

BROADBAND: TOWARDS UNDERSTANDING USERS

PROFESSOR TREVOR BARR

(Refereed)

Swinburne University and
Principal Investigator,
ARC Centre of Excellence for Creative Industries and Innovation

Acknowledgment is made of the contribution of the Smart Internet CRC of the resources and conference support for this paper.

tbarr@swin.edu.au
03 9214 8106

Abstract

This paper suggests that the forgotten domain of the complex and vigorous debates about the future of higher speed broadband in Australia is the experience and expectations of users and consumers with broadband. Research to date about such user experiences, especially in Australia, has essentially concentrated on Internet services and mainly with narrowband users. Yet Internet is not broadband.

We, in Australia, have much to learn from recent European experiences with broadband. The paper examines four factors that are driving user take up of broadband: new convergent consumer models of service provision; user-led innovations facilitated through vehicles such as You Tube and My Space that need faster upload and download speeds; successful models of collective ownership building community services; and burgeoning specialised attractive new institutional services, such as the revolution in broadband services now offered by the British Library.

Factors such as these are part of new forces at work in driving the recent impressive uptake of broadband services in Europe. A 'tipping point' appears to have been reached. A call is made here for new kinds of research investigations, in both international and Australian contexts, to investigate new service options for broadband consumers and related consumer responses.

Introduction

Much of the focus of attention on broadband debates in Australia is about alleged regulatory bottlenecks preventing further major investment, or about appropriate responsibilities for infrastructure investments and choices by government and the private sector, or about the business dynamics of possible network operators, especially Telstra. Generally speaking very little research work has been drawn upon, both from international or our national experience in order to inform and frame these complex public policy debates and decision making. This paper argues that the most glaring absence of attention, by both policy makers and researchers, is about new issues concerning the users and consumers of broadband.

Broadband is not Internet

To date the key research about users and broadband, as distinguished from Internet user studies alone, may be broadly categorised in these ways:

1. Studies which mainly relate to supply factors dealing with different modes of delivery, such as the number of non-dial up household and business subscribers, and their geographical location. The Australian Bureau of Statistics releases regular statistical updates on supply factors related to Australian participants.¹
2. Studies of patterns of usage, including the investigation of issues such as whether broadband users spend more time online, and do more things more often, than narrowband users. {eg., major studies in the U.S.A are by Horrigan and Rainie of Pew (2002) and in the UK the work at University of Essex in the Chimera project, 2005-06.}²
3. Investigations into the factors which affect Internet and broadband take-up by consumers. These include several international studies of the relative significance of factors such as age, income, education level, value in inter-personal communication, and price as key predictors in the U.S.A {e.g., Kridel et al in the USA, Lee in Sth Korea and Adams in Australia}.³

It is argued that new kinds of investigations are now required into the benefits to consumers that come with higher speed broadband. Put simply a hypothesis about take-up suggests substantial numbers of consumers on narrowband systems *do not* consider that the cost of paying more for higher speed broadband is clearly outweighed by substantial service benefits that come with speed. Quicker processing of e-mails yes, but what else, they ask, do we get for an extra \$30-50 a month? And, of course, is this extra expenditure affordable? This paper suggests that based on European experience there are indications now that a substantial increase of consumer take-up appears to be underway within higher speed broadband systems related to changing consumer perceptions of clear benefits. The reasons are complex, and not readily transferable to the Australian scene. Note that this paper does not attempt to provide a critical analysis of the full range of factors driving user take-up of broadband but concentrates on select new drivers, mainly for Europe.

Best practice models for broadband users can be found in Western Europe today. A bird's eye view of new West European broadband systems shows just how far Australia is behind, and just how much we are missing out on. In Europe so much energy, new investment and creative service innovation are driving the introduction of new broadband systems.

This paper focuses on four factors which are driving user take-up of broadband services:

1. New consumer models of broadband service provision based on convergent services, characterised by the industry as 'triple play' services.

¹ See Australian Bureau of Statistics, 8135 Internet Activity, Australia, March 2007

² Horrigan, J.B and Rainie (2002), 'The broadband Difference: How Online America's Behaviour Changes with High Speed Internet Connections at Home', WashingtonDC, Pew Internet and American Life Project. For the UK, 'The Social Impact of Broadband Household Internet Access' Chimera Working Paper Number:2005-06, University of Essex at www.essex.ac.uk/chimera

³ For USA Kridal, D., P. Rappoport, et al.(2002) 'The Demand For High Speed Access to the Internet', Topics in regulatory economics and policy 39:11-22. For Sth Korea, Lee, H., R.M, O'Keefe, et al 'The Growth of Broadband and electronic commerce in Sth Korea; Contributing Factors' The Information Society 19 (1): 81-93. For Australia Adams, P., 'In search of broadband's tipping point – a conceptual model, CR&SK, Sydney, 2005.

