

# Naked DSL: the potential impact in New Zealand

Final report for the MED, April 2006

Network Strategies Report Number 26010

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## 1 Executive summary

Naked DSL (NDSL) is the supply of DSL service at a wholesale or retail level on a standalone basis without the need for concurrent supply of PSTN telephone service. This report addresses the MED's request for advice on the following issues:

- the potential impact of NDSL on the following:
  - the take-up of wholesale and retail broadband services, including VoIP
  - fixed-mobile substitution and convergence
  - the service mix contributing to cost recovery of local access lines
  - the TSO mechanism.
- the extent to which NDSL is compatible with the hypothetical regulatory access options of local loop unbundling (LLU) and unconstrained Unbundled Bitstream Service (UBS).

Our key findings are as follows:

- NDSL is offered in Austria, Belgium, Canada, Estonia, France, Italy, Netherlands, Norway, Sweden and in the United States
- NDSL is offered principally as retail NDSL, which is effectively an incumbent's existing broadband service priced to exist without bundled PSTN access
- Wholesale NDSL is equivalent to New Zealand's existing regulated bitstream service without the current bandwidth and service constraints
- any regulated wholesale NDSL service must facilitate high quality VoIP services if it is to act as a replacement for PSTN telephony (i.e. does not have bandwidth constraints)
- the extent of fixed-to-mobile substitution will depend on the ability of telecommunications service providers (TSPs) to convince consumers that such substitution is a cheaper alternative to 'free' local calling on the PSTN
- regulated wholesale NDSL could allow TSPs to offer highly attractive retail bundles, such as mobile telephony with broadband Internet access. The business case for such services depends heavily on the pricing of any future NDSL services

- regulated NDSL could result in Telecom regaining market share from Vodafone through the introduction of quadruple-play (broadband Internet access, fixed voice, mobile and TV) bundles
- regulated NDSL could allow TSPs to rapidly acquire broadband customer bases, assuming that pricing is appropriate
- NDSL will affect each type of convergence differently but the effect will in all cases be to increase convergence and stimulate the uptake of broadband-enabled services
- if regulated NDSL is not available then we expect the range and uptake of broadband services in New Zealand to increase at a lower rate than in more advanced broadband markets
- NDSL has significant potential impacts for cost recovery of copper access lines supporting both DSL service and TSO local telephone service
- Unbundled Bitstream Service (as a form of wholesale NDSL) is likely over time to be purchased by wholesale access seekers in preference to Bundled Bitstream Service which couples wholesale DSL with PSTN telephone service
- UBS demand, and its impact on LLU demand, is dependent on the relative pricing, and the underlying capabilities, of each service.

## 2 What is NDSL?

NDSL refers to the situation where an end user is supplied DSL service without the simultaneous supply of PSTN telephone service on the same access line.

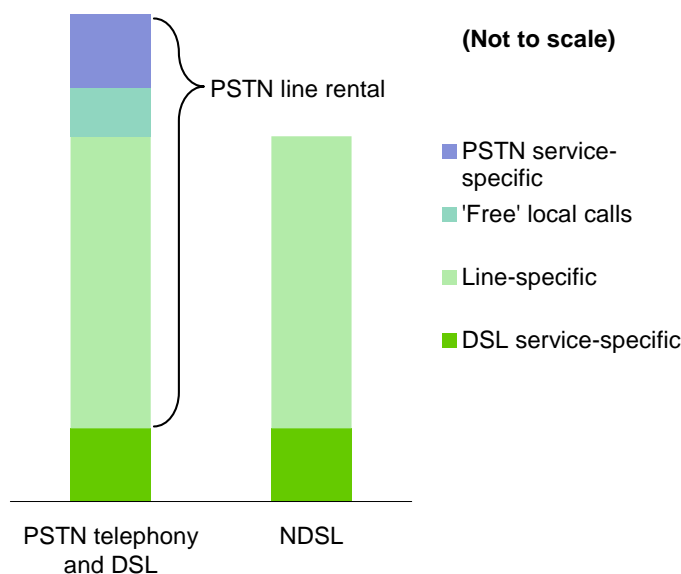
For the purposes of this paper, it is assumed that:

- retail NDSL services, such as those offered directly by an incumbent provider, include ISP and other data charges which are part of commercial retail DSL offerings (such as Jetstream in New Zealand). Retail NDSL is therefore the supply of retail DSL service without the supply of PSTN service over the same access line
- wholesale NDSL is available in New Zealand in the form of the regulated service Unbundled Bitstream Service (UBS).
- the unregulated or commercial version of wholesale DSL service offered by Telecom New Zealand is a Bundled Bitstream Service (BBS) wherein DSL service is bundled with PSTN telephone service

- Telecom New Zealand’s commercial retail DSL service offerings bundle DSL service and PSTN telephone service together
- resale wholesale DSL (bulk retail DSL service) from Telecom New Zealand is available as a regulated service and has the characteristics of Telecom’s retail service.

