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International Broadband Market Comparisons

Update March 2006

Covering the period October-December 2005

A Report for the Department of Trade and Industry

Contents

1. Executive Summary

The UK broadband market has continued to show positive signs of development over the three-month period October 2005 to December 2005. Overall it is performing very well against the other G7 countries, plus Australia, Ireland, South Korea and Sweden. There continues to be very little change in the ranking of the individual indices. However, during the period March 2005 to December 2005, the UK experienced 27% broadband growth, which is one of the highest among all countries. By the end of December 2005, there were almost 9.83 million broadband connections in the UK. Also, the UK has extended its lead on extensiveness, primarily due to the much-improved coverage of DSL across the country to reach 99.7% of households, with cable and fixed-wireless access bringing the total reach to 99.8%.

The competitiveness index reflects performance on choice, price and regulation. The UK retained its third position in the last quarter 2005 ahead of France, despite the latter's lead on pricing. Japan and Canada have maintained first and second place by some margin. The regulatory picture has remained fairly constant throughout the year, although there is some movement in Germany anticipated with Deutsche Telekom agreeing to EC requirements that the operator opens its new 50Mbps fibre-optic network up to competitors. The US regulatory landscape has seen some upheaval, as the FCC implements its decision to remove wholesale broadband access obligations on ILECs (Incumbent Local Exchange Carriers) and classes wireline broadband Internet services as 'Information Services', in line with the cable market. This is considered to be something that will affect competitive market conditions going forward. However, these developments do not change the regulation index scoring, and the UK retains its first position jointly with the US.

The Choice Index has remained fairly static, with only South Korea, Germany and Ireland seeing much positive movement. The UK's score has remained stationary as BT Wholesale hits the 6.9 million mark for broadband subscribers, and whilst there is stiff competition in the retail market, BT's share of the wholesale market suppresses any growth in the choice index. The impact of LLU in the UK is also still to be seen. Japan and France continue to be the most progressive countries currently in offering LLU opportunities for alternative operators.

The UK remains in fourth position in the price index – behind Japan, France and Canada. Despite continued improvements in pricing, the UK has been unable yet to catch these countries. Japan retains its top position as probably the cheapest broadband market in the world, and it remains to be seen how long it can sustain such competitive pricing – France seems to have had trouble doing this resulting in price increases over the previous six months.

The market context index reflects the potential addressable market for broadband (the market context) and its availability. The former measures the potential market for broadband take-up by looking at use of services considered 'part way' towards broadband (e.g. flat rate narrowband, ISDN, digital TV, 3G). The UK lags only the US, of its high position being attributable to its strong digital TV market, with nearly 70% of

households now taking a digital satellite, cable or terrestrial service, as well as emerging interest in 3G mobile services and continuing improvements in broadband take-up itself.

The UK continues to demonstrate a strong performance in the availability index retaining its first position. We have seen significant improvements due to BT removing any limit on the length of copper between exchange and end user that is viable for broadband provision. In addition, BT has continued to DSL-enable exchanges, which has meant that more communities now have access to broadband. Indeed, the 99.7% household coverage of DSL in the UK at the end of December 2005 has exceeded BT's promise is of 99.4% coverage by the end of 2005. Broadband coverage is estimated to be 85% now in Ireland due to promises by Eircom to achieve 90% by March 2006 (although there is still some debate as to how many broadband lines can actually carry 512kbps services).

The combined score of market context and availability ensures that the UK maintains its top position in the extensiveness index, a position it is anticipated to keep over the course of the next year.

Take-up has been a major challenge for the UK, although during the last three months significant improvements have been made. The UK now equals the US, and is rapidly catching up with France with 39% household penetration. The UK experienced the second greatest percentage point increase in its score among all countries under review. Canada retains its first position among the G7 countries with 57% penetration.

Going forward, if the UK is to improve its positioning among the G7, the focus must remain on competitiveness – primarily choice available to end-users. The more choice of suppliers available, the greater the impact on pricing as well as service quality, so improving take-up. It is important that alternative operators are provided with opportunities to compete, offering customers a variety of different services from which to choose that will perhaps fit better with their own particular lifestyles.

2. Broadband market indices

2.1 Measuring success: key metrics

This report, covering the period from October 2005 to December 2005, commissioned by the DTI from Ovum, continues the series of reports to benchmark the progress of the UK against certain key broadband enabled countries. It is in support of the Government's overarching objective for the UK to have the most extensive and competitive broadband market in the G7 by the end of 2005.

For the previous International Broadband Comparisons Reports, broadband market indices were developed with Ofcom and the Broadband Stakeholder Group to measure and compare the attractiveness and performance of the broadband market across a range of countries. Ovum has used the same indices in analysing the findings for this report.

The underlying principles used to develop the indices that comprise the broadband market index are:

- Simplicity: the index must be transparent and easy to explain and understand
- Quantifiable: the data to be used in the index must exist in a consistent manner across all the countries studied
- Realistic: it should give as realistic an impression as possible as to the status of broadband in a given country.

When dealing with any complicated, dynamic environment, measuring performance is never easy. Such difficulty is compounded when dealing with a market, which is developing, such as broadband. What will constitute success? Once measures of success have been decided, how should they be interpreted?

In these situations, it is sensible to start from an end goal and work backwards. In the UK's case, the goal is to have the most extensive and competitive broadband market in the G7[1] by the end of 2005. Therefore, extensiveness and competitiveness are clearly the two criteria that will need to be measured. These words do not naturally lend themselves to measurement in a simple fashion

A consensus has emerged around a dashboard of six indicators. A range of indicators enables a deeper understanding of the relative strengths and weaknesses of each international market that cannot be attained from a single aggregated measure. A further advantage is that causes (e.g. regulation, competition) can be separated from effects (e.g. take-up) and analysed independently. This section presents definitions for each dashboard indicator and the rankings for the 11 countries studied.

[1] G7 countries are: Canada; France; Germany; Italy; Japan; the UK and the USA.

2.2 Definition of indices and country rankings

Six key measures of success have been identified: price, choice, regulation, availability, market context and take-up. These are calculated as indices between 0 and 1, where a high score represents a good performance. Weightings are attached to these different indices to produce extensiveness and competitiveness indices, against which countries can be ranked. All indices are defined so as to give a value between 0 and 1, so that the weightings applied to each index are transparent. All indices are calculated based on the situation at the end of December 2005.

2.2.1 Choice index

The choice index comprises three parameters:

- Infrastructure competition: sum of the squares of the top three infrastructure player market shares
- Infrastructure choice: proportion of households with a choice of terrestrial infrastructure operator
- Retail competition: sum of the squares of the top five retail ISPs market shares.

The scores and rankings for the choice index are provided in Figure 2.1.

Figure 2.1: Choice Index at Q4 2005

	Q4 2005	G7 rank Q4 2005	Q3 2005	G7 rank Q3 2005	Q1 2005	G7 rank Q1 2005
Japan	0.91	1	0.91	1	0.94	1
Canada	0.83	2	0.84	2	0.83	2
US	0.76	3	0.76	3	0.78	3
South Korea	0.75		0.69		0.70	
France	0.67	4	0.66	=4	0.54	5
UK	**0.66**	**5**	**0.66**	**=4**	**0.66**	**4**
Sweden	0.65		0.65		0.66	
Germany	0.62	6	0.54	6	0.48	6
Australia	0.61		0.62		0.59	
Ireland	0.32		0.27		0.19	
Italy	0.26	7	0.29	7	0.38	7

Source: Ovum

Since October 2005, choice of supply has improved in four of the markets examined – a significant jump in Germany, South Korea, and Ireland, with a smaller gain in

France. In South Korea, Thrunet and Shinbiro (Onse) have gained market share at the expense of KT and Hanaro and in Ireland, NTL is gaining on Eircom, albeit slowly. In France, Free and Neuf Cegetel have shown minor increases in market share, but the incumbent's market share has remained the same. However, the increase in France's index is primarily due to the decrease of France Telecom's broadband infrastructure share to just under 66% - down from 67% at September 2005. Germany has seen substantial improvement in the index as T-Online continues to lose market share – now calculated at 42% from 48%.

The UK's score was steady again as all ISPs increased subscriber numbers. BT's retail DSL subscribers increased from 2.1 million at the end of September 2005 to 2.3 million at the end of December 2005. Its broadband end users, however, reached 6.9 million at end of 2005, demonstrating its continuing strength in the wholesale market. In January 2006, the Office of the Telecoms Adjudicator (OTA) reported 210,000 unbundled lines. It further estimates that 2-3 million lines will be unbundled by the end of 2006.

The choice index for Italy has continued to decline due to the increase of Telecom Italia's retail market share during the last 3 months to almost 85% and its continuing stranglehold on the supply of broadband.

2.2.2 Price index

The price index is calculated as the price of the top 5 retail ISPs, weighted by market share. Prices used are for mainstream residential products and include connection fees amortised over a three-year period and are adjusted for purchasing power parity (PPP).[2] In order to give a value between 0 and 1 for this index a PPP price of USD200 or less (per year) is allocated a score of 1, with a PPP price of USD800 or more allocated 0. A linear scale is used between these points.

The scores and rankings for the price index are provided in Figure 2.2.

[2] Prices are converted from local currency to USD using the exchange rate from the same time as the PPP factors to ensure consistency.

Figure 2.2: Price Index at Q4 2005

	Q4 2005	G7 rank Q4 2005	Q3 2005	G7 rank Q3 2005	Q1 2005	G7 rank Q1 2005
Japan	0.97	1	0.98	1	0.98	1
France	0.86	2	0.85	2	0.94	2
Canada	0.79	3	0.80	3	0.77	3
UK	**0.77**	**4**	**0.76**	**4**	**0.72**	**4**
Ireland	0.75		0.75		0.67	
Italy	0.71	5	0.70	5	0.50	6
Australia	0.69		0.69		0.63	
Sweden	0.64		0.65		0.63	
US	0.63	6	0.62	6	0.62	5
South Korea	0.53		0.54		0.53	
Germany	0.44	7	0.46	7	0.41	7

Source: Ovum

There have been improvements by the UK, France, Italy and the US in the price index since September 2005.

