



Federal Ministry
of Transport and
Digital Infrastructure



Rheinland-Pfalz

Action Plan for the Transformation of Radio Broadcasting in the Digital Age

Roadmap

Progress Report for the Digital Radio Board

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Foreword

The switch to digital is affecting all areas of life and business. Digital technologies are changing the way in which media content is produced, disseminated and consumed. In television, the digital transformation was started years ago, and today it is virtually complete. The situation in radio is different: although most broadcasters have now adopted hybrid strategies for the dissemination of their programmes, broadcasting via FM (or in German UKW, ultra-short wave) is still the mainstay of the radio scene in Germany. However, its popularity also led to analogue FM broadcasting coming up against its limits some years ago. The frequency spectrum is crowded. It does not offer any capacity for more programmes and additional contemporary offerings.

DAB+ (Digital Audio Broadcasting) offers a new terrestrial digital transmission option in the VHF spectrum. DAB+ started in August 2011 with the broadcasting of 13 radio stations, which have since been disseminated via a nationwide multiplex. Now, not only public broadcasters but also many commercial radio stations are broadcasting their programmes via DAB+. In addition, the Internet also offers radio stations a good option for reaching listeners. Both for conventional linear radio programmes and for non-linear audio offerings, the dissemination of programmes over the Internet has been growing continually in recent years. This is evidence of steady growth in online audio offerings and curated playlists¹ in Germany.

The Federal Ministry of Transport and Digital Infrastructure is working together with the federal states to open up new development prospects for radio in tomorrow's digital world. This concerns both the provision of high-performance mobile and stationary Internet connections, as well as digitisation of terrestrial radio broadcasting. The radio of the future is to be based on listeners' interests. This is true of stationary use and for radio usage on the move.

The Federal Government and the federal states intend this roadmap to provide a framework for building a long-lasting digital radio broadcasting infrastructure in Germany, which enables innovations in radio, broadens the range of programming and opens up the world of digital radio sound all over Germany. In addition, the development of additional and traffic information services will be rendered possible. For that purpose, legislative and organisational changes are required.

¹ "curated playlists" are lists of pieces of music or songs chosen by the station's editorial team

Management summary

FM radio is still the most intensively used means of transmission, but the Internet and DAB+ can point to rising usage statistics. The recognised DRM30 and DRM+ standards are also available for digital terrestrial transmission.

The radio of the future will be based on listeners' interests. Exactly how the switch to digital radio will happen depends on which digital transmission modes listeners will put their trust in for the long term.

The roadmap contains eight measures which create the necessary framework for the transformation of radio broadcasting in the digital age:

1. "Smart Radio" regulation: mandatory equipment of radio receivers with at least one digital interface;
2. creation of a regulation that ensures that analogue transmission capacity released by public broadcasters is no longer available for new or different analogue radio offerings;
3. support of the roll-out of digital high-speed broadband networks;
4. provision of the necessary transmission capacity for setting up a second nationwide DAB+ multiplex by the Federal Network Agency;
5. creation of the conditions for using TPEG;
6. agreement on a method for determining levels of DAB+ equipment;
7. further development of the measuring methods for radio usage in liaison with ARD to also include the usage of digital terrestrial broadcasting;
8. political follow-up of the transformation process from analogue to digital radio broadcasting by evaluation and updating of the roadmap.

1. Radio usage

Radio usage in Germany has been consistently high for years. Three out of four Germans (78.7%) listen to radio on weekdays. That makes 57 million listeners a day. The average time spent listening is 190 minutes, the longest time spent listening to one station 242 minutes.² In the 10-29 year-old age group, the average listening time and the longest time spent listening to one station on weekdays are usually lower, at 127 minutes and 181 minutes respectively.

By far the main radio transmission mode in Germany is still analogue modulated FM, despite the possibility of listening to radio in a fixed location or on the move via the Internet. 98% of daily audio usage is offline use of radio and recordings. Online use of audio (podcasts, music files, radio streaming and other online audio) on the other hand only accounts for a 2.5% share of the total duration of usage. The highest online usage of audio content is among 14-19 year-olds, with an 11.6% share, and among 20-29 year-olds at 3.8%.³ The ARD/ZDF long-term study on mass communication comes to the conclusion that radio, as the oldest electronic medium, will not be superseded by new audio offerings.⁴

Nevertheless, the Internet is an increasingly relevant platform for radio broadcasters. They are using it to broaden their offering to listeners. Besides the simultaneous broadcasting of their FM programmes, they offer music streams, podcasts, news and information about schedules, presenters and events over the Internet. In 2015, online audio advertising generated 17 million euros (net) in sales. This figure is growing at 37% per year and will reach 39 million euros in 2018.⁵

In countries which are considered as pioneers of digital terrestrial radio (DAB+), the share of radio usage via digital transmission is also rising continuously. 60% of Norwegians, 53% of Swiss and 45.5% of British people listen to digital radio.⁶

The Digitisation Report 2016 (Digitalisierungsbericht 2016) by the media authorities accordingly finds: "In

² https://www.agma-mmc.de/fileadmin/user_upload/Pressemitteilungen/2016/PM_ma_2016_Radio_II.pdf

³ Gattringer/Mai; Radio bleibt der Soundtrack des Tages (Radio remains the soundtrack of the day); Media Perspektive 4/2016; p. 209

⁴ Gattringer/Mai (FN 2); p. 214

⁵ <http://webradiomonitor.de/studie/webradiomonitor-2016/>

⁶ Concerning DAB+ usage in individual countries, see <http://www.worlddab.org/country-information>

comparison with television, digitisation of radio has so far had a shadowy existence. Now that seems to be gradually changing. According to the survey results for the Digitisation Report 2016, digital radio and even Internet radio have recorded positive growth for the third year in a row. On the other hand, radio reception via cable and satellite is down."⁷

2. Transmission modes

In the early days of radio in the 1920s, programmes were broadcast on medium wave. After the Second World War, transmission using FM started in Germany. On 28 February 1949, Bavarian Radio began operating the first FM transmitter in Europe. In the VHF band, FM (Frequency Modulation) established itself as a modulation process and made VHF a successful radio transmission mode.

