

Submission to the Department of Communications, Information  
Technology and the Arts

on

The Broadband Connect and Clever Networks Discussion Paper  
of November 2005

from

**Ausanda Communications Pty Ltd**

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1. Ausanda Communications Pty Ltd is an Australian start-up company developing new technology (DWDM-Lite™) to provide more cost-effective and sustainable backhaul bandwidth transmission systems for regional and rural communities. Research and development and early commercialization activities have been supported by a *Commercial Ready* grant from the Australian Government.
2. DWDM-Lite™ is an innovative enhancement of the widely installed dense wavelength multiplexing (DWDM) technology used for long-haul intercapital transmission systems. DWDM-Lite™ enables telecommunication carriers to use a single wavelength channel (typically 10 Gbps) from their long haul DWDM network to provision high backhaul bandwidth capacity to a multiplicity of regional centres.
3. With current DWDM technology, provisioning backhaul bandwidth from such a network to regional centres requires dedicating a whole 10Gps wavelength to each centre. This provides poor returns on investment, so carriers don't do it. Alternatives such as the use of spare fibres in the intercapital cables for regional SDH loops from capital cities are used as the norm. This current solution is not sustainable in the longer term as the success of broadband in regional communities will rapidly drive backhaul bandwidth demand beyond the capacity of such solutions.
4. DWDM-Lite™ is a significant breakthrough designed to enable add-drop of bandwidth in the optical domain in channels of less than a full wavelength to a multiplicity of regional centres situated along currently installed long-distance transmission fibre paths. This technology will maximise long-term return on investment for owners of long haul fibre optic cables, and would make a significant contribution to the *Connect Australia* objectives for equitable access to modern, high bandwidth regional telecommunications services.

### **DWDM-Lite™ and the Clever Networks Program**

5. DWDM-Lite™ is a new technology in prototype form which has the capacity to be deployed in a commercial pilot later in 2006. Providers of backhaul bandwidth transmission systems to regional and rural centres will however find it difficult to justify investment in new capacity whilst existing infrastructure can meet existing demand and considerable uncertainty remains about the scale of future bandwidth demand which will flow from *Connect Australia* initiatives and other commercial broadband developments in regional centres.
6. Current solutions are slightly more expensive, but of comparable scale of price to implementation of a DWDM-Lite™ solution, until the total aggregated backhaul demand on an SDH loop approaches 10Gps. Past that point, the DWDM-Lite™ solution is more cost-effective. In addition it is a more sustainable solution in the longer term because each SDH loop requires dedication of additional fibre, creating a finite limit to the capacity of the currently installed inter-capital fibre infrastructure. So the DWDM-Lite™ solution is more sustainable in the longer term, deferring the time when additional expensive (and currently non-investable) long-haul fibre roll would be required.

7. If regional and rural communities are to receive equitable access to broadband services, an important consideration for the Clever Networks program will be the backhaul infrastructure capacity and price available to support newer high-bandwidth customer access network technologies in regional communities (such as FTH, WiMAX and ADSL2+). For example, a significant roll-out of 10Mbps broadband to regional customers (required to meet the goal of equity of broadband access with city dwellers within the life of the Clever Networks program) will rapidly utilize the available backhaul infrastructure and require new technologies and new investments to maintain equitable regional access sustainably into the mid-term.
8. The Clever Networks program has aims to support innovation, sustainable solutions, solutions that continue to meet emerging needs and solutions that promote competitive provision of services. These aims require attention to the medium-term investment and competitive provisioning scenarios for backhaul services to support expanding regional customer access to and demand for high bandwidth services in regional areas.
9. In order to achieve these aims the Clever Networks program should include provision to support pilots of new approaches to the backhaul requirement which will meet the potential demand of high-bandwidth regional customer access networks, and address the likelihood that investors will not without some intervention invest in the backhaul infrastructure required to ensure a cost-effective and competitive market in backhaul services.
10. It is the intention of Ausanda Communications Pty Ltd to apply under the Clever Networks program for support for a commercial pilot of DWDM-Lite™ via a consortium consisting of the owner of a significant long-haul fibre asset, two major technology provider partners, with the cooperation of some existing backhaul bandwidth customers of the fibre asset owner. Such a commercial pilot would have features which are dissimilar from the types of projects previously considered, in that it trials new transmission technology on existing fibre infrastructure, rather than the construction of new infrastructure.