There has been a slight decline in the price index for Germany, mostly as a result of PPP changes

The UK price index has improved slightly, helped by AOL lowering its prices in the last quarter of 2005.

2.2.3 Regulation index

The regulation index compares and contrasts the broadband market actions taken by regulators in each country. The regulation index is based on simple, binary scores for the presence (or absence) of regulatory provision for:

- wholesale DSL
- wholesale cable
- local loop unbundling (LLUB) – mandated
- access upstream of MDF
- line sharing
- separation of network ownership.

The scores and rankings for the regulation index are provided in figure 2.3.

Figure 2.3: Regulation Index at Q4 2005

	Q4 2005	G7 rank Q4 2005	Q3 2005	G7 rank Q3 2005	Q1 2005	G7 rank Q1 2005
UK	**1.00**	**1=**	**1.00**	**1=**	**1.00**	**1=**
US	1.00	1=	1.00	1=	1.00	1=
Canada	0.83	3	0.83	3	0.83	3
South Korea	0.83		0.83		0.83	
Ireland	0.83		0.83		0.83	
Japan	0.67	4=	0.67	4=	0.67	4=
France	0.67	4=	0.67	4=	0.67	4=
Germany	0.67	4=	0.67	4=	0.67	4=
Italy	0.67	4=	0.67	4=	0.67	4=
Sweden	0.67		0.67		0.67	
Australia	0.67		0.67		0.67	

Source: Ovum

There has been no change in the regulatory index over the last 3 months.

2.2.4 Availability index

The availability index is a measure of the percentage of the population with access to a terrestrial broadband solution (naturally a value between 0 and 1).

The scores and rankings for the availability index are provided in figure 2.4.

Figure 2.4: Availability Index at Q4 2005

	Q4 2005	G7 rank Q4 2005	Q3 2005	G7 rank Q3 2005	Q1 2005	G7 rank Q1 2005
UK	**1.00 (0.998)**	**1**	**1.00 (0.997)**	**1**	**0.98**	**1**
South Korea	0.97		0.97		0.97	
Japan	0.96	2	0.96	2	0.95	2
France	0.95	3	0.95	3	0.90	3=
US	0.94	4	0.94	4	0.89	6
Germany	0.91	5	0.91	5	0.90	3=
Sweden	0.90		0.90		0.90	
Italy	0.90	6	0.90	6	0.90	3=
Canada	0.89	7	0.89	7	0.86	7
Australia	0.85		0.85		0.80	
Ireland	0.85		0.81		0.74	

Source: Ovum

There is little change reported in the final Quarter of 2005 with regard to total availability or coverage for various broadband services. Availability is already at or close to the 90% mark in most countries, and we have assumed that for the majority there will have been a less than 1% increase in availability over the last three months. Availability has almost reached a standstill at current levels, as operators reach the limit of viable areas and exchanges that can economically and realistically be broadband enabled.

Eircom, however, has announced that it plans to achieve 90% broadband coverage in Ireland by March 2006 and is calling on Government to help deliver the remaining 10% so that Ireland may achieve 100% broadband availability by 2007. We have therefore estimated that broadband availability at the end of 2005 is in the region of 85%.

2.2.5 Market context index

Countries with a high penetration of services that are 'part way' towards broadband (i.e. flat rate narrowband, ISDN, digital TV, 3G) have a large pool of subscribers, who may quickly switch over to broadband given certain circumstances. Hence countries with high flat rate, ISDN, or DTV penetration could expect an accelerated growth in broadband penetration either: once broadband prices are close to flat rate prices; the applications for which broadband is essential increase in attractiveness; and/or digital TV becomes a competitive platform for broadband delivery. 3G provides an additional

way of providing mobile broadband access, albeit at lower data rates/higher cost per Mbyte transferred. The Market Context index is calculated as a sum of the estimated percentage of households with DTV, ISDN, flat rate Internet subscriptions and broadband, plus 3G users. The total is divided by 200%.

The scores and rankings for the market context index are provided in figure 2.5.

Figure 2.5: Market Context Index at Q4 2005

	Q4 2005	G7 rank Q4 2005	Q3 2005	G7 rank Q3 2005	Q1 2005	G7 rank Q1 2005
South Korea	0.87		0.81		0.79	
US	0.77	1	0.69	1	0.63	1
UK	**0.71**	**2**	**0.65**	**2**	**0.58**	**=2**
Canada	0.68	3	0.61	3	0.58	=2
Australia	0.66		0.54		0.49	
Sweden	0.64		0.55		0.50	
Japan	0.63	4	0.54	4	0.47	4
Germany	0.48	5=	0.42	5	0.38	5
Ireland	0.48		0.39		0.32	
Italy	0.48	5=	0.34	7	0.27	7
France	0.46	7	0.40	6	0.36	6

Source: Ovum

The market context index has increased substantially between October and December 2005. The main driver for that is the increase in household broadband penetration for all the countries examined, but also improvements in digital TV uptake together with increases in 3G adoption in some markets. The UK is still leading in digital TV with a penetration rate of just under 70% of households, up from 65.9% in the previous quarter.

2.2.6 Take-up index

The take-up index is a measurement of household broadband penetration (resulting in a value between 0 and 1). To qualify as broadband, a service must be capable of delivering ‘always-on’ services to each individual at data rates above 128kbps.

The scores and rankings for the take-up index are provided in figure 2.6.

Figure 2.6: Take-up Index at Q4 2005

	Q4 2005	G7 rank Q4 2005	Q3 2005	G7 rank Q3 2005	Q1 2005	G7 rank Q1 2005
South Korea	0.72		0.71		0.72	
Canada	0.57	1	0.53	1	0.50	1
Japan	0.45	2	0.43	2	0.41	2
Sweden	0.46		0.40		0.34	
France	0.40	3	0.36	4	0.31	4
UK	**0.39**	**4=**	**0.35**	**5**	**0.29**	**5**
US	0.39	4=	0.37	3	0.33	3
Australia	0.36		0.31		0.25	
Italy	0.29	6	0.25	6	0.23	6
Germany	0.27	7	0.21	7	0.19	7
Ireland	0.19		0.13		0.11	

Source: Ovum

As broadband availability is approaching 100% in many countries, the major focus is shifting towards increasing the take-up of broadband. 2004 and 2005 have been key years for many countries in terms of broadband growth.

The countries with the highest broadband growth between December 2004 and December 2005 are Ireland (49%), Australia (44%) and UK (38%). In these markets broadband penetration has reached the mass market.

According to Point Topic, the UK was still just behind France in terms of broadband numbers at the end of 2005, with a total of 9,828,300 lines against 9,957,400 in France. The UK added more than 3.7m broadband lines in the full year to December 2005 while France added only 3.2m. Despite not quite reaching France, the UK has nevertheless managed to improve its position, coming level with the US.

Germany, however, has now jumped into first place in terms of number of European broadband connections with 10,706,600 lines at the end of 2005. According to T-Online, its launch of DSL full-package marketing and the development of its tariff portfolio to include flat rate DSL telephony contributed to the increase of DSL subscribers during 2005.

By end 2005, Japan aimed to have ‘always on’ broadband connections to at least 30 million homes, and ultra high-speed access networks to at least 10 million homes. Japan’s infrastructure is one of the most advanced in the world but as yet has not reached full utilisation and has fallen short of its stated target, reaching just over 22 million homes at the end of 2005.

2.3 Comparisons

The UK's score has improved slightly when comparing price against choice due mainly to AOL decreasing its tariffs from £24.99 to £17.99 a month in the last quarter of 2005. However, BT Retail also made a slight gain in market share in the last quarter of 2005 which has limited any increase in the choice index.

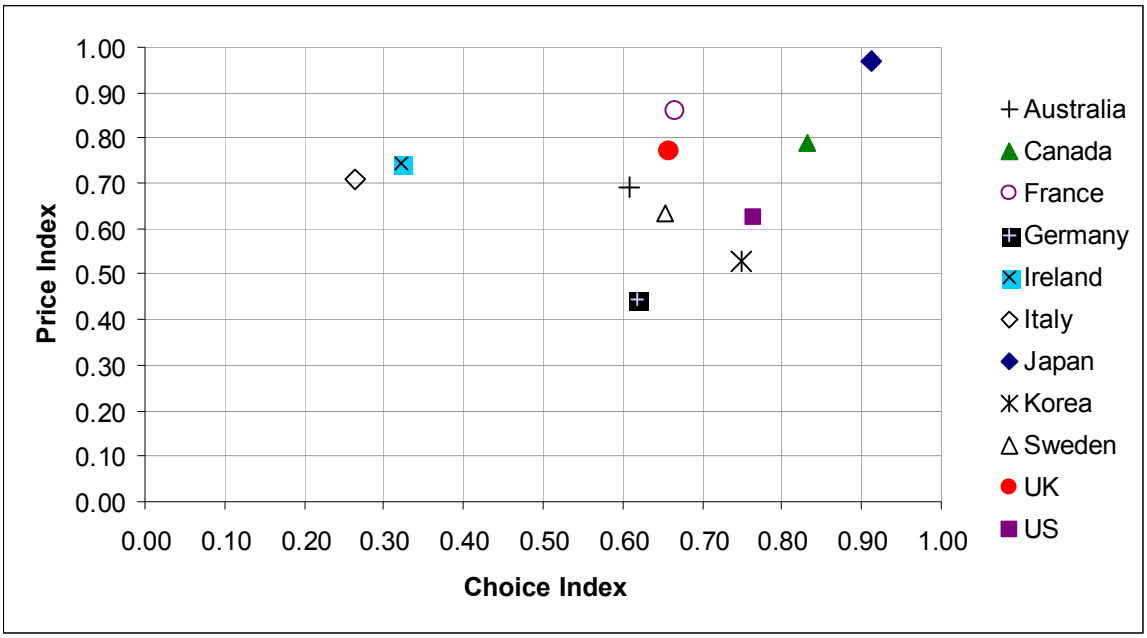
Japan, Canada and France remain ahead of the game at the end of 2005, having demonstrated a determined push in driving competitive activity. LLU in Japan and France, strong public sector support in Canada, together with slashed prices have helped maintain this leading position.

