BÖCKER ZIEMEN

BREKO BroadbandStudy20

Bonn, 1 September 2020

Prof. Dr. Jens Böcker

Agenda

01.
Market Data

02.
Fibre Trends

03.
Deployment & State

04.
Corona Impacts

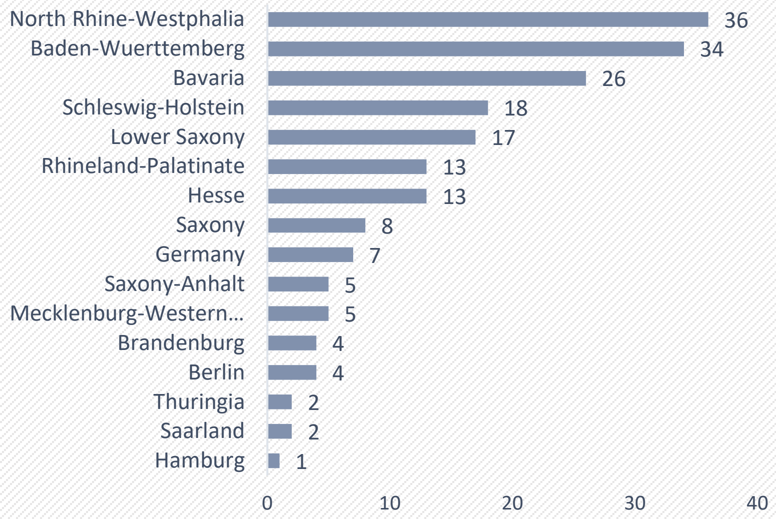
Sample

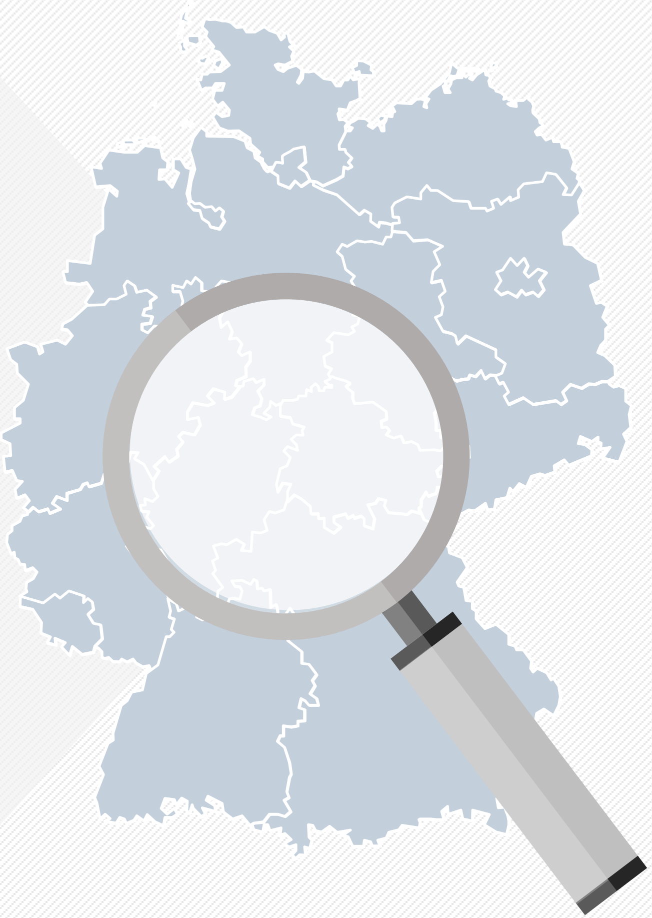
BREKO German Broadband Association   BÖCKER ZIEMEN

195 BREKO network operators have been interviewed throughout Germany in May and June 2020. The interviewees are executives of telecommunications companies (e.g. Managing Directors, Heads of Strategy, etc.).

BREKO data summary

- 208 of 270 active alternate network operators in Germany are part of BREKO (77%)
- The BREKO market study is representative for the German market and is validated by additional sources
- Regional distribution of the BREKO members:





1 Revenue of BREKO network operators in 2019: **€ 7.8 billion**

2 Investments by BREKO network operators in 2019: **€ 2.5 billion**

3 Homes activated by BREKO network operators : **1.5 million**

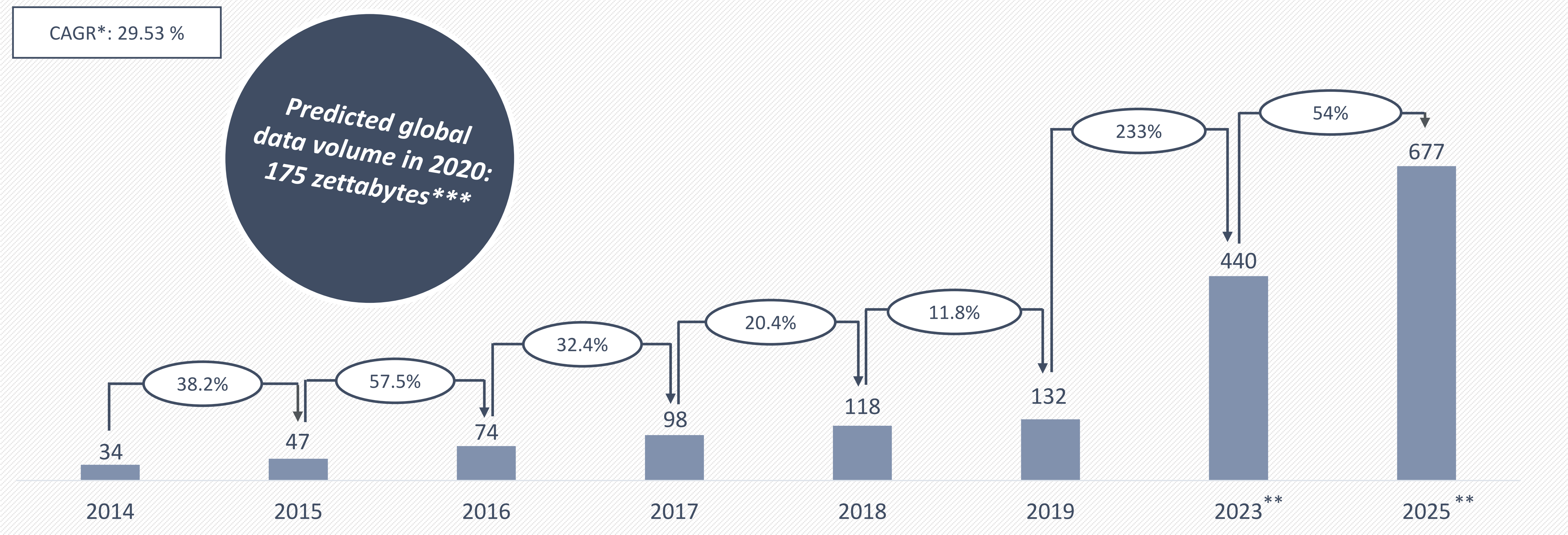
4 Homes connected by BREKO network operators : **3.6 million**

Source: survey of network operators (n=187-195).

Evolution of the data volume

The demand for fixed network data volumes is steadily increasing. The average growth between 2014 and 2025 is approximately 30% per year.