The Resale wholesale DSL option is considered to raise similar issues as UBS and has therefore not been considered separately.

The key difference between unbundled or naked DSL and bundled DSL is that the latter requires the purchase of PSTN telephone service for the same access line on which DSL service is supplied. For naked DSL only the DSL service can recover line specific costs, whereas for bundled DSL both the DSL service and the PSTN telephone service can recover line specific costs. This is illustrated in Exhibit 1 below.



**Exhibit 1:**  
 Cost elements of  
 wholesale NDSL  
 versus PSTN and  
 UBS [Source:  
 Network Strategies]

We note that, although New Zealand’s regulated bitstream service is actually wholesale NDSL, there are no current wholesale or retail DSL service offerings which do not require an associated PSTN service.

### 3 NDSL deployment and NDSL-related developments internationally

Analysys Research's recent report<sup>1</sup>, *Naked DSL: challenges and opportunities*, summarises the worldwide deployment of NDSL and NDSL related developments. In the following country summaries, NDSL is assumed to be retail, unless specifically identified as wholesale:

#### *Austria*

The incumbent, Telekom Austria, announced in November 2005 that it would introduce NDSL in December 2005. Ostensible reasons included: winning back high-end users, attracting mobile-only households, and countering the dominant position of the cable operators in Vienna.

The product will be priced at a monthly rental of EUR64.90, with an installation fee of EUR167. The company says this pricing will prevent cannibalisation of its existing broadband product portfolio.

Almost simultaneously, the Austrian regulator (RTR) published a draft decision for open consultation, in which it found Telekom Austria had significant market power in broadband provision, and included the provision of NDSL from January 2006 as one of the remedies.

#### *Belgium*

Belgacom's BROBA II bitstream offer is effectively a wholesale NDSL service. There is no retail offering, but customers could combine a reduced usage Discovery Line PSTN subscription with DSL. There is a high proportion of mobile-only homes in Belgium.

GSM mobile operator Mobistar is using ULL to install its own DSLAMs to offer broadband as part of a fixed/mobile package, and is to offer an NDSL product based on this network architecture.

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<sup>1</sup> Analysys Research Limited (2006). *Naked DSL: challenges and opportunities*. 27 January 2006.

<i>Canada</i>	The national regulator CRTC permitted one of the incumbent operators (Bell Canada) to begin offering a retail NDSL service in March 2005.
<i>Estonia</i>	The incumbent, Elion, offers DSL-only services (such as Home ADSL, Homework ADSL and Small Office ADSL services) and has also focused heavily on the bundling of fixed lines, Internet access and voice minutes so as to encourage customers to retain and use its fixed network services (such as the Home Solution service). The bundled pricing is such that the PSTN charge is effectively heavily discounted when combined with DSL, thereby blurring the distinction between DSL and PSTN subscriptions. It is now building further on the principle of bundling value into the fixed line by offering combined Internet, TV and telephone services using FTTH.
<i>France</i>	France Telecom has indicated that it will introduce NDSL in 2006.
<i>Italy</i>	Telecom Italia introduced NDSL in July 2005.
<i>Netherlands</i>	KPN introduced NDSL in February 2005 as its 'ADSL Only' service, targeted at mobile-only customers.
<i>Norway</i>	The incumbent Telenor launched NDSL in Norway in 2003 as a pre-emptive measure following discussions with the national regulator. By the third quarter of 2004, 7% of Telenor's DSL subscriber base was already using the NDSL offering. Telenor charges NOK60 (EUR7.5) per month for the NDSL line-rental component, compared to the standard PSTN line rental of NOK159 (EUR19.7) per month, comprising a discount of about 60%. Operating in a market that has the highest proportion of DSL connections that use ULLs in Europe, Telenor is also seeking ways to minimise the growth opportunities of ULL operators such as NextGenTel.