Whereas in the USA, medium wave in particular is still a standard transmission mode for radio, in Germany programmes are no longer broadcast via long or medium wave. The last medium wave transmitter operated by a publicly-owned broadcaster in Germany was switched off on 31 December 2015. Commercial stations gave up using this transmission mode much longer ago.

The digital transformation brings about major challenges for traditional radio broadcasting, and it opens up new opportunities. Media usage is becoming increasingly convergent and the popularity of non-linear audio offerings is growing continuously, which is why individual voices foresee a gloomy future for purely linear programme offerings. Against this backdrop, the Federal Ministry of Transport and Digital Infrastructure presented, in April 2015, a study commissioned from the Broadcast Technology Institute (Institut für Rundfunktechnik - IRT).⁸ The discussion since publication about the individual transmission modes is summarised below.

2.1. FM

The discussion about the FM transmission mode concentrates primarily on its economic significance.

⁷ Arbeitsgemeinschaft der Landesmedienanstalten GbR: Digitalisierungsbericht 2016 (Association of State Media Authorities: Digitisation Report 2016)

⁸ Institut für Rundfunktechnik: Terrestrischer Hörfunk: Zukünftige Entwicklung im Hinblick konkurrierender Übertragungswege (Broadcast Technology Institute: Terrestrial radio: future developments concerning competing transmission modes)

The popularity and importance of analogue broadcasting via FM continue unabated. The Association of Private Broadcasters and Telemedia (Verband privater Rundfunk und Telemedien e.V. - VPRT) emphasises that commercial radio funds itself based on usage and reach. Therefore, switching off this transmission mode is not up for discussion. Politicians are expected to create the conditions for the market to decide freely between transmission modes and standards.

The Consortium of Private Broadcasters (Arbeitsgemeinschaft privater Rundfunk - APR) is also in favour of a market-driven solution, with decisions being taken by competing radio broadcasters. APR considers it to be the job of the politicians to broaden the options of the market players rather than restrict them.

The Consortium of Public Broadcasters in the Federal Republic of Germany (Arbeitsgemeinschaft der öffentlich-rechtlichen Rundfunkanstalten der Bundesrepublik Deutschland - ARD) and Deutschlandradio are pursuing the aim of introducing digital radio using DAB+ as part of a hybrid strategy. According to ARD, the ending of a simulcast phase, during which FM and DAB+ are operated in parallel, and the ending of FM transmissions can only occur with the cooperation of all market players, and only in sync with the commercial broadcasters.

In its 20th report, the Commission for Identifying the Financial Requirements of Broadcasters (Kommission zur Ermittlung des Finanzbedarfs der Rundfunkanstalten - KEF), which audits the funding of public broadcasters and makes a recommendation about the level of the licence fee, evaluated the "Digital Radio (DAB+)" development project. It came to the conclusion that it was not economic to operate two transmission modes for radio for the period of time planned by ARD and Deutschlandradio and that the switchover to DAB+, which was cheaper in comparison to FM, could not succeed unless there were clear commitments by the Federal Government, the German Bundestag and the Federal states regarding DAB+ and a realistic switch-off date set for FM.⁹

2.2. DAB+

Since 1999, the first programmes in DAB mode have been broadcast predominantly on VHF channel 12 and on the L band at 1.5 GHz with a limited transmission power. Due to the proximity of military usage, channel 12 was subject to a transmission power limit, and the L band did not provide

sufficient transmission power either. For this reason, as well as due to the low number of programmes per multiplex, the transmission via DAB was not a success.

Only after the RRC-06 conference¹⁰, which released the whole VHF band for DAB, and due to the introduction of DAB+ with improved audio coding using MPEG 4, was it possible to broadcast more programmes in one multiplex and several multiplexes in the same place with a significantly higher transmission power to ensure indoor reception. Only then was a sufficiently high market attractiveness achieved.

Advocates of DAB+ emphasise the possibilities of achieving greater programme diversity, better sound quality, user-friendliness of the receivers and cheaper broadcasting while, at the same time, cutting energy consumption. According to Bayern Digital Radio GmbH, the Bavaria-wide broadcasting of a programme via 40 FM transmitters requires 116 kW of electricity, whereas for broadcasting a programme via 60 transmitters using DAB+ only 22.4 kW are required.¹¹

Moreover, digital transmission via DAB+ offers cost advantages compared with analogue broadcasting. According to data from ARD, the costs of broadcasting via DAB+ after switching off FM will be between 75% and 80% of the current FM broadcasting costs.¹² The media authorities examined the suitability of digital radio systems for local/regional radio broadcasting in a report and issued recommendations for action.¹³

Critics have found fault with the currently still relatively low market penetration and, in comparison with FM receivers, low level of equipment of vehicles and households with DAB+ receivers. In addition, there are doubts that lower-cost broadcasting using DAB+ will be

¹⁰ ITU Regional Radiocommunication Conference, 2006

¹¹ Bayern Digital Radio GmbH: GREEN BROADCAST – the economic and ecological benefits of DAB+; published at <http://www.worlddab.org/technology-rollout/business-case>

¹² 19. KEF-Bericht(KEF Report), p. 133, marginal no. 251

¹³ Direktorenkonferenz der Landesmedienanstalten, Fachausschuss 2, hier: Technische Konferenz der Landesmedienanstalten (TKLM): Digitale terrestrische Verbreitung des lokalen/regionalen Hörfunks – Bewertung und Empfehlung von digitalen Hörfunksystemen für die lokale/regionale Hörfunkversorgung, Bericht vom 20.10.2015 (Conference of Directors of the State Media Authorities, Expert Committee 2, here: Technical Conference of the State Media Authorities (TKLM): Digital Terrestrial Broadcasting of Local and Regional Radio - Assessment and Recommendation of Digital Radio Systems for Local and Regional Radio Broadcasting, Report of 20 October 2015)

⁹ 20. KEF-Bericht (KEF Report), introductory remark in Chapter 6, Section 1, p. 187

possible for broadcasters of local or regional programmes. Thus, the cost advantages depend on having a well-utilised multiplex. The merger of several adjacent FM broadcasting territories into one DAB+ broadcasting territory - as proposed by the media authorities - entails the risk of cannibalisation due to the geographical proximity of stations on the advertising market.