Average data volume of fixed networks per connection and per month in gb over time (incl. TV and streaming services)

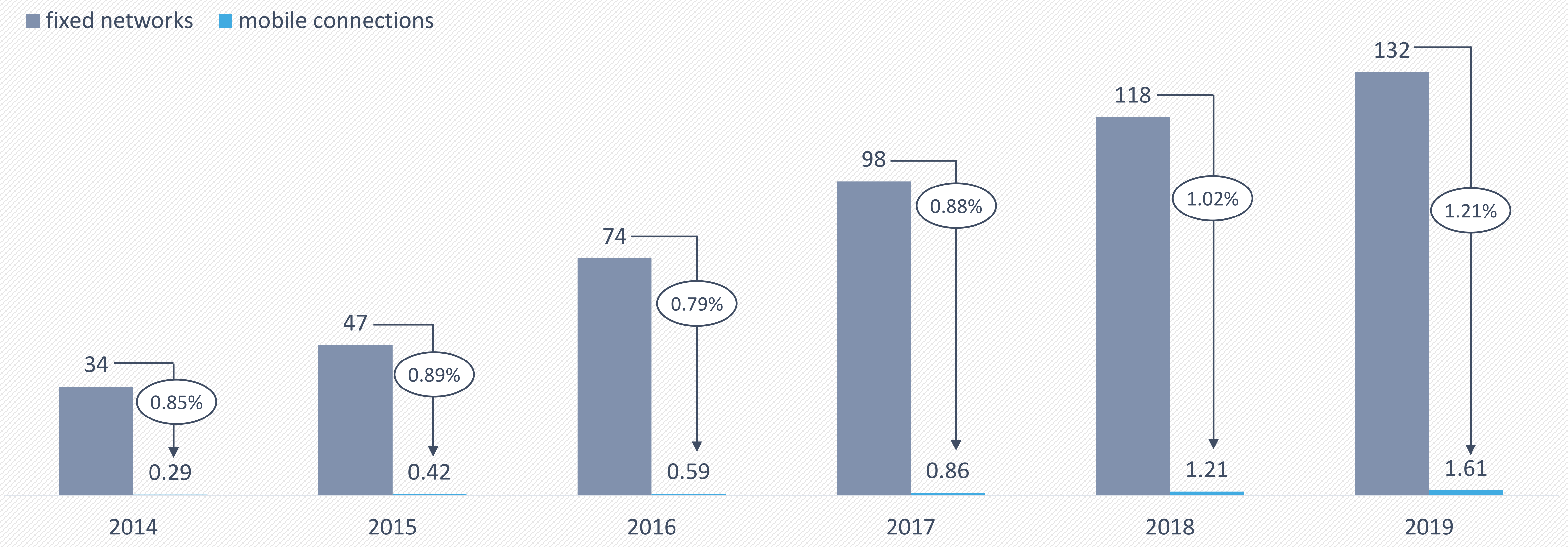


Source: Bundesnetzagentur, Annual Report 2019, p. 52.; *Compound Annual Growth Rate, here 2012-2025.; ** BREKO forecast; *** Seagate/IDC

Ratio mobile / fixed data volume

The ratio of mobile to fixed data volume remains relatively stable. A substitution of fixed networks by mobile connections is still not apparent.

Ratio mobile / fixed data volume on average per user and per month in gb



Source: Bundesnetzagentur, Annual Report 2019, p. 52, 57.

Available connections by bit rate

Increase in connections with high bitrates: every forth connection faster than 100 Mbps in 2019.

bit rates \ years	2014 *29.6 Mio. available connections*	2015 *30.7 Mio. available connections*	2016 *32 Mio. available connections*	2017 *33.2 Mio. available connections*	2018 *34.2 Mio. available connections*	2019 *35.1 Mio. available connections*	
< 10 Mbps	43%	29%	21%	16%	12%	8%	-1.2 Mio.*
10-30 Mbps	36%	42%	43%	39%	33%	28%	-1.6 Mio.*
30-100 Mbps	16%	21%	25%	30%	35%	38%	+1.3 Mio.*
> 100 Mbps	5%	8%	11%	15%	20%	26%	+2.4 Mio.*

Already 5% of BREKO operators' customers book ≥ 1GB

*compared to previous years

Source: Bundesnetzagentur, Annual Report 2019, p. 49.; survey of network operators (n=40)

Available broadband connections by technology

Local VDSL deployment almost completed. Fibre rollout (FTTB/H) is gaining momentum.

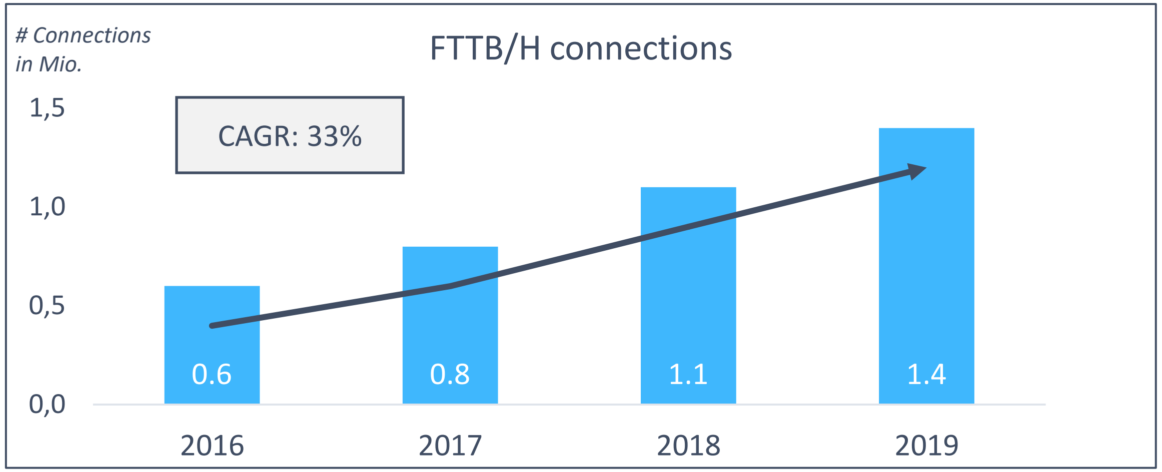
Share technologies and available broadband connections >50 Mbps in %

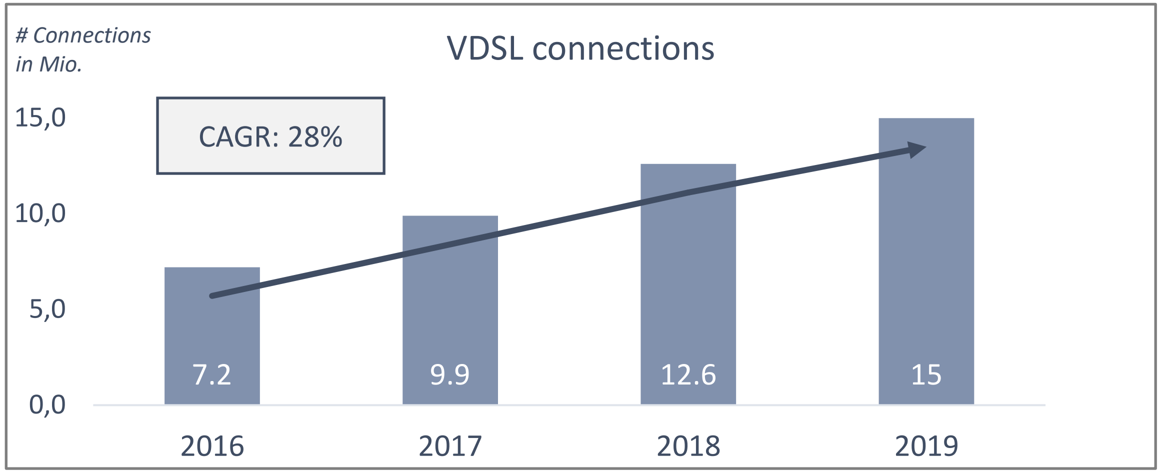
technology \ years	2014	2015	2016	2017	2018	2019
CATV	60.0%	63.3%	63.4%	63.9%	64.6%	66.7%
VDSL/DSL	17.1%	26.5%	44.9%	59.7%	65.8%	84.1%
FTTB/H	4.4%	6.7%	7.5%	9.0%	11.2%	13.5%

