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BREKO
Bundesverband Breitbandkommunikation e.V

BREKO Market Study 22

Bonn, 6 September 2022

Prof. Dr. Jens Böcker

Fibre deployment in Germany

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Survey of 208 network operators in Germany in May 2022 and an update of relevant fibre deployment rates by 30 June 2022 in August 2022. The interviewees are executives of telecommunications companies (e.g. Managing Directors, etc.).

BREKO Market Study 22

- ✓ The BREKO Market Study is representative for the German telecommunications market
- ✓ Validated by additional sources
- ✓ In total: approx. 270 active network operators in Germany, of which 237 are organised in BREKO
- ✓ Based on deployment numbers of all relevant companies deploying fibre networks in Germany
- ✓ Complete analysis of fibre deployment in Germany

1. Revenue of network operators in the area of telecommunications services in 2021: **€53.13 billion**
2. Investments of network operators in 2021: **€11 billion**
3. Homes Passed fibre connections by **30 June 2022: 12.7 million**
4. Fibre coverage Homes Passed by **30. Juni 2022: 26%**

Source: Survey of network operators (n=183).; Bundesnetzagentur, Annual report 2021 p. 49.

Agenda

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1. **Market Data**
2. Fibre Trends
3. Public Funding
4. Open Access
5. Sustainability

Evolution of data volume (fixed networks)

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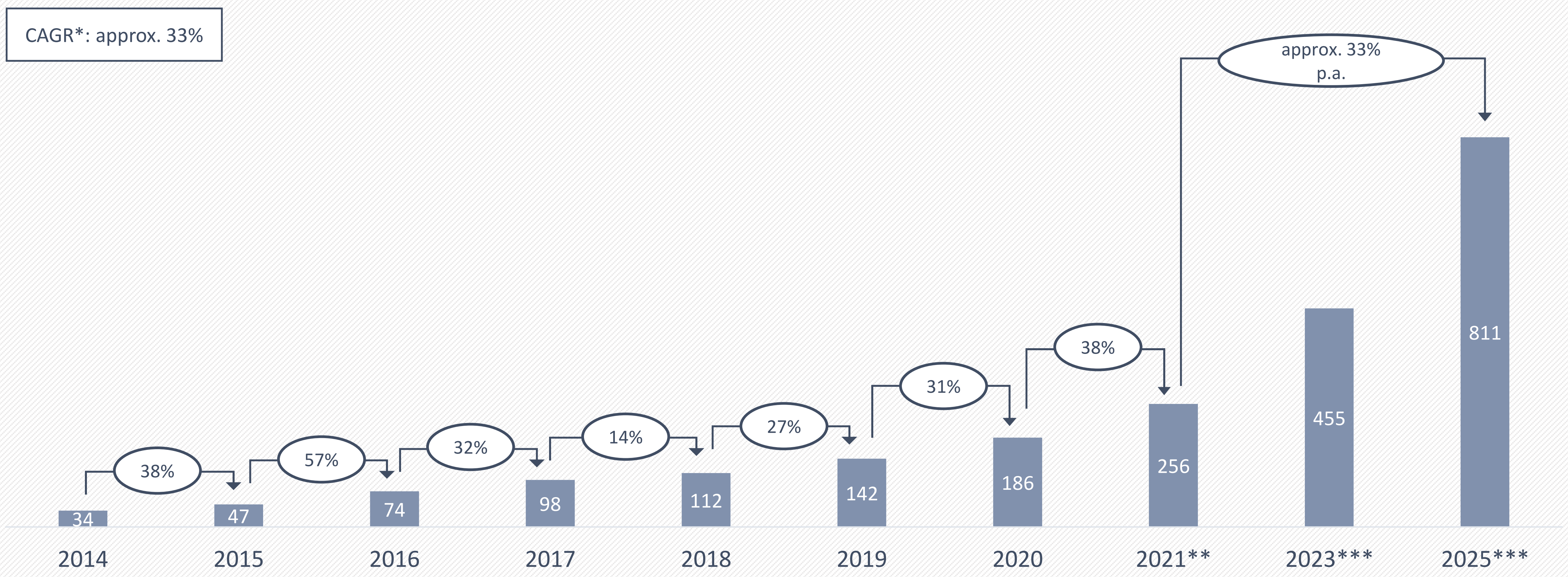
The average growth of data volume in Germany until 2025 will be 30-35% per year.

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



Source: Bundesnetzagentur, Annual Report 2021 p. 57; *Compound Annual Growth Rate, here 2014-2021.; ** incl. 30 GB TV and streaming surcharge *** BREKO forecast

Relation data volume mobile to fixed networks

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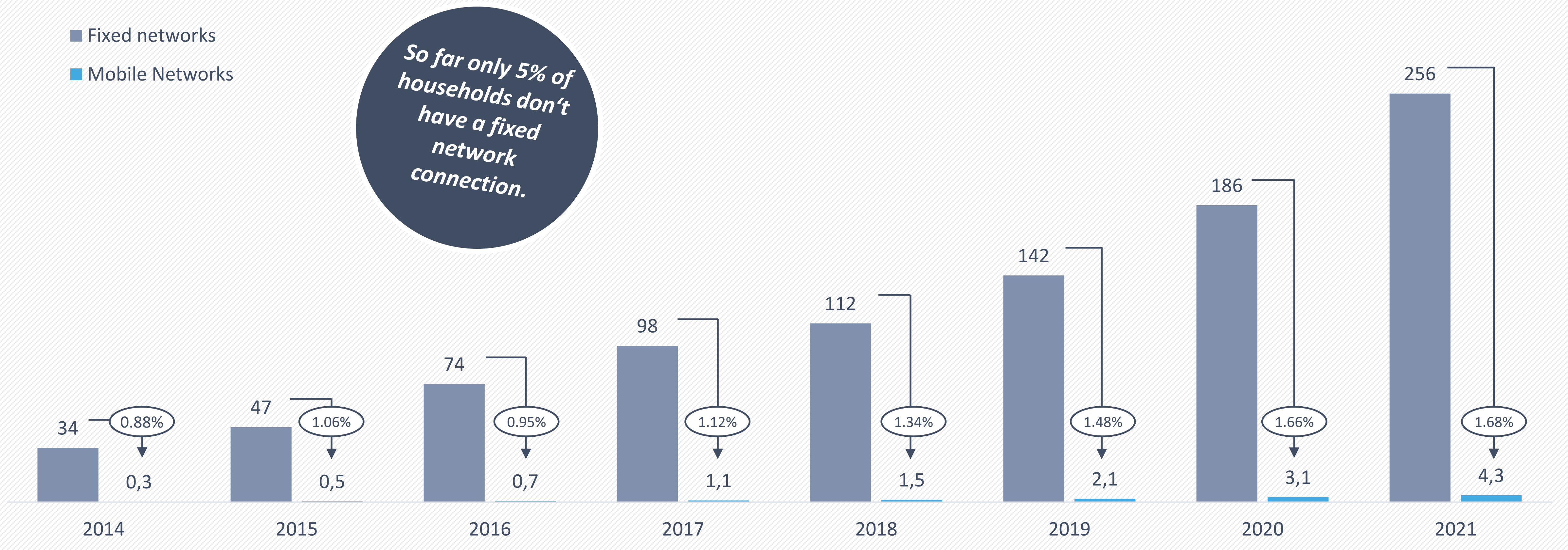
Fixed and mobile networks complement each other – no substitution effects despite 5G rollout.

Relation of data volume mobile to fixed networks, average per end user and month in GB



Source: Bundesnetzagentur, Annual Report 2021, p. 57, p. 62.; *Growth of 1.1 million fixed network connections since 2014 until 2021.

Distribution of subscriptions by speed

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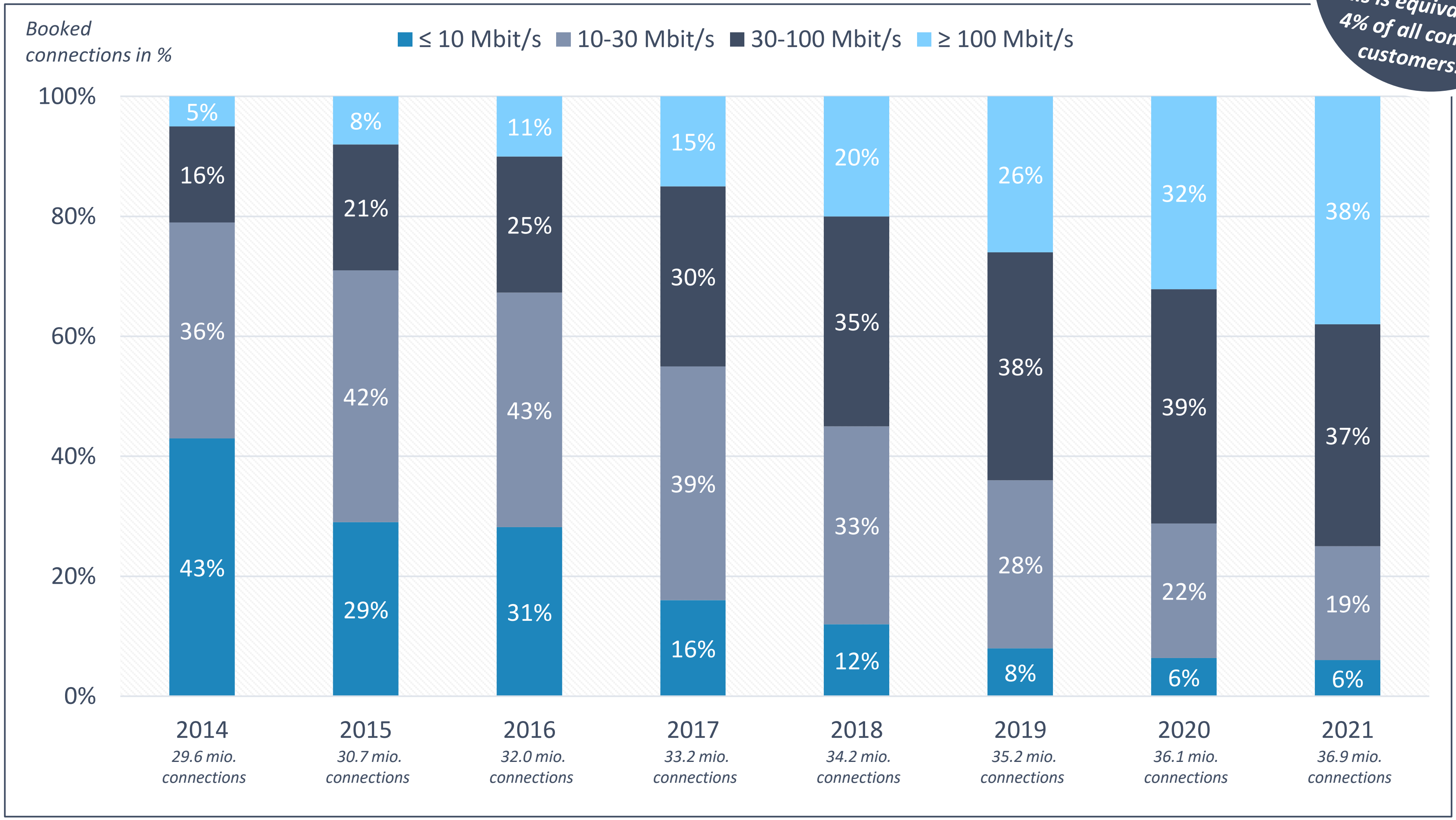
Over 1/3 of subscriptions in 2021 ≥ 100 Mbit/s.