The VPRT therefore calls for a technically and journalistically meaningful and at the same time financially viable solution for the further development of local radio in DAB+. This solution would have to be found beforehand for the various different structures in the federal states concerned (e.g. Baden-Württemberg, Bavaria, Lower Saxony, North Rhine-Westphalia, Saxony).

The APR points out that the advantages claimed for DAB+ with regard to programming sales would have to be decisive for every company under their specific constraints to give them a reason to commit to DAB+ and, even more so, to drop their existing distribution channel. The opposite would be the case if regulatory pressure were brought to bear to make each company commit to DAB+ or give up FM despite the benefits for the company not being apparent.

In this regard, the Federal Ministry of Transport and Digital Infrastructure supports a pilot project proposal by the Media Authority of Lower Saxony (Niedersächsische Landesmedienanstalt - NLM), in which the expansion of the DAB/DAB+ system and the possibility of broadcasting different regional programmes within single-frequency networks will be investigated. The project was launched at the end of 2015 and is due to be completed within two years.

2.3. DRM30 und DRM+

Digital Radio Mondiale (DRM) is a narrow-band digital transmission system developed initially for the digitisation of radio on long, medium and short-wave frequencies. For use up to 30 MHz, Modes A to D were standardised in 2001. These variants are also referred to collectively as "DRM30".

In 2009, Mode E was added to the DRM standard, which is suitable for use in the VHF frequency range (frequency range from 30 MHz to 300 MHz). This variant is also known as "DRM+".

The German DRM Forum refers to the particular suitability of the standard for local radio. It believes that the creation of local radio structures is not feasible with DAB or DAB+. It points out that DRM+ with its narrow-band transmission

signal (96 kHz) can be used both in VHF Band II (87.5 MHz – 108 MHz) and in VHF Band III (174 MHz – 230 MHz). In this regard, the compatibility with existing radio services above 108 MHz and below 87.5 MHz still needs to be clarified, particularly for VHF Band II.

It is not out of the question that DRM+ could play a more significant role in radio broadcasting in the future. However - apart from software-based solutions - there are, at present, no receivers on the market that are suitable for reception of DRM+.

2.4. Internet and IP radio

According to the Digitisation Report 2016 by the media authorities, Internet radio is the second most frequently used type of reception after FM (34.1% compared with 94.1% for FM use). However, only 2.9% of transmissions are received on special radio sets connected via WiFi. It is mostly smartphones, PCs, laptops and tablet computers that are used for reception. Only 0.7% of usage is via permanently installed IP radio receivers in cars.¹⁴

The diversity of audio offerings on the Internet is unsurpassed. According to the Webradiomonitor 2016, a total of 10139 different online audio offerings and curated playlists were in existence in Germany, including 2453 different webradio streams. Of the webradio streams, 1781 were online-only offerings, 415 streams were simulcast offerings¹⁵ and 257 streams were online sub-brands of the simulcast offerings.¹⁶ In this way, the traditional programme makers link the transmission modes within their hybrid strategies and use both transmission modes.

For transmission via the Internet, programme makers are reliant on well-developed telecommunications networks. This relates not only to fixed-line Internet but particularly to mobile phone networks. Radio broadcasters point out in this regard that the business models of the mobile phone networks with their profit-oriented pricing models, user-dependent network extension, limited volume tariffs, etc. are not compatible with the aim of public service radio, which is to provide continuous, free and unrestricted access to radio offerings with a stable nationwide service.

¹⁴ Arbeitsgemeinschaft der Landesmedienanstalten GbR: Digitalisierungsbericht 2016 (Association of State Media Authorities: Digitisation Report 2016)

¹⁵ Simulcast offerings include one-to-one transmission of conventional FM/DAB+ radio programmes over the Internet.

¹⁶ <http://webradiomonitor.de/studie/webradiomonitor-2016/>

2.5. Digital radio in Europe

In Europe too, analogue radio transmission via FM continues to be at high levels, whereas the introduction of DRM+ is only being considered. No unequivocal statement can be made for the whole of Europe about the use of the Internet as a transmission mode for radio broadcasting. DAB+ is now an established radio transmission mode in the United Kingdom, Norway, Switzerland, Denmark, the Netherlands and Italy.¹⁷

During the course of 2017, Norway will switch over to DAB+ and switch off most of its FM transmitters. Switzerland is planning the digital switch-over between 2020 and 2024. The United Kingdom is extending its national and local DAB transmitter networks and has defined the criteria for switching off FM. In Denmark, a consistent roadmap for digital radio has been presented, which provides for a complete switch-over. In the Netherlands - after the start of national programming in 2013-2015 - new coverage with regional services has come into service. In Italy, the digital radio network has been extended to Southern Italy, Sardinia and Sicily. 43% of the population already have coverage. The number of digital stations is growing continuously. RAS (the South Tyrol broadcaster) has announced that at the end of 2017, it will start switching off the first smaller FM transmitting stations.

In the meantime, France, Belgium, Poland, Austria and Slovakia have also begun broadcasting programmes via DAB+.

In France, DAB+ services have been in operation in Paris, Nice and Marseilles since 2014. A further development of digital radio all over France is planned. In Belgium, broadcasters have been transmitting via DAB+ in Brussels since 2015. The extension to Flanders is planned for 2016. In Poland, Polish radio has extended its digital radio coverage and is now reaching 55% of the population. In Austria, a pilot operation with 15 DAB+ stations was started in the Greater Vienna area in May 2015. Since December 2015, Slovakia has also been running a DAB+ trial in Bratislava. And in Slovenia, a licence was issued to the public broadcaster in 2016 for the first national DAB+ multiplex.

¹⁷ Concerning individual European countries, see EBU; Market Report – Digital Radio 2016; <http://www.ebu.ch/files/live/sites/ebu/files/Publications/EBU-MIS%20-%20Digital%20Radio%20Report%202016.pdf>

3. The role of the federal states, the Federal Government and the EU

The Federal Government, the federal states and the EU already successfully created the framework conditions for the switch-over from analogue to digital radio transmission during the digitisation of television broadcasting. This roadmap is to pave the way for supporting the digital transformation of radio and create the relevant framework conditions.

