Market potential for high-speed broadband connections in Germany in the year 2025

Overview and results

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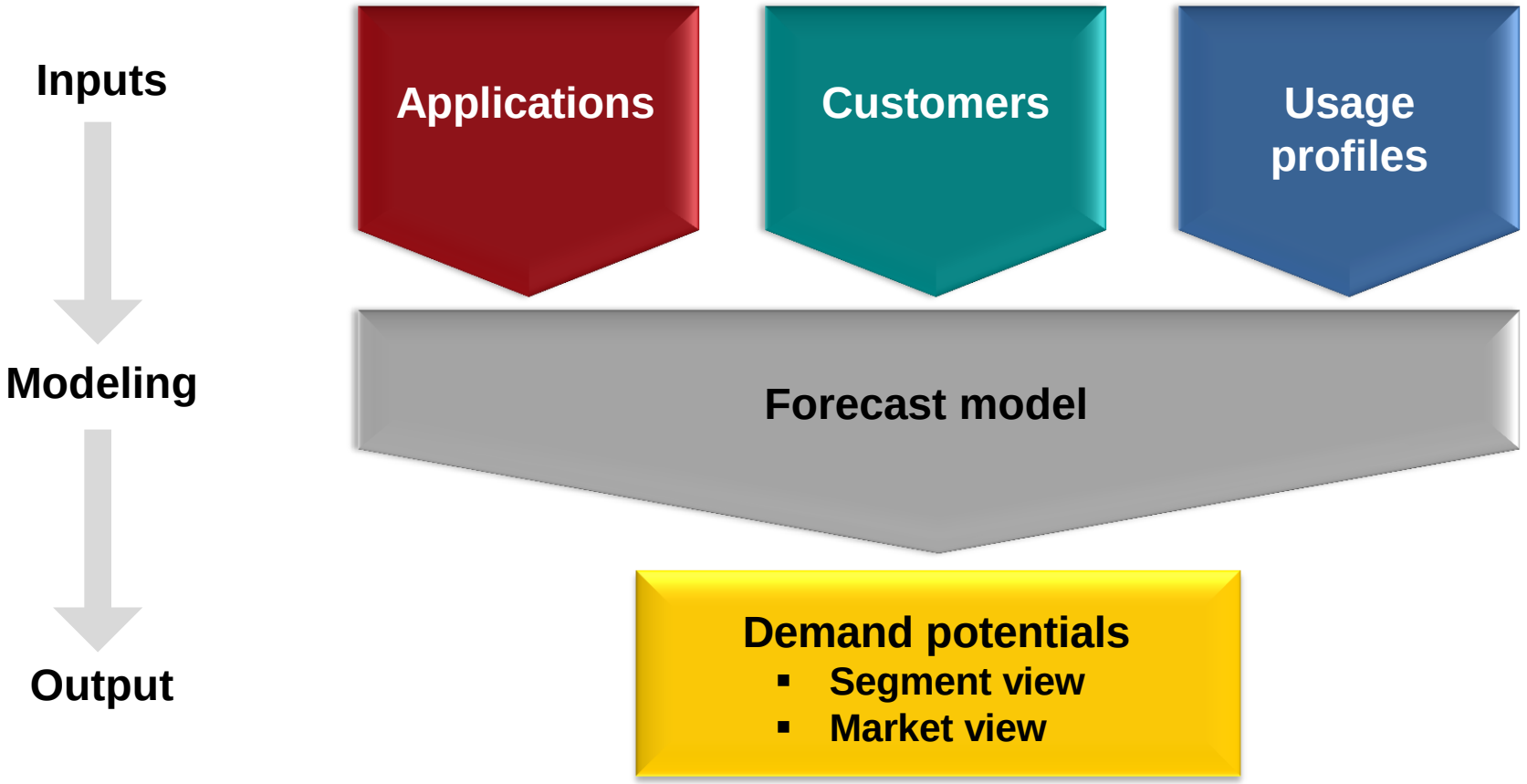
The central element in forecasting market potentials consists of a model with three main input parameters.



The approach is consistently based on „optimal user experience“, i.e. the customer is experiencing the best possible usage without limitations in usability or function.

The demand potential is determined by future applications as well as customer and user characteristics.

