

VIDEO

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# Digitisation 2019

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# Preface



**Cornelia Holsten**

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**Thomas Fuchs**

Coordinator of the expert committee on communications networks, technology and convergence of the ZAK

The report on digitisation is celebrating an anniversary this year: 15 years can be a long time – and yet, they can pass in no time at all! This is all the more so when one considers the speed of technological change the media sector is experiencing. And how things are changing is particularly evident in the research that shows up trends revealing a great deal about the market: How do television viewers use their sets, how are they adapting their patterns of usage? How are the transmission routes and the content provided changing?

Dr. Hans Hege and Andreas Hamann have been accompanying these developments for the media authorities; by looking back over the past 15 years, their paper allows an insight into the work, research, and the approach governing media regulation. This look back shows the magnitude of the changes in the media world: While in 2005, just a quarter of German households could receive digital television, the number today is 100 per cent. Among the youngest audience group, VOD content consumed via the internet successively displaces traditional linear television. The work of the media authorities has changed in the same vein;

they have been dealing with the changes of technology along the route as mediators, moderators, and partners.

Naturally, the research conducted for the report on digitisation has also advanced and been aligned to encompass the technical innovations. For quite some time, the report on digitisation had widened its focus to cover more than the original status report on the progress made in the digitisation of transmission routes: In a very differentiated fashion it documents the changes in the consumption of moving images which ultimately also result from digitisation. Alongside the de-linearisation of video consumption which is driven by VOD, we can now see that IP networks first and foremost gain in relevance for the transmission of moving images, be it via the smartphone, tablet or smart TV set. As a result, the user surfaces of these devices and the apps installed on them are increasingly moving upfront – after all, they are the bottleneck content providers must pass for delivering their products to the viewers.

The first hurdle along this path is presented by the appliance manufacturers: They decide which apps for moving images are pre-installed on the device purchased by a consumer, how easily consumers can adapt the apps or install their own favourite apps. Apart from the issue whether user surfaces of television sets are adapted at all by consumers, we therefore for the first time investigate which video apps are used on (which) smart TV set.

Hurdle number two are the providers of live television content in open networks themselves who are also in a position to discriminate against certain content thanks to the way in which they design their apps and surfaces. Although still lagging far behind VOD, the consumption of live television via the open internet is gradually gaining in relevance as more and more providers enter the market. For us, this is sufficient reason to take a closer look at which offers are actually consumed as the content provided has grown: IPTV or cable providers now offer their live programme packages across the open internet, thus separating television viewing more and more from the “traditional” routes of

transmission – and indeed, the number of so-called “cord cutters” has experienced a sharp rise over last year, even if the figure overall is still very low.

On the international stage, the digitisation both of television homes and HD reception is steadily on the rise; this is shown by Ricardo Topham in his comparison of European countries. The demands of users regarding video offers are also growing: Consumers expect flexibility not just as regards content, but also as regards the different screens. Device manufacturers and content providers are thus called upon to offer varied options for consumption – a trend which in the view of the media authorities is only to be welcomed. The media authorities will go on covering these developments and new trends of consumption and will continue to act as partners for the media industry accompanying and moderating developments.



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# Digitisation report no. 15

## Looking back and forward

Dr Hans Hege, Andreas Hamann

In 2005, a mere quarter of German households could receive digital television. Broadband internet at the time was only carried via DSL and was still in its infancy. YouTube had just celebrated its first birthday and had not yet been bought up by Google, Facebook was irrelevant for media consumption and public communication, and the iPhone revolution for mobile media use was still two years away.

2005 was also the year in which the first report on digitisation was published. It featured two main issues: an analysis of the challenges brought about by digital television and the transition from analogue to digital delivery facing the industry, politics, and regulation, plus a section offering facts and figures based on a survey on the digitisation of the German TV market assessing the status quo in German TV households.

In taking up with these issues over and above their remit of platform regulation, the media authorities intended to contribute to the general understanding of digital developments and the way they were going to be shaped. The results of

the surveys were to help moderating the process of transition. Digitisation could not be realised by simply instructing its coming into effect, but rather required a dialogue involving all partners in the market. The regulators put a special focus on developing diversity of providers, securing opportunities for local and regional broadcasters and ensuring open access to hardware and to technologies. In addition, the media authorities also wanted to contribute to the discourse which takes place outside of their traditional remit: the digital dividend and the future of public-service broadcasting.

In the 2005 report on digitisation, the media authorities identified the following issues which were of specific interest to the public or required regulation:

- securing choice for users/consumers
- a diverse content offer and the prevention of dominant positions with a view to the formation of opinion
- securing development opportunities for local and regional content

- universal (full-range) access of users/consumers to the most relevant media content
- protection of minors
- protection of consumers
- copyright protection
- developing the media industry and strengthening it as a growth industry.



The changes brought about by digitisation since then have been more profound than we expected at the time, and they are by no means completed yet. The mission of effecting the analogue-digital switchover of broadcasting transmission routes which we focussed on at the time has been successfully accomplished. We can draw our conclusions from this phase and in the light of it analyse the new challenges arising from the subsequent phases of digitisation, the role the internet has taken on for audiovisual media dissemination, and the alterations of communications structures that had been originally shaped by classical media and have since been impacted by new players.

### Phase one: the digitisation of broadcast transmission routes

In the first phase of digitisation the media authorities focused on the digitisation of broadcast transmission routes, i.e. the infrastructures providing the main avenues for the linear transmission of television content. Digital transmission paved the way for a higher number of services, better picture quality and new business models. Overcoming scarcity, however, came at the expense of the specific influence which the media authorities and legislators could exert in the founding period of commercial television by allocating scarce resources, especially under local considerations. As regards regulation, higher bandwidths reduced the relevance of access to infrastructures. The network operators successively introduced new models, included the broadcasters in their offers and provided funding to the providers for their content, thereby increasing the importance of these terms guiding content distribution

Consumers were forced to acquire a set-top box for receiving digitally transmitted content as standard TV sets usually were not equipped with the necessary reception technology. Synergies of DVB technology made prices acceptable due to the added value provided.

The analogue offer which was limited and was provided for on the basis of the decisions of the media authorities gave way to electronic programme guides offering orientation within the growing range of digital channels. EPGs turned into a new major field of the new platform regulation.

### Analogue-digital switchover of terrestrial transmission

Going digital was the only way in which the terrestrial transmission route for television content could be preserved. The share of households consuming analogue terrestrial TV had dropped below 10 per cent, and it was therefore only a question of time before the commercial broadcasters would have ceased offering content terrestrially as the cost per viewer increased accordingly.

The media authorities played a major role in organising the analogue-digital switchover which was completed well before the original deadline which had politically been fixed for 2010.

The switchover to DTT could turn into a success only because both public-service and commercial content providers went along with it. The switchover processes organised in the various regions of Germany were helped considerably by the media authorities drawing on the benefits provided by the federal structure of broadcast regulation. They succeeded in preserving choice for consumers in particular in the major conurbations where – owing to the lack of access to satellite TV reception – the only alternative would have been cable reception. For this reason, consumers went along and accepted the switch-off of analogue transmission without compensation.

A decade later, terrestrial TV transmission faced the next challenge: It could be preserved only by switching from DTT to DTT2 HD. The new infrastructure provides HD content of the same quality as the other transmission routes. In order to win over the commercial broadcasters to participate in this step, a platform model had to be developed under which users now have to pay for receiving commercially-provided content.

While the terrestrial frequencies lost their relevance for broadcast transmission, they gained attraction for mobile operators and politicians who were interested in making the most of the benefit of the frequency spectrum with its overall coverage to expand broadband supply in rural areas.

### Analogue-digital switchover of satellite transmission

In 2005, TV reception via satellite constituted the most important route of digital transmission, providing TV reception for almost 40 per cent of satellite households. The media authorities played a major role in turning this into a success by pushing for open receiver standards not incorporating any proprietary functions of navigators or billing regimes. In other European countries, the satellite reception market is dominated by pay-TV platforms.



Over the following years, the share of digital satellite households went up steadily. At the same time, the range of HD offers was expanded with commercial content providers operating a model under which they receive a share of the actual

fee payable to the satellite platforms (HD+). Once more, the media authorities were in demand for mediating and for project steering when analogue transmission was switched off, as this necessitated a joint national communication strategy. Free reception of commercial channels transmitted in SD quality was maintained, requiring a timely information of the approx. 10 per cent of households resorting to analogue reception. In 2012, analogue transmission was switched off.

### Analogue-digital switchover of cable transmission

Switching over cable reception from analogue to digital was the most time-consuming process involving the regulators. Alongside analogue transmission, the developing digital SD and HD offers presented sufficient choice for many consumers and could be received without the need to acquire an additional reception device. The housing industry which is of major relevance for cable providers did not wish to confuse tenants while content providers were keen to preserve the benefits of audience reach provided by analogue

cable transmission; they therefore paid for the added benefit. The interests of the cable network operators, on the other hand, in switching from analogue to digital service provision initially remained limited despite the on-going parallel expansion of broadband. However, the share of digital cable households went up year on year, and more and more homes acquired a digital-ready receiver. The flat screen made HD a true attraction which could be enjoyed only by resorting to digital reception.

The lead for effecting the switchover was the responsibility of the cable operators, and unlike with satellite, no national solution was needed. Again, the media authorities moderated the process, balancing interests among the parties involved and ensuring both consumer protection and preserving diversity of content.

### Analogue-digital switchover: the whole picture – only limited innovation and alteration

The digitisation of broadcast transmission infrastructures in Germany is more or less complete by now. It remains to be seen whether and, if so, when SD transmission is discontinued for reasons of capacity, limiting transmission of content to HD quality offers. The transmission processes involved, however, at first glance do not involve such principal issues as the switch-off of analogue terrestrial transmission. The basic structure of the German television landscape which dates from the analogue era and involved two public-service providers and two commercial families remained untouched by the digitisation of transmission infrastructures, nor was it impacted by the changes in the ownership of the ProSiebenSat.1 group.



What can be stated is that the digitisation brought about an expansion of the variety of content services as had been hoped, both as regards public-service content and commercial offers. Between July 2004 and July 2005, the number of commercial services distributed nationally rose from 75 to 95 channels (see 8th annual KEK report). By mid-2018, 190 commercial TV channels had been granted a licence for national distribution, and compared to last year, the range of commercial services available has risen further (see 20th annual KEK report).

Another change to be observed during this process concerns the funding of the commercial television sector. Whereas in 2005, advertising constituted the major and almost exclusive basis, new funding models were successively introduced under which some content providers receive returns from the distribution revenues generated.

Average viewing time of traditional television is still high, although it is going down among the younger audience groups. This change became very evident in the 2017 survey as outlined in the digitisation report for that year: For the first time, the youngest age group (consumers aged 14–29 years) spent more time watching VOD than traditional linear television. In the following year, the share of young TV users dropped an entire 25 per cent over the previous year.

Attempts to not only increase picture quality and to widen the choice of offers, but also to introduce new services met with only limited success. The Media Home Platform (MHP) provided technical options for linking services with internet offers, but did not achieve the attraction provided by using the internet in parallel to consuming TV content. The successor technology HbbTV while being acknowledged as a technical standard still remains

limited in application. Access to content via app portals or new platforms such as Joyn, which was started recently, appear to provide users with an easier route.

The tendency of overestimating its own networks and of underestimating the dynamics of the internet which the broadcasting industry was given to resulted in the greatest failure when it attempted to pave the way into the new world of mobile devices providing video and audio reception offering linear television services for mobile reception.

The media authorities supported both DVB-H as an advanced technology compared to DTT, and DMB as the next technical stage of DAB. At more or less the same time, the iPhone and LTE were developed for broadband mobile reception – unnoticed both by the general public and the media authorities. Nokia, as the most successful manufacturer of mobile phones, went under in the process.



The world of television got away suffering less damage since mobile TV did not ever get beyond the trial stage. Linear TV, which users can only

watch along a predetermined schedule of content provision, is nowhere lacking more in attraction than regarding mobile reception. Even high-profile soccer, which could be considered an exception, does not provide for a business model that is sufficiently sound for funding the set-up of a separate transmission network. This developed much faster than foreseen by many technical experts, however, by the internet.

### Phase two: audiovisual media content disseminated via the world-wide web

The development of broadband technology via DSL, which was pushed by Deutsche Telekom in particular, provided the basis for compiling and marketing linear television content, paving the way for IPTV as the fourth digital transmission infrastructure. It has already overtaken terrestrial reception in television households, and offers more choice to consumers especially in major conurbations.



The specific network structures provided by IPTV allow for the benefit of a guaranteed image quality. Advanced internet technology and higher data rates in broadband supply formed the basis for the distribution of audiovisual media content across the open internet as an attractive competitive offer, regarding both the media libraries built up by the content providers and video platforms such as Netflix or YouTube.

The infrastructure employed for the transmission of broadcast content is rather simple: It is governed by a clear priority for broadcasting content, it is available without the spectrum being auctioned and it is distributed via regionally structured networks operated by platforms selecting and marketing the content they offer.

Ever since the internet went broadband, it has been able to carry audiovisual content to a large number of users simultaneously, but also reaching individual consumers in a personalised form. Broadcast content is not privileged concerning transmission on the internet, but the principle of net neutrality applies, and this is not related to any specific type of content. The World Wide Web is a global structure providing specific benefits thanks to its advantages and network effects in particular to providers offering their services not merely on a national level.

Unlike traditional broadcast transmission platforms, the internet is not governed by a single dominant operator able to determine use. This difference becomes especially evident looking at cable network operators active in the traditional industry who select the content which is regulated by the media authorities in the framework of platform

regulation, but at the same time offer data rates in the internet consumption of which is decided upon by the respective customer.

Traditional telecommunications enterprises adopted a strategy that had also been chosen by AOL for the brief period of its success, capitalising not only on data transmission across the internet, but also compiling content and uses. These closed worlds, however, were not successful in the long run as they could not keep up in the competition against the open internet.

In the same vein, hardware manufacturers undertook attempts repeatedly to promote the reception of content and services they had selected. No major instances of abuse requiring the regulators to step in occurred, however, as the existing competition and the dynamic development of the internet counteracted these strategies.

The internet owes its innovative force to the fact that it was not set up by traditional media or cable operators but by new enterprises which utilized the open access and could develop economies of scale in the global competition without operating their own networks or funding their own content. In the US, in particular, these entrepreneurs benefited from regulatory leave which was unheard of in the traditional media and telecommunications industries. The downside resulting from this scenario: These companies have acquired dominating positions that exceed those of the traditional companies by far.

