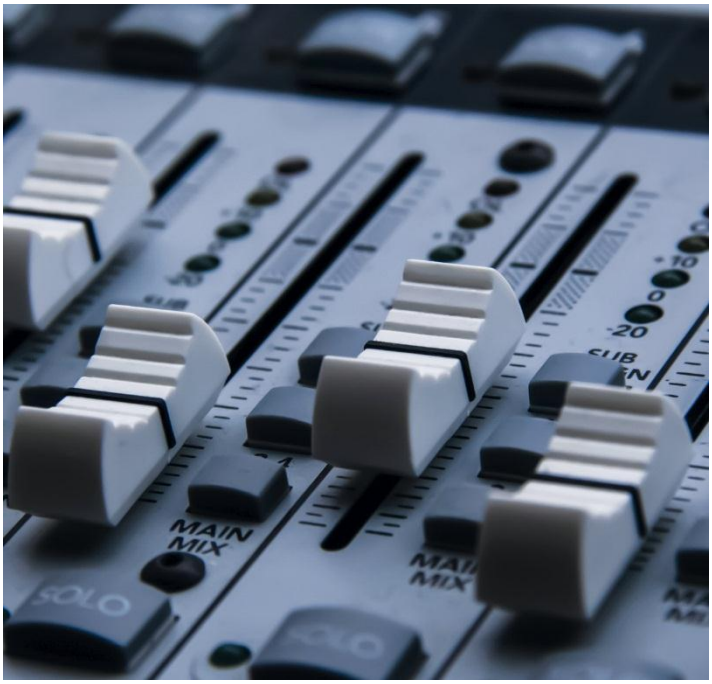
From FM to DAB+

Final Report of the Digital Migration Working Group



vsp
Verband Schweizer Privatradios
Association of Swiss Private Radios

SRG SSR

RRR
| Radios Régionales Romandes |

UNIKOM
RADIOS
UNION NICHT KOMMERZORIENTIERTER LOKALRADIOS

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Bundesamt für Kommunikation BAKOM
Office fédéral de la communication OFCOM
Ufficio federale delle comunicazioni UFCOM
Uffizi federal da communicaziun UFCOM
Federal Office of Communications OFCOM

DigiMig Working Group

The Core Group included the following members:

- Jürg Bachmann, President of the Association of Swiss Private Radios ASPR
- Marco Derighetti, Director of Operations SRG
- Heinz Gantenbein, Chief of Staff Swiss Radio and Television SRG
- Marcel Regnotto, Head of Media Section, OFCOM
- Markus Ruoss, Association of Swiss Private Radios ASPR
- Thomas Saner, Head of Strategic Coverage Planning, SRG
- Konrad Vonlanthen, Head of Frequency Assignment, OFCOM
- Lukas Weiss, President of the Union of Non-Commercial Local Radio Stations UNIKOM
- René Wehrlin, Media Section, OFCOM (secretariat, editorial)
- Philippe Zahno, President of the Union Romande des Radios Régionales RRR

The meetings of the core group and its committee were chaired by Mrs Inger Schjold, Process Facilitator, fresh wind AG.

The following were members of the Regulation sub-group:

- Marcel Regnotto, Head of the Media Section, OFCOM (Chair)
- Jürg Bachmann, President of the Association of Swiss Private Radios ASPR
- Patrick Holtz, Head of the Legal Service SRG
- René Wehrlin, media specialist, Media Section, OFCOM
- Lukas Weiss, President of the Union of Non-Commercial Local Radio Stations UNIKOM
- Philippe Zahno, President of the Union Romande des Radios Régionales RRR

The Market and Communication sub-group consisted of the following persons:

- Jürg Bachmann, President if the Association of Swiss Private Radios ASPR (Chair)
- Roland Baumgartner, CEO Radio Argovia
- Nik Eugster, CEO Radio Energy Bern (since June 2014 also Radio Energy Basel)
- Daniel Gamper, Service Manager AMAG
- Heinz Gantenbein, Chief of Staff Swiss Radio and Television SRF
- Alfred Hostettler, Deputy Head of the Media Section, OFCOM
- Niklaus Kühne, Head of Technical Communications, SRG
- Angela Meier, Head of Marketing Radio 3FACH
- Béatrice Merlach, CEO MCDT AG
- Markus Ruoss, Association of Swiss Private Radio ASPR
- Marc Savary, Deputy Head Market and Quality, SRG
- Bernhard Schmid, Head of Marketing & Sales, Swisscom Broadcast AG
- Rolf Schwitzgebel, Coordinator Audi Original Accessories, AMAG
- Ernst Werder, Managing Partner MCDT AG
- Philippe Zahno, President of the Union Romande des Radios Régionales RRR

The Market Research Committee consisted of the following persons:

- Tanja Hackenbruch, Head of Market and Audience Research, SRG (Technical Chair)
- Niklaus Kühne, Head of Technical Communications, SRG (Administrative Chair)
- Jost Aregger, Research Manager, OFCOM
- Jürg Bachmann, President of the Association of Swiss Private Radios ASPR
- Béatrice Merlach, CEO MCDT AG
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- Philippe Zahno, President of the Union Romande des Radios Régionales RRR

The following persons were members of the sub-group:

- Thomas Saner, Head of Strategic Coverage Planning SRG (Chair)
- Dominik Born, Project Manager “diy.fm”, SRG
- André Burger, Head of Operations, Swisscom Broadcast AG
- Grégory Cachot, Image et Son SA
- Matthias Coinchon, Senior Project Manager, EBU Technology & Development
- Markus Ruoss, Association of Swiss Private Radios ASPR
- Konrad Vonlanthen, Head of the Frequency Assignment Section, OFCOM

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Management Summary

By 2024 at the latest, all radio programme services are to be broadcast digitally, mainly on DAB+ platforms. All analogue FM transmitters are to be switched off at this time. In 2013 the DigiMig Working Group (Digimig WG) was founded and set itself the goal of developing a joint strategy for the radio industry for a co-ordinated migration of radio stations from FM to DAB+. The working group consists of representatives of the SRG, the Association of Swiss Private Radio Stations (ASPR), the Union Romande des Radios Régionales (RRR), the Union of Non-Commercial Radio Stations (UNIKOM) and the Federal Office of Communications (OFCOM). The DigiMig WG has formulated 15 measures aimed at various target groups which form a roadmap for the switch to DAB+. This roadmap envisages that the Federal Government will open up a time window within which the SRG and local radio stations will organise the digital migration independently and taking into account distinctive regional characteristics.