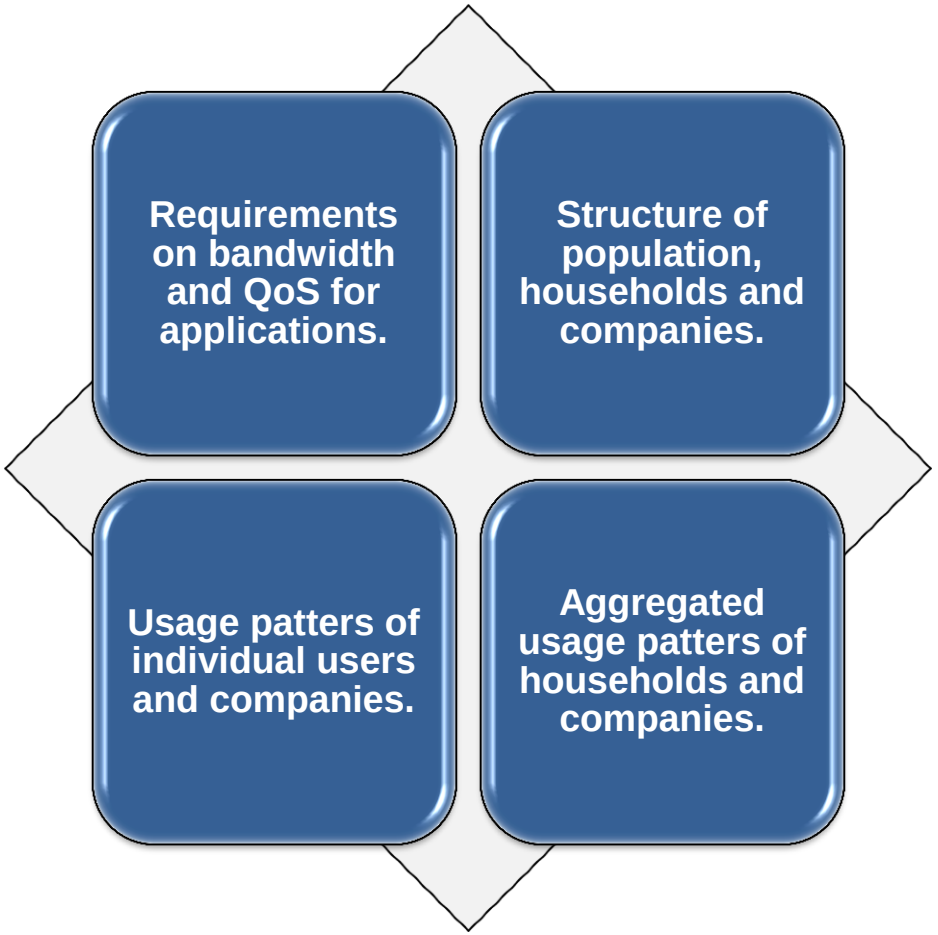
Basic assumptions

- Neutral understanding of stationary broadband connections, i.e. no limitations on technologies.
- Customers and clients are:

