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**COMMISSION STAFF WORKING DOCUMENT**

**Europe's Digital Progress Report 2017**

# Europe's Digital Progress Report (2017)

## Telecoms chapter

### GERMANY

1.

#### Competitive environment

Coverage	DE-2015	DE-2016	EU-2016
Fixed broadband coverage (total)	98%	99%	98%
Fixed broadband coverage (rural)	93%	94%	93%
Fixed next generation access (NGA) coverage (total)	81%	82%	76%
Fixed NGA coverage (rural)	36%	49%	40%
4G coverage (average of operators)	no data	86%	84%

Source: Broadband Coverage Study (IHS and Point Topic). Data as of October 2015 and October 2016.

#### Fixed Broadband Market

In recent years, there have been no significant changes in market share. Deutsche Telekom's competitors were able to maintain or expand their market share in many areas.

In the company list of the Federal Network Agency (*Bundesnetzagentur*), the number of municipal utilities (*Stadtwerke*) and of their spin-off subsidiary companies, that provide telecommunications services is growing steadily. Some of these companies build infrastructure for selling wholesale telecoms services to telecoms service providers; others provide services directly on telecommunications retail markets.

At the same time, and with regard to market consolidation it is worth mentioning the acquisition of PrimaCom and Pepcom by Tele Columbus in 2015, the acquisition of NeckarCom by NetCom BW on 1 September 2016 and the takeover of Level 3 by CenturyLink on 31 October 2016.

New entrants' DSL subscriptions by type of access (VDSL included)	DE-2015	DE-2016	EU-2016
Own network	0%	0%	0.7%
Full LLU	73.9%	65.5%	75.3%
Shared access	0.2%	0.2%	4.1%
Bitstream	9.5%	13.3%	13.4%
Resale	16.2%	20.9%	6.6%

Source: Communications Committee. Data as of July 2015 and July 2016.

There was a shift in new entrants' demand for wholesale products from full LLU towards bitstream and resale products from Deutsche Telekom AG. On the other hand, end-users are increasingly buying products from cable providers. Since cable providers can use their own infrastructures for broadband services, they don't need to use the local loops of Deutsche Telekom AG.<sup>1</sup>

<sup>1</sup> *Bundesnetzagentur: Jahresbericht 2015* (Federal Network Agency: 2015 Annual Report), p. 57, published on 13 May 2016

([https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Allgemeines/Bundesnetzagentur/Publikationen/Berichte/2016/Jahresbericht2015.pdf?\\_\\_blob=publicationFile&v=2](https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Allgemeines/Bundesnetzagentur/Publikationen/Berichte/2016/Jahresbericht2015.pdf?__blob=publicationFile&v=2)).

<b>Fixed broadband market share</b>	DE-2015	DE-2016	EU-2016
Incumbent market share in fixed broadband	41.6%	40.7%	40.7%
Technology market share			
DSL	77.7%	76.1%	66.8%
Cable	20.7%	22.0%	19.1%
FTTH/B	1.3%	1.6%	10.7%
Other	0.3%	0.3%	3.4%

Source: Communications Committee. Data as of July 2015 and July 2016.

<b>Charges of Local Loop Unbundling (monthly average total cost in €)</b>	DE-2015	DE-2016	EU-2016
Full LLU	11.0	10.8	9.2
Shared Access	2.7	-	2.4

Source: Communications Committee. Data as of October 2015 and October 2016.

The supply of  $\geq 50$  Mbps connections has further improved. At the end of 2016, these connections were available to 75.5% of the approximately 40.8 million households in Germany, compared to 66.4% at the end of 2014 (all technologies). This is mainly due to cable infrastructure, which is the most important alternative broadband infrastructure and accounted for 63.4% of connection possibilities<sup>2</sup> at the end of 2016.<sup>3</sup> It also provides the largest high-performance infrastructure based on DOCSIS 3.0 technology, which allows for download speeds of up to 400 Mbps in networks made of fibre optic and coaxial cables. At the end of 2015, 6.6 million broadband connections were provided via hybrid fibre-coaxial (HFC) networks, 1.9 million of them with download speeds of 100 Mbps or more. Over the past few years, HFC broadband connections have grown steadily by between 700,000 and 800,000 a year. They create highly competitive pressure on the market.<sup>4</sup> Starting in 2017, the DOCSIS 3.1 technology, which enables data rates of 1Gbps and more, will be gradually deployed by cable operators in Germany.<sup>5</sup>

There was a significant increase in the coverage provided by VDSL connections, from 13.9% in 2014 to 28.3% in mid-2016.<sup>6</sup> The vectoring technology is expected to further increase the importance and spread of VDSL. It allows theoretical transmission speeds of up to 100 Mbps for VDSL connections. According to a provisional estimate by the Federal Network Agency, at the end of 2015 about 4% of the 4.8 million VDSL connections which had been taken up were equipped with such high data rates.<sup>7</sup>

<sup>2</sup> This is in terms of homes passed, not in terms of actual and active subscriptions to broadband connections via cable.

