Broadband guide for Wales

Contents

Section 1

Summary

1.1   Ofcom is the independent regulator and competition authority for the UK communications industries, with responsibilities across television, radio, telecommunications and wireless communications services.

1.2   This guide provides a comprehensive overview of what broadband is, what the current situation is in Wales and what we, the Welsh Assembly Government and the UK Government are doing to address some of the outstanding issues that exist for citizens and consumers in Wales.

1.3   Broadband is a high-speed internet service enabling users to download files, view television programmes and films, take part in video conferencing and online gaming and access a wide range of other media, information and services online. According to the latest figures from our Communications Market Report for Wales, take-up of broadband in Wales has reached 64%.

1.4   There are two major access networks for fixed-line broadband in Wales: BT's copper telephone network and Virgin Media's cable network. Local-loop unbundling (LLU) is the process whereby BT makes the local loops in its copper access network available to other communications providers. These are able to upgrade individual lines using digital subscriber line (DSL) technology to offer high-speed internet access direct to the customer. 77% of households in Wales are connected to an unbundled local exchange.

1.5   Virgin Media is the UK's main cable-broadband company. It provides high-speed broadband internet access via fibre-optic cables, which also provide digital-television and telephone services.

1.6   Communications networks are moving to Next-Generation Access (NGA) and the replacement of copper by optical fibres. There are two main types of fibre deployment: fibre to the cabinet (FTTC) and fibre to the premises (FTTP).

1.7   BT are providing FTTC services, offering speeds of up to 40 Megabits per second (Mbps), from the Barry, Caerphilly, Cardiff Central, Penarth and Taffs Well exchanges. Service availability is due to be extended by March 2011 to the Bridgend, Chepstow, Connah's Quay, Hawarden, Hengoed, Llanedeyrn, Llanishen, Llantrisant and Newtown Llantwit exchanges.

1.8   There are a number of alternatives to fixed-line broadband: satellite broadband, broadband wireless access (BWA) and mobile broadband.

1.9   Satellite broadband is available almost anywhere in the UK using a dish. However, satellite transmissions may be affected by weather conditions or local obstructions, and the cost of installing and running satellite broadband can be quite expensive compared with other types of broadband.

1.10   BWA requires an aerial to be installed to connect to the internet. The most common technology for long-distance BWA is WiMAX. A telephone line is not required.

1.11   A Wi-Fi "wireless hotspot" is a public area that has a wireless network. Hotspots are more common in cities and at locations where large numbers of people are likely to be: airports, train stations, motorway service stations and hotels, for example.

1.12   Mobile broadband is generally available where there is 3G coverage. The service is provided via a mobile device or a "dongle" that plugs into a computer's USB port.

1.13   Typically (though not always), the reason for slow broadband (or none at all) over a fixed telephone line is the length of the copper wire from the house or business to the telephone exchange. Unlike conventional telephone calls, a broadband DSL signal reduces with distance from the exchange to a point where the broadband service will not work at all (generally at around 5 km).

1.14   The UK's average actual fixed-line residential broadband speed has increased by over 25% over the past year (from 4.1 Mbps to 5.2 Mbps) as Internet-service providers (ISPs) increasingly move to offer higher-speed broadband packages.

1.15   We committed to review switching processes in our Annual Plan 2010/11, following requests from communications providers and consumer groups to improve and simplify them. We subsequently published research and a consultation in September 2010 that looked at switching in a number of services – including broadband – to identify similarities and common challenges that arise in making sure the process is easy and reliable

1.16   We recently published a statement setting out the conclusions of our review of the UK market for wholesale local access (WLA). We imposed new obligations on BT to provide virtual unbundled access to its NGA services and to open up access to its duct and pole infrastructure. We are now in the process of reviewing the UK market for wholesale broadband access (WBA). While the reviews relate to wholesale markets, they are important for consumers because effective competition – or effective regulation where sufficient competition does not exist – in wholesale markets underpins the choice in retail offers available to consumers.

1.17   The Welsh Assembly Government has made a number of interventions including the Regional Innovative Broadband Support (RIBS) scheme, Fibrespeed and the Broadband Support Scheme and has recently announced a new Economic Renewal Programme that aims to deliver next-generation broadband to every business in Wales by the middle of 2016 and every household in Wales by 2020.

1.18   The UK Government is committed to delivering universal broadband at speeds of 2 Mbps within the lifetime of the current Parliament (2015). It will consider whether to use money available from the underspend of the Digital Switchover Help Scheme to do so where the market has not delivered. In the meantime, it has announced three market-testing projects in rural areas, including one location in Wales: Felindre near Swansea.

Section 2

What is broadband?

2.1   Broadband is a high-speed internet service enabling users to download files, view television programmes and films, take part in video conferencing and online gaming and access a wide range of other media, information and services online.

2.2   Typically, broadband speeds using a standard telephone line are tens – and increasingly hundreds – of times faster than dial-up internet connections. Speeds are measured in bits per second: 512 kilobits per second (512 kbps) is 10 times the speed of dial-up and the minimum generally considered to be broadband; 1 Mbps is 20 times faster etc. 2 Mbps is the minimum speed necessary to watch standard-definition video online.

2.3   Recent attention has focused particularly on the provision of next-generation or superfast broadband services, which provide download speeds in excess of those that can be delivered using conventional copper wires (i.e. over 24 Mbps).

Broadband take-up in Wales

2.4   According to our latest Communications Market Report for Wales,[1] take-up of broadband in Wales has reached 64% and the gap with the UK average (71%) has narrowed from 10 to seven percentage points since last year. Some 69% of people in rural Wales have a broadband connection compared with 62% of people in urban Wales. 70% of people in North/Mid Wales have a broadband connection compared with 66% in South West Wales and 58% in South East Wales.