2. User-led innovations facilitated, through vehicles such as You Tube and My Space, that need better upload and download speeds.
3. Successful models of collective broadband system ownership building community services.
4. Burgeoning specialised attractive new institutional services, such as the revolution in broadband services now offered by the British Library.

Taking these in turn now:

1. New consumer models of service provision, notably the notion of ‘triple play’ services.

The ‘triple play’ concept involves the re-packaging of many existing services, and the marketing of group packages around offering higher Internet speeds.

Infrastructure decisions about providing communication services have become more experimental in a Europe which now sees old utilities using networks in new ways. In 2002 a Norwegian power company, Lyse Energi, used the power distribution networks of this parent company to create a broadband subsidiary company called Lyse Tele, which laid fibre through its electricity, gas and direct heating ducts to provide connections for communications services to subscribers’ homes. And typical of this frontier country those Norwegian customers who were prepared to do the digging and trenching themselves for the last 25 metres of their front yard were rewarded with good installation discounts! Lyse Tele boasts that it was the first broadband service provider in Europe to build a broadband system that combines good speed Internet from 2Mbps to 10Mbps with digital television and telephone services over a single fibre optic cable to homes. And all of this is offered at a price to its Norwegian customers, for this convergence of services, at 20% below what they were previously paying for comparable services separately.

Dagfinn Wage of Lyse explains (personal interview, November 2006, Stavanger) that ‘Internet access and broadband access are two different things. Internet access carries (open) unmanaged IP services, while broadband access carries managed IP services (chosen by the particular broadband company)’. So once Lyse’s 63,000 contracted consumers in southern Norway bought into good speed IP access on their Lyse broadband system, initially because of the ‘pull’ of what the Internet offered them, Wage said that these customers then found that they ‘use their broadband system for whatever else in communications they liked’. Over 80% of all of the Lyse broadband subscribers, who mainly wanted better speed Internet access, also used both the cheaper IP based voice services on the new system and transferred to the television services offered on the broadband. Consequently the established industry players in Norway, notably the incumbent telecommunications voice carrier Telenor, and several of the established cable television operators, have seen their customer base being progressively eroded by this broadband newcomer.

France is a broadband success story of a different kind. Sam Paltridge, (personal interview, November 2006, Paris) an expatriate Australian who has worked for the OECD in Paris for the past decade providing the much quoted index of comparative broadband success for 30 OECD countries, asked ‘guess what you get for \$A50 a month from a broadband operator in Paris?’ The answer – Internet download speeds of up to 24 megabits a second and unlimited bandwidth, at least 100 television channels in the basic package (and the offer of another 100 channels for those who want to pay extra for more programs), unlimited IP based phone calls

within France, and phone calls to other countries that save heaps – all offered with no maximum contract period for customers.

How has this been possible? Until recently France was often seen as an anachronism of the Western European telecommunications industry allegedly dominated by a state owned telecommunications carrier, France Telecom, which was often accused of hampering the growth of France's broadband markets. However some of the key network competition regulatory bottlenecks between incumbent carrier France Telecom, and the state regulatory body, L'Autotite De Regulation des Communications Electroniques et des Postes, have recently been resolved, enabling new players to emerge. The outcome is that not only does France Telecom itself now have one of the highest number of broadband subscribers among operators in Europe, but vibrant new broadband providers have emerged as a result of gaining access to France Telecom's old copper wires through ADSL technology.

The French broadband newcomers have shown they are prepared to make substantial capital investments in infrastructure and take bold risks. France's big new broadband player called Free, an Iliard Group subsidiary, claims that it was the first European company to offer comprehensive 'triple play' telecommunications services through its Freebox modem. Its 'triple play' services are Internet access, IPTV, and voice services, as VoIP. In September 2006 Free launched its new fibre to the home service offer with high speeds up to 50 Mbits/s – and for only €29.99 a month. Its parent Iliard group, with good profits now coming from broadband, has a €1 billion fibre optic network investment underway that will eventually reach four million households in Paris. Today more than 75% of all French Internet users are 'triple play' subscribers. The French telecommunications transformation of just over the past few years has been remarkable, and Parisians now have access to broadband services that are much faster and cheaper than almost anywhere in the United States of America.

