

**BEFORE THE  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC**

**In the Matter of** )  
 )  
**Inquiry Regarding Carrier** ) **ET Docket No. 03-104**  
**Current Systems, Including** )  
**Broadband over Power Line Systems** )

**To: The Commission**

**JOINT REPLY COMMENTS OF  
THE NATIONAL RURAL TELECOMMUNICATIONS COOPERATIVE  
AND THE NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION**

The National Rural Telecommunications Cooperative (NRTC) and the National Rural Electric Cooperative Association (NRECA) have reviewed the initial comments filed in this docket and hereby submit these Reply Comments.<sup>1</sup> NRTC and NRECA welcome the advent of new technology such as broadband over power line (BPL) and the advancement of existing technologies looking toward a competitive broadband marketplace for rural Americans. This not only will ensure broadband access but will lead to lower prices and improvements in technology.

We urge the Commission to allow BPL deployment but to refrain from establishing new rules -- or relaxing existing rules -- until it is determined with confidence that interference can be limited to acceptable levels. We also urge the Commission to encourage a multifaceted competitive approach to broadband deployment that will best ensure rural Americans are fully served.

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<sup>1</sup> Notice of Inquiry Regarding Carrier Current Systems, including Broadband over Power Line Systems, ET Docket No. 03-104, 18 FCC Rcd. 8498 (2003).

## **I. BACKGROUND.**

1. NRECA is the not-for-profit, national service organization representing 930 rural electric systems that provide electric service to 36 million customers, or approximately 12 percent of the U.S. population. Rural electric cooperatives are found in 47 states and in 2,500 of the nation's 3,128 counties. Many NRECA members are, as are other electric utilities, providing a full range of telecommunications services to consumers.

2. NRTC is a not-for-profit cooperative comprised of 750 rural electric cooperatives, 128 rural telephone cooperatives and 189 independent rural telephone companies located throughout 46 States. Since its founding in 1986, NRTC's mission has been to provide advanced technologies and telecommunications services to rural America.

## **II. REPLY COMMENTS.**

### **A. The Importance of Broadband to Rural America.**

3. NRECA, NRTC and their Members feel strongly that the availability of always-on, high-speed broadband Internet service is essential to the quality of life and productivity of business in rural America. NRTC and NRECA firmly believe that widespread broadband availability will enable new and improved products, services and opportunities to reach rural people and businesses. As NRTC and NRECA noted in comments filed in 2001 with the National Telecommunications and Information Administration (NTIA), broadband capability can enable rural economic development, distance learning, telemedicine, and community development and well-being.<sup>2</sup>

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<sup>2</sup> See Comments of the National Rural Telecommunications Cooperative, pp. 3 - 11; Comments of the National Rural Electric Cooperative Association, pp. 1 - 8, submitted in response to National Telecommunications and Information Administration, Docket No. 011109273-1273-01, Deployment of Broadband Networks and Advanced (continued . . .)

4. The impact of broadband services on the economic and social well-being of the United States cannot be overstated. Without access to broadband services, persons living in rural areas are unable to compete on the same level as urban Americans.<sup>3</sup> The NTIA and the Department of Agriculture's Rural Utilities Service (RUS) recognized the importance of broadband services to rural America when they stated in a joint report that "the rate of deployment of broadband services will be key to the future economic growth of every region, particularly in rural areas that can benefit from high-speed connections to urban and world markets."<sup>4</sup>

5. This goal of universal access to broadband services is one strongly championed by the Commission. NRTC and NRECA agree with Chairman Powell's belief that a "principal objective" for broadband policy should be the "commit[ment] to achieving universal availability of broadband."<sup>5</sup>

6. NRECA, NRTC and their Members commend the Commission for its recognition of the importance of broadband Internet service to rural America and welcome the Commission's

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Telecommunications, 66 Fed.Reg. 57941 (2001). The initial Notice contained an incorrect date for the deadline, but a correction was published the following week. See 66 Fed.Reg. 59050 (Nov. 26, 2001).