Technical progress in particular favours a digital migration. FM, as the last analogue link in the otherwise fully digitised radio chain, has reached its limits and can no longer keep pace with digital advances: In contrast to DAB+, FM does not allow stable, noise-free reception in high quality. In addition, text, graphics, and services (such as weather or traffic information and interactive services) can be broadcast on FM only to a very limited degree. In addition, the densely used FM frequency spectrum does not allow for any expansion of offerings: new players, especially those with claims to regional-language broadcasting, have little opportunity to enter the market. This contradicts the goal of media diversity set out in the federal constitution.

Background to the recommendations

In its work the DigiMig WG based itself on the on the strategy formulated by the Federal Council in 2006 for the future of radio broadcasting in Switzerland, which emphasises the benefits of digital technology. The working group is convinced that the switch to digital radio serves radio broadcasters in particular. They will acquire a low-cost, energy-efficient broadcasting technology suited to future developments and requirements. In addition, the digital migration is also a major commitment to the future of the medium of radio as such. For radio to survive in an increasingly digitised world, it must make the change to integrated communications. Radio must become a medium which includes other media and different broadcasting channels. A digital migration is indispensable for this change. If this is lacking, other services, such as those from the internet, will take over the function of the medium of radio.

Switzerland is also ripe for a digital migration: today more than 95 per cent of all households can already receive radio programme services digitally. Some 70 radio stations in all linguistic regions are already being broadcast on DAB+ platforms. These include all the SRG stations, more than half of all licensed private FM stations, exclusive DAB+ stations, internet radio stations and also two stations from abroad. There are already 1.7 million DAB+ devices in Swiss households; in stores, displays of DAB-capable radios have pride of place and the car trade is gradually moving towards DAB+ radios fitted as standard in new vehicles.

Key features of the recommendations

In terms of regulation, the future radio landscape will be determined by two key facts: On the one hand the FM licences will expire at the end of 2019, and on the other hand the Federal Council must examine the number and structure of the coverage areas by mid-2017 at the latest.

In principle and according to the legislation, the FM licences would have to be put out to tender in 2019 and awarded for a term of ten years. These are also linked to a geographically clearly defined coverage area, which must also be reviewed by the Federal Council after ten years - according to the current timetable this should take place by 2017 at the latest.

Since these dates almost coincide, this is a favourable opportunity to take fundamental decisions on the future of radio broadcasting. Bearing in mind the measures for a digital migration already under consideration by the Confederation, the DigiMig WG is therefore not recommending any further changes to the structure of the existing FM radio landscape or the award of any new licences for FM radio broadcasters. At the same time, the existing licences should be extended at this time by a maximum of five years (until the end of 2024 at the latest). However, this should only take place subject to the condition that by the end of 2019 at the latest broadcasters are also broadcasting their FM stations in parallel on a DAB+ platform (so-called simulcast operation). Within these five years, the FM radio broadcasters should be encouraged, by means of appropriate support measures from the Confederation, to commence simulcast operation.

A parallel offering of FM and DAB+ increases the costs of coverage of the current licence areas by approximately 50 per cent. The radio broadcasters who bear these costs are therefore dependent on support from the public purse. Only in this way can the additional costs incurred be covered during this intermediate phase preceding an exclusively DAB+ offering. The goal of the digital migration must therefore be a simulcast phase which is as short as possible.

The DigiMig WG recommends, as a first step, a generous interpretation of the existing provisions to support new technologies, in order to ease the financial burden on broadcasters during the simulcast phase. In a second stage, the DigiMig WG expects a significant increase in support funding for the radio industry from the Confederation. The essential industry-wide marketing efforts for the introduction of DAB+ could then also be financed using these funds. When DAB+ has become established in Switzerland, these provisions can be adapted and the support measures reduced.

The existing licences require local transmitters to use FM to serve their coverage areas. The DigiMig WG is recommending a relaxation of this obligation if the station is simultaneously broadcast via DAB+. This measure will help broadcasters to avoid making futile investments in aging FM transmitters. As previously mentioned, the federal authorities must at the same time refrain from re-allocating FM frequencies. This measure will give broadcasters the necessary assurance that they will not face new FM competition during the migration process.

Today practically all the purely commercially oriented broadcasters are already having their programmes transmitted on a DAB+ platform. This is also because they are hoping for the relaxation measures proposed by the DigiMig WG and do not want to be marginalised. For radio stations in mountain areas, simulcast operation constitutes a cost obstacle which cannot be overcome with the existing support measures. In a second phase the DigiMig WG is therefore proposing to address specific support measures currently provided for FM for mountain radio stations to adopt DAB+ transmission in particular.

For the DigiMig WG the co-ordinated phase-out of FM broadcasting and joint industry-wide marketing efforts for the new services constitute the core and focal point of the migration scenario. For this the associations of private radio stations and the SRG must determine the basic parameters of the migration process in an agreement and specify the shutdown dates for major FM transmitters. The migration from FM to DAB+ is expected to be concluded no later than the end of 2024, according to the agreements between the SRG and the private radio stations concerned. After the shutdown of the last FM transmitter the Federal Council will decide on the future use of the FM band.

Two phases of the digital migration

According to the action plan proposed by the DigiMig WG, the digital migration process should take place in two phases:

First phase 2014-2019: all FM broadcasters commence DAB+ transmission

- Effective financial support for DAB+ broadcasting
- Massive marketing campaigns
- Provision of DAB+ in the major road tunnels
- Easing of the FM broadcasting obligation, relinquished FM frequencies remain with OFCOM
- No tender procedures for FM licences, unchanged coverage areas
- Extension of the FM radio frequencies by a maximum of five years with simulcast operation

Second phase from 2020 – 2024: gradual switchover from FM to DAB+

- Coordinated switch-off of major FM transmitters by private broadcasters and the SRG; comprehensive FM reception is no longer guaranteed
- Mountain assistance now only for DAB+ broadcasting
- Gradual reduction of technology support
- Coordinated switch-off of the remaining FM transmitters by the end of 2024 at the latest

Competition between internet-based digital radio stations and DAB+

There is an important difference between wireless terrestrial broadcasting (FM/DAB+) and internet-based digital radio (IP radio/internet radio): whilst in the case of broadcasting via FM or DAB+ the signals are broadcast by the transmitter to a large number of users, in the case of streaming media such as internet-based radio stations a web server is necessary, which generally establishes a so-called “point-to-point connection” separately for each user.