In South Korea, Thrunet and Shinbiro (Onse) have gained market share at the expense of KT and Hanaro and have therefore led to an improvement in Korea's choice index, however its price index has declined slightly. As a result, Korea's positioning with regard to price versus choice is lower than one might expect for such a leading edge country.

In Ireland, Eircom and NTL have started to really push broadband services and as a result NTL has gained market share from Eircom in the last three months of 2005. Ireland has now overtaken Italy in terms of choice.

Italy continues to fall back in the choice index due to Telecom Italia again increasing its market share in the last quarter of 2005.

Figure 2.7: Choice versus price



Source: Ovum

2.4 The 2005 Government target

The UK Government target is to have the most competitive and extensive broadband network in the G7 by the end of 2005. The target may therefore be broken down into the two factors – competitiveness and extensiveness – that combine to provide the overall market environment for broadband. We can define these two factors in terms of the relevant dashboard indicators as follows:

- *competitiveness* is defined as a composite measure of the market regulation index (a leading indicator), market choice, and price (a lagging indicator) – these are weighted: choice (3), price (3) and regulation (1)
- *extensiveness* is defined as a composite measure of market context and broadband availability – these are weighted availability (2) and market context (1).

Figure 2.8 illustrates the competitiveness index.

Figure 2.8: Competitiveness Index at Q4 2005

	Q4 2005	**G7 rank Q4 2005**	**Q3 2005**	**G7 rank Q3 2005**	**Q1 2005**	**G7 rank Q1 2005**
Japan	0.90	1	0.90	1	0.92	1
Canada	0.81	2	0.82	2	0.80	2
UK	**0.76**	**3**	**0.75**	**3**	**0.74**	**3=**
France	0.75	4	0.74	4=	0.73	5
US	0.74	5	0.74	4=	0.74	3=
Sweden	0.65		0.65		0.65	
Australia	0.65		0.65		0.62	
South Korea	0.67		0.64		0.65	
Ireland	0.58		0.55		0.49	
Germany	0.55	6	0.52	6=	0.48	6
Italy	0.51	7	0.52	6=	0.47	7

Source: Ovum

The UK, France, Germany South Korea and Ireland have shown improvements in the competitiveness index in the last quarter of 2005. Canada and Italy have all presented a small decline in their competitiveness index, which in the case of Italy, is a result of the incumbent operator gaining market share in the last three months of 2005.

Figure 2.9 illustrates the extensiveness index. Here we see improvements across the board (extensiveness will continue to grow as markets mature), with the UK, as a result of improvement in availability to 99.8%, and high digital TV penetration retaining its first position among the G7.

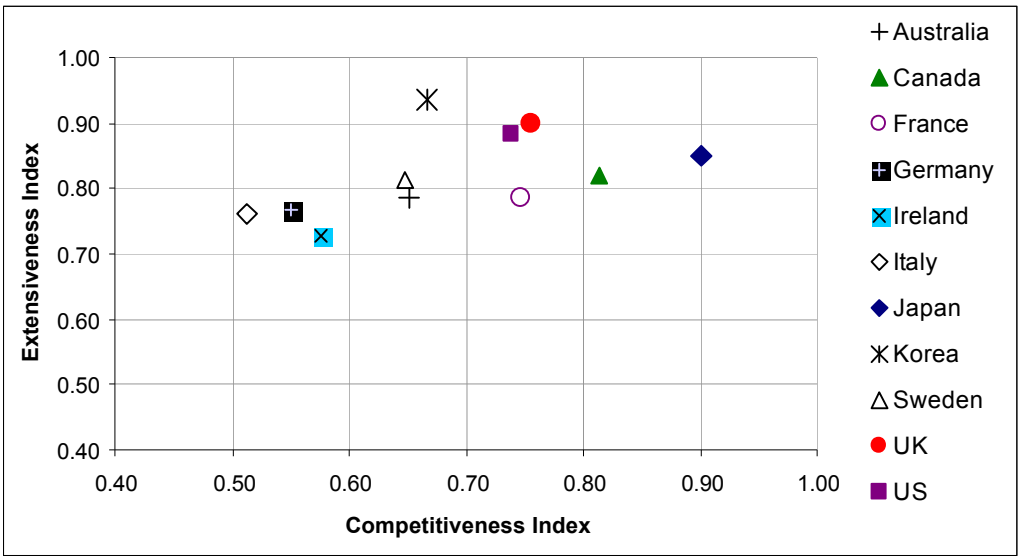
Figure 2.9: Extensiveness Index at Q4 2005

	Q4 2005	G7 rank Q4 2005	Q3 2005	G7 rank Q3 2005	Q1 2005	G7 rank Q1 2005
South Korea	0.94		0.92		0.91	
UK	**0.90**	**1**	**0.88**	**1**	**0.84**	**1**
US	0.88	2	0.86	2	0.80	2
Japan	0.85	3	0.82	3	0.79	3
Canada	0.82	4	0.80	4	0.77	4
Sweden	0.81		0.78		0.77	
France	0.79	5	0.77	5	0.72	6
Australia	0.79		0.75		0.70	
Germany	0.77	6	0.75	6	0.73	5
Italy	0.76	7	0.71	7	0.69	7
Ireland	0.73		0.67		0.60	

Source: Ovum

Plotting competitiveness against extensiveness, we see the following effects.

Figure 2.12: Extensiveness versus competitiveness



Source: Ovum

The UK is well positioned among the G7 countries, leading on extensiveness and lagging only Japan and Canada on extensiveness. Overall, the picture at the end of

2005 is very positive, and we expect the gains to be made by the UK going forward to improve further.

3. Developments, plans and initiatives

This chapter summarises some of the key developments, plans and initiatives in each of the country markets under review during the period October-December 2005.

Below we have listed in country order some of the key announcements made during this period.

3.1 Australia

Telstra delays rollout of next-generation network

In December 2005, Telstra announced that it would delay rollout of the planned “fibre-to-the-node” component of its next generation network until the government gives it firmer guarantees that competitors will not be allowed to piggyback on its multi-billion dollar investment. Telstra awarded a contract to Alcatel for the rollout of fibre-to-the-node, but has now told the French company that the project is on hold.

Telstra has repeatedly stated that it won’t risk shareholder funds in upgrading the network if it could be forced to allow access to competitors. *(Total Telecom, December 2005)*

3.2 Canada

Cogeco Cable speed and price decreases

Cogeco is a provider of cable TV, high speed Internet and broadcasting services in Ontario and Quebec. It offers its cable TV services through its cable division, Cogeco Cable. It also operates television and radio stations through its Cogeco Radio-Television subsidiary.

In the fourth quarter of 2005, Cogeco phased out its 'High-Speed Internet Advantage 'business service. It also decreased the speed of its 'Cogeco High-Speed Internet Standard' residential service and its 'High-Speed Internet Business Starter' business service from 6 Mbps to 5 Mbps. It reduced the monthly rental rate of its' High-Speed Internet WorkGroup package' business service by 2%. *(Point Topic, December 2005)*

Shaw Communications price increases

In the fourth quarter of 2005, Shaw increased the monthly rental rates of its 'High-Speed Internet' residential service by 3%. *(Point Topic, December 2005)*

Rogers cable price increases

In the fourth quarter of 2005, Rogers' Cable increased the monthly rental rates of its 'Hi-Speed Internet Lite' residential and business service to a maximum of 17 percent. *(Point Topic, December 2005)*

Bell Canada speed and price increases

In the fourth quarter of 2005, Bell Canada doubled the downstream speeds of its 'Sympatico DSL Basic Internet' service. It also increased the monthly rental rates of its' Sympatico DSL Basic Lite' and 'Sympatico DSL Basic Internet' residential services by up to 25 percent. *(Point Topic, January 2006)*

3.3 France

France Telecom to offer free TV programs

As part of the French incumbents' triple-play broadband services, France Telecom plans to offer free TV programming such as films through fast-speed internet connection starting early 2006, La Tribune reports.

France Telecom would compete with alternative broadband operator Free, a leading provider of Internet, telephone and TV services in one package. *(Total telecom, December 2005)*

France Telecom to launch FTTH pilot

France Telecom has announced that it will test fibre to the home (FTTH) by the summer of 2006, in six districts in Paris and six cities in the Haute-de-Seine region. The experiment will deliver optical fibre service into thousands of trial households. The telco has chosen to migrate to FTTH technology to meet future needs.

During the pilot programme, France Telecom will deliver high definition TV, unlimited telephony and very high speed Internet services. *(Digital Media Europe, January 2006)*

Altice to acquire UPC France for Euro 1.25bn

Cable operator Altice and investment group Cinven have agreed to purchase French cable company UPC France from Liberty Global for Euro 1.25bn. The companies expect to complete the transaction in the second quarter of 2006.

UPC France, a wholly owned subsidiary of telecoms investing giant Liberty Global, offers cable TV, Internet and telephony services to over 1.6 million customers in France.