<sup>3</sup> *Aktuelle Breitbandverfügbarkeit in Deutschland (Stand Ende 2016), Erhebung des TÜV Rheinland im Auftrag des BMVI* (Current broadband availability in Germany (status end of 2016), survey by TÜV Rheinland commissioned by the Federal Ministry for Transport and Digital Infrastructure) ([https://www.bmvi.de/SharedDocs/DE/Publikationen/DG/breitbandverfuegbarkeit-ende-2016.pdf?\\_\\_blob=publicationFile](https://www.bmvi.de/SharedDocs/DE/Publikationen/DG/breitbandverfuegbarkeit-ende-2016.pdf?__blob=publicationFile))

<sup>4</sup> Federal Network Agency: 2015 Annual Report, p. 53, published on 13 May 2016.

<sup>5</sup> ANGA, *Das deutsche Breitbandkabel 2016* (German Broadband Cable, 2016).

<sup>6</sup> *Bericht zum Breitbandatlas Mitte 2016 im Auftrag des Bundesministeriums für Verkehr und digitale Infrastruktur (BMVI)* (Report on the Broadband Atlas for mid-2016, commissioned by the Federal Ministry for Transport and Digital Infrastructure), p. 7 ([http://www.bmvi.de/SharedDocs/DE/Anlage/Digitales/bericht-zum-breitbandatlas-mitte-2016-ergebnisse.pdf?\\_\\_blob=publicationFile](http://www.bmvi.de/SharedDocs/DE/Anlage/Digitales/bericht-zum-breitbandatlas-mitte-2016-ergebnisse.pdf?__blob=publicationFile)).

<sup>7</sup> Federal Network Agency: 2015 Annual Report, p. 52, published on 13 May 2016.

As of mid-2016, about 7.1% of households were covered with fibre optic infrastructure (FTTB/H), mainly by alternative suppliers.<sup>8</sup>

Rural next generation access (NGA)<sup>9</sup> coverage has improved significantly since October 2015. As of October 2016, almost half (49%) of Germany's rural population had next generation access, well above the EU average (40%). Rural fixed broadband coverage rose slightly from 93% (Q3 2015) to 94% (Q3 2016), and is slightly above the EU average (93%).<sup>10</sup>

The cheapest fixed broadband retail price (12-30 Mbps or above) for a standalone offer was €19.29 in Germany, versus an EU average of €21.33.<sup>11</sup>

## Mobile market

Mobile market	DE-2015	DE-2016	EU-2016
Market share of market leader	-	-	34%
Market share of second largest operator	-	-	28%
Number of mobile network operators (MNOs)	3	3	-
Number of mobile virtual network operators (MVNOs)	4	4	-
Market share of MVNOs (SIM cards)	-	-	-

Source: Communications Committee. Data as of October 2015 and October 2016.

4G coverage (average of operators) was slightly above the EU average (86% versus 84%) in Germany in October 2016.<sup>12</sup> In Q3 2016 the leading mobile operator was the same as last year, the merged company of Telefónica Germany (O2) and E-Plus with a 34.3% subscriber market share. Vodafone was the second largest mobile network operator (MNO), with a 33.5% market share.<sup>13</sup> T-Mobile was the third largest operator, with a market share of 32.2%.<sup>14</sup>

For termination services, in addition to the MNOs there are four full mobile virtual network operators (MVNOs) that are currently subject to regulation in the German market. These are Lycamobile Germany GmbH, Truphone GmbH, Sipgate Wireless GmbH and Voiceworks GmbH.

<sup>8</sup> Report on the Broadband Atlas for mid-2016, commissioned by the Federal Ministry for Transport and Digital Infrastructure, p. 7.

<sup>9</sup> NGA is defined in the Commission Recommendation 2010/572/EU, article 11; see <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2010:251:FULL&from=EN>, p. 40.

<sup>10</sup> Broadband Coverage Study (IHS and Point Topic). Data as of October 2015 and October 2016.

<sup>11</sup> Fixed broadband prices in Europe in 2016 (Empirica). Prices expressed in EUR/PPP, VAT included. Data as of autumn 2016.

<sup>12</sup> Broadband Coverage Study (IHS and Point Topic). Data as of October 2016.

<sup>13</sup> The new counting method at Vodafone resulted in a gain of 11.5 million subscribers for the operator from 30,334,000 in Q1 2016 to 41,890,000 in Q2 2016.

([https://www.bundesnetzagentur.de/cln\\_1411/DE/Sachgebiete/Telekommunikation/Unternehmen\\_Institutionen/Marktbeobachtung/Deutschland/Mobilfunkteilnehmer/Mobilfunknehmer.html?nn=268208](https://www.bundesnetzagentur.de/cln_1411/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Marktbeobachtung/Deutschland/Mobilfunkteilnehmer/Mobilfunknehmer.html?nn=268208)).

<sup>14</sup> The market shares are calculated based on mobile subscriber numbers from the Federal Network Agency's website, which are 'registered subscribers'. These figures were published by the operators in their quarterly / annual reports. Data from the Communications Committee (in the table) is based on 'active subscribers' and is not available for Germany.

([https://www.bundesnetzagentur.de/cln\\_1411/DE/Sachgebiete/Telekommunikation/Unternehmen\\_Institutionen/Marktbeobachtung/Deutschland/Mobilfunkteilnehmer/Mobilfunknehmer.html?nn=268208](https://www.bundesnetzagentur.de/cln_1411/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Marktbeobachtung/Deutschland/Mobilfunkteilnehmer/Mobilfunknehmer.html?nn=268208)).