*Ca, 1,4 million customers subscribe to ≥ 1 Gbit/s. This is equivalent to 4% of all contract customers. **

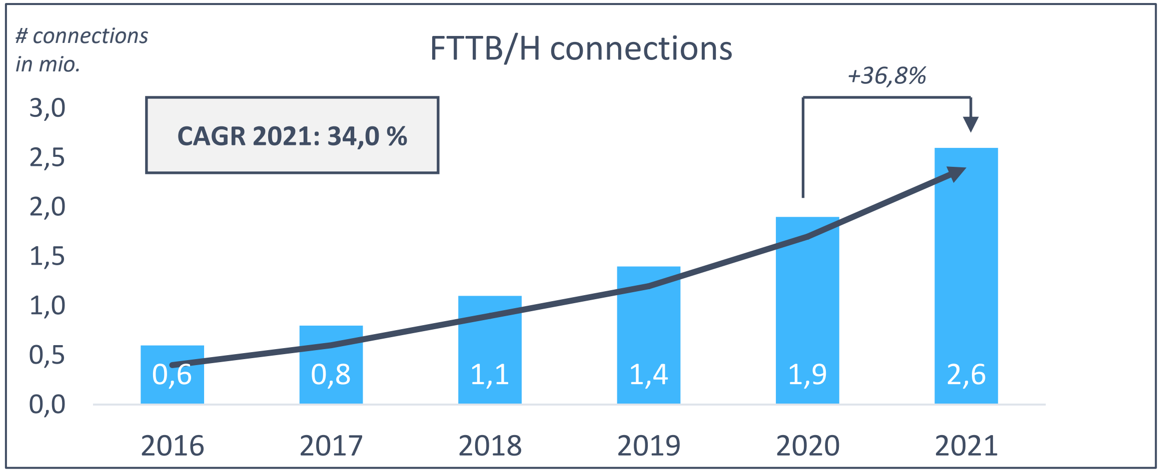


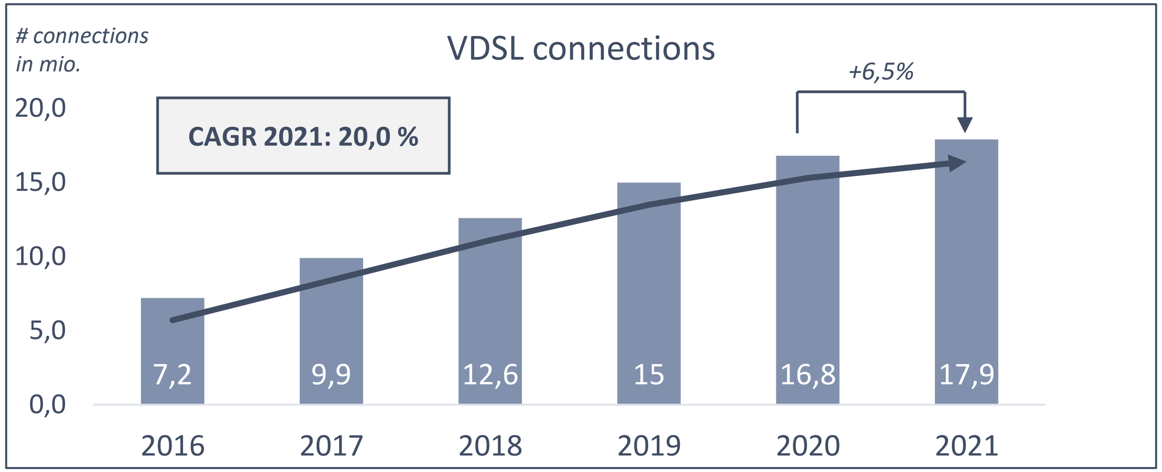
Bitrate	Growth in connections
≥ 100 Mbit/s	+2.7 mio.
30-100 Mbit/s	-0.6 mio.
10-30 Mbit/s	-1.2 mio.
≤ 10 Mbit/s	-0.2 mio.

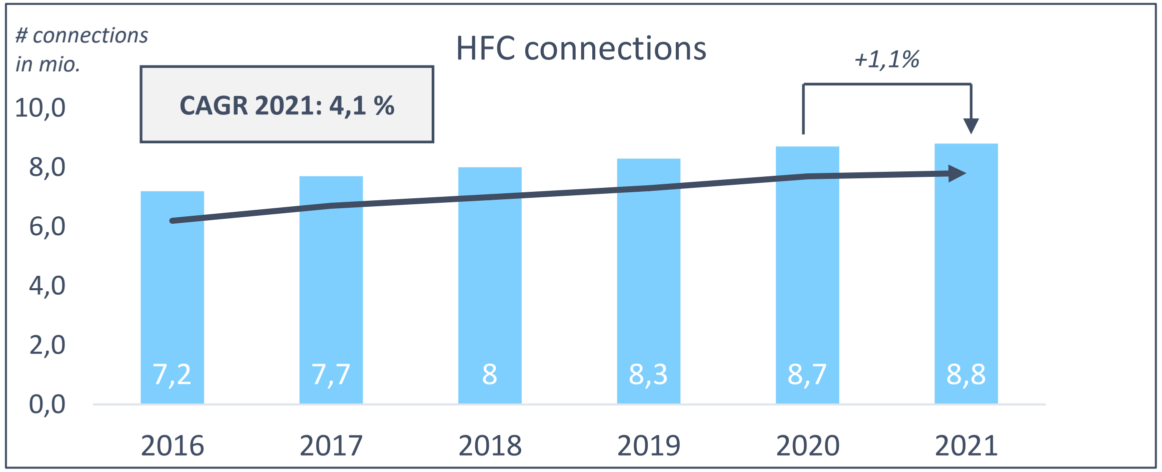
Source: Bundesnetzagentur, Annual Report 2021, p. 53; *Comparative value of BREKO network operators is around 10%.

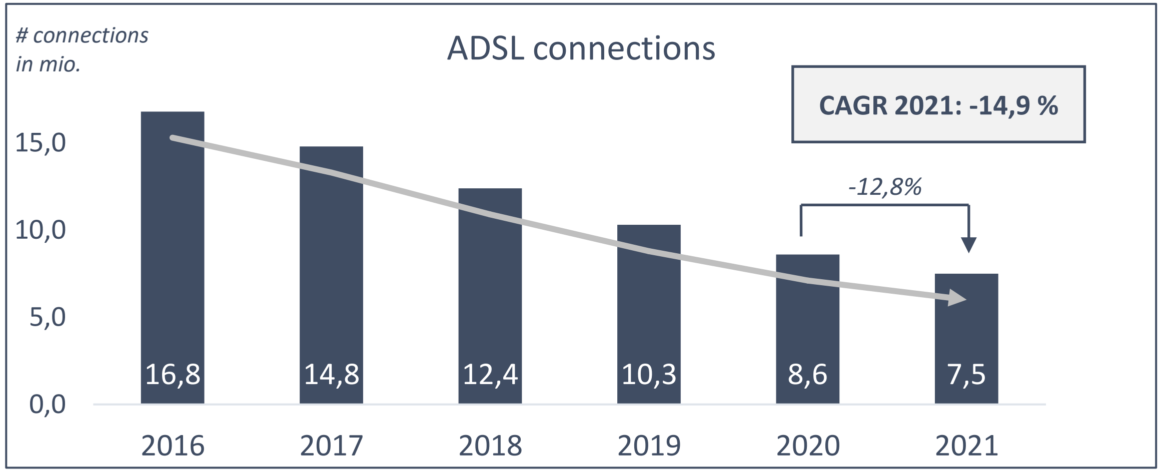
Broadband connections by technology

Above-average growth in active fibre connections (Homes Activated). When directly comparing gigabit capable connections, customers prefer FTTB/H connections.









Source: Bundesnetzagentur, Annual Report 2016 - 2021, p. 52-55.

Total investments in broadband network infrastructure

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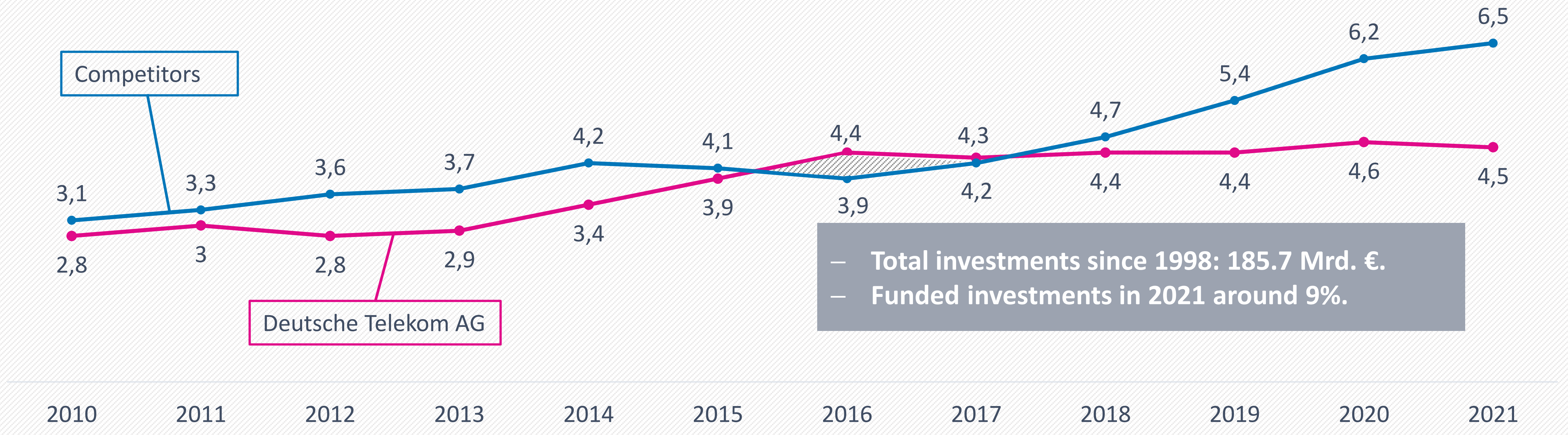
Record investments in 2021: €11 billion (+1.9%), of which 59% is invested by competitors.

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



- Total investments since 1998: 185.7 Mrd. €.
- Funded investments in 2021 around 9%.

Source: Bundesnetzagentur, Annual Report 2021, p. 50; BMDV; *incl. public funding; **investments in new and existing broadband network infrastructures (without investments in mobile networks) /// Vectoring dent triggered by the vectoring decision of the German national regulator „Bundesnetzagentur“.