Altice is based in Luxembourg and is wholly owned by UK investment firm Cinven, which also bought the cable businesses of France telecom and Canal Plus. With the

purchase of UPC France, Altice/Cinven will be the largest cable operator in France. *(Digital Media Europe, March 2006)*

3.4 Germany

DT's VDSL project

The German incumbent, Deutsche Telecom (DT), has announced plans for a high-speed 50Mbit/s VDSL (FTTN) project, which is the basis for its "Conquer the home" triple-play strategy. The operator is prepared to invest Euro 3bn in order to upgrade 50 cities to 50Mbit/s by 2007. To date, it has run pilots for ADSL2+, VDSL and WiMAX up to 25Mbit/s. The new "grand coalition" German government agreed to exempt DT's Euro 3bn investment from "regulatory actions for a certain period of time" to ensure adequate returns. (*Ovum, November 2005)*

Kabel Deutschland GmbH (KDG) plans triple-play investment

Over the next three years, cable operator KDG is planning to invest EUR500 million in its network to allow it to offer digital TV, broadband internet and telephone triple-play services to about 90% of the 15.3 million connectable households in Germany. *(Total Telecom, December 2005)*

Kabel Deutschland launches new services

In the fourth quarter of 2005, Kabel Deutschland phased out all its residential and business services and launched its 'Volume Basic', 'Flat Comfort', 'Flat Professional' and 'Flat Premium' services with speeds up to 8200 Kbps in its residential and business grades.

The operator introduced its first IP telephony service in Leipzig, expanding it eventually to the cities of Hamburg, Berlin, Munich, Dresden and Koblenz in the fourth quarter of 2005. *(Point Topic, December 2005)*

Unity Media to deliver triple play cable services

Unity Media has deployed a Nortel optical Ethernet network to support triple play cable services such as VoIP, video-on-demand and Internet. The recently formed German cable operator Unity Media is the proprietor of established cable network operators Ish and Iesy. Nortel’s optical Ethernet solution is helping Unity Media to enhance its service portfolio and expand its service area. *(Digital Media Europe, December 2005)*

3.5 Ireland

Broadband subscriptions more than tripled

In December 2005, the Irish regulator ComReg announced that Broadband subscriptions had more than tripled in the 12 months to September 2005.

ComReg said that there are 208,500 broadband subscribers in Ireland, up 19% in the three months to September and up nearly 230% in the 12 months to September, with Eircom taking 79% of the fixed-line market share. DSL remains the dominant technology, while subscriptions using fixed-line wireless, satellite or cable account for 21% of subscribers. *(Total Telecom, December 2005)*

Eircom reaches 200,000 ADSL subscribers

Eircom's ADSL subscribers increased from 156,000 at the end of August 2005 to 200,000 at the end of December 2005. The company attributed the increase to the low cost ADSL access offered to its subscribers. It also plans to increase the ADSL number to 500,000 users by the end of December 2007. *(Point Topic, February 2006)*

3.6 Italy

Telecom Italia starts rollout of IPTV

Telecom Italia SpA began rollout of its new broadband TV service on December 2 in Rome, Milan, Bologna and Palermo. The Italian incumbent aims to reach 250 cities or 8 million households by the end of 2006. The service completes a trio of Internet, voice and video services in which Telecom Italia will be investing EUR350 million through to 2008.

In addition Telecom Italia will boost the speed of its broadband connections in Italy to 20Mbit/s in 2006, as well as in France and Germany where it will also launch its new IPTV offer.

Telecom Italia's basic triple play service will cost EUR45.90 a month, excluding phone calls. *(Total Telecom, November 2005)*

Telecom Italia and Samsung to trial WiBro handsets

Telecom Italia Mobile signed an agreement with Samsung Electronics to run trials of wireless broadband mobile phones based on WiBro technology at the Turin 2006 Winter Olympics. The Italian incumbent said that it would be the first in Europe to try out the Korean technology. The new technology is currently being tested in South Korea, Japan and the U.S.

WiBro enables multi-conferencing, handles multiple video calls, and at the same time keeps open an audio, video, television or Internet multimedia session. *(Total Telecom, December 2005)*

FastWeb launches new triple-play services

In the fourth quarter of 2005, FastWeb launched its '30 hours' residential service and phased out its 'Night' and 'Weekend' residential services. The operator also launched triple play services for its business and residential subscribers in Vicenza.

The operator's total subscribers (DSL and Fibre) increased from 644,000 at the end of September 2005 to 714,000 at the end of December 2005.

In November 2005, FastWeb launched the new browser and interaction tools for its IP TV service. *(Point Topic, February 2006)*

3.7 Japan

NTT to launch cut price VoIP service

NTT East and NTT West, the two regional carriers of Japanese incumbent NTT Corp, have announced they are to launch a new, competitively priced IP telephony service for homes and businesses that have access to their fibre-optic networks.

The service will be offered as an optional extra to the B Flets fibre-optic broadband Internet access currently available from NTT. Customers will have the option of adding up to five separate IP telephone lines per subscription, each with its own number, ideal for large families or small businesses.

Each initial subscription will cost 500 yen (3.6 euros) a month on top of the B Flets existing price of 4,100 yen (29.5 euros). This will pay for an IP telephony line that can be used to make calls anywhere in Japan for a flat rate of 8 yen for three minutes.

By keeping the basic price well below 1500 yen for up to five IP telephone lines, the two NTT regional carriers hope to broaden sales and undercut their rivals – KDDI. *(Total Telecom, October 2005)*

NTT FTTH network expansion

NTT offers its high-speed Internet service on its FTTH network under the brand name 'B FLET'S'. In November 2005, NTT expanded its FTTH network via a new wiring system with an aim to reach a target FTTH subscriber base of 30 million by 2010. The operator also tested an IPv6 based remote monitoring system to offer security features to its subscribers.

Its B FLET'S' subscribers increased from 1.9 million at the end of June 2005 to 2.4 million at the end of September 2005. The operator targets 3.46 million B FLETS' customers by the end of March 2006. *(Point Topic, December 2005)*

Sony launches 1Mbit residential service

Sony offers DSL services through So-net. So-net's broadband subscribers were 720,000 at the end of August 2005. The operator plans to increase its broadband subscribers to 830,000 by the end of March 2006.

In the fourth quarter of 2005, the operator launched 'so-net ADSL 1M' service as an ADSL entry course with speeds up to 1 Mbps in its residential grade. *(Point Topic, February 2006)*

3.8 South Korea

KT Corp to invest $2.9 billion in 2006 to strengthen operations

KT Corp, South Korea's largest fixed line operator, plans to invest KRW3 trillion ($2.9 billion) in new business areas including wireless broadband and content.

The investment plan for the next year includes KRW1 trillion that KT has allocated for wireless broadband, IPTV and digital entertainment content. *(Total Telecom, December 2005)*

South Korea OK's Hanarotelecom with Korea Thrunet

South Korea's Ministry of Communication has approved the merger of broadband internet service provider Hanarotelecom Inc. with smaller rival Korea Thrunet Co. The merger is scheduled to take place on 1 January 2006.

Broadband service providers are facing sluggish growth in South Korea as more than 70% of households already have broadband internet connections. Tough competition has forced companies like Hanarotelecom to consolidate with smaller rivals in order to remain competitive against market leader KT.

Hanarotelecom has also cut its total work force by 14% through early retirement as part of a restructuring program aimed at reducing costs and bringing the operator back to profitability. *(Total Telecom, December 2005)*

Korean cable operators pile on Internet subscribers

South Korea's cable TV operators are seeing booming sales of their Internet access services, which will help push total revenue of the top seven firms over the 1 trillion won (US$1 billion) mark this year.

Manager of market leader Taekwang, said that "the increase in the number of subscribers to broadband Internet service from 270,000 households to 670,000 households contributed greatly to a rise in our revenues". *(Total Telecom, December 2005)*

Korea Telecom (KT) expects to launch IPTV in 2006

KT expects to launch IPTV services in the second half of 2006. The company has been ready to launch for some time now but has been prevented from doing so by a turf war between telecoms and broadcasting regulators.

The Korea Broadcasting Commission says IPTV should be subject to broadcasting regulations and the launch of any IPTV service should be determined by the needs of cable television operators. However, The Ministry of Information and Communication argues that IPTV is a form of telecommunication service and requested that IPTV be referred to as Internet content on demand (ICOD).

KT expects the regulatory issues to be taken care of during the first part of 2006. *(Total Telecom, December 2005)*

South Korean firms push WiBro

WiBro will be a key focus for 2006 states South Korean vendor Samsung. However, there is still some confusion as to what WiBro actually represents. WiBro is just a brand of mobile WiMax that is available in the Korean market and also being tested in Italy. WiMax may conflict with 3G, however, WiMax has advantages including cheapness of spectrum in comparison to 3G.

SK Telecom said it will introduce mobile WiMax services nation-wide over the next four years, while KT Corp will deploy the technology across 10 cities by 2006, reaching 84 cities by 2008. *(Total Telecom, October 2005)*

3.9 Sweden

TeliaSonera offers naked DSL

TeliaSonera has reluctantly agreed to a ruling from PTS, the Swedish regulator, that it must offer broadband access unbundled from its PSTN service. This goes under various names including naked DSL, dry loop/line or basic copper access. Customers in Sweden will now be able to opt for broadband-only by the end of October.

The decision comes after PTS threatened to impose an SKr 100m (Euro 10.7m) fine for non-compliance with its ruling.

Providing naked DSL at the retail level is not difficult, as other countries have shown - and to deny customers' access to it amounts to forced bundling of services, which regulators are right to be strict about. In an era when more and more people want to rely on a mobile phone for their phone calls, possibly with the addition of VoIP services, there is no basis for the intransigence of incumbents. There is very little argument to force customers to get PSTN service with their ADSL service if they don't want it. Wholesale naked DSL, on the other hand, is a different issue because it is inherently more complex.