The dynamism of the European broadband market has emerged from new players (such as Free), or new infrastructure providers who are diversifying (such as Lyse, with a parent power company), or deliberately created broadband network and service providers who are structurally separated (such as in the Netherlands – see later).

2. User-led innovations facilitated, through vehicles such as You Tube and My Space, that are creating demand for better upload and download speeds.

Some historical perspective about access is needed. For over forty years , from the 1930s to the 1970s, only two groups in Australian society were granted spectrum access to radio licences – commercial companies and the then Australian Broadcasting Commission. It is often forgotten that it was the Fraser government (1975-83) that opened up a new tier of broadcasting in the mid 1970s – community radio – which brought a raft of new kinds of participants and greater ideological diversity to the radio medium. When radio station 3CR opened in Melbourne in 1975, the author of this paper was employed by Swinburne College of Advanced Education in Hawthorn which boasted a famous Swinburne Film and Television School. The Film School nurtured many talented students some of whom eventually became world class film makers, notably Gillian Armstrong and Richard Lowenstein. In those days all of the Swinburne community was invited annually to watch the films made by students at a cinema house screening, generally the only release for the students' films for the year. Within walking distance of Swinburne was Channel Nine, but as far as is known no Swinburne Film

School student ever approached the Nine Network with a request to screen their film, nor was any student film ever shown on commercial television.

Today, however, on the web site You Tube about 65,000 videos created by ordinary mortals are uploaded daily⁴. Little wonder that Google acquired You Tube for \$1.65 billion in October, 2006. The blog search engine company, Technorati, is currently tracking 70 million blogs in the United States market alone and estimates that over 120,000 new blogs are created daily. The News Corporation owned My Space website, offering interactive user created personal profiles, photos, videos and music, attracted registrations at a rate of 230,00 per day reaching 100 million accounts on August 9, 2006.⁵ And a relative newcomer, Facebook, doubled its market share of visits in eight months between September 2006 and April 2007.⁶

Clearly, the global platform of the Internet has facilitated an extraordinary increase in user access and content diversity as a result of this plethora on new user-centred web sites. However growth of the contemporary social networking phenomena – user led innovation – can hardly be explained just in terms of wider technological access to new web sites. Collectively My Space and You Tube, and their multiple new counterparts, provide not merely new platforms for showing videos and photos, but rather they facilitate a deeper set of processes of social networking. Darren Sharp explains:

‘The Web has become the habitat for a new media ecology that is remarkably complex, adaptive, and self-organising. At the heart of these fundamental changes are the shifting value networks of media production, distribution and consumption... It has never been easier for people to tell their own stories, express their creativity and form communities of passion. A range of Do-It-Yourself (DIY) Internet-based services now give any user with access the ability to become a producer in a variety of social fields. This has spawned an entirely new understanding of authorship and content production in video (You Tube), games (Second Life), journalism (blogs), radio (podcasting), Web services (mashups), and knowledge production (Wikipedia).’⁷

What does this have to do with broadband? Essentially this extraordinary new social networking movement is another force driving demand for higher speed broadband. A personal perspective for instance. Many people missed the original but later much publicised 2006 interview of President Bill Clinton on Sky News in the U.S.A and former Prime Minister, Paul Keating, being interviewed by Tony Jones on *Lateline* in June 2007. Both interviews were subsequently re-screened on You Tube. But try watching them on You Tube with a 1.2 Mbps broadband connection (at \$29.95 a month, courtesy Telstra)! The waiting during ‘buffering’ is not only aesthetically annoying but the time taken to eventually see the whole interview is multiplied six fold compared to the original broadcast time. So what is being suggested here is that research investigations into the multiple forms of social networking and their greater appeal on broadband, both in terms of higher speed and finer quality of resolution of the images, are desirable in the interests of understanding new consumer complexities of broadband demand both internationally and in Australia.