Fibre connections to mobile sites

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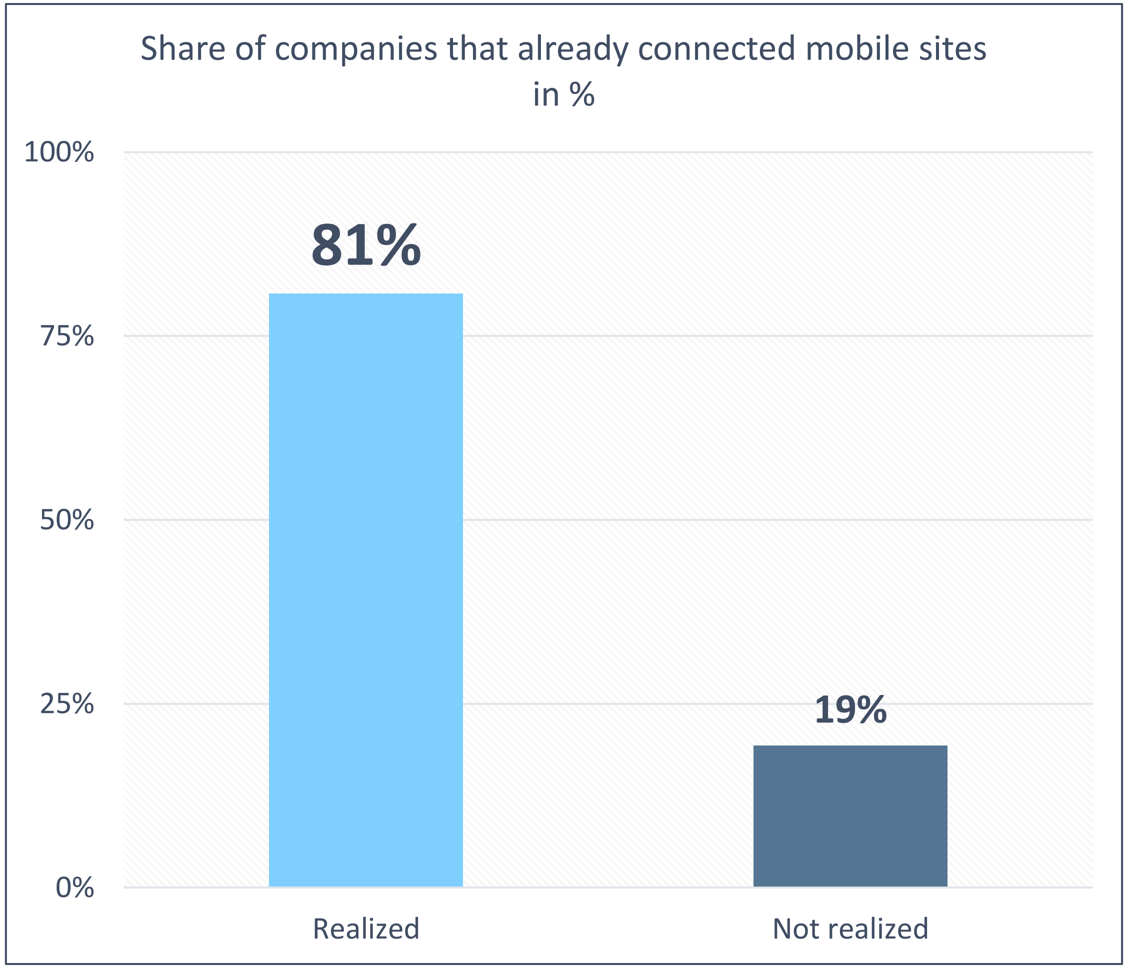
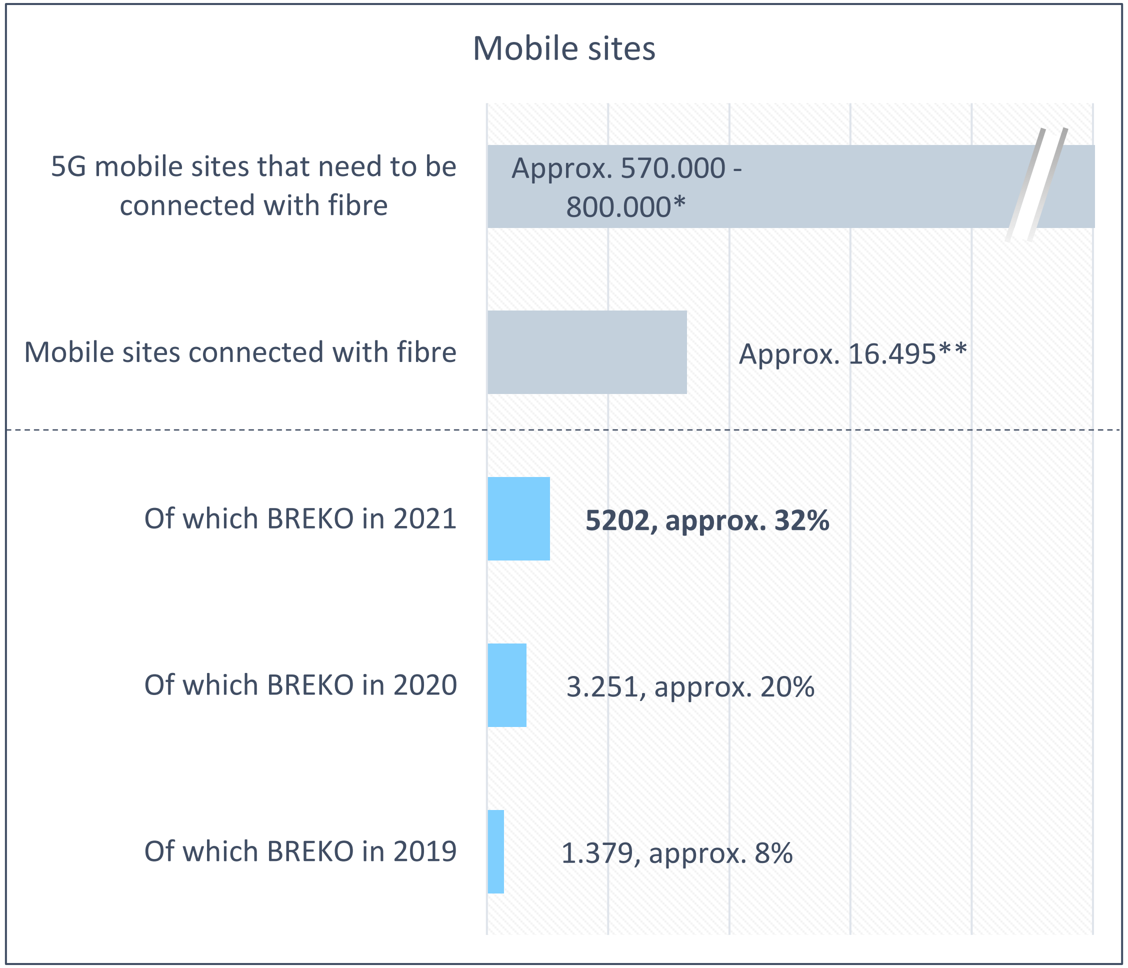
The large majority of BREKO network operators connects 5G mobile sites with fibre.





Source: Survey of network operators (n=83); *Bitkom 2018; Federal Ministry for Environment, 2019.; **Statista, 2021: Base stations nationwide: 82.479, approx. 20% connected with fibre (16.495).

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2. **Fibre Trends**

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Terminology of different connections

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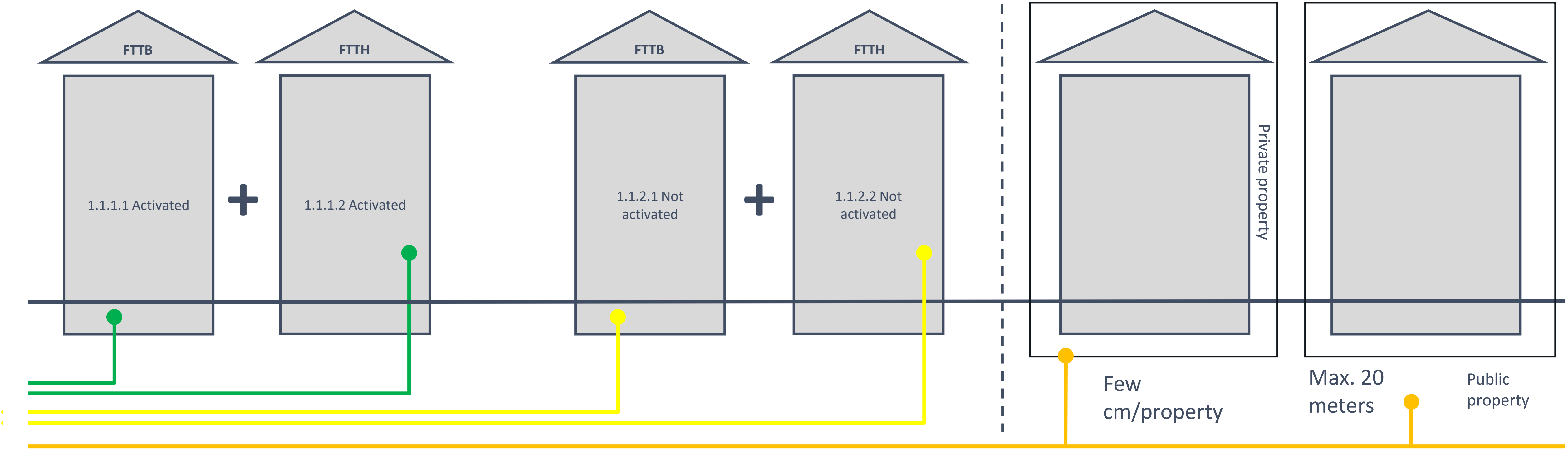
Total number:
Homes Activated, Homes Connected, Homes Passed

In operation & bookable in the short term (Homes Activated, Homes Connected)		Short to medium term	Medium to long term
Homes Activated[1)]	**Homes Connected[2)]**	**Homes Passed Plus[3)]**	**Homes Passed[4)]**



1) Active end user contracts

2) Bookable connections

3) Connections available in the short term - require civil works on private property

4) Connections available in the medium / long term – require civil works on public property

Fibre coverage over time

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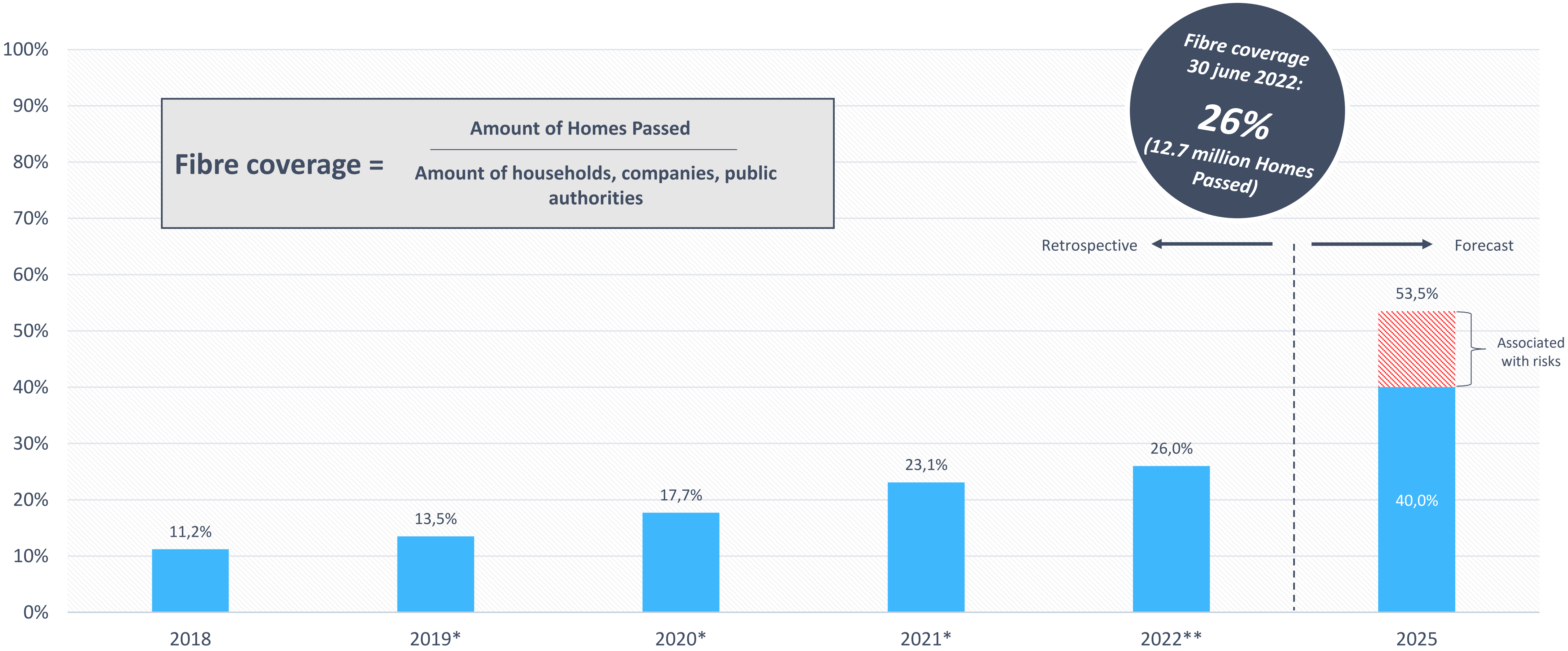
Steady increase of fibre coverage – deployment targets of the Federal Government until 2025 within reach.



Source: Survey of network operators (n=183); BMDV, Breitbandatlas Stand Mitte 2021, p. 8; *Numbers in relation to Homes Passed: FTTB/H 2019, 2020 & 2021: incl. Households, companies, public buildings, as of end 2021: 11.2 Mio. Homes Passed;
**as of 30 june 2022,: 12,7 Mio. Homes Passed.

Risks in fibre deployment

The following factors could significantly affect the speed of fibre deployment.