Under the federal system of the Federal Republic of Germany, broadcasting is a matter for the federal states. Under the Basic Law, the Federal Government is only responsible for technical matters relating to telecommunications and terminals. The transformation of radio broadcasting in the digital era therefore requires cooperation between the Federal Government and the federal states.

The usual practice for this cooperation takes the following form: the federal states specify the basic structure for the broadcasting scene and decide whether programmes are to be broadcast nationwide, state-wide, regionally and/or locally and formulate the requirements to meet the needs for coverage. Based on these definitions, the Federal Network Agency makes available the frequencies required for terrestrial broadcasting to meet those needs. The federal states or the bodies designated by them decide which transmission capacities or requirements will be allocated to the public and which to the commercial broadcasters. The capacity allocated to commercial radio is then put out to tender by the media authorities of the federal states as a platform or as individual programme channels. At present, requirements for coverage with analogue and digital terrestrial radio are laid down in all federal states.

3.1. Media law provisions in federal state law

In the individual federal states, the media laws currently contain concrete provisions for a planned switch-off of FM. In Saxony, radio programmes can still be broadcast via FM until the end of 2025. From 2026 onward, terrestrial radio transmission is to only use digital.¹⁸ In Saxony-Anhalt, the deadline for the switch, which has already been postponed once, is also set as 31 December 2025. A shutdown of FM is possible before that date if the criteria laid down by law are already fulfilled at an earlier date.¹⁹

¹⁸ Section 4(6) of Saxony's Commercial Radio Act (SächsPRG)

¹⁹ Section 35 of Saxony-Anhalt's Media Act (MedienG LSA)

In Bavaria, digital and analogue radio broadcasting licences have been granted for an unlimited period since 1 September 2016. There is a clause permitting the revocation of the FM licence if the station is not also broadcast digitally. In Saxony-Anhalt, the extension of FM licences is tied to the condition that the broadcaster concerned also broadcasts its programming via DAB+. Overall, the broadcast licensing practices of the federal states vary.

At federal and EU level, on the other hand, there are, at present, no legal provisions regarding the future of analogue terrestrial radio or a compulsory introduction of digital terrestrial radio.

For television, the European Commission set a deadline, in an action plan and two communications²⁰ for switching off analogue TV transmission in 2012.²¹ To support this process the EU adopted, in 2002, the Universal Service Directive²², which provides that only TV sets equipped with a digital interface compliant with the EU standard may be brought onto the market.

3.2. Digital Radio Board

Together with the federal states, the Federal Ministry of Transport and Digital Infrastructure set up the Digital Radio Board in 2015 to discuss the changes in radio caused by the switch to digital with representatives of the commercial and public radio broadcasters, the media authorities of the federal states, the car and radio manufacturers as well as network operators and jointly shape the subsequent developments. In this roadmap, the Digital Radio Board defines the tasks, actions, responsibilities and timetable for a coordinated process. At the same time, the Digital Radio Board oversees the implementation of the roadmap.

In doing so, it considers the positions of the Association of State Media Authorities (Arbeitsgemeinschaft der Landesmedienanstalten - ALM), the ARD, Deutschlandradio,

the Association of Private Broadcasters and Telemedia (VPRT), the Central Association of the Electrical Engineering and Electronics Industries (Zentralverband Elektrotechnik- und Elektronikindustrie e.V. - ZVEI) and the Association of the German Automobile Industry (Verband der Automobilindustrie e.V. - VDA).

The roadmap defines actions to pave the way forward from analogue to digital radio broadcasting.

4. Digitisation of radio broadcasting

4.1. Framework conditions for broadcasters

The public broadcasters can fulfil their statutory mandate to make and broadcast programming - operating as a medium and a factor in the process of free individual and public opinion formation - by using suitable transmission modes. In choosing the transmission mode, they have to observe the principles of viability and economy. In assessing viability, the Commission for Identifying the Financial Requirements of Broadcasters (KEF) considers matters including the availability of receivers in households and the mass fitting of cars with receivers.

Commercial radio funds itself with advertising revenue based on usage and reach. For this purpose, appropriate receivers must be available for the target groups concerned, and the programming must be receivable. The VPRT is therefore calling for the entry into migration phases to be considered only once proven technical usage - and not merely the technical range - of a digital standard reaches 40% in a geographically extensive network structure on a par with that of the ARD broadcasters, based on economic considerations. At the time of the launch of the nationwide DAB+ multiplex in 2011, the VPRT talked about plans according to which for DAB+ programming to be a success, 16 million receivers would have to be reached among users within four years.

According to the Digitisation Report by the media authorities dating from 2016 there are, at present, around 139.4 million FM radios, compared with 8.2 million DAB+ receivers and 4.6 million IP radio receivers. 12.6% of households have at least one DAB+ receiver.

According to the DAT report 2017, 21% of new car buyers and 10% of all used car buyers ordered or bought a car with a DAB+ car radio. 22% of car owners have a suitable receiver. That compares with 76% of new car buyers, 85% of

²⁰ COM(2002) 263 fin.; Europe 2005: A European Information Society for growth and employment; COM(2203) 541 fin.; Communication from the Commission on the transition from analogue to digital broadcasting (from digital 'switchover' to analogue 'switch-off') and COM (2005) 204 fin.; Communication from the Commission on accelerating the transition from analogue to digital broadcasting

²¹ COM(2005) 229 fin.; 1 June 2005

²² Annex VI to Art. 24; Directive 2009/136/EC of the European Parliament and of the Council of 25 November 2009 amending Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services.

used car buyers and 75% of car owners who own a car fitted with a car radio.²³

The statements and figures quoted show: the revenue that commercial broadcasters generate from advertising is just as dependent on the availability of receivers in homes and vehicles as the cost-effectiveness of the DAB+ transmission mode for the public broadcasters. So the success of digitisation of radio is fundamentally dependent on the availability of digital receivers in homes and vehicles.

4.2. Smart Radio regulation

The introduction of DVB-T for digital terrestrial TV transmission within a decade is a good example of a successful analogue to digital migration. A prerequisite for the creation of digital reception possibilities was the obligation imposed on manufacturers and retailers since 1997 to only bring onto the market television sets with an interface for digital reception.²⁴ In the Universal Services Directive, the EU made this compulsory throughout Europe.