Until now, TeliaSonera's response has been that there's low demand so there is no need to supply it. But of course, that is merely highlighting an issue of awareness. There has long been a residual resentment that broadband-only services are not widely available, although it is fair to say most customers do not understand the costs issues and that these do need to be resolved. This can often result in higher retail prices.

In Finland, TeliaSonera's other main market, naked DSL has been a de-facto phenomenon for some time because of the structure of the supply market. (*Ovum, October 2005*)

Stokab to build WiMax network

Stokab, the broadband services operator owned by the City of Stockholm, has received clearance to build a wireless broadband network based on WiMax technology in the greater Stockholm area. Stokab plans to connect 50,000 apartments managed by the City of Stockholm-owned housing company Svenska Bostader to broadband services by 2009. *(Total Telecom, November 2005)*

TDC launches broadband and telephony services in Sweden

In October 2005, Denmark-based TDC launched three broadband products and two types of telephony subscription to residential customers in Sweden. TDC is able to offer its new products to about a third of the Swedish market, mainly large urban areas, with the aim to increase coverage to more than 50% in the course of the next few years.

TDC also has plans to introduce a broadband TV service in Sweden in 2006. *(TDC, October 2005)*

B2 Bredband increases speeds of residential services

In fourth quarter of 2005, B2 Bredband AB (Bredbandsbolaget) planned to increase the speeds of all its residential services from 10 Mbps to 100 Mbps by June 2006.The operator also acquired the broadband subscriber base of Eurobells in September 2005 that increased its subscriber base by 2000 subscribers. This move would help the operator penetrate in new markets. *(Point Topic, December 2005)*

3.10 USA

Verizon ups ante with IPTV campaign

Verizon is targeting a 20-25% share of the video market with its new IPTV services, as well as more than 50% of the US broadband market.

Verizon is currently offering its fibre-to-the-premise (FTTP) network, called FiOS, in 775 communities with an average penetration of 12% after six months of marketing. The network will pass 3 million homes by the end of 2006.

Verizon has launched its FiOS TV service in three states now – Florida, Texas and Virginia.

The services costs $39.95 per month offering 400 channels and 1800 VOD titles and will also include a “passive personalisation” where recommended services will be presented to the viewer via the “MeTV” service. *(Total Telecom, December 2005)*

AT&T offers faster web service

Following moves by other phone companies, AT&T is doubling the speed of its broadband service to 6Mbps. The new service, launched in December 2005, is priced at $49.99 a month for three months, and then $64.99 a month thereafter. The service is being offered to all consumers and also small and medium-sized businesses. *(Wall Street Journal, December 2005)*

Cable operators and telcos launch premium broadband services

Verizon, Cablevision, AT&T and BellSouth have all launched premium versions of their broadband services, which allow customers to send photos, large files and videos at speeds up to a dozen times faster than regular broadband. The fees for the new offerings can run as high as $179.95 a month.

It isn’t yet clear how wide an audience there will be for the faster, more expensive services. For many customers, standard broadband plans are likely to suffice for popular activities such as sending emails, shopping online and checking new sites, but there may be a high-end market that will use the new services for hobbies or work. *(Wall Street Journal, December 2005)*

Broadband over powerline coming of age

After struggling for years, technology for delivering broadband Internet access over powerlines may finally be coming of age. Advances in technology that have lowered costs and increase download speeds as well as renewed interest from utilities has won broadband over powerline, or BPL, new converts.

Texas utility TXU Corp, has signed a deal with Current Communications Group LLC that will allow up to 2 million homes in north Texas to access the Internet through electricity outlets. Earthlink Inc, an Internet service provider, is also involved in three separate trials of BPL and expects to have an offering in 2006. (*Dow Jones Newswire, December 2005)*

Time Warner Cable phases out services

In the fourth quarter of 2005, Time Warner Cable phased out its 'RR Lite' and 'RR Lite-Static' business services. Its cable Internet subscribers increased from 4.3 million at the end of June 2005 to 4.6 million at the end of September 2005. The operator had around 614,000 VoIP customers as of 31 Mar 2005. *(Point Topic, December 2005)*

Comcast launches new business services

In the fourth quarter of 2005, Comcast launched 'Comcast Workplace – Lite' and 'Comcast Workplace – access' with speeds up to 4 Mbps in its business grade. *(Point Topic, December 2005)*

DSL and other broadband technologies gaining market share

Cable broadband is the dominant broadband technology in the US. DSL has been fighting back to gain market share and has done so. In 2004 cable broadband held a 58% share of the total broadband market. We estimate this to decrease to 54% by the end of 2005 and that DSL broadband will pick up most of the remaining share.

Other broadband technologies are also growing, including technologies such as FTTP, fixed wireless access (FWA) and powerline communications (PLC). *(Ovum, December 2005).*

4. Summary of key data

4.1 Broadband market competitiveness

Broadband market competitiveness is defined in terms of choice, price and regulation.

4.1.1 Choice

A comparison of choice between the UK and other markets is assessed based on the level of infrastructure supplier competition, retail competition and choice of supplier for the end user. It is notable and not unsurprising that the least competitive markets are those with the strongest incumbents. Deutsche Telekom, Telecom Italia, Telstra and Eircom all continue to dominate the broadband space, and all are considered to wield more power than their respective country regulators in determining the market dynamics in which they operate. Strides in LLU in France, and hefty price cuts have helped improve competitiveness there. By the end of December 2005 there were over 2.8m unbundled lines in France, but only 210,000 in the UK.

The UK also offers competitive choice through its cable players, with ntl and Telewest increasing their subscriber bases – soon to be one subscriber base following the merger announcement in October 2005[3]. Telewest added 85,000 broadband subscriptions in the last quarter 2005 and almost 307,000 new broadband subscribers in the year to 31 December 2005.

Despite the fact that many of the broadband markets covered in this report are nearing maturity in terms of availability and penetration, there are still new players entering some of these markets hoping to improve choice and competition for consumers and businesses.

For example, in October 2005, Denmark-based TDC launched three broadband products and two types of telephony subscription to residential customers in Sweden. TDC is able to offer its new products to about a third of the Swedish market, mainly large urban areas, with the aim to increase coverage to more than 50% in the course of the next few years. TDC also has plans to introduce a broadband TV service in Sweden in 2006.

In the US, utility companies are partnering with ISPs to deliver broadband over powerline (BPL) services. Advances in technology that have lowered costs and increased download speeds, have won BPL new converts.

Texas utility TXU Corp, has signed a deal with Current Communications Group LLC that will allow up to 2 million homes in north Texas to access the Internet through

- [3] NTL Incorporated and Telewest Global announced in October 2005 a definitive merger agreement under which ntl will acquire Telewest,.

electricity outlets. Earthlink Inc, an Internet service provider, is also involved in three separate trials of BPL and expects to have an offering in 2006.

4.1.2 Price

As the broadband markets covered in this report mature, there have been a number of changes in the last three months of 2005 to the way service offerings are being priced.

In Canada, Cogeco Cable phased out its 'High-Speed Internet Advantage 'business service. It also decreased the speed of its 'Cogeco High-Speed Internet Standard' residential service and its 'High-Speed Internet Business Starter' business service from 6 Mbps to 5 Mbps. It reduced the monthly rental rate of its' High-Speed Internet WorkGroup package' business service by 2%.

Also in Canada, Shaw increased the monthly rental rates of its 'High-Speed Internet' residential service by 3% and Rogers' Cable increased the monthly rental rates of its 'Hi-Speed Internet Lite' residential and business service to a maximum of 17 percent.

Bell Canada doubled the downstream speeds of its 'Sympatico DSL Basic Internet' service. It also increased the monthly rental rates of its' Sympatico DSL Basic Lite' and 'Sympatico DSL Basic Internet' residential services by up to 25 percent.

In France, France Telecom plans to offer free TV programming such as films through fast-speed internet connection starting early in 2006, La Tribune reports. France Telecom would compete with alternative broadband operator Free, a leading provider of Internet, telephone and TV services in one package.

In Japan, NTT East and NTT West, the two regional carriers of Japanese incumbent NTT Corp, have announced they are to launch a new, competitively priced IP telephony service for homes and businesses that have access to their fibre-optic networks.

The service will be offered as an optional extra to the B Flets fibre-optic broadband Internet access currently available from NTT. Customers will have the option of adding up to five separate IP telephone lines per subscription, each with its own number, ideal for large families or small businesses.

Each initial subscription will cost 500 yen (3.6 euros) a month on top of the B Flets existing price of 4,100 yen (29.5 euros). This will pay for an IP telephony line that can be used to make calls anywhere in Japan for a flat rate of 8 yen for three minutes.

By keeping the basic price well below 1500 yen for up to five IP telephone lines, the two NTT regional carriers hope to broaden sales and undercut their rival – KDDI.

In the US, Verizon is targeting a 20-25% share of the video market with its new IPTV services, as well as more than 50% of the US broadband market.

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Verizon has launched its FiOS TV service in three states now – Florida, Texas and Virginia. The service costs $39.95 per month offering 400 channels and 1800 video-on-demand (VOD) titles and will also include a "passive personalisation" where recommended services will be presented to the viewer via the "MeTV" service.

4.1.3 Regulation

Although not impacting on the regulatory index, there have been a few key regulatory developments of note within the countries addressed in this report – particularly around new technology licence awards and wholesale pricing. A selection of these are provided below.