⁴ <http://www.msnbc.msn.com/id/13890520/>

⁵ See www.hitwise/socialnets.php

⁶ See www.hitwise/socialnets.php

⁷ Sharp, D., Digital Lifestyles Monitor, Smart Internet Technology CRC, September 2006, p 9-10

3. Successful models of collective broadband ownership building community services.

An outstanding example of how the forces of social networking can find institutional homes with broadband is well seen with the most imaginative pioneers of broadband service innovation in the Netherlands. OECD data for mid 2006 shows that the Netherlands leads broadband usage in Europe, with a near 60% national take-up per household. In 2002 the Dutch Government, in association with several private corporations, constructed an experimental communications model called Kenniswijk, which translates as somewhere between ‘knowledge domain’ and ‘smart city’ and which was seen as a vehicle for further energising Dutch society and commerce.

Tenders were called from municipalities wishing to participate in a broadband systems trial, and the first successful submission was by the market town of Nuenen, in the southern Netherlands. Approximately 8,000 Nuenen dwellings, housing around 15,000 people, were connected to a fibre-to-the-home network free of charge, which represented a 96% take-up. The Netherlands government subsidised this experiment for a total cost of €6.4 million (each connection cost €800). Use of the network infrastructure was available to a number of service providers: the Kenniswijk directors considered that it was essential to ensure a separation between the party that operated the network from the parties offering services on the network. Unusually for a telecommunications system, the residents of Nuenen themselves, rather than an internet service provider or a carrier company, own the network: their ownership is formalised within a co-operative society called Ons Net (Our Network). The fibre link operated at a standard 10 Mbps in an open network.

Residents were given the opportunity to donate their €800 government subsidy to Ons Net *in return for co-operative membership*. These consumers also were given a flag to put in their front garden to signify that they were participants in this experiment. So parents who originally opted out of joining the experiment were asked by their children how come their neighbours were enjoying rich new services as well as flaunting a lovely flag in their front gardens! The consumer ownership of the system also brought with it remarkable consultation with users about the kinds of services they might expect or want: from over 1,000 invited submissions for project ideas, 300 became detailed proposals, and over 100 submissions for services were eventually approved and subsidised. This is not a common practice in the telecommunications industry!

When the period of free access had ended in this test bed, at the end of 2005, the services became user pays at €60 to €75 per month, depending on bundling discounts. So how did the users respond when they could no longer have access to this system for free? Remarkably at the beginning of 2006, and largely still maintained now, 80% of Nuenen residents chose to continue their broadband subscriptions on a paying basis.

One of the founders of this clever experiment is wily Kees Rovers, who lives in the Nuenen – famous too because it was Vincent Van Gogh’s home for many years – where Rovers named his business ‘Close the Gap’ on the grounds that to be successful broadband operators ‘must close the last gap between providers and buyers’. Rovers offered (personal interview, November, 2006, Nuenen) his own ‘seven pillars of wisdom’ for anyone who wanted to ensure that broadband worked, for both business investors and communities:

- Build a business model that can be funded.
- Ensure an ‘US’ feeling with strong emphasis on local ownership.

- Have the ability to offer three basic services – telephony, TV, and super fast Internet.
- Add value through locally generated services and content (local TV, video contacts with doctors, recreation and clubs, churches and schools).
- Develop an extensive ‘communications protocol’ to drive community engagement with individuals, groups and clubs.
- Focus on customer care with a local emphasis.
- Deliver a high quality network after a rapid build with little disruption to the town.

4. Specialised and substantially upgraded web base services now offered by established institutions such as the British Library.

This fourth factor is represented by a case study to show how some institutions have revolutionised their Internet based services in ways that must enhance their appeal to broadband communities. The British Library is a case in point where a highly reputable public institution, with huge repositories of information, has made its data banks available to a wide public. And the greatest beneficiaries among those users who access these data banks of newly created services are the broadband users. Shared credit must especially go to the talented and creative staff of the British Library, but also to national and local governments who saw themselves as catalysts to broadband benefits in the U.K.

Just as the government of the Netherlands had been a key factor driving broadband innovation so too was the Blair government of the U.K. In 1997 (the year of Blair’s first election victory) the Internet was still in its dial-up days. The Internet was new and exciting, and it held the promise of great possibilities, but the extent to which the post dial up phase would transform broadband had not been properly imagined, let alone explored.

The Blair Government’s determination to generate a radical improvement in Britain’s broadband status saw the emergence of a number of potent strategies. Among these were the establishment of a consultative group, the Broadband Stakeholder Group (BSG), the decision to stimulate development (through Regional Development Agencies or RDAs) at a local level rather than from the top down, and the creation of a fund of around £30 million to encourage innovation and growth.