<sup>3</sup> See e.g. Third Report, In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps To Accelerate Such Deployment, 17 FCC Rcd. 2844, ¶95 (released Feb. 6, 2002) (*Third Broadband Report*), noting the fear of some communities that "a lack of infrastructure to support advanced services could prevent communities from attracting businesses and pursuing economic development opportunities." See also Jim Hopkins, *In Rural Areas, Fast Net Service Vital but Elusive; Speed Needed to Attract Businesses*, USA Today, Nov. 12, 2001, at E4 ("Economic development leaders...view broadband as important as sewer, gas and other utilities when attracting firms. That's because lack of high-speed service makes it tougher for rural areas to create, recruit and keep firms that benefit from fast Internet access."); Alexia Bowie, *Success Stories from the States*, Rural Telecommunications, Jan. 1, 2001 (At a press conference announcing the network, North Dakota's chief information officer was quoted, "All business will need broadband access to be competitive...The simple reality is, businesses will go where higher speed access is available, period.").

<sup>4</sup> National Telecommunications and Information Administration and Rural Utilities Service, *Advanced Telecommunications In Rural America: The Challenge of Bringing Broadband Service to All Americans*, pg. ii. (April, 2000).

<sup>5</sup> Press Conference of Chairman Michael K. Powell, Federal Communications Commission, Digital Broadband Migration Part II, Oct. 23, 2001 (Press Conference).

efforts to support and expedite the availability of rural broadband Internet service over multiple delivery platforms. Because of lower consumer density and a continuing economic depression of the telecommunications industry, DSL and cable modem, the two primary broadband platforms today, will not reach significant portions of rural America anytime soon. The length of the loop, the high cost of deployment, low demand by consumers, and the lack of cost-effective equipment scaled for smaller companies create major barriers to the deployment of advanced services to rural areas.<sup>6</sup>

7. Therefore, it remains imperative that the Commission continue to foster the development of new technologies, such as BPL, as well as others such as satellite broadband and fixed wireless, as it strives to achieve its strategic objective of promoting the availability of broadband to all Americans.<sup>7</sup>

**B. BPL Technology May Not Be a Viable Broadband Alternative for Rural Americans in the Near Future.**

8. NRECA, NRTC and their member rural electric cooperatives are keenly interested in BPL as an emerging technology that could help extend broadband to rural consumers. NRTC's and NRECA's market research indicate that roughly half of rural Americans have access to the Internet, but that the great majority of those have only dial-up access with no real prospects for a broadband connection any time soon.<sup>8</sup> Although the Commission noted the increased deployment of broadband services, it concluded that most areas outside of major cities do not have multiple advanced service providers," and that these same communities "may not

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<sup>6</sup> *Third Broadband Report*, ¶113.

<sup>7</sup> The Commission's upcoming Rural Wireless ISP Showcase is a good first step for exploring broadband options available to rural consumers.

<sup>8</sup> NRECA and NRTC, *Broadband for Rural America 2002 Status Report*, April 2002.

see the benefits of price competition.”<sup>9</sup> It would be a boon for rural Americans if it were possible to connect to the Internet economically and reliably at high speeds for long distances over rural power lines, since these lines already extend to nearly every rural home and business.

9. NRECA and NRTC have been closely monitoring the state of BPL technology, the status of BPL developers and vendors, and the viability of BPL for rural consumers. In 1997, NRECA’s Cooperative Research Network (CRN) completed an investigation of the potential of power line carrier for high speed data communications. The research project determined that high speed data communications over power lines was not viable nor would it be for several years due to technical and economic barriers. In 2000, NRECA’s CRN and NRTC co-sponsored an investigation to update the status of high speed data communications via power line carrier. The investigation did not reveal any developer or vendor at the time that appeared likely to surmount the interrelated and combined technical and economic hurdles.

10. In 2001 and 2002, BPL development activity accelerated and new developers and vendors and other organizations appeared. Earlier this year, NRECA’s CRN and NRTC co-sponsored a research project to again investigate the prospects of BPL for rural consumers. The results were presented in a conference in Cincinnati on July 28 and 29, 2003, that was attended by approximately 150 electric cooperative representatives.<sup>10</sup> All but one of the leading BPL vendors in the U.S. participated as presenters and exhibitors.

11. The 2003 CRN/NRTC investigation revealed several existing and new developers and vendors that are making progress with BPL technology for deployment in the United States. They are working to overcome the technology barriers. Developers and vendors are projecting

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<sup>9</sup> *Third Broadband Report*, ¶97.

<sup>10</sup> The conference agenda is attached hereto as Exhibit A.

equipment and service costs for commercial production that could be competitive with other broadband technology options for urban and suburban deployment.