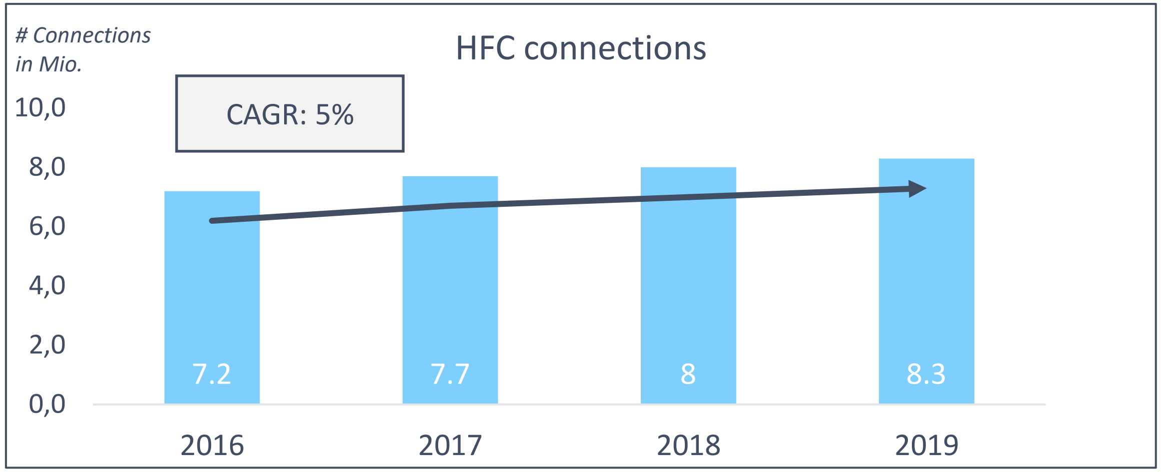
Source: BMVI (Federal Ministry of Transport and Digital Infrastructure), Broadband Atlas late 2019, p. 3. Data refer to Homes Passed: FTTB/H 2019: incl. corporate clients.

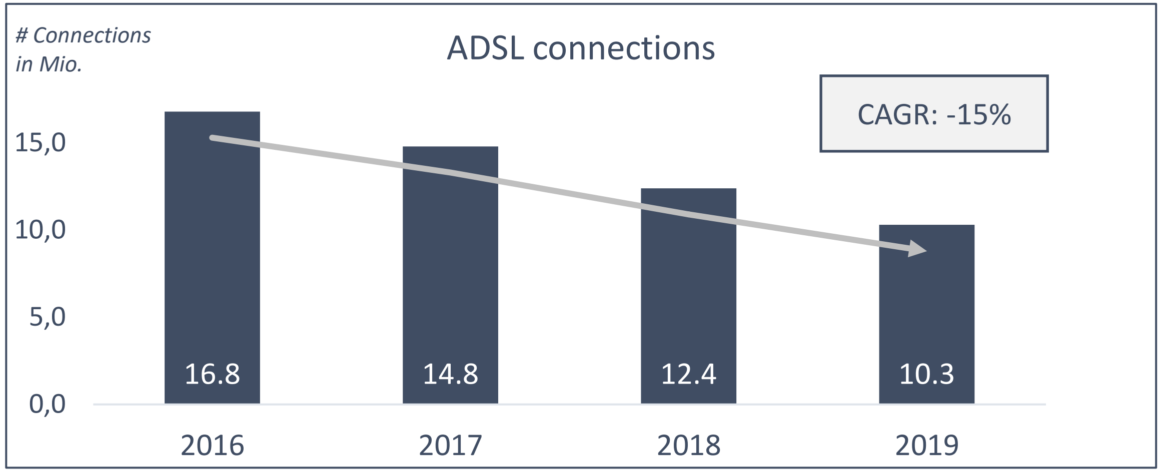
Development of private customers by technology

Strongest increase in FTTB/H connections. As expected, the number of ADSL customers decrease.





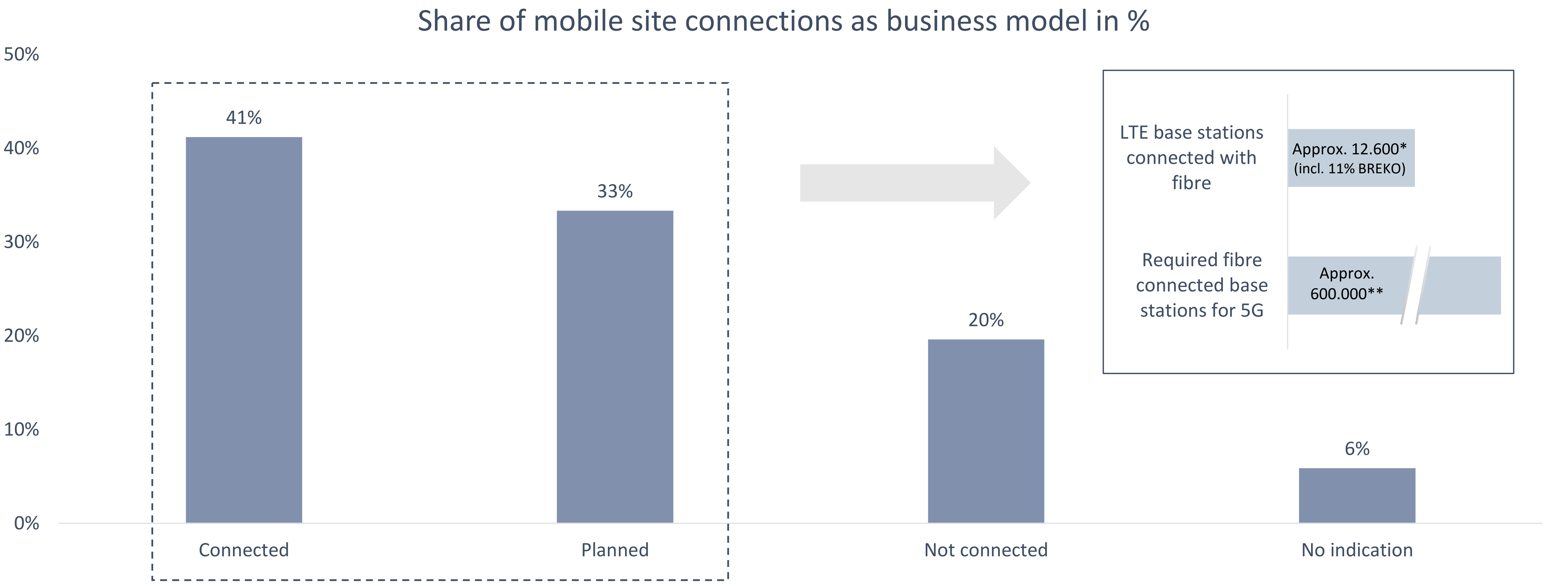




Source: Bundesnetzagentur, Annual Report 2016 - 2019, p. 45-52

Fibre connection of mobile sites

74% of network operators see the connection of mobile sites as a potential business model. BREKO network operators already provide about 11% of the approx. 12.600 base stations with fibre.