Network infrastructure

2.5   There are two major access networks for fixed-line broadband in Wales: BT's copper telephone network (which is used by a range of commercial suppliers, including BT Retail, to provide broadband to customers) and Virgin Media's cable network. Satellite and wireless technologies (both fixed and mobile) can also provide broadband services.

BT

2.6   BT's access network is illustrated below.[2] In most cases, a street cabinet is situated between the customer's premises and BT's local exchange. All premises in Wales are connected to a broadband-enabled exchange. BT estimates 99.6% of premises connected to its copper network are able in theory to obtain broadband speeds of at least 512 kbps. However, for a number of reasons, not all households are able to receive a broadband service. These reasons include issues with network quality, shared lines and distance from the exchange. Even with such high availability, a significant number of consumers remain unable to receive broadband services.

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[1] http://stakeholders.ofcom.org.uk/binaries/research/cmr/753567/CMR_Wales_2010.pdf.
[2] Following our Telecommunications Strategic Review in 2004, BT agreed undertakings that resulted in the separation of the company's wholesale (i.e. access-network) and retail operations. BT created Openreach to manage its access network. The undertakings enable other communications providers to use BT's access network on the same or equivalent terms as BT Retail.

2.7   However, Openreach has been working on a programme to extend broadband coverage in Wales by removing line-concentrator cabinets (which enable multiple customers to share lines running from the cabinet to the exchange) and digital-access carrier systems (DACS, which enables two voice services to be supported on one physical line), none of which are able to support broadband.
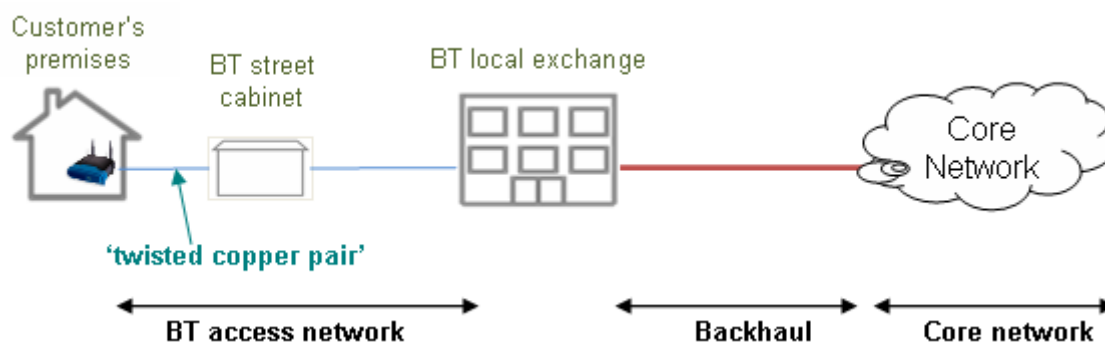
2.8   Broadband delivered via copper is mainly based around variants of DSL technology.

- ADSL (asymmetric DSL) is the most common DSL technology. Information is downloaded more rapidly than it is uploaded. (Typically for an 8 Mbps service, the download speed might be around 3.2 Mbps while the upload speed might be 0.5 Mbps.) As ADSL popularity grew, a new family of standards known as ADSL2 was developed. ADSL2 extends the capability of basic ADSL in data rates to 12 Mbps download and 3.5 Mbps upload. ADSL2+ allows even higher download data rates to be achieved within 3 or 4 km of an exchange. ADSL2+ is now available in 41 out of 437 exchanges in Wales, offering speeds of up to a theoretical maximum of 24 Mbps.

  BT has announced that it plans to roll out ADSL2+ to exchange areas covering 75% of the UK population. This will lead to significant improvements in broadband speeds for Welsh consumers, although the detailed rollout plans have not yet been finalised.

- VDSL (very high bit-rate DSL) can offer up to 52 Mbps but only over even shorter distances compared to ADSL. VDSL2, the newest and most advanced standard of DSL technology, deteriorates quickly from a theoretical maximum of 250 Mbps "at source" to 100 Mbps at 300 m and 50 Mbps at 1 km. By around 1.6 km from an exchange, its performance is similar to ADSL2+.

- SDSL (symmetric DSL) downloads and uploads information at the same speed. This type of broadband requires an extra telephone line. It is particularly suitable for businesses that send large volumes of information (e.g. those using computer-assisted design packages).

Local-loop unbundling

2.9   LLU is the process whereby BT makes the local loops in its copper access network available to other communications providers. These are able to upgrade individual lines using DSL technology to offer high-speed internet access direct to the customer.

2.10   LLU is one way in which we have been able to encourage competition in the provision of current-generation broadband services over copper.[3] LLU providers can offer broadband services at a competitive price and bundle them with other services.

2.11   77% of households in Wales are connected to an unbundled local exchange, which is the second-highest proportion among the UK nations (UK average: 85%). This represents a 45 percentage-point increase since the end of 2006.

Sub-loop unbundling

2.12   In sub-loop unbundling (SLU), communications providers install equipment that connects to the copper lines at the green street cabinet rather than at the telephone exchange. This arrangement can be used for distributing very high-bandwidth services, such as VDSL, which can only be sent a short distance over copper.

Wholesale bitstream services

2.13   Wholesale bitstream services are provided by BT to ISPs. They support retail competition in areas where LLU uptake is not widespread. BT is required to provide these services in Markets 1 and 2 and supplies them on a commercial basis in Market 3 (see section 4).

Virgin Media

2.14   Virgin Media is the UK's main cable-broadband company. It provides high-speed broadband internet access via fibre-optic cables, which also provide digital-television and telephone services (although the final part of the connection to domestic premises is made via coaxial cable for the television and broadband service and copper for the telephone service).

