers. The second provision relating to cross-subsidization focuses on the issue of revenue allocation. The bill states that "revenues of an affiliated BPL operator or an affiliated BPL ISP shall not be deemed the revenues of an electric utility for the purposes of setting rates."

Favoring legislative certainty over ambiguity, the Texas legislature draws a boundary distinguishing which BPL-related costs may be allocated to electric ratepayers and which revenue may not be attributed to electric utilities. In this way, SB 5 is not only the first state effort to formally regulate BPL deployment, and in particular address cross-subsidization, but it is also a law to which other states have turned for guidance.

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184 *Id.* § 43.001(b).
185 *Id.* § 43.052(a).
186 *Id.* § 43.001(d).
187 *Id.* § 43.102(a).
188 *Id.* § 43.102(c).
2. California

In April 2006, the California Public Utilities Commission ("CPUC") implemented "a regulatory framework that fosters competition in the broadband market by giving regulatory certainty to companies seeking to provide broadband over power lines (BPL) in California."\(^\text{189}\) The CPUC recognizes BPL's potential to: (1) provide consumers a "new broadband pipe to the home;" (2) promote widespread access to broadband applications; (3) enhance electric utility reliability; and (4) reduce customer energy expenses.\(^\text{190}\) In light of this position, CPUC's policy proposes a "BPL-friendly" regulatory framework "to ensure that [California] ha[s] the most advantageous regulatory climate to attract major infrastructure investment in California's broadband infrastructure."\(^\text{191}\)

Like Texas' SB 5, the CPUC's policy allows an electrical utility to deploy BPL through an affiliate or an unaffiliated third-party.\(^\text{192}\) However, the CPUC asserts that allowing affiliates to deploy BPL raises cross-subsidization concerns.\(^\text{193}\) As such, the CPUC's policy is designed to balance safeguarding against cross-subsidization with avoiding a regulatory framework that unnecessarily burdens BPL deployment.\(^\text{194}\) The policy states in pertinent part:

[W]e hold that a utility shall not make rate base investments in BPL if the BPL will be used for commercial broadband deployment. A utility may, however, invest in assets that make use of a BPL system provided that the investments can be justified on the basis of utility benefits.\(^\text{195}\)

Thus, like Texas' SB 5, CPUC's policy distinguishes how ratepayer funds may be allocated to offset the costs of BPL deployment.

Unlike Texas, the CPUC will review occasions when the utility invests in a BPL system. For example, the CPUC will review utility investment in enhanced metering applications via "advanced metering proceedings."\(^\text{196}\) Furthermore, the Commission will review occasions when a utility purchases BPL services to ensure that the purchases were "justified by utility benefits."\(^\text{197}\) When the purchases are made from a BPL affiliate, the CPUC adds additional rules as a safeguard.\(^\text{198}\) These rules, known as the Affiliate Reporting Require-

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\(^{189}\) California Policy on BPL, supra note 168, at 2.
\(^{190}\) Id.
\(^{191}\) Id. at 9.
\(^{192}\) Id. at 2.
\(^{193}\) Id. at 13.
\(^{194}\) Id.
\(^{195}\) Id. at 17.
\(^{196}\) Id.
\(^{197}\) Id.
\(^{198}\) Id.
ments, require the utility to report its fair market value methodology to the Commission.\textsuperscript{199} The purpose of reporting this information is to allow the Commission to "exercise significant oversight" of BPL affiliate transactions.\textsuperscript{200} Thus, the CPUC's policy brings to light an emerging trend where states avoid cross-subsidization by clearly delineating in their respective policy statements and legislation how electric ratepayer funds may be allocated.

3. New York

Effective October 18, 2006, the New York Public Service Commission ("NYPSC") issued its Statement of Policy on the Deployment of Broadband Over Power Line Technologies.\textsuperscript{201} Recognizing that BPL is in New York's public interest, the NYPSC adopted this policy to guide BPL deployment, paying specific attention to ensuring that electric ratepayers do not bear the financial risks of deployment.\textsuperscript{202} Increased regulatory flexibility encourages BPL deployment. However, this must be balanced with the inherent cross-subsidization concerns that arise when electric ratepayers bear the financial burden of BPL deployment. In weighing these factors, NYPSC took a more restrictive approach than Texas and California.