Source: survey of network operators (n=51);
* Total number of mobile sites in Germany: 63.000; **WIK 2018.

Question: Are you considering the connection of mobile sites as a business model? If so, how many mobile sites have you already connected?

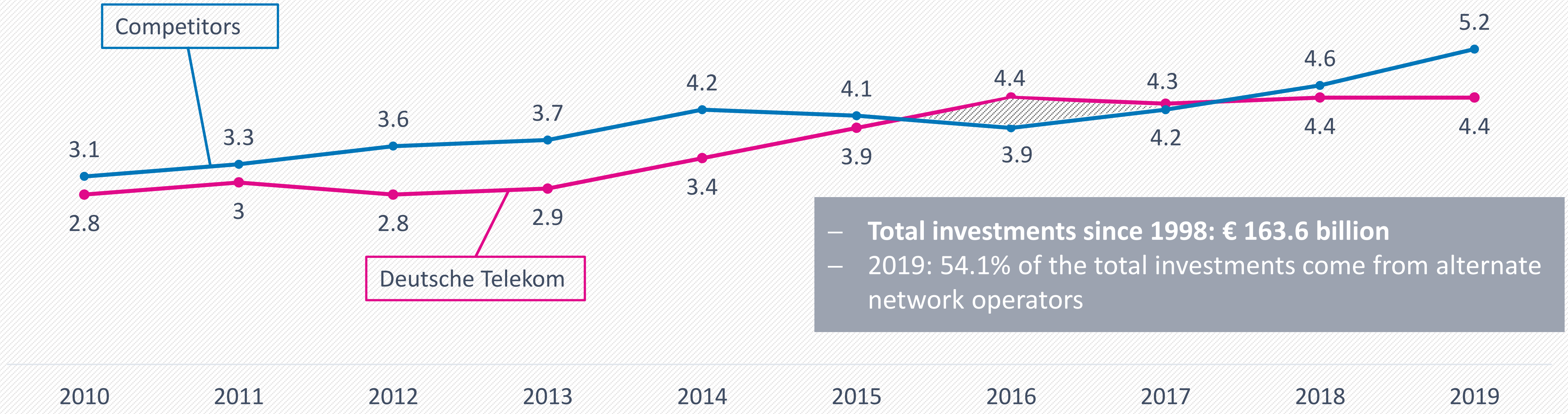
Total investments in broadband network infrastructure

BREKO German Broadband Association

BÖCKER ZIEMEN

Investments increased by 6.7% to € 9.6 billion in 2019. The 2018 trend continues, competitors are investing more than Deutsche Telekom in network infrastructure. This includes 5% funded investments.

Investments* in broadband network infrastructure** in the telecoms market in € billion



- **Total investments since 1998: € 163.6 billion**
- 2019: 54.1% of the total investments come from alternate network operators

Source: Bundesnetzagentur, Annual Report 2019, p. 47; * incl. publicly funds; ** Investments in predominantly new, but also in existing broadband networks infrastructure. /// Vectoring dent triggered by the vectoring decision of the German national regulator „Bundesnetzagentur".

Agenda

01.
Market Data

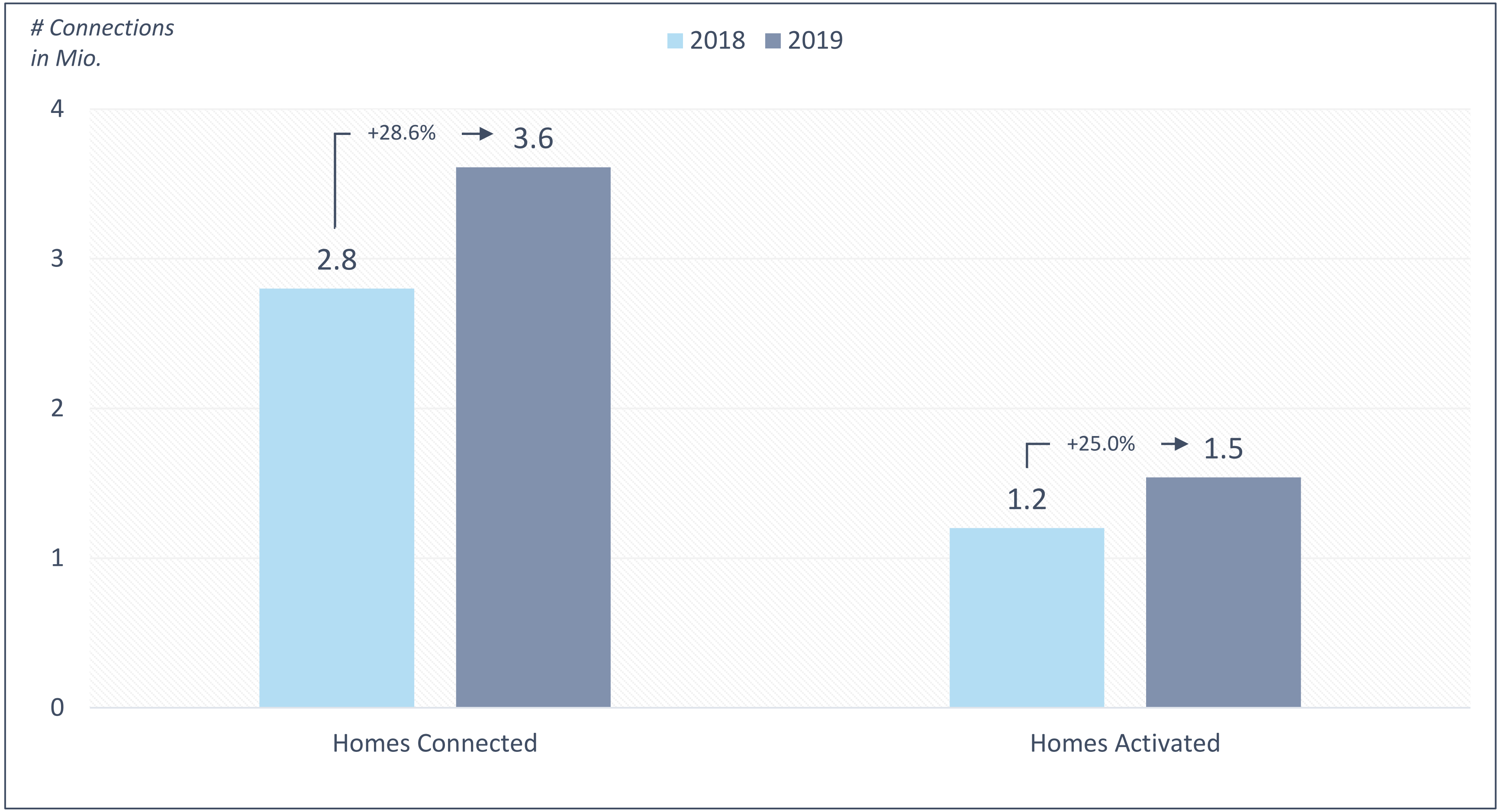
02.
Fibre Trends

03.
Deployment & State

04.
Corona Impacts

Homes Connected and Homes Activated

BREKO network operators connected approx. 30% more homes in 2019 than 2018. In total, almost 560.000 km of fibre were deployed.