In order to strengthen digital radio broadcasting, a comparable regulation is needed for audio receivers. It should be technology-neutral and guarantee the interoperability of receivers.

Such a measure promotes the technical basis for reception of digitally transmitted programming and at the same time creates planning certainty for manufacturers and retailers. It will also be necessary to plan for appropriate transitional periods. The ZVEI has called for a lead-time of 1.5 to 2 years for the receiver manufacturers. This period is required both for the development and production of new receivers as well as for retailers to sell off existing equipment.²⁵

An obligation to incorporate digital interfaces into new audio receivers should, however, not be interpreted as anticipating a switch-off of FM or constituting a precedent for a particular transmission standard. Nevertheless, it will support the digitisation of radio broadcasting.

Measure 1:

In order to support the digitisation of radio, the Federal Ministry of Transport and Digital Infrastructure is proposing to incorporate a provision in the Telecommunications Act under which the vast majority of radio receivers would have to be equipped in the future with at least one digital interface, enabling reception and playback of digitally encoded content, provided that this is allowable under European law. To achieve advantages of scale in production, Germany will push for this rule to be included in the regulatory framework of other EU Member States.

The Federal Ministry of Transport and Digital Infrastructure and the federal states first called on the European Commission in spring 2016 to include digital radio in the Digital Agenda for Europe and to incorporate an obligation to ensure interoperability of radio receivers in the revision of the regulatory framework for electronic communication. In their position papers on the European Commission's planned amendment of the regulatory framework for electronic communication, the United Kingdom²⁶ and the Netherlands²⁷ both made similar calls. The European Commission has not responded to the request for such a provision in the regulatory framework for electronic communication.²⁸ An EU-wide Smart Radio regulation is not achievable at present. However, the European Commission has revealed itself to be open to national initiatives.

5. Digital future of the radio landscape

5.1. Strategies of the parties concerned

ARD and Deutschlandradio are pursuing the strategic objective of maintaining a stand-alone terrestrial transmission mode for radio broadcasting and introducing digital radio via DAB+ consistently as part of a hybrid strategy. In the long term, they are counting exclusively on digital transmission and the switch-off of all analogue

²³ Deutsche Automobil-Treuhand GmbH, DAT-Report 2017; <http://www.dat.de/report>

²⁴ Law on the Application of Standards for the Transmission of Television Signals (Television Transmission Act; Fernsehsignalübertragungs-Gesetz - FÜG) of 14 November 1997; now section 48 of the Telecommunications Act (TRG)

²⁵ ZVEI; Positionspapier zur vollständigen Digitalisierung im Hörfunk (Position Paper on Complete Digitisation in Radio Broadcasting); July 2015; p. 4

²⁶ UK Government response to the European Commission consultation on the review of the Audiovisual Media Services Directive (AVMSD); p. 2

²⁷ Position Paper of the Netherlands on the review of the regulatory framework for electronic communications networks and services; p. 6

²⁸ Proposal for a directive establishing the European Electronic Communications Code: <https://ec.europa.eu/digital-single-market/en/news/proposed-directive-establishing-european-electronic-communications-code>

radio transmission modes. The operation in parallel of analogue and digital transmission (simulcast operation) is to occur for the shortest possible period and only for as long as necessary. They have signalled the funding necessary for parallel operation to the Commission for Identifying the Financial Requirements of Broadcasters (KEF) for the funding period 2017 to 2020. The KEF has allocated the corresponding funding but pointed out at the same time that it was uneconomic to operate two transmission modes for radio for the period planned by ARD and Deutschlandradio.²⁹

ARD plans to achieve virtually nationwide DAB+ coverage of 95% of the population in the period between 2018 and 2020. For network extension and the associated marketing measures, it has signalled that it needs funding of 122.7 million euros and has proposed a switch-off of FM transmissions after 2025 or after 2028.

Deutschlandradio plans a further extension of its transmitter network and has signalled that it needs 73.7 million euros including 4 million euros for marketing. It has stated its intention to switch off its FM transmitters starting in 2025 at the latest.

For DAB+, the KEF allocated ARD funding of 89.4 million euros and Deutschlandradio 63.6 million euros. This is tied to a clear call for the politicians to set “clear framework conditions for the introduction of DAB+ and the subsequent ending of a simulcast.”³⁰

The KEF is therefore expecting that the following milestones will have been achieved when the applications with regard to its 22nd report in 2019 are made:

1. The decision by the Federal Government and the federal states on the concept for the FM switch-off has been reached;
2. a methodology for determining DAB+ usage has been agreed between the market participants and usage statistics have been published;
3. the large car manufacturers have been motivated by means of appropriate, possibly regulatory measures to offer DAB+ radios as standard equipment;
4. at least 27% of households own DAB+ receivers (10% in 2015 and 3.5 annual rates of increase of 33% each).³¹

ARD and Deutschlandradio are prepared to take FM transmitters out of service incrementally even before the final switch-over to DAB+. They would wish to receive assurances that the FM frequencies released will not be allocated to commercial competitors. Likewise if commercial broadcasters decide to cease FM transmission and transmit exclusively via DAB+, either for all their operations or only in some regions. With a view to transmission on the nationwide DAB+ multiplex, for example Klassik-Radio already switched off its less powerful FM transmitters in 2015.

The media acts of the federal states provide that in this case, users must reach agreement about the allocation of the analogue transmission capacity released. In the event of a dispute, the federal state government concerned or its media authority decides on allocation. With the planned switch to DAB+ in mind, they could basically decide not to re-allocate any FM frequencies that are released. But since they are currently obliged by law to allocate available frequencies, an amendment to media legislation is usually required to rule out further allocation or assignment. On this point, individual federal states have quite different positions so that at present, there appears to be no prospect of a uniform procedure for the federal states to take account of the legitimate interests of the public and commercial broadcasters.

5.2. Measures

There are various and partly contradictory opinions about what to do with the frequencies used for analogue transmission in the FM band. Representatives of commercial radio stations are pressing for the market to be allowed to decide freely between transmission modes and standards. ARD and Deutschlandradio point out that the cessation of the simulcast phase in a transition of terrestrial radio broadcasting from VHF-FM to DAB+ can only happen in collaboration with all market participants and only in sync with the commercial broadcasters. Others take the view that a sensible transition to digital terrestrial radio broadcasting in combination with the intended promotion of media pluralism cannot succeed unless analogue transmission capacity which is no longer needed is re-allocated to start new FM offerings. In order to achieve a balance of interests, the Digital Radio Board proposes the following measure:

²⁹ 20. KEF-Bericht (KEF Report); marginal no. 299 et seq.

