Appendix H: United Kingdom

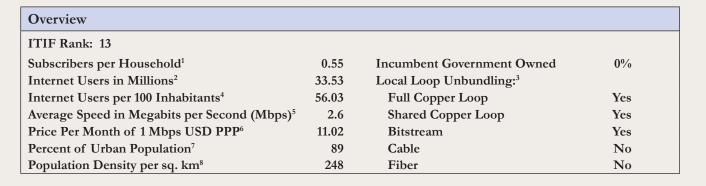| Overview			
ITIF Rank: 13			
Subscribers per Household[1]	0.55	**Incumbent Government Owned**	0%
Internet Users in Millions[2]	33.53	**Local Loop Unbundling:[3]**	
Internet Users per 100 Inhabitants[4]	56.03	**Full Copper Loop**	Yes
Average Speed in Megabits per Second (Mbps)[5]	2.6	**Shared Copper Loop**	Yes
Price Per Month of 1 Mbps USD PPP[6]	11.02	**Bitstream**	Yes
Percent of Urban Population[7]	89	**Cable**	No
Population Density per sq. km[8]	248	**Fiber**	No

Geography and Demography

The United Kingdom is comprised of four nations: England, Scotland, Wales, and Northern Ireland. While the population density varies throughout, overall it is high at 248 people per square kilometer.[9] The United Kingdom also has a highly urban population with 89 percent of the people living in cities, as compared to 81 in the United States.[10] Nonetheless, it has many rural areas, particularly in the north and west of Scotland and in western Wales.

Policy

In 2001 the UK government established its national broadband strategy through its white paper: "Opportunity for All in a World of Change," with a target "for the UK to have the most extensive and competitive broadband market in the G7 by 2005."[11] Accordingly, from 2003 to 2006 the government spent more than $2 billion on building public sector networks.[12] The funding was made available via the Broadband Aggregation Project (BAP), which is focused on providing key public services with broadband connectivity, including primary and secondary schools and National Health Service clinics.[13] The project's concept is to aggregate demand for broadband connectivity, thus making it more attractive for broadband providers because it will deliver a large number of guaranteed subscribers. The UK government's digital strategy, released in 2005, also focuses on the demand side of broadband by promoting virtual learning, universal access to advanced public services, fostering the creation of innovative broadband content, providing communal access points and providing digital literacy programs for adults, making home computers more affordable, and removing access barriers for people with disabilities.[14]

Rural Access

The UK national and local governments support broadband infrastructure development in rural areas, and also focus on helping public entities to build networks and aggregate demand–thus guaranteeing a subscriber base for broadband providers. Specifically, via the BAP, the UK government provided more than $2 billion between 2003 and 2006 to build public sector networks providing key public services with broadband connectivity, including

Rural Access (*continued*)

primary and secondary schools and National Health Service clinics.[15] In addition, from 2001 to 2005, via the Broadband Fund the UK government gave grants of around $127 million to more than 13 projects.[16] The government of Scotland funded the development in 2003 for a virtual Telecoms Trading Exchange (TTE) to provide a marketplace for wholesale broadband connectivity in rural areas using grants from Project ATLAS. Also in Scotland, the 2004 Broadband Pathfinder Project provided grants to communities in remote areas of western Scotland to aggregate public sector demand for broadband infrastructure and wire up schools, libraries, and other public buildings.[17]

In England, the municipalities of Cornwall, Hampshire, and Yorkshire have set up broadband initiatives. One early project was the UK Broadband Fund-supported Remote Area Broadband Inclusion Trial (RABBIT) to promote broadband for businesses and organizations in remote areas.[18] In Northern Ireland local government programs are giving financial aid to small businesses that need broadband connectivity; connecting public libraries; and providing e-mail, messaging systems, web publishing, and other services for schools.[19]

Competition

The UK government recognized early that it needed a regulatory framework that encouraged competition. British Telecom (BT) owns the majority of the fixed line telecommunications infrastructure and—most importantly—the last mile between the exchange and residences or businesses. This allows BT to control who has access to its network and without government intervention it would be unlikely to allow competitors to use its network or equipment. Accordingly, the government required BT to unbundle its local loops in 2000. In addition to offering unbundled local loops, beginning in 2000 BT also offered non-discriminatory access to a wholesale end-to-end asymmetric digital subscriber line (ADSL) product and a bitstream product.[20] Initially, demand for unbundled local loops was nonetheless very low. So, at the end of 2004 the Office of Communications (Ofcom) – Britain's telecommunications regulator – required BT to reduce its charges for unbundled local loops by up to 70 percent.[21] In addition, in 2005, after the government determined that competition still was insufficient, it required BT to set up a separate business unit (called Openreach) to administer its unbundled network lines on a non-discriminatory basis. The result was a dramatic increase in the number of unbundled lines from 365,000 at the end of 2005 to 1.7 million by February 2007.

