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Success story: free choice of terminal equipment fosters innovation and consumer empowerment

In Regulation (EU) 2015/2120 ("Net Neutrality Regulation"), which applies in all EU Member States, the European Union has expressly stated that end users have the right "to use terminal equipment of their choice".

This right has also been enshrined in German law since 2016. The clear definition of the network termination point in the Act on the Selection and Connection of Telecommunications Terminal Equipment (TK-EndG) dated 23 January 2016, as a necessary precondition for the free choice of terminal equipment, has proven its worth and is accepted on the market.

Italian end users have also once again been free to choose their terminal equipment since the autumn of 2018 thanks to the adoption of Delibera N. 348/18/CONS.

Thus, there is a clear trend in Europe towards the free choice of terminal equipment. This is fuelling competition in the market for telecommunications terminal equipment, with all of the many associated benefits for end users.

Mutual gains from the development of telecommunications terminal equipment and networks

There has been dynamic development in telecommunications technology and products in recent years. These advancements in telecommunications networks and terminal equipment are mutually beneficial. With end users free to choose their own terminal equipment, manufacturers are all the more motivated to upgrade and innovate. A multitude of different products are now available on the market, from inexpensive devices for basic requirements through to integrated, feature-rich equipment with the latest technology. These are based on all major current standards and fully support high-performance connection technologies and the services provided through them.

Technological advancements in terminal equipment mean that networks – especially the gigabit-ready networks of the future (e.g. fibre) – will become even more "usable" for end users. Figures confirm the dynamic development of high-performance networks as well.

A look at mobile communications also shows that the free choice of terminal equipment does not impede the continuous technological advancement of networks. Indeed, the development of terminal equipment and networks results in mutual gains; without this, the iPhone would never have been a success story, for example.



The "socket on the wall" as a passive network termination point is technology-neutral and meets EECC requirements

The legal requirements for restoring freedom of choice with regard to terminal equipment in the German Telecommunications Act (TKG) were deliberately formulated in a technology-neutral manner to encompass all access technologies, including DSL, cable, fibre, etc. Accordingly, the junction box ("socket on the wall") to the subscriber connection line ("cable from the wall") should be regarded as the general network termination point.

Thus, the clarification in German law that the network termination point is "passive" already corresponds today to European legislation (Directive (EU) 2018/1972 establishing the European Electronic Communications Code (EECC)), which is yet to be transposed into national law.

The network termination point is "the physical point at which an end user is provided with access to a public electronic communications network" (Art. 2(9) EECC). This kind of passive physical connection point exists in all fixed networks, completely independent of the transmission technology (copper, coaxial cable, fibre, etc.) and network topology (point-to-point, point-to-multipoint, etc.). The "passive" property of the network termination point is therefore technology-neutral, particularly as it only clarifies that the terminal equipment connected to the network termination point has access to the physical transmission medium (the "line").

Cable modems, ONTs and electro-optical converters are *not* part of the public network

Terminal equipment is connected to the interface of a public telecommunications network (network termination point) and cannot, therefore, be part of this network. This means that what network operators call "network termination devices" (such as cable modems, optical network terminations (ONTs) and electro-optical converters) cannot be network termination points. The clarification in Section 45d TKG that the network termination point is "passive" is therefore in conformity with European law.

Furthermore, it follows from European law (EECC) that cable modems, ONTs, electro-optical converters and the like, due to their technical properties/functions, are nothing more than modems, which are considered terminal equipment in the EECC. According to the Net Neutrality Regulation (Art. 3(1)), end users have the right to freely choose their terminal equipment.

In addition, neither end users nor service providers are interested in an additional electronic, power-consuming device when an integrated device would be possible.



Integrated terminal equipment works with all network technologies

It applied and still applies to all network technologies that the transmitted signals (whether optical, electromagnetic or electrical) are converted and "unbundled" by the terminal equipment on the subscriber connection in such a way that the subscriber can use these.