2.15   Faster speeds – currently up to 50 Mbps – are a key benefit of cable broadband. Virgin Media plans to introduce a 100 Mbps service and is conducting higher-speed 200 Mbps trials in some areas. But in Wales, only 24% of premises – concentrated primarily in the major cities of Cardiff, Newport and Swansea in South Wales – are served by Virgin Media's cable network.

2.16   Virgin Media has recently announced plans to extend its network coverage to a further one million UK homes.

2.17   Virgin Media has announced a trial to provide broadband via electricity cables in the village of Crumlin in South Wales. The trial began in August 2010 and is expected to run until 2011. Customers who take part will receive up to 50 Mbps broadband along with Virgin Media's digital-television services.

2.18   Virgin Media's cable-network architecture is shown below. It also comprises street cabinets between the access network and the hub site. A number of cable street cabinets connect to a Virgin Media hub site.

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[3] Communications providers can also buy wholesale capacity from BT and offer a broadband service without investing in LLU.
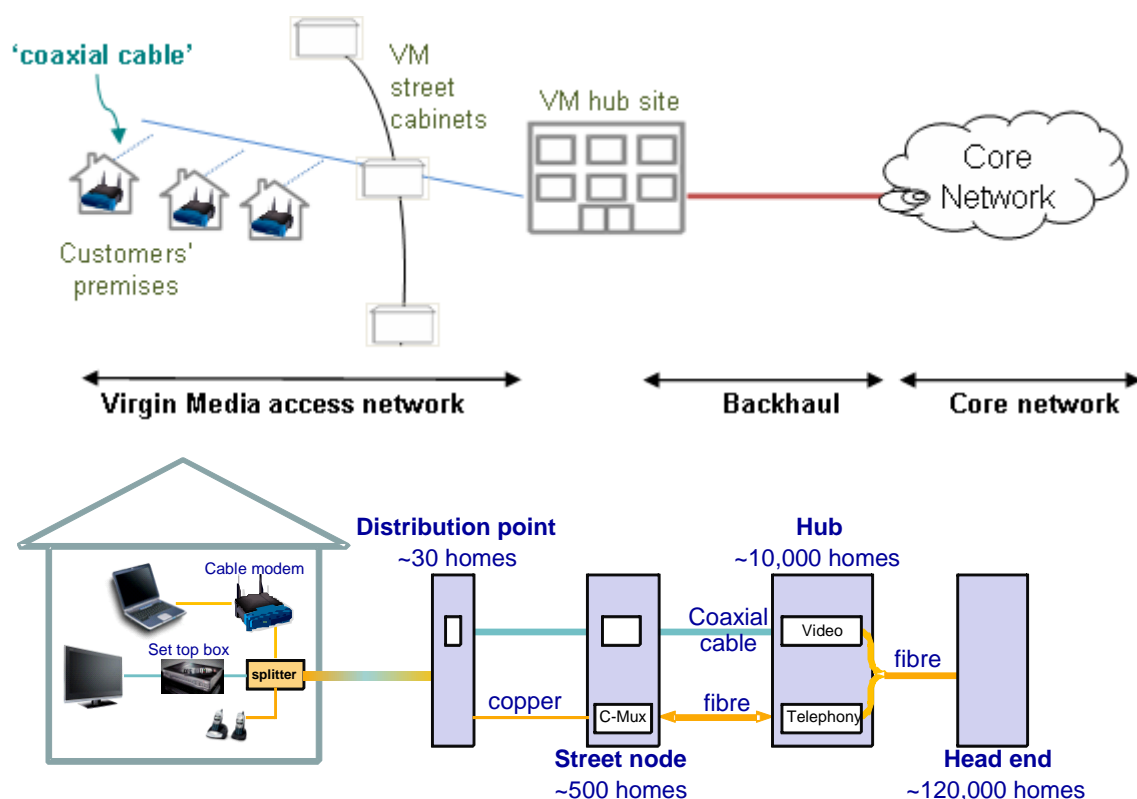
Next-Generation Access

2.19   As broadband services become more bandwidth demanding, communications networks are moving to NGA, promising to offer very high speeds to end-customers. Current broadband services based on the existing copper access infrastructure are limited by the length and quality of the copper loop. A future-proof solution is the replacement of copper by optical fibres, which use lasers to transmit pulses of light down very fine strands of silicon. Fibre-optic cable can carry thousands of times more data than copper, is lightweight and free from electromagnetic interference and experiences no loss of broadband service over distance. Fibre-optics can theoretically provide nearly unlimited bandwidth potential depending on how close the fibre is brought to the end-user.

2.20   There are two main types of fibre deployment:

- FTTC, where fibre is run from the exchange to a street cabinet serving an average of around 300 premises but the existing copper cables connect the cabinet to those premises; and

- FTTP, where fibre is run directly to the customer's premises.

BT superfast-broadband investment

2.21   In June 2008, BT announced an ambitious £1.5bn programme over four years to replace major parts of its copper access network with fibre, at least to the street cabinet, connecting 10 million UK homes. BT has since announced that it will spend a further £1 billion to extend coverage to two-thirds of UK homes by 2015, using a combination of FTTC and fibre to the home.

2.22   BT has published an initial list of around 500 exchange areas across the UK in which it will roll out superfast broadband services, based initially on FTTC, including a number of exchange areas in Wales. These include the Whitchurch area of Cardiff, where a trial of FTTC was held in 2009/10.

2.23   FTTC services, offering speeds of up to 40 Mbps, are now available from the Barry, Caerphilly, Cardiff Central, Penarth and Taffs Well exchanges. Service availability is due to be extended by March 2011 to the Bridgend, Chepstow, Connah's Quay, Hawarden, Hengoed, ,Llanedeyrn, Llanishen, Llantrisant and Newtown Llantwit exchanges. Many other Welsh communities are likely to benefit from BT's planned investment, although further rollout plans are not yet known.