EXPLANATION OF THE RISKS

Risk factors due to the war in Ukraine and the Covid-19-pandemic:

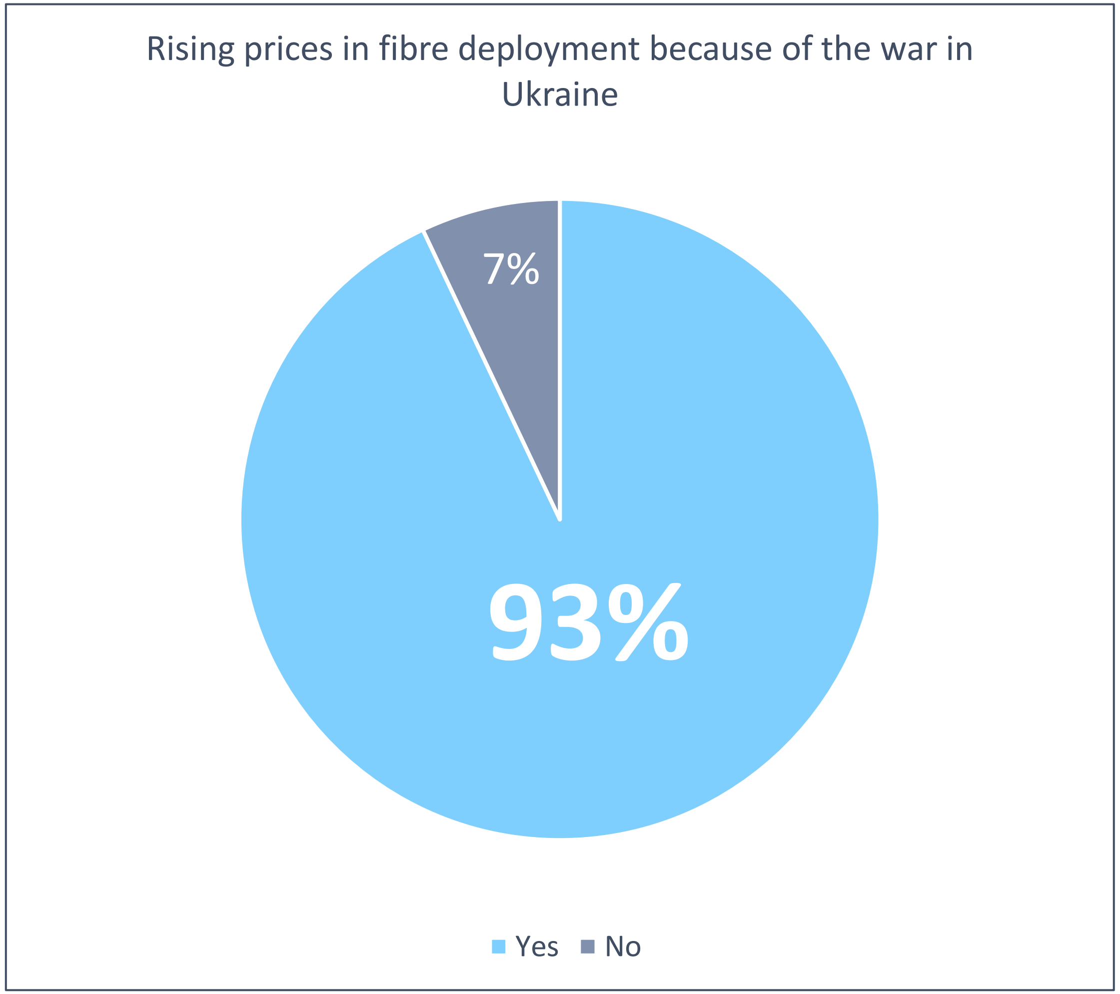
- Price increases and supply bottlenecks
- High inflation

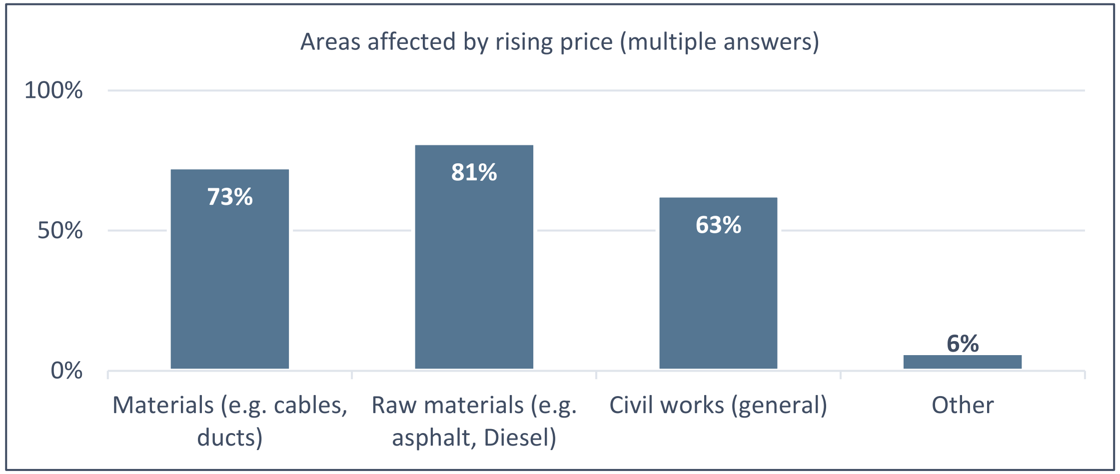
Sector specific risk factors:

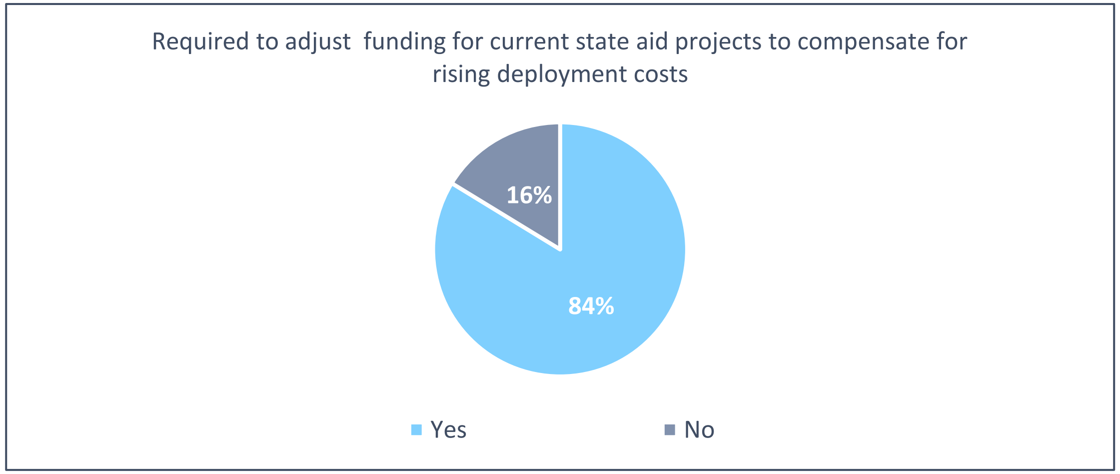
- New federal state aid programme starting in 2023
- Slow permit granting procedures
- Low acceptance of alternative deployment methods
- Shortage of skilled workers in all areas of fibre deployment

Impact of the war in Ukraine on deployment

Rising prices have also reached fibre deployment.







Source: Umfrage von BDEW & BREKO zu aktuellen Investitionshemmnissen im Glasfaserausbau (n=80), Stand: 29.08.2022.

Share of former incumbents in fibre deployment

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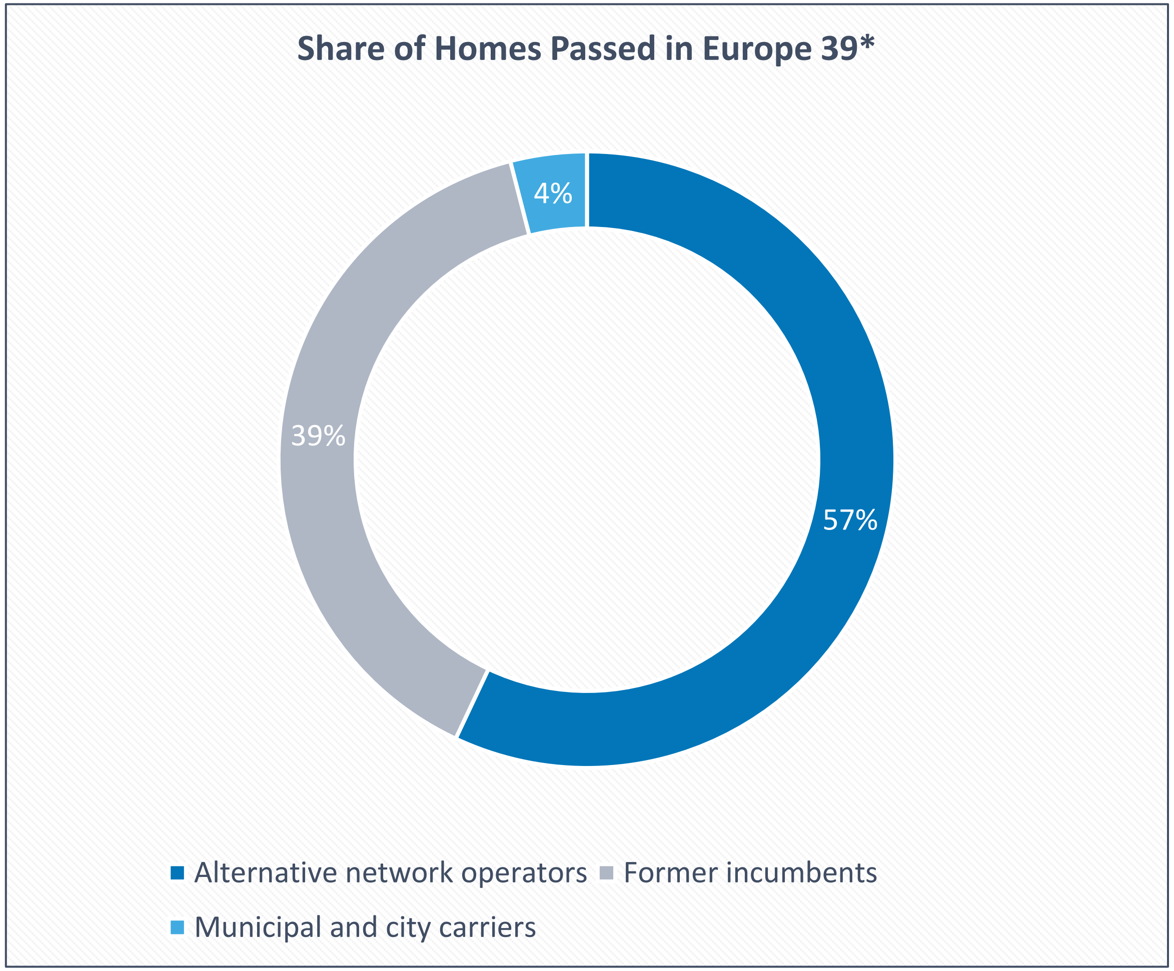
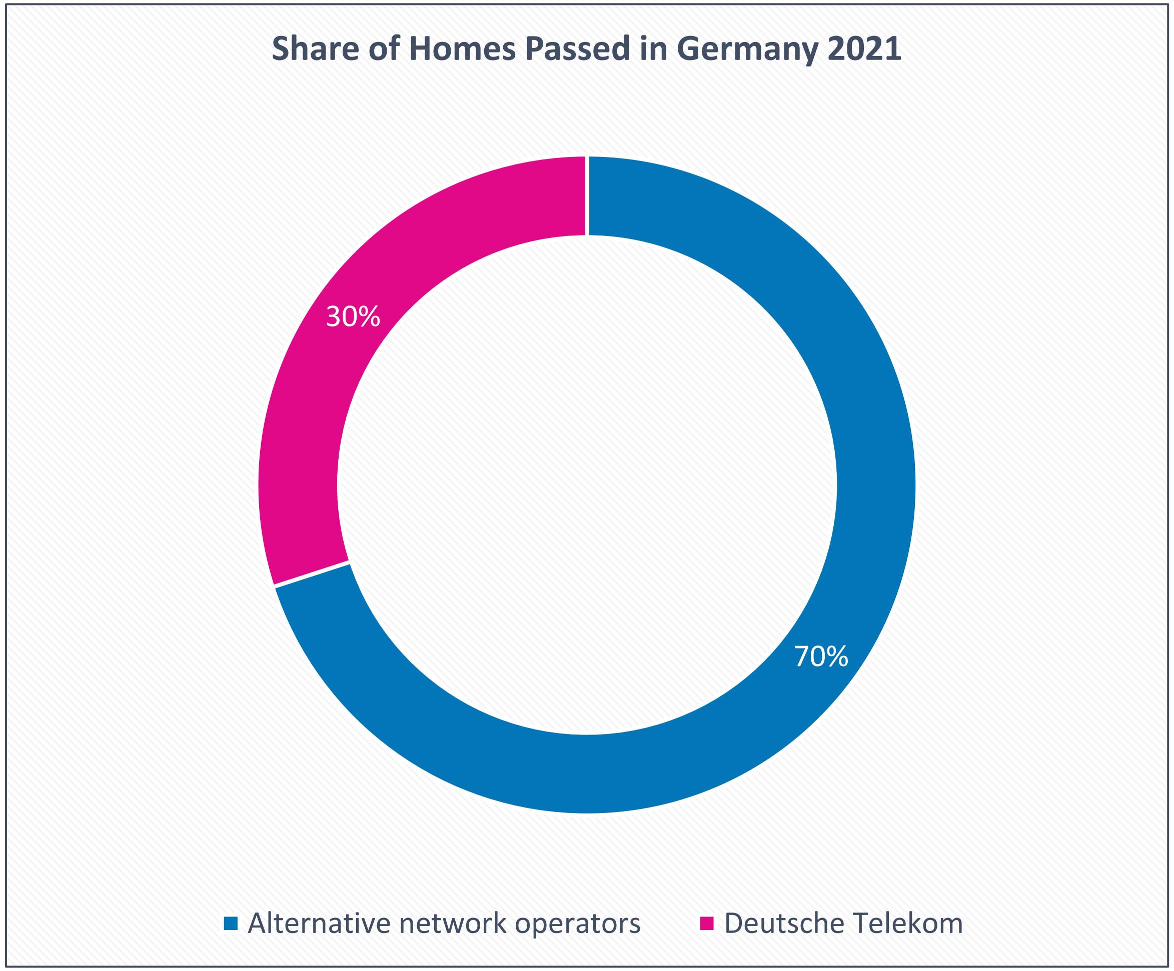
In Europe the share of former incumbents in fibre deployment in 39%, in Germany only 30%. Telekom increased its share by 5 percent.