A majority of UK residents and businesses receive broadband access via ADSL, supplied primarily by BT since 2000, but also by a variety of competitors because of the government's requirement for BT to unbundle its local loop.[22] BT and its main competitor—Virgin Media (a merger of the two largest cable companies, ntl and Telewest)—account for half of all retail broadband connections.[23] As the UK's incumbent fixed telecommunications operator and owner of a majority of the country's infrastructure, BT also is the UK's largest wholesale broadband provider, its second largest supplier of retail broadband connections, and it has 24 percent of retail broadband subscribers.[24] The primary alternate service is the cable modem, which comprised nearly a quarter of the United Kingdom's broadband connections by the end of 2006—a distant second to DSL broadband despite its debut as the pioneer broadband service in 1999.[25] This is because cable's share of the broadband market has declined significantly from 60 percent in 2001 as most new subscribers have chosen ADSL.[26] Yet Virgin Media is nonetheless the UK's largest broadband provider, with 26 percent of the market.[27] The country's third largest broadband provider, after Virgin Media and BT, is Carphone Warehouse, which began its service only in 2006 after it bought AOL UK with 1.5 million broadband customers and then migrated its TalkTalk fixed telephony customers over to its broadband service.[28] The remainder of the market includes Tiscali, one of the largest pan-European ISPs;

Competition (*continued*)

Orange Home UK – a subsidiary of the French incumbent telecommunications operator (formerly France Telecom); Pipex, primarily through the acquisition of Cable and Wireless' broadband subsidiary, Bulldog in 2006 (via LLU and wholesale); and BSkyB/Easynet, through unbundled local exchanges.[29]

Fiber

BT is only just now beginning to roll out fiber via BT Openreach, its network access business. It is deploying a fiber network in Ebbsfleet Valley, a new housing development of 9,500 homes and offices in Kent in a deal between BT Openreach, Land Securities and BSkyB. BT also has done trials of FTTH in a number of locations including Suffolk, Milton Keynes, and London's Docklands, as well as in South Wales. Despite these investments, BT currently has no plans to replace its existing copper networks with fiber.[30]

Demand

The UK government's digital strategy includes several programs to promote broadband demand. These include Directgov, launched in 2004, that allows British citizens to access information from a variety of government agencies, and Government Gateway, a centralized registration point for government services online.[31] Demand evidently is important to encourage take-up of broadband services, as the British government's research shows that the number one reason its citizens do not subscribe to broadband when they have access to it is lack of interest, and the number two reason is lack of perceived need.[32] Other important factors are lack of confidence and knowledge, PC cost, and software application complexity.[33] To address the problem of PC cost as a barrier to broadband access – particularly in households with children – the UK government established the E-Learning Foundation, which offers parents financing to lease laptops for four years with a delayed payment scheme that begins after 15 months. To stimulate interest in the Internet, the government's Department of Trade and Industry has created the Technology Program, which provides funding to encourage innovation and research in developing broadband content.[34]

In addition to the national programs, each nation has its own initiatives funded both locally and with national funds. For example, with over $5 million of the UK Broadband Fund, the Welsh government set up the Broadband Wales Program in 2002 aimed at stimulating demand for broadband and encouraging supply, including satellite access subsidies; local ICT support centers called "Try Before You Buy;" projects to aggregate public sector demand; the Lifelong Learning Network to deliver connectivity to schools, libraries, and learning centers; and initiatives to bring "second generation" infrastructure to businesses and business parks.[35]

The availability of increased broadband speed also has fueled demand as it facilitates a wider variety of Internet services, including video downloads (such as YouTube), streaming television (such as Choose andWatch.com and Beelinetv.com), and Internet Protocol television (IPTV – such as BT Vision and Tiscali TV). The majority of broadband subscribers use the service as a source of information, but half use it to download music or videos and more than a third play online games.[36] Increasing upload speeds also are spurring the growth of online content, particularly among young people, with 44 percent of users uploading pictures or photos to a website and 15 percent uploading videos.[37] Demand also is increasing as providers offer bundles of services to encourage subscribers to get telephone, broadband, cable TV, and other options from the same company at a combined price.