2.24   However, the business case for investment in Wales' rural telecommunications infrastructure is challenging, and BT's current investment is focused primarily on the commercially more attractive Market 3 areas (see section 4). Industry and economic analysis has concluded there is no obvious means whereby the market, unaided, will serve the final third of the UK population (a higher proportion of the population in Wales, which falls mainly into Market 1 areas).

Satellite broadband

2.25   Satellite broadband is available almost anywhere in the UK using a dish. However, satellite transmissions may be affected by weather conditions or local obstructions including foliage and trees, and the cost of installing and running satellite broadband can be quite expensive compared with other types of broadband. Satellite broadband also generally has quite a high latency (delay) compared to other broadband and so is potentially unsuitable for certain types of real-time internet services such as voice over Internet Protocol, video conferencing and online gaming.

Broadband wireless access

2.26   BWA requires an aerial to be installed to connect to the internet. The most common technology for long-distance BWA is WiMAX. A telephone line is not required.

2.27   BWA is particularly suitable for distributing information between buildings and for homes in remote locations where access to ADSL or cable broadband is unavailable.

Wi-Fi

2.28   A Wi-Fi "wireless hotspot" is a public area that has a wireless network. Hotspots are more common in cities and at locations where large numbers of people are likely to be: airports, train stations, motorway service stations and hotels, for example. Normally, even in the case of free services, users will need a password to access Wi-Fi hotspots via their computer or mobile device (e.g. smartphone, iPhone or BlackBerry). Some providers (e.g. BT Openzone) supply free access to hotspots bundled with a fixed-line broadband package.

2.29   Wi-Fi can also be used to provide wireless broadband networks anywhere in the home without the need for trailing wires. A wireless router provides the signal, and each computer uses a wireless network card (often already built in) to connect. The broadband connection comes in via the telephone line or cable connection and is accessed by the wireless router.

Mobile broadband

2.30   Mobile broadband uses a mobile telephone network to connect to the internet. The service is provided via a mobile device or a "dongle" that plugs into a computer's USB port. Communications providers may charge for data downloaded or set a monthly fee with no download limit.

2.31   Mobile broadband is generally available where there is 3G coverage. Our mobile-broadband coverage tool links to the various communications providers' websites, which provide postcode checkers for service availability and quality of coverage.[4]

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[4] See www.ofcom.org.uk/consumer/2009/08/mobile-broadband-coverage-checker.

Section 3

Consumer issues

Broadband "not-spots"

3.1   Typically (though not always), the reason for slow broadband (or none at all) over a fixed telephone line is the length of the copper wire from the house or business to the telephone exchange. Unlike conventional telephone calls, a broadband DSL signal reduces with distance from the exchange to a point where the broadband service will not work at all (generally at around 5 km).[5] Other factors also impact on fixed-line broadband availability including poor home wiring or other network issues such as the presence of line concentrators, DACS and aluminium cabling, which does not carry a broadband signal as efficiently as copper.

3.2   Such locations are known as not-spots and are a particular problem in Wales as a greater proportion of rural homes and small and medium-sized enterprises are situated a long way from exchanges compared to other parts of the UK. Approximately 18% of premises in Wales are situated further than 5 km from an exchange compared to the UK average of 14%.

Mobile-broadband not-spots

3.3   Mobile broadband is generally available where there is 3G coverage. Wales' 3G population coverage (using the 90% postcode-district threshold) is at 69%. This is lower than the UK-wide average (87%) but higher than Scotland (60%) and Northern Ireland (40%). Geographic coverage of 3G services provided by four or more operators remains at 7%, the same level as in 2009, as shown below.

Map of 3G mobile phone geographic coverage in Wales

Five operators
Four operators
Three operators
Two operators
One operator
No operators
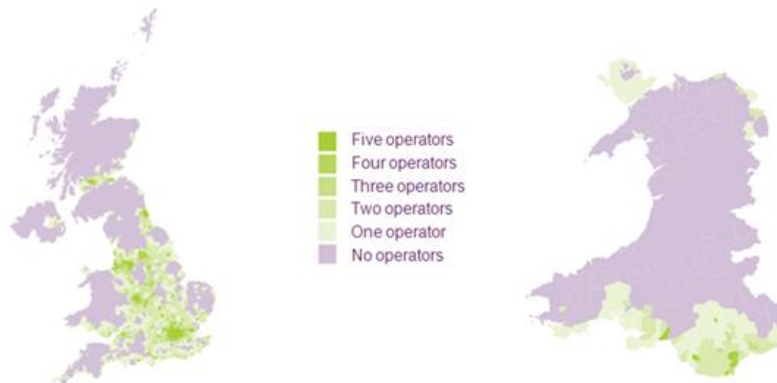
Source: Ofcom / GSM Association / Europa Technologies; Q2 2010
Note: Map shows the number of 3G operators with at least 90% area coverage; not directly comparable to that published in the 2009 report.

3.4   One of our priorities for 2010/11 is to make progress on mobile-phone and broadband not-spots. We have undertaken further research to understand the

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[5] Openreach has developed Broadband-Enabling Technology (BET), which could provide a 1 Mbps broadband service for lines up to 12 km in length. A BET trial has been conducted in Llanfyllin in Wales, but deployment is expensive and Openreach claims it is difficult to construct a viable business case for deployment across the UK. See www.openreach.co.uk/orpg/products/llu/BET/bet.do.

causes of not-spots, where they are and what impact they have on citizens and consumers across the UK. We intend to publish the results later this year. We plan to use this evidence base to consider whether there are any appropriate solutions, within the scope of our duties and powers, for improving coverage.

Broadband speeds

3.5   The UK's average actual fixed-line residential broadband speed has increased by over 25% over the past year (from 4.1 Mbps to 5.2 Mbps) as ISPs increasingly move to offer higher-speed broadband packages.