*Sweden*

The incumbent, TeliaSonera Sweden, announced in May 2004 that it was preparing to unbundle its PSTN subscription, at both a retail and wholesale level, into the separate component elements of network access, traffic and other services. This was a proactive move designed at least in part to counter future intervention by the Swedish regulator (PTS). Subsequently, the regulator required TeliaSonera to offer NDSL, and in October 2005 the company stated that it would comply.

TeliaSonera Sweden faces a growing challenge from B2 Bredband (VDSL and FTTH broadband provider), and the cable operator com hem, both of which are set to introduce triple-play service offerings. The line charge paid by a B2 NDSL customer (in addition to the standard DSL charge) is SEK29 (EUR3.1) per month for ADSL service and SEK49 (EUR5.3) for VDSL service. The cost of a basic PSTN service is SEK125 (EUR13.5) per month.

*United Kingdom*

The national regulator, Ofcom, has raised the possibility of mandating NDSL, but in the context of granting number portability to broadband voice services. The new regulatory regime introduced in June 2005 to govern BT's fixed telecoms does not include NDSL in the list of proposed equivalent inputs (effectively network or service elements). However, Ofcom has sought the views of the telecoms industry on NDSL as part of its second phase UK Telecommunications Review.

*United States*

Verizon and Qwest offer NDSL in certain locations, depending on the competitive situation. They first offered NDSL as a response to the obligation to port fixed numbers to mobile, so as to avoid losing customers to cable operators. Qwest charges NDSL at a USD5 (EUR4.1) monthly premium to its standard PSTN-tied DSL product to cover the NDSL line-rental component. Verizon has stated that it intends to offer NDSL throughout its entire territory eventually. However, in March 2005 the FCC ruled against various state regulators that had sought to mandate NDSL on the incumbent

BellSouth. The ruling exposed internal FCC dissent, but essentially reiterated earlier decisions that the low-frequency (PSTN) portion of a local loop is not subject to the same unbundling requirements as the higher-frequency (DSL) portion, thus rendering NDSL impossible to mandate.

However, the FCC did issue a notice of inquiry to seek comment on the impact of service bundling (such as PSTN and DSL) on competition. Nevertheless, the FCC subsequently mandated that, as a condition of approving the Verizon Communications/MCI merger, the companies make NDSL available.

Local regulators appear to view NDSL more favourably. In addition to the Public Utility Commissions in Florida, Georgia, Kentucky and Louisiana, when the New York State Public Service Commission approved the Verizon Communications/MCI merger in late 2005, it required the combined companies to make a two year commitment to offering NDSL, thus following the FCC condition.

#### **4 Potential impact of NDSL on the scope and take-up of broadband-enabled services**

NDSL is expected to facilitate the creation of new revenue streams from broadband services including:

- VoIP telephony
- property surveillance
- IP-TV
- video telephony
- mobile telephony and broadband Internet access bundles
- quadruple play bundles – broadband Internet access, IP-TV, mobile telephony and fixed VoIP.

Retail and, in particular, wholesale NDSL are significant threats to conventional PSTN telephony revenues. Current bitstream offerings in New Zealand do not allow for high quality VoIP telephony due to latency (delay) and jitter (variability of latency) issues. However the offerings do support lower quality VoIP such as that provided by Skype.

Network Strategies believes that the future impact of NDSL on the scope and uptake of broadband-enabled services in New Zealand is very much dependent on how the Bitstream (NDSL) regulated wholesale service is defined. We describe the potential impact on a with NDSL or without NDSL scenario basis. The baseline scenario assumes continuing with the mandated availability of wholesale NDSL through the Bitstream regulated service versus the counter scenario of revoking the Bitstream regulated service.

#### **4.1 Potential impact of continuing regulated wholesale NDSL**

A key issue in the regulation of wholesale NDSL is setting the appropriate price for the service, taking into account:

- the pricing principle to be applied
- the approach to determining or imputing the cost/price components including PSTN calling costs, ISP data charges and line costs
- incentives for entrants to move from wholesale to infrastructure based competition at some time in the future.

Network Strategies believes that, ideally, NDSL pricing should facilitate new broadband entry into areas where competitive carriers have no network presence or insufficient customers to make the use of other entry strategies (such as LLU or wireless) economic. If this were the case, then regulated wholesale NDSL would result in an increase in broadband take-up and in the number of broadband-enabled services offered to New Zealand consumers as:

- Both PSTN-only and PSTN plus DSL retail subscribers who do not use their PSTN line often would substitute PSTN telephony with mobile and/or fixed VoIP telephony. This will depend on TSPs' abilities to convince consumers that such substitution is a cheaper alternative to 'free' local calling on the PSTN.