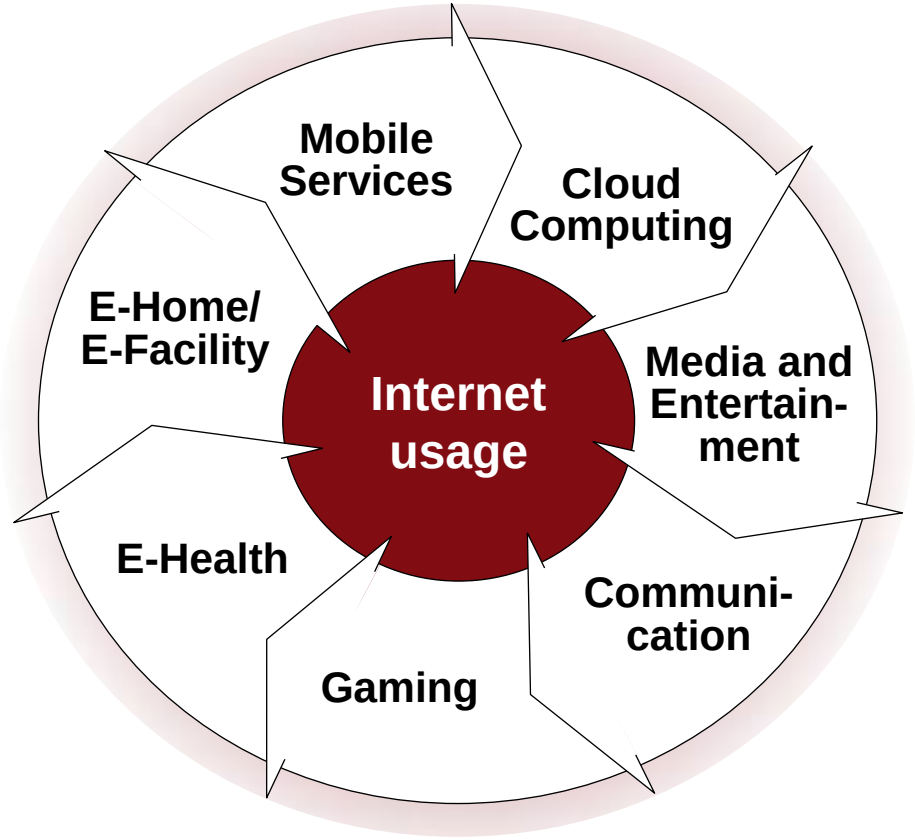
Households

Companies

Categories of relevant influencing factors



Future Internet usage, besides basic Internet usage, will be determined by seven central application categories.



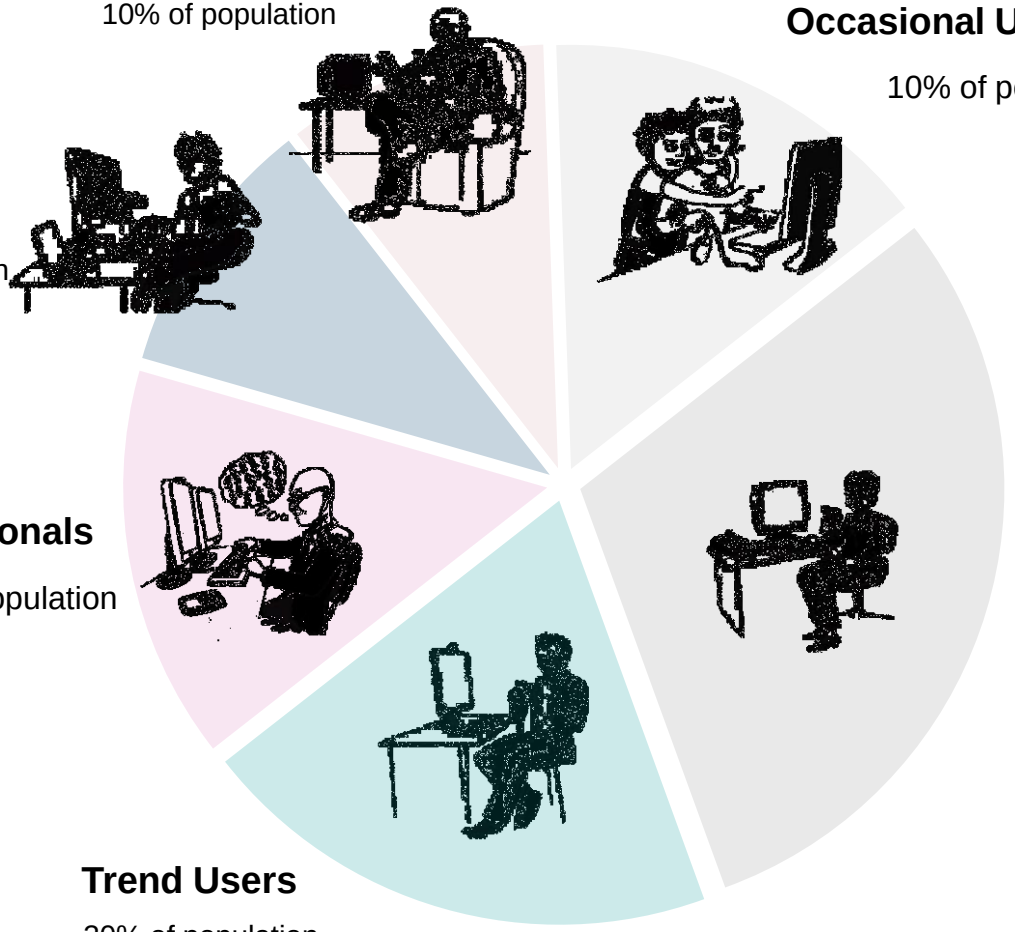
Application categories	Example
Cloud Computing	SaaS, IaaS, PaaS, …
Media and Entertainment	Video/Film, Web-TV, HD-TV, 3D-TV…
	Ultra-HD-TV, …
Communication	Telephony, Chats, IM, …
	Videotelephony, Videoconferencing, E-Learning, Homeoffice, ...
Gaming	Online-Gaming, MMOG, virtual worlds, ..
E-Health	Monitoring, Remote diagnostics, AAL, …
E-Home/E-Facility	Smart Meter, Home Networks, Smart Grid, Security, ...
Mobile Services	Location-based Services, Mobile Business, Apps, WiFi-Offloading, ...
Basic Internet	Websurfing, News/Mail, Photo, Downloads, Videoclips, Social Networks, Online Storage, ...