When the NYPSC initiated its proceedings on BPL deployment, it contemplated allowing electric utilities to deploy BPL commercially only through a landlord-tenant model.\textsuperscript{203} Prompted by concerns that such a restrictive approach would hinder BPL deployment, the NYPSC decided to allow electric utilities to deploy BPL either through affiliates or unaffiliated entities.\textsuperscript{204} Furthermore, NYPSC affirmed its original conclusion that electric utilities are prohibited from providing BPL competitively in the broadband market.\textsuperscript{205} The NYPSC supports affiliate transactions provided that rules are established to prevent cross-subsidization and ensure that competition is not impaired.\textsuperscript{206} Beyond requiring affiliate transaction rules, New York goes a step

\textsuperscript{199} Id. at 21.
\textsuperscript{200} Id.
\textsuperscript{202} Id. at 8.
\textsuperscript{203} Id. at 6.
\textsuperscript{204} Id.
\textsuperscript{205} Id.
\textsuperscript{206} Id.
Further than Texas and California by requiring an incumbent electric utility, when it wishes to deploy BPL through an affiliate to "demonstrate to the Commission that qualified independent providers were unwilling to enter into a comparable arrangement with the utility." Consequently, if an unaffiliated entity is willing to contract with an electric utility in the same manner as an affiliated entity, the electric utility may be forced to contract with the unaffiliated entity despite preferring to contract with an affiliated one. Furthermore, where the unaffiliated entity is unable to offer a "comparable arrangement" the utility must make a case for why the affiliate should be allowed to participate by showing the commission that customers and competition are not to be harmed.

New York’s approach to safeguarding against cross-subsidization, unlike Texas and California, does not involve explicitly distinguishing which costs may be allocated to ratepayers. Rather, the NYPSC focuses on managing affiliate transactions by treating unaffiliated entities preferentially and requiring utilities to convince the commission that the use of an affiliate is appropriate. While this approach may seem inconsistent with the proposed emerging trend of state legislatures and public utility commissions to alleviate cross-subsidization by clearly dividing BPL-related costs between those used for utility applications and those used for commercial broadband service, New York’s efforts, in fact, implicitly comport with this trend. As mentioned above, NYPSC agrees with the notion that neither the utility nor its customers should subsidize the efforts of a BPL affiliate to deploy BPL commercially. Seeking to preserve fair competition and to protect electric ratepayers, NYPSC in particular addressed circumstances where ratepayer funds may not be used to support BPL utility application functions. Specifically, where a utility must perform maintenance on the BPL system, whether through the use of the utility’s own employed personnel or through contractors, protocols should be established to ensure that only those costs associated with maintaining BPL for utility applications are allocated to ratepayers. Therefore, NYPSC’s general concern for protecting electric utility customers and preferred method of handling BPL system maintenance costs indicates that New York’s policy is aligned with the trend set by Texas and California to avoid cross-subsidization.

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207 Id.
208 Id.
209 See id.
210 Id.
211 Id. at 7.
212 Id.
4. Arkansas

In 2007, the General Assembly of Arkansas enacted enabling legislation for BPL deployment. According to this act, an electric utility, affiliate, or an unaffiliated entity may own, “construct, maintain, and operate a broadband system and provide broadband services on an electric utility’s electric delivery system.” On the issue of cross-subsidization, Arkansas incorporated language that continues the trend of delineating those costs and revenues that may be allocated to electricity ratepayers and those that may not. Foremost, the legislation includes an aspect of the functional approach to preventing cross-subsidization. It states that “[t]he costs incurred . . . shall be allocated to the electric utility’s accounts between regulated broadband services and nonregulated broadband services in accordance with applicable accounting principles and standards.” Arkansas provides further explanation by differentiating between regulated and nonregulated broadband services. Namely, it states that nonregulated broadband services are “outside the scope of an electric utility’s providing of electric service to the public” and as such, “[s]hall not be recoverable through its rates for the providing of electric service.”

These provisions reflect the concern that Arkansas shares with its predecessors, Texas, California, and New York, that the deployment of BPL presents cross-subsidization concerns. While such efforts comport with the trend of clearly distinguishing how costs should be allocated between the regulated and nonregulated services, Arkansas uniquely includes the application of general accounting principles. Such a distinction offers additional assurance that the allocations of BPL related costs are appropriate.

V. PROPOSED STANDARD OF REVIEW FOR CROSS-SUBSIDIZATION

The endeavors by Texas, California, New York, and Arkansas to minimize BPL related cross-subsidization by clearly distinguishing which costs electric ratepayers may cover is an appropriate step. It is a reasonable and logical distinction that may provide clarity to electric utilities as they pursue BPL deployment, both for its utility operation benefits and for the provision of broadband services. Nevertheless, it remains uncertain how states will properly manage that distinction. It is also unclear how state utility commissions and

214 Id. § 23-18-703(a).
215 Id. § 23-18-706(b)(1).
courts will determine whether questionable rate payer fund allocations constitute cross-subsidization.