A new type of platform has come about that differs fundamentally from the broadcasting platforms governed by the provisions of the Interstate Broadcasting Treaty.

Audiovisual media content makes up for only a section of the internet irrespective of the fact that video offers take up a specifically large percentage of transmission capacities. Platforms such as Google not only exert considerable influence in the media sector – the cases of abuse that have been investigated relate to the link to commercial activities outside of the media sector.

Media regulation now has to face the question whether, and in which way, the traded privileges of the broadcasting sector can be ensured online as well. Or will media regulation have to content with at least preventing disadvantages to specific offers and opinions?



In their reports on digitisation, the media authorities have outlined that the share in the consumption of professional media content via the internet is growing: More and more devices featuring a large screen (in the past, measurements related to TV sets only) are now internet-ready, and consumption via tablets and smartphones is also on the way up.



An evident problem is the funding of local and regional content in the future as the established business models for this sector are disappearing. The advertising market is shifting towards new internet companies. Findability is another major challenge, considering that the amount of media content on offer is getting ever larger. This puts an ever greater question mark behind the issue of funding content which is of essential relevance for local identity and discourse.

The issue of how to define public-service content and its funding from public means in the future was raised in the first report on digitisation as early as 2005. An answer from politics is wanting to this day. The structure and remit of public-service broadcasting in Germany remains as controversial as the way in which it is paid for. In the commercial sector, the debate focuses on public value linked to privileged findability. And the idea of funding commercial content from the licence fee revenue has thus far remained limited to the habitat of industry events such as the Munich Media Days.

### **Phase three: changes in the formation of public opinion through the internet**

Traditional media regulation is geared to the impact which media exert on the formation of public opinion. On the one hand, it aims at limiting the concentration of power of opinion by restricting its impact across the various media. On the other hand, the regulation of platforms is meant to ensure equal access for content providers to platforms, and thus to users. In election times, specific provisions apply.

The traditional media continue to exert major impact, but more and more, the formation of opinion is initiated no longer by them, but by third

parties resorting to opportunities the internet has to offer. The idea of “open channels”, which dates from the analogue world, has turned into a success story, but this success is due to commercial platforms such as YouTube and Facebook. The algorithms employed by these platforms are geared to the commercial interest relating to attention – and hence – advertising revenue, rather than to equal access of the established media. With the internet, opportunities have developed for impacting the formation of opinion outside of the provision of opinion of the established media that have been totally unheard of to date. However, these opportunities can also be used to disseminate hate speech and fake news which frequently tend to attract greater attention than serious reports based on journalistic principles. While the traditional media are clearly transparent as regards their responsibility in this respect, the internet opens up opportunities for sources at home and abroad which are difficult to identify.

The internet platforms have now started to set up defence mechanisms in an attempt to get a grip on hate speech and manipulation at elections. However, they are not adapting their business models which benefit from the attention extreme messages and even fake news are attracting. In addition, populist movements can be seen to be particularly present and active in the internet.

The processes governing the formation of opinion in a democratic society on which the Federal Constitutional Court based its broadcasting decisions are mirrored less and less in the actual developments which the process of communication is experiencing. While the regulation of traditional media was a comparatively simple pro-

cess, Facebook and Google exert a different type of influence, and the necessary rules and their implementation are an issue discussed all over the world.

Regulatory frameworks such as rules for election advertising or public relations activities of state institutions are based on the models that worked in the old world.



What is required is a new definition of the responsibilities of traditional broadcasting platforms. They do not collate journalistic content in the way in which this is done by traditional media, but nevertheless exert some influence on the formation of public opinion. Alongside abuse by third parties, there is certainly also the risk that the platforms might discriminate against certain opinions themselves. Rupert Murdoch, for instance, exerted considerable influence on political developments through his media outlets – if not in Germany, then certainly in the United Kingdom and the United States. The digital platform he set up did not yield the same success that Facebook enjoyed

subsequently. But the requirement laid down by the Federal Constitutional Court to counter undesirable developments at an early stage still applies.

Another player in the market for media, and thus the market for the formation of opinion, are the so-called intermediaries. They are increasingly morphing from simple technical platforms providing to everyone the opportunity to offer and search content into processed pages dealing with specific issues. While a considerable number of varied provisions for governing potential abuse was developed at the start of commercial television in Germany, no such regulation was established governing internet platforms. It is fair to state, however, that the mechanisms under which they operate are more complicated and complex; this relates not only to the secretive algorithms, but also to new forms of use and economic rules.

The above-mentioned objectives for media regulation have not lost any of their relevance in today's digital media world. Ensuring a free public process for the formation of opinion is (again) of eminent relevance for our society. To secure these objectives and safeguard the formation of opinion a neutral, independent public institution continues to be essential.

The media authorities are in the position to fulfil this task in the digital world, too. They have always been able to face new challenges developing in the markets and have already started to analyse the new phenomena. This activity is based on their remit of watching and analysing the market which was started in 2005 with the first report on the digitisation for the area of digitisation.



# Digitisation in Germany: facts and figures

# The current status of digitisation of TV reception and the use of digital TV and video in Germany

September 2019

Dr Simon Berghofer

The report on digitisation, which is published by the German media authorities, has been covering the process of television transmission infrastructures going digital for fifteen years; it thus also provides a comprehensive documentation of the changes in the media consumption in the wake of digitisation. This year we can report that full digitisation has been achieved and analogue TV coverage is now part of the history of television transmission in Germany. This is a good reason for taking a look back at the process of digitisation including the main stages and milestones; they underpin the unprecedented variety and quality of content offers we can now resort to as viewers in Germany. The first section of this report will therefore take a closer look at the longer-term trends of the development and the market shares of the video transmission routes, giving ample room not only to up-to-date interesting current data such as growth in the area of IP-based television transmission, the rate of internet connections used for television consumption, or household figures for smart TV, HD and UHD receivers. As is good tradition for the report on digitisation, the second part will show up the changes in the television and

video consumption resulting from digitisation. It offers detailed data on the use and preferences of reception equipment; the current figures also show up a continued trend towards delinearisation and video on demand (VOD) consumption. Video usage independent of time and place and independent of the source, which could be a media library offered by a television channel, YouTube, or a video streaming provider, is getting ever more relevant. At the same time, more and more live programmes are streamed via the internet – all this is reason enough for a closer look at the content and the providers in this sector. The content offers and the platforms which consumers watch online are increasingly dependent on how easily they are found – and this automatically leads to the question of how user surfaces on end devices and apps are designed. At the end of this article, we will therefore also analyse the apps for moving images installed on smart TV sets and how they can be adapted and personalised.

## Part I: Digitalisation and distribution of reception infrastructures

In 2019, 38.5 million households in Germany have at least one television set at their disposal. The corresponding rate of 95.4 per cent of all homes shows a continued slight trend downwards over five years and in figures came to a mere 1.7 percentage points. The number of households in Germany that currently do not have a television set at all is just under 1.9 million homes.

### Television transmission infrastructures now fully digital

More or less every household in Germany equipped with a television set consumes television via digital infrastructures. The successful completion of the analogue-digital switchover of the cable networks formed the final piece in the digitisation

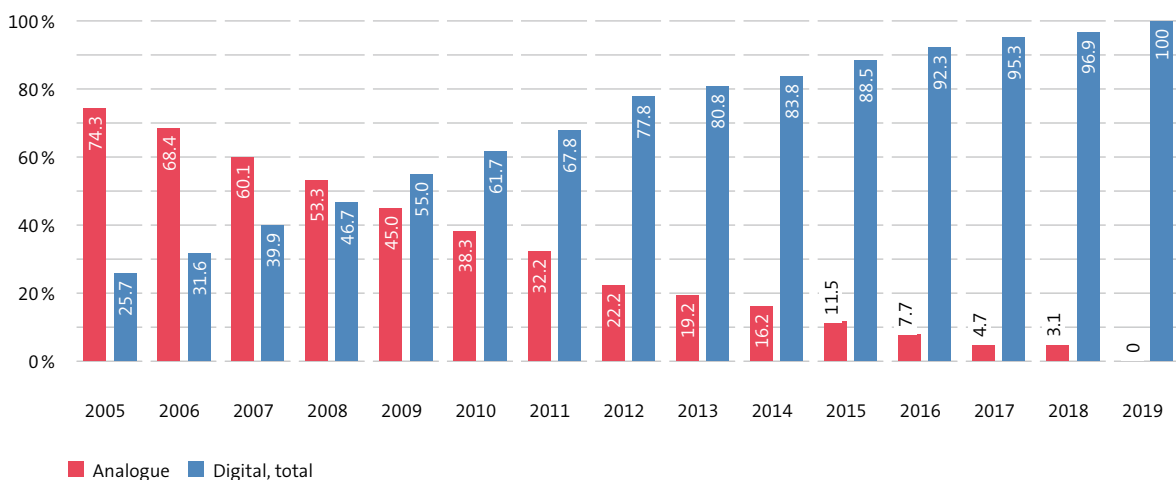
jigsaw making up the television infrastructures in Germany. There are now only a small number of local cable networks supplying TV signals to some housing units with analogue TV signals.<sup>1</sup>

The media authorities have been accompanying the process of digitisation of television transmission infrastructures for fifteen years. The long-term trend reveals the varying stages en route to full digitisation. The starting signal for the process of digitisation of the television transmission routes was given in the 1990s; after the completion of the necessary standardisation of technology, the infrastructures were successively switched over

<sup>1</sup> Considering their small number, these networks can be disregarded at this point; they could not be statistically presented in a meaningful fashion.

Fig. 1

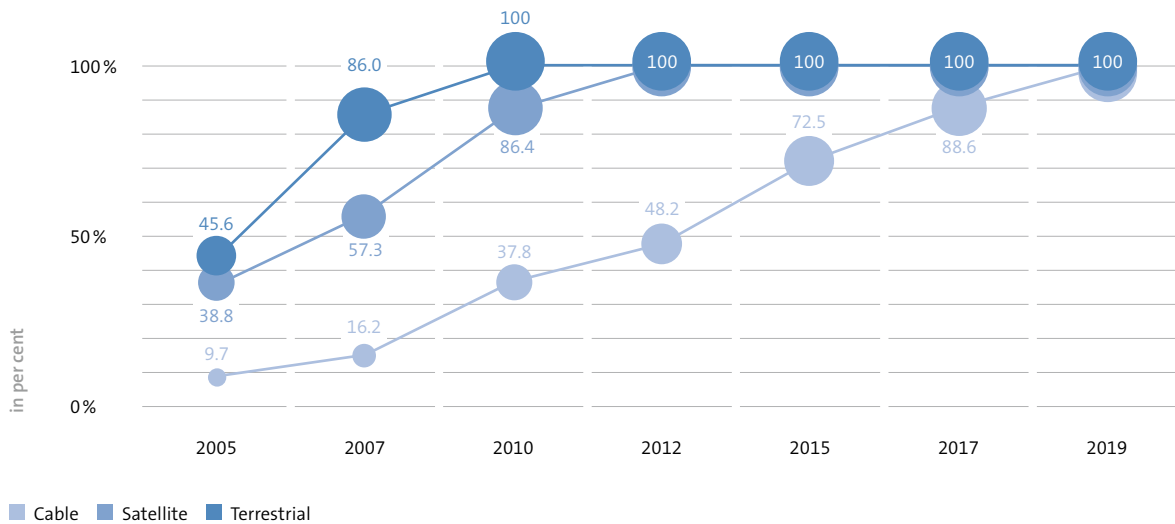
### Digitisation of television transmission 2005–2019



Source: Kantar; Basis: 33.899 / 33.904 / 36.981 / 37.277 / 37.412 / 37.464 / 37.668 / 37.977 / 38.157 / 38.557 / 38.899 / 38.076 / 38.306 / 38.697 / 38.491 million television households in Germany

Fig. 2

**Digitisation by routes of transmission 2005–2019**



Source: Kantar; Basis: 17.529 / 19.859 / 19.273 / 18.201 / 17.933 / 17.564 / 17.218 million cable TV households in Germany; 14.616 / 15.734 / 16.048 / 17.320 / 18.079 / 17.502 / 17.256 million satellite TV households in Germany; 3.241 / 4.243 / 4.167 / 4.756 / 3.764 / 2.840 / 2.298 terrestrial TV households in Germany

from analogue to digital transmission. These processes were at all times guided by the objective of rapidly arriving at the complete digitisation of the technical infrastructures and of keeping the inefficient period of multicast transmission as short as possible. The switchover processes were guided by the endeavour of taking regard of all interest groups – broadcasters, receiver manufacturers and viewers alike – and managing the switchover without screens going “blank” where at all possible. The first analogue infrastructure to cease operation was the terrestrial transmission signal. After terrestrial transmission in Germany had been changed over to the DTT standard from 2002 onwards, the analogue signal was finally switched off completely in 2010, making terrestrial transmission the first route to complete digitisation. It took