³⁰ 20. KEF-Bericht (KEF Report); marginal no. 310

³¹ 20. KEF-Bericht (2KEF Report); marginal no. 317

Measure 2:

Alternative 1:

A provision is incorporated into the Frequency Regulation which provides for the following:

If a public broadcaster decides to cease completely or partially the transmission of its programming via FM, the transmission capacity released by this decision shall not be available for meeting additional or different needs for analogue radio transmission.³²

Alternative 2:

The federal states examine whether a provision should be created in federal state law which provides for the following:

Frequency Modulation radio transmission initially used the frequency range from 87.5 MHz to 100 MHz, on the basis of the Stockholm Frequency Plan of 1961 for Europe and Africa.³³ The allocation for the radio service was extended by the ITU at the WARC 1979 to the range up to 108 MHz³⁴ and implemented in the Geneva Plan of 1984³⁵, which came into effect in 1987. Only with that extension, the expansion of broadband cable networks and direct satellite reception did sufficient resources become available to make the current breadth of commercial radio programming in Germany possible.³⁶

Nowadays, commercial radio is a second mainstay of the dual broadcasting system. Therefore, media regulation can provide that in parallel to terrestrial FM broadcasting, there must also be an additional digital terrestrial transmission mode. These provisions are also to contribute to compensating what has been, to an extent for historical reasons, an unequal distribution of the frequency resource between public and commercial broadcasters.

6. Infrastructure for digital radio

An extensive infrastructure is required to make digitisation of radio a success. This concerns both the extension of the Internet for broadcasting via Internet Protocol (IP) as well as the actual radio transmitter network. Accordingly, further measures address both the extension of broadband

networks in general and, in addition, there are special measures for digital terrestrial radio using the DAB+ standard.

6.1. Internet-based transmission

Germany aspires to play a pioneering role in the penetration and use of digital services. Demand for high-speed Internet connections is rising extremely fast: due to increased video communication and transmission, the simultaneous use of digital devices in the home, applications such as digital learning, increased networking within the home, telework or audio services and Internet-based radio. Everyone needs to be able to exploit the advantages of the switch to digital. Therefore, Germany needs nationwide high-speed networks. The Federal Government's target is to achieve, by the end of 2018, in a first stage based on an efficient technology mix, a nationwide broadband infrastructure with a download speed of at least 50 Mbit/s. In a second stage, the broadband networks are to be sustainably focused on the needs of the Gigabit Society and developed further.

Since construction and extension of these nationwide high-speed networks cannot be achieved only through the private sector, government stimuli are needed. In the context of its responsibility for the digital infrastructure, the Federal Government has taken numerous measures to create optimal framework conditions for the private sector to build and extend networks. For example, this was done by making available more former radio frequency bands suitable for broadcasting in wide areas which laid the foundations for enabling access in very rural areas to mobile broadband services as well as constantly improving nationwide penetration of smart mobility services. In addition, the Federal Government and the federal states have supported the extension of broadband where a programme extension based purely on economic grounds would not have enabled extension.

³² Adaptation of transmission capacities to meet the coverage targets of unchanged existing coverage requirements of the federal states is possible to the extent necessary..

³³ Regional Agreement for the European Broadcasting Area, Stockholm, 1961 (ST61)

³⁴ Final Acts of WARC-79 (Geneva, 1979); <http://handle.itu.int/11.1004/020.1000/4.101>

³⁵ Plan for use of the band 87.5-108 MHz for FM sound broadcasting in Region 1 and part of Region 3, Geneva, 1984 (GE84)

³⁶ See also the 3rd Broadcasting Judgement of the Federal Constitutional Court; BVerfGE 57, 295 FRAG (1981)

Measure 3:

The Federal Government is currently promoting the extension of high-speed broadband networks with 4 billion euros. It is planned to continue these support measures. In addition, the federal states are providing support measures.

6.2. Extension of the DAB+ transmitter network

Since the end of 2016, 82% of the German population have been able to receive the programmes of the nationwide DAB+ multiplex in their homes. German motorways enjoy 98% coverage. Other transmitters are planned to achieve virtually nationwide coverage. Progress on extending the transmitter network has reached different stages in the individual federal states.

The ARD broadcasters already have a good DAB+ infrastructure in their federal states and are increasing coverage incrementally.

For local, regional and state-wide commercial stations, basically a North-South divide has emerged. The best coverage is in Bavaria and Baden-Württemberg and in the city states of Hamburg and Berlin. In other federal states, for example in Mecklenburg-Western Pomerania and Lower Saxony, there are no corresponding networks of commercial broadcasters.

Since the regional broadcasting conference RRC-06 (2006), the requirements notified for VHF Band III (frequency range from 174 MHz to 230 MHz) in Germany have changed. The originally planned partial use for DVB-T is no longer being pursued. Instead, the resources in VHF Band III are to be used entirely for the transmission of DAB+. In order to achieve the intended coverage, the frequencies have to be negotiated and coordinated with Germany's neighbours. This is based on the federal states having shared their ideas on the requirements structure with the Federal Network Agency in September 2016.

6.2.1. Second nationwide multiplex

The first nationwide DAB+ multiplex has made an important contribution to the success of DAB+. Thanks to the multiplex, retailers have included a wider range of DAB+ radio sets in their product ranges, listeners can receive digital programming regardless of the network extension in the individual federal states and public awareness of DAB+ has grown due to increased reporting in the media.

It can be anticipated that a second nationwide multiplex will give the development of DAB+ further impetus. This is

also shown by the experience in the United Kingdom and in the Netherlands. In these countries, network operators and broadcasters have joined forces to operate a national DAB+ platform.

The Commission on the Authorisation and Supervision of Media Authorities (Kommission zur Zulassung und Aufsicht der Medienanstalten) published a tender for a second nationwide DAB+ multiplex on 15 November 2016. The corresponding requirements were reported to the Federal Network Agency which confirmed their feasibility. The allocation under media law was carried out at the Conference of Minister-Presidents on 8 December 2016.

