Australia's Academic and Research Network

21 February 2011

Committee Secretary
House of Representatives Standing Committee on
Infrastructure and Communications
PO Box 6021
Parliament House
CANBERRA ACT 2600

Dear Sir/Madam

INQUIRY INTO THE ROLE AND POTENTIAL OF THE NATIONAL BROADBAND NETWORK

Thank you for the opportunity to make a submission on the Australian Government's Inquiry into the role and potential of the National Broadband Network. This submission is made on behalf of AARNet Pty Ltd (AARNet) and its Shareholders; the 38 Universities and CSIRO.

AARNet commends the Australian Government on its vision for improving and extending telecommunications infrastructure into the underserved areas of Australia. As requested AARNet provides the following summary at the front of this submission:

- AARNet is the National Research and Education Network for Australia (NREN). NRENs exist to serve the closed communities of research and education and in particular the specialist needs of education and the high bandwidth research demands of such disciplines as astronomy, high energy physics, climate change, medical science, marine science, supercomputing and all of the other major research disciplines in the country.

- AARNet provides specialised services to the research and education sector, and provides the quality of services and high bandwidth capacities that are not available, from commercial carriers.

- AARNet's interests are complimentary to the role espoused by the Australian Government for a National Broadband Network which aims to provide wholesale open access to the home or premise.

- NBN services will extend the AARNet reach to small sites and staff and students. AARNet, as the carrier of choice for Universities and research organisations, will be pleased to take NBN services for the connection of outlying small university sites, and the connection of staff and students from their homes to the valuable resources both in Australia and around the world.

- Research and education will also benefit from having their own campus resources

AARNet Pty Ltd   I   GPO Box 1559   I   Canberra ACT 2601   I   Tel +61 2 6222 3530   I   Fax +61 2 6222 3535
www.aarnet.edu.au   I   ABN 54 084 540 518

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delivered to the home.

▪ AARNet is working together with State Government funded research groups such as ACBI and IBES as the test bed for the deployment of advanced broadband services.

▪ AARNet welcomes the development service models that will give access at the infrastructure level to enable AARNet to develop sustainable and competitive services for the replacement of aging infrastructure.

1. Background to AARNet

The Australian Academic and Research Network was established in the 1980's to introduce the nascent Internet to Australia.

Following the deregulation of the telecommunications market in the 1990's, AARNet evolved into a licensed telecommunications carrier providing Internet access and other services to each of the Australian universities, and CSIRO, each of whom are its shareholders, and to more than one hundred entities serving research and education across Australia and the South Pacific.

In the early 2000's, in the wake of the Internet's growth to prominence as a global phenomenon, the Australian Government formed the Higher Education Bandwidth Advisory Council (HEBAC) to examine the special needs of the higher education and research sector. In its 2003 Report, the HEBAC reported a market failure in the provision of the very high bandwidth services demanded by the sector, and recommended the formation, and funding, of an Australian Research and Education Network (AREN).

The AREN was not established as a new entity. Rather, the Government assisted with funding to upgrade the AARNet backbone infrastructure in Australia and to upgrade its international links to the US. The Government also funded the establishment of two state based companies to provide optical fibre based infrastructure in Melbourne, Adelaide and regional Victoria.

AARNet is Australia's National Research and Education Network (NREN); one of 119 NRENs around the world that exist to serve the closed communities of research and education in particular the specialist needs of education and the high bandwidth research demands of such disciplines as astronomy and high energy physics, climate change, medical science, marine science, supercomputing and all other major research disciplines in the country.

2. The role of a National Research and Education Network

"NREN Providers" display a number of characteristics which distinguish them markedly from commercial telecommunications providers in terms of their constitutions, objects, structure, services and customer base.

NREN providers are generally companies established and owned by their principal customers, that is, the universities and key research bodies, under constitutions directed at the provision of advanced telecommunications services specifically for research and/or educational (R&E) use.

In Australia AARNet is a tax exempt body, conditional on the supply of services to parties

whose principal activities or operations are concerned with the provision or conduct of education and research, and for purposes that directly benefit education and research.

NRENs support research users whose need for bandwidth dramatically exceeds the capacity of normal commercial offerings. For example AARNet is currently constructing infrastructure to link the Australian Square Kilometre Array Pathfinder site in remote Western Australia which, when operational, will transmit data at speeds in excess of 40 Gigabits per second to supercomputer facilities located in Perth and Canberra. Should Australia win the right to host the full Square Kilometre Array project in 2012, the bandwidth requirements of the site will grow by a factor of at least 1000 by 2024.

NRENs generally operate on a cost recovery basis delivering data services at the minimum rate permitted by the costs of underlying infrastructure   that is, they are charged whatever it costs (including management overhead etc.) to establish and operate the necessary infrastructure irrespective of bandwidth or the volume of data transmitted. Once telecommunications infrastructure is installed and operating, the marginal cost of data transfer is almost zero. Therefore the cost recovery charges for high volume data services reflect relatively fixed costs, and users are generally charged by means of an annual subscription.

3.   The need for continuing investment in e-infrastructure for research and education

The Australian Government continues to invest in the AREN, with its most recent program being the $37m National Research Network component of DIISR's Super Science program under the Education Investment Fund (EIF). This project is currently rolling out a series of enhancements to the AREN, principally via the Universities and AARNet. The Australian Government's past and continuing investment in infrastructure for research and education users was made on the assumption that such infrastructure would be applied to benefit the research and education sector.