- TSPs could offer highly attractive bundles, especially mobile telephony and broadband Internet access.
- Telecom could attempt to win back Vodafone customers by offering quadruple-play bundles, something that Vodafone is in a far weaker position to do because it has no wireline access network infrastructure.
- Regulated NDSL allows TSPs to more rapidly acquire a broadband customer base.

#### 4.2 Potential impact of revoking regulated wholesale NDSL

If regulation of NDSL is revoked Network Strategies believes that Telecom is very unlikely to offer retail NDSL and even less likely to offer commercial or unregulated wholesale NDSL. In other countries, retail NDSL has been a reaction to loss of PSTN customers to cable services or an attempt to gain access to a base of “mobile only” customers. Wholesale NDSL is available in New Zealand in the form of regulated bitstream service.

Issues which would strengthen Telecom’s business case for retail NDSL include:

- increased numbers of broadband connections, and thus revenues, through NDSL
- new revenue streams from quadruple-play bundles, and mobile telephony / broadband Internet access bundles, both of which would also enable Telecom to increase its share in the mobile market.

However, we believe that there are a number of issues which would weaken Telecom’s retail NDSL business case:

- reduced PSTN telephony revenues
- the flow through of retail NDSL to wholesale whereby retail NDSL automatically becomes available as a regulated resale wholesale offering as soon as it is introduced as a retail offering
- many Telecom PSTN telephony customers are also Sky TV customers, and Sky’s interactive digital service currently requires PSTN service for the return channel.

If regulated NDSL is revoked, we expect the range and uptake of broadband services to increase at a lower rate than in more advanced broadband markets.

## 5 NDSL and convergence

The Hong Kong regulator (OFTA) has identified four types of convergence in the telecommunications market:

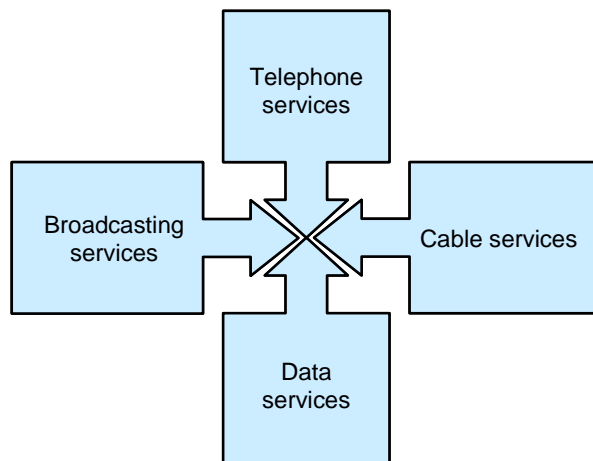
- service provider convergence
- terminal equipment convergence
- convergence of modes of delivery
- convergence of markets.

Network Strategies believes that NDSL will affect each type of convergence differently but the effect will in all cases be greater convergence, increasing the uptake of broadband-enabled services.

The possible effects of NDSL upon each of the above types of convergence are discussed below.

### 5.1 Service provider convergence

Service provider convergence (Exhibit 2) relates to the situation in which service providers are able to offer services which could be provided by only one type of service provider previously.



**Exhibit 2:**  
*Service provider  
 convergence*  
 [Source: OFTA]

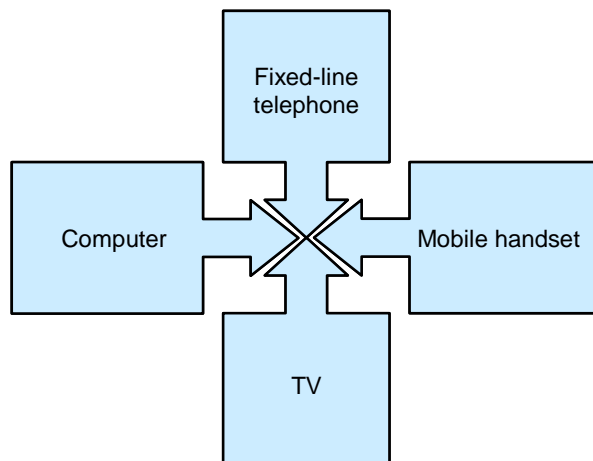
Examples of such situations include:

- cable TV service providers deploying voice telephony services
- mobile network operators offering broadband Internet access
- PSTN operators offering IP-TV services.