Down- and upstream speed as well as QoS-characteristics are used as input variables for the forecast model.

Application category	Downstream (Mbit/s)	Upstream (Mbit/s)	Packet loss	Latency
Basic Internet	≈12	≈10	o	o
Homeoffice/VPN	≈100	≈100	+	+
Cloud Computing	≈100	≈100	+	++
Media and Entertainment HD/3D	≈30	≈6	++	+
Media and Entertainment Ultra-HD	≈60	≈12	++	+
Communication	≈2	≈2	++	+
Videocommunication (HD)	≈25	≈25	++	++
Gaming	≈10	≈5	++	++
E-Health	≈8	≈8	++	+
E-Home/E-Facility	≈8	≈8	o	o
Mobile Services / Wifi-Offloading	≈12	≈10	o	o

O = No specific importance
+ = High importance
++ = Very high importance

Assumed structure of German population in 2025 based on D21-Internet typologies from 2010.



Digital Outsiders

10% of population

Occasional Users

10% of population

Digital Avantgarde

15% of population

Digital Professionals

20% of population

Job Users

15% of population

Trend Users

30% of population

Source: D21, WIK assumptions, Expert judgment

Assumptions on corporations in Germany in 2025

Assumptions

- **There is no structural change within company and SME segments for the future in Germany.**
- **The vast majority of companies operates within the micro segment of up to 9 employees.**
- **Medium-sized companies constitute only a small fraction of the company structure.**
- **Assumption: One site per company.**

Assumed number of companies

SME segment	Usage	Number
Micro (Up to 9 employees and up to 2 mn Euro annual sales volume)	Standard User*	ca. 590.000
	Heavy User**	ca. 2,7 Mio.
Small (Up to 49 employees and up to 10 mn Euro annual sales volume)	Standard User	ca. 80.000
	Heavy User	ca. 165.000
Medium (Up to 249 employees and up to 50 mn Euro annual sales volume)	Standard User	ca. 20.000
	Heavy User	ca. 35.000

* Non-service sector
** Service sector

Source: WIK assumptions, Expert judgment

Assumptions for usage patterns within population segments in 2025

Application category	Digital Outsiders	Occasional Users	Job Users	Trend User	Digital Professionals	Digital Avantgarde
Basic Internet	◑	◑	◔	●	●	●
Homeoffice/VPN	○	○	●	◔	◑	◔
Cloud Computing	◔	◔	◑	●	●	●
Media and Entertainment	○	◔	◔	◔	●	●
Media and Entertainment (Ultra-HD)	○	○	○	◑	◑	◔
Communication	◔	◔	◔	◑	◑	◑
Videocommunication	◔	◔	◑	◔	●	●
Gaming	○	◔	○	◑	◔	●
eHealth	◑	◔	◔	◑	◔	◔
eHome	◔	◔	◔	◔	◔	◔
Mobile Services / Wifi-Offloading	◑	◑	◑	◔	●	●