AUSTRALIA

Telstra proposes uniform wholesale price

In December 2005, Telstra proposed a new uniform price of A$30 per month for its unconditioned local loop which allows wholesale customers to use Telstra's copper network to supply broadband and voice services. This proposal follows the government's announcement that it intends to require a uniform national price for retail services. This latest proposal is now with the Australian Competition and Consumer Commission (ACCC), which must now decide whether to accept the new pricing. *(Total Telecom, December 2005)*

FRANCE

French regulator auctions 44 licences for WiMax technology

ARCEP, France's telecommunications regulator is auctioning 44 licences (two for each region of France) which will allow operators to provide wireless internet services over a WiMax network. The regulator stated that 76 operators have indicated they intend to bid. The bids had to be received by 6th January 2006. *(Total Telecom, October 2005)*

GERMANY

Deutsche Telekom's (DT's) new broadband network to be regulated

DT plans to rollout a high-speed 50Mbps optical fibre network that will transmit data up to 20 times faster than current offerings. This is DT's basis for its 'Conquer the Home' triple-play strategyhe plan is to provide Germany's 50 largest cities with high-speed broadband lines by 2007. To October,2005, it had run pilots for ADSL2+, VDSL and WiMAX up to 25Mbit/s.

The German government had previously agreed with DT's argument that it could only make a decent profit on its proposed Euro 3 billion high-speed network if it was entirely exempt from regulation and from any requirement to offer its lines to rivals. The European Commission, however, called the arrangement unfair and said that a compromise had now been reached and that DT had agreed the network would be regulated and competitors would be given access to the new network infrastructure where appropriate. The extent of the regulation is yet to be determined. *(Total Telecom, Ovum, December 2005)*

ITALY

Italy frees up rural WiFi access

The Italian Ministry of Communications released details of the Broadcasting Consolidation Act in October 2005. Amongst the provisions of the Act, restrictions to wireless data transmission, previously confined to indoor spaces, have been removed. Reportedly, the changes give ISPs the potential to gain roughly 15 million users nation-wide. *(Ovum, October 2005)*

IRELAND

Ofcom and ComReg team up to award spectrum licences

The UK and Irish regulators have teamed up to award licences for spectrum frequencies in the 1785-1805 MHz band, in order to resolve the problem of radio waves crossing national borders in the Republic of Ireland and Northern Ireland.

The coordination marks the first time that the regulators have taken a joint approach to awarding spectrum, allowing operators to use spectrum more efficiently with greater economies of scale.

Spectrum from the 1785-1805 MHz band is being flagged as suitable for new services such as broadband wireless access (fixed and mobile), digital video links, CCTV, mobile technologies and wireless microphones.

ComReg will award the first licence in Ireland, followed by a second licence in Northern Ireland. Both licences will be awarded by auction in 2006, based on a single round of sealed bids. *(Total Telecom, December 2005)*

SWEDEN

TeliaSonera holding up broadband competition

The Swedish telecom regulator, PTS, claims that TeliaSonera's refusal to offer its competitors bitstream access means that it is only possible to introduce competition for broadband to about 60% of the Swedish population, and could also lead to TeliaSonera strengthening its own position in this market.

PTS ordered TeliaSonera to provide bitstream access in November 2004, but TeliaSonera appealed the decision and a court gave the company the right to delay the introduction of the product until it had made a ruling. A ruling by the court could well be delayed until the second half of 2006. *(Total Telecom, December 2005)*

4.2 Broadband market extensiveness

Broadband market extensiveness is defined in terms of broadband availability as a percentage of population coverage, and market context, which assesses potential broadband take-up, and takes account of similar technology services such as ISDN, 3G, flat-rate narrowband and digital TV.

4.2.1 Availability

As broadband availability climbs over 90% in almost all the countries covered by this report mainly through DSL and cable modems, operators look to alternative, more economical technologies to reach 100% coverage in their markets.

Some of the key developments in the fourth quarter of 2005 are outlined below.

France

France Telecom has announced that it will test fibre to the home (FTTH) by the summer of 2006, in six districts in Paris and six cities in the Haute-de-Seine region. The experiment will deliver optical fibre service into thousands of trial households. The telco has chosen to migrate to FTTH technology to meet future needs.

During the pilot programme, France Telecom will deliver high definition TV, unlimited telephony and very high speed Internet services.

Italy

Telecom Italia Mobile signed an agreement with Samsung Electronics to run trials of wireless broadband mobile phones based on WiBro technology at the Turin 2006 Winter Olympics. The Italian incumbent said that it would be the first in Europe to try out the Korean technology. The new technology is currently being tested in South Korea, Japan and the U.S.

WiBro enables multi-conferencing, handles multiple video calls, and at the same time keeps open an audio, video, television or Internet multimedia session.

Japan

NTT offers its high-speed Internet service on its FTTH network under the brand name 'B FLET'S'. In November 2005, NTT expanded its FTTH network via a new wiring system with an aim to reach a target FTTH subscriber base of 30 million by 2010. The operator also tested an IPv6 based remote monitoring system to offer security features to its subscribers.

Its B FLET'S' subscribers increased from 1.9 million at the end of June 2005 to 2.4 million at the end of September 2005. The operator is targeting 3.46 million B FLETS' customers by the end of March 2006.

South Korea

KT Corp, South Korea's largest fixed line operator, plans to invest KRW3 trillion ($2.9 billion) in new business areas including wireless broadband and content.

The investment plan for the next year includes KRW1 trillion that KT has allocated for wireless broadband, IPTV and digital entertainment content.

WiBro will be a key focus for 2006 according to South Korean vendor Samsung. WiMax may conflict with 3G, however, WiMax has advantages including cheapness of spectrum in comparison to 3G. SK Telecom said it will introduce mobile WiMax services nation-wide over the next four years, while KT Corp will deploy the technology across 10 cities by 2006, reaching 84 cities by 2008.

Sweden

Stokab, the broadband services operator owned by the City of Stockholm, has received clearance to build a wireless broadband network based on WiMax technology in the greater Stockholm area. Stokab plans to connect 50,000 apartments managed by the City of Stockholm-owned housing company Svenska Bostader to broadband services by 2009.

US

After struggling for years, technology for delivering broadband Internet access over powerlines may finally be coming of age. Advances in technology that have lowered costs and increase download speeds as well as renewed interest from utilities has won broadband over powerline, or BPL, new converts.

Texas utility TXU Corp, has signed a deal with Current Communications Group LLC that will allow up to 2 million homes in north Texas to access the Internet through electricity outlets. Earthlink Inc, an Internet service provider, is also involved in three separate trials of BPL and expects to have an offering in 2006.

4.2.2 Market Context

In predicting the next wave of broadband adopters, it is useful to examine those consumers of similar digital technologies such as digital TV, 3G, ISDN and flat-rate narrowband services. The UK scores particularly well as an early adopter of digital TV services, with nearly 70% of households taking up digital TV services, increasing our propensity to take-up not just fixed Internet services, but so-called 'triple play' offerings (TV, telephone and broadband Internet).

The common thread of these similar technologies is the use of interactive, content-based services. These will be the ultimate driver of future broadband growth and are

therefore important considerations in predicting development and commercial revenues – increasingly important as take-up improves and competitors seek to differentiate their respective services.

4.3 Broadband take-up

As availability and population coverage of broadband approaches 100% in many markets, the key indicator of demand and performance becomes take-up. The number of broadband lines around the world has now exceeded 200 million, according to Point Topic, there were a total of 209 million DSL, cable modem and other broadband connections world-wide as of 31 December 2005.

It is well documented that the UK got off to a late start, but is now making substantial headway in terms of growth. Whilst there is still some way to go before equalling South Korea, Canada and Japan, the UK has seen 27% growth in take up between March 2005 and December 2005, and now equals the US with regard to penetration. According to Point Topic the UK was still just behind France in terms of broadband subscribers at the end of 2005, with 9,828,300 lines against 9,957,400 in France. However, the UK added more than 3.7m broadband lines in the full year to December 2005 while France added only 3.2m.

Germany has now pushed ahead in terms of the number of European broadband connections, with 10,706,600 lines at the end of 2005. According to T-Online, its launch of DSL full-package marketing and the development of its tariff portfolio to include flat rate DSL telephony contributed to the increase of DSL subscribers during 2005.

Broadband lines in South Korea are flatlining, if not actually falling, although the reported number of broadband lines did actually decline slightly from 12.3m lines in Q2 to 12.0m in Q3 2005 but recovered to 12.2m in Q4 2005. On the other hand, countries that are coming from behind such as Australia are now showing rapid growth.

In the USA, the DSL providers added over 1.58 million lines during Q4, almost 630,000 more than cable modem growth. This represents an 8.4% increase for Q4 against only 4.1% for cable. Canada and Sweden, however, saw cable modems with fibre and other technologies catching up on the quarterly DSL line growth in absolute terms.

The number of broadband lines at end Quarter 4, 2005 and resulting penetration is detailed in Figure 4.1.