Network Strategies believes that service provider convergence is the type of convergence that would be most affected by regulated wholesale NDSL. The availability of NDSL can facilitate a greater range of mass market and niche TSPs to provide broadband-enabled services including IP-TV and VoIP.

## 5.2 Terminal equipment convergence

Terminal equipment convergence (Exhibit 3) refers to the situation in which users are able to access a variety of services using one terminal where previously multiple terminals would have been required.



**Exhibit 3:**  
Terminal  
equipment  
convergence  
[Source: OFTA]

Examples include:

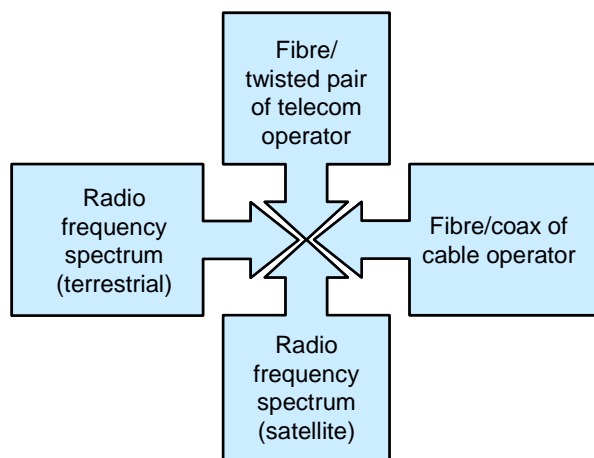
- computer with multimedia player instead of separate computer / HiFi / TV
- computer with VoIP softphone instead of separate PSTN telephony
- mobile and Wi-Fi enabled handsets allowing for data and telephony services.

Network Strategies believes that NDSL will:

- encourage fixed terminal equipment convergence by removing the need for a PSTN telephone
- have some limited impact on computer monitor-TV substitution but TVs expected to remain the primary means of displaying TV programmes for the near term future.

### 5.3 Convergence of modes of delivery

Convergence of modes of delivery (Exhibit 4) refers to the delivery of a service over multiple physical media.



**Exhibit 4:**  
*Convergence of  
 modes of delivery*  
 [Source: OFTA]

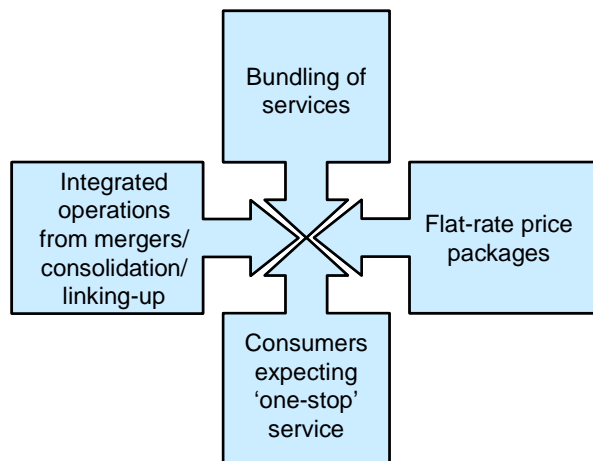
Examples include:

- broadband Internet access over twisted copper pair, coax, fibre and wireless media
- fixed telephony over twisted copper pair and fixed wireless technologies
- broadcast digital TV over coax and radio-frequency spectrum
- the IP Multimedia Subsystem (IMS) – a standardised NGN architecture for telecommunications operators who want to provide circuit and packet-switched mobile and fixed multimedia services.

NDSL will affect the convergence of modes of delivery in the short term by increasing the proportion of broadband-enabled services which are delivered over twisted copper pair cable. In the longer term we expect TSPs to migrate their NDSL customers to their own broadband networks.

#### 5.4 Convergence of markets.

Convergence of markets (Exhibit 5) relates to the merging of markets which were formerly separated by technology and regulation.



**Exhibit 5:**  
*Convergence of  
 markets [Source:  
 OFTA]*

Examples include:

- fixed-mobile convergence services where a mobile handset provides access to the PSTN in the home and mobile access out of the home
- triple-play packages offered by cable TV and telecommunications operators.