Usage intensity

- ○ very low
- ◔ low
- ◑ medium
- ◔ high
- ● very high

Assumptions for usage patterns within company segments in 2025

Application category	Micro		Small		Medium	
	Standard User	Heavy User	Standard User	Heavy User	Standard User	Heavy User
Basic Internet	●	●	●	●	●	●
Homeoffice/VPN	◔	◕	◕	◕	◕	●
Cloud Computing	◔	◕	◑	●	◕	●
Media and Entertainment	○	○	○	○	○	○
Media and Entertainment (Ultra-HD)	○	○	○	○	○	○
Communication	◔	◑	◑	◕	◑	●
Videocommunication	◔	◕	◑	●	◕	●
Gaming	○	○	○	○	○	○
eHealth	○	○	○	○	○	○
eHome	○	○	◑	◑	◑	◑
Mobile Services / Wifi-Offloading	◑	●	◑	●	◑	●

Usage intensity

- ○ very low
- ◔ low
- ◑ medium
- ◕ high
- ● very high

Assumptions on simultaneous usage

Households and corporations

- **Optimal user experience has to be guaranteed at any time. No limitations on usability or function.**
- **Applications with at least medium usage intensity are included in the calculation for bandwidth demand.**
- **Realistic modeling of usage patterns via primary and secondary activities:**
  - User will not use all of the applications included in his usage profile actively and simultaneously.
  - Secondary activities/applications run in the background and do not require users‘ attention (e.g. synchronization of data). Instead, primary activities with high bandwidth requirements (e.g. HD-TV stream) are the main focus of user attention.
- **Assumptions on primary and secondary activity:**
  - Primary/main activity is the application with the highest bandwidth requirement.
  - Simultaneous secondary activities are Basic Internet, E-Health, E-Home/E-Facility and Mobile Services/WiFi-Offloading (as long as they are relevant for individual usage patterns).

Transformation from single user level to household and company level

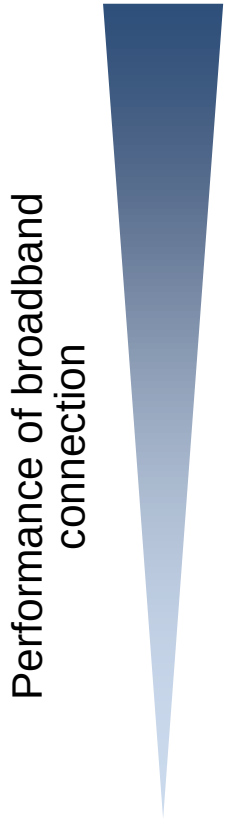
Households

- „Principle of affinity“: usage-intense household members do influence other members. Households are mainly composed of „nearby“ population segments.
- Head of household is assigned another household member out of adjacent next-best segment.
- Example: Household with 2 individuals, head of household is „Digital Avantgarde“, second member is „Digital Professional“.
- Focusing on households with 1, 2 and 3 or more individuals.

Companies

- Basic data on internet affinity
  - # of employees
  - % of employees with computer
  - % of employees with Internet
- Assumptions on simultaneous Internet usage.
- Assumption on minimum bandwidth requirement for micro companies.

The market potential for broadband connections in Germany in 2025 covers more than 90% of households and 100% of companies and is distributed across four demand categories.



„Top Level Plus“-demand:
350 Mbit/s and more downstream
320 Mbit/s and more upstream

- Ca.6,8 mn households
- Ca. 300.000 companies

15,9%

„Top Level“-demand:
200 – 300 Mbit/s downstream
170 – 280 Mbit/s upstream

- Ca. 12,3 mn households

27,7%

„Medium Level“-demand:
70 – 150 Mbit/s downstream
60 – 140 Mbit/s upstream

- Ca. 13,3 mn households
- Ca. 2,7 mn companies

35,9%

„Low Level“-demand:
up to 60 Mbit/s downstream
up to 50 Mbit/s upstream

- Ca. 4,3 mn households
- Ca. 590.000 companies

10,9%

No broadband / Refusal

- Ca. 4,3 mn households (refusing Broadband/Internet)

9,7%

∑ ca. 44,8 Mio. **100%**

Source: WIK

Key results – Broadband usage in 2025 in Germany

- Up to 4 distinct categories of broadband demand in the future
- Required bandwidth in the range of 60 Mbit/s downstream (entry level segments) and up to 350 Mbit/s downstream (high-end level segments)
- Total market potential for high-speed broadband connections of roughly 45 mn households and companies (SME)
- Vast majority of bandwidth requirements (nearly 2/3 of potential) within 70-300 Mbit/s downstream speed
- Requirement for substantial upstream speed (nearly symmetric with downstream requirements)