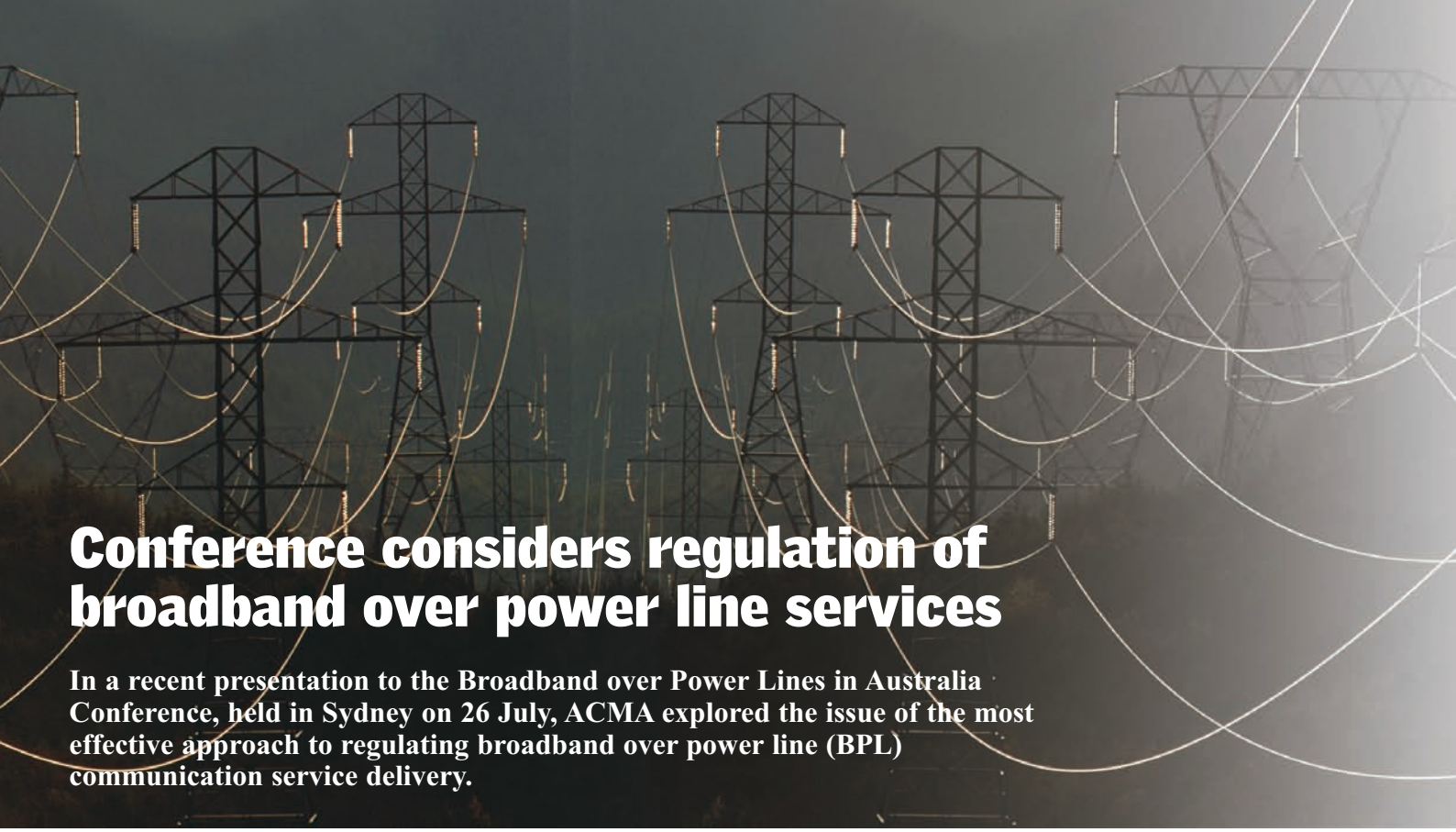

Conference considers regulation of broadband over power line services

In a recent presentation to the Broadband over Power Lines in Australia Conference, held in Sydney on 26 July, ACMA explored the issue of the most effective approach to regulating broadband over power line (BPL) communication service delivery.

BPL is one of a number of technologies that can be used to provide access to telecommunications services either within a premises or over what is colloquially known as the 'last mile', the link between a service provider and an end user. The technology behind BPL is not new, with the earliest version of communications over electrical supply infrastructure appearing in 1895. Recent advances in technology have significantly broadened the scope of power line communications, making the supply of broadband services possible, hence the term 'broadband over power line' or BPL.

Current versions of the technology involve the distribution of radiofrequency energy over an electrical supply network predominantly using frequencies in the range 2–34 MHz. As well as being a broadband access technology, BPL is also recognised as a valuable tool for electricity utilities, with proponents claiming it allows utilities unprecedented control over network operations and significant savings through efficient power management.