There is no individual assignment-based obligation for MNOs to contract with MVNOs. However, the 2 GHz/UMTS licences include a Service Provider obligation. In addition, under certain conditions Telefónica is required to allow MVNOs onto its network, based on the commitment it made during the Telefónica / E-Plus merger process led by the Commission: Telefónica committed to selling up to 30% of the new company's network capacity to one or more MVNOs. In June 2014, a wholly-owned subsidiary (MS Mobile Services GmbH) of Drillisch AG entered into an agreement with Telefónica Deutschland. Based on this, Telefónica grants MS Mobile access to up to 30% of the used network capacity of all current and future technologies.

<b>Mobile broadband prices</b>	DE-2015	DE-2016	EU-2016
Least expensive offer for handset (1 GB + 300 calls basket)	41	27	30
Least expensive offer for tablet and laptop (5 GB basket)	19	24	18

*Source: Mobile Broadband Price Study (Van Dijk). Prices expressed in EUR/PPP,<sup>15</sup> VAT included. Data as of February 2015 and February 2016.*

Mobile broadband prices for handset offers have dropped significantly from February 2015 to February 2016, below the EU average. The prices of mobile broadband offers (5GB basket) for tablets and laptops have increased in the same time period, and are above the EU average.

## 2. Supporting measures for deployment and investment in high-speed networks

### a. Spectrum

Harmonised bands	MHz spectrum assigned <sup>16</sup>	% of the harmonised band assigned
700MHz	60	100%
800MHz	60	100%
900MHz	70	100%
1500MHz	40	100%
1800MHz	150	100%
2000MHz paired	120	100%
2600MHz	190	100%
3400-3600MHz	200	100%
3600-3800MHz	200	100%

Germany is the only EU country to have assigned 100% of the overall harmonised spectrum for broadband. In 2015, spectrum from the 700 MHz, 900 MHz, 1500 MHz and 1800 MHz bands was awarded.<sup>17</sup> No auctions were held in 2016.

<sup>15</sup> Purchasing power parity.

<sup>16</sup> Including guard bands.

On 15 July 2016, the Federal Network Agency (*Bundesnetzagentur*) published the ‘*Frequenz-Kompass*’, which gives interested parties an overview of forthcoming frequency regulation activities. This document prepares the next spectrum assignment procedure for mobile broadband. With regard to assignments, it discusses the timely provision of the 2 GHz spectrum that will become available upon the expiry of the 2 GHz assignments (spectrum commonly known as UMTS frequencies) and of additional spectrum (e.g. 3.5 GHz). Apart from spectrum in the 2 GHz and 3.5 GHz bands, additional spectrum needs to be identified for further roll-out of digital infrastructure. The ‘*Frequenz-Kompass*’ serves as an initial orientation guide and identifies some early regulatory areas of action, especially the provision of 2 GHz and additional spectrum. Interested parties were given the opportunity to submit their views by 30 September 2016. Following the ‘*Frequenz-Kompass*’ the Agency published ‘Points of Orientation’ in December 2016 which could be commented until 1 March 2017.<sup>18</sup>

b. **EU and national investment in broadband**

In 2014, the Federal Government adopted the Digital Agenda 2014-2017.<sup>19</sup> The Federal Ministry of Transport and Digital Infrastructure (*BMVI*) is confident that the target set in the Agenda - broadband of at least 50 Mbps for all households by the end of 2018 - will be achieved.

The deployment of high-performance broadband networks in Germany is primarily driven by private companies. For example, the companies belonging to the Network Alliance for a Digital Germany (*Netzallianz Digitales Deutschland*), founded by the Federal Ministry of Transport and Digital Infrastructure, invested €8 billion in network expansion in 2015, and an equally high amount in 2016. Deutsche Telekom invested €4 billion in network build-out and transformation in 2015<sup>20</sup> and €4.2 billion in 2016.<sup>21</sup> Deutsche Telekom relies primarily on vectoring and in addition, it intends to deploy near-shore vectoring.<sup>22</sup> It also expects a significant increase in data transmission rates using G.fast technology. Deutsche Telekom plans to invest in FTTB/H as well.

Deutsche Glasfaser Holding GmbH plans to deploy one million fibre connections. The BREKO member companies also plan to continue their fibre roll-out and intend to offer FTTB/H connections to a total of 4.2 million households and companies by 2018. Some competitors also strive to deploy G.fast.

However, private-sector expansion does not gather considerable speed concerning NGA roll-out in rural and structurally weak regions. Both the Federal Government and the federal states (*Länder*) are taking action to close this gap. The Federal Government approved the ‘Subsidy guideline to support broadband deployment in the Federal Republic of Germany’ on 21

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<sup>17</sup>

[http://www.bundesnetzagentur.de/EN/Areas/Telecommunications/Companies/FrequencyManagement/ElectronicCommunicationsServices/MobileBroadbandProject2016/project2016\\_node.html](http://www.bundesnetzagentur.de/EN/Areas/Telecommunications/Companies/FrequencyManagement/ElectronicCommunicationsServices/MobileBroadbandProject2016/project2016_node.html).

<sup>18</sup> [www.bnetza.de/mobilebroadband](http://www.bnetza.de/mobilebroadband).