AARNet itself has continued to make very substantial investments in the building of dark fibre Australia wide. Over the last 7 years AARNet has built thousands of kilometres of fibre; regional and rural fibre builds and metropolitan fibre loops, all with the aim of providing long term sustainable access into its backbone.

Science discovery is increasingly done through international collaboration. It is important to note that the NBN does not include international connectivity to support the international research collaboration communities.

4.   The role and potential of the National Broadband Network

AARNet provides a wide range of educational and research bodies, including universities, TAFE institutions, schools, the CSIRO, the Defence Science and Technology Organisation, the Australian Institute of Marine Sciences and Australian Nuclear Science and Technology Organisation and many cultural institutions. The services provided are not 'commodity' or standard telecommunications services of the type provided by mainstream commercial carriers, but are specialised and tailored for the particular needs of the research and education sector.

AARNet supports the development of any e infrastructure that will enable AARNet to access such services and commends the Australian Government's Regional Backhaul Blackspot Program (RBBP) which will provide access at the infrastructure level for new backbone transmission links into the under served and priority regional locations in Australia.

The NBN is not designed to underpin world class e infrastructure for research, education and high bandwidth applications such as medical research. However it will provide sufficient capacity to increase participation and collaboration through connection of outlying small sites, and the connection of staff and students from their homes to the valuable resources both in Australia and around the world.

NBN's wholesale open access services to ISPs and carriers such as AARNet will enable Universities to deliver their campus resources to the home and most importantly access to the valuable information resources that are generally only available through international peering, that is the collaboration of national research and education networks around the world.

AARNet welcomes the potential for NBN service models that will give access at the infrastructure level to enable AARNet to develop sustainable and competitive services for the replacement of aging infrastructure.

5. Terms of Reference

AARNet makes the following observations in relation to the terms of reference:

a) **the delivery of government services and programs;**
AARNet provides a wide range of educational and research bodies, including universities, TAFE institutions, schools, the CSIRO, the Defence Science and Technology Organisation, the Australian Institute of Marine Sciences and Australian Nuclear Science and Technology Organisation and many cultural institutions. The services AARNet provides to these organisations are not retail standard telecommunications services but specialised and tailored for the particular needs of the research and education sector.

The NBN is not designed to underpin world class e infrastructure for research, education and high bandwidth applications such as medical research. However it will provide sufficient capacity to increase participation and collaboration through connection of outlying small sites, and the connection of staff and students from their homes to the valuable resources both in Australia and around the world.

b) **achieving health outcomes;**
NBN services will assist the interface between research and education organisations and health organisations and specifically to address issues of connectivity between the networks of the health and education sectors. This is critical to the R&E community to facilitate the large numbers of researchers, educators and students who are placed on health campuses where they are often connected to the health networks.

c) **improving the educational resources and training available for teachers and students;**

NBN's wholesale open access services to ISPs and carriers such as AARNet will enable Universities to deliver their campus resources to the home and most importantly access to the valuable information resources that are generally only available through international peering, that is the collaboration of national research and education networks around the world.

d) **the management of Australia's built and natural resources and environmental sustainability;**

The NBN will enable AARNet to extend its reach to engender the participation and collaboration of research partners who are focussed on natural resources and environmental management.

e) **impacting regional economic growth and employment opportunities;**

The Universities are active partners in their communities and AARNet recognises that Universities Australia and or individual Universities may make a submission on this matter and we will be guided by their response.

f) **impacting business efficiencies and revenues, particularly for small and medium business, and Australia's export market;**

Not applicable.

g) **interaction with research and development and related innovation investments;**

The Australian Government continues to invest in the AREN, which comprises AARNet and two state based companies, VERNet and SabreNet, who provide optical fibre based infrastructure in Melbourne, Adelaide and regional Victoria. Its most recent program being the $37m National Research Network component of DIISR's Super Science program under the Education Investment Fund (EIF). This project is currently rolling out a series of enhancements to the AREN, principally via the Universities and AARNet. The Australian Government's investment in infrastructure for research and education users is made on the assumption that such infrastructure is applied to benefit the research and education sector.

Science discovery is increasingly done through international collaboration. It is important to note that the NBN does not include international connectivity to support the international research collaboration communities.

h) **facilitating community and social benefits;**

The Universities and research organisations by definition facilitate community and social benefits and AARNet recognises that these parties may make a submission on this matter and AARNet will be guided by their response.

i) **the optimal capacity and technological requirements of a network to deliver these outcomes.**

AARNet supports the development of any e infrastructure that will enable AARNet to deliver services for research and education and commends the Australian Government's

Regional Backhaul Blackspot Program (RBBP) which will provide access at the infrastructure level for new backbone transmission links into the under served and priority regional locations in Australia.

The NBN is not designed to underpin world class e infrastructure for research, education and high bandwidth applications such as medical research. However it will provide sufficient capacity to increase participation and collaboration through connection of outlying small sites, and the connection of staff and students from their homes to the valuable resources both in Australia and around the world.

AARNet welcomes the opportunity to discuss this submission with members of the Committee. Please feel free to contact me on   for further comment as required.

Yours faithfully

Chris Hancock
Chief Executive Officer