Some of the advantages claimed for BPL technology are that it:

- allows better network management and control by assisting in network management and security, offering advances on power line communications technology, which operates below 525 kHz, in enabling functions like automatic meter reading and real-time video-monitoring of facilities
- by offering an alternative to more traditional communications technologies such as DSL, cable and wireless technologies, increases competition in service provision, which can benefit consumers
- can provide a last mile or last 30 metres solution, depending on the technology and the topology of the deployment—often combined with other technologies in an overall network configuration
- uses existing infrastructure and has lower installation costs, which can be passed on to consumers, but the cost of adequate interference management needs to be taken into account and
- can reach where some other technologies are not economically viable—again because of the use of existing infrastructure and the ubiquitous nature of electrical infrastructure.

Three uses of BPL should be considered when looking at how the current regulatory arrangements apply and whether new arrangements are required for deployment of this technology.

'Access BPL' refers to the supply of broadband services, including voice, internet and video, over the electrical infrastructure, where the BPL is part of the technology used to carry broadband services from the service provider to the premises of the end user;

'In-house BPL' refers to the situation where BPL is used to distribute broadband services or signals within a building over the existing electrical wiring. In-house BPL can be used in multi-unit dwellings or office blocks without the need to rewire, which means costs are lower. It can be used for internet access, video streaming, in-building management and security.

As well as being an access technology for last mile delivery of broadband, BPL can be used by electrical utilities to **manage network operations and functions** such as automated meter reading, outage detection and restoration confirmation, remote monitoring and operation of switches, transformers and other network elements, and facility security through video surveillance.

BPL is attracting new players to the telecommunications sector—utilities more familiar with the distribution of electricity venturing into the telecommunications sector either on their own or in cooperation with existing telecommunications carriers. Utilities enabling their networks with BPL that is then used to supply carriage services become subject to the ACMA powers to regulate in respect of network operations, content and service provision.

New players in the communications sector are advised to understand the regulatory environment and the consequences of becoming a telecommunications carrier. Where they become a telecommunications carrier, they must understand the obligations they are taking on, particularly under existing telecommunications industry codes made under Part 6 of the *Telecommunications Act 1997*. They should also participate in the cooperative environment that exists between ACMA and the communications industry, by engaging with organisations like the Australian Communications Industry Forum.

REGULATORY REQUIREMENTS

ACMA has a suite of regulatory tools available that cover equipment supply and use, and service delivery in the telecommunications and radiocommunications environments for which it has responsibility. While ACMA recognises the economic benefits that may accrue from deployment of a broadband access technology such as BPL, it must address risks associated with deployment of a technology that, without effective management, could lead to adverse spectrum management outcomes.

While there is as yet no regulatory arrangement specifically for BPL, some aspects of a BPL network are already covered by existing regulatory arrangements. Equipment used in deploying BPL networks is subject to regulatory arrangements for electromagnetic compatibility (EMC) and, in some cases, arrangements applying to telecommunications customer equipment. The electrical networks over which BPL is deployed are subject to provisions in the *Radiocommunications Act 1992* regarding interference to radiocommunications services.

Carriers providing telecommunications services over BPL are also subject to industry codes under the telecommunications and broadcasting regulatory arrangements.

Perhaps the single most significant issue ACMA faces in dealing with the use of BPL technology for communications is the potential for radiocommunications interference. The interference potential of BPL depends on a larger set of variables than is usual, including factors such as the type of technology deployed, the levels at which communications occurs, the condition of the electricity network and the types of radiocommunications services that are deployed near those networks.

At an international level, there is no firm agreement on an appropriate standard or testing methodology for measurement of the emissions from BPL-enabled networks. This is partially due to differing opinions regarding the interference potential of the systems; the fact that many of the technologies are proprietary, with closely guarded performance characteristics, and that the technology has been undergoing rapid change and development, making benchmarking of performance difficult.

ACMA is working with industry both at a national and international level to keep abreast of developments in standardisation and to develop an Australian position on the requirements that should exist in any developed standards that may be adopted within Australia. ACMA, Standards Australia, peak bodies representing the utilities, BPL equipment vendors and organisations with an interest in the deployment of BPL are working together to facilitate the development of appropriate national standards and provide input for international standards.

Standards are but one part of the mechanism that will be needed to facilitate the deployment of BPL without that deployment being to the detriment of the effective and efficient use of the radiofrequency spectrum. ACMA's view is that whatever regulatory arrangement is implemented it should:

- serve to preserve the utility of the radiofrequency spectrum
- encourage dialogue and require ongoing consultation
- address interference management
- define compliance and
- use regulatory action as a last resort.

Any regulatory arrangement developed to address issues arising from BPL deployment must be within the bounds of the relevant Acts under which ACMA operates and must serve to address the concerns of end users. Various groups have expressed concern about BPL and believe its deployment needs to be effectively managed and that appropriate regulatory mechanisms need to be in place.

Broadcasters are concerned about the effect of BPL on reception of television and broadcast AM radio, particularly with the expected deployment of digital radio or DRM, which may be more sensitive to the types of interference produced by BPL. Other users of HF radio services include the Department of Defence, emergency service organisations, amateur radio operators and safety of life services. Each of these groups have expressed concerns about the raising of the HF noise floor and some believe the cumulative effects of larger BPL deployments will not necessarily be evident from the smaller scale deployments currently being conducted.