Network Strategies expects convergence of markets to be a natural outcome of service provider convergence as TSPs bundle broadband Internet access, fixed and mobile voice and IP-TV services, creating new markets for bundled services.

## 6 NDSL and the TSO mechanism

NDSL has the potential to change the basic mode of voice service delivery over copper from traditional dial-up to DSL-based applications. This process is unlikely to occur quickly, but even the initial adoption of NDSL has the potential to affect Telecom's ability to comply with the TSO service commitment as set out in the TSO Deed.

The TSO Deed requires Telecom to provide conventional voice and dial-up data services over all copper access lines which were available for supplying service in December 2001. Telecom continues to be responsible for making PSTN telephone service available on these access lines even if a customer cancels telephone service or churns to another service provider.

As these lines are converted to retail or wholesale NDSL, Telecom will no longer supply dial-tone and may also not supply exchange voltage and loop wetting<sup>2</sup> current over the line. Although dial-up telephone service is not supplied on an access line for NDSL, the provisions of the TSO Deed require Telecom to supply dial-up telephone service should the customer wish to revert to conventional service at any time in the future. In theory, this means that Telecom must keep in place equipment to supply PSTN telephone service to the vast majority of its access lines.

Efficient pricing would suggest that PSTN specific costs be fully recovered by PSTN charges for analogue or dial-up telephone service facilitated by the PSTN and not DSL services. The charges would include Telecom wholesale and retail charges to customers for the supply of PSTN telephone service and any TSO charge applicable for PSTN services. With the provision of NDSL service, an allocation of the maintenance and other operational costs for the copper access lines on which NDSL is supplied will need to be recovered in the NDSL pricing.

Both bundled DSL and unbundled (or naked) DSL services are expected to have a significant impact on the calculation of TSO costs for PSTN local telephone service as the current methodology assumes access line local loop costs are only recovered through charges for PSTN services and not other line services such as DSL. Two types of cost sharing could potentially apply in the future:

- sharing between PSTN and DSL services on a single loop
- sharing between voice and other broadband applications in the broadband DSL data stream (in the case of naked DSL)

Methodologies for determining the net cost for the local service TSO may need to be significantly modified.

If functionality to supply PSTN telephone service on an NDSL access line is disabled additional operational costs could be incurred, particularly if removal of PSTN service requires changes to automated line testing procedures. If disabling PSTN service

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<sup>2</sup> Loop wetting refers to having DC current flowing through the copper cable in order to maintain the integrity of the joints.

functionality involves the removal of DC exchange voltage, the copper lines, particularly in older cable systems, may also suffer higher failure rates due to deterioration of joints.

Overall, modification of current TSO arrangements and settings is expected to be necessary to take account of the impact of NDSL.

## **7 Impact of NDSL on the take-up of LLU and unconstrained UBS**

NDSL potentially enables an alternative TSP to pursue a variety of service opportunities depending on its convergence strategy. While wholesale NDSL is only available as constrained UBS, an alternative TSP is restricted in its ability to retail a service substituting for PSTN telephone service. Until the TSP has available to it an unconstrained UBS suitable for supplying a substitute for PSTN telephone service, the TSP may need to take Bitstream Service bundled with PSTN telephone service when customers want both telephone service and broadband Internet access.

If wholesale NDSL became available in the form of unconstrained UBS then an alternative service provider would have many more choices in the range of service it supplies, and could offer retail DSL service in conjunction with its own retail VoIP fixed or mobile telephone service. Over time, we expect that wholesale NDSL unbundled from PSTN telephone service will become prevalent, with the PSTN service emulated over DSL for customers who still require the look and feel of a conventional telephone.

The impact of NDSL on LLU depends on:

- the scope of each regulated service
- timing of the availability of each regulated service
- the capability/speed of the bitstream service associated with NDSL
- the relative costs of NDSL and unbundled loops, co-location and backhaul charges.

Wholesale NDSL is likely to provide lower risk and lower cost (depending on pricing principle) entry to an exchange area than full LLU. As numbers of NDSL customers in an area grows, there could be incentives to 'step up' to full LLU.

We believe that the wholesale NDSL – LLU decision will hinge on the relative costs/economies of scale and on the ability of an entrant to provide innovative services using the NDSL bitstream capability. Once these costs and capabilities are known it will be possible to make a more definitive prediction concerning the likely impact of NDSL on LLU.