The DigiMig WG is of the opinion that these two transmission methods do not compete but complement each other. While from a technical viewpoint internet-based transmission could replace DAB+, in the mobile sector radio broadcasting via DAB+ remains indispensable, which is why in future both vectors will be required. For this reason, the DigiMig WG considers the option of radio broadcasting limited purely to transmission via mobile radio networks to be unrealistic in the immediate future. In addition, DAB+ and IP radio are based on different business models: whilst IP reception requires the conclusion of a paid-for contract with a telecommunications operator, wireless reception via DAB+ is unrestricted and free of charge. In the opinion of the DigiMig WG, the achievement of unrestricted, free-of-charge radio reception should not be given up - at least until an equivalent technological alternative is available. This must allow broadcasters transmission under predictable, reasonable conditions and assure the public of reception at no additional cost.

Security aspects

The Federal Office for Civil Protection (FOCP) operates a system for alerting the population known as “POLYALERT”. By the end of 2015 it will be possible to remotely trigger approximately 5000 sirens in Switzerland. The system is constructed with redundancy; FM plays an important role in the feed to the sirens. The decision-makers in the FOCP are aware of the foreseeable FM switch-off and have ensured that it will be possible to retrofit control of the sirens using DAB.

Switzerland as a DAB+ island in the middle of an analogue Europe: a risk for tourism and through traffic?

Although DAB+ is a topic in most European countries, the stage of development varies widely from country to country. National media policies and timetables also exhibit large differences. Switzerland is leading the way in the introduction of DAB+. While some countries in northern Europe have developed scenarios for a migration from FM to DAB+, similar initiatives have not yet been taken by Switzerland’s neighbours. It would therefore be possible that after 2024 Switzerland may be a FM-free island in Europe. As Switzerland is a traditional tourist destination and a country through which people pass, there are concerns that this scenario could adversely affect the image of Switzerland. After the shutdown of the last transmitter at the latest, FM will no longer be available for radio traffic information. This means that all tourists and travellers will no longer be able to receive FM in Switzerland. Since messages about the traffic situation are also broadcast via FM, there are reservations about switching FM off completely. However, the DigiMig WG considers this aspect of the FM phase-out as of little relevance, since in dangerous situations communication by the safety organisations does not take place exclusively via traffic news on radio. Rather, it is based on a multiplicity of elements which inform road users in good time about the conduct required by the situation (for example: automatically controlled warning notices and traffic lights). In addition, in the future more car radios will have an IP connection, which in an emergency will also enable drivers to be addressed via mobile radio.

Summary of the 15 DigiMig WG recommendations for the digital migration

First phase 2014-2019: all FM broadcasters commence DAB+ transmission

1. A generous interpretation of the provisions to promote new technologies and to support radio broadcasting in mountain regions in accordance with the existing legislation.
2. Easing of the FM coverage obligation – no re-allocation of relinquished FM frequencies
3. Broadcasters and network planners agree on a jointly accepted definition of the technical values for coverage via FM, DAB+ and IP
4. The radio industry creates appropriate structures for marketing coordination and defines the conditions for research into usage relating specifically to the migration process
5. Equipping of the major national road tunnels with DAB+ by the end of 2018 by the FEDRO (Federal Roads Office)
6. Substantial support for simulcast costs by the Confederation under new legislation
7. FM radio broadcasters prepare their stations for hybrid use of FM, DAB+ and IP
8. No new licences or coverage areas in the FM band from 2017 onward
9. Extension of FM utilisation for a maximum of five years

Second phase 2020-2024: a gradual changeover from FM to DAB+

10. The SRG and private radio stations jointly agree the timetable for the FM switch off; gradual coordinated shutdown of FM transmitters
11. Abolition of the FM coverage areas in Annex 1 of the Radio and Television Ordinance (RTVO) in parallel with the FM switch-off
12. Mountain regions: support for DAB+ broadcasting exclusively
13. Reduction of technology support between 2020 and the end of 2024
14. Provision of access rights for licensed local broadcasters when DAB+ radio licences are renewed
15. Conclusion of the migration by the end of 2024 at the latest; thereafter, a decision by the Federal Council on the future use of the FM band

Contents

1 The Digital Migration (DigiMig) Working Group

1.1 Introduction: how the present industry solution came about

The history of terrestrial radio broadcasting in Switzerland has already gone through several stages. At the beginning of the 20th century, radio started on medium wave and for a long time public information and entertainment over the airwaves was a privilege of the public broadcaster, the SRG. In the 1980s, there was a universal desire for a wider range of programming. Private local radio stations quickly sprang up. In parallel, a new transmission technology grew in importance – analogue FM technology. Only this technology allowed broadcasting by a wide range of different stations in a large number of local areas, resulting in a closer relationship with listeners. As a result, FM replaced medium wave.

Since then, analogue FM technology has reached its limits. The FM spectrum is congested and the supply of frequencies cannot cope with demand. In parallel, digitisation has arrived in all areas of communication. In other words: another technological leap is imminent for radio. The Federal Council recognised this in 2006 when it declared that digital technology was the future of radio.

In comparison with the situation in the 1970s some 40 years ago, when the switchover from medium wave to FM took place, radio today is much more complex and multi-layered. A political commitment to the new technology alone is no longer sufficient. What is required is a joint effort by all players in the radio sector to implement the technological migration successfully.

Representatives of the private radio associations decided in autumn 2012 to develop an industry solution for the transition from FM broadcasting to digital radio. In this way the industry was responding to the fact that the Federal Council had essentially adopted a digital broadcasting strategy, although to date this strategy had remained without any comprehensive approach to implementation.

OFCOM and the SRG supported the concept of an industry solution, since a migration implemented by all players seemed more effective than an officially decreed change of technology. As a goal, the Working Group adopted the production of a comprehensive action plan for the migration from FM to DAB+, which would be adopted and eventually implemented by the industry as a whole.

1.2 Composition and method of working of the DigiMig WG

On 8 March 2013, the newly created "Digital Migration" (DigiMig) Working Group met for the first time. Those present were the Association of Swiss Private Radios (ASPR[1]), the Association of regional radio stations from western Switzerland (Union Romande des Radios Régionales; RRR[2]), the Union of Non-Commercial Local Radio Stations (UNIKOM)[3] and the SRG[4]. OFCOM[5] took on the coordination of meetings, the taking of minutes and administrative tasks.

The work of the DigiMig WG was coordinated by a **Core Group**, which assumed the function of a steering committee and made the landmark decisions[6]. The core group met ten times in plenary session or as a committee.

The DigiMig WG set up three sub-groups, which addressed individual aspects of the migration in detail. In addition to the representatives of the founding members of the DigiMig WG, representatives of other sectors of the media industry also took part in individual sub-groups, for example representatives of the equipment and automotive trades, network construction and operation, and marketing.