12. However promising these developments may appear to be, the 2003 CRN/NRTC investigation also suggests that BPL will not be a viable solution for most Americans in truly rural areas any time soon. The very limited deployment of BPL technology within the U.S. involves traversing only a mile or two of power distribution lines in areas with relatively dense population. Many rural Americans are served by electric distribution lines that are many miles long with as few as one or two consumers per mile of line along many parts of the line. To date, no BPL system has been demonstrated to work, much less been commercially deployed, on a long, sparsely populated rural electric power line.

13. NRECA and NRTC are aware of the existence of numerous distribution feeder lines owned by rural electric cooperatives that are more than 20 miles in length, and some lines that transverse distances of well over 100 miles. Even if BPL technology proves to be reliable and does not cause unacceptable radio frequency interference in rural deployment, the economics will likely be prohibitive for some time to come. This is because signal repeaters or regenerators will be required at intervals as small as one-fourth to three-fourths of a mile along lengthy rural power lines. In addition numerous new network access points (NAP) and backhaul lines to NAPs will be needed to connect these rural lines to the Internet backbone.

14. NRTC, NRECA and their Members do not believe that there is sufficient data available to draw valid conclusions about the technical performance of BPL in urban or rural settings because of the extremely limited volume and concentration of deployment in the United States. It appears that there are far fewer than 1,000 retail subscriber endpoints presently in service in the United States. None of them is deployed with a significant penetration of potential

subscribers in a proximate geographical area. Only with actual data on performance and radio frequency interference for BPL in a full deployment environment will it be possible to predict with confidence that there will be no adverse interference with other wireless or wire-line applications or users. There have been reports of adverse experience with unintentional radiation effects in Europe and Japan leading to restriction of BPL deployment there.<sup>11</sup>

**C. Suggested Changes to the Commission's Rules From the BPL Industry Warrant Further Consideration by the Commission.**

15. The BPL industry has suggested that the Commission's Part 15 requirements be relaxed for BPL in rural areas to help overcome the technical and economic barriers.<sup>12</sup> Again, insufficient field data exists to demonstrate persuasively that interference or other adverse effects can be maintained at acceptable levels.

16. NRTC, NRECA and their Members are further concerned about the absence of standardization of communications protocols between and among the developers and vendors. The equipment and systems that they propose to provide are not interoperable with each other. The emerging developers and vendors are all relatively young start-ups operating with venture capital. It is not certain that any of them will prevail. It is likely that one or more will not. As a result, a rural electric utility could be stranded with a useless technology if it should happen to choose a BPL supplier that does not successfully make the often lengthy transition from funded startup to commercial viability. Standardization of communications protocols could prevent

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<sup>11</sup> See e.g. Power Line Communications (PLC) and Amateur Radio < [http://www.arrl.org/tis/info/HTML/plc/#Amateur Interference Studies](http://www.arrl.org/tis/info/HTML/plc/#Amateur_Interference_Studies) > (visited Aug. 5, 2003).

<sup>12</sup> See e.g. Comments of Southern Linc, Southern Telecom, Inc. and Southern Company Services, p. 18 (July 7, 2003), stating its belief that "testing will show that [the Commission's Part 15] rules can be relaxed, which could greatly facilitate the provision of BPL to less populated areas." Comments of Electric Broadband, p. 8 (July 7, 2003), concluding that "test data will show that emission limits can be raised without causing harmful interference to other users." Comments of the United Power Line Council, p. 10 (July 7, 2003), stating that "[i]f anything, the existing [Part 15] rules may be too stringent and unnecessarily limit the range of BPL."

such stranded investment from occurring. We urge the Commission to encourage standardization.