Implications

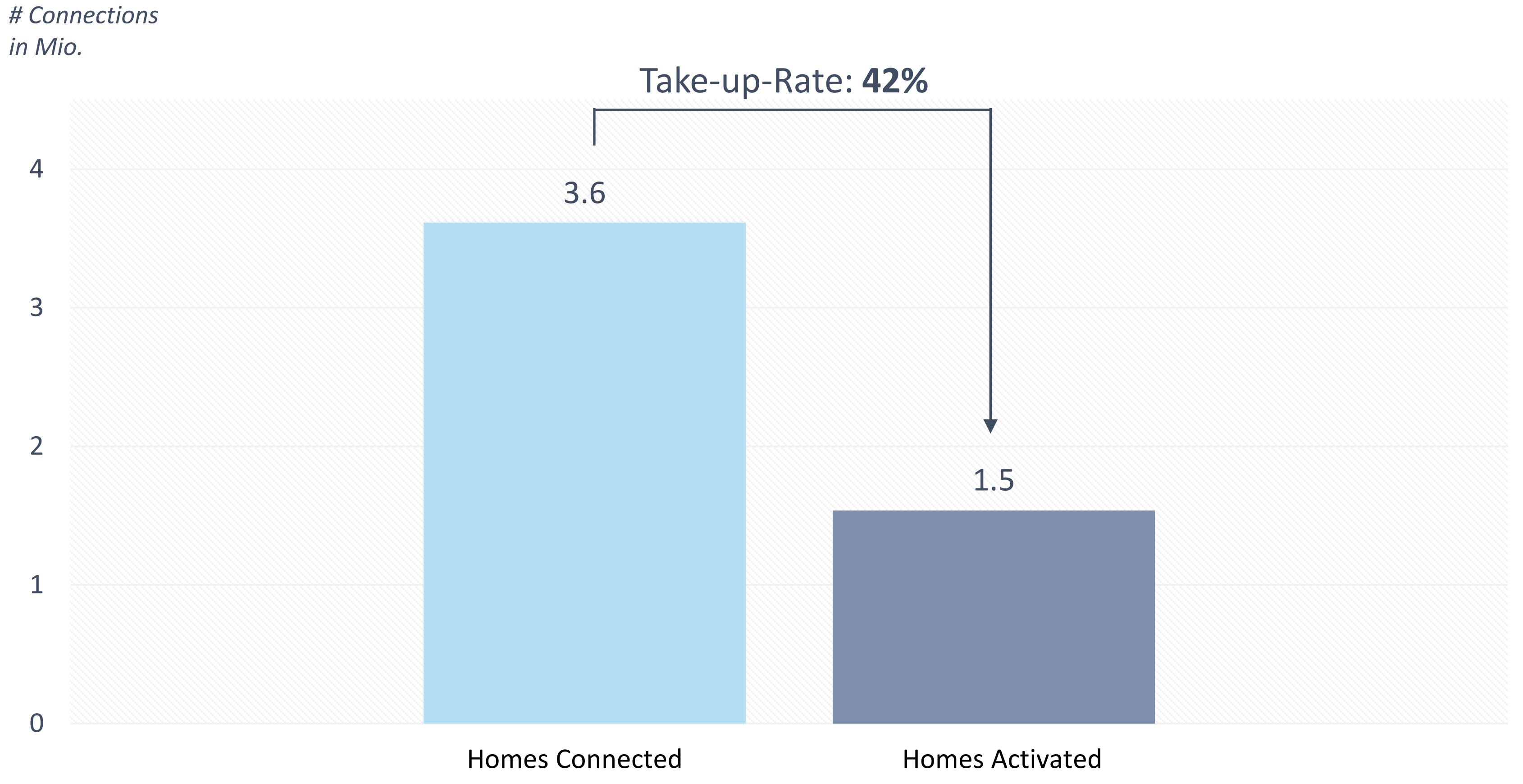
- The number **of homes connected** grew by **approx. 30%** to **3.6 million** compared to the previous year.
- The number **of homes activated** grew by **25%** to **1.5 million.**
- In total, the alternate network operators deployed almost **560.000 km of fibre.**

Source: survey of network operators (n=161-180).

Question: Please indicate the number of your gigabit-capable connections for the following deployment stages: FTTB/H; HFC; statements refer to your own infrastructure, without leased appliances.

Homes Connected and Homes Activated

With 42% BREKO is slightly above the EU39 average take-up rate of around 41%. Despite an increased number of deployment projects, the take-up rate remains stable at a high level.



Implications

- The take-up rate of **42%** fibre connections is 12 percent **higher than the take-up rate of HFC connections** (30%).
- Comparison EU39: 40.9%.
- Germany is the **fifth fastest growing** FTTB/H market in Europe behind Belgium, Ireland, Switzerland and the UK.

Source: survey of network operators (n=161-180).; FTTH Council Europe – European Broadband Status

Question: Please indicate the number of your gigabit-capable connections for the following expansion stages: FTTB/H; HFC; statements refer to your own infrastructure, without leased appliances.

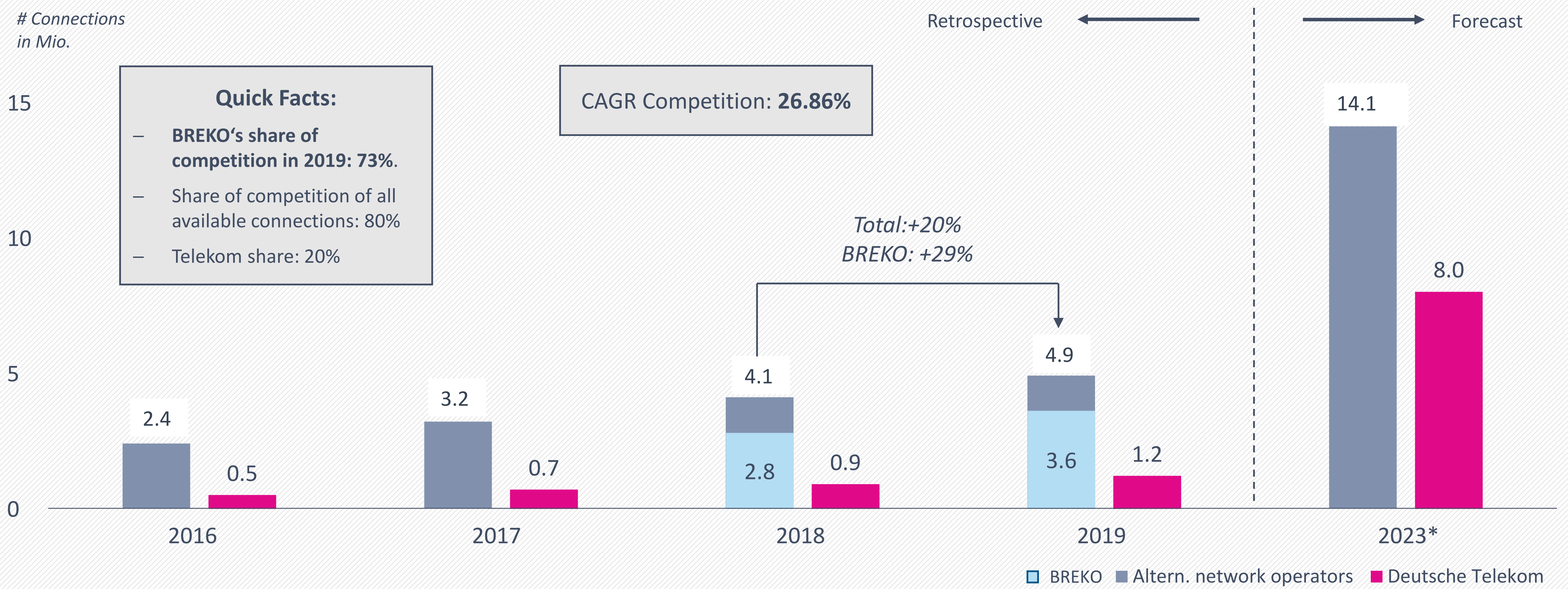
Homes connected by competitors vs. Deutsche Telekom

BREKO German Broadband Association

BÖCKER ZIEMEN

The total number of homes connected by alternate network operators increased by 20% in 2019.
The average annual growth of homes connected is around 27%.