Since the publication of its initial strategy document in 2001, the government continued to publish further reports at regular intervals, some generated within itself and others commissioned from independent bodies, in order to continue updating and refining its broadband vision for the country. These tactics would appear to have been successful: broadband in the UK is not simply doing well, it is a spectacular success.

Against this background of constructive telecommunications public policy activity, the British Library examined its practices, investigated the opportunities open to it, and developed its own strategies. The British Library’s web page back in 1997 gave only the most basic details – where the library was, what it did, what its departments were. It’s come a remarkably long way since then which its new home page (<http://www.bl.uk/>) captures to some extent. Viv Kelly’s investigations of the British Library web services, and her interviews with staff in London in May 2007, show the extent of change.⁸

⁸ Dr Viv Kelly conducted interviews on behalf of the ARC Centre of Excellence for Creative Industries and Innovation (CCI) and acknowledgement is also due to Colin Wight, Web Master of the British Library, for his generous assistance in the writing of this article.

The likeliest function for any library web page to offer is probably a catalogue search, and the British Library's home page duly offers it, up front. It looks a simple exercise, and indeed it is a simple exercise for the user: type in a keyword, and your answer appears. To discover that answer, the search engine has browsed over 13 million items contained in a number of catalogues: apart from the principal integrated catalogue, there are catalogues for newspapers, manuscripts, maps, and journals. Specialist catalogues are numerous and include photographs, Chinese and Japanese publications, materials from the India Office, microform and microfiche, Asian language newspapers, illuminated manuscripts, and business information. It is interesting to note that when, in around 2004, the web team at the British Library looked to update and improve their online catalogue, they introduced this one-point search after having discovered the federated search of all collections which is a feature of the website of the National Library of Australia.

On visiting the Library's home page, your eye might be drawn by a little feature called 'Turning the Pages'.⁹ Here you can examine a number of especially valuable or spectacular or unusual texts (for instance, the Lindisfarne Gospels, the Luttrell Psalter, Blake's notebooks, Jane Austen's 'History of England', Vesalius's Anatomy) have been scanned and uploaded so that a website visitor can leaf through them, 'turning the page' with a mouse in a way which simulates turning an ordinary page physically.¹⁰ One of these texts is Mozart's musical notebook, a catalogue of work kept by the composer during the last nine years of his life. Through this page you can leaf through the catalogue itself; you can zoom it; you can see translations of it; you can read or hear about it and about the different entries in it; and you can hear excerpts from the musical pieces.¹¹

The introduction of the MS Vista operating system has facilitated the re-creation of books to be exhibited in this program, and the Library plans for the appearance of many more. It has been a spectacularly successful enterprise for them in terms of the numbers of users it has attracted, and is part of a larger digitisation push which also includes newspapers and magazines, although they will not try to implement the labour-intensive and expensive turning-pages software for ordinary items. Part of the thrill of turning the page is generated by the specialness of the text.

'Turning the Pages' allows anyone – let's say a teacher – to make notes on particular pages and also to bookmark those pages: the bookmarked notes can then be accessed and the notes read by the teacher's students, or more generally online – for instance by other scholars viewing the same pages. The capacity to create and share online in this way is one of the great advantages offered by broadband.

The Library has found that teenagers, because of their expertise with electronic games, have a far greater sense than other sectors of the general public of what broadband enables in terms of the display and manipulation of images. They tend to have higher expectations of what the software can deliver, and to be readier to exploit it. The Library hopes that this technologically more sophisticated audience will choose to convert their knowledge and sophistication into using and benefiting from these web pages: in effect, free education is online to anyone who is interested enough to take advantage of it, provided s/he has the wherewithal to access the Internet at broadband speeds. The Library staff – exhibition

⁹ <http://www.bl.uk/onlinegallery/tp/tpbooks.html>

¹⁰ <http://www.bl.uk/onlinegallery/tp/tpbooks.html>

¹¹ http://tp.bl.uk/collections/treasures/mozart/mozart_broadband.htm?top

curators, specialists, experts in various fields – are actively engaged in making their knowledge and expertise available in online exhibitions, so when you visit these pages you are not only accessing attractive or fascinating images but learning from some of the leading scholars in the world at the same time.