3.6   Our broadband-speeds research, conducted in partnership with broadband-monitoring specialists SamKnows, shows nearly a quarter (24%) of UK fixed-line residential broadband connections had a headline or advertised speed of above "up to" 10 Mbps in May 2010, compared to just 8% in April 2009.[6]

3.7   However, in practice, headline broadband speeds are rarely experienced by consumers. The move to faster headline speeds has led to a growing gap between the actual speeds delivered and the speeds that some ISPs use to advertise their services. Differences between headline and actual speeds are often caused by broadband being delivered over copper lines, which were originally designed for phone calls. Hence speeds slow down over long and poor-quality lines and because of electrical interference.

3.8   We have recently strengthened our Voluntary Code of Practice on Broadband Speeds,[7] which we first introduced in 2008. ISPs who sign up to the revised Code commit to give consumers a more accurate and consistent estimate of the maximum speed likely to be achievable on their line. ISPs also commit to help consumers improve their speeds and to give consumers the option to leave their contracts early (within three months of signing up to the service) and without penalty if they receive a maximum line speed that is significantly below the estimate they are given at point of sale and the ISP is unable to resolve the problem.

3.9   Some ISPs have in the past year moved away from advertising their services on the basis of "up to" headline speeds, but others continue to do so. We have discussed this issue with the Advertising Standards Authority and the Committee on Advertising Practice, who are currently undertaking a review in this area.

3.10   Many consumers could take some relatively simple steps to improve their broadband performance. We provide advice for consumers on the factors to take into account when choosing a broadband provider and how to improve broadband speeds at home.[8]

Switching broadband providers

3.11   Over time, various processes have been developed for switching between providers of different communications services. Currently, many broadband services are switched using the Migration Access Code (MAC) process. This is an example of a losing-provider-led process, where the consumer contacts their current provider to

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[6] http://stakeholders.ofcom.org.uk/market-data-research/telecoms-research/broadband-speeds/broadband-speeds-2010/.

[7] http://stakeholders.ofcom.org.uk/telecoms/codes-of-practice/broadband-speeds-cop-2010/.

[8] See http://consumers.ofcom.org.uk/guides/.

obtain a MAC. The consumer must then contact their new provider to give it their MAC within 30 days.[9]

3.12   We committed to review switching processes in our Annual Plan 2010/11,[10] following requests from communications providers and consumer groups to improve and simplify them. We subsequently published research and a consultation on 10 September 2010 that looked at switching in a number of services – fixed and mobile telecommunications and pay TV as well as broadband – to identify similarities and common challenges that arise in making sure the process is easy and reliable.

3.13   We focused on two key areas. First, we wanted to ensure an individual consumer's experience of switching is easy and hassle free, both now and in the future. Second, we wanted to ensure switching processes do not get in the way of providers competing vigorously with each other to deliver benefits to all consumers in terms of lower prices, greater choice and innovation and value for money. Notably according to our research, over a third (39%) of those consumers who have switched broadband provider using the MAC process thought changing provider seemed like too much hassle.[11]

3.14   We instead proposed a process where the customer's new service provider (the gaining provider) takes the lead on switching the service, delivering lower prices, more choice and innovation for consumers. This would include appropriate measures to protect consumers from so-called "slamming," where a customer is switched without their consent.

3.15   The consultation closes on 19 November 2010.

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[9] See http://consumers.ofcom.org.uk/2010/08/switching-broadband-provider/.

[10] www.ofcom.org.uk/about/annual-reports-and-plans/annual-plans/annual-plan-2010-11/.

[11] http://stakeholders.ofcom.org.uk/consultations/consumer-switching/.

Section 4

Our current market reviews

4.1 We recently completed a review of the UK market for WLA. We published a statement setting out its conclusions on 7 October 2010.[12] We are now in the process of reviewing the UK market for WBA. We published consultations on our proposals for the WBA market on 23 March and 20 August 2010,[13] and we plan to publish a final statement on this review before the end of the year.

4.2 We periodically review various markets in order to assess whether any communications providers have a position of significant market power (SMP), which essentially means power to influence markets to a significant degree in a way that could harm consumers. If any communications provider has SMP, we assess the regulatory remedies that need to be imposed to address this.

4.3 While the reviews relate to wholesale markets, they are important for consumers because effective competition – or effective regulation where sufficient competition does not exist – in wholesale markets underpins the choice in retail offers available to consumers.

Wholesale local access

4.4 WLA relates to the network infrastructure that provides local access connections to individual consumers, for use in the provision of telephony, broadband and other services. We have defined this market to include copper loops, cable networks and optical fibre at a fixed location but not mobile, fixed-wireless and satellite technologies. We concluded BT has a position of SMP in this market and imposed a number of remedies with the aim of ensuring it provides access to its network to other communications providers.

4.5 The remedies are designed to promote both investment and competition. For current-generation services, we have retained the existing remedies (LLU and SLU). To support the development of superfast-broadband services, we have introduced two new remedies, namely virtual unbundled local access (VULA) and physical infrastructure access (PIA).

- LLU – this is an established remedy that allows other communications providers to physically take over BT's existing copper lines between telephone exchanges and customer premises.

- SLU – this is also an existing remedy, currently only used in very limited situations, which allows communications providers to physically take over (or share) BT's existing copper lines between street cabinets and customer premises. This remedy allows providers to deploy FTTC technology where they consider this to be economic.

- VULA – this new remedy must be provided by BT wherever it has deployed its NGA network (both FTTC and FTTP). VULA will provide access to the NGA network in a way similar to how LLU provides access to BT's copper access

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[12] http://stakeholders.ofcom.org.uk/consultations/wla/statement.
[13] http://stakeholders.ofcom.org.uk/consultations/wba/ and http://stakeholders.ofcom.org.uk/consultations/wholesale-broadband-markets/ respectively.

network. However, rather than providing a physical line, VULA will provide a virtual connection that gives communications providers a dedicated link to their customers.