Number of homes connected in millions over time: alternate network operators vs. Deutsche Telekom



Quick Facts:

- **BREKO's share of competition in 2019: 73%.**
- Share of competition of all available connections: 80%
- Telekom share: 20%

CAGR Competition: **26.86%**

Source: Deutsche Telekom, Blog from 18.07.2019; *BREKO Forecast, in April 2020: DTAG 1.7 Mio. FTTB/H connections & Quote from Tim Höttges, annual general assembly 2020.

Agenda

BREKO German Broadband Association

BÖCKER ZIEMEN

01.
Market Data

02.
Fibre Trends

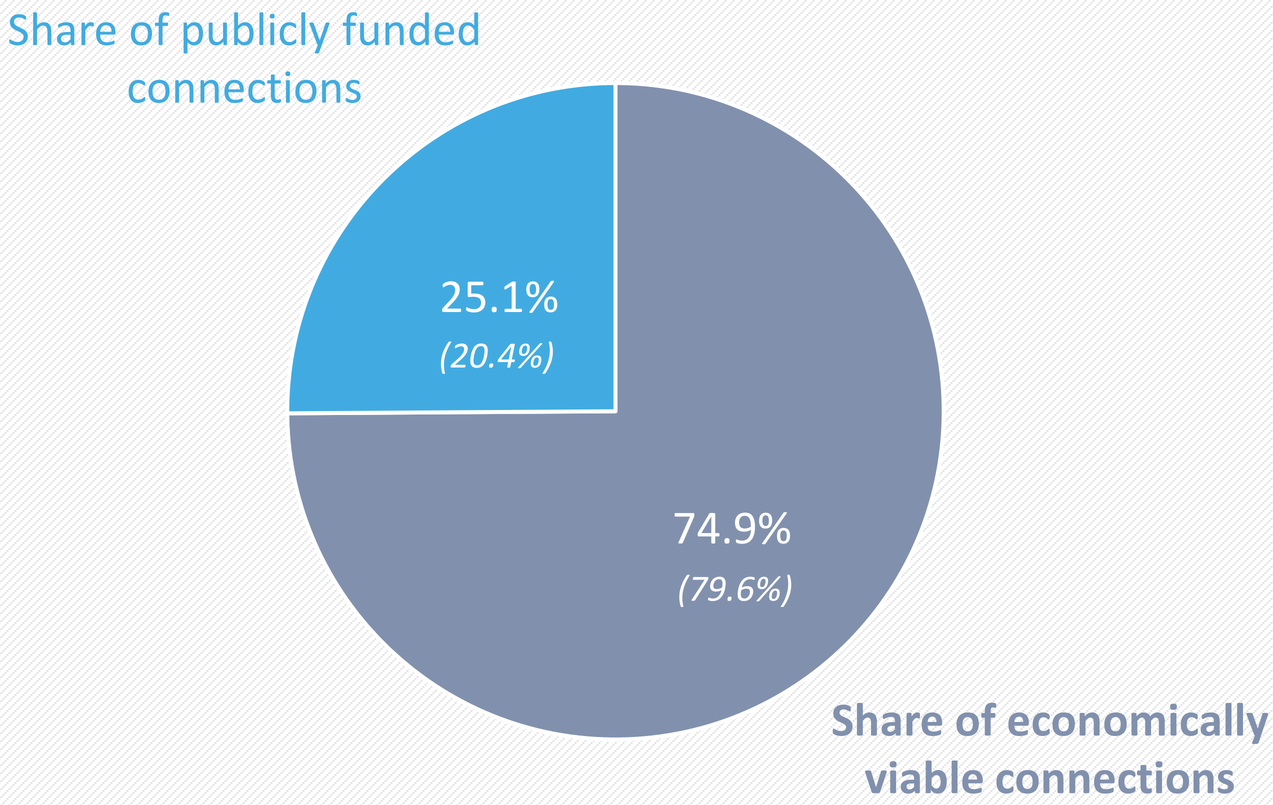
03.
Deployment & State

04.
Corona Impacts

Economically viable and publicly funded deployment

BREKO network operators build their networks economically viable. Almost ¾ of the deployment projects were self-financed in 2019. Publicly funded connections grow by five percent.

Percentage of network deployment in 2019 based on the number of connections



Source: survey of network operators (n=153).; values for 2018 in parenthesis.

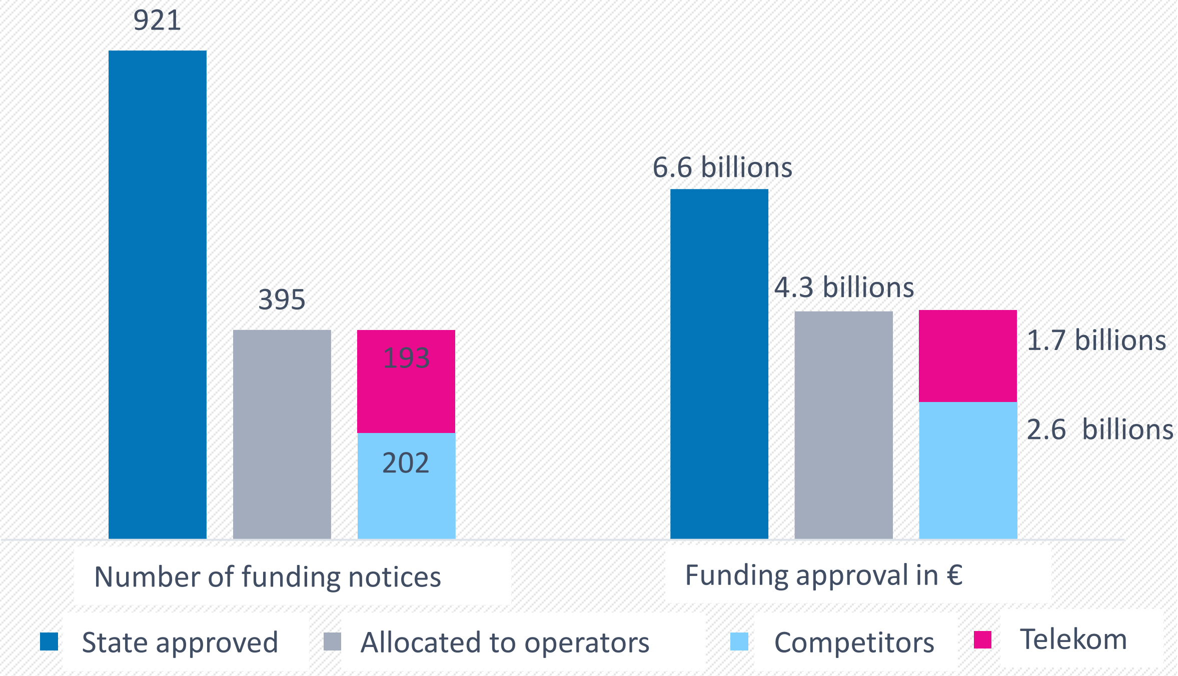
Question: Please indicate the percentage of economically viable and publicly funded connections you expanded in 2019 .