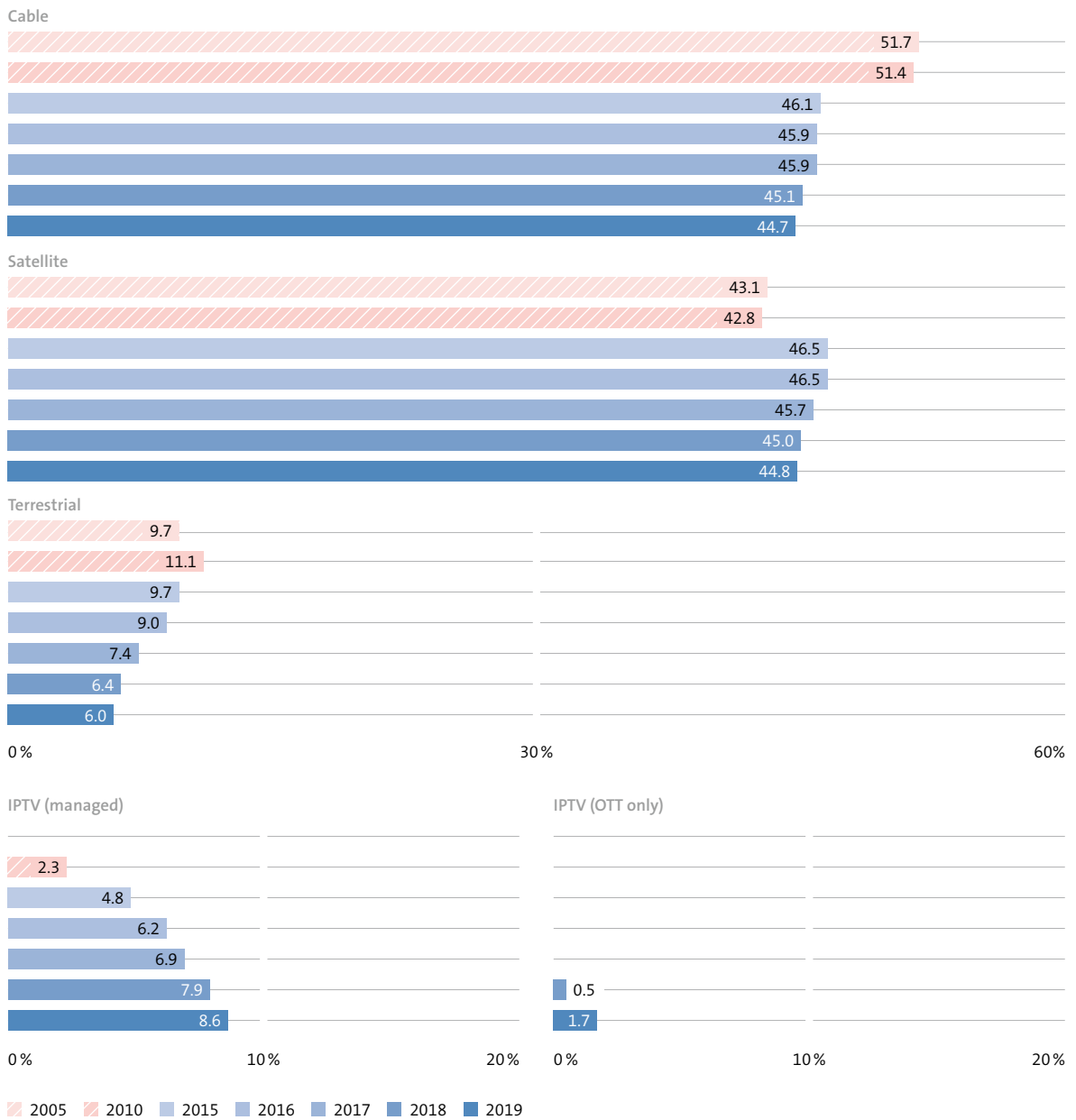
only two more years for achieving an adequate rate of digitisation for the satellite infrastructure to be able to discontinue transmission of analogue television signals via satellite. The year 2019 then saw the completion of cable networks going fully digital. As a result, the digitisation of television transmission routes in Germany is now completed and analogue television a thing of the past.

**Shares of transmission routes stable, IP transmission going up**

The process of digitisation caused only little movement in the shares of the transmission infrastructures overall. What was more relevant than the technical switchover from analogue to digital transmission can be assumed to be the emergence

Fig. 3

**Distribution of transmission routes**



Total > 100 per cent due to multiple reception

Source: Kantar; Basis: 33.904 / 37.464 / 38.899 / 38.076 / 38.306 / 38.697 / 38.491 million television households in Germany



of new digital transmission routes based on the internet protocol (IP) including, for instance, “DSL-TV”, as the product which is now labelled IPTV was originally called.

The latest data contained in this report on digitisation reveal that for the overall majority of television households in Germany, cable or satellite continue to serve as the preferred mode of reception. Close to 17.3 million homes go for satellite television with cable at more than 17.2 million households being a very close runner-up. Both transmission infrastructures have been keeping their levels stable at almost 45 per cent each in German television households.

Terrestrial reception at 2.3 million households has been going down slightly. However, in relative terms, the decrease is smaller than in the preceding years, with terrestrial reception continuing to serve 6 per cent of television households. As a stabilising factor in this regard, DTT T-2 HD switchover has now been more or less completed with only 0.5 per cent of television households still resorting to the outdated DTT standard.

The trend of the last years continues in that television transmission via IP-based networks is going up further. A major share is made up of so-called managed IP networks operated by Telekom, Vodafone, or 1&1. More than 3.3 million households consume television via IPTV; this corresponds to 8.6 per cent of television homes in Germany.

The number of households owning a television set but exclusively resorting to the (open) internet for consuming television content has increased. Compared to last year, the number of these so-called “cord cutters” has tripled while still remaining at a comparatively modest level of just

over 650,000 households. The number of cord cutters is likely to increase over the coming years as the market for internet-based television reception is only just taking off. Both Telekom and Vodafone recently took up marketing their TV platforms as over-the-top (OTT) offers as well, i.e. programme packages which are distributed exclusively via the internet. In addition, the television channels joined the market for internet-based television platforms via the platform joyn, thereby entering into a direct competition against the dominating providers on the internet which include Zattoo or Waipu (see also Part II of this article).

#### Cord Cutters

In the US television market a development has been noticeable for a number of years under which consumers cancel their cable TV contract and switch to consuming moving images offered as VOD and live streaming TV exclusively via the internet. This phenomenon hit the headlines under the catchphrase of “cord cutting”. In the report on digitisation, it was described for the first time in 2018. Households stating that they own a television set but do not name any of the “traditional” transmission infrastructures are asked whether they consume television channels exclusively via the internet.

#### Smart TV continues to grow

The television set continues to serve as the most important means for the consumption of moving images – irrespective of the way via which the content is transmitted or which type of content is watched. Compared to last year, the increase in households acquiring a smart TV set rose by

almost five percentage points; smart TV sets are now available in 56.4 per cent of television homes. And it is now no longer unusual for homes to own more than one television set: Well over every ninth TV household now has two or more smart TV sets at its disposal, and in more than every third home, all television sets are smart TVs. Samsung dominates the market for smart TV sets, and close to every fourth television household (23 per cent) has a device of the Korean manufacturer at home while sets manufactured by Philips, Sony, Panasonic and LG are each found in approximately 6 per cent of households, with the remaining share being distributed across a large number of other manufacturers. Looking at the route of transmission, the use of smart TVs is spread relatively evenly: the “traditional” routes of transmission take up 53.6 per cent (terrestrial transmission), 54.3 per cent (cable) and 57.2 per cent (satellite) of homes respectively, and only IPTV and OTT households show a relatively high share of smart TV sets at 73.3 per cent.

#### **More than 20 million TV households have connected their TV sets to the internet**

For providing the full functional benefits, the smart TV set must be connected to the internet which permits consumption of additional content offers including the media libraries provided by the TV channels or other apps and HbbTV offers via the device. The rate of sets connected to the internet has by now reached close to 70 per cent of smart TV households; this means that 15 million households have connected their smart TV set to the internet.

However, for making a television set internet-ready, it is not necessary in all instances to acquire a smart TV set: Peripheral devices such as streaming sticks, settop boxes or a computer or smartphone also connect to the internet. Adding

up all of these options, more than every second television household in Germany has a television receiver that is connected to the internet at least occasionally. In total, a little more than 21 million households in Germany have at least one connectable TV receiver at their disposal. In homes owning several television sets, well over every eighth household (14 per cent) can connect two or more television receivers to the internet, and the trend is on the way up. In more than every third television household, all television sets are connected to the internet at least every now and then.

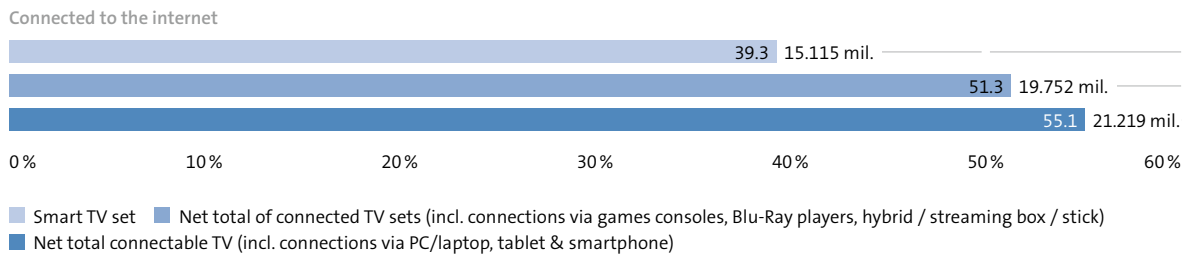
#### **More and more second sets are HDTV-ready**

Four out of five television households (82.4 per cent) own at least one high-definition TV receiver. Compared to last year, the number of HDTV households has thus risen by a little over two percentage points. A comparison of the transmission routes shows that practically all households receiving DTT T-2 HD television (98.7 per cent) have an HDTV set at their disposal. The high rate is not surprising considering that an HD-ready receiver is a must for receiving offers in DTT-2 HD quality. And even homes that are traditionally somewhat more interested in technology and resort to IPTV feature an above-average rate of HDTV sets (90.4 per cent) while cable homes (82.9 per cent) and satellite households (79.6 per cent) rank closely to the overall average or slightly below it.

A greater increase can be recorded for the number of households owning several HDTV receivers. In almost every fourth household (24.3 per cent) two or more high-definition sets can be found; this is a rise of 4.5 percentage points over last year. The number of households equipped exclusively with HDTV receivers remains comparatively stable at slightly more than two thirds (67.7 per cent) of

Fig. 4

### Connected TV sets



Source: Kantar; Basis: 38.491 million television households in Germany

German television households. This figure is also reflected in the number of sets available: Taking all television receivers in the homes into consideration, a total of 59.3 million TV receivers are found in German households. Some 74.3 per cent are HDTV receivers; this is equivalent to 44.1 million sets.

#### HD reception up above all via cable

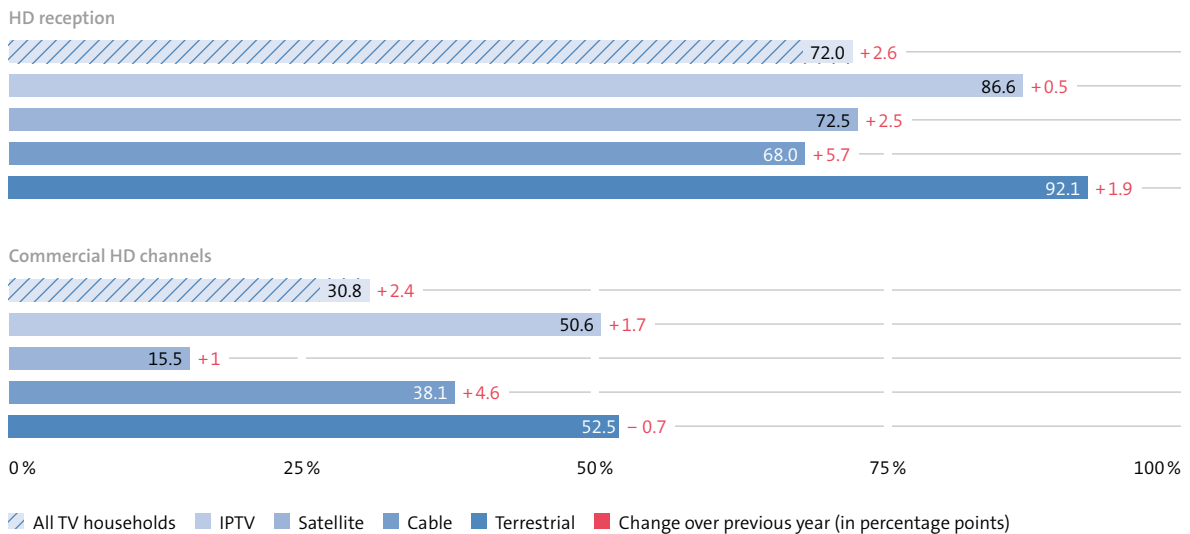
Having an HD receiver at home does not automatically mean that members of this household watch high-definition television programmes. Even though the public-service broadcasters are technically available in all households in Germany in HD quality, actual reception, however, does not correspond to television homes being equipped with HDTV sets. This discrepancy might be due to the fact that the channel list or list of favourites was not adjusted or that individual hardware components of the home video system are not HD-ready. A total 72 per cent of television households consume television channels in high-definition quality; this corresponds to 27.7 million homes. HDTV reception has risen by 2.6 percentage points across all

routes of transmission, with cable (+ 5.7 percentage points) and satellite transmission (+ 2.5 percentage points) featuring the largest increases (see Fig. 5).

For also receiving commercial television in HD quality, viewers – contrary to the availability of public-service broadcasting – are required to subscribe to an additional HD package with a television platform provider. These packages are offered across all transmission infrastructures. The total number of households receiving commercial HD channels has increased by three percentage points compared to last year and has now reached almost one third (30.8 per cent) or 11.8 million television households. More than half of the households that have opted for terrestrial reception (52.5 per cent) or IPTV (50.6 per cent) also have commercial HD channels at their disposal. Reception of commercial channels in HD quality via cable could score an above-average growth: At over 38 per cent of television households, the increase came to a total of 4.6 percentage points compared to last year. Satellite reception went up by one percentage point, totalling 15.5 per cent, and could thus stop the downwards trend of recent years. One reason might be that the offers available experi-

Fig. 5

### HD reception and commercial HD channels



Source: Kantar; Basis: 38.491 million TV households; 17.218 million cable households; 17.256 million satellite households; 2.298 million terrestrial households; 3.309 million IPTV households in Germany

enced diversification as a result of Freenet TV Sat and Diveo entering the market. Including HD+, three platform providers now offer commercial HD channels via satellite.

#### Around every fifth household owns a UHD set

Television sets as a trend are clearly going in the direction of increasingly better image quality. The number of households owning a 4K or Ultra HD (UHD) device has increased by more than one third compared to last year, with approximately every fifth television household (18.8 per cent) in Germany owning a UHD-ready television receiver. Most content offers in 4K or Ultra HD quality can be enjoyed by customers of pay-TV or VOD offers. The number of UHD television sets in households that have subscribed to pay-TV (33.2 per cent) or

homes using VOD services available against payment only (30.4 per cent) is disproportionately high. And the rate of households consuming commercial television channels offered in HD quality and owning a UHD set is also above average at 27.6 per cent. Looking at the transmission route, IPTV households (25.6 per cent) and terrestrial homes (20.6 per cent) feature ultra-high resolution receivers. In cable households (19.2 per cent) and satellite homes (19.4 per cent), around every fifth household has an HDTV receiver at their disposal.