<sup>19</sup> [https://www.digitale-agenda.de/Content/DE/\\_Anlagen/2014/08/2014-08-20-digitale-agenda-engl.pdf?\\_\\_blob=publicationFile&v=6](https://www.digitale-agenda.de/Content/DE/_Anlagen/2014/08/2014-08-20-digitale-agenda-engl.pdf?__blob=publicationFile&v=6).

<sup>20</sup> Deutsche Telekom: Annual Report 2015, p. 119

([http://www.annualreport.telekom.com/site0216/fileadmin/15\\_AR/PDF\\_EN/DTAG\\_AR15\\_complete.pdf](http://www.annualreport.telekom.com/site0216/fileadmin/15_AR/PDF_EN/DTAG_AR15_complete.pdf)).

<sup>21</sup> Deutsche Telekom: Annual Report 2016, p. 91

([http://www.annualreport.telekom.com/site0317/fileadmin/16\\_AR/PDF\\_EN/telekom\\_ar16\\_complete.pdf](http://www.annualreport.telekom.com/site0317/fileadmin/16_AR/PDF_EN/telekom_ar16_complete.pdf)).

<sup>22</sup> Use of vectoring in the areas within 550m of a local exchange.

October 2015.<sup>23</sup> Previously, the Commission had approved the next generation access (NGA) framework<sup>24</sup> on 15 June 2015.<sup>25</sup> With the broadband funding programme, the Federal Government is investing around €4 billion in nationwide network deployment. The funding for broadband support comes partly from the federal budget, and partly from the auction of the 700 MHz (digital dividend II) and 1500 MHz radio frequencies (€1.3 billion). Sustainability is an important aspect of the funding.

Under the broadband funding programme, a special call '*Sonderprogramm Gewerbegebiete*'<sup>26</sup> was launched, with €350 million specifically to promote network deployment in underserved industrial and commercial areas as well as harbours. The payment is dependent on a percentage of property owners in the concerned area committing themselves to making a financial contribution. This demand aggregation threshold is intended to ensure an efficient assignment of the available funds and to encourage property owners and companies considering the benefits of sustainable broadband infrastructures and digital applications. An ongoing evaluation monitors the success of the programme.

In Germany, funding is granted for two models: (1) the profitability gap model (*Wirtschaftlichkeitslückenmodell*), where the profitability gap is covered by the state; (2) and the operator model (*Betreibermodell*), where municipalities are subsidised to roll out passive infrastructure that will be leased to network operators. Around 75% of funds go to the profitability gap model.

On 27 September 2016, the Federal Ministry of Transport and Infrastructure (*BMVI*) started a 5G initiative to prepare a comprehensive 5G strategy for Germany. The Federal Government's aim is to position Germany as the lead market for 5G applications and to support the rapid and successful introduction of the 5G technology.

On 8 November 2016, the Network Alliance for a Digital Germany (*Netzallianz Digitales Deutschland*) and BMVI set out the first cornerstones of a gigabit strategy in the document entitled '*Eckpunkte Zukunftsoffensive Gigabit-Deutschland*'.<sup>27</sup> The document emphasises the need to install fibre infrastructure on a large scale. The roadmap envisages four stages and outlines the following goals: 50 Mbps for all households (by the end of 2018); deployment of fibre infrastructure in underserved industrial areas (by the end of 2019); creating the preconditions for nationwide 5G roll-out (by the end of 2020); and gigabit-capable converged infrastructure (by 2025).<sup>28</sup>

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<sup>23</sup> *Richtlinie - Förderung zur Unterstützung des Breitbandausbaus in der Bundesrepublik Deutschland* (<https://www.bmvi.de/SharedDocs/DE/Anlage/Digitales/foerderrichtlinie-breitbandausbau.pdf>).

<sup>24</sup> *NGA Rahmenregelung* ([http://breitbandbuero.de/wp-content/uploads/2017/01/150615\\_NGA\\_Rahmenregelung.pdf](http://breitbandbuero.de/wp-content/uploads/2017/01/150615_NGA_Rahmenregelung.pdf)).

<sup>25</sup> State aid: Commission approves €3 billion aid scheme in Germany to support high-speed internet roll-out ([http://europa.eu/rapid/press-release\\_IP-15-5186\\_en.htm](http://europa.eu/rapid/press-release_IP-15-5186_en.htm)).

<sup>26</sup> <https://www.bmvi.de/SharedDocs/DE/Pressemitteilungen/2017/002-dobrindt-sonderprogramm-gewerbegebiete.html>

<sup>27</sup> <http://www.bmvi.de/SharedDocs/DE/Artikel/DG/eckpunkte-zukunftsoffensive-gigabit-deutschland.html>.