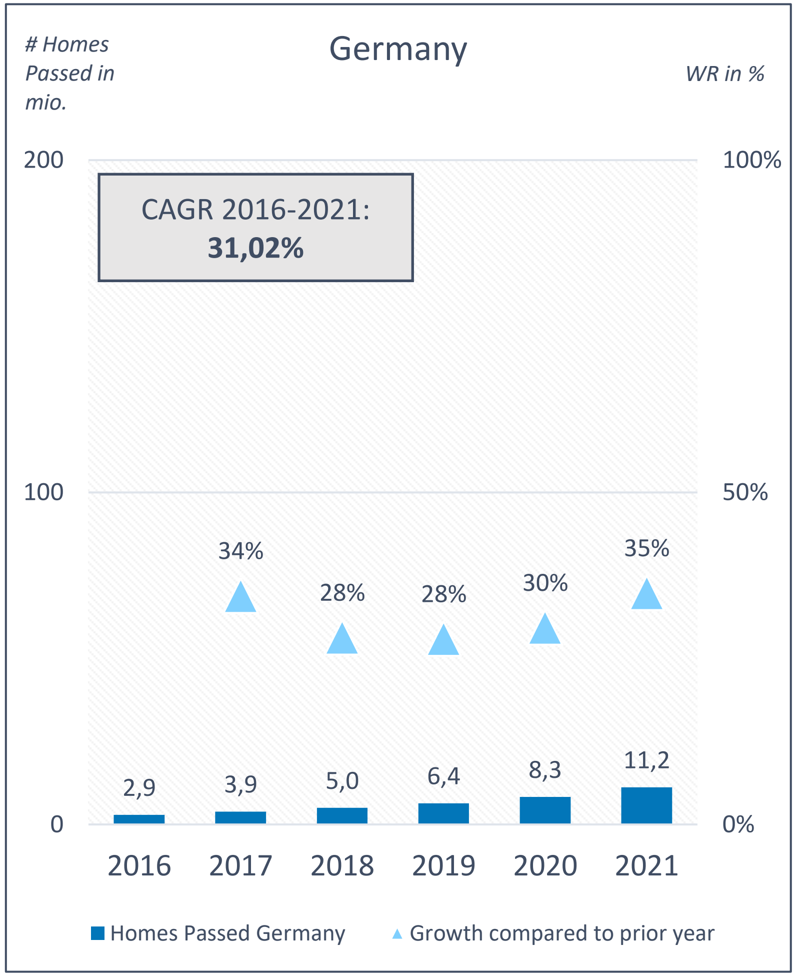
Source: FTTH Council Europe, FTTH/B Market Panorama 2022, p.8.; *EU27, UK, Kasachstan, Ukraine, Iceland, Israel, Northern Macedonia, Norway, Serbia, Switzerland, Turkey, 2 unknown CIS-countries.

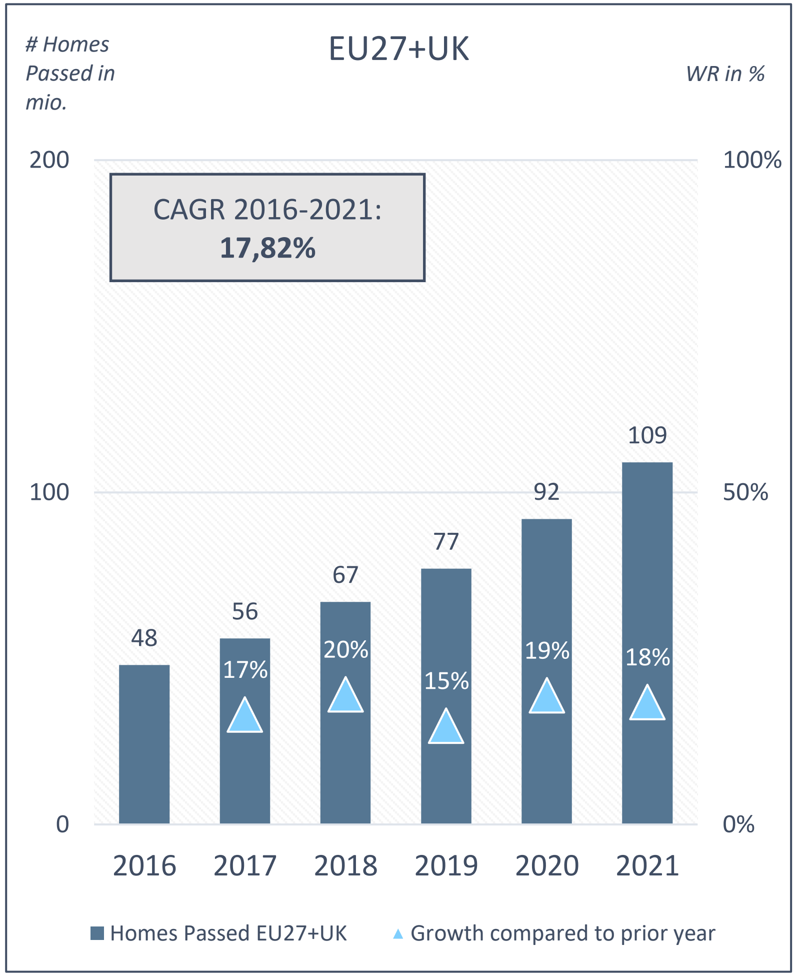


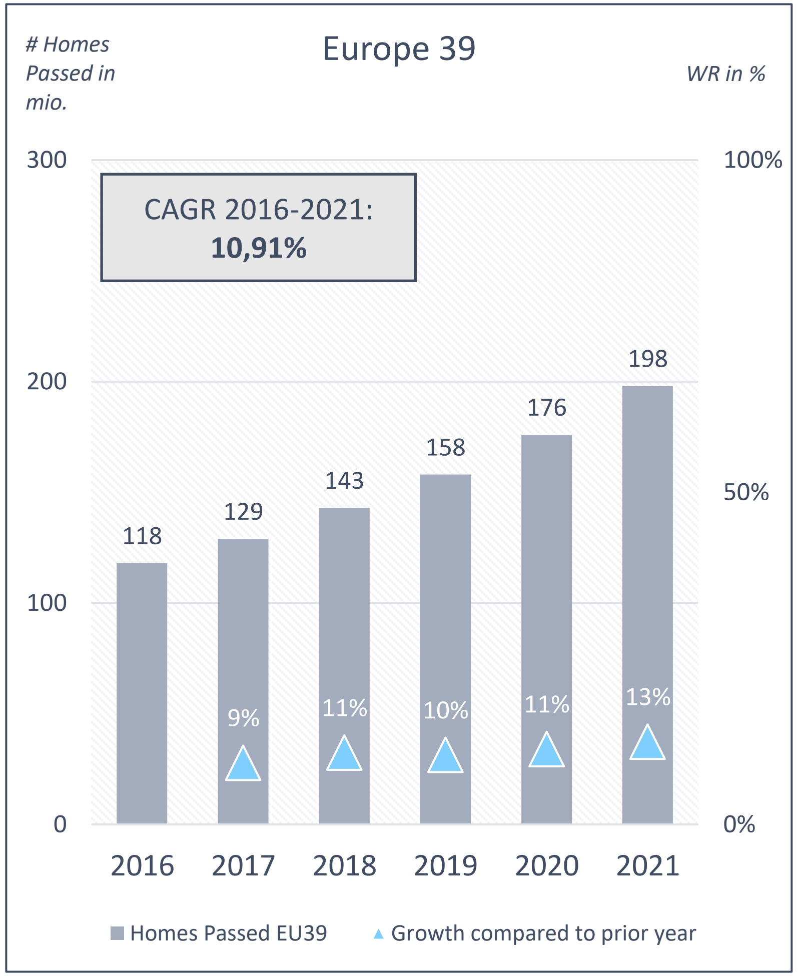
Source: Survey of network operators (n=183); BREKO-forecast.

Germany compared to other European countries

The growth rate for fibre in Germany is above average compared to other European countries.
Rank 3 for total growth rate.