**D. Multiple Platforms for Broadband Delivery Will Best Meet the Needs of Rural Americans.**

17. NRTC and NRECA strongly believe that a single broadband option will not fit the needs of rural America. In many parts of rural America, DSL and cable are simply not available, or are limited in scope.<sup>13</sup> In particular, there continues to be a “significant disparity in access to advanced services between those living in rural population centers and those living in sparsely-populated outlying areas.”<sup>14</sup>

18. Moreover, recent reports suggest that “[broadband] investment in rural areas appears to be slowing,”<sup>15</sup> and that “the provision of high-speed DSL Internet service may not be economically viable in many rural areas for rural telephone carriers.”<sup>16</sup>

19. In other locations wireless systems also have their limitations. Ground-based alternatives that propose to use line-of-sight, wireless technology for providing broadband face significant infrastructure hurdles. Wireless technologies will still be required to build many relay stations in the vicinity of each and every rural community where wireless service is to be

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<sup>13</sup> *Third Broadband Report*, ¶109. In separate statements, Commissioners Copsps and Martin expressed concern regarding these statistics. Commission Michael Copsps stated his belief that “the Commission must ensure that communities are not being left behind. Importantly, the Report states that certain citizens – those living in rural or insular areas or on tribal lands, those with low incomes, and those with disabilities – are at significantly greater risk of not having access to broadband.” *See Third Broadband Report, Dissenting Statement Of Commissioner Michael Copsps*. Similarly, Commissioner Kevin J. Martin stated that while the digital divide may indeed be narrowing, “there is no question that the continued lag is far from ideal. Moreover, the fact that a particular zip code contains one subscriber to a service does not necessarily indicate that the service is widely available.” *See Id.* Separate Statement Of Commissioner Kevin J. Martin.

<sup>14</sup> *Third Broadband Report*, ¶109.

<sup>15</sup> *Id.*, ¶113.

<sup>16</sup> *Id.*, ¶114.

delivered. As such, this option also offers only limited delivery of broadband services to specific rural communities.

20. For ground-based technologies to provide service to small, rural areas, they must dedicate an inordinate amount of time, money and manpower. The economic incentive to justify that type of commitment throughout all nonserved and underserved areas of the country has not been demonstrated. As noted during the Commission's recent rural initiatives meeting, "the question for rural America is how to overcome the traditional limitations of wires, including fiber and coaxial cable where they really don't make economic sense due to low density."<sup>17</sup>

21. It is expected that Ka band satellite technology will offer true broadband service throughout the country in 2004. NRTC has entered into a partnership with WildBlue to offer this type of service to rural utilities and affiliates. Collectively, through WildBlue, both rural electric and telephone systems will be able to offer broadband access to all of their consumers -- even those in the most isolated areas. Satellite may provide in the near future the only available broadband option for rural Americans.

### **III. CONCLUSION.**

22. While broadband over power line is promising, much more information is needed before it can be determined with confidence that BPL will be a viable broadband platform for rural America. The following recommendations are offered as the Commission reviews the record in this proceeding and weighs its options for regulatory action:

- Without conclusive evidence of unacceptable performance, BPL deployment should not be banned or severely restricted because BPL may prove to be a viable broadband solution in certain circumstances.

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<sup>17</sup> Statement of Dr. Robert Pepper, Chief, Policy Development, Office of Strategic Planning and Policy Analysis (Aug. 6, 2003).

- BPL interference requirements should not be endorsed or relaxed without more conclusive evidence that interference to wireless or wire-line applications can be limited to acceptable levels.
- Because there are significant unresolved technical and economic issues at this time, BPL should not be presumed to be the only technology that can significantly, much less completely, close the rural digital divide.

23. NRECA and NRTC stand ready to assist the FCC with any additional investigation into BPL and other technologies that promise to make affordable broadband available to all rural Americans.

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**August 20, 2003**

# Broadband Over Power Lines: The Potential for Rural Utilities

A conference co-sponsored by NRECA's Cooperative Research Network and the National Rural Telecommunications Cooperative

July 28-29, 2003  
Hilton Netherland Plaza Hotel  
Cincinnati, Ohio

Is the emerging technology of moving broadband signals over power lines a viable option for electric cooperatives? Does it have the potential to expand Internet access and improve high-speed communications in rural America? NRECA's Cooperative Research Network (CRN) and the National Rural Telecommunications Cooperative (NRTC) are co-sponsoring a conference July 28 and 29 in Cincinnati to answer these questions.

## Session Descriptions

### Monday, July 28

**8:00 – 8:30**                    *Coffee and Continental Breakfast*

**8:30 – 9:00**                    Introduction and Welcoming Remarks

**9:00 – 10:00**                    What's The Real Scoop On Broadband over Power Lines (BPL)?

Broadband over Power Lines has received increased media attention in the U.S. in recent months, triggered by trials of the technology at several utilities and remarks from the Federal Communications Commission. In this overview talk we'll begin separating fact from fiction. How does BPL work? Who are the players? Who are the competitors?