<sup>28</sup> On 7 March 2017, the Network Alliance and BMVI set out the strategy '*Zukunftsoffensive Gigabit-Deutschland*'. ([https://www.bmvi.de/SharedDocs/DE/Anlage/Presse/029-dobrindt-netzallianz-zukunftsoffensive.pdf?\\_\\_blob=publicationFile](https://www.bmvi.de/SharedDocs/DE/Anlage/Presse/029-dobrindt-netzallianz-zukunftsoffensive.pdf?__blob=publicationFile)). The strategy restates the goals mentioned in the document '*Eckpunkte Zukunftsoffensive Gigabit-Deutschland*'. In order to reach these goals, the Network Alliance commits itself to further expanding its already high financial investment into the broadband networks in Germany. The Federal Government plans a continuous provision of three billion euro per year for the promotion of broadband infrastructures in areas where private investments are not economically feasible. Altogether the



In the 2014-2020 programming period, Germany plans to devote €96 million of European Structural and Investment Funds (ESIF)<sup>29</sup> to support interventions in different ICT areas (i.a. broadband, SMEs, intelligent transport systems and energy distribution systems, eSkills and eHealth). These include notably €61 million devoted to the improvement of high speed broadband networks: €24 million under the European Agricultural Fund for Rural Development (EAFRD) and €37 million under the European Regional Development Fund (ERDF).

c. **State of transposition of the  
Broadband Cost Reduction Directive**

The deadline for transposing the Broadband Cost Reduction Directive 2014/61/EU<sup>30</sup> expired on 1 January 2016, prompting the opening of infringement proceedings against Germany in March 2016. The ‘Act to Facilitate the Efficient Expansion of Digital High-Speed Networks’ (*DigiNetz-Gesetz*<sup>31</sup>) that transposes the Directive was published in the Official Journal on 9 November 2016 and came into force on 10 November 2016. This law is designed to speed up the nationwide roll-out of broadband. Its central components are the cost-effective co-deployment of fibre optic networks in the domain of civil works, transparency concerning physical infrastructure, and the shared use of existing networks owned by network operators (as defined in Article 2 of the Broadband Cost Reduction Directive, i.e. telecoms as well as other utility networks) for broadband deployment. The Federal Network Agency (*Bundesnetzagentur*) acts as the single information point and the dispute settlement body. It manages a tool called the ‘infrastructure atlas’ (*Infrastrukturatlas*), which provides an overview of facilities that can be used for telecommunications purposes and information necessary for shared use of physical network infrastructure and for coordinating civil works. The infrastructure atlas is currently being adapted to the provisions of the *DigiNetz-Gesetz*.

3. **Regulatory function**

Provider liability was abolished by the new WLAN law, the ‘Second Act amending the Telemedia Act’ (*Zweites Gesetz zur Änderung des Telemediengesetzes*<sup>32</sup>), which came into force on 27 July 2016. This concerns compensation for damages incurred by content providers through illicit use of internet access. However, the WLAN operator is still obliged to ensure that such illicit practices are discontinued. In this context, the Court of Justice of the European Union decision of 15 September 2016 regarding the use of passwords of Wi-Fi operators triggered an internal debate at the Federal Ministry of Economic Affairs (*BMWi*). Originally, the *BMWi* had envisaged exempting public Wi-Fi operators from legal obligations relating to the behaviour of users of their network.

Certain markets listed only in the 2003 and 2007 Recommendations on Relevant Markets are still subject to ex-ante regulation: ex-market 2 of the 2007 Recommendation<sup>33</sup> is regulated,

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Network Alliance plans to invest around €100 billion until 2023 in order to realise gigabit capable converged infrastructures by 2025.

<sup>29</sup> <http://s3platform.jrc.ec.europa.eu/ict-monitoring>.

<sup>30</sup> Directive 2014/61/EU of the European Parliament and of the Council of 15 May 2014 on measures to reduce the cost of deploying high-speed electronic communications networks.

<sup>31</sup> *Gesetz zur Erleichterung des Ausbaus digitaler Hochgeschwindigkeitsnetze* (Act to Facilitate the Efficient Expansion of Digital High-Speed Networks) (Official publication: Bundesgesetzblatt Teil 1 (BGB 1); Number: 52; Publication date: 09/11/2016; Page number: 02473-02487).

<sup>32</sup> Bundesgesetzblatt Jahrgang 2016 Teil I Nr. 36, published in Bonn on 26 July 2016.

<sup>33</sup> Call origination on fixed networks.

whereas ex-market 1 of the 2007 Recommendation<sup>34</sup> and ex-market 18 of the 2003 Recommendation<sup>35</sup> are partially regulated.

In 2016, the Commission received notifications from the Federal Network Agency regarding the following markets: markets 1, 2, 3a, 3b, 4 of the 2014 Recommendation, ex-market 2 of the 2007 Recommendation and ex-market 18 of the 2003 Recommendation. A full market review was carried out for markets 1, 2, 4 of the 2014 Recommendation,<sup>36</sup> ex-market 2 of the 2007 Recommendation and ex-market 18 of the 2003 Recommendation.

The Federal Network Agency notified its decision on near-shore (*Nahbereich*) vectoring for the first time on 7 April 2016, and — given the Commission’s serious doubts (described in a letter sent on 10 May 2016) — withdrew it in early June. On 20 June 2016, the Agency then re-notified improved plans, taking account of some of the Commission’s concerns. The Commission largely accepted these revised plans, and also commented on a number of points that the Agency was asked to reconsider (e.g. criteria for vectoring deployment by alternative operators and access to ducts). The improvements made in the revised proposals reduced the adverse effects that vectoring deployment could have on the position of alternative operators in Germany.

In November 2016, the Commission received two separate notifications, one on the technical parameters of the Layer-2 product (the subject of the Commission decision of 5 December 2016) and one on the proposed pricing, relevant to vectoring outside the near-shore area. In addition, the Federal Network Agency had already signalled that two further notifications are expected, on the technical parameters and pricing for the specific situation in the near-shore areas, where alternative operators will be forced to move away from VDSL-LLU access to the Layer-2 product and where specific considerations of substitutability play an important role. In both of these recent cases, the Commission highlighted a few areas for improvement (both technical and in terms of pricing). For both cases, the Commission also broadly set out what it expects from the Agency as regards the notifications planned for the spring of 2017.