In 2001 the UK had 0.6 broadband subscribers per 100 inhabitants. In the following years this rose as follows:

2002	2.3
2003	5.4
2004	10.5
2005	16.4
2006	21.6¹²

By the end of 2005 the UK claimed one of the highest broadband growths (5.9 new subscribers per 100 inhabitants) in Europe. In early 2007 the website of the former Department of Trade and Industry (now the Department of Business, Enterprise and Regulatory Reform) claimed to have 60,000 new connections every week: the Budde Report on the UK says the figure is around 70,000.¹³ More than 30% of British homes are connected to broadband.¹⁴

Collectively the user innovations outlined in this paper, together with other factors of influence beyond the scope of this brief, appear to have contributed to a recent surge in European broadband take-up. The table below indicates substantial increase in broadband take-up during the past five years and factors such as those outlined in this paper are likely to have made substantial contribution to such growth.

Broadband subscribers per 100 inhabitants, 2001-2006 ¹⁵

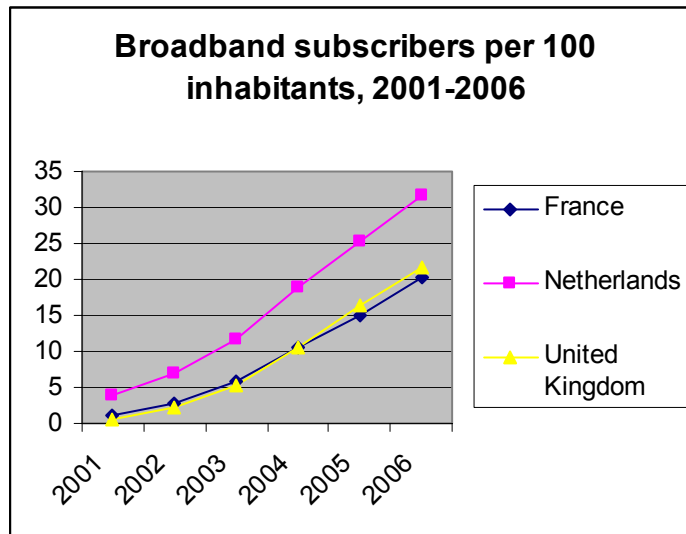
	2001	2002	2003	2004	2005	2006
France	1.0	2.8	5.9	10.5	15.1	20.3
Netherlands	3.8	7.0	11.8	19.0	25.2	31.8
United Kingdom	0.6	2.3	5.4	10.5	16.4	21.6

¹² Ibid

¹³ *United Kingdom – Broadband – Fixed Network Overview, Statistics & Forecasts*, Paul Budde 2006.

¹⁴ Ibid.

¹⁵ Figures from <http://www.oecd.org/sti/ict/broadband>



The graph from this table demonstrates comparative progress:

Significant research findings about the impact of switching to broadband for six countries – UK, Italy, Germany, Norway, Bulgaria, and Israel – concluded that the much touted notion of broadband as being revolutionary, as proposed in the e Europe 2005 Action Plan, was not yet a sustainable proposition.¹⁶ This work, however, was undertaken at the beginning of the decade, and with users of ‘slow’ broadband.

One wonders whether this remains valid now and whether by 2010 a ‘tipping point’ will clearly be reached in Europe due to the attractiveness of broadband services and the value users put on them to manage and enjoy their lives. A call is made here for different forms of research investigations that try to come to terms with some of the possible relevance for Australia of the questions posed above.

Some of the user-centred research questions that need further investigation might be:

1. Does a ‘triple play’ model demonstrate that convergent services are now viable for commercial operators because they are perceived as popular and affordable for most consumers?
2. Might ‘triple play’ service models emerge in Australia, and if so, how?
3. Have Internet-based services offered at below cost to consumers become the loss leader for commercial operators to build strong broadband businesses?
4. What new services might drive the uptake of broadband in Australia, and how might their benefits to consumers be portrayed?
5. Is there a ‘tipping point’ where the attraction of new services offered by high speed broadband services would facilitate substantial take up in Australia?

In a wider context Australia has a long way to go to resolve fundamental public policy questions about broadband systems, players, and the rules of the game. Unlike much of Europe, we have little comparable sense of experimentation with telecommunications

¹⁶ Social Impact of broadband household Access, Chimera working paper, 2005-06, University of Essex.

co-operative ownership, serious network experimentation with fibre, or an approach which involves consumers in the detailed co-construction of services.

Perhaps our most constructive course of action at present is to concentrate on new research investigations about broadband users and feed the findings into the public policy debates and processes.