- PIA – like VULA, this is a new remedy. It will allow communications providers to deploy fibre in the access network using BT's ducts and poles to support deployment of either FTTC or FTTP technology. In the case of FTTC, it could be used to provide a "backhaul" connection between street cabinets and the provider's network. BT is required to produce a draft reference offer for duct and pole access by January 2011, with a view to launching a commercial product in the middle of the year.

  PIA will be designed particularly to support superfast broadband availability in areas that will not be covered by BT's NGA rollout (i.e. in the final third). PIA will reduce the costs of entry for non-BT providers and improve the economics of broadband delivery in the final third.

Wholesale broadband access

4.6   WBA relates to the broadband products and services communications providers provide for themselves and sell to each other. We last reviewed the WBA market in May 2008,[14] and at that time we concluded competition based on LLU had developed to a point where regulation was no longer required in parts of the UK (known as Market 3 areas). In other places, there was competition but not at a sufficient level (Market 2 areas), and in some parts of the UK, including large parts of Wales, there was no competition at all (Market 1 areas). The map below shows the distribution of Market 1, 2 and 3 areas in Wales.
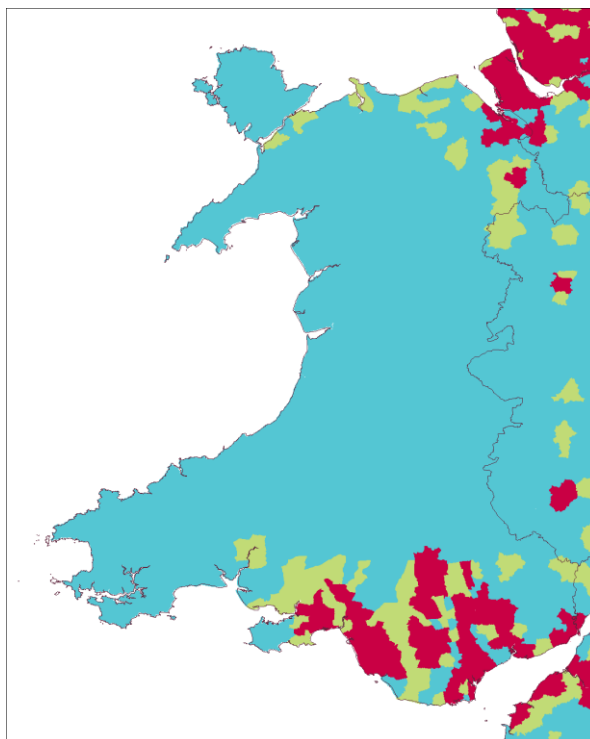
Key: blue = Market 1 areas, green = Market 2 areas, red = Market 3 areas

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4.7 The population split in Wales between Markets 1, 2 and 3, as proxied by the number of distribution points suggests just under 50% of the Welsh population is in Market 3, with 22% in Market 2 and 29% in Market 1.

4.8 We concluded BT had SMP in Markets 1 and 2 but no operator had SMP in Market 3, where no regulatory controls apply. To address the potential competition problems posed by BT's dominance in Market 1 and Market 2 areas, we have proposed BT should continue to be required to provide bitstream services in a non-discriminatory manner and on the basis of cost-oriented prices. These proposals are designed to ensure consumers benefit from competitive services provision at the retail level.

4.9 In addition, we have proposed BT's prices in Market 1 should be subject to a charge control. This will provide additional protection against excessive pricing in areas where the prospect of further investment by competing providers is limited.

4.10 We will publish a separate detailed consultation on the Market 1 charge controls in the autumn.

Section 5

Welsh Assembly Government interventions

Regional Innovative Broadband Support

5.1   The Welsh Assembly Government's RIBS project was specifically designed to provide 35 exchange areas of Wales, initially deemed unviable by BT, with first-generation (512 kbps–2 Mbps download, 256-512 kbps upload) broadband services at affordable prices comparable with urban areas of Wales. The RIBS initiative has provided around 8,500 households and businesses with broadband access and played an important role in reducing the digital divide that exists between rural and urban areas of Wales.

5.2   The project has also looked at addressing not-spot areas, and work was carried out in 2009 to broadband-enable the lines serving the West Wales communities of Bronwydd Arms, Cilcennin, Llanpumsaint, Reynalton and Saundersfoot and Gwytherin in North Wales. This allowed more than 1,000 residents and businesses to enjoy access to broadband services for the first time.

5.3   BT/Openreach is continuing to work through the RIBS contract to address some of the other known not-spots in Wales. The Welsh Assembly Government and BT have announced the second phase of the scheme, which will see a further four not-spots get broadband. These are Beulah and Ystrad Meurig in Ceredigion and Cil-y-Cwm and Llanfynydd in Carmarthenshire.

Economic Renewal Programme

5.4   In July 2010, the Deputy First Minister, Ieuan Wyn Jones AM, announced a new Economic Renewal Programme that aims to provide every business in Wales with access to next-generation broadband by the middle of 2016. Speeds will vary depending on whether a company is based in an urban (100 Mbps) or rural (30 Mbps) location. The Economic Renewal Programme is also committed to seeing all households in Wales being broadband-enabled by 2020.

Broadband Support Scheme

5.5   The Welsh Assembly Government has announced a new £2m Broadband Support Scheme that will provide consumers in rural not-spots with a grant of up to £1,000 to enable them to gain access to broadband by approaching service providers directly.

FibreSpeed

5.6   The FibreSpeed Open Access Network for Wales is a Welsh Assembly Government initiative that aims to provide affordable broadband connectivity (minimum 10 Mbps symmetric) to business parks in North Wales. Financing for the project has come jointly from the European Regional Development Fund, the Welsh Assembly Government and Geo Networks, FibreSpeed's parent company.