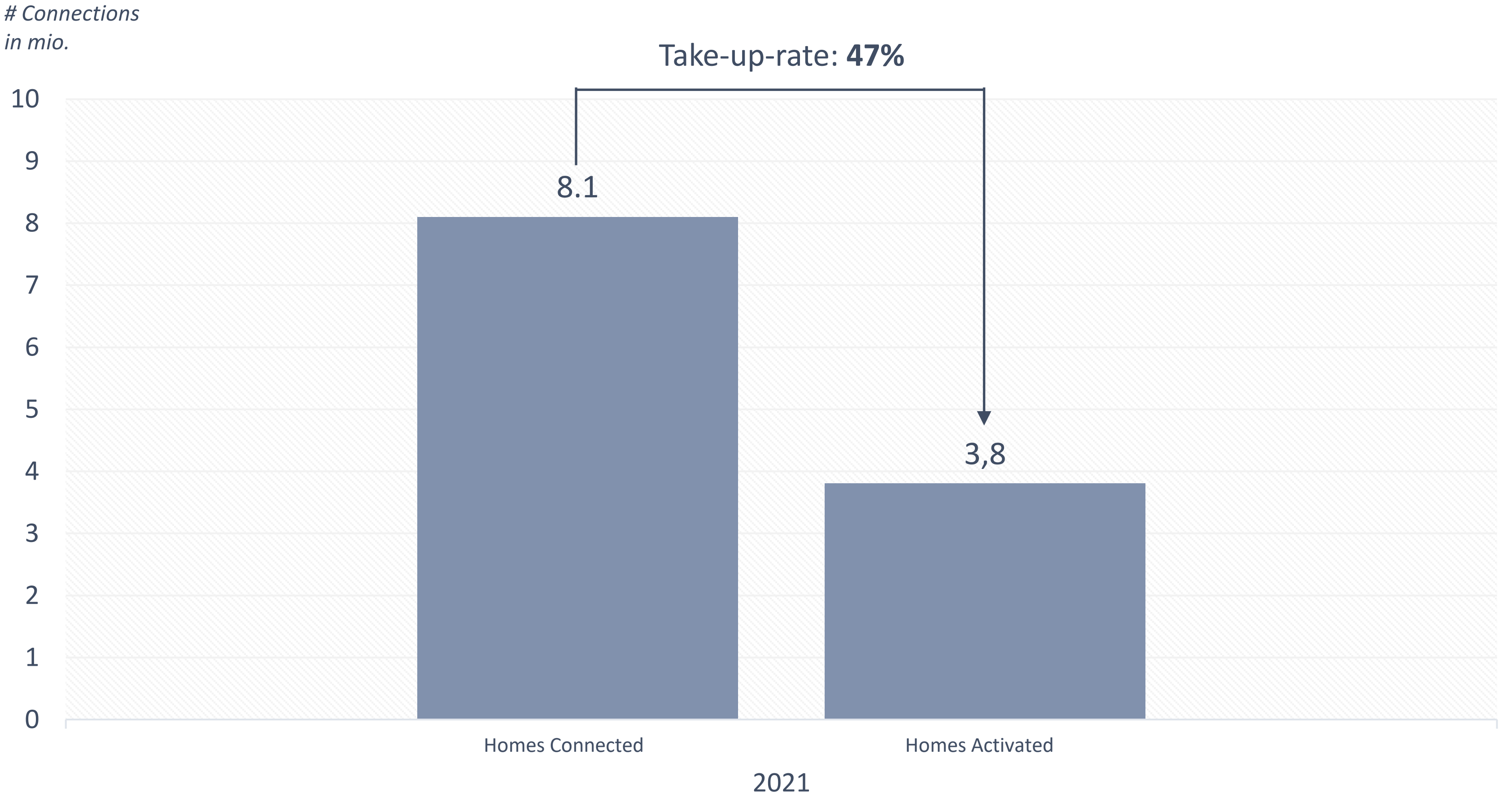




Source: Survey of network operators (n=182); Coordination talks DTAG; FTTH Council Europe, FTTH/B Market Panorama 2022, p.7., p.11; rank 1: France, rank 2: UK.

Demand for fibre connections

The benefits of real fibre connections (FTTB/H) are being increasingly recognised.



Source: Survey of network operators (n=180-184).; BREKO-forecast. FTTH Council Europe, FTTH/B Market Panorama 2022, p.6.

Question: Please state the amount of your gigabit capable connections (based on your own infrastructure, including infrastructure in your group) for the following deployment stages: FTTB/H, HFC.

Implications

- **Take-up rate** for fibre connections in Germany is approx. 47%.
- Despite a strong growth in deployment, the take-up rate is just below the EU39 average of 49%.

Demand for fibre connections with BREKO network operators

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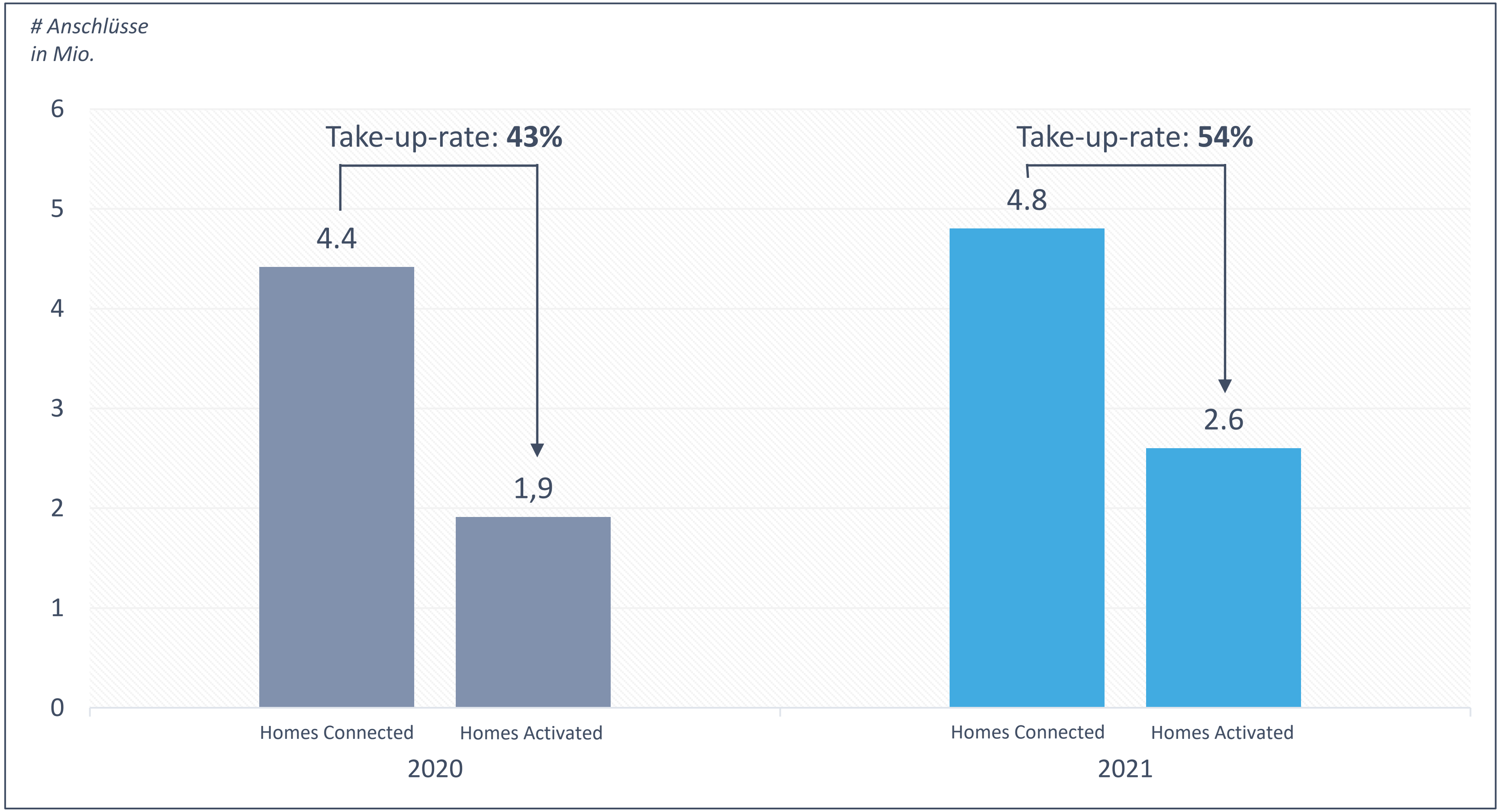
For the first time, BREKO network operators sell more than half of the connections, which can be activated in the short term.



Source: Survey of network operators (n=180-184). FTTH Council Europe, FTTH/B Market Panorama 2022, p.6; ZfTM, Dialog Consult, p.7; Bundesnetzagentur, Annual report 2021, p. 54.

Question: Please state the number of your gigabit capable connections (based on your own infrastructure, including infrastructure in your group) for the following deployment stages: FTTB/H, HFC.

Implications

- In 2021, the **Take-up rate** increased by 11 percent to **54%**.
- In comparison with **EU27+UK (52%)** and **EU39 (49%)** the take-up rate of BREKO network operators is higher.
- Take-up rate of fibre connections is 20 percent higher than Docsis 3.1 (34%).

Number of fibre connections of BREKO network operators

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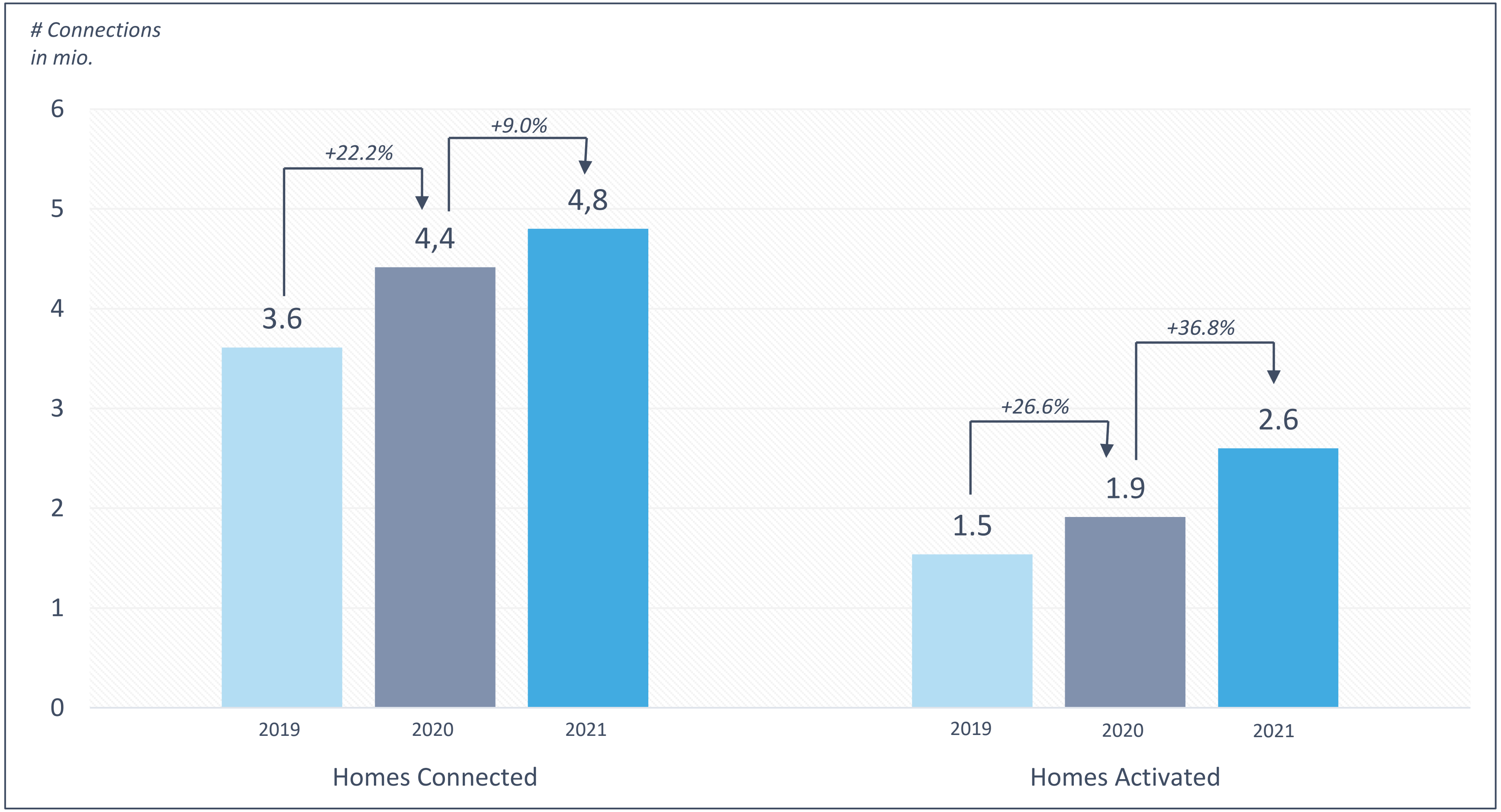
Network operators have more and more activate fibre connections – demand on the customer side is strongly increasing.



Source: Survey of network operators (n=180-184). Question: Please state the number of your gigabit capable connections (based on your own infrastructure, including infrastructure in your group) for the following deployment stages: FTTB/H, HFC.

Implications

- The number of **Homes Connected** is **increasing slower** than in the prior year (9%).
- The number of **Homes Activated** shows above-average growth with **36.8%**.