Deutsche Telekom made a voluntary, unilateral and irrevocable offer according to which they will deploy vectoring to all street cabinets in the near-shore areas, where they are applying to provide near-shore vectoring. This commitment has been taken into account by the Federal Network Agency when considering imposing or withdrawing an LLU access obligation. This offer is valid also in areas that are covered by FTTB/H, and even if such an alternative network has received State aid. According to the Federal Network Agency, in such cases a restraint on infrastructure competition would infringe EU State aid rules. The lower investment costs of VDSL vectoring relative to FTTB/H, if translated into retail pricing strategies, could undermine the short-term returns of the latter kind of network.

For both fixed and mobile termination rates, the Federal Network Agency calculated the costs of an efficient operator using a LRIC+ instead of a pure BU-LRIC<sup>37</sup> costing methodology, as

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<sup>34</sup> Access to PSTN for residential and non-residential use.

<sup>35</sup> Broadcast transmission.

<sup>36</sup> Respectively: voice call termination on fixed networks, voice call termination on mobile networks and wholesale high quality access.

<sup>37</sup> The recommended pure bottom-up long-run incremental cost (BU-LRIC) model allows operators to recover only those additional (incremental) costs that would be avoided if wholesale call termination services were no longer provided to third parties. The main difference between a LRIC+ cost model and the recommended ‘pure’ LRIC model is that LRIC+ allows operators to recover some common costs (if providing this service entails such

recommended by the Commission's 2009 Termination Rates Recommendation.<sup>38</sup> When referring to this recommendation, the Commission has repeatedly expressed its serious doubts about the compatibility with EU law of the Federal Network Agency's regulatory approach to termination rates. It has requested on several occasions that the Agency amend its costing methodology. On 18 May 2016, the Agency launched a national public consultation on a draft decision proposing that mobile termination be based on a purely bottom-up incremental cost model (BU LRIC). This proposal follows for the first time the Commission's 2009 Termination Rates Recommendation. The Federal Network Agency notified the measure that follows the approach recommended by the Commission on 1 July 2016. For fixed termination rates, a national consultation was launched on 28 September 2016 and the Agency notified the measure that follows the approach recommended by the Commission on 17 November 2016. The Agency notified the resulting mobile termination rates level and the exact fixed termination rates level to the Commission in January 2017.<sup>39</sup>

The Non-Discrimination and Costing Methodology Recommendation has been taken into account in determining the fees for unbundled subscriber lines and Layer 2 bitstream access as regards the assessment of non-replicable, reusable constructional infrastructure. It has also been taken into account in the regulation of market 3a and the reference offer for Layer 2 bitstream access in terms of imposing of Key Performance Indicators (KPIs) and the definition of Service Level Guarantees (SLGs).

#### 4.

#### Consumer issues

##### Portability

Number portability		DE-2015	DE-2016
Fixed	Number of transactions [1]	-	-
	Transactions as a % of total numbers [1]	-	-
	Maximum wholesale price [2]	-	-
	Maximum time under regulation (number of working days) [2]	1	1
Mobile	Number of transactions [1]	1,763,077	2,069,645
	Transactions as a % of total numbers [1]	1.6%	1.6%
	Maximum wholesale price [2]	-	-
	Maximum time under regulation (number of working days) [2]	1	1

[1] Source: Communications Committee. Data as of January to September 2015 and January to September 2016.

[2] Source: Communications Committee. Data as of October 2015 and October 2016.

40% of the 74,000 complaints and inquiries filed with the customer services of the Federal Network Agency in 2015 were related to switching providers.<sup>40</sup> The number of escalations

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costs), by applying an additional mark-up to the calculated LRIC tariff. No mark-up is allowed under pure BU-LRIC.

<sup>38</sup> Commission Recommendation of 7 May 2009 on the regulatory treatment of fixed and mobile termination rates in the EU, OJ L 124, 20.05.2009, p.67 .

<sup>39</sup> On 23 February 2017, the Commission opened a Phase II investigation. (<https://ec.europa.eu/digital-single-market/en/news/european-commission-opens-depth-investigation-fixed-termination-rates-imposed-german-telecoms>).

<sup>40</sup> Federal Network Agency: 2015 Annual Report, p. 62, published on 13 May 2016.

related to changing providers initiated through the Agency remained constant in 2015 compared to 2014, at around 5,300 cases. Since the second half of 2015, market-wide improvements made to the process of switching have led to lower complaint numbers. These significant improvements were possible because of the strong pressure placed on the four major providers in particular. This positive trend continued in 2016. The fee charged for porting a number is capped at €29.95.

## Bundles

Bundled products have steadily increased in importance in recent years. In the fixed market, as of end 2015 around 95% of the approximately 30.7 million broadband connections (>144 kbps download rate) were contracted as bundled offers. It is hardly possible for new customers to obtain services as a single offer; this is especially true for pure voice telephony subscriptions.<sup>41</sup>

## Transparency

On 19 December 2016, the Federal Network Agency adopted the Transparency Ordinance for the telecommunications sector (*TK-Transparenzverordnung*),<sup>42</sup> which improves end-users' rights to information from their fixed network and mobile telephony providers. This ordinance, published in the Federal Gazette on 22 December 2016 (BGBl I p. 2937), enters into force<sup>43</sup> on 1 June 2017. It is intended, as defined in Section 45n of the German Telecommunications Law (*Telekommunikationsgesetz*), to provide telecoms consumers with transparent, comparable, adequate and up-to-date information in a clear, comprehensible and easily accessible form.