5.7   The project's initial focus was on serving 14 key strategic business parks in North Wales from Wrexham and Deeside in the east and along the A55 corridor to Holyhead (see below). Overall, the network could potentially expand to incorporate around 50 locations across Wales. As a wholesale-only provider, FibreSpeed will

allow other service providers to acquire capacity and offer high-speed communications services to businesses and consumers in Wales at the same rates enjoyed in other, more urban parts of the UK.
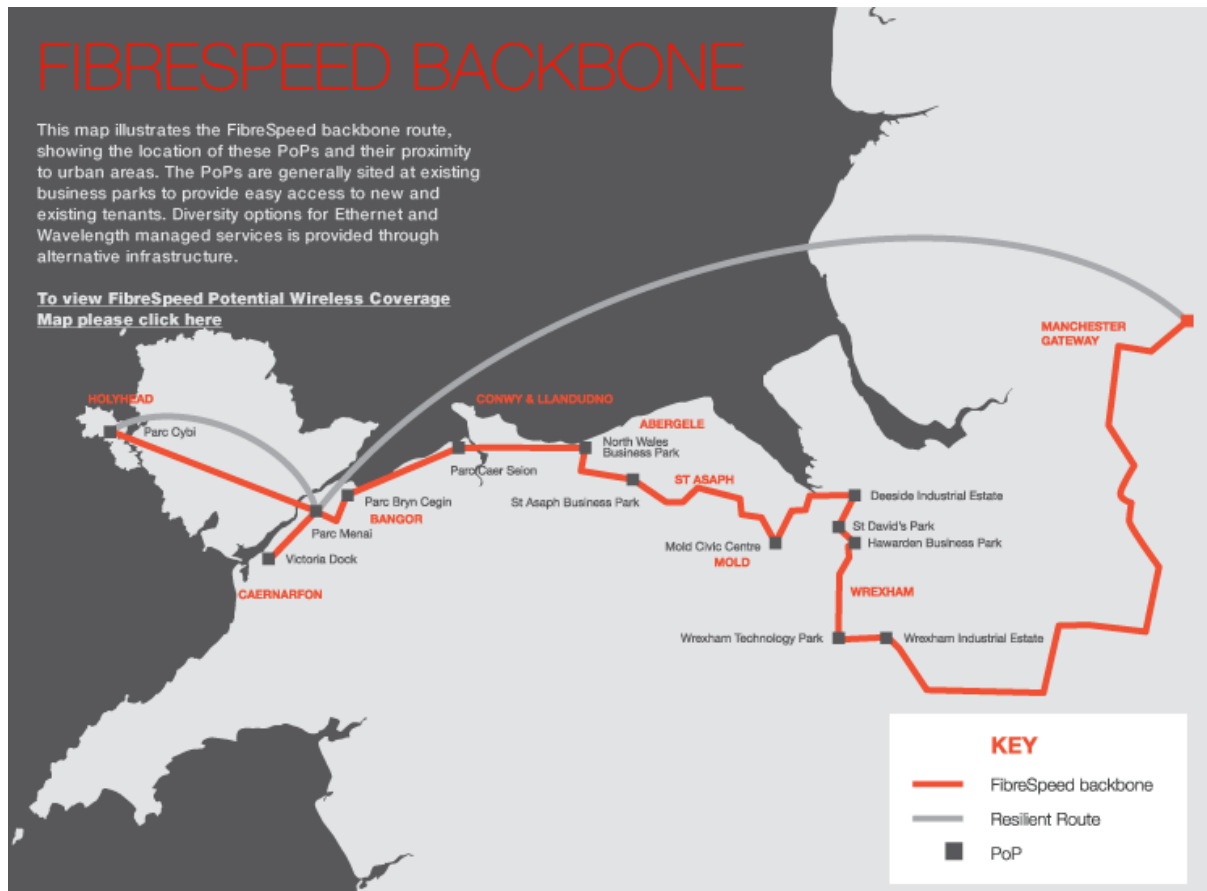
Section 6

UK Government interventions

Universal broadband

6.1 The UK Government is committed to delivering universal broadband at speeds of 2 Mbps within the lifetime of the current Parliament (2015). It will consider whether to use money available from the underspend of the Digital Switchover Help Scheme to do so where the market has not delivered. These are primarily rural areas, but there is a significant minority of suburban and urban broadband not-spots.[15]

Superfast broadband

6.2 The UK Government wants the country to have the best superfast broadband in Europe by the end of the current Parliament. It has announced three market-testing projects in rural areas, including one location in Wales: Felindre near Swansea.

Broadband Delivery UK

6.3 Broadband Delivery UK (BDUK) has been created within the Department for Business, Innovation and Skills (BIS) as a delivery vehicle for the UK Government's broadband policies, reporting to the responsible Minister, Ed Vaizey MP. It is engaging with a wide range of stakeholders (including the "industry," public-sector bodies, Ofcom, regional bodies and community groups) to:

- develop the commercial models that will be used for implementing the universal-service commitment;

- agree the minimum service specification required to achieve the policy objectives of the universal-service commitment;

- plan the deployment of the superfast-broadband pilots to ensure the maximum information is gained for targeting potential future UK Government intervention; and

- investigate the detail of reuse of public-sector networks and assets, identify the challenges and develop solutions.

Broadband deployment and infrastructure sharing

6.4 The UK Government is committed to ensuring BT and other infrastructure providers allow the use of their assets to deliver broadband access. On 15 July 2010, BIS published a discussion paper examining the benefits and problems associated with sharing non-telecommunications utilities infrastructure as a means of facilitating the deployment of broadband networks.[16]

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[15] www.culture.gov.uk/images/publications/SRP_DCMS_150710.pdf.
[16] www.bis.gov.uk/Consultations/broadband-deployment-and-sharing-other-utilities-infrastructure?cat=closedawaitingresponse.