Demand for bit rates in the next five years

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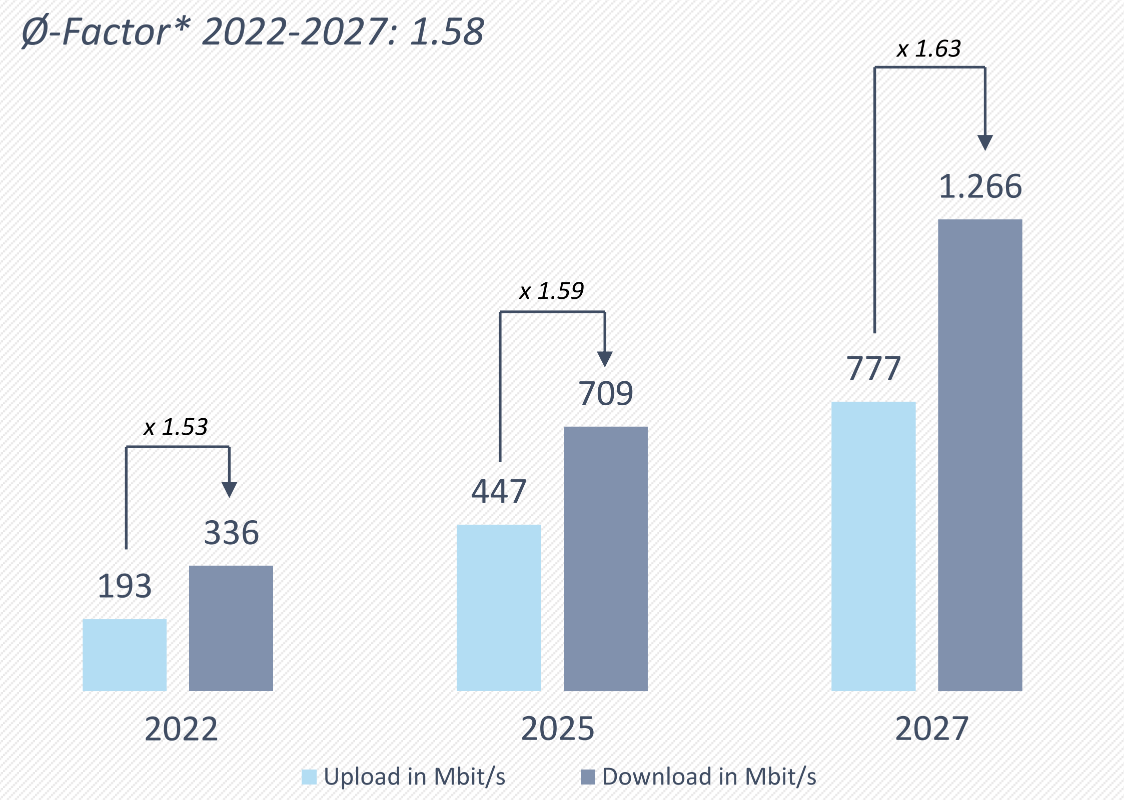
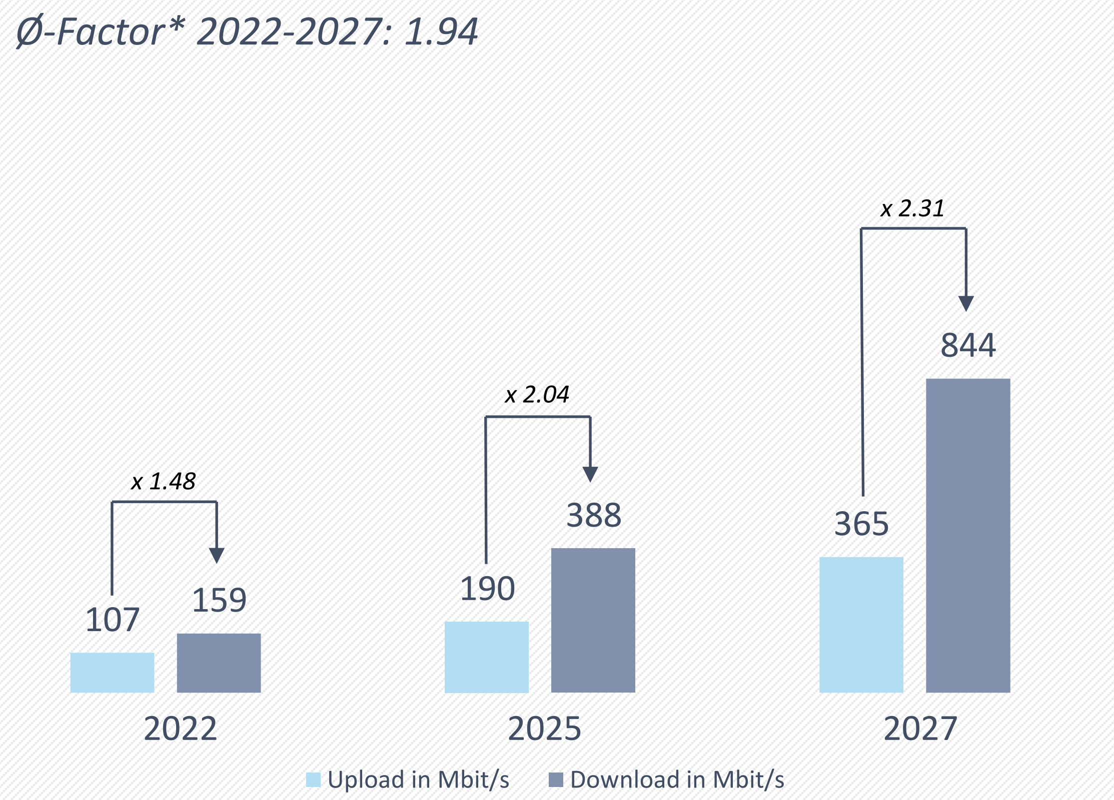
Network operators differentiate their portfolios: More symmetric connections with business clients.

Business clients



Source: Survey of network operators (n=128). *Verhältnis Upload zu Download.

Private clients



Question: How will the bit rates for business clients and private clients develop in the coming years?

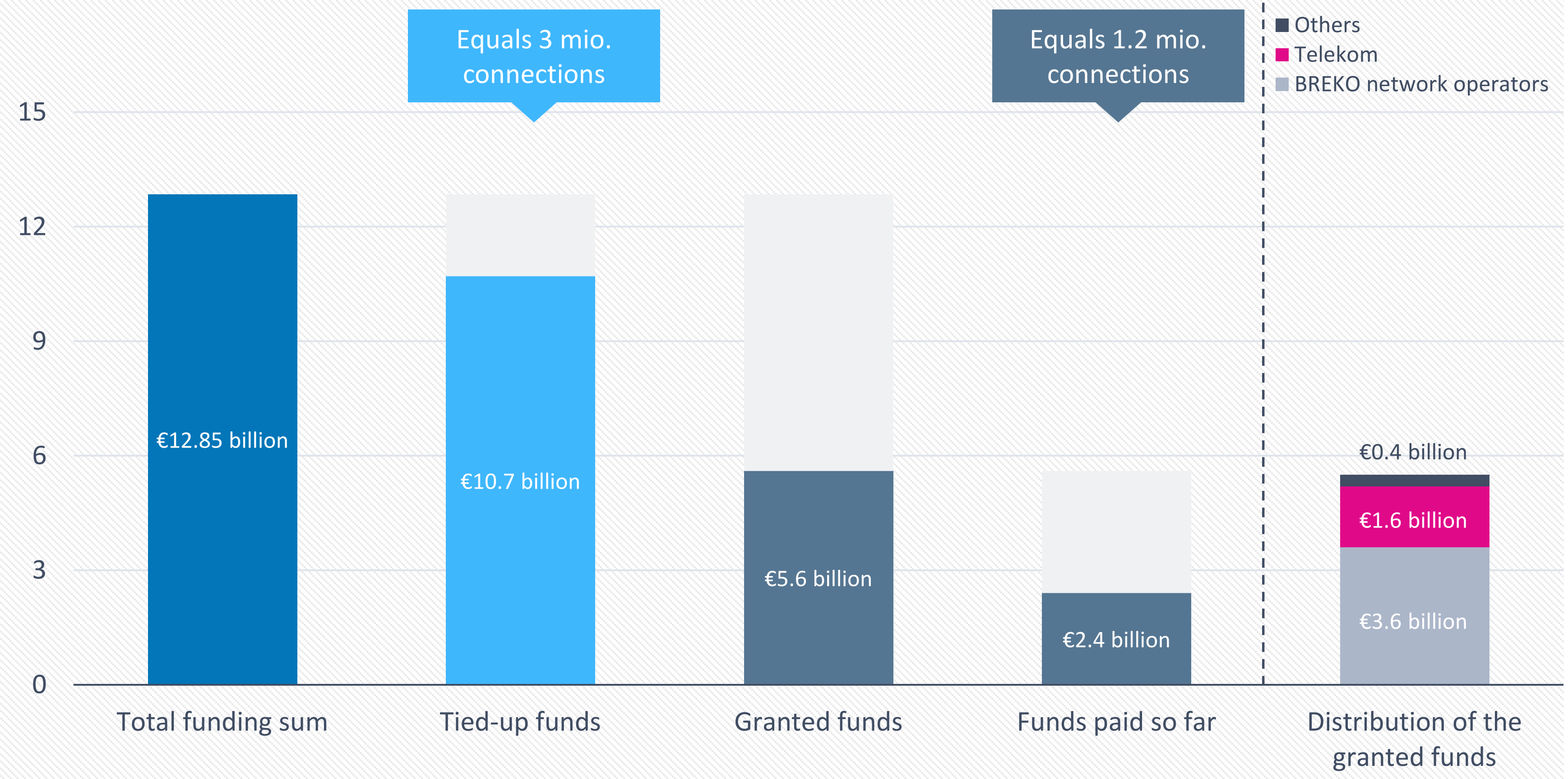
Agenda

1. Market Data
2. Fibre Trends
3. **Public Funding**
4. Open Access
5. Sustainability

Federal State Aid programme

22.5% of the available funds have been distributed until now.

Funds* of the federal state aid programme



Source: BMDV, Kennzahlen zur Breitbandförderung, Stand Mitte August 2022; BMDV, Liste der Zuschlagsgewinner, Stand 07. Juli 2022; *Bezug auf Bundesfördermittel ohne Länderanteil/kommunalem Eigenanteil.

Implications

- 3 mio. total connections are supposed to be achieved by 2,480 funded deployment projects.
- 2.3 mio. connections are currently being built or are aleady finished.
- 1.2 mio. connections are already finished.
- Outflow of funds: 22.5% of the earmarked funds were distributed so far.

Agenda

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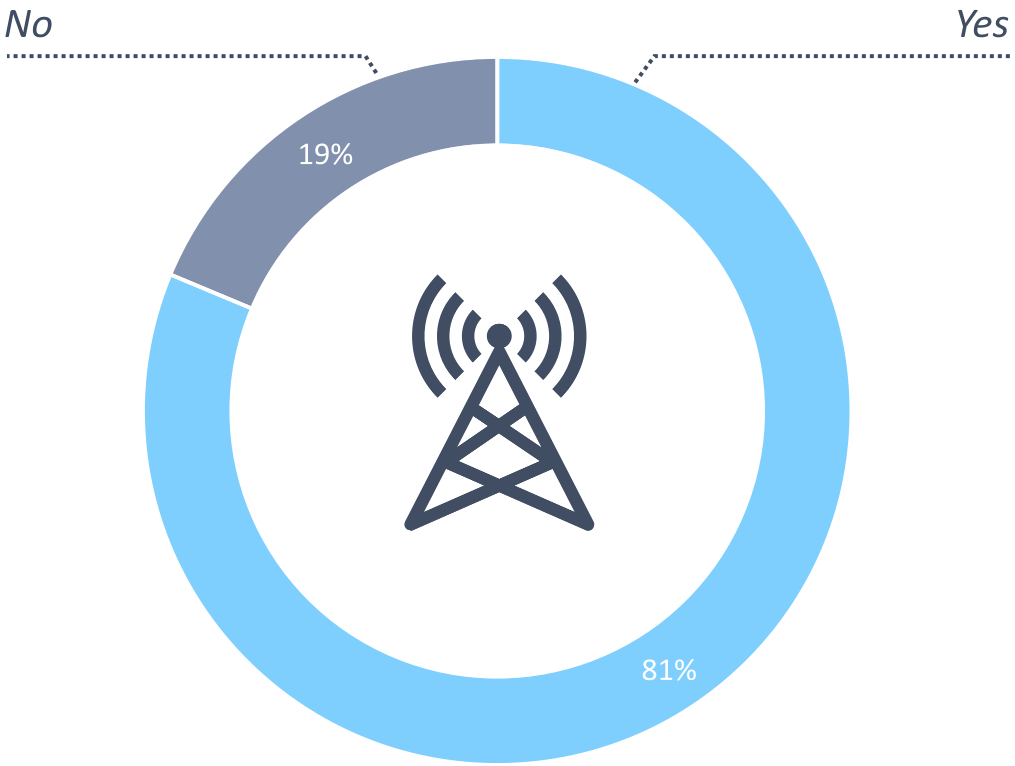
1.	Market Data
2.	Fibre Trends
3.	Public Funding
4.	**Open Access**
5.	Sustainability

Open Access

A predominant part of BREKO network operators offers Open Access and is open for cooperations.