- The "**Regulation**" sub-group examined the legal framework for the digital migration and outlined the individual stages of the migration process.
- The "**Market and Communication**" sub-group dealt with the question of how the market, with the involvement of all relevant stakeholders, can be optimally prepared for digital radio and how to measure the impact of the measures.
- This sub-group also established the "Market Research" committee. The committee defined the requirements for a new user research project to survey digital radio usage from 2014 to 2024 at the latest.
- Finally, the "**Technology**" sub-group focussed on the technical issues regarding the migration to DAB+.

On 26 May 2014, at OFCOM in Biel, the DigiMig WG held a split meeting of the industry in German and French, during which it informed the representatives of the radio sector of the status of its work and presented its vision of a migration scenario. The suggestions and comments of the specialists present were taken into account when the final report of the DigiMig WG was drawn up.

1 Verband Schweizerischer Privatradios (ASPR) [Association of Swiss Private Radios]: http://www.vsp-asrp.ch/
2 Radios Régionales Romandes (RRR): http://www.urrr.ch/
3 Union of Non-Commercial Local Radio Stations (UNIKOM): http://www.unikomradios.ch/
4 SRG SSR: http://www.srg.ch/
5 Federal Office of Communications (OFCOM): http://www.bakom.admin.ch/index.html?lang=de
6 For members of all working groups see page 2

2 Formation and development of radio broadcasting in Switzerland

2.1 Medium wave

2.1.1 The beginnings

In Switzerland, "general broadcasting operations"[7] commenced on aerodromes after the first World War: the aerodromes installed transmitters which operated in the medium-wave band, for the transmission of messages and weather reports to pilots. And when there was no flying, the radio pioneers broadcast music from gramophone records.

As early as 14 October 1922 Parliament adopted a federal law on telegraph and telephone communications. Switzerland was therefore one of the first countries in Europe which regulated the dissemination of broadcast transmissions[8].

The aerodrome transmitters quickly developed into actual broadcasting stations. In the 1920s, the station operators founded local radio cooperatives, and by 1929 the number of households which had a licence for receiving radio programmes increased to 100,000. They paid a license fee of CHF 15.

On 24 February 1931 the Schweizerische Rundspruchgesellschaft (SRG) was founded as an umbrella organisation of all the regional radio organisations. The SRG received the exclusive licence for radio broadcasts in Switzerland from the Federal Council. The Federal postal and telegraph administration (which became the PTT) was commissioned to construct and maintain the transmitters and shortly afterwards the Sottens and Beromünster medium-wave transmitters commenced operation (both in 1931) and Monte Ceneri commenced operation in 1933.

2.1.2 Phase-out of medium wave: migration to FM

Medium wave remained the only radio broadcasting technology for 21 years. This changed on 1 October 1952, when the SRG commenced operation of the first FM transmitter on St. Anton mountain (in the municipality of Oberegg, Appenzell-Innerrhoden) and for the first time broadcast Radio Beromünster via a FM transmitter on 94.8 MHz. Only four years later, on 16 December 1956, the SRG launched its second radio station which – initially for a few hours at a time – broadcast exclusively on FM. However, it would be decades before the then PTT had constructed two, and from 1983 three nationwide FM transmitter networks with nationwide coverage.

The fact that FM would become the main broadcast medium for radio stations in Switzerland was not initially foreseen: FM receivers were hardly available on the market, and switching from medium-wave devices was possible but cost between CHF 100 and 200, equivalent today to between CHF 450 and 900 (depending on purchasing power). And although the equipment situa-

[7] Formulation in the Federal Act on Telegraph and Telephone Traffic (CC 7 867) dated 14 October 1922 (Act unavailable in electronic form).

[8] Source: Schweizer Radio DRS: Die Geschichte des Radios in der Schweiz von 1911–2008 [The history of radio in Switzerland from 1911 to 2008]; http://modules.drs.ch/data/attachments/archiv/Geschichte%20des%20Radios%201911-2008.pdf

tion quickly improved thanks to the invention of the transistor, the medium-wave audience remained loyal for the time being. The SRG therefore tried to lure its listeners onto the new FM frequencies by means of extensive information campaigns. In 1978, in German-speaking Switzerland, the SRG created the character of "UKFee", portrayed by the actress Birgit Steinegger. This was accompanied by the singer Polo Hofer, advertising the new technology (slogan: "UKFee brings FM").

The actual FM upsurge only set in from 1 November 1983, with the ordinance on trialling local radio stations[9] and the licensing of private radio stations. Since then, the FM landscape in Switzerland has grown organically, assuming its present form in particular from 1994/96, after the adoption of the first Radio and Television Act. It is striking that the coverage areas of the local and regional radio stations in terms of their number and structure have remained essentially the same.

The first radio era came to an end in 1996: at that time the SRG stopped broadcasting its first station on medium wave from the Beromünster transmitter and replaced it with the folk music station Musikwelle 531. On 28 December 2008, the legendary Beromünster national medium-wave transmitter finally fell silent and Musikwelle 531 was moved to a DAB platform. The 125 m high transmitter mast, which commenced operations on 11 June 1931, was demolished on 19 August 2011. [10]

In French-speaking Switzerland, two years earlier, the SRG had already replaced Radio Suisse Romande by Option Musique, the so-called "chaîne de la chanson [music channel]", on the Sottens transmitter. But on 5 December 2010 the national transmitter from French-speaking Switzerland also fell silent and this marked the very end of the radio adventure of our grandparents' era, after 79 years.

The transmitter on Monte Ceneri in Ticino lasted the longest. Though the SRG ceased broadcasting Rete1 on 30 June 2008; between March 2011 and December 2012 medium-wave signals could be received once again at 558 kHz – the Voice of Russia, which received a corresponding radio licence from OFCOM.

[9] Ordinance of 7 June 1982 on local radio broadcasting experiments, AS **1982** 1149, **1984** 724, **1985** 1609, **1988** 92, **1989** 1229, **1990** 1747, **1991** 355

[10] The tower which was demolished was the first tower in Beromünster. After the commissioning of the new 217 metre Blosenberg tower in 1937, it served as a reserve antenna.