## Part II: Consumption of digital moving images

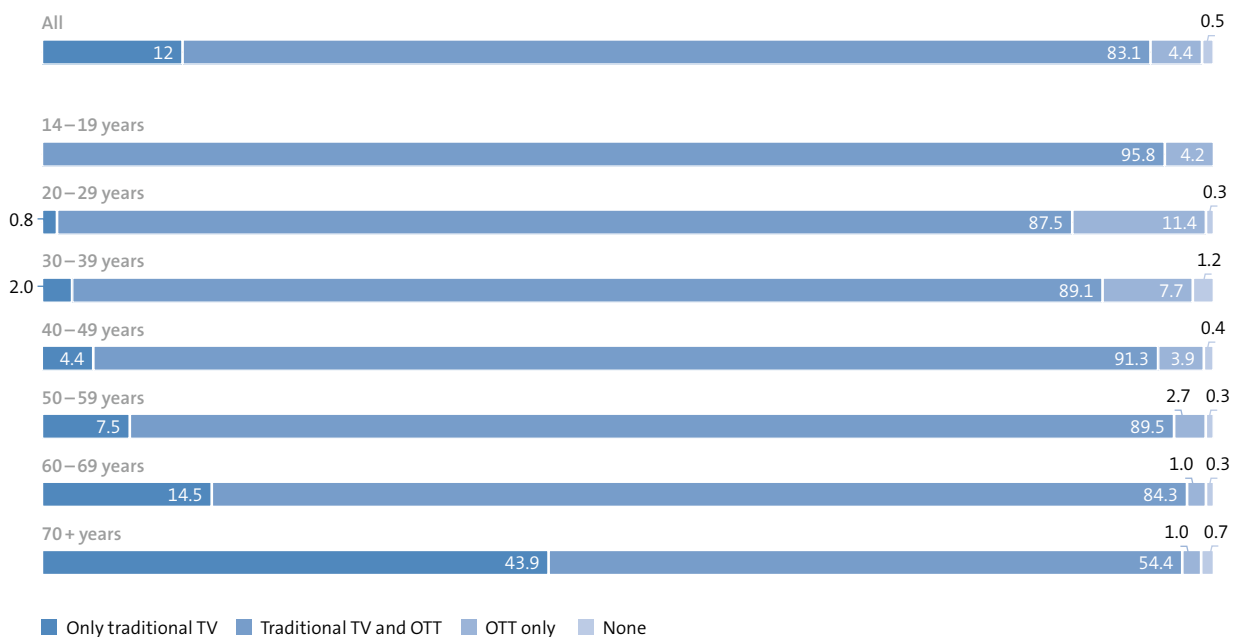
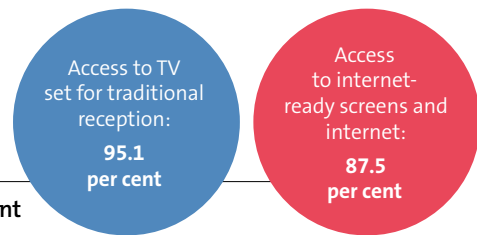
### Nearly everyone can consume moving images via the internet

Digital video consumption has become omnipresent by now. Whether it is the computer at work, the laptop at a cafe or the smartphone on the bus or train, viewers now use every opportunity at any time to consume moving images. This is not really surprising as the convergence of technology for

end devices means that nine out of ten people in Germany (87.5 per cent) now have the necessary equipment for consuming video content via the internet – and this rate applies across more or less all age groups. The rate of internet-ready equipment or screens connected to the internet drops below 90 per cent only for people aged 60 years or older, but even among persons aged 70 years and beyond,

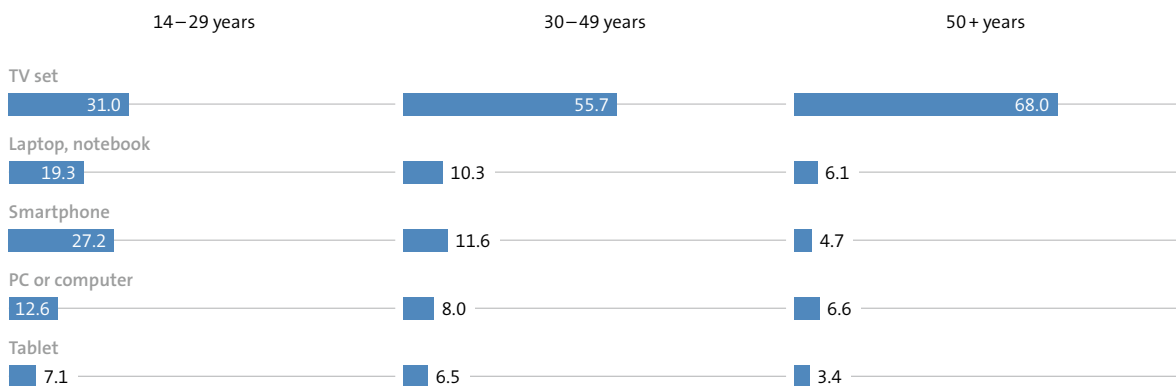
Fig. 6

Consumption of television vs OTT consumption (all devices), in per cent



Source: Kantar; Basis: 70.445 million persons aged 14 years or older in Germany

Fig. 7

**Most important device for video consumption, by age groups (in per cent)**

Source: Kantar; Basis: 14.776 persons aged 14–29 years; 21.199 persons aged 30–49 years; 34.470 persons aged 50 years or older

more than half have the technical end devices for continuous video consumption at their disposal (Fig. 6). While in comparison a higher number of persons still has access to a television set (95.1 per cent) for classical reception, it is remarkable that among persons in the age group 20–29 more than every tenth person no longer accesses the traditional transmission routes for television consumption but uses OTT services exclusively. While this does not mean that this age group does not consume linear television any longer, it implies, however, that they use the internet for watching linear TV.

#### **TV set remains most important device for video consumption – except for 14–19 year olds**

More than half of the population (56.6 per cent) consider the television set to be the most important device for consuming moving images. As a trend, the relevance of the television set continues

its downward trend, losing around seven percentage points while smartphones are gaining in popularity for video consumption. They are now named as the most important screen for video use by every ninth person questioned (11.5 per cent). The laptop (10.2 per cent), desktop PC (8.3 per cent) and tablet (5.1 per cent) take up the next places. Unsurprisingly, there are distinct differences in preference by age groups: For 14–29-year-old viewers, the television set still presents the most important video device at just under one third (31 per cent), with the smartphone (27.2 per cent), the laptop (19.3 per cent), PC (12.6 per cent) and tablet (7.1 per cent) following on the next places.

A closer analysis of the age groups reveals that the TV set for the first time no longer takes first place in popularity for moving image receivers among the youngest viewer age group. Just under one third (32.2 per cent) of 14–19 year olds considers the smartphone the most important device for video

consumption. The TV set is named top by a little more than a quarter of this age group (25.7 per cent), and is thus only runner-up. Among viewers aged 20–29 years, the opposite applies with the TV set being named as the most important device for video watching by a little over one third (33.6 per cent) while the smartphone here reaches only second place (just under one quarter or 24.8 per cent). The age group 30–49 shows a relatively even picture with the preference being clearly placed on the TV set (55.7 per cent) and the smartphone being the most important device for moving image consumption only for approximately every ninth person (11.6 per cent); the laptop at 10.3 per cent follows with very little margin while the PC (8.0 per cent) and the tablet (6.5 per cent) only rank in the middle field. Among viewers aged 50 years or older, more than two thirds (68 per cent) prefer the television set while the smartphone only plays a minor role for this section of the population, with just 4.7 per cent of consumers in this age group rating the smartphone the top screen for video watching.

#### **Trend for delinearisation continues across all age groups**

The offers for non-linear moving image content has continually increased over the last few years: Not only did the number of VOD providers expand last year, but the media libraries of the television broadcasters as well as the on demand content offered by platform operators was also extended and upgraded. The possibilities of consuming television content or other video material independently of place or time have thus multiplied. The development of the consumption of moving images also reflects this trend: Over the last four years, the number of people stating that they primarily use linear offers for moving images such as classical television or online live streams has dropped from

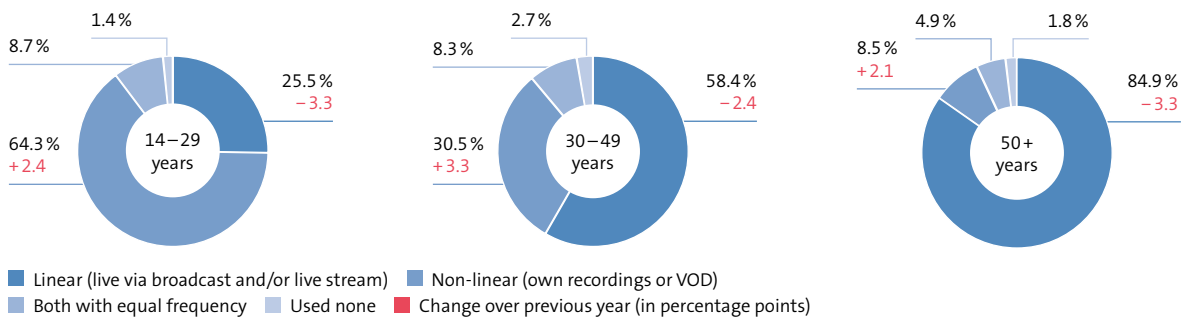
just under three quarters of the population (74 per cent) to two thirds (64.5 per cent). Over the same period the number of consumers stating that they predominantly resort to non-linear offers such as video on demand content or content they recorded themselves has gone up from 16.2 per cent to 26.8 per cent. Users of non-linear content are aged 33 years on average, and are thus considerably younger than people primarily watching linear content offers (on average 56 years of age). And in fact, only a little more than one quarter (25.5 per cent) of people aged less than 30 years stated that they mainly watch linear content, while two thirds (64.3 per cent) primarily resort to broadcasts they recorded themselves or to VOD offers. Among viewers aged more than 50 years the opposite can be noted with linear consumption still the preferred mode of video consumption for more than four fifth of the population, irrespective of a slight decline (see Fig. 8).

#### **For the first time, older viewers spend less time watching classical TV**

When asked how much time viewers spend on video consumption overall, those questioned rated traditional television consumption highest at an average 60.5 per cent. By population average, more than one quarter (25.5 per cent) of the video time budget is spent on consuming VOD offers while live streaming makes up 6.2 per cent of the time budget, and content recorded by viewers themselves takes up 5.8 per cent. The clear distinctions between the various age groups persist: Younger consumers aged between 14 and 29 years spend most of their time (59.4 per cent) for video on demand consumption with traditional television filling just under a quarter of the time spent on video consumption overall. Among the age group 30–49, traditional television watching still

Fig. 8

**Consumption of linear vs non-linear video consumption by age groups (in per cent)**



Source: Kantar; Basis: 70.445 million persons aged 14 years or older in Germany; 14.776 persons aged 14–29 years; 21.199 million persons aged 30–49 years; 34.470 million persons aged 50 years or older

dominates but now accounts only for a little more than half the time spent on average. In the age group 50 plus, traditional television is still clearly in the lead, but going down for the first time.

This confirms the continued tendency of a clear shift from traditional television consumption to VOD use. Traditional TV consumption has gone down by a good ten percentage points since 2016 as an average of the population while VOD use increased by the same rate of ten percentage points over this period. Time spent on consuming live streaming offers also went up slightly over the preceding years. As a new development, traditional television watching among viewers aged 50 years or older went down slightly for the first time while time spent on VOD consumption and live streaming usage experienced a market increase also among older viewers (see Fig. 9).

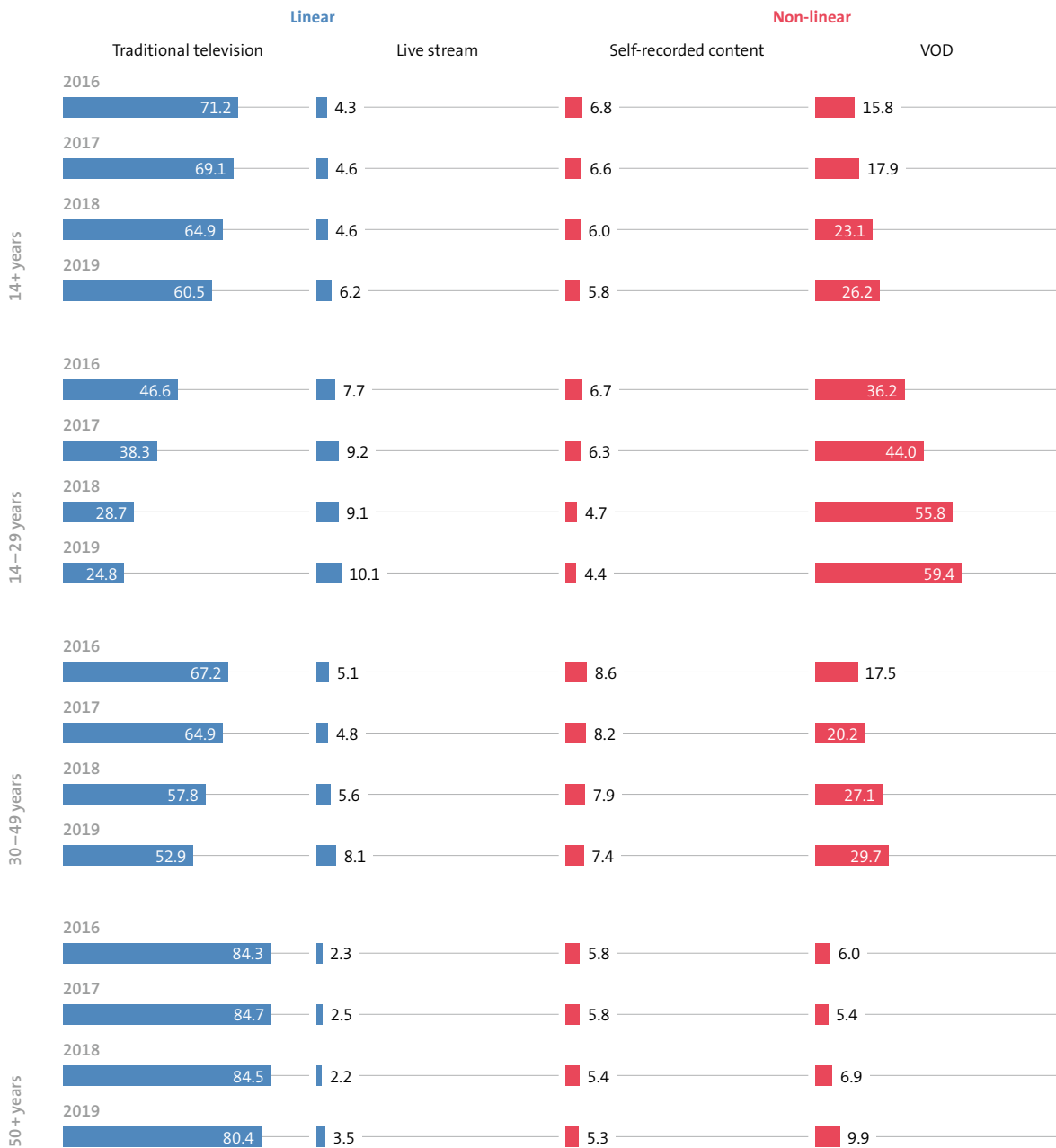
**Every second viewer regularly resorts to OTT offers**

More than half (54.2 per cent) of people aged 14 years or older in Germany watches video offers transmitted via the internet at least once a month. This corresponds to 38 million people. A little under half (46 per cent) uses the TV set (smart TV or connected TV) or a computer (PC or laptop; 45 per cent) for doing so, while the smartphone is used by more than one third of viewers (34.2 per cent), with the tablet being resorted to by around one quarter (23.5 per cent). Analysed by type of content, video on demand offers clearly dominate with just under half (49.5 per cent) of people aged 14 years or older in Germany using them regularly, i.e. at least once a month. Almost one third (28.9 per cent) regularly consumes live streaming offers.