Offering Open Access



Source: Survey of network operators (n=182).

Question: Do you offer Open Access

Around 23% of surveyed operators' fibre connections are marketed through Open Access Partners.

For around 14% of surveyed network operators a significant demand already exists, making Open Access part of their core business.

Agenda

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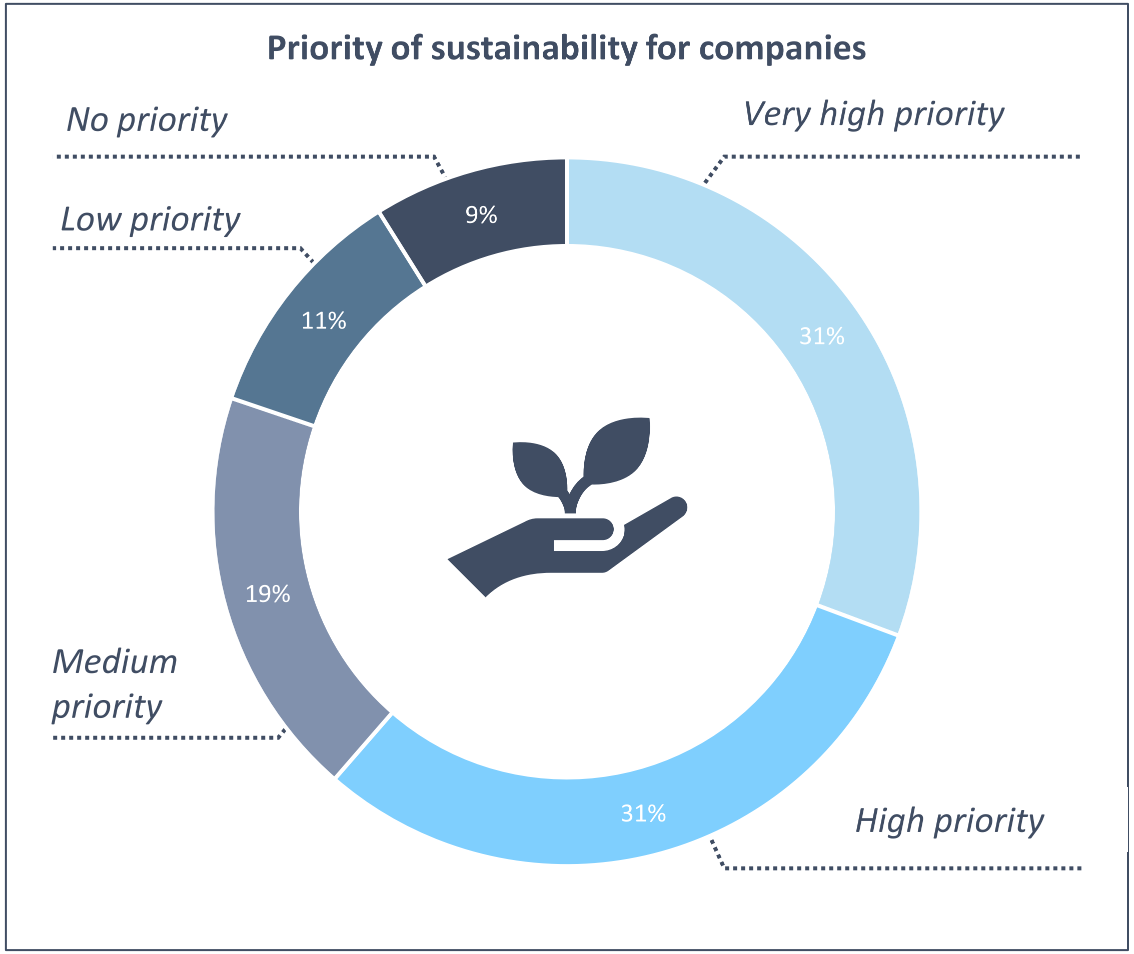
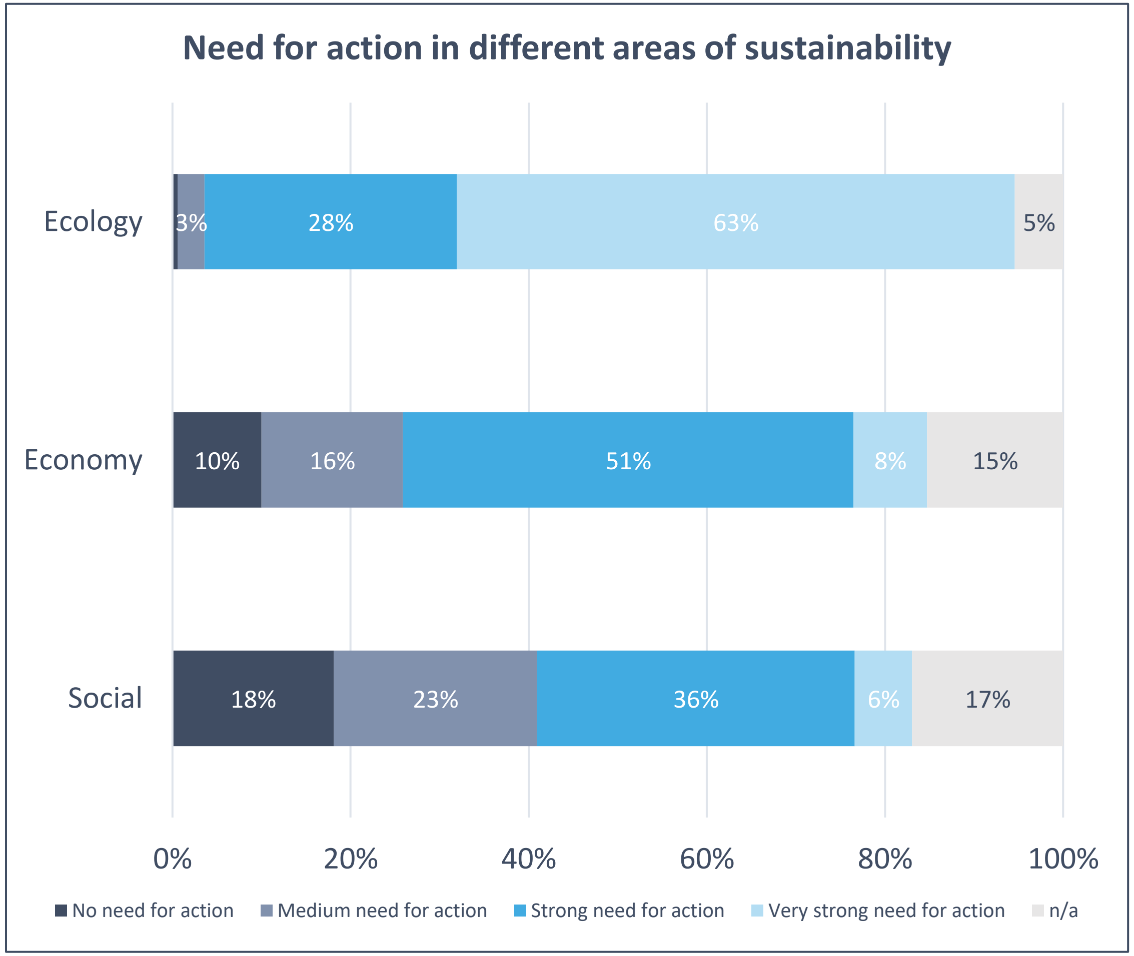
5. **Sustainability**

Priority of sustainability

Sustainability is a priority for network operators – but there is still a lot that needs to be done.



Source: Survey of network operators (n=182).Question: Which priority has the issue of sustainability in your company? Percentages are rounded.

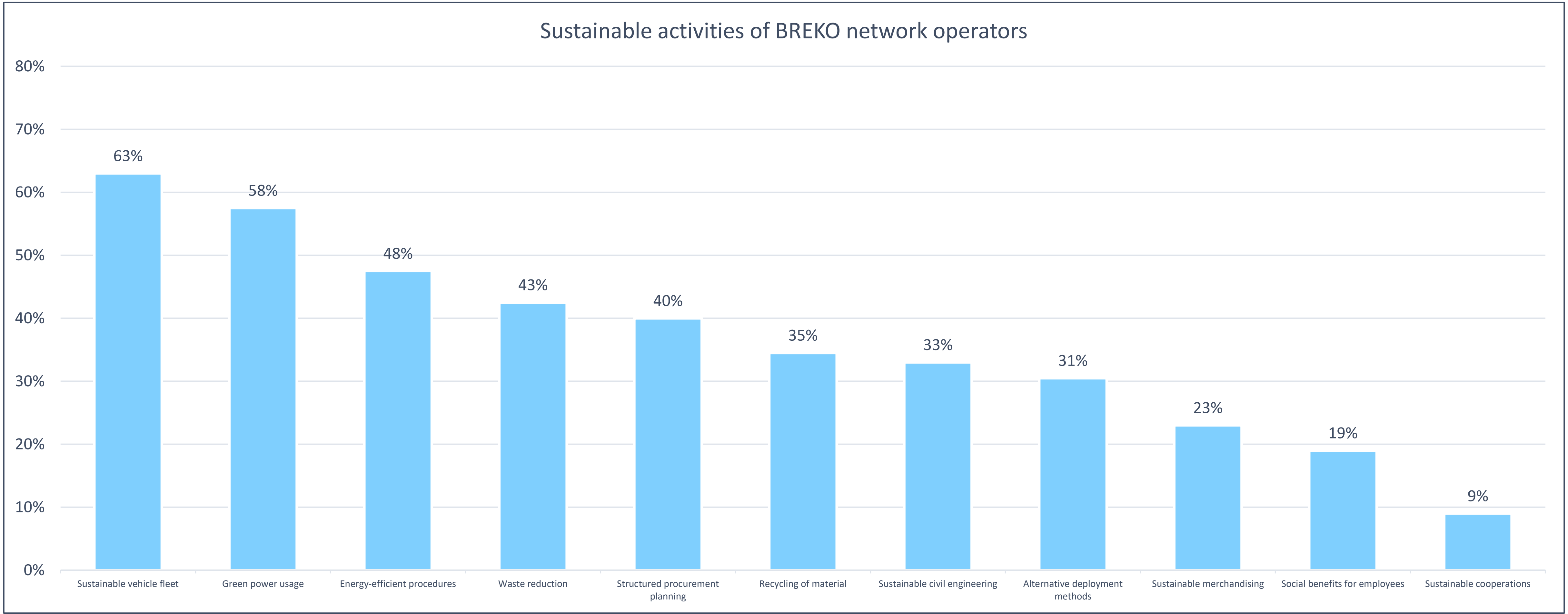


Source: Survey of network operators (n=166-171).

Question: Please judge the three areas of sustainabilty.

Sustainable activities

BREKO network operators are already developing a large number of sustainable activities.



Source: Survey of network operators (n=200).Question: Which sustainable activities are you pursuing today and in the future (multiple answers possible)?

BREKO Market Study 2022 – Summary:

- The availability of fibre connections in Germany is strongly increasing: Fibre coverage increases to 26% (as of 30 June 2022). Generally positive forecast for further deployment.
- Impacts of the war agains Ukraine are noticeable through price increases and supply bottlenecks, the perspective for further deployment is associated with risks due to uncertain developments.
- Take-up rate for fibre connections increases despite significantly higher availability of fibre to 47%.
- Record investments of €11 billion in 2021 in the German telecommunications market.
- Open Access is an important part of succesful fibre deployment in Germany.
- No significant substitution effects between fixed and mobile networks.
- Relevance of sustainability issues is increasing strongly.

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