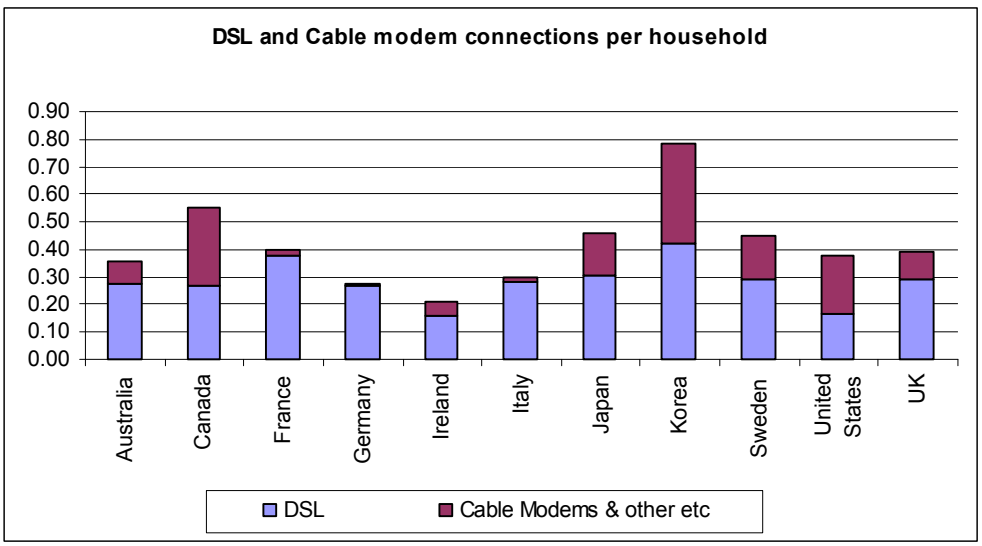
Figure 4.1 Broadband lines and penetration Quarter 4, 2005

Country	Broadband lines	Households (000)	Penetration (%)	Growth in lines since Q1 2005
Australia	2,741,000	7,534	36%	33%
Canada	6,855,000	12,047	57%	14%
France	9,957,400	25,067	40%	23%
Germany	10,706,600	39,346	27%	30%
Ireland	263,000	1,369	19%	42%
Italy	6,733,000	23,192	29%	22%
Japan	22,146,000	49,120	45%	11%
South Korea	12,200,000	17,000	72%	1%
Sweden	1,958,000	4,223	46%	27%
US	43,360,000	111,220	39%	16%
UK	9,828,300	25,440	39%	27%

Source: Point Topic, Ovum

Figure 4.2 presents the broadband subscribers per household, by technology, as of end December 2005.

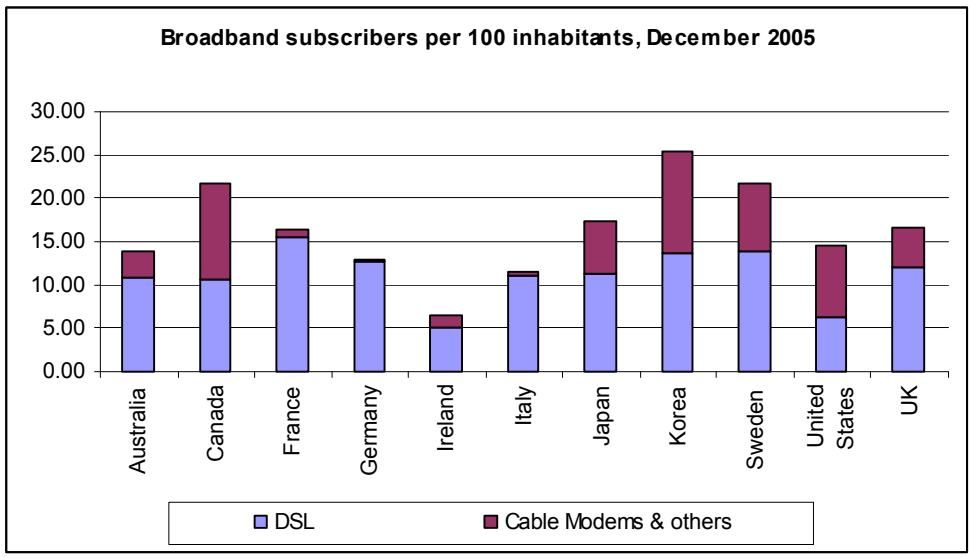
Figure 4.2 Broadband subscribers by technology per household, December 2005



Source: Point Topic

Figure 4.3 presents the broadband subscribers per 100 inhabitants, by technology, as at December 2005.

Figure 4.3 Broadband subscribers per 100 inhabitants, by technology, December 2005



Source: Point Topic

4.4 Country characteristics, comparisons with the UK and learning points

4.4.1 Australia

Culturally, Australia is very similar to the UK, but the country's differentiator is that it has two major cities (Sydney and Melbourne) and state capitals (Canberra, Darwin, Perth) which are sophisticated and innovative, while much of the rest of the country is rural. The urban centres have been the focus of trials and deployment of new technologies, such as fixed wireless broadband and fibre. TransAct in Canberra has a mixed fibre-to-the-kerb solution but otherwise it is greenfield ventures driven by Telstra, whereas elsewhere it is proving a struggle for potential users to get access to broadband services.

After years of very slow growth, broadband is finally taking off in Australia making it one of the fastest growing markets in the Asia Pacific region, and achieving more than 36% household penetration by December 2005 due to strong price competition. Unbundled local loop and line sharing has been available for some years, but only now are alternative operators deploying their own infrastructure in the Telstra exchanges. However this is confined to urban and metropolitan areas. Telstra is possibly the most vertically integrated incumbent in the world, dominating every sector in which it operates despite increasing competitive pressures.

Access-based competition alone will not sustain alternative operators building out their own infrastructure. Few have the scale compared to Telstra, with subscribers numbering in the thousands or tens of thousands at best. First movers may be able to capitalise on the bandwidth capability and speed offered by ADSL2+, but this window of advantage will soon be eroded. The need for scale becomes greater in the residential market, where margins are much smaller.

Australia's broadband sector is competitive on services, but remains heavily reliant on wholesale access and resale arrangements with Telstra. There has been massive investment in inter-capital transmission networks, with five to seven competing networks. There is also trunk capacity between major regional centres, although competition here can vary. However, facilities-based competition at the access level is fragmented, primarily confined to business districts and metropolitan centres with the focus on business customers.

Mobile broadband is seen as a growth market by a plethora of vendors, operators and investors. Its promise is built on the theory that two of the strongest themes in telecoms over the last decade, bandwidth and wireless, will converge. However, coverage is still predominantly confined to Sydney, Melbourne, Canberra, the Gold Coast and Brisbane, with very limited scale in some of these cities. Nevertheless, whereas the UK is fairly content to continue along the DSL route, the geographic challenges mean that Australia could well become a key player in the development of wireless broadband technologies, driven by the need to increase coverage.

4.4.2 Canada

One might consider Canada to be similar in some ways to Australia due to the rural challenges, but the market has vastly different drivers. Not least is an underlying desire to be recognised as an equal to the US in the technology space. The technology vendor market is thriving, particularly in the wireless space, and the large cable market provides significant competition to the telcos.

We anticipate Europe as a whole trying to close the gap on Canada and the US over the next 5 years, but would expect Canada and the US to remain some way ahead. In the meantime, Canada's bullish drive to increase broadband uptake is admirable. It has focused on enabling the more rural areas, fighting for universal access, and *choice* across the country. This is not just about providing 'poor man's access', i.e. a basic service level, in more remote areas. The view is that all citizens should be able to access the same level of sophisticated, value-added services nationwide.

This proactive approach is continuing as Canada expresses some concerns recently that its lead in the global broadband market is being eroded. In May 2005 the Minister of the Environment, on behalf of the Minister of Industry and several other federal partners, announced that the 'Centre des technologies de l'information et des communications' would receive C$6.9 million in funding from the Government of Canada to deploy broadband, or high-capacity Internet to an estimated 51 municipalities. In May 2005, the Canadian Government also allocated C$10 million to expand broadband connectivity in northern Ontario. In July 2005, Bell Canada partnered with Nortel Networks to develop high-speed broadband networks in rural

Canada demonstrating a keenness for the commercial sector to get involved in seeking new opportunities in rural regions.

4.4.3 France

France has made great strides over the last year in improving and consolidating its position as a leading broadband market – predominantly however in the DSL space. It is performing well in Europe following substantial LLU activity – driven in the main by triple-play service providers. The rise of competitors such as Free, Neuf (which merged with Cegetel), NC Numericable and UPC France (which acquired Noos) is improving the country's competitive stance.

Since the end of 2004, there has been consolidation in the market due to the high-level of competition (as a result of a combination of low prices and continuous focus on higher performance and innovation). Telecom Italia bought Tiscali France (April 2005) and Neuf Telecom and Cegetel merged to form neuf cegetel in August 2005. Similar consolidation continues in the cable sector and a single operator will likely emerge before long – probably UPC.

The success of LLU in France is something to note and learn from. We have seen (some might say unprecedented) proactive and speedy action by the regulator ART (now Arcep) in removing the barriers for ADSL2+, stimulating competition, and allowing greater speeds to be offered at little increase in price to the end user.

Other activity worthy of note in France is the greater role played by local authorities in the development of broadband infrastructure. Government has encouraged these bodies to build out their own local access loops by offering reduced-rate loans. As a result, many of them are specifying networks, financing roll-out and contracting directly with operators and service providers to build and run them. End users of the network are then customers of those service providers.

4.4.4 Germany

Germany is a fairly large, well-populated country with one dominant national player, Deutsche Telekom. Although an early mover with Deutsche Telekom driving DSL roll-out according to its estimation of financial viability, competition has started to increase over the past year.

Germany's differentiator is that the legacy systems have been based on the federal states or Länder, with business communities and opportunities based in and around these areas. Broadband players have therefore sprung up within these major conurbation areas (e.g. HanseNet in Hamburg, and NetCologne), and whilst their individual subscriber bases (and hence market shares) are generally comparatively small, they are nevertheless providing competition to the incumbent on a region by region basis. (Although players such as HanseNet are starting to build out into other cities). One key challenge for Deutsche Telekom in this respect is that it is difficult for the incumbent to define competitive national rates, as it is competing with a different player in different regions. In June 2005, Deutsche Telekom's T-Online unit reduced

the monthly rate for its best-selling DSL package by 50% in response to competitors' price cuts.

Interesting though this phenomenon is, it is unlikely to be witnessed in the UK where players are likely to seek economies of scale through national roll-out rather than restricting to a single urban area.