A. Existing Cross-Subsidization Standards

The CPUC's Opinion Implementing Policy on BPL deployment provides for general review of BPL service purchases such that the purchases must be "justified on the basis of utility benefits."\(^{217}\) Furthermore, the policy provides for "significant oversight over" BPL affiliate transactions.\(^{218}\) The Commission requires a review of all BPL affiliate transactions to ensure the fair market value standard is satisfied.\(^{219}\) While it is commendable that the Commission is proactively addressing cross-subsidization concerns, such involved oversight is inappropriate. Requiring utilities and their affiliates to survive Commission review each time a transaction occurs is too burdensome and may become a disincentive to deployment.

Comparatively, the Texas legislature does not explicitly state by which standard electric ratepayer cost allocations for BPL smart grid capabilities are to be reviewed.\(^{220}\) Rather, the standard that a commission or court would use to review cross-subsidization claims may be extracted from the language of SB 5, textually drawing a line between those funds that may be allocated to ratepayers and those that may not. Specifically, any capital investments allocated to electric ratepayers must be "used and useful" and any fees or operating expenses allocated to electric ratepayers must be "reasonable and necessary."\(^{221}\)

The Texas standard requiring that capital investments be "used and useful" is inappropriate. First, qualifying capital investments with the term "used" does provide some limitation by confining the use of electric ratepayer allocations to those investments that were "used" and not merely to those investments that were made. Where the utility has made an investment not used for the purpose of obtaining BPL utility applications, ratepayers may not bear the burden of aiding the utility in recovering the cost. Furthermore, such a limitation also encourages utilities to make wise investment choices. The "useful" component of this qualifying term poses a problem because it is a low standard that does not encourage the utility to modestly consider capital investments. As long as the utility uses the investment, even if the investment is not necessary or reasonable, the utility may allocate the cost of usage to electric ratepayers so long

\(^{217}\) California Policy on BPL, supra note 168, at 17.

\(^{218}\) Id. at 21.

\(^{219}\) Id.

\(^{220}\) See TEX. UTIL. CODE ANN. § 43.102 (Vernon 2006).

\(^{221}\) Id. § 43.102(a).
as the utility can at least show that it was useful. Such a low standard may not sufficiently protect electric ratepayers from unnecessary investments.

The "reasonable and necessary" standard applicable to fees and operating expenses associated with BPL for utility applications is also insufficient. Because BPL deployment is still a new technology, the requirement that expenses and fees not only be reasonable, but also necessary, is too restrictive. While BPL deployment has moved forward in Texas, it may be difficult to ascertain the necessary expenses and fees.\textsuperscript{222} A lesser standard, though not quite as low as "useful," may be more appropriate to properly strike a balance between avoiding cross-subsidization and incentivizing electric utility forays into BPL deployment.

NYPSC provides even less clarity as to how a commission or court may review claims of cross-subsidization. The only guidance NYPSC provides is the burden it places on electric utilities seeking to use an affiliate for the provision of BPL communications services. Electric utilities must show the commission that any affiliate transaction agreements entered into do not harm customers or competition.\textsuperscript{223} Such a showing merely reflects the commission's reservations regarding affiliate transactions. It only relates to the commission's review of prospective affiliate arrangements and not to how the NYPSC would review questionable allocations of electric ratepayer funds.

Finally, beyond the unique requirement that general accounting principles be applied when determining the proper allocation of BPL costs, Arkansas also fails to provide a suitable standard of review. Unlike Texas and California, Arkansas makes no mention of reasonableness or any other qualifying language akin to a reasonableness review. Although appropriate, merely providing for functional separation alone will not provide an appropriate framework for reviewing cost allocations potentially constituting cross-subsidization.

B. Proposed Standard of Review

As evidenced by Texas, California, New York, and Arkansas, safeguarding against cross-subsidization begins with unambiguously drawing a line between those costs that may be allocated to electric ratepayers and those costs that may not. Such a distinction is fair and reasonable. It ensures that electric ratepayers

\textsuperscript{222} As of 2006, Texas initiated two deployments of BPL. First, in June of that year, a partnership was established between CenterPoint Energy and IBM to jointly perform studies on BPL deployment and to engage in a small scale demonstration in Houston. Second, in December, Texas Electric Delivery partnered with CURRENT Communications to deploy BPL in a region, including Dallas, serving approximately two million customers. 2005 NARUC REPORT, supra note 21, at 5.