According to the requirements notified, the needs are to be met using single frequency networks with as much reach as possible. If this cannot be achieved at present due to the short implementation deadline and technical constraints, other frequencies will initially have to be used on a transitional basis.

Measure 4:

The Federal Network Agency will make the required transmission capacity available for the implementation of a second nationwide DAB+ multiplex. That includes the option of using Channel 5A where this is possible without interfering with the adjacent BOS utilisation.

6.2.2. Regional and local DAB+ transmitters

Local radio or regional radio in Germany takes different geographical and organisational forms. In some federal states, the broadcasting territory has a diameter of up to 150 km (regional), while in other territories, it is only 10 km (local). Besides commercial local radio stations, there are civic radio and educational radio as well as campus radio stations.

According to a study by the Technical Conference of the State Media Authorities (TKLM), it appears possible to cover the broadcasting territories for local radio content with DAB+ too. This would mean that any local radio station would be able to cover at least its current FM territory.

However, for economic reasons, it is not reasonable to install a multiplex capable of transmitting about 15 stations for every broadcasting territory of an individual station. On grounds of making optimal use of frequencies as well as on cost grounds, several local broadcasting territories should be combined into one larger DAB+ area and broadcast via a shared multiplex. That cuts the broadcasting costs for every station, and the local radio stations have the possibility to

include more programming in their portfolio.³⁷ In Bavaria and Baden-Württemberg, it has already been implemented in this way. Moreover, the broadcasting costs can be further reduced if local radio stations can share the use of regional multiplexes.

In order to save more broadcasting costs, a “Small-Scale DAB” concept was developed in Switzerland especially for community radio stations. Open Source software (ODR-mmbTools) was used to generate the DAB multiplex. Eight larger Swiss cities are already covered by small-scale DAB transmitters and 12 more towns will follow by the end of 2017.

In Germany, a first DAB transmitter using small-scale DAB was built in Rhineland-Palatinate in 2014 (collaboration between the Federal State Centre for Media and Communications and the Technical University of Kaiserslautern) as a pilot project, and it was demonstrated that it could be used in continuous operation. Reports on the design and laboratory measurements were published, and based on them, the Broadcast Technology Institute (IRT) built a small-scale DAB transmitter and undertook further research.

The British regulator Ofcom undertook a trial of small-scale DAB in 2015 and published the final report in September 2016.³⁸

6.2.3. Funding

Section 40 of the Interstate Agreement on Broadcasting (Rundfunkstaatsvertrag – RStV) provides for the possibility of state media authorities funding the technical infrastructure, which can also be used for the switch from analogue to digital terrestrial radio. The federal states are making use of this possibility in different ways.

6.2.4. Broadcasting of traffic information and warnings

Use of the radio in the car amounts to 28 minutes per person per day.³⁹ Most drivers switch on their radio out of

habit. For traffic news, they trust not only the spoken traffic reports but also their satellite navigation system, which receives traffic data together with the FM radio signal. However, the RDS-TMC system⁴⁰ currently used no longer meets the requirements for “smart traffic systems”.

The European Commission specified its requirements for a modern traffic information system in the ITS Directive⁴¹ and made implementation mandatory for the Member States. On that basis, the Intelligent Transport Systems Act (Intelligente Verkehrssysteme Gesetz - IVSG) was adopted in Germany in 2013.

In its “Action Plan for the Roads”⁴², the Federal Ministry of Transport and Digital Infrastructure assumes that digital radio is indispensable as a transmission mode for traffic information, because it does not generate any additional costs for users and all content is received and evaluated by all navigation devices at the same time. In the context of the national ITS Action Plan for the Roads (Action area 1.5), the participants collaborate with the objective of conveying all safety-relevant traffic information to road-users with the required quality without additional payment and regardless of the data source.⁴³ Radio broadcasters are not compelled to broadcast traffic information, but if they nevertheless decide to do so, the information service must fulfil certain conditions.⁴⁴

For traffic information, the National IT Summit⁴⁵ Summit45 is pursuing a hybrid approach consisting of

⁴⁰ RDS-TMC, Radio Data System – Traffic Message Channel. RDS is a system whereby additional information can be transmitted with the FM radio signal. TMC is a service within RDS for transmission of encoded traffic messages.

⁴¹ Directive 2010/40/EU of the European Parliament and the Council of 7 July 2010 on the framework for the deployment of intelligent traffic systems in road transport, and for interfaces with other modes of transport

⁴² <http://www.bmvi.de/cae/servlet/contentblob/102800/publicationFile/70307/ivs-aktionsplan-street-broschuere.pdf>; p. 16

⁴³ https://www.bmvi.de/SharedDocs/DE/Anlage/VerkehrUndMobilitaet/Strasse/ivs-massnahmen.pdf?_blob=publicationFile; p. 22

⁴⁴ See Article 8 of the delegated Commission Regulation (EU) No. 886/2013 of 15 May 2013 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to data and procedures for the provision, where possible, of road safety-related minimum universal traffic information free of charge to users

⁴⁵ Nationaler IT-Gipfel 2015: Digitale Netze und intelligente Mobilität (National IT Summit 2015; Digital Networks and Intelligent Mobility Roadmap) <http://www.bmvi.de/SharedDocs/DE/System/Digitales/it-gipfel-kompass.pdf?blob=publicationFile>; p. 13

³⁷ Direktorenkonferenz der Landesmedienanstalten, Fachausschuss 2, hier: Technische Konferenz der Landesmedienanstalten (TKLM): Digitale terrestrische Verbreitung des lokalen/regionalen Hörfunks – Bewertung und Empfehlung von digitalen Hörfunksystemen für die lokale/regionale Hörfunkversorgung, Bericht vom 20.10.2015 [see translation in footnote no 13]

³⁸ <https://www.ofcom.org.uk/research-and-data/tv-radio-and-on-demand/radio-research/small-scale-dab-final-report>

³⁹ Gattringer/Mai (FN 2); p. 211

radio and mobile telephony, with a basic offering of safety-relevant traffic information via DAB+ and an individual premium offering via mobile telephony. The data transmission occurs in the TPEG format.⁴⁶ In comparison with RDS-TMC, it offers, among other things, improved capabilities for location referencing as well as faster and more frequent data transmission. This is particularly important for safety-relevant information.

