



# Appendix C: Germany

## Overview

ITIF Rank: 16

Subscribers per Household <sup>1</sup>	0.47	Incumbent Government Owned	38.02%
Internet Users in Millions <sup>2</sup>	38.6	Local Loop Unbundling: <sup>3</sup>	
Internet Users per 100 Inhabitants <sup>4</sup>	46.67	Full Copper Loop	Yes
Average Speed in Megabits per Second (Mbps) <sup>5</sup>	6.0	Shared Copper Loop	Yes
Price Per Month of 1 Mbps USD PPP <sup>6</sup>	5.2	Bitstream	Yes
Percent of Urban Population <sup>7</sup>	88	Cable	No
Population Density per sq. km <sup>8</sup>	232	Fiber	No

## Geography and Demography

Germany has the largest population in Europe of 82.6 million people with a population density of 232 people per square kilometer.<sup>9</sup> The country also has a very high percentage of its citizens living in cities – 88 percent – higher than the United States (81 percent) and nearly as high as the United Kingdom (89 percent).<sup>10</sup>

## Policy

As early as 1999, to support and promote the development of the information society the German government launched Initiative D21. The goal was to bring local and national governmental bodies together with industry to study broadband strategy, conduct workshops, and prepare policy documents.<sup>11</sup> In 2003 the German government placed broadband infrastructure at the center of an initiative to foster the “Information Society” and followed up with plans in 2005 to increase competition in broadband access technologies, including DSL and cable, as well as in broadband content, with a goal to reach 50 percent residential penetration by 2010 (90 percent for small and medium enterprises).<sup>12</sup> Initiatives under the government’s broadband strategy include the Deutsches Forschungsnetz (DFN), the development of a high-bandwidth network for research and educational institutions and the Breitbandatlas, a map showing broadband coverage for the country. The government also offers free consulting services for small and medium size businesses to promote broadband and provides awards for innovative broadband projects.<sup>13</sup>

## Rural Access

The main thrust of Germany’s broadband policy has been to foster competition. Although its programs have not singled out rural access as a priority, presumably such access is included in its Initiative D21 to raise broadband penetration throughout the country. In addition, rural areas with educational institutions benefited from the governments emphasis on building broadband networks for research. Moreover, rural residents could use the Breitbandatlas to determine broadband coverage in their communities.

## Competition

In 2001 the regulator RegTP (Regulierungsbehörde für Telekommunikation und Post – as of 2005 the Bundesnetzagentur or Federal Network Agency (FNA)) required Deutsche Telecom to provide non-discriminatory access to shared local loop lines in accordance with EU directive 2887/2000. Although Deutsche Telecom appealed this decision, the German courts upheld it and by August 2001 the company offered its first line-sharing contract.<sup>14</sup>

Yet, competitors found Deutsche Telecom's rates for leasing unbundled loops to be too high and it wasn't until 2004 (under pressure from the European Commission) that the FNA forced Deutsche Telecom to reduce its charges for its T-digital subscriber line (T-DSL) wholesale product by a third (which allows ISPs to offer T-DSL customers Internet services) and also required the company to further reduce its monthly local loop rental charge by 10 percent.<sup>15</sup> After Deutsche Telecom further reduced prices in 2005 the number of competitors in the market increased and Germany now has one of the highest shares of unbundled local loops (24 percent) in Western Europe.<sup>16</sup> By 2006 Internet service providers (ISPs) purchasing Deutsche Telecom's T-DSL lines accounted for 80 percent of all resale lines and there were over 80 DSL operators in early 2007.<sup>17</sup> Nonetheless, in 2006 Deutsche Telecom dominated the broadband market with 67 percent of all subscribers (although that may gradually change as Deutsche Telecom reduced the prices it charges resellers between 28 to 27 percent in late 2006).<sup>18</sup> In 2006, the FNA determined that Deutsche Telecom should not have to open up its very high speed DSL (VDSL) network to competitors for three years—a decision that the European Commission overturned. However, the FNA has required Deutsche Telecom to offer its competitors bitstream access beginning in April 2008. Another reason Deutsche Telecom may still dominate the broadband market may be because its ISP—T-Online—has tremendous brand recognition and is the leading European ISP.<sup>19</sup> Competitors' market shares increased from 33 percent in October 2005 to 47 percent less than a year later in July 2006, although this mostly reflects an increase in DSL resale lines, as opposed to facilities-based competition – such as cable, which had only 2.9 percent of the broadband market in October 2006.<sup>20</sup> Deutsche Telecom's largest DSL network competitor is Arcor with 1.3 million subscribers compared to Deutsche Telecom's 6.4 million, or 12.5 percent of the total broadband market (as compared to Deutsche Telecom's 62 percent). Other broadband service providers comprise the remaining 25.5 percent of the market, including the country's second largest ISP – United Internet, with 2.36 million subscribers (2007), and Versatel with 390,000 subscribers (2006), with the remainder divided up among Debitel, QSC, and Tropolys.<sup>21</sup> While these services are mainly reselling Deutsche Telecom's DSL offering, one company – Freenet – developed its own asymmetric DSL2+ (ADSL2+) broadband network, which it was offering to 40 percent of German households by mid-2006.<sup>22</sup> Arcor also began to offer ADSL2+ services in 300 cities in 2006 and in 2007 Telefónica rolled out ADSL2+ services. Tiscali invested euro 200 million in its own DSL infrastructure in 2005 and rolled out unbundled telephony services in 2006.<sup>23</sup> In addition, Quality Service Communications (QSC) also is expanding its ADSL2+ network.<sup>24</sup>