This session will offer some facts and perspectives to keep in mind as attendees listen to the sessions that follow.

**10:00 – 10:15**                    *Break*

**10:15 – 12:00**                    BPL Technology Vendor Presentations

As many as six BPL vendors will discuss their products and services, business and economic models, target markets, product roadmaps, and technical viability. Each vendor will be responding to a set of questions to help the audience compare 'apples to apples'.

**12:00 – 1:00**                    *Lunch*

**1:00 – 2:45**                    BPL Technology Vendor Presentations (continued)

The BPL vendor presentations continue.

**2:45 – 3:45**      **What Is The Experience To Date Of Utilities Testing BPL?**

Up to three utilities with testing and early commercial experience with BPL will discuss their field trials and deployment strategies.

**3:45 – 4:00**      ***Break***

**4:00 – 5:30**      **How Feasible Is BPL For Rural Utilities?**

We will focus in on an analysis of BPL as a potential service at rural electric cooperatives. As an exercise to test the business modeling in a “real-world” application, two electric cooperative case studies will be presented, and attendees will be asked to evaluate the costs and benefits.

**6:00**      ***Reception – Visit Vendor displays***

**Tuesday, July 29**

**8:00 – 8:30**      ***Coffee and Continental Breakfast***

**8:30 – 9:15**      **Point/Counter Point Panel Assesses BPL**

Is the viability of BPL in the eye of the beholder? We will pick up where we left off in the last session with a Point/Counterpoint three-way discussion that includes a BPL proponent, a skeptic and a middle-of-the-roader. Panelists will challenge each other’s facts, opinions and assumptions and hopefully shed light on whether BPL is an answer for rural communications needs.

**9:15 – 9:45**      **Regulatory Impacts on BPL**

This session will review the FCC’s recent Notice of Inquiry (NOI) on Broadband Power Line Systems and explore the implications of regulatory action on the deployment of BPL.

**9:45 – 10:30**      **BPL Networking Basics, Deployment and Operations**

We’ll give you an understanding of the planning and resources required for establishing a BPL business, from customer issues and back office integration to data networking, device deployment and operation of the data infrastructure.

**10:30 – 10:45**      ***Break***

**10:45 – 12:00**      **BPL Strategic Partnerships**

Building strategic partnerships may be critical to the successful implementation and operation of a BPL business.

**12:00 – 1:00**      ***Lunch***

**1:00 – 1:15**      **Financing a BPL Project**

What are the options and approaches to paying for the build-out of a BPL infrastructure?

**1:15 – 1:45**      **What's on Deck?**

What will the next generation of BPL offer in terms of bandwidth, cost, and interoperability? What standards are being developed for BPL?

**1:45 – 3:00**      **What Did We Learn At This Conference?**

This session is open only to co-op attendees and conference organizers. We'll assess what we learned over the two days, answer any remaining questions and arrive at some conclusions about the viability of the technology for electric cooperatives.

*The conference is a product of a joint research project of CRN's Marketing and Energy Services and Automation, Telecommunications & Information Technology task forces. For more information about the conference, please call Bob Gibson of CRN at 703.907.5853 or by email at [bob.gibson@nreca.org](mailto:bob.gibson@nreca.org)*

# Broadband Over Power Lines: The Potential for Rural Utilities

A conference co-sponsored by NRECA's  
Cooperative Research Network and the  
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Cooperative

July 28-29, 2003

Hilton Netherland Plaza Hotel  
Cincinnati, Ohio

MONDAY, JULY 28

8:00 - 8:30 Coffee and Continental Breakfast

8:30 - 8:45 Introduction and Welcoming Remarks  
Bob Gibson, CRN

8:45 - 10:00 What's The Real Scoop On Broadband over Power Lines (BPL)?  
David Shpigler, Electric Broadband  
Steve Collier, NRTC

Broadband over Power Lines has received increased media attention in the U.S. in recent months, triggered by trials of the technology at several utilities and remarks from the Federal Communications Commission. In this overview talk we'll begin separating fact from fiction. How does BPL work? Who are the players? What is the competition?

This session will offer some facts and perspectives to keep in mind as attendees listen to the sessions that follow.