Telecommunications providers will have to provide product information sheets for products allowing the end-user access to the internet. This will enable end-users to inform themselves quickly and easily about the essential performance details and contract content before signing. The product information sheet must include information on the available data transmission rates, the length of the contract, the conditions for extending and terminating the contract, and the monthly costs. Customers must also be informed about which services are part of the contractually agreed data volume.<sup>44</sup> The ordinance also provides for an obligation to inform each consumer of the effective data transmission rate of their fixed or mobile subscription after their connection is activated. The effectively achieved data transmission rate can be established using various methods, first and foremost using the provider's measurement tools. The ordinance prescribes how the measurement results (but not the technical characteristics) must be presented to the customer. Alternatively, a reference can be given to the Federal Network Agency's measurement tool.<sup>45</sup>

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<sup>41</sup> Federal Network Agency: 2015 Annual Report, p. 50-51, published on 13 May 2016.

<sup>42</sup>[https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Telekommunikation/Unternehmen\\_Institutionen/Anbieterpflichten/Kundenschutz/Transparenzma%C3%9Fnahmen/bgbl\\_2016\\_Teil1\\_Nr.62.pdf?\\_\\_blob=publicationFile&v=4](https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Anbieterpflichten/Kundenschutz/Transparenzma%C3%9Fnahmen/bgbl_2016_Teil1_Nr.62.pdf?__blob=publicationFile&v=4).

<sup>43</sup> Most of the provisions of the ordinance.

<sup>44</sup>

[https://www.bundesnetzagentur.de/DE/Sachgebiete/Telekommunikation/Unternehmen\\_Institutionen/Anbieterpflichten/Kundenschutz/Transparenzmassnahmen/Transparenzmassnahmen-node.html](https://www.bundesnetzagentur.de/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Anbieterpflichten/Kundenschutz/Transparenzmassnahmen/Transparenzmassnahmen-node.html).

<sup>45</sup> 'Breitbandmessung' (<https://breitbandmessung.de/>).

This broadband measurement tool the Agency has been using since 25 September 2015. It allows end-users of internet access services (fixed and mobile) to measure and compare actual and contracted speed. By doing so, end-users can quickly and easily determine the performance of their stationary and/or mobile broadband access. A map gives a first visual overview of the results of the tests conducted so far and shows end-users whether measurements have been made in their region and, if so, what the results are. According to the BEREC Guidelines<sup>46</sup> adopted in 2016, this test should be considered a certified monitoring mechanism under Article 4(4) of Regulation (EU) 2015/2120.

## Roaming

Germany's average retail Eurotariff price for roaming in Q1 2016 was €0.123 per minute for outgoing calls (higher than the EEA average of €0.112 per minute), €0.013 per minute of incoming calls (half the EEA average of €0.026 per minute), and €0.053 per Euro-text message (very close to the EEA average of €0.047 per Euro-text message). For data, the price was €0.084 per MB (significantly above the EEA average of €0.047 per MB).<sup>47</sup>

The Roaming Regulation (EU) No 531/2012 as amended in 2015 has provided, for a transitional retail price regime ('Roam Like At Home+', or 'RLAH+') which applies since 30 April 2016. The Federal Network Agency can fine operators that fail to comply with the Roaming Regulation. It can also request operators to cease offering or to change tariff plans that do not comply with the Regulation. So far, there has been no need to do this, as all complaints received have been resolved by asking the operator in question to terminate any activity in breach of the Roaming Regulation.

On 12 August 2016, the Federal Government published the draft of a Third Law Amending the Telecommunications Act (*Entwurf eines Dritten Gesetzes zur Änderung des Telekommunikationsgesetzes*<sup>48</sup>), updated on 12 October 2016,<sup>49</sup> setting out the administrative fines to be levied upon operators that breach certain articles of the Roaming Regulation.<sup>50</sup> These fines can go up to €100,000 for infringements of Article 3(5), Article 5(1), Article 6a and Article 6e(1)(2) and up to €10,000 for violations of the other provisions of the Roaming Regulation.

## Net neutrality

Article 6 of Regulation (EU) 2015/2120<sup>51</sup> stipulates that 'Member States shall lay down the rules on penalties applicable to infringements of Articles 3, 4 and 5'. The Draft of a Third

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<sup>46</sup> BEREC Guidelines on the Implementation by National Regulators of the European Net Neutrality Rules, August 2016 (BoR (16) 127).

<sup>47</sup> International Roaming BEREC Benchmark Data Report October 2015 — March 2016, BoR (16) 160.

<sup>48</sup> *Gesetzentwurf der Bundesregierung — Entwurf eines Dritten Gesetzes zur Änderung des Telekommunikationsgesetzes*, Drucksache 436/16, 12.08.2016 (<https://www.bundestag.de/blob/478034/fb0659ec8ffd73e256611b6e9ca9b6a4/vorlage-18-9951-data.pdf>).