2.2 FM

2.2.1 Current utilisation of the FM spectrum by the SRG and private radio stations

2.2.1.1 The SRG's FM stations

The Radio and Television Act of 24 March 2006[11] entrusts the SRG with the task of providing the population with a basic national and regional-language editorial offering. Currently, in accordance with the licence granted by the Federal Council, the SRG broadcasts on 11 FM radio stations in different language regions, as well as six regional journals in German-speaking Switzerland.[12]

Table 1: The SRG's FM stations

FM landscape 2014 – SRG stations	
German-speaking Switzerland	SRF 1 (incl. 6 regional journals) SRF 2 SRF 3
French-speaking Switzerland	La Première Espace 2 Couleur 3 Option Musique (Geneva, Valais)
Ticino	Rete Uno Rete Due Rete Tre
Grisons	Radio Rumantsch
Total FM stations	**11**

2.2.1.2 Private broadcasters' FM stations

In the local and regional sphere, the RTVA primarily assigns to private operators an editorial coverage task. Here, to complement the SRG, they fulfil a journalistic performance mandate adapted to respective local conditions and in return receive licences with access rights to the broadcasting infrastructures – therefore currently historically justified rights of access to FM frequencies – and in economically unfavourable areas the right to support from fees (cf. Art. 38 and 43 of the RTVA).

The RTVA tasks the Federal Council with defining the number and structure of the local and regional coverage areas in which licences with access rights and fee-splitting may be awarded. In this way the Federal Council essentially defines the topography of the Swiss local/regional radio landscape.[13]

[11] Radio and Television Act of 24 March 2006 (RTVA; CC 784.40) http://www.admin.ch/opc/de/classified-compilation/20001794/index.html

[12] SRG licence: http://www.bakom.admin.ch/themen/radio_tv/marktuebersicht/ssr_srg/04634/index.html?lang=de

[13] Art. 39 para. 1 RTVA, and Annex 1 of the Radio and Television Ordinance of 9 March 2007 [RTVO, CC 784.401]); http://www.admin.ch/opc/de/classified-compilation/20063007/index.html

The Federal Council is obliged to examine the number and structure of the FM coverage areas every ten years and to adapt them to changed circumstances where applicable. This last occurred in 2007[14]. At that time the Federal Council made no fundamental changes and merely adapted the regional FM radio landscape slightly – with regard to the 20-year development which led to today's coverage areas[15].

Table 2: Licensed private FM broadcasters

FM Landscape 2014 – Private FM broadcasters	
Coverage areas	34
Commercial private broadcasters with a performance mandate, without fee-splitting	21
Commercial private broadcasters with a performance mandate and fee-splitting	12
Non-commercial private broadcasters with a performance mandate and fee-splitting	9
Total licences	**42**

2.2.1.3 Distribution of the allocated FM frequencies

The statutory assignment of roles to the SRG and the local radio stations means that the majority of frequencies must be made available to the SRG. Overall, the SRG radio stations occupy 72 percent of all frequency positions in use in Switzerland; private local radio stations occupy the other 28 percent. However, this imbalance arises first and foremost because of the use of the spectrum in the Alpine region: the SRG, with three to five stations in each case requires an above-average number of frequency positions to provide the prescribed comprehensive and good quality coverage.

Considering just the central plateau and the Jura, i.e. where demand for spectrum is high, the ratio is more balanced: In these areas, the SRG uses 55 percent of all FM frequency positions in use there; the local radio stations use 45 percent. The ratio is even reversed in some coverage areas: In FM coverage area No. 24, Zurich Region, the SRG uses a total of 15 FM frequency positions for broadcasting its radio stations; the private local radio stations together use 23.

Table 3: Distribution of assigned FM frequency positions among broadcasters

Broadcaster	Alps		Central plateau – Jura		Total	
SRG	555	85%	304	55%	859	72%
Private radio stations	98	15%	244	45%	342	28%
Total	**653**	**100%**	**548**	**100%**	**1201**	**100%**

[14] Federal Council defines new coverage areas: http://www.bakom.admin.ch/dokumentation/medieninformationen/00471/index.html?lang=de&msg-id=13299

[15] FM coverage areas and maps: http://www.bakom.admin.ch/org/grundlagen/00955/01137/01998/index.html?lang=de

2.2.1.4 A paradigm shift in FM planning

Until 2013, FM planning of transmitter networks took place within an iterative process between OFCOM and the broadcasters. However – and this was unique in Europe – in practice OFCOM played the leading role in technical planning. In April 2013, however, OFCOM decided from that point onwards to leave the planning of FM transmitters and frequencies to radio broadcasters and to concentrate on its original function as a regulator.[16]

The stimulus for the paradigm shift was the realisation that the technical development of local FM coverage areas was to a large extent complete, after a long construction period, and that therefore centrally controlled FM network planning was unnecessary.

2.2.2 A digression: studies on the use of the FM spectrum

The reason for the continuity of the FM landscape for some 30 years is that the FM spectrum has for a long time been used very densely and the organisational decisions of the responsible federal authorities were targeted very early on at the optimal possibilities in terms of spectrum technology. However, claims were regularly made that the FM spectrum was inefficiently managed or that unused frequency reserves were available. The use of any frequency reserves and the planning practice of the authorities were then examined several times.

2.2.2.1 FM 1992 study group

In May 1991, just before the adoption of the first Radio and Television Act, the PTT enterprises, the then planning authority, made public their concepts for future FM planning. In some sectors of the public, the existing and planned utilisation of FM frequencies met with a lack of understanding and scepticism. Initial complaints concerned the lack of transparency of the spectrum policy to date, the alleged inaccuracy of the methods used for measurement of reception quality and a planning doctrine of the PTT enterprises which in the opinion of the critics was very conservative.

On behalf of the then Federal Department of Transport and Energy, the FM 92 study group, which included representatives of the SRG, the associations of commercial and non-commercial private radio stations, as well as the PTT and OFCOM, which had just been created on 1 April 1992, looked into these criticisms. The study group submitted a report with 14 recommendations for improvement of FM radio coverage in September 1992.[17]

Individual recommendations by the study group, such as the definition of coverage areas or the designation of the OBB measuring method[18] as a uniform “currency” for determining the quality of coverage, were then incorporated into the directives for FM transmitter network planning, which the Federal Council issued on 31 August 1994 and 8 May 1996[19].

[16] FM frequency planning handbook: http://www.bakom.admin.ch/themen/radio_tv/01214/02302/04190/index.html?lang=de

[17] Final report of the FM study group dated September 1992: http://www.bakom.admin.ch/themen/radio_tv/01214/02302/02353/index.html?lang=de

[18] OBB: "Automatische Registrierung der objektiven Beurteilung" [Automatic registration of objective assessment]; definition in para. 2, Annex 1 RTVO: http://www.admin.ch/opc/de/classified-compilation/20063007/index.html#a83

[19] Federal Gazette 1994 III 1583, and Federal Gazette1996 II 982

2.2.2.2 FM 2001 expert group

The 1994/1996 directives for FM transmitter network planning were designed for a period of ten years. Accordingly the Federal Council was to examine and redefine the coverage areas by the end of 2004. In order to prepare these decisions, in 2001/2002 it tasked a study group with analysing whether and under what conditions frequency gains could be achieved in the FM spectrum. The "FM 2001 Expert Group ", comprising specialists from the SRG, the local radio associations, OFCOM and other interested parties, formulated twelve new recommendations, which it eventually combined into five different technical scenarios for a possible reconfiguration of the Swiss radio landscape.[20]

OFCOM submitted the final report of the FM 2001 expert group, along with the results of other studies, to a broad public consultation process.[21] A large majority of the associations, cantons and institutions consulted expressed the opinion that FM would continue to shape the radio landscape for another 15 to 20 years. However, most of the participants in the consultation opposed large-scale investment in the FM network. They stated that the sums required for a frequency optimisation should instead be used to construct a DAB transmitter network. However, most of those consulted shied away from rapid adoption of DAB and recommended a slow introduction of DAB with a long phase of parallel analogue and digital operation (the simulcast phase).