10:00 - 10:15 Break

10:15 - 12:00 BPL Technology Vendor Presentations  
Jorge Luis Schcolnik, EBA  
Joe Cufari, Current Technologies  
Steve Turner, IBEC

Six BPL vendors will discuss their products and services, business and economic models, target markets, product roadmaps, and technical viability. Each vendor will be responding to a set of questions to help the audience compare 'apples to apples'.

12:00 - 1:00 Lunch

1:00 - 2:45 BPL Technology Vendor Presentations (continued)  
Joe Marsili, Main.net  
Jeffrey Tolnar, Amperion  
Richard Lynn, DSz

- 2:45 - 3:45**      **What Is The Experience To Date Of Utilities Testing BPL?**  
 Tim Sweeney, PPL Telcom  
 Mike McWaters, Cullman Electric Cooperative  
 Allen Todd, City of Manassas
- Three utilities with testing and/or early commercial experience with BPL discuss their field trials and deployment strategies.
- 3:45 - 4:00**      **Break**
- 4:00 - 5:30**      **How Feasible Is BPL For Rural Utilities?**  
 David Shpigler, Electric Broadband
- We will focus in on an analysis of BPL as a potential service at rural electric cooperatives. As an exercise to test the business modeling in a "real-world" application, two electric cooperative case studies will be presented in detail. We will use the case studies as the basis of general discussion, and attendees will be invited to offer their utility service area characteristics for a thumbnail evaluation of costs and benefits.
- 6:00 - 7:00**      **Reception - Visit Vendor displays**

**TUESDAY, JULY 29**

- 8:00 - 8:30**      **Coffee and Continental Breakfast**
- 8:30 - 9:15**      **Point/Counter Point Panel Assesses BPL**  
 Marty Gordon, CRN  
 Lance Rosen, Electric Broadband  
 Steve Collier, NRTC
- Is the viability of BPL in the eye of the beholder? We will pick up where we left off in the last session with a Point/Counterpoint three-way discussion that includes a BPL proponent, a skeptic and a person in the middle. Panelists will challenge each other's facts, opinions and assumptions and hopefully shed light on whether BPL offers an answer for rural communications needs.
- 9:15 - 9:45**      **Regulatory Impacts on BPL**  
 James Stenger, Thelen, Reid & Priest  
 Brett Kilbourne, United Telecommunications Council
- This session will review the FCC's recent Notice of Inquiry (NOI) on Broadband Power Line Systems and explore the implications of regulatory action on the deployment of BPL.
- 9:45 - 10:30**      **BPL Networking: Basics, Deployment and Operations**  
 Lance Rosen, Electric Broadband  
 John Loe, JDL Strategic Management  
 Henry Quinten, Finepoint Technologies
- We'll give you an understanding of the planning and resources required for establishing a BPL business, from customer issues and back office integration to data networking, device deployment and operation of the data infrastructure.

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Steve Collier, NRTC  
David Shpigler, Electric Broadband

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Steve Collier, NRTC

What are the options and approaches to paying for the build-out of a BPL infrastructure?

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Lance Rosen, Electric Broadband

What will the next generation of BPL offer in terms of bandwidth, cost, and interoperability?  
What standards are being developed for BPL?

1:45 - 3:00 **What Did We Learn At This Conference?**  
Lance Rosen, Electric Broadband  
David Shpigler, Electric Broadband  
Ralph Abbott, Plexus Research  
John Lee, JDL Strategic Management

This session is open only to co-op attendees and conference organizers. We'll assess what we heard and learned over the two days, answer any remaining questions and attempt to reach some conclusions about the viability of the technology for electric cooperatives.

The conference is a product of a joint research project of CRN's Marketing and Energy Services and Automation, Telecommunications & Information Technology task forces. For additional information about the CRN's research in broadband over power line, please contact Bob Gibson at 703.907.5853 or bob.gibson@nreca.coop, or Marty Gordon at 703.907.5840 or martin.gordon@nreca.coop.

## Certificate of Service

I HEREBY CERTIFY that on this 20<sup>th</sup> day of August, 2003, a true and correct copy of the foregoing Joint Reply Comments Of The National Rural Telecommunications Cooperative and the National Rural Electric Cooperative Association (ET Docket No. 03-104), was submitted electronically to the Federal Communications Commission and served via courier and electronic mail upon the following.

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