\textsuperscript{223} NYPSC POLICY STATEMENT, supra note 201, at 7.
subsidize only the services from which they receive a benefit. While this distinction is appropriate and provides a solid foundation to avoid cross-subsidization, attention must be given to enforcing that line should the need arise. The goal of state regulators to address the issue of cross-subsidization should not stop short of providing an appropriate standard by which electric utilities may be reviewed. Accordingly, this Comment proposes a more appropriate standard for reviewing claims of cross-subsidization, namely, *any operating expenses related to BPL deployment for the provision of utility applications must be shown, upon review when necessary, to be reasonable and substantially supported by appropriate accounting principles.*

Because state regulators and the FCC are concerned with providing ample incentives for electric utilities to pursue BPL both for its electric grid enhancements and broadband service, a reasonableness standard requires the utility to make a fairly strong showing that any funds derived from electric ratepayers to support BPL deployment were in fact used to enhance the provision of electricity. Furthermore, this standard allows the utility a modicum of leeway, so that an electric utility is not held accountable for cross-subsidization covering the marginal costs of BPL deployment, where such an occurrence may not be easily avoided. Additionally, this language does not permit a utility commission to review every use of electric ratepayer funds to support BPL utility applications because such a requirement would be administratively cumbersome. Rather, cost allocations may be reviewed when necessary. For example, when a claim of cross-subsidization is made against a BPL provider or the commission becomes aware of such a problem, then the standard may be applied to guide such review. Finally, this level of review incorporates a requirement that the allocation of electric ratepayer funds be supported by proper accounting. Incorporating this form of the functional approach into determining whether electric ratepayer funds are properly justified by BPL utility applications not only requires the BPL provider to show that it has properly allocated the costs, but also encourages BPL providers to maintain sound accounting records of their transactions.

As a whole, this proposed standard complements state efforts to avoid cross-subsidization while providing suitable guidance to determine whether a BPL provider has participated in cross-subsidization. At this point in the development of BPL, states are called upon to "tailor appropriate regulatory roadmaps and responses" to difficult regulatory issues such as cross-subsidization. While a "minimally intrusive approach" encourages the deployment of new

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224 See 2005 NARUC REPORT, supra note 21, at 22.
225 Id. at 3.
226 Id. at 4.
broadband technologies, such a nuanced modification of state legislative and policy efforts is still appropriate. This proposal is crafted to support the regulatory trend that states are initiating to resolve cross-subsidization concerns, bearing in mind the states’ competing interests in encouraging electric utilities to deploy BPL.

VII. CONCLUSION

BPL is an exciting development in broadband technology. Compared to other new technologies making computers smaller, phones sleeker, and Internet connections invisible, BPL is a case of taking something old and antiquated-in-appearance and making it new. Where approximately ninety-seven percent of homes and businesses in the United States have electricity,²²⁷ the potential breadth of BPL is extremely enticing.

Beginning only a few short years ago, the FCC embarked on an effort to guide the deployment of BPL through its initial obstacle, RF interference concerns. Although RF interference is still a concern among some members of the telecommunications community, a great deal has been achieved to mitigate such effects from BPL use. Furthermore, the FCC has stayed true to providing a market-oriented competitive framework for broadband services as it concluded that BPL is an information service, exempt from Title II common-carrier regulations akin to its potential competitors, DSL and cable. Consistent with its “light regulatory touch,”²²⁸ the FCC has gone no further in regulating BPL. Rather, state legislatures and utility commissions have taken the lead, offering regulatory certainty where necessary.

States such as Texas, California, New York, and Arkansas have taken the greatest leaps forward by enacting legislation, crafting policy statements, and giving due attention to important regulatory issues such as pole attachment fees, BPL business models, and cross-subsidization. In an effort to address cross-subsidization, a trend is emerging among states to unambiguously indicate which BPL-related costs may be allocated to electric ratepayers. Namely, a BPL provider may allocate the costs of BPL deployment for utility applications to electric ratepayers as they are the class receiving the benefit. While such a distinction is appropriate for its clarity and ease of application, states have fallen short of providing a suitable standard for enforcing that distinction should the need arise.

²²⁷ UPLC White paper, supra note 46, at 1.
²²⁸ Information Service Memorandum Opinion and Order, supra note 130, at 13,298 (statement of Commissioner Deborah Taylor Tate).
Consequently, after consideration of the efforts by Texas, California, New York, and Arkansas, this Comment proposes a more appropriate standard that strikes a balance between providing a suitable and complete solution to cross-subsidization and ensuring that any cross-subsidization related regulation does not discourage BPL deployment. As states continue to enact legislation and craft policies for BPL deployment, they should consider application of this standard of review when determining whether BPL-related cost allocations constitute cross-subsidization. This standard comports with the federal government and various state efforts to deploy BPL as a means of creating a more robust broadband market, while assuring that such deployment does not occur at the expense of fair competition and electric ratepayers’ pockets.