Federal funding programme for broadband deployment

Competitors receive € 2.6 billion, which represents 60% of the total amount of funding. This means that 51% of approved funding notices can be realised.

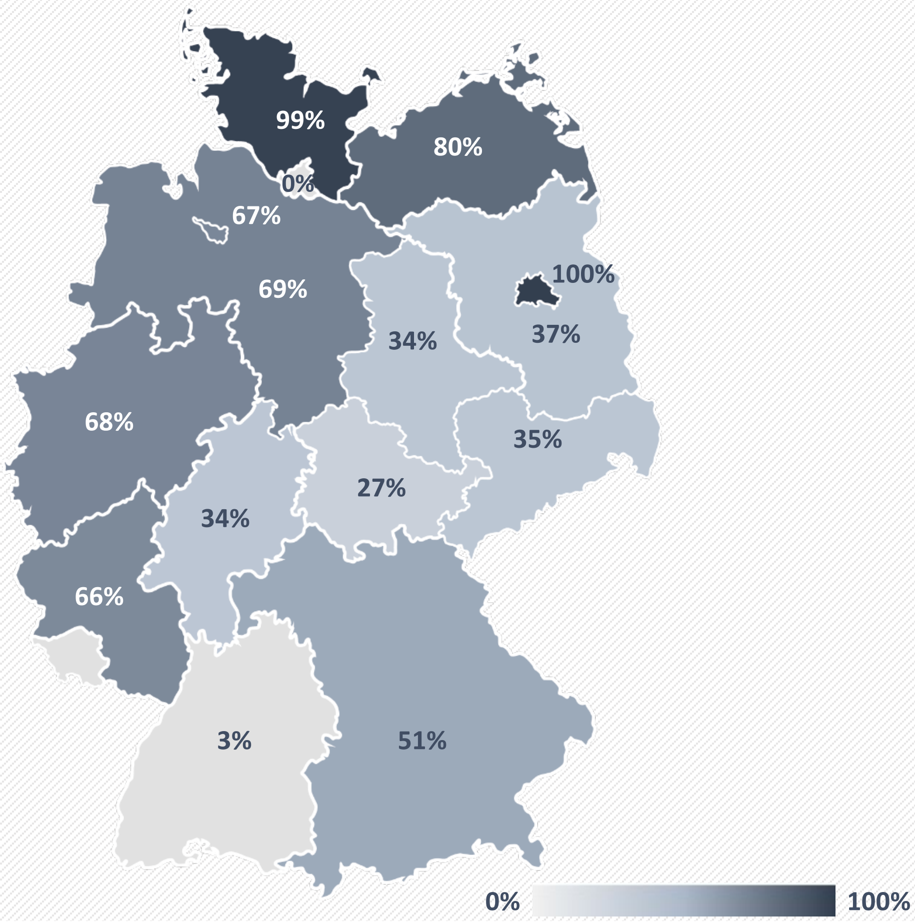
Competition's share of funding notices and funding approval

Start of the federal funding programme: 2015



Source: atene KOM, BMVI (Federal Ministry of Transport and Digital Infrastructure) (03.06.2020), BREKO Research.

Competition's share of funding notices per federal state



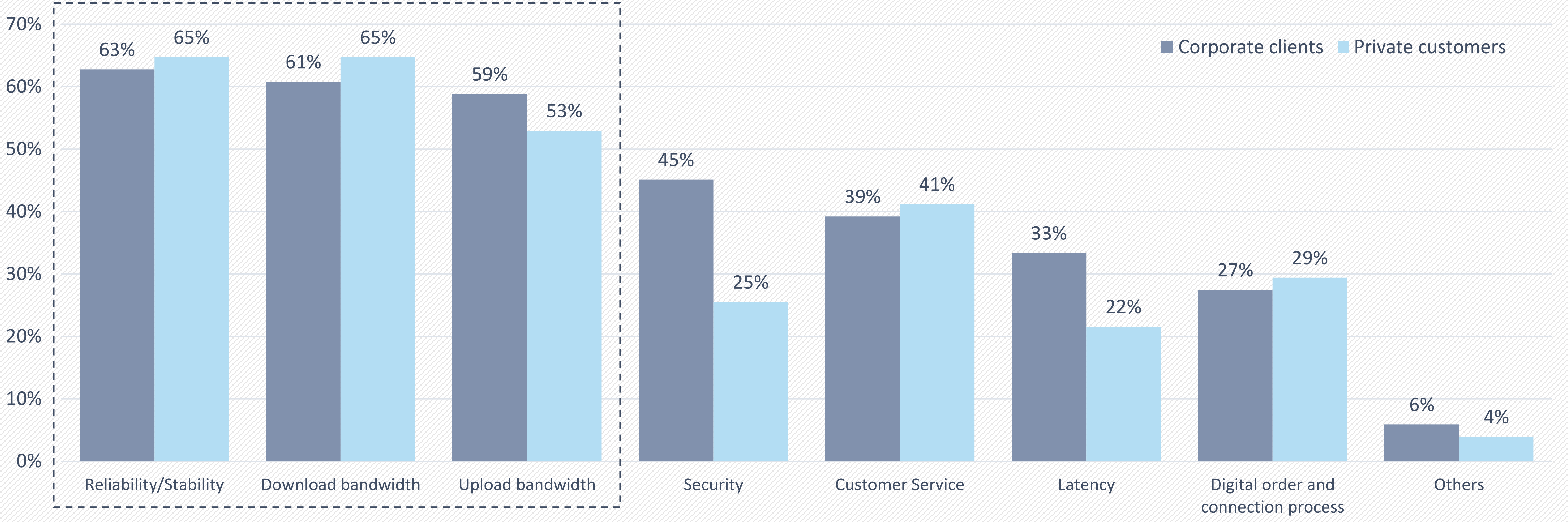
Agenda

01. Market Data	02. Fibre Trends	03. Deployment & State	04. Corona Impacts

Development of corporate clients & private customers

For corporate clients and private customers, reliability/stability and download/upload bandwidth are much more important than before the corona crisis. Corporate clients also rank security as increasingly important.