Neither point-to-point nor point-to-multipoint networks require an electronically active network termination (ONT, cable modem or electro-optical converter). Instead, even for fibre and cable (as with DSL and mobile telephony), terminal equipment with an integrated modem is needed.

Direct connection to the network successfully in use worldwide

There are a large number of networks being successfully operated without active network termination – including cable networks in Germany (some 8 million connections¹) and the USA (some 61.5 million connections²), PON fibre networks in China (more than 140 million connections via China Telecom alone³) and mobile networks worldwide (some 8.2 billion connections⁴).

Interoperability and high transmission quality guaranteed with free choice of terminal equipment

The examples from the other countries also show that the free choice of terminal equipment functions perfectly in gigabit-ready networks, especially with regard to interoperability and transmission quality.

Since the modems in the integrated terminal equipment have been developed based on international standards, interoperability is ensured, as the standards not only specify requirements in respect of data transmission but also provisions for the configuration of connection properties, error detection/correction and fault prevention. Otherwise, competition would serve as a natural filter in this regard – non-interoperable terminal equipment would simply not sell.

Therefore, terminal equipment manufacturers have a strong interest in ensuring that their equipment is interoperable and without outdated firmware versions or vulnerabilities. Otherwise, end users will turn to other manufacturers to find the best terminal equipment.

Mobile telephony as a shared medium (point-to-multipoint network) also relies strongly on cooperation and roaming agreements. In spite of the very large variety of applied standards and terminal equipment, free choice of terminal equipment has worked perfectly in the area of mobile telephony for a long time.

¹ In 2018; Dialog Consult/VATM: Broadband connections by network type

² In 2018 (Q2); Wikipedia: Internet in the United States, 2 Broadband Providers

³ In 2018; Statista: Number of wireline broadband fibre-to-the-home (FTTH) customers of China Telecom from 2016 to 2018 (in millions)

⁴ In 2018; Statista: Number of mobile lines worldwide from 1993 to 2018 (in millions)



Open access an obvious possibility with free choice of terminal equipment

A glance at other markets shows that there is no issue with the use of customer-specific terminal equipment in open-access models. Standard offers or comparable cooperation offers based on the passive junction box are available in gigabit-ready cable networks in Belgium, the Netherlands and Germany. In the Netherlands, Sweden and Switzerland, there are fibre cooperation and open-access models which consider the passive fibre junction box (OTO, fibre telecommunications connection unit (Gf-TAE)) as the final stage of the wholesale service; an ONT is not part of the wholesale service there. In the Spanish GPON network, wholesale offers for passive fibre from multiple network operators are based on a regulated standard offer, which expressly does not include the ONT.

Of course, the terminal equipment for DSL, cable, fibre and mobile networks must meet the respective network operator's interface specifications and comply with all other requirements such as electromagnetic compatibility, low voltage and general product safety. Furthermore, the terminal equipment is based on national and international standards which, among other things, govern the transmission of user data as well as processes for the configuration of connection properties, error detection, troubleshooting and fault prevention. This ensures interoperability between networks and terminal equipment and prevents faults and restricted service quality. It is therefore not clear what would stand in the way of a regulated wholesale service if there was free choice of terminal equipment.

Into the future with free choice of terminal equipment

The general public and policy-makers have a strong interest in seeing the further expansion of gigabit-ready networks in the near future. This means formulating attractive offers for customers. We firmly believe that these attractive offers in particular require that gigabit-ready networks can also be used with freely chosen, high-performance terminal equipment. Private and commercial end users must have offers tailored to their specific needs – both in respect of the network and the terminal equipment.

Network operators want to extend their sovereignty over the network as far as possible into the local/home network of their customers, as this is not only convenient for them, but, more importantly, represents an additional source of income. However, this situation inevitably leads to terminal equipment monocultures and all of the associated disadvantages in terms of quality, innovation and security.

Free choice of terminal equipment leads to innovation and product diversity, which is in the interests of end users and promotes a vibrant competitive market for telecommunications terminal equipment. This is why EU Member States need to rigorously adopt/implement the already established right of end users or restore their freedom to choose terminal equipment.