> **Demand (*continued*)**
>
> Cable operators first began offering bundled cable and telephony services after 2000 and now 37 percent of UK homes subscribe to more than one service from the same provider.[38] Triple-play packages (telephony, broadband, and TV) are the most common, with some operators adding mobile phone service (quad-play). Bundling may offer a way for providers to raise broadband prices by including broadband services in a competitively priced package that also includes telephony and TV.

ENDNOTES

1. OECD measures penetration on a per capita basis because comprehensive data on household penetration is generally unavailable. ITIF has used average household size as a multiplier to convert June 2007 OECD per capita penetration data to household penetration data. It should be noted that one problem with this method is that the OECD data likely also includes some DSL business subscribers.

2. International Telecommunications Union, "Internet Indicators: Subscribers, Users, and Broadband Subscribers," International Telecommunications Union ICT Statistics Database (ITU, 2006) <www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx#>.

3. Unbundling is a policy by which regulators require incumbent telecommunications operators (those with dominant market status who control access to the telecommunications infrastructure) or cable companies to give their competitors access to raw copper pairs, fiber, or coaxial cable networks so that they can install their own transmission equipment at the incumbent's central office (local exchange). *Full unbundling* requires the incumbent to make all copper pair frequencies or fiber networks available to competitors. *Shared access* to the local loop requires the incumbent to make the "high" frequency bands (those that carry data, but not voice) of the copper pair available to its competitors, allowing them to offer xDSL broadband services. *Bitstream access* requires incumbent operators to allow competitors access to the incumbents' equipment at their central office. *Cable access* enables competitors to use cable companies' coaxial cable local loops and fiber access requires telecommunications operators to give competitors access to their fiber local loops.

4. International Telecommunications Union, "Internet Indicators: Subscribers, Users, and Broadband Subscribers," International Telecommunications Union ICT Statistics Database (ITU, 2006) <www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx#>.

5. Our methodology for calculating broadband speed in the ITIF Broadband Rankings involves averaging the speeds of the incumbent DSL, cable and fiber offerings provided in the OECD's April 2006 "Multiple Play," report, with each assigned a weight according to that technology's respective percentage of the nations overall broadband subscribership, as reported in the OECD's "Broadband Statistics to December 2006."

6. USD price per bit (PPP) of the fastest available technology is calculated from the broadband offerings examined in the OECD's "Multiple Play: Pricing and Policy Trends" report.

7. The World Bank, "Information and Communications for Development 2006," (2006): 172.

8. The United Nations, "World Population Prospects: The 2006 Revision Population Database," 2007 <esa.un.org/unpp/>.

9. Ibid.

10. The World Bank, "Information and Communications for Development 2006," (2006): 285.

11. Department of Trade and Industry, Review of the UK Broadband Fund, 2005 <www.berr.gov.uk/files/file13440.pdf>.

12. Broadband Stakeholders Group, "UK National Broadband Strategy," (2004): 8.

13. Ibid: 10.

14. The Prime Minister's Strategy Unit and the Department of Trade and Industry, "Connecting the UK: the Digital Strategy," (March 2005): 8.

15. Broadband Stakeholders Group, "UK National Broadband Strategy," (2004): 8.

16. Ibid.

17. Ibid: 6.

18. Ibid: 5.

19. Ibid: 7.

20. Ibid: 15.

21. United Kingdom Office of Communications, The Communications Market: Broadband: Digital Progress Report, (April 2, 2007): 13.

22. Broadband Stakeholders Group, "UK National Broadband Strategy," (2004): 8.

23. United Kingdom Office of Communications, The Communications Market: Broadband: Digital Progress Report, (April 2, 2007): 9.

24. Ibid: 9.

25. Ibid: 5-7.

26. Ibid: 7.

27. Ibid: 9.

28. Ibid: 10.

29. Ibid: 10-11.

30. "BT Deploys FTTH in Kent," Screen Digest, February 7, 2007 <www.screendigest.com/online_services/ intelligence/ broadband/updates/bi-070207-jg1sj/view.html>.

31. Ibid: 18.

32. Ibid: 24.

33. Ibid.

34. Ibid: 41.

35. Arsyllfa Band Eang Cymru-Broadband Wales Observatory, "UK Broadband Market 2005," (2005): 4.

36. Ibid: 20.

37. Ibid: 23.

38. Ibid: 34.