Rise in importance of individual features for corporate clients and private customers in %



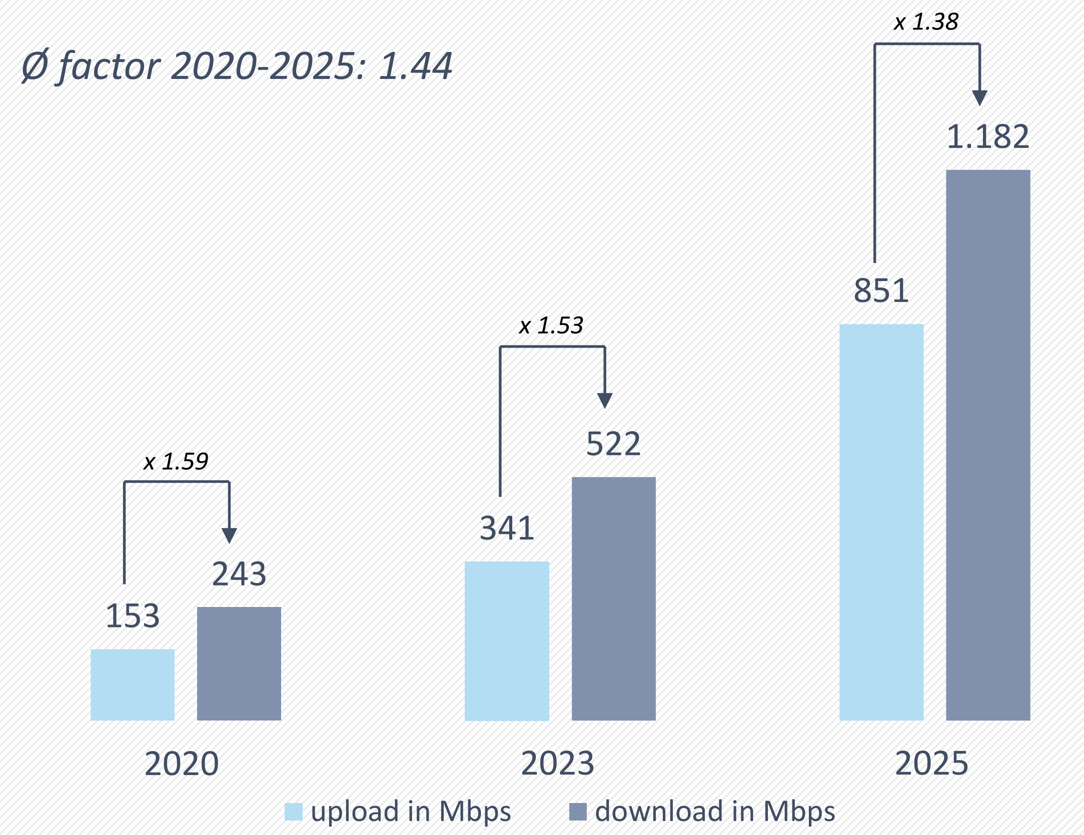
Source: survey of network operators (n=51).

Question: Which features have become more important for corporate clients and private customers due to the current corona crisis development?

Expected broadband demand

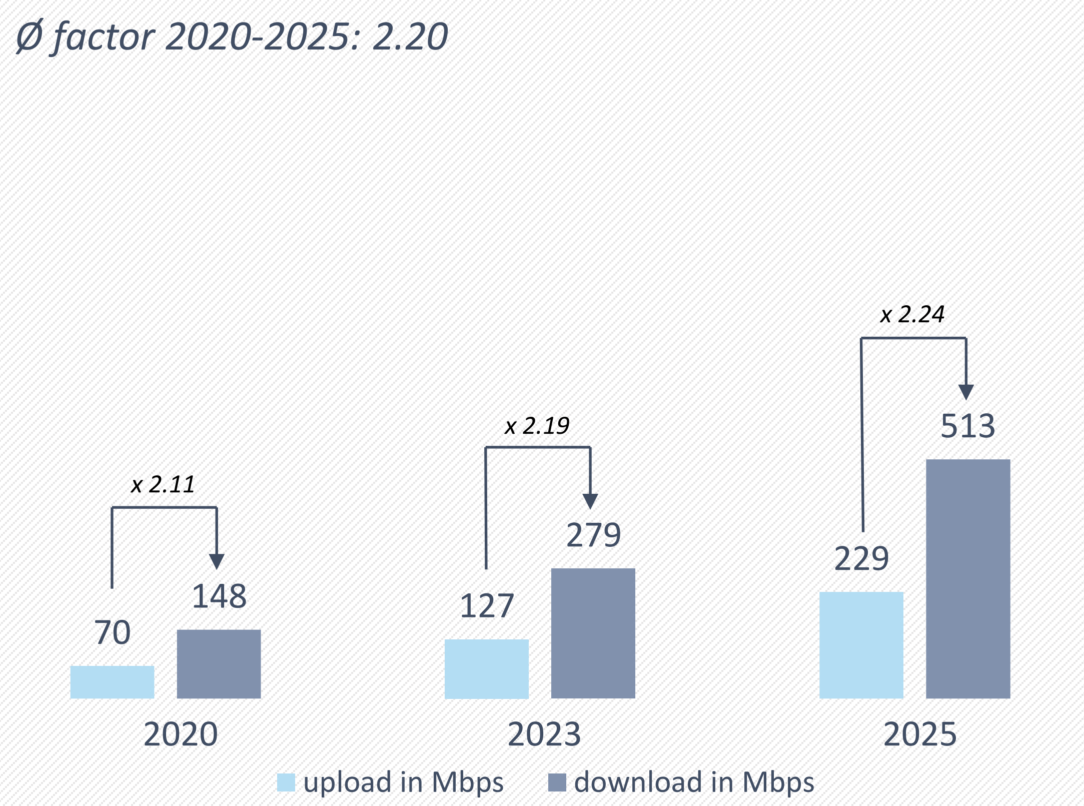
Symmetrical bandwidth was already standard for corporate clients before the corona crisis. For private customers asymmetrical bandwidth is still evident.

Corporate clients



Source: survey of network operators (n=130-135).

Private customers



Question: How will the demand for bandwidth develop for corporate clients and private customers in the next years?

BREKO BroadbandStudy 20 - summary:

BREKO German Broadband Association BÖCKER ZIEMEN

Fibre deployment prevails: highly dynamic deployment and application.

- In 2019, telecommunications investments were € 9.6 billion; of which 54% came from the competitors.
- Very dynamic: 13.5% of corporate clients and private customers in Germany can be connected by fibre – 80% was built by competitors.
- By 2023, approx. 22 million fibre connections (Homes Connected) will be available in Germany. Competitors will provide just under 2/3 of these connections.
- BREKO network operators have successfully switched (Homes Activated) 42% of all available fibre connections (Homes Connected). This figure is above the European average (EU39: approx. 40 %).
- Approximately 3/4 of BREKO network operators invest in new business models, such as the connection of fibre to mobile sites. 11% of these fibre connections have already been connected by BREKO network operators.
- As in previous years, BREKO network operators primarily deploy their networks in an economically viable manner. 3/4 of the projects were self-financed.
- The Corona pandemic has significantly increased the importance of telecommunications services: reliability/stability, download and upload bandwidth are equally important for corporate clients and private customers.
- Network infrastructure has passed the “Corona test” and helped bring customers through the crisis.
- This results in an increased demand for more bandwidth. In 2025, the download speed for corporate clients is expected to be almost 1.2 Gbit/s and approx. 500 Mbit/s for private customers.

Contact

BREKO

Dr. Stephan Albers
Managing Director
albers@brekoverband.de
+49 (0) 228 24 999 – 70

Anna Nass
Director Strategy and Economics
nass@brekoverband.de
+49 (0) 228 24 999 – 70

BOECKER ZIEMEN

Prof. Dr. Jens Böcker
Scientific Advisory Board
boecker@boecker-ziemen.de
+49 (0) 228 97 27 99 – 10

Nicholas Hayer
Consultant
hayer@boecker-ziemen.de
+49 (0) 228 97 27 99 – 18