Section 7

Case studies

Rutland Telecom

7.1   Rutland Telecom offers broadband services to rural areas using ADSL2+, SDSL, wireless and fibre-optics. It is one of the first UK communications providers to develop FTTC in Market 1 areas with full access to copper lines to premises. It has implemented a voice and data network in Oakham and Lyddington – previously technologically isolated rural communities in Rutland suffering from poor broadband speeds – and announced similar plans to bring up to 40 Mbps speeds to the village of Erbistock near Wrexham, a rural area where many people currently receive no broadband services at all.

7.2   See www.rutlandtelecom.co.uk for more information.

Avanti satellite broadband

7.3   Avanti intends to launch a broadband-specific satellite called Hylas 1 in late 2010 that will aim to tackle some of the UK's broadband not-spots. Another satellite, Hylas 2, will launch in 2012. Two larger Hercules satellites will follow. Hylas will be able to provide broadband at speeds of 2 Mbps to some 350,000 customers in the UK. The Hercules satellites will have the capacity to provide 50 Mbps to an estimated 800,000 consumers.

7.4   Avanti already has 4,000 subscribers using existing satellite technology. In Scotland, it recently won a Scottish Government contract to supply 2,400 rural homes, all of which will benefit from faster speeds when Hylas is launched. The Scottish Government is subsidising the cost of installing the satellite equipment after running its own not-spot campaign.

7.5   The costs of satellite have proved prohibitively high in the past, with an average installation fee of around £400 plus a monthly cost of about £40. However, with the launch of Hylas, costs are likely to fall in line with market prices. Avanti estimates it will be able to offer satellite broadband for around £15 per month with a one-off installation fee of around £300.

7.6   Avanti will face competition from Eutelsat, which is planning its own satellite launch in 2010.

7.7   See www.avantiplc.com for more information.

BeyonDSL

7.8   BeyonDSL offers a range of satellite-broadband packages that come with either an unlimited data allowance (subject to a fair-use policy and a sliding speed limit) or a data allowance that can be topped up as required. For an extra charge, users wishing to download large amounts of data overnight can also add the "free zone" option without the sliding speed limit. A value-package 2 Mbps connection costs £39.99 per month, and the standard equipment and activation fee is £349.99. Beyond DSL is the only satellite-broadband provider in the UK that offers Sky Digital/freesat television along with broadband services from the same dish, and the

company also offers combined television and broadband packages (although pay-television subscription charges require additional monthly payments).

7.9   See www.beyondsl.net for more information.

Wales Broadband and Telecoms Facilities Limited

7.10   walesbroadband.com was formed to deliver broadband internet services to the remotest areas of Wales. The company has developed a partnership with the Tower Sites and Infrastructure Division of TFL-Group. Established in 1983, TFL-Group offers a portfolio of services ranging from professional two-way radiocommunications systems through to wireless broadband delivery. TFL-Group operates a network of hill-top communications tower sites in Wales that deliver secure, sustainable and fully integrated wireless systems.

7.11   See www.tfl-group.com for more information.

Exwavia

7.12   Originally called Olive Tree IT, Exwavia specialises in the deployment of wireless broadband solutions to rural areas of Wales at prices comparable to the services found in towns and cities (4 Mbps+ for £19.99 per month to 12 Mbps+ for £34.99 per month). It believes delivering broadband wirelessly is more cost-effective, more reliable and better value for money than satellite broadband.

7.13   Some of the company's methods of delivering a wireless service to rural locations in Wales are proprietary. However, the basic technology is available to all. Essentially, Exwavia purchases bandwidth from its wholesale supplier and then places its first wireless distribution node at or near the telephone exchange. This is used to "send" the broadband to where it is required. The distribution of broadband to users is then a simple case of feeding the wireless signal to each premises using the same wireless technology. The entire network is monitored, maintained, configured and upgraded from Exwavia's office in Powys.

7.14   In the past, wireless technology has been plagued by interference, poor performance and intermittent delivery. However, Exwavia argues that its partner, Ruckus Wireless, has solved these issues and the performance of wireless broadband is now comparable with the performance of cable broadband.

7.15   Exwavia is committed to bringing superfast internet connections to all parts of Wales and will introduce speeds of 20 Mbps+ to rural areas when wholesale prices fall.

7.16   Exwavia does not use the term "up to" to deliver services, believing consumers should receive what they order, so if a consumer orders a 4 Mbps connection, that is the minimum speed they will receive.

7.17   Exwavia is planning additional services including discounted telephone services, streaming media and streaming TV in the near future.

7.18   See http://exwavia.co.uk for more information.

Annex 1

Abbreviations

3G	Third-generation mobile-phone standards and technology
ADSL	Asymmetric DSL
BDUK	Broadband Delivery UK
BET	Broadband-Enabling Technology
BIS	Department for Business, Innovation and Skills
BWA	Broadband wireless access
DACS	Digital-access carrier system
DSL	Digital subscriber line
FTTC	Fibre to the cabinet
FTTP	Fibre to the premises
ISP	Internet-service provider
kbps	Kilobits per second
LLU	Local-loop unbundling
MAC	Migration Access Code
Mbps	Megabits per second
NGA	Next-Generation Access
PIA	Physical infrastructure access
RIBS	Regional Innovative Broadband Support
SDSL	Symmetric DSL
SLU	Sub-loop unbundling
SMP	Significant market power
USB	Universal serial bus
VDSL	Very high bit-rate DSL
VULA	Virtual unbundled local access
WBA	Wholesale broadband access
WiMAX	Worldwide Interoperability for Microwave Access
WLA	Wholesale local access