Another issue raising some concern is that of 'immunity' of equipment such as air conditioners and video and audio equipment to the BPL signals. Despite the conduct of several BPL trial deployments there is no evidence of equipment reacting to the presence of BPL on the power supply. While there are no mandatory immunity requirements in Australia under ACMA regulatory arrangements, devices such as medical equipment are required to meet mandatory immunity standards made by the Therapeutic Goods Administration (TGA). While from evidence to date immunity issues appear to be relatively low risk, the TGA arrangements for medical equipment serve to further reduce the immunity risk presented by BPL to sensitive medical equipment.

While the current regulatory arrangements can be enforced to protect the interests of affected parties when issues arise from BPL deployments, ACMA is working with industry members to develop more robust and proactive regulatory arrangements that meet the aims described earlier.

The regulatory options open to ACMA and industry to address the potential interference issues includes such things as voluntary industry codes, code development under Part 6 of the

Telecommunications Act, industry standards mandated through provisions within carrier licences or a combination of these options to achieve regulatory effect.

Each of these options has a proactive element serving to reduce risks of interference yet each has identifiable strengths and weaknesses. Any option or combination of options has the interference provisions within the Radiocommunications Act as a safeguard in the event of an interference issue arising.

TELECOMMUNICATIONS INDUSTRY CODE

If an industry code under Part 6 of the Telecommunications Act were implemented, ACMA could issue formal warnings or directions about the code requirements. If all users of BPL technology use that technology to provide broadband services, then the approach of using an industry code is attractive in that it is recognised and understood within the telecommunications industry, has sound compliance and enforcement options and aligns with current government policy on industry self-regulation.

While codes developed under Part 6 can incorporate many things including compliance requirements, and complaint handling and resolution processes, there are disadvantages which include:

- they do do not apply to electricity networks where BPL is used solely for network management, although the interference risk is similar
- they have reasonably long development times and are not easy to amend or replace in short time frames and
- while not impossible, making a technical requirement mandatory under a code is difficult—there need would to be clear grounds to establish that a radiocommunications emission level standard related to the telecommunications performance aspects of a code for BPL providers.

RADIOCOMMUNICATIONS EMISSIONS STANDARD

A radiocommunications standard regulating emissions for an installation or network is another regulatory option. While the Telecommunications and Radiocommunications Acts do not readily allow for making standards for performance of an installation or network, this form of radiocommunications standard could be incorporated into the requirements for a carrier licence, a voluntary industry code of practice or a code under Part 6 of the Telecommunications Act. In the case of an electricity supplier using BPL solely for network management, the standard only has effect as a performance benchmark that can be taken into account by a court in assessing whether a radiocommunications interference offence has been committed.

VOLUNTARY (ELECTRICAL INDUSTRY) CODE OF PRACTICE

A peak electrical industry body that could satisfy ACMA that it was representative of the entire industry—all those using BPL, not just those providing carriage services over BPL—could develop a suitable industry code of practice. The advantages of such an industry code are that it:

- would apply to all members of the sector—all utilities owning electrical infrastructure, not just those intending to supply access BPL
- could include compliance requirements, and complaint handling and resolution processes, common elements in telecommunications industry codes and possibly in electrical industry codes
- could provide for consultation requirements for deployment, operation and rollout of the BPL service, requiring utilities to consider sensitive locations such as receiver and transmitter sites, hospitals and other identified sensitive sites
- could reference emission standards or emission levels specified in standards, which could be amended as more appropriate standards become available—ACMA could investigate emission levels in an interference complaint and use the recorded levels in a prosecution
- can improve cooperation between industry and concerned sectors of the community as the code is developed, with appropriate measures to address community concerns while meeting the aims of BPL carriers, and
- can describe what must be considered between a utility and a carrier or carriage service provider in interference management when parties are entering into an agreement.

Codes or standards developed to address issues specifically related to BPL would not need to address matters already covered by existing codes applying to carriers. Development of such an industry code can take time and resource commitment, and there are some risks, including the failure of some stakeholders to engage in the process. The risks can be managed, especially with the guidance of code development bodies such as Standards Australia and the Australian Communications Industry Forum.

Investigations into regulatory requirements for BPL are continuing and many parties are taking an active role in the process. Current work on regulatory arrangements for BPL includes:

- Standards Australia committees responsible for EMC have initiated activities to look into the appropriateness of current EMC and emissions standards
- the utilities sector has begun investigating and scoping development of a self-regulatory code
- ACMA, in cooperation with Standards Australia, are sending a delegation to the CISPR International conference on BPL to be held in Sweden in September and
- stakeholders such as the Wireless Institute of Australia and broadcasters are taking an active role in these committees and activities to ensure their concerns are addressed.

More information about BPL is on the ACMA website at www.acma.gov.au (go to Industry > Radiocommunications > Broadband over Power Line Communications).