The new Radio and Television Act entered into force on 1 April 2007. With a view to the imminent tender procedure for local broadcasters' licences, the Federal Council shortly afterwards published the new definitions of the local/regional coverage areas[22]. It was guided by the findings of the FM 2001 expert group and the results of the associated public consultation and opted for a moderate adaptation of the existing radio landscape. In view of new, more spectrum-efficient and more powerful digital technologies, however, the Federal Council found that this analogue broadcasting concept was obsolete.

2.2.2.3 Ad-hoc working group on the Fourth FM coverage in Zurich (2009)

In October 2008, within the framework of the tender procedure for local broadcaster's licences, after DETEC did not allocate any of the three available FM broadcasters' licences for the Zurich-Glarus region to Radio Energy Zurich, political demands were again made for the release of additional FM frequencies in the Zurich area. An ad-hoc-working group, consisting of independent spectrum experts, a representative of Radio Energy Zurich and OFCOM specialists, then examined the feasibility of a fourth FM coverage for the Zurich-Glarus coverage area.

[20] Final report of the FM 2001 study group:
http://www.bakom.admin.ch/themen/radio_tv/01214/02302/02353/index.html?lang=de

[21] Radiozukunft Schweiz: Forschungsergebnisse zu den Möglichkeiten und Grenzen [Switzerland, the Future of Radio: Research Results on the Possibilities and Limits]
http://www.bakom.admin.ch/themen/radio_tv/01214/02302/02352/index.html? lang=de

[22] DETEC media release: The Federal Council designates new coverage areas for FM radio stations and regional television stations (04.07.2007)
http://www.bakom.admin.ch/dokumentation/medieninformationen/00471/index.html?lang=de&msg-id=13299

In their study, published on 27 February 2009, the working group stated that the introduction of a fourth FM coverage in the Zurich-Glarus coverage area would be feasible only in the medium to long term, assuming considerable planning and capital costs and numerous frequency changes affecting uninvolved radio stations.[23] DETEC therefore decided not to launch a tender for a fourth chain of transmitters in the Greater Zurich region.[24]

2.2.2.4 Federal Council report on the Leutenegger postulate (2011)

In its report of 11 October 2011 in relation to the postulate of National Councillor Filippo Leutenegger of 9 March 2009, the Federal Council stated that frequency gains in the FM range were theoretically possible but at a disproportionately high price for all those concerned. It therefore rejected additional studies on the frequency situation in the FM spectrum and referred to its DAB strategy[25].

2.2.3 HD radio

From 2006 to 2010, intensive and internationally observed field tests were carried out in Switzerland on the private initiative of the private radio industry, applying the proprietary American HD radio technology[26]. These activities were supported and funded by OFCOM and a large number of private sponsors. HD radio should have become an economical alternative for local and regional private radio broadcasters to complement DAB+.

The results of the field tests were successful and led to an implementation project for which the first hybrid receivers for DAB+ and HD radio were already available. The essential preconditions in terms of licensing law were also met for a first group of five private radio stations, which scheduled an operational start-up date of September 2010.

Despite comparatively low costs for the individual private radio stations, not all of the five broadcasters released the investment funds necessary for the introduction of HD technology, and this led to the project being aborted in mid-2010, shortly before start-up. Given the current state of development of DAB+ and the discussion on the digital migration, HD radio technology no longer constitutes an alternative for the private radio broadcasters. The window of opportunity for the introduction of HD radio must be regarded as closed in Switzerland. This also applies to the majority of the close neighbours in Europe, who had likewise participated in projects within the framework of the "European HD Radio Alliance (EHDRA)"; however, these projects did not progress beyond the project stage either, which is why the EHDRA was dissolved in 2012.

[23] Technische Machbarkeit einer vierten FM Bedeckung für das Versorgungsgebiet Zürich-Glarus [Technical feasibility of a fourth FM coverage for the Zurich-Glarus coverage area]: http://www.bakom.admin.ch/themen/radio_tv/00509/01188/03103/index.html?lang=de

[24] DETEC media release: No immediately available FM frequencies in the Greater Zurich region http://www.bakom.admin.ch/dokumentation/medieninformationen/00471/index.html?lang=de&msg-id=25587

[25] FM frequency reserves in Switzerland. Report of the Federal Council in fulfilment of Leutenegger postulate 09.3071 of 9 March 2009; http://www.bakom.admin.ch/themen/radio_tv/01214/02302/03865/index.html?lang=de

[26] HD radio = digital piggyback on existing FM frequencies, see also www.hdradio.ch (Information on the trials in Switzerland and Europe), www.ibiquity.com/ www.hdradio.com (system supplier the USA)

2.3 Digital Audio Broadcasting DAB/DAB+

2.3.1 A brief introduction to DAB/DAB+ technology

Digital Audio Broadcasting (DAB) is a standard for terrestrial reception of digitally broadcast radio programmes. DAB was developed in the European Union's Eureka-147 research project between 1987 and 2000. In 2006 the DAB standard was further developed with DAB+; this concerned in particular the number of stations which could be transmitted and the sound quality. The DAB standard and the various additions can be consulted on the WorldDMB website, the advocacy organisation for DAB/DAB+.[27]

Until 2006, DAB/DAB+ signals were broadcast exclusively on FM channel 12 and in rare cases on the L band (1.5 GHz). Since the Regional Radio Conference held in Geneva in 2006 under the patronage of the International Telecommunication Union, the frequency range in FM band III (174-230 MHz, channels 5 to 12 and later K 13) as well as the L band (1.5 GHz) are now available for digital broadcasting of radio programmes.