Fig. 9

**Linear vs. non-linear video consumption by age (in per cent)**



Source: Kantar; Basis: 69.241 / 69.563 / 70.094 / 70.445 million persons aged 14 years or older in Germany

### **VOD goes towards TV sets and longer formats**

More than two thirds (70.1 per cent) of regular VOD consumers watch this content (also) via a television set connected to the internet. About half (50 per cent) use the PC or laptop while more than one third (39.2 per cent) consume video on demand content with their smartphones. Tablets are the preferred screen for about a quarter (24.9 per cent) of viewers regularly consuming VOD content. As a tendency the TV set connected to the internet appears to replace the PC/laptop more and more. The number of people stating that they regularly watch VOD content via their PC or laptop went down by 22 percentage points compared to the year 2015. The number of consumers watching VOD via their TV set increased by the same rate of 22 percentage points over the same period. Irrespective of that, the long-term trend also reveals that more and more consumers regularly watching VOD content use the screen of the smartphone for doing so (plus 16 percentage points).

The type of screen used is also a decisive factor as regards the duration of content being consumed. Three quarters of regular VOD consumers state that they largely watch entire broadcasts via their smart TV set; by contrast, the smartphone is used more for clips or parts of offers by half of the viewers, and only one third stated that they watch entire programmes this way as a rule. The trend tends to go in the direction of longer formats – all screens are used more frequently than five years ago for consuming entire VOD programmes via the internet (see Fig. 10).

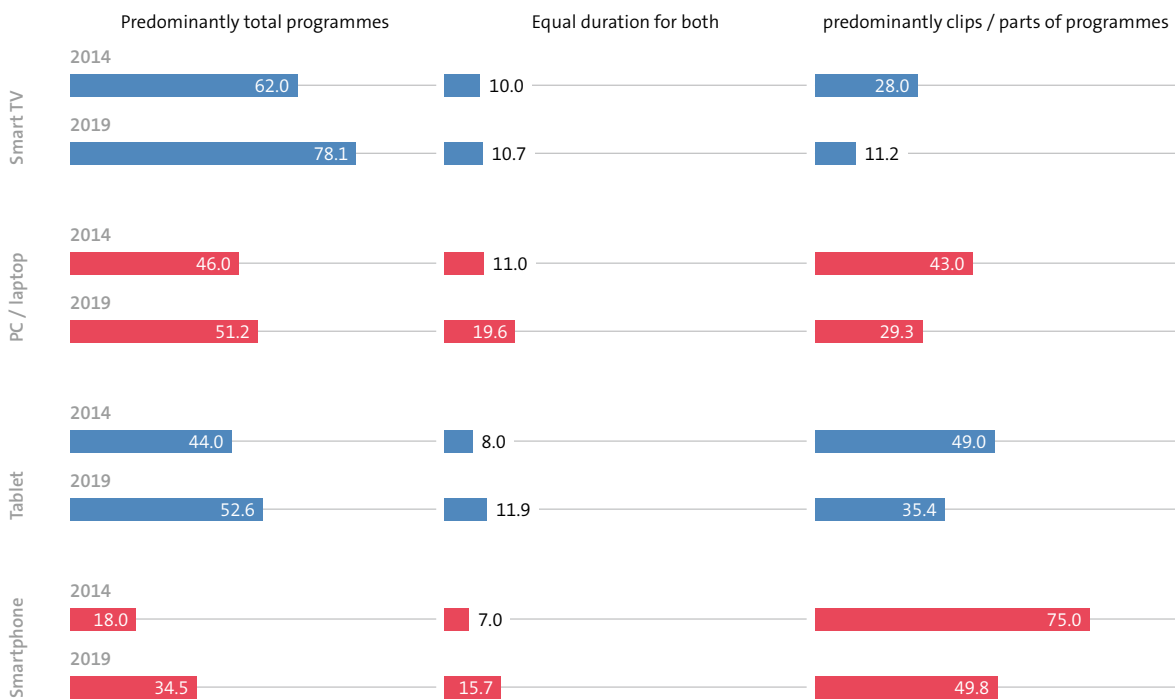
### **Media libraries of TV broadcasters almost on par with YouTube – commercials increase share above all**

The growth in the VOD sector is also mirrored by the rising numbers for VOD consumption. All VOD offers are now used by more people than last year. In top position are still the video portals – two out of five people in Germany aged 14 years or older (39.8 per cent) resort to the offers available via video portals with YouTube being way upfront. This corresponds to more than 28 million people. The media libraries of the television broadcasters are equally popular and have caught up to YouTube except for around one percentage point. The media libraries offered by public-service television are used by more than one third (35.6 per cent) of viewers, while the media libraries operated by the commercial broadcasters have gained in excess of seven percentage points compared to last year, with their contents now used by around every fourth person (23.6 per cent).

The offers of streaming services available for payment are also attracting viewers. They are used by 37.5 per cent of people aged 14 years or older in Germany at least rarely – this presents a rise of eight percentage points compared to the previous year. The majority of VOD users consume video offers provided by Netflix and Amazon Prime Video. Both services are used by approximately a quarter of people aged 14 years or older, while DAZN and Eurosport-Player as comparatively new thematic offers have now also established solid positions in the video market (see Fig. 11).

Fig. 10

**Duration of video consumption by type of receiver (in per cent)**



Source: Kantar; Basis: 16.113 / 34.924 million persons aged 14 years or older in Germany using VOD offers (professional content) at least once per month

**Streaming services still top among younger consumers**

VOD offers are particularly popular among younger consumers: In the age group 14 – 29 years, almost twice as many people use VOD offers than the average. Eight out of ten people of this age group resort to streaming services (79.6 per cent) or video portals (79.1 per cent), while two thirds (63.9 per cent) consume content available via media libraries. The

media libraries of the commercial broadcasters are resorted to by almost every second viewer (44.8 per cent) in the process; they are thus only narrowly beaten by video consumption via social networks (51.8 per cent). Among the streaming services, Netflix clearly dominates the category with more than two thirds (68.3 per cent) using the offers of the Los Gatos-based company. Direct competitor Amazon Video is the choice for around half of the

regular VOD viewers in this age group, thus ranging behind the offers of the public-service media libraries (56.8 per cent), but still ahead of the media libraries of the commercial television broadcasters. Top position among these offers continues to be held by YouTube; the video portal is used by 79 per cent of people aged between 14 and 29 years.

**Live stream consumption on the up**

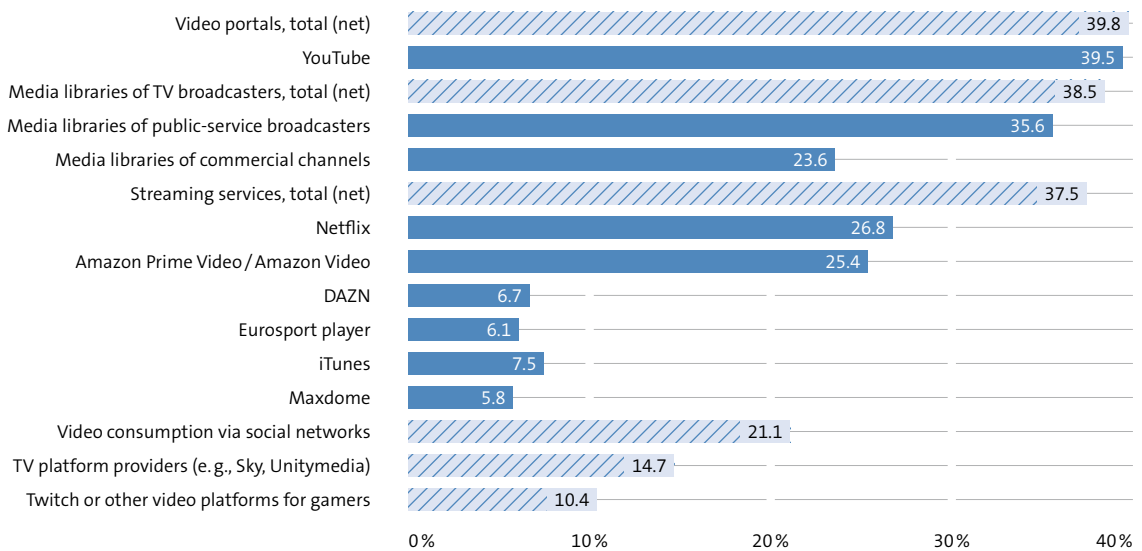
Many traditional television broadcasters and other service providers complement on-demand offers by making their linear offers available online in the form of live streams. Unlike VOD consumption, live streams are consumed predominantly via the PC or laptop. Well over 60 per cent of viewers who con-

sume live streaming offers at least once a month do so with the help of their computer. Increasingly, the television set connected to the internet is used for this activity. More than half (55.3 per cent) of regular consumers of live streaming offers stated that they used their television set for this activity. A smaller number (42.6 per cent) use the smartphone for this activity while well over a quarter of OTT live streaming consumers also use the tablet (26.8 per cent).

About 17.902 million people in Germany watch live streaming offers via the internet at least on occasion. The figure has gone up by well over four million compared to last year and corresponds to 25.4 per cent of the total population. When analysing

Fig. 11

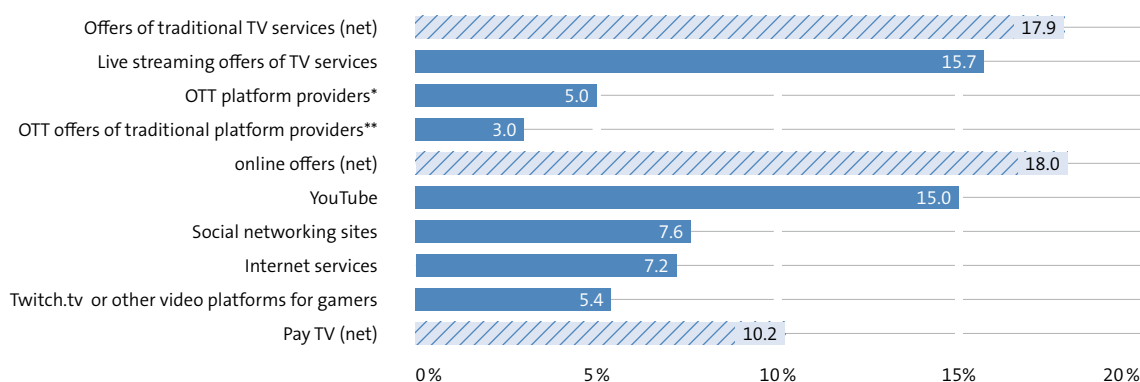
**Consumption of VOD offers**



Source: Kantar; Basis: 70.445 million persons aged 14 years or older in Germany

Fig. 12

**Consumption of live streaming offers**



Offer used once already; \*e.g. Zattoo or waipu.tv; \*\*Vodafone Kabel App and/or Giga TV Net, Magenta TV App Plus, Horizon Go;  
 Source: Kantar, Basis: 70.445 million persons aged 14 years or older in Germany

consumption by types of offer, we found that 17.9 per cent of people aged 14 years or older in Germany consumed the content offers of the traditional television broadcasters transmitted via the internet with the “direct” live stream of the services being used most frequently. Apart from the TV services, OTT platforms also bundle the TV content offers. Here, a distinction can be made between (1) independent OTT platform providers including Zattoo or Waipu.tv which aggregate their own offers – these offers are used by 5 per cent of people in Germany – and (2) traditional TV platform providers such as Vodafone, Telekom or Unitymedia. These providers transmit their platform offers additionally via the open internet, thus either reaching new customers or providing mobile TV consumption or multi-room solutions to their traditional television customers (3 per cent of people aged 14 years or older).

Apart from the linear services provided by the traditional television broadcasters, intermediaries and other providers also make live streaming available via the internet. Among services available is the live offer provided by YouTube which is used by 15 per cent of the population. Social networks including Facebook or Twitter (7.6 per cent), internet-only television providers (7.2 per cent) or gaming platforms such as Twitch.TV (5.4 per cent) are among them. A third category to be identified are pay-TV offers available as OTT content; they include the offers of pay-TV broadcaster Sky and the thematic sports offers provided by DAZN and Eurosport Player. Pay-TV offers are used by a good 10 per cent of people aged 14 years or older in Germany.

### User surfaces steer findability

The design of the user surface of an end device and of video apps plays a key role for the findability of programme content in particular for the use of OTT offers. Similar to the TV broadcaster listings on traditional television, the user surfaces basically determine whether and how easily offers such as the live stream or the media library of a television broadcaster or another offer can be found and used by viewers. Around 18.724 million people in Germany are using OTT offers via their smart TV set. About two thirds (65.1 per cent) of them resort to the apps or the surface of their smart TV set for doing so.

It is the apps of streaming services that are mostly used to this end (69.1 per cent of viewers regularly consuming OTT content via the apps on the surface of the smart TV set), media libraries (52.4 per cent) and video portals (51.6 per cent). Listed by type of offer, YouTube (51.4 per cent), Netflix (48.8 per cent) and Amazon Prime (24.6 per cent) lead the popularity league among users of smart TV; they are followed by the media library apps of public-service broadcasters (41.6 per cent) and commercial channels (23.1 per cent). Key for the success of a video app is its pre-installation on the surface of the smart television set. After all, more than half (51.6 per cent) of regular OTT consumers using their smart TV for this purpose do not bother to adapt the surface or the app available on their television set.