#### **Comments on Program design to facilitate a commercial pilot of DWDM-Lite™**

11. The first and most basic observation to make is to recommend that the Clever Networks program supports commercial pilots of innovative technologies not yet in the mainstream. There are some significant differences in the program guidelines relevant to commercial pilots where there is still an element of technology risk, but meeting the needs of regional communities is going to require the deployment of innovative solutions, not the same solutions that have been optimised for major markets.
12. Innovation in the backhaul transmission technology proposed by Ausanda Communications Pty Ltd is designed to increase the capacity, cost-effectiveness and sustainability of utilization of the existing fibre infrastructure. The fibre infrastructure to provide regional backhaul to 82% of Australia's regional population has already been constructed, but availability to regional broadband customer access network providers is still limited in terms of cost-effectiveness, sustainability or competitiveness.

13. Relatively new long haul fibre cable infrastructure passes through 51 (including capital cities) of the 66 points of carrier interconnection in Australia. Of these 51 points of inter-connect, 45 are non-metro and these 45 points of interconnect cover approximately 82% of Australia's non-metro population. These inter-connect points are the networking points to which much higher bandwidth needs to be reticulated, if Australia's regional broadband objectives are to be achieved.
14. A significant component of ensuring equity in access to high bandwidth services for regional customers will be ensuring that the use of this existing fibre infrastructure is characterised by innovation, sustainability and competitiveness. Many investors in long-haul fibre infrastructure have however been badly burned by the failure of investment in these assets to generate acceptable short-term returns, and it is likely that they will continue to be reluctant to make timely investments necessary to meet the broader medium-term regional access agenda.
15. For the Clever Networks program, it will be important that the program guidelines are broad enough to encompass commercial pilots of innovation in the existing backbone transmission assets, rather than limiting eligibility to new assets. This is necessary to meet the goal of ensuring that cost-effective, sustainable and competitive backhaul services are available to support expanded regional customer access networks.
16. Similarly, an existing fibre backbone will have existing regional broadband providers as customers of its backhaul services. Projects applying for support may be connecting new regional customer access networks, but it is also possible that the backhaul provider trials the innovative, more cost-effective and sustainable technology with selected volunteers among current customers seeking greater security of future supply. Such a project would not directly increase the current access to regional broadband services but it would still be contributing to expanded access and sustainability in the medium term by its impact on future investment decisions of network owners to expand their backhaul capacity. Program guidelines should envisage this possibility.
17. The focus on government services in the Clever Networks program is understandable given the history of the CCIF program. And there is no doubt that video-quality education applications and the demands of medical imaging and PACS systems in health will drive regional backhaul bandwidth requirements. Many of the current broadband applications in health and education in regional areas are however running on the short-lived SDH loop backhaul technology described earlier, and the current approach to provisioning backhaul for regional centres will not be sustainable once health and education demand grows. Innovation in the backhaul transmission infrastructure will not easily distinguish among customers on a sectoral basis and we would suggest that this sectoral application should not be used as a restrictive eligibility requirement such as to preclude a project such as the one foreshadowed here.
18. The principle of equitable access for regional customers to broadband services will see demands within the life of the Connect Australia program for the higher bandwidth service levels and quality which are now being made available to metropolitan areas. We would contend that the Clever Networks program should have a significant emphasis on newer technologies/higher bandwidth projects. The

scenario for broadband services is now firmly focused on the territory beyond 'barely broadband' ADSL services.

19. Finally, as the major issue in innovative, timely, competitive and sustainable provision of high bandwidth backhaul services to regional and rural communities lies in influencing medium-term investment decisions of owners of infrastructure assets, the objectives, eligibility criteria and evaluation criteria for the Clever Networks program should be drawn up to encourage projects which will make an impact on this factor, and not just on immediate customer connection numbers.

**Further information**

20. Further information in support of the points made in this submission can be made available to the Department on a 'Commercial in Confidence' basis if required.

## Ausanda Communications Pty Ltd

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