The following features characterise DAB/DAB+ technology:

- **Near-CD quality:** in order to broadcast an average radio programme on DAB+, a data rate of 64 kbit/s is required. Although this data rate is approximately 7.5 times lower than that of a CD, the sound quality corresponds subjectively to that of a CD.
- **Station packages instead of individual stations:** in contrast to FM, with DAB/DAB+ several radio stations are broadcast at the same time as a uniform data stream via one frequency block. DAB+ allows broadcasting of a maximum of 18 radio stations at 64kbs.
- **Broadcasting of sound, image, text and data services:** DAB/DAB+ enables broadcasting not only of sound, but also images, text and even short video sequences. The standard therefore permits broadcasting of innovative data services such as illustrated traffic information, teletext, service information, cover information for music titles, links to websites, etc.
- **One DAB+ frequency block for the entire coverage area:** if FM frequencies are used with too small a spacing between them, interference occurs. For this reason, for coverage of a specific area, a different FM frequency must be used from each transmission site (Multi Frequency Network MFN). In contrast, in a defined DAB+ transmission area (Allotment) the same frequency block will be assigned to all transmitters, on which broadcasting of the stations will be synchronised (Single Frequency Network SFN, synchronised network). This allows far greater frequency efficiency and more stable coverage than FM technology.
- **Efficient, economical and energy-saving:** since up to 18 stations are broadcast on one DAB/DAB+ transmission network, digital radio is considerably more economical for a coverage area comparable with FM. In addition, the energy consumption of DAB/DAB+ transmitters and the non-ionising radiation are distinctly lower than with FM.

[27] WorldDMB, Technical Specifications List
http://www.worlddab.org/technology-rollout/standards/technical-specifications-list

Digital Multimedia Broadcasting DMB

DMB (Digital Multimedia Broadcasting) also belongs to the DAB system family. It was developed especially for the transmission of video signals and multimedia content on mobile terminals with small-format displays (e.g. DMB-capable mobile telephones, PDAs or multimedia players). DMB is therefore often also described as "mobile TV". The special error protection mechanisms of the DAB system family also permit mobile video reception at high speeds (e.g. in cars or on trains). From a technical viewpoint, hybrid operation consisting of DAB/DAB+ services and formats with DMB video services is possible. France is the only country in Europe which has so far opted for DMB instead of DAB, but has in addition recently authorised the use of DAB+[28]. In Asia, however, the DMB standard is frequently used (above all in South Korea).

2.3.2 The beginnings: the SRG as driving force

With a share of approximately 60 percent, the SRG SSR stations are by far the most strongly represented in the Swiss radio market. For this reason and in the conviction that perseverance was needed for the digital build-up, the Federal Council decided that the introduction of digital radio broadcasting could only function if the public service broadcaster were to take on the driving force. With this in mind, the SRG put the first DAB platform into operation on 20 November 1999; broadcasting was initially limited to the conurbations of Bern, Zurich and Lake Geneva but by the end of 2009 encompassed the whole of Switzerland. Today, the SRG operates one transmitter network in German-speaking Switzerland, French-speaking Switzerland, Ticino and Grisons with approximately 12 stations respectively and achieves digital network coverage of almost 100 per cent of the resident population.

2.3.3 Initial activities of the private broadcasters

However, it was not only the SRG which showed early interest in digital broadcasting of radio programmes. As a response to the SRG's application of 26 March 1998 to construct a DAB network and the launch of a new youth station, the private broadcasters and Swisscom followed and submitted corresponding applications to OFCOM. In its concept of 5 May 1998, the ASPR expressed its conviction that "within 10 to 20 years most radio broadcasting services will be digitised[29]." On behalf of 18 private radio stations, the ASPR therefore requested the Federal Council to approve the construction of DAB platforms, on which the licensed FM broadcasters would be able to transmit regional-language stations. The infrastructure was to be financed from the technical portion of reception fees. At the same time, Radio 24 as an individual broadcaster also made a claim to the use of DAB frequencies for broadcasting of two stations. In its application, Swisscom in turn expressed an intention to construct and operate DAB networks on channel 12 and in the L band, via which its own radio and television stations and a wide variety of services, provided by various non-media players, were to be broadcast.

At the time the applications were not taken up: on the one hand, the Federal Council lacked the legal basis for an award of radio licences for the operation of DAB networks; on the other hand, amendment of the legislation would have been necessary to finance the infrastructure from reception fees. "Even though the Federal Council first tasked the SRG with the development of

[28] http://www.csa.fr/Radio/Autres-thematiques/La-radio-numerique-terrestre/Radio-numerique-possibilite-d-emission-dans-la-norme-DAB2

[29] Letter of 5 May 1998 to OFCOM

DAB, the door must remain open for the private sector", Federal Councillor Moritz Leuenberger decided in his response to the ASPR on 27 April 1999[30].

2.3.4 The Confederation's key strategic choices

On 29 March 2006 the Federal Council approved the directives for T-DAB transmitter network planning (Site: Federal Gazette 2006 3745), giving private radio broadcasters the possibility of digitally broadcasting existing and new radio stations on a regional-language basis[31]. At the same time it formulated its strategy for the future of radio broadcasting in Switzerland. In the process, it relied on the results of FM 2001 study, the public consultation in 2004[32] and a needs assessment carried out in 2005. In the context of this assessment, 84% of the private radio stations indicated an interest in using DAB.

The Federal Council's strategy includes two approaches:

- At the regional-language level, digitisation is being encouraged; in particular, new regional-language private broadcasters are to be allowed to broadcast only on digital platforms. Since DAB uses TV frequencies, rather than analogue radio frequencies, digitisation at the regional-language level can continue separately from FM planning.
- At local/regional level, no major technical restructuring or launching of new FM coverage areas will be implemented. Minor adjustments of coverage areas and filling existing gaps in reception, however, will still be possible.