Apart from user surfaces, recommendation systems can also exert considerable influence as regards the findability of VOD content or live streams. More than one third (38.6 per cent) of people aged 14 years or older in Germany have already used edited recommendation systems; this is equivalent to an increase of six percentage points over

last year. More than one quarter (26.2 per cent) use such systems at least on occasion while every eleventh consumer (8.9 per cent) stated that they use them frequently. Among the 27 million users of recommendation systems, more than eight out of ten people use systems which give tips on the basis of their viewing habits – i. e. on the basis of algorithms – (85.8 per cent); some three quarters use curated recommendations (73.8 per cent) or recommendations based on the viewing habits of other viewers (72.8 per cent).

As was to be expected, recommendation systems are used above all by younger consumers – while just under three quarters (73.3 per cent) of viewers aged between 14 and 29 years have experienced such systems, the rate among 30–49 year olds is only around half (47.5 per cent). And among the age group 50 plus, only around every fifth person (18.3 per cent) has used automated recommendation systems once.

### Conclusion

The completion of the digitisation of television transmission finalises a process which was accompanied by a range of developments and innovations in the television and video sectors. The dynamism which digitisation brought about reaches way beyond the purely technical optimising of transmission efficiency. Viewers today can enjoy an endless choice of digital television services in SD, HD or UHD standard. Resorting to the time-shift or replay functions or cloud-based recording functionalities, they can determine autonomously which content they want to consume at what time and in which place. In this scenario, IP-based networks gain increasingly in relevancy.

ce both as back-up and as return channels for OTT offers, but also as independent routes of distribution for television services or other video content.

The data of this report on digitisation delivers clear proof of this development: More German television households have already (also) connected their television set to the internet than to a cable network or a satellite antenna; the number of cord cutters, i. e. consumers foregoing traditional routes of transmission – is on the increase. At the same time, mobile and smart end devices gain in importance for video consumption. Most importantly in the youngest age group (14–19 years), the smartphone has by now overtaken the television set as a video screen, and among 20–29-year-olds, more than every tenth viewer does no longer access television in the “traditional” way. VOD consumption continues to go up even in the age group 50 plus. Live streaming offers of video providers via the internet also increases, even though this is still at a comparatively modest level. The market reacts to the changes in consumption patterns with all major platform and content providers now making a comprehensive VOD offer available. Cable and IPTV providers including Vodafone and Telekom also transmit their own content packages across the open internet, thereby entering into competition with internet-based TV platforms such as Zattoo or Waipu. And the service providers are forming successful new alliances as demonstrated by the platform joyn which started only recently.

The developments raise new issues and challenges – findability and non-discrimination, especially with a view to the various apps and user surfaces – all turn into key questions for media pluralism. At the same time, the question arises whether and how the differing intensity of regulation between linear and non-linear offers can be upheld. A lot of things are continuing to move, and the report on video digitisation continues to serve as an indispensable source of data and information – for both the industry and regulation alike.





# Methodology

This study was conducted by Kantar Media Research on behalf of the German media authorities with the participation of Media Broadcast, SES/Astra Deutschland and Vodafone. For the first time this year, the study comprised a mix of methods involving telephone interviews and online interviews.

Telephone interviews still present a highly relevant survey method for establishing valid and representative data that are suited as a basis for projections or other purposes. The increasing difficulty of reaching consumers, especially in the younger target groups, however, constitutes a challenge as regards methodology. Online-supported web interviews, on the other hand, are gaining in relevance more and more, and in the framework of the report on digitisation, web interviews also provide an adequate means as the content and topics discussed are widely found among the sections of the population with a greater affinity to the internet (e.g., the consumption of content OTT). In order to take account of this fact and to adequately represent the younger target groups, online interviews were integrated into the samples for the first time this year. Only a small part of the sample (16 per cent) was collected online in the 2019 survey.

## Telephone interviews

As in the preceding years, the telephone interviews employed computer-assisted telephone interviews (CATI). For better accommodating the increased percentage of persons exclusively or mostly available via mobile phones, the survey was conducted via so-called dual-frame telephone interviews, i.e. as a combination of landline telephones and mobile phones (80 versus 20 per cent). The selection was based on the telephone random sampling system for fixed-line phones and mobile phones

used by the association of German market research institutes (“Arbeitsgemeinschaft der deutschen Marktforschungsinstitute”, ADM).

The population in German-language households aged 14 years or older presented the overall population basis for the survey. This corresponds to the definition used by Media-Analyse (ma) (= German households with an EU 28 head of household plus households with a non-EU head of household with completed school education).

## Online survey

The German-language online population presented the overall population basis. Online surveys are permissible from age 16 only; since persons aged 70 years or older are very difficult to reach by means of online panels, the online sample was limited to persons aged between 16 and 69 years.

The participants were recruited with the help of an online access panel. They include panel members who are invited to participate in surveys based on specific criteria guiding recruitment. A quota system was applied for the sample using target specifications for the online population based on the radio survey conducted by Media Analyse (ma). The overall population basis for this year comprises 40.350 million households. Of these, 95.4 per cent have at least one television set at their disposal. These 38.491 million television households form the basis for the results concerning television reception. The survey was conducted during the period 06 May–15 July 2019.

### Bifurcation of the survey since the 2018 report on digitisation

The data for video and radio were raised using a joint questionnaire until and including the 2017 report on digitisation while in 2018, the report was split into a video and a radio survey for the first time. The comparability of the results with previous years and the valid extrapolation of the existing time series was ensured for the video section by maintaining the established structure of the questionnaire. A test study conducted in parallel with the survey for the 2017 report on digitisation showed that the change of methodology does not cause any significant deviations in the results.

### Sampling and number of cases

The 2019 survey is based on a net number of 7,083 interviews comprising 5,923 telephone interviews and 1,160 online interviews. Until the 2012 report on digitisation the person in a household with whom the interview was conducted was the person stating that they knew best about television reception. In line with the last six years, for 2019 the interviewee was selected at random; this allows for information on personal media consumption. The overall basis relating to persons interviewed comprised 70.445 million persons aged 14 years or older.

Similar to previous years, the interviews were conducted disproportionately to warrant a sufficiently solid minimum basis for each German state. At least 200 interviews were conducted for each state. For separately showing the results relating to states with a smaller population, the number of interviews conducted was increased to 500 interviews at the request of a number of media authorities. The disproportionality was subsequently balanced during weighting for obtaining representative results on a “total” basis for

all persons or households respectively. Availability via telephone has been going down for years especially among the age group 14–29 years; this issue cannot be remedied even with a sample involving availability via mobile phones. For this reason, a partial sample specifically relating to persons aged 14–29 years was carried out to increase the share of this age group in the net sample. In households including more than one person in this age group, one of the persons aged between 14 and 29 years was selected at random.

The two sampling frames (landline and mobile telephony), the “14–29 age group interviews” and the online sample were merged by design weighting to obtain a representative picture of the population.

### Definition and surveying the routes of transmission

For the main receiver in the household, all routes of transmission were established. All further television receivers available in a household over and above the main set were summarised as was the case in the previous year. Households consuming television with the first receiver, second or further sets both terrestrially and via satellite were counted for both infrastructures when establishing the routes of transmission. With several households using more than one mode of reception, the sum total exceeds 100 per cent.



# Digitisation in international markets: facts and figures

# Digital TV reception in Europe on the road to success

Barely 6 per cent of European TV homes remain analogue as of year-end 2018

Ricardo Topham

As of year-end 2018, only 6.6 per cent of TV homes in Europe remain analogue, compared to 7.1 per cent the previous year; this translates to 93.4 per cent of TV homes in the region being digital (compared to 92.9 per cent on year-end 2017). Simultaneously, HD continues to experience growth: 59 per cent of TV homes are currently enjoying HD content, up from 57 per cent in Year-End 2017. High-definition television (HDTV) has now become the broadcasting standard and SDTV is gradually becoming a thing of the past as end users are looking for a better picture quality. At the same time, viewers demand more flexibility in terms of video consumption: TVs are becoming smart and connected, linear and non-linear video consumption happens now on both TV set and other devices, be it tablets, smartphones, PCs, etc.

All these trends on the European television market in 2018 are underlined by the data collected in the annual Satellite Monitor survey conducted by SES which monitors the progress of TV reception within the footprint of the European SES satellite fleet.<sup>1</sup>

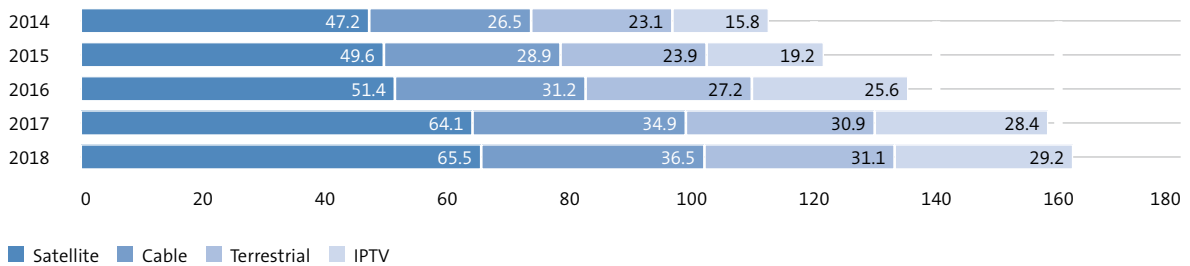
## Status of digitisation in Europe

At the end of 2018, digitisation of European TV households had increased from 92.9 per cent (2017) to 93.4 per cent at present. Expressed in the number of households in Europe, 258.3 of the 275.2 million TV homes now have digital TV reception resorting to one of the four modes of reception (satellite, cable, DTT, IPTV and/or DSL-TV). Compared to the end of 2017, the number of analogue TV homes decreased by 1.6 million, now only 18.1 million remain to be switched to digital TV reception.

<sup>1</sup> For the purpose of the SES Satellite Monitor study Europe is defined as: Algeria, Austria, Belarus, Belgium, Bosnia, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Moldova, Morocco, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Tunisia, Turkey, Ukraine, and the United Kingdom

Fig. 1

**European HDTV homes per infrastructure (in million)**



Source: SES Satellite Monitor Year End 2018

High-definition television once again proved to be the driver of digitisation. HDTV has continued to grow, thus offering one of the key benefits of digital television reception: 162.4 million TV homes are enjoying HD at present, corresponding to 59 per cent of all TV households. This includes 65.5 million satellite homes placing satellite at the top spot of the audience reach of HDTV platforms. The

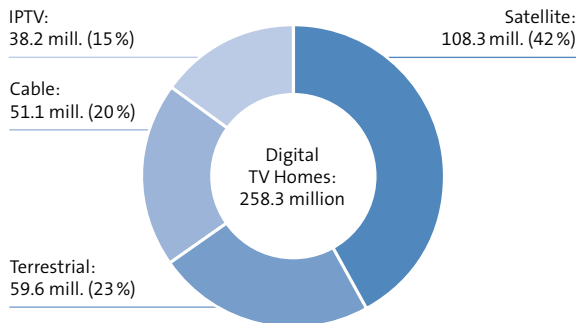
share of HDTV households among satellite homes has reached 60 per cent. A further 36.5 million households receive their HDTV channels via digital cable, 31.1 million via DTT and 29.2 million via IPTV.

**Infrastructure progress**

In the course of this development, the share of digital households related to the various transmission modes did not see any major changes:

Fig. 2

**Modes of digital TV reception in Europe at Year-End 2018**



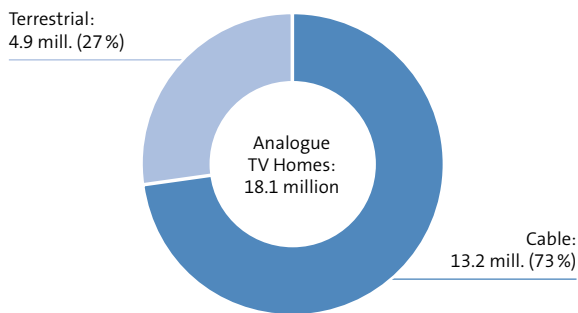
Source: SES Satellite Monitor Year End 2018

The market share of 42.1 per cent puts satellite at the top of the digital reception league with 108.3 million households, followed by DTT at 59.6 million households (corresponding to a market share of 23.2 per cent) and digital cable attracting 51.1 million households (19.9 per cent of the total) while IPTV brings up the rear with 38.2 million (14.8 per cent).

The remaining 18.1 million analogue TV homes in Europe are shared between cable (13.2 million) and terrestrial (4.9 million).

Fig. 3

**Modes of TV reception among analogue TV homes in Europe at Year-End 2018**



Source: SES Satellite Monitor Year End 2018

The majority (13.2 million) of analogue homes receives its television via cable, which equates to 20.6 per cent of cable homes across Europe still awaiting digitisation. Regarding terrestrial, 92.4 per cent of homes now receive digital television providing an extended range of channels.

**Comparison by regions**

As could already be noted over the last years, there is still a clear West-East divide. In Western Europe, 98.7 per cent of TV households have already gone digital whereas in Eastern Europe, digitisation has only reached 78.3 per cent to date. The regional discrepancy is also evident when comparing the status of cable homes: 93.0 per cent of cable households in Western Europe are digital versus 56.8 per cent in Eastern Europe. The difference is even more marked for terrestrial reception: while in Western Europe virtually all terrestrial TV homes use DTT (99.1 per cent), the rate in Eastern Europe is 70.9 per cent.

In nine European countries digitisation has reached or is nearing completion: Austria, Croatia, Finland, France, Ireland, Italy, Spain, Switzerland, and the UK. A further eleven countries rank above the European digitisation average of 93.8 per cent and are thus well en route to full digitisation while sixteen countries surveyed rank below the average level of digitisation. This is the case mainly for markets in Eastern Europe where both the cable networks and the terrestrial infrastructure are lagging behind.

The difference between Western and Eastern Europe can also be noted when analysing HDTV: 120.8 of 162.4 million HD homes are located in Western Europe, corresponding to 75.9 per cent of all TV households in the respective region; the 41.6 million HD homes in Eastern Europe correspond to a regional share of 62.4 per cent. A similar picture emerges when looking at satellite reception: 40.0 million satellite HD households in Western Europe (75.9 per cent of satellite homes overall) compare with 12.0 million satellite HD households (or 62.8 per cent) in Eastern Europe.