The regulator RegTP (now called the Bundesnetzagentur) is trying to address the balance of power of a particularly strong incumbent. In August it announced a one-off cut in local loop unbundling (LLU) charges and line-sharing monthly charges in an attempt to boost competition in the broadband market. Nevertheless, Deutsche Telekom continues to dominate the market, and will likely do so for some time. Note that there is still no wholesale bitstream DSL service from Deutsche Telekom.

The cable broadband sector remains relatively weak due to continued fragmentation- this despite a modest rate of network modernisation and some consolidation. In particular, Ish and Iesy, the level 3 cable operators, completed their merger and announced the acquisition of Telecolumbus, a major level 4 cable provider. The situation will persist for a while yet, leaving DSL to dominate as the main broadband technology. Germany struggles with infrastructure competition despite very widespread availability of cable TV services. It therefore bears little resemblance to the UK in this respect.

4.4.5 Ireland

Despite significant investment from EU funds and initiatives from government, broadband has been slow to develop in Ireland. Poor infrastructure and limited competition continues to hold back the market, although prices are now falling, stimulating renewed growth over the last six months. ComReg is however increasingly demanding changes on the part of Eircom, imposing *ex ante* obligations and interim price controls on wholesale and bitstream products.

In March 2005 the regulator announced the response to its consultation on shared access. ComReg suggested that Eircom only receive the incremental costs of providing shared access to the local loop. With this thinking ComReg calculated a charge of euro 0.39 per month for shared access - 96% lower than the previous charge of euro 9.00. This would be the lowest price in Europe. Notwithstanding this, Eircom continues to dismiss the importance of LLU to broadband and maintains a rather diffident approach towards its regulator.

Significant investment and initiatives from government are hoped to make Ireland a country with 100% broadband coverage by 2007. As of August 2005, the government had invested over euro 7.4 million in 265 communities covering over 165,000 of the population, in its Group Broadband Scheme. Also, 81 projects had been approved by the government under the second phase of GBS. Eircom has a goal of having 500,000 ADSL customers by the end of 2007. Ireland has seen modest but significant growth in cable broadband and fixed wireless access in the absence of strong DSL growth.

4.4.6 Italy

Not scoring particularly well against the other country markets in this report, Italy nevertheless is proving an innovative, forward-looking market. Fastweb has brought forward its development plans by four years and now expects to make its service available to 10 million homes across large swathes of Italy by the end of 2006. It is viewed as perhaps the most successful triple play operator outside of Asia with its fibre and unbundled DSL services offering advanced video and interactive services.

Telecom Italia too is building its reputation as an innovator, offering some interesting tariffing models, and propositions for fixed-mobile convergence and migration. Characterised by its high quality, value-added services, Italy is demonstrating that it can build a promising market without having a significantly competitive one.

Broadband access services in 2005 have been characterised by more à la carte pricing including pay-as-you-go offers, flexible contracts and a strong push on wireless broadband from Telecom Italia in particular.

Wireless broadband based on Wi-Fi and WiMAX technologies is touted as a scheme for providing Internet access to rural areas, places where there may be limited or no other service available. However, Telecom Italia has invested in satellite broadband services that will provide broadband access to rural consumers and businesses countrywide. The Italian government had already set aside euro 300 million so that all of Southern Italy would have broadband access.

Unlike the UK, there is no cable in Italy, but the unbundled lines used by Fastweb demonstrates a much greater deployment of LLU than in the UK. Italy also demonstrates the most successful use of fixed-wireless access for triple play outside of Asia.

Reasonable prices in the areas of local loop unbundling (LLU) and wholesale DSL mean uptake has been relatively successful, with aggressive deployment from Fastweb and Wind. Uptake of LLU will continue, driven primarily by Fastweb, which continues to extend its footprint. Operators will also continue to push VoIP in order to compete on voice tariffs and benefit from internal cost savings.

4.4.7 Japan

Japan is a vastly different market to the UK, and as such is difficult to compare on a like for like basis. It prides itself on being at the forefront of technological evolution, and leads technology deployment, such as VDSL, VoIP, and FTTH. It has a strong competitive market, aided by progressive regulation, with some cable, and is very much demand driven. For example, national fixed line voice services were seen to be expensive in Japan, and this led alternative operator Yahoo! BB to provide much cheaper VoIP services. Over 90% of its customers take VoIP as part of their broadband service.

Technology savvy users and the strong early adopter culture are driven by one-upmanship – particularly against South Korea as well as against their co-citizens. If

one subscriber buys a 45Mbps service, then chances are his neighbour will also want that and more.

The Japanese experience is seen as difficult to copy outside of that particular culture, but it is nevertheless useful to study. Unlike Italy and the US, Japan is actually not significantly ahead in the provision of value-added services (although there seems to be a lot on offer, from video games to electronic books, music downloads to Voice over IP), but they have the capability and capacity to provide whatever is demanded.

Government programmes to drive IT literacy and online education have accelerated this. While the government has driven facility-based competition through its e-Japan strategy, effective deregulation such as local loop unbundling (LLU) has enabled service-based competition, inviting more players to the market.

4.4.8 South Korea

South Korea's main broadband driver was a strong government push to become a leading global force in the broadband space. The South Korean Government invested significant amounts of money into national backbone infrastructure to stimulate competition. It also provided major tax-breaks for broadband operators. But what government and service providers failed to identify fully was the business case for broadband. In 2003, South Korean telcos suffered substantial losses, and the intense, competitive marketing activity between them resulted in increased churn and costs. The financially distressed cable operator Thrunet was acquired by Hanaro in 2005 – as a direct result of over-indulgence in promoting ultra-cheap broadband at the expense of sound business.

Nevertheless, Korea is still one of the most advanced markets for broadband, and it is useful for other markets to understand the reasons behind South Korea's market difficulties and learn from them.

With around 71% of South Korean households having broadband, the technology is pervasive and getting faster. It is changing the accepted business models for creative sectors in a country where digital music downloads already vie with CD sales, and the online video games market is larger than that of VHS and DVDs combined. Online gaming is the emerging star of South Korea's broadband sector. It is a cultural phenomenon, which spreads beyond the home to high-street cafes and beyond the traditional male skew of western games markets.

Addressing the desire for ever more pervasive broadband, Korea Telecom plans to offer a mobile wireless broadband service called WiBro that will allow users to access the Internet when travelling at 60 km/h. Access points are being built in Seoul and 19 other cities for a launch next year and the top access speed will be 1 Mbps.

South Korea provides the UK with other learning points, particularly as regards its approach to access agnosticism: many service providers will use the best and most effective technology available to them, whether it be cable, DSL, FWA or fibre to the apartment. In the UK, cable operator ntl is also considering spreading its own footprint using DSL, and it will be useful to examine the South Korean experience in

undertaking this. Other useful lessons relate to new pricing models and capped rates being undertaken by major South Korean operators.

4.4.9 Sweden

A major driver for broadband uptake in Sweden is the public sector – enabling schools, universities and other public services is a key concern for the government. By the end of 2004, only 10 municipalities, out of 283 in total, did not have infrastructure in place to support broadband services and some have developed open access fibre networks. For example in Västerås an open access fibre network has been developed and any operator can use it (Telia already does so).

In addition, the high number of apartments has made it relatively easy for B2 to install fibre, pushing forward the roll-out of higher speed services. Landlords have made high-speed broadband services a key differentiator in the residential property rental market.

Sweden's geography is also considered to play a part in driving broadband. Remote areas and short daylight hours in the winter has encouraged the Swedes to find new ways of communicating and as a result, wiring up rural areas has been encouraged.

Sweden is a competitive market, where cable and fibre vie with the incumbent, TeliaSonera – the cable operators UPC and Comhem in particular being quite aggressive about broadband roll-out.

In terms of best practice, the UK can learn from Sweden's public sector push where significant investment is being made into public services with direct involvement of private, commercial companies.

4.4.10 US

The US broadband market is dominated by ten players, six cable operators and four local phone companies, which between them have almost 90% of the market. However, each of the phone companies and each of the cable companies has a discrete geographic coverage area, so that in any given part of the country the market is largely fought over by one local phone company and one cable company, creating a series of local duopolies. Competition based on regulated access to networks is minimal, although a handful of players, mostly serving business customers, have made this their business.

The cable operators entered the broadband market first, followed by the telcos using DSL, and cable has maintained a majority share ever since, though the gap is closing due to rapid DSL growth. Cable services tend to be offered at higher speeds for a higher price, while DSL is typically offered for slightly slower speeds and lower prices. Part of the reason for the latter is that long local-loop lengths has limited the availability of higher speed services. Cable TV covers the vast majority of households in the US, and broadband availability is at 88% of cable deployment. The US provides an interesting example of inter-modal or facilities-based competition, a situation which

has come about despite early attempts by regulators to foster service-based competition.

The quest for a triple, or quadruple, play defines the competing operators' current and future plans. On the one hand, the cable operators, whose heritage is cable TV, have launched first broadband Internet access and more recently voice over IP services. On the other, the local phone companies are rolling out advanced fibre-based networks to support higher-speed broadband services including TV.

Most of the cable operators now offer VoIP services – the earliest deployments began in 2004. These are now displacing some of the original TDM-based voice services. Take-up rates vary among the major cable operators but an estimated two million cable VoIP lines are now in service and good potential remains - the incumbents are expected to lose further market share to the cable players and independents like Vonage.

In some ways, the US may be seen as too competitive. The FCC is currently experiencing some quandaries in regulating open access to networks. It has decided not to require fibre-to-the-home providers to open their networks. This might be negative in terms of competition, but the alternative is that if players are mandated to open up, they will refuse to co-operate or to invest at all. In addition, the FCC's recent decision of removing the obligation from ILECs to unbundle the transmission components and grant access to other ISPs will likely transform the US broadband market over the next year.

Annex

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