<sup>49</sup> *Gesetzentwurf der Bundesregierung — Entwurf eines Dritten Gesetzes zur Änderung des Telekommunikationsgesetzes*, Drucksache 18/9951, 12.10.2016 (<http://dip21.bundestag.de/dip21/btd/18/099/1809951.pdf>).

<sup>50</sup> Regulation (EU) No 531/2012 of the European Parliament and of the Council of 13 June 2012 on roaming on public mobile communications networks within the Union (OJ L 172, 30.6.2012, p. 10) amended by Regulation (EU) 2015/2120 of the European Parliament and of the Council of 25 November 2015.

<sup>51</sup> Regulation (EU) 2015/2120 of the European Parliament and of the Council of 25 November 2015 laying down measures concerning open internet access and amending Directive 2002/22/EC on universal service and users'

Law Amending the Telecommunications Act<sup>52</sup> sets out the rules on penalties under Article 6 of Regulation (EU) 2015/2120. In particular, it stipulates administrative fines for certain infringements of Article 3 and Article 4 of Regulation (EU) 2015/2120. The maximum fine is €500,000 for certain infringements of Article 3(3)(3) (applying the mentioned traffic management practices), and for infringements of executable administrative orders based on Article 5(1). The maximum fine is €100,000 for infringements of Article 4(1) (not providing the information in the contract) and maximum €10,000 for infringements of Article 5(2) (not providing information at all, correctly, completely or in time to the national regulatory authority (NRA)). On 12 October 2016, the Federal Government published an update of the draft law.<sup>53</sup> The law is expected to be adopted in 2017. The deadline to notify the Commission of rules and measures transposing Article 6 of Regulation (EU) 2015/2120 was 30 April 2016.

The Federal Network Agency has received consumer complaints about alleged breaches of the open internet provisions of Regulation 2015/2120/EU. It has already investigated some of these cases and is in the process of investigating others. No formal decision has so far been taken to impose a penalty for violation of these provisions.

The Agency has not yet taken any decision to impose requirements on technical characteristics, minimum quality of service, or other appropriate and necessary measures under Article 5(1) of Regulation 2015/2120/EU.

### **Scope of the universal service**

There have been no changes in this regard since 2016. Under the German Telecommunications Act, the scope of the universal service includes: (i) connection to a public telecommunications network at a fixed location which allows voice calls, facsimile and data communications at data rates that are sufficient to allow functional internet access; (ii) access to public telephony services through this connection; (iii) availability of at least one subscriber directory; (iv) availability of at least one public telephone enquiry service; (v) nationwide allocation of public pay phones or other access points to public telephone services; (vi) the ability to make calls to emergency call services 112 and 110 from public pay phones by simple handling and free of charge.

No company has been designated to provide universal service. The authorities have not intervened so far, as they believe the market provides the necessary services.

### **112 and access for disabled end-users to emergency services**

There are new requirements for emergency calls in all IP environments, as new parameters have to be met. However, the public safety answering points (of which there are several hundred) cannot receive such calls, because they are not IP-enabled.

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rights relating to electronic communications networks and services and Regulation (EU) No 531/2012 on roaming on public mobile communications networks within the Union

<sup>52</sup> *Gesetzentwurf der Bundesregierung — Entwurf eines Dritten Gesetzes zur Änderung des Telekommunikationsgesetzes*, Drucksache 436/16, 12.08.2016

(<https://www.bundestag.de/blob/478034/fb0659ec8ffd73e256611b6e9ca9b6a4/vorlage-18-9951-data.pdf>).

<sup>53</sup> *Gesetzentwurf der Bundesregierung — Entwurf eines Dritten Gesetzes zur Änderung des Telekommunikationsgesetzes*, Drucksache 18/9951, 12.10.2016

(<http://dip21.bundestag.de/dip21/btd/18/099/1809951.pdf>).

As regards equal access to emergency services for customers with disabilities, in Germany people with hearing or speech impairments can make a 112 emergency relief request by fax transmission only.<sup>54</sup> Such communication is cumbersome, is not seamless, and cannot be used on the move, for instance through mobile phones.<sup>55</sup> Fax transmission is thus unsatisfactory in that it does not ensure equal access to emergency services for this group of people.

From 07:00h to 23:00h end-users with hearing or speech impairments can also use a particular human translator service providing video transmission and speed texting for their emergency calls.

## 5.

## Conclusion

Germany is generally performing well as regards connectivity. However, if it wants to achieve its gigabit targets, more investment in fibre networks will be needed. One of the country's main challenges in the coming years will be to promote investment in ultrafast broadband networks. In this regard, its short-term and medium-term policy and regulatory initiatives are in a degree of tension. Although vectoring will deliver substantial performance gains in the short term, the regulatory conditions for its introduction, including in the near-shore areas, will be critical for Germany's progress towards the competitive provision of higher-performance technologies in the longer term.

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<sup>54</sup> The current wording of Article 108(2) of the German Telecommunications Law (*Telekommunikationsgesetz*) that transposes Article 26(4) of the Universal Service Directive (USD) provides for a specific technical solution for disabled end-users, i.e. fax transmission.

<sup>55</sup> Other alternative means of access that ensure equal access are reported in EU Member States: applications implementing total conversation, real-time text, SMS, video streaming, and text relay services.