**Ultra HD is emerging**

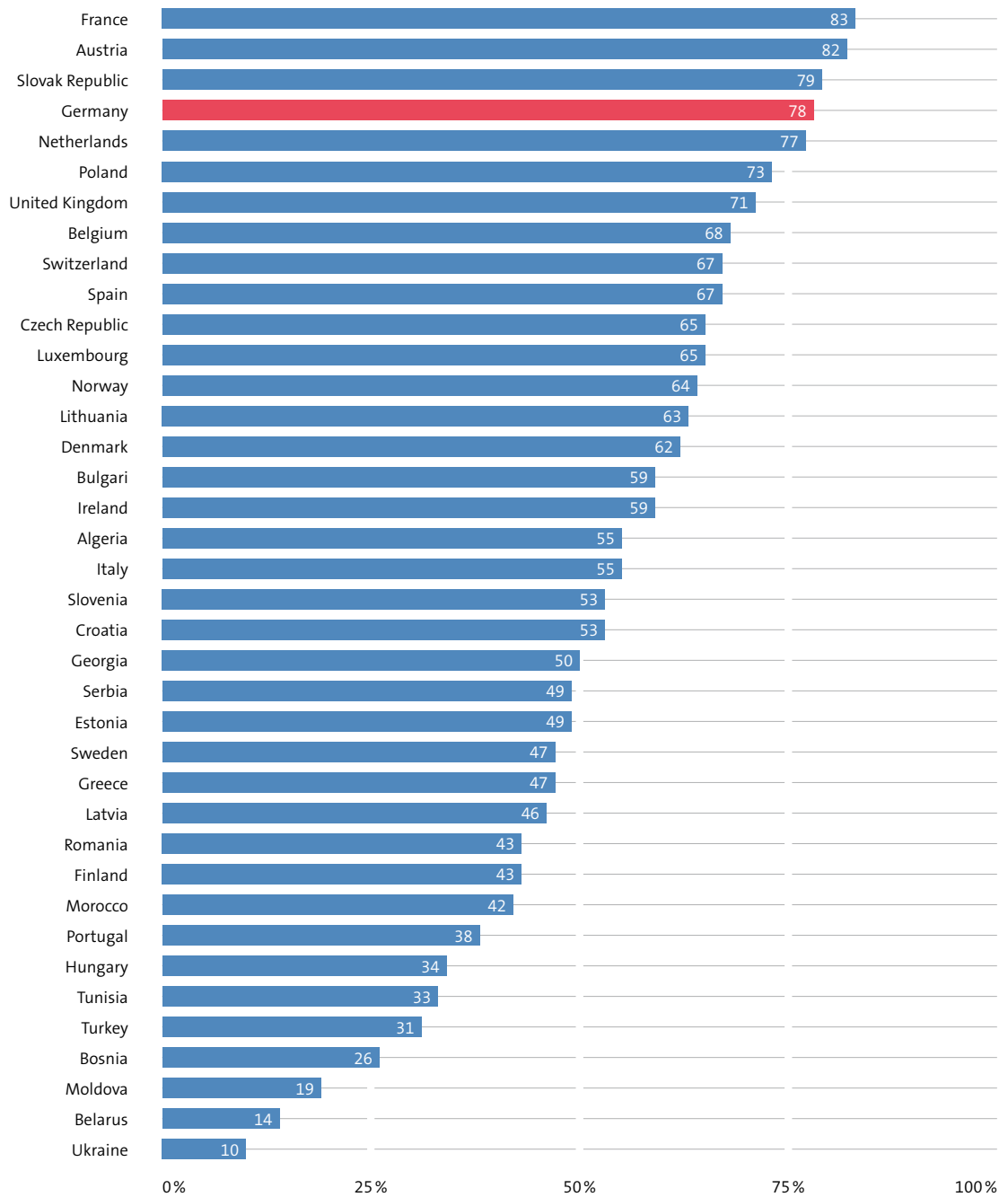
Consumers are looking for better picture quality and, while the transition from SD to HD continues, Ultra HD is emerging both in terms of TV sets and TV channels.

At Q2 2019, almost 150 TV channels are broadcast via satellite in Ultra HD worldwide. Over 50 of them are hosted on SES satellites serving mainly the European and North American markets.

69.9 per cent of the German TV homes have already heard about Ultra HD (compared to 63.4 per cent at year-end 2017). This is well above the European average of 52.3 per cent.

Fig. 4

Percentage of HDTV among all homes (per country)

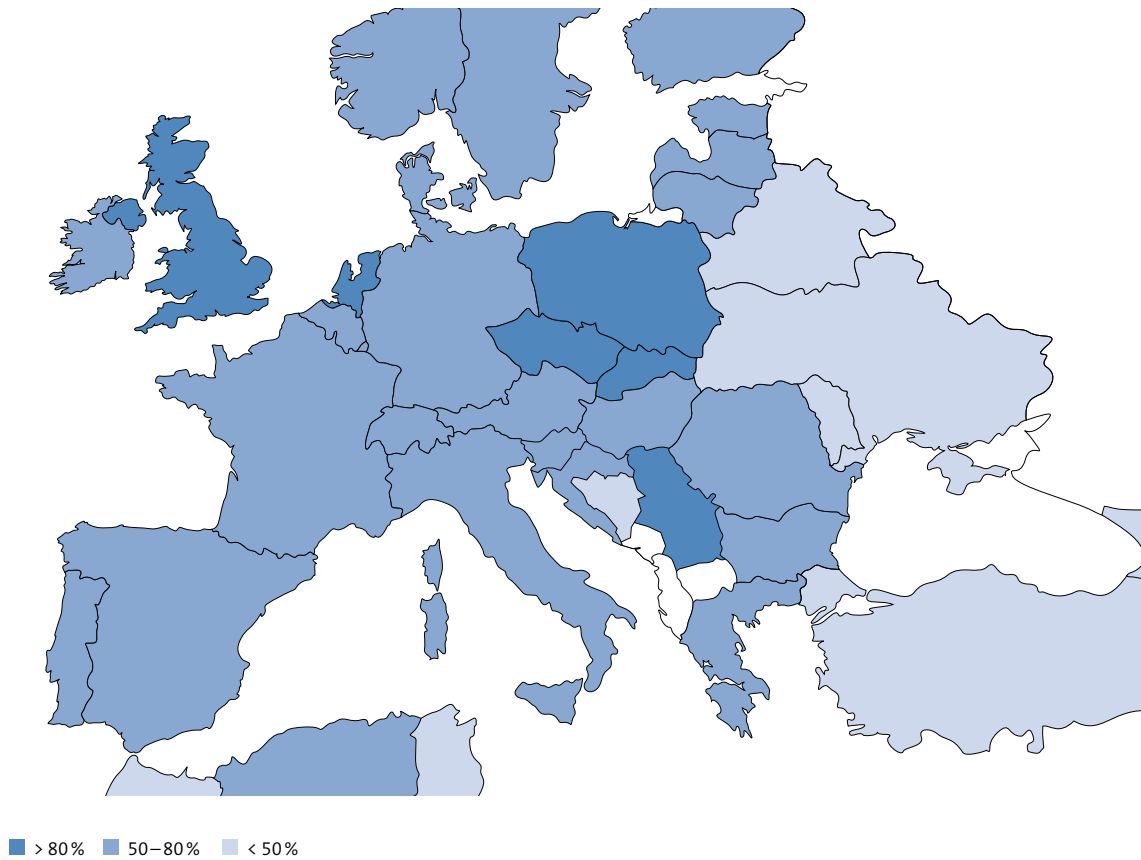


Source: SES Satellite Monitor Year End 2018



Fig. 5

Percentage of HDTV among satellite homes (per country)



Source: SES Satellite Monitor Year End 2018

In terms of ownership, 11.9 per cent already own an Ultra HD TV screen, slightly above the European average of 11.2 per cent.

The number of Ultra HD screens in Europe has gradually increased over the past years, reaching 28.6 million in 2018. As of the end of 2018, 11.2 per cent of European homes are already equipped with an Ultra HD screen, a trend that is expected to continue over the next years.

Satellite leads the way among the UHD-ready homes (homes owning an Ultra HD screen). Almost half of the Ultra HD ready homes (47.8 per cent) in Europe are satellite homes.

### The rise of OTT in Europe

Consumers watch high quality TV on their large screens while they use complementary offers, including on-demand services, on other platforms and alternative screens.

OTT offers a great variety of video content. End-users can either watch live web TV on any device, such as TV programs at the same time as they are broadcast on the “traditional” television set.

They can also watch programs over the internet on demand, derived from the broadcasters’ media libraries, from VOD providers such as Netflix or Amazon, from video-sharing websites such as YouTube or through social networks, just to name a few examples.

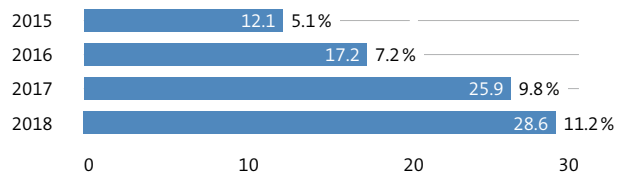
Despite the emergence of OTT services such as Netflix and Amazon in the past years, the proportion of TV homes over the total number of homes in Europe has marginally decreased: 1.4 percentage points from year-end 2014 to year-end 2018. Findings of the SES Satellite Monitor surveys show that European consumers use OTT to complement their traditional TV offers.

At year-end 2016, for the first time, SES Satellite Monitors research included the OTT landscape: 19 countries were surveyed regarding OTT; following expansions in year-end 2017 and year-2018, a total of 28 countries are being surveyed, representing a sample of 249.5 million homes. Out of them, 135.2 million/54.2 per cent claimed that they consume OTT on any device.

Looking in more detail at the trend of OTT usage at the TV set for those homes with a “classic” TV reception mode (satellite, cable, terrestrial, IPTV), the trend is clear: OTT is becoming increasingly

Fig. 6

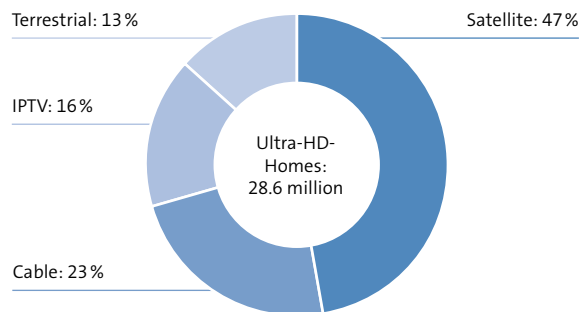
### TV homes equipped with Ultra HD / 4K screens in Europe



Source: SES Satellite Monitor Year End 2018

Fig. 7

### Percentage of UHD ready homes by mode of reception

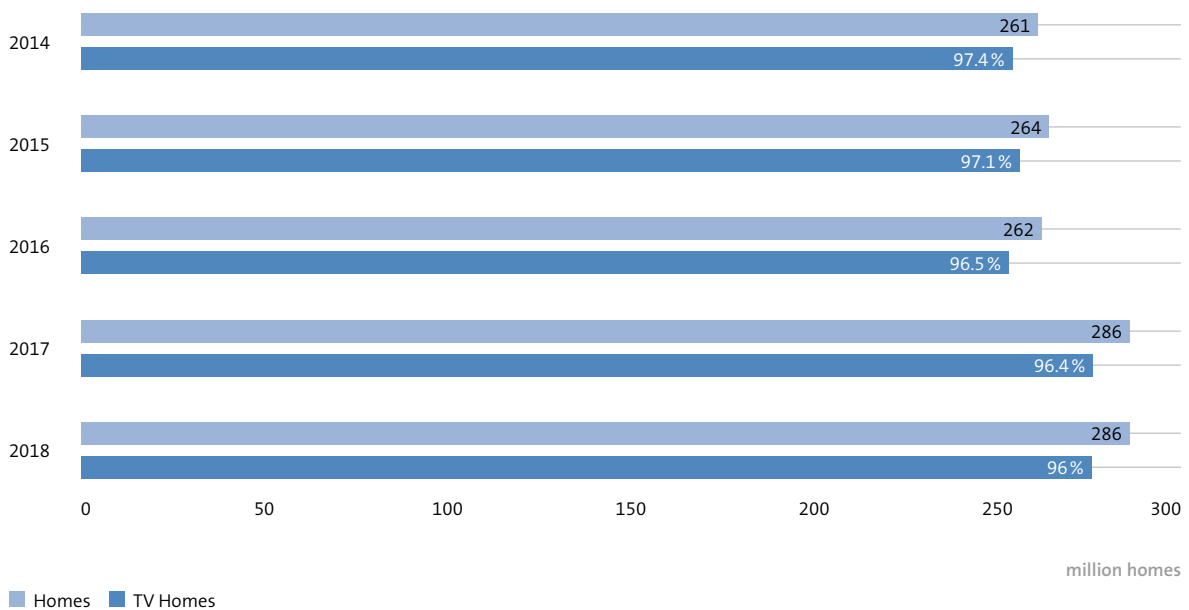


Source: SES Satellite Monitor Year End 2018

popular and is now enjoyed by 22 per cent of TV homes in Europe. OTT is here to stay, providing complementarity to traditional TV viewing. The number of OTT-only TV homes, this is, TV homes using only OTT at their main TV set remains negligible in Europe: approximately 1 million TV homes are only using OTT to watch TV. All in all, SES Satellite Monitor data suggests that cord-cutting is a phenomenon that is marginal in Europe, if not

Fig. 8

**Number of Homes & TV Homes and TV penetration rate (in per cent) in Europe**



Source: SES Satellite Monitor Year End 2018

close-to non-existent: consumers in this region have access to plenty of free-to-air TV offers and use OTT to complement these.

OTT consumption is well-established on a variety of devices, but non-TV devices are by far the most popular (59 per cent), 30 per cent use both TV sets and non-TV devices, and a mere 11 per cent of homes use only the TV for this. This highlights the complementarity of OTT to traditional linear TV. In almost two-third of the cases OTT is consumed on non-TV devices and in another quarter TV sets and non-TV devices are used interchangeably.