At present, the potential of TPEG cannot be fully exploited. On the one hand, not all DAB+ radios in vehicles are TPEG-ready, and on the other hand, the content and quality of the traffic information sent by the mobile phone operators barely differs from that of TMC information.

Measure 5:

The transmission network operators, the automotive industry and the commercial and public radio broadcasters will sign a joint agreement to create the conditions for TPEG to be fully usable in the field of broadcasting.

Furthermore, there is EWF (Emergency Warning Functionality) - a technology with considerable potential that is currently in the trial phase. Using EWF, digital radios fitted with the relevant equipment can receive bad weather and disaster warnings independently of the Internet or mobile phone services.

6.2.5. Determining the number of radios

The KEF has made the granting of additional funding for the DAB+ network extension conditional, as from 2020, on at least 27% of households owning a DAB+ radio.

So far, the number of DAB+ radios has been determined by a survey in connection with the digitisation report by the state media authorities. Moreover, the market research institute GfK produces monthly sales figures for radio receivers. However, that does not include, for example, DAB+ car radios in new cars.

For the decision on a migration from analogue to digital terrestrial broadcasting, it is necessary to have a significant data basis regarding the actual market penetration of digital radio receivers. This is becoming urgent, because for the next KEF funding application in 2019, the number of radios sold will be taken into account.

Measure 6:

The market participants will agree a method to determine the level of DAB+ equipment by mid-2017.

6.2.6. Determining radio usage

Commercial radio programmes are financed by advertising. The ARD organisations also broadcast advertising. Advertisers choose radio stations based on their reach and target groups.

In Germany, reach is measured for all media genres by the umbrella organisation agma (Association for Media Analysis; Arbeitsgemeinschaft Media-Analyse e.V.). For radio, the necessary data is gathered by a computer-assisted telephone interview (CATI) (ma Radio). The interview does not ask which transmission mode the listener used for the programme. For audio offerings on the Internet, the retrieval of the programmes is ascertained by technical means (ma IP Audio). This interview is supplemented by surveys in order to get a comprehensive picture in terms of the personal reach. A convergent reach (ma Audio) is determined from the data for ma Radio and ma IP Audio.

Now there is radio equipment that can measure radio usage electronically, which is comparable with TV audience measurement.

Radio usage via DAB+ is currently not measured separately. In the computer-assisted interview for ma Radio, agma restricts its scope to the FM stations that can usually be received locally. Stations that are only transmitted via DAB+ in the region concerned are not surveyed. However, reliable figures concerning radio usage via DAB+ are a prerequisite for assessing the cost-effectiveness of this transmission mode. The KEF will also demand this evidence in support of the funding applications by the public broadcasters for the funding period from 2020 onward.

Measure 7:

The market participants will discuss a further development of the measuring methods to also cover the usage of digital terrestrial transmission in liaison with agma. The aim should be to ascertain the reach in an increasingly diverse radio landscape without discrimination, objectively, appropriately and in a comparable manner for all transmission modes. From 2018 onward, radio usage via FM and DAB+ is to be published based on the refined measurement methods. It should be ensured that the proof of performance of commercial radio stations which is needed by advertisers is not harmed.

⁴⁶ TPEG: Transport Protocol Experts Group – international standard for transmission of speech-independent and multimodal traffic and travel information

With regard to the DAB+ usage, representatives of ARD, Deutschlandradio, the state media authorities and commercial radio stations agreed with agma in May 2016 to carry out a “DAB+ special study” in a first stage.

6.2.7. Digital Radio Office

The introduction of DAB+ will only be a success if all companies and organisations with an interest in success coordinate their diverse activities and speak with a single voice. For this purpose, a project office backed by all parties, which coordinates the tasks of communication with listeners, retailers, the car industry, etc., can play a supporting role.

In Switzerland, this task is performed by the MCDT, an SRG company, in which private broadcasters now also have a stake. In the UK, “Digital Radio UK” was founded for this purpose. Comparable organisations exist in the Netherlands and Norway.

Following the example of the UK, the members of the association Digital Radio Germany (Verein Digitalradio Deutschland e.V.) founded the Digital Radio Office Germany (Digitalradio Büro Deutschland) in June 2016. It has a manager and other staff made available by Deutschlandradio. The task of the office is to inform the public about digital radio/DAB+ and coordinate the cooperation of the various stakeholders. The office also manages the promoters who are currently employed by Deutschlandradio. Membership of the association - and the collaboration within the Digital Radio Office Germany - is open to any interested market participant without discrimination.

The aim is to promote competition among programme makers, within retailing, among equipment manufacturers, platform providers, transmitter operators and providers of transmitter sites.

ARD has set up its own organisation to promote DAB+, which has at its disposal the marketing budget made available by the KEF.

7. Future activities; timetable

It is not possible to predict with certainty how the switch to digital radio will progress. What will be decisive is which digital transmission mode listeners will trust in the long term. Here, the development trends are still not clear. Therefore, the federal states will keep a very close watch on the subsequent development of radio, together with the Federal Government. This roadmap thus creates a media and telecommunications regulatory framework which will continue to promote the further development of the digital transformation of radio.

The measures proposed can mostly only be effective in the long term, but in the view of the federal states and the Federal Government, they are necessary to speed up the digitisation of radio.

Final decisions on the digital future of radio can according to the current assessment only be made reliably in a few years' time, based on findings which have yet to be reached about the development of the digital radio market. The media authorities provide an important overview of the digitisation of radio with their annual digitisation report. The Webradiomonitor, produced by the Bavarian Regulatory Authority for New Media (Bayerische Landeszentrale für neue Medien), the German Association of Digital Economy (Bundesverband Digitale Wirtschaft - BVDW) and the Association of Private Broadcasters and Telemedia (VPRT), also documents the development of Internet radio and online audio offerings each year. These reports have already been taken into account in the decision-making for this roadmap.

Measure 8:

The Federal Government and the federal states support the development process from analogue to digital radio broadcasting. They agree to evaluate and develop this roadmap further.

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