As of 2006 the primary broadband technology continued to be DSL (98.4 percent of subscribers) and the main provider Deutsche Telecom.<sup>25</sup> Although in 2002 nearly 70 percent of German households had access to the cable TV network, fragmentation in the cable market prevented early uptake of cable broadband services.<sup>26</sup> One reason may be because Deutsche Telecom originally held 80 percent of the cable broadband backbone infrastructure and about 30 percent of the links to customers' residences and only began to divest its holdings in 2001.<sup>27</sup> In fact, the cable provider offering the fastest speeds (up to 100 mbps) is not even originally a cable company – NetCologne started as a municipal network in Cologne, Bonn, and Aachen that in 2006 upgraded its network to compete with Deutsche Telecom's high-speed VDSL offering (although the majority of Deutsche Telecom's subscriptions are still ADSL).<sup>28</sup> The market continues to be fragmented, with around 30 cable network operators in 2006, many of which are too small to upgrade their networks to provide broadband services.<sup>29</sup>

## Fiber

NetCologne began offering fiber-to-the-home (FTTH) in July 2006 to compete with Deutsche Telecom's VDSL network. Yet, this service is limited to the Cologne market, where NetCologne already has 45 percent of subscribers.<sup>30</sup> The only other providers of FTTH are the Dutch incumbent, KPN, which teamed with WINGAS, Germany's natural gas company, to offer 5,000 km of fiber networks in Germany in 2007, interconnecting through points-of-presence (PoPs) in several large cities.<sup>31</sup>

## Demand

Deutsche Telecom has, to a certain extent, taken up the role of encouraging broadband demand by deploying its services to public facilities. For example, in 2006 it began to provide Internet access at speeds up to 6 Mbps to Germany's schools as part of its T@School infrastructure project to connect all of the country's 28,000 schools – which it began in 2000 by offering all public and state-approved schools with free Internet access.<sup>32</sup> Yet, the initial low prices Deutsche Telecom offered and the recent increase in DSL competition are only two of the drivers of Germany's broadband penetration. The popularity of music and video downloads also is driving demand, as well as online shopping. Revenues from digital music downloads increased by 33 percent in 2006 over 2005 and sales of online products exceeded \$10 billion in the first half of 2006.<sup>33</sup>

## 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, 2006 <[www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx#](http://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, 2006 <[www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx#](http://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. 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): 198.
11. Arsyllfa Band Eang Cymru-Broadband Wales Observatory, "Germany Broadband Market Report 2005" <www.broadbandwalesobservatory.org.uk/broadband-3323>.
12. Paul Budde Communication Pty Ltd, "Germany - Broadband Market - Overview, Statistics & Forecasts," Telecommunications and Information Highways (Bucketty, Australia: 2007): 3.
13. Arsyllfa Band Eang Cymru-Broadband Wales Observatory, "Germany Broadband Market Report 2005" <www.broadbandwalesobservatory.org.uk/broadband-3323>.
14. Margit A. Vanberg, "Competition in the German Broadband Access Market," ZEW Centre for European Economic Research, Discussion Paper No. 02-80 (October 2002): 11.
15. Paul Budde Communication Pty Ltd, "Germany - Broadband Market - Overview, Statistics & Forecasts," Telecommunications and Information Highways (Bucketty, Australia: 2007): 3.
16. Arsyllfa Band Eang Cymru-Broadband Wales Observatory, "Germany Broadband Market Report 2005" <www.broadbandwalesobservatory.org.uk/broadband-3323>.
17. Ibid: 2.
18. Ibid.
19. Martin Fransman (ed.), *Global Broadband Battles: Why the U.S. and Europe Lag While Asia Leads* (Stanford, California: Stanford Business Books, 2006) 197.
20. Paul Budde Communication Pty Ltd, "Germany - Broadband Market - Overview, Statistics & Forecasts," Telecommunications and Information Highways (Bucketty, Australia: 2007) 3.
21. Ibid: 14.
22. Ibid: 15.
23. Ibid: 16.
24. Ibid: 17.
25. Margit A. Vanberg, "Competition in the German Broadband Access Market," ZEW Centre for European Economic Research, Discussion Paper No. 02-80 (October 2002): 6.
26. Ibid: 12.
27. Ibid: 13.
28. Ibid: 1.
29. Ibid: 10.
30. Ibid: 9.
31. Paul Budde Communication Pty Ltd, "Germany - Broadband Market - Overview, Statistics & Forecasts," Telecommunications and Information Highways (2007): 19.
32. Ibid: 13.
33. Ibid: 4.