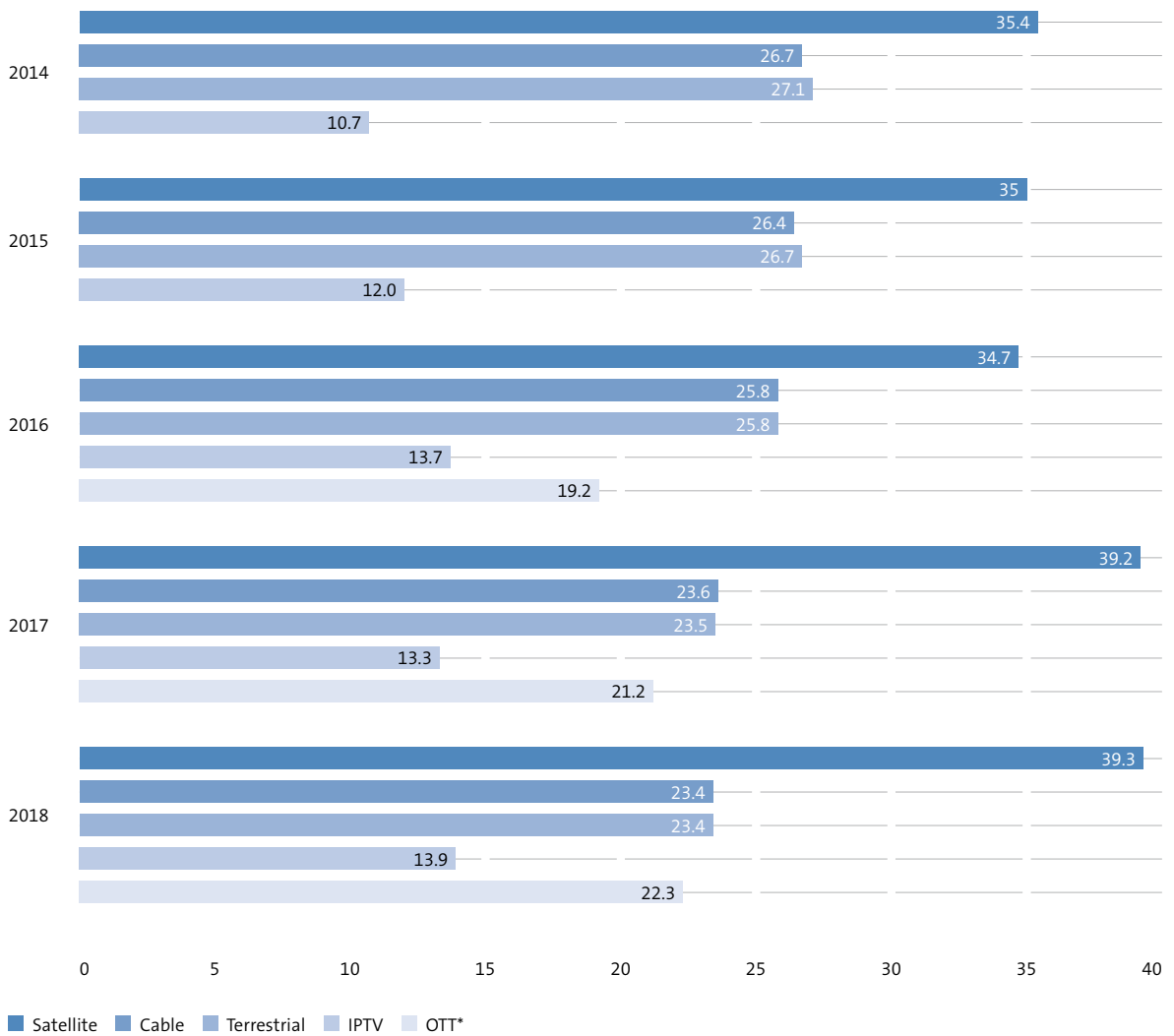
Homes viewing OTT have a slight preference for consuming non-linear video content (86 per cent) rather than linear (73 per cent).

The trend that we see here is a diversification of the video offer: people favour flexibility, to use different screens and different forms of consumption at the same time.

When it comes to paying for OTT services or to using them for free, a large majority of consumers (71 per cent) prefer enjoying the OTT services available for free only. Just over a quarter pay for certain services in addition (26 per cent).

Fig. 9

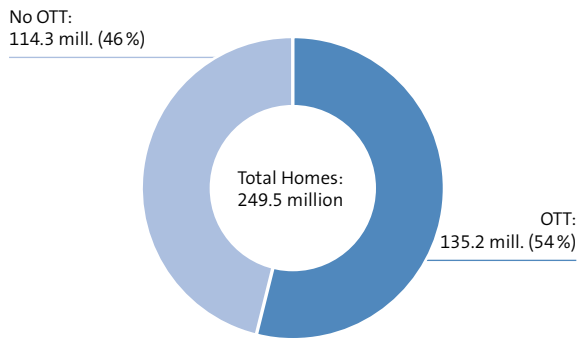
TV homes and usage of OTT (in per cent) in Europe



\*TV homes with satellite, cable, terrestrial, or IPTV and using OTT in addition (at the main TV set)  
 Source: SES Satellite Monitor Year End 2018

Fig. 10

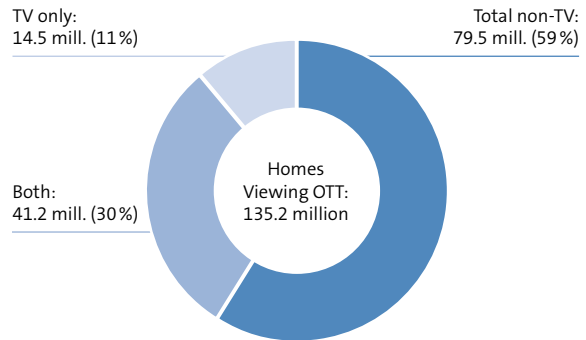
**OTT-Konsum auf sämtlichen Geräten**



Source: SES Satellite Monitor Year End 2018

Fig. 11

**Devices used for OTT consumption**



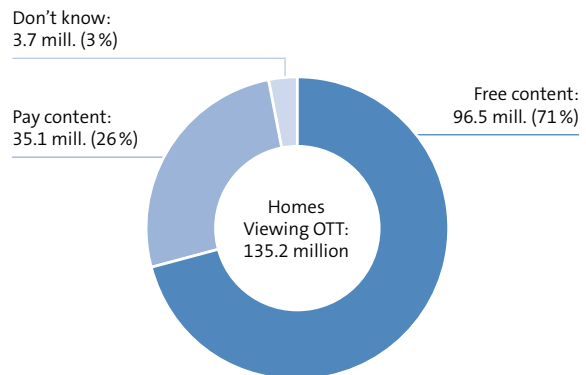
Source: SES Satellite Monitor Year End 2018

**Conclusion and outlook**

As of year-end 2018, barely 18 million TV homes remain analogue. These homes will sooner rather than later switch to digital television infrastructure. HDTV will continue to act as a key enabler and driver for digitisation in the near future. Ultra HD / 4k, with four times the picture resolution of HDTV, is gaining traction in the more advanced TV markets across Europe. The availability of Ultra HD channels is continuously increasing, whether via SES satellites or elsewhere. While picture quality remains at the forefront in terms of viewing experience for the end consumers, they also value enjoying a wider offer of video content from the internet on a variety of devices (smart TV, mobile devices, etc.). The complementarity of OTT to traditional linear TV allows an even greater diversification of the video offer: the end user can use different screens and different forms of consumption simultaneously.

Fig. 12

**Type of video content (pay versus free only) used by European homes**



Quelle: SES Satelliten-Monitor Ende 2018





# The remit of the media authorities regulating platforms

Platform regulation as laid down in German broadcasting law aims at securing equal access to networks and platforms and at ensuring that broadcasting offers can be found by viewers. The infrastructures of the networks and the user surfaces are to be found in a central position between the broadcasters and the viewers, and can potentially impact access to the audience for the broadcasters and thus ultimately affect the free formation of opinion. This scenario necessitates an independent institution regulating this sector.

## Ensuring findability on user surfaces

User surfaces, electronic programme guides (EPG in short), navigators or listings show the content available, allowing direct access to content for a viewer. The media authorities ensure equal opportunities and non-discrimination for all broadcasting content to be found via these surfaces. This comprises, among other things, that differing providers offering the same category of content are listed in a comparable fashion. The criteria adopted by platform providers for listing content are published on the website of the media authorities to help making this transparent. The

empirical survey conducted in the framework of the report on digitisation proves that pre-set listings still have considerable importance. At the same time, the relevance of app portals provided on smart TV sets is enjoying a noticeable increase.

Regulation at present applies only to the user surfaces provided by platform operators. For this reason, the media authorities advocate an extension of regulation to cover all user surfaces including, among others, smart TV sets, home screens or set-top boxes which present an overview of all broadcast services available and allow individual services to be accessed directly.

## Ensuring equal access to platforms

With the scarcity of transmission capacities having come to its end, the must-carry provisions have somewhat shifted out of focus. In turn, the economic terms applying to content distribution are gaining considerable relevance as the significance of HDTV increases and the platform operators now market HD content. The structure of the payment schemes must pass the criterion of plurality of opinions. The media authorities



verify whether comparable offers are distributed at comparable terms on the basis of the contractual agreements reached between broadcasters and platform operators.

Alongside the traditional routes of transmission, OTT platforms are becoming more and more important, permitting audiences to access broadcast offers and comparable video content; this is shown in the facts and figures section of the report on digitisation. In this context the media authorities also pay attention to the developments in politics and media legislation as regards net neutrality. Here, too, plurality commands that individual offers are not granted preferential treatment.

### Transparency and cooperation

For the media authorities, transparency in the broadcasting sector constitutes a key objective. To this end, they regularly go public organising events and issue publications including this report on digitisation; they offer information and conduct debates on topical issues. Platform regulation is handled in the Commission on Licensing and Supervision (ZAK) of the media authorities. Alongside this cooperation of the media authorities among themselves, the regulators also exchange views and positions with the Federal Network Agency and the Federal Cartel Office. Regarding the introduction of DTT2 HD, for instance, the issue of cooperation among market players was discussed with the Federal Cartel Office while the necessary capacity requirements were developed jointly with the Federal Network Agency and the German states. This well-established cooperation should now be underpinned by a stronger legal provision, thus attributing the appropriate relevance to securing pluralism in the process.

### Accompanying the process of transformation – the media authorities as moderators

The progress of technology results in changes of the broadcast transmission infrastructures at irregular intervals. The media authorities have been accompanying these processes of transformation for several years already. They are involved in the switchover to the new terrestrial television standard DTT2 HD procedure which will continue until 2019 in some areas; in this process the media authorities moderated a Round Table of the major television groups and the association of commercial broadcasters (VPRT) to ensure a joint approach. The communication policy in particular necessitated a thorough exchange of views and positions in advance of informing the general public and the experts.

In the context of the impending switch-off of analogue cable transmission the media authorities initially conducted several meetings with the industry seeking to develop a joint line from the differing positions of content providers, network operators and the housing industry. The Round Table on the switchover of cable from analogue to digital transmission now provides a platform for all players involved to determine the concrete conditions for the switchover. The data in this report on digitisation outline the aspects that need to be taken into consideration for a consumer-friendly switchover.

# The authors



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works as consultant for media economics and research in the Joint Management Office of the German media authorities

Simon Berghofer studied journalism and communication science, political science, and modern German literature at the Free University of Berlin. After graduation, he worked for several years as a research associate at the Free University where he researched and taught media regulation, media markets, and media governance, and earned a doctorate. Since the beginning of 2018, he has been responsible for various research projects on digitisation, convergence and the usage of media in the Joint Management Office of the German media authorities. He also deals with economic issues relating to platform regulation and works for the expert committee on networks, technology and convergence of the Commission on Licensing and supervision (ZAK).



**Andreas Hamann**  
is the General Manager of the Joint Management Office of the German media authorities

Andreas Hamann studied law in Konstanz from 1989 to 1994 and thereafter went to Karlsruhe as a legal trainee. In 1996, he worked in the department for contract management at the Bundesanstalt für vereinigungsbedingte Sonderaufgaben (Federal Institute for reunification-related special tasks) in Leipzig. From 1997 to 2010 he was consultant for television issues at the media authority of Baden-Wuerttemberg (LFK). From 2006 to 2010, he was additionally in charge of the Commission on digital access or the media authorities. Since 2010, Andreas Hamann has been General Manager of the Joint Management Office of the German media authorities in Berlin.



**Dr Hans Hege**  
is the former director of Medienanstalt  
Berlin-Brandenburg (mabb)

Dr. Hans Hege was director of the media authority in Berlin-Brandenburg from 1985–2016. Initially the Anstalt für Cablekommunikation Berlin, it was renamed Medienanstalt Berlin-Brandenburg in 1992 following its expansion to also cover the state of Brandenburg after reunification. From 1995 to 2013, he dealt with the issue of digitisation for the media authorities; from 2008–2013 he acted as Representative for platform regulation and digital access (of the Commission on licensing and supervision (ZAK)).



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Ricardo Topham completed his telecommunication engineering studies in 2010, followed by an M.Sc. in telecommunication technologies at the University of Las Palmas de Gran Canaria and an M.Sc. in space management at the International Space University. During the summer of 2012 he was a visiting researcher in NASA Goddard Space Flight Center. He then worked as a strategic planning and market analysis consultant for Euroconsult from 2012 to 2015. Ricardo joined SES S.A. in Betzdorf (Luxembourg) in 2015 as a senior business and market analyst within the Marketing department, to lead the market research projects globally. Since then he has become the key contributor to the Satellite Monitors project, a survey conducted among private homes to find out about the development of TV reception in 38 countries in Europe and 5 countries in Africa.

This issue of the report on digitisation celebrates the 15th anniversary of its publication. Over the period of these 15 years, the research covered in the report on digitisation has advanced just as much as has technological innovation in the sector of the media. Alongside the progress of transmission infrastructures for broadcasting content, the report also covers the changes in the consumption of moving images and includes data on the end devices used as well as the trends of usage, be it for traditional linear television or video on demand offers. Regarding the findability of broadcast content, the user surfaces provided on end devices and the pre-installed apps play a major role as they form the entry gate via which content providers deliver their ware to the viewers. The number of so-called „cord cutters“ turning their backs on the traditional routes of transmission is growing – for the time being, though, it is still a minor factor in the market overall.

The presentation of our research results in this report on the digitisation of the video market is complemented by a look back over the past 15 years. The review highlights the major changes in the media sector and the approach the media authorities have adopted for dealing with it. And developments in Europe are again detailed in a comparative section of the report: Which course is the digitisation of TV households and HD reception taking in other countries? With their research and this publication, the media authorities document the latest trends of media consumption, acting as moderators and partners of the media industry.



The digitisation reports are available on our website  
[www.die-medienanstalten.de](http://www.die-medienanstalten.de).