The Federal Council wants to establish a flexible legal environment so that the new technologies can be applied without having to overcome any major hurdles, but at the same time it is leaving it up to the market to develop and introduce models with audience appeal. Since 2006, the Federal Council has repeatedly affirmed its position in favour of digital radio, for example in numerous appearances by its representatives and in a dozen responses to parliamentary initiatives on this subject.[33]

30 Letter of 27 April 1999 from Federal Councillor Moritz Leuenberger to the ASPR

31 Federal Council sets the course for digital radio: http://www.bakom.admin.ch/themen/radio_tv/01214/02302/03865/index.html?lang=en

32 Cf. Section 2.2.2.1

33 Cf. The Federal Council's responses to the following initiatives: 13.4236 (interpellation Piller Carrard Valérie: Financial support for regional radio stations during transmission via FM and DAB+), 13,3143 (interpellation Pieren Nadja: Licence for a regional-language DAB radio with performance mandate, without fee-splitting. Where are the advantages for the performance mandate), 12,4128 (interpellation Müri Felix: Isn't DVB-T a technology eligible for support?), 12,3632 (interpellation Gutzwiller Felix: World Radio Switzerland as part of the public service), 12.1073 (urgent inquiry Reimann Lukas: Surprising disconnection of the DAB radio frequency), 09,3094 (interpellation Hochreutener Norbert, Temporary solution of analogue broadcasting for transmission via digital platforms), 09,3075 (postulate Janiak Claude: Temporary solution for broadcasting of local and regional radio stations), 09,3074 (postulate Janiak Claude: Examination of frequency reserves within the various coverage areas in Switzerland), 09,3071 (postulate Leutenegger Filippo: Examination of frequency reserves within the various coverage areas in Switzerland), 08,3554 (motion Leutenegger Filippo: 50 per cent of FM frequencies for private radio stations), 08,3079 (interpellation Rickli Natalie Simone: Language switch of the SRG on DAB. More FM frequencies for other uses), 07,3230 (interpellation Hegetschwiler Rolf: Use of the surplus revenue of CHF 25 million at the SRG), all published at www.parlament.ch.

On the basis of the Geneva Agreement of 2006 Switzerland has at its disposal frequencies for a total of seven DAB+ coverages[34]. The frequencies can be used for national and regional-language broadcasting as well as for regional DAB+ broadcasting with a maximum of 18 stations respectively per allotment. The use of individual frequencies is also possible.

On 22 December 2010 the Federal Council issued broadcasting guidelines which cede to DETEC the decision on the release of digital frequencies and thus the orientation of media policy.[35] On this basis, DETEC developed its strategy for the future allocation of digital frequencies. Thus, primarily, one regional-language universal service including SRG stations and private providers' stations is to be assured (1st/2nd allotment) as well as sufficient scope for action and reserves for future developments (5th-7th allotment). The remaining capacities (3rd/4th allotment) are to be released in accordance with the needs of private interests; a regional-language, regional or local coverage is conceivable.

Table 4: DETEC concept for the release of DAB frequencies (status: June 2014)

	German-speaking Switzerland	French-speaking Switzerland	Ticino
7th coverage	Reserve	Reserve	Reserve
6th coverage	Reserve	Reserve	Reserve
5th coverage	Reserve	Reserve	Reserve
4th coverage + individual frequencies*	According to market and frequency situation: Digris AG, DAB+ islands	According to market and frequency situation	According to market and frequency situation
3rd coverage + individual frequencies *	According to market and frequency situation: SMC AG, regional allotments	According to market and frequency situation: Digris AG, DAB+ islands	According to market and frequency situation
2nd coverage	Universal service SwissMediaCast AG regional language	Universal service Romandie Médias SA regional language	According to market and frequency situation: Digris AG, DAB+ islands
1st coverage	Universal service SRG regional language	Universal service SRG regional language	Universal service SRG regional language

**) If coverage is regionally split into smaller coverage areas than planned in the 06 Geneva Agreement, the frequencies of two allotments and additionally coordinated frequencies will be required.*
***) Colour scheme: blue: assigned, green: available, red: reserved for later planning*

34 New digital frequency plan; ITU Radio Conference of 16 June 2006: http://www.bakom.admin.ch/themen/radio_tv/01214/02301/index.html?lang=de

35 Broadcasting directives regulate the dissemination of radio and TV: http://www.bakom.admin.ch/org/grundlagen/00563/01138/01917/index.html?lang=de

2.3.5 Private DAB/DAB+ platforms (status: August 2014)

As early as mid-2005 there were initial concrete efforts by the private sector to commence digital radio broadcasting: In July 2005, Radio Tele AG, Tamedia AG, the media entrepreneur Suzanne Speich and the SRG SSR formed a consortium to promote DAB in Switzerland. The goal of the consortium was to give new impetus to the future development of the medium of radio with DAB. In the longer term, according to the consortium, DAB should replace FM technology and in this way end the shortage of frequencies for broadcasting radio programme services. Later the ASPR, UNIKOM, Radio Zürisee and the publishing house Ringier also joined the consortium. As early as 2007, SwissMediaCast AG (SMC) emerged from this association; it was intended to construct a DAB transmitter network for private broadcasters in German-speaking Switzerland.

SMC is a joint venture company which unites key players in the electronic media and technology market: private radio broadcasters, publishers, the SRG and Swisscom. In 2009, in German-speaking Switzerland, it was able to put into operation a second, regional-language transmitter network, the first one for receiving private radio stations. On this platform, 15 private stations are broadcast, in addition to three SRG stations.

At the end of 2012 the SMC commenced construction of another DAB+ network with regional allotments in German-speaking Switzerland. A first partial coverage, the Aargau/Zurich allotment, went into operation in December 2012 and was extended a year later to include the central Switzerland and Basel regions. At the same time, more allotments followed for the Bern/Fribourg conurbation and eastern Switzerland. The Valais and Grisons allotments are in the planning stage; they are expected to start operation in 2015.

In April 2014, private radio broadcasters in French-speaking Switzerland also acquired a regional-language DAB+ platform. This involved Romandie Médias SA. This company too is a joint project of the private radio broadcasters from western Switzerland, the SRG and Swisscom. Today, with two exceptions, all the private FM stations licensed in this language area are broadcast digitally on the Romandie Médias SA platform.

On 1 May 2014, another DAB+ platform, this time locally based, commenced operation in Geneva. Digris AG received a radio licence for this purpose. Unlike the operators of existing regional-language or regional/supraregional platforms, Digris AG applies a different approach, i.e. the construction of digital coverage islands in larger Swiss conurbations. Primarily, this approach is intended to enable non-commercial radio stations and stations which broadcast over the internet to broadcast their programmes digitally. Accordingly, Digris AG is essentially supported by the stations organised in the non-commercial broadcasters' federation (UNIKOM) and the internet radio stations' association (ASROC). The licensee uses a new, software-based technology for island broadcasting aimed at urban areas. In this way, radio stations can be provided with much cheaper digital broadcasting than is the case with the large-scale DAB+ transmission areas. At the end of August 2014, the Zurich city allotment came into operation as a second allotment. More DAB+ islands are planned in other large urban areas.

2.3.6 The DAB+ radio landscape (status: August 2014)

Across the regions, some 70 radio stations are currently being broadcast on DAB+ platforms. They include all 17 SRG stations, licensed private FM stations, exclusive DAB+ stations and internet radio stations as well as two stations from abroad [36]. In German-speaking Switzerland, more than half of all private FM regional radio stations can also be received via a DAB+ platform, a large number of them across the entire language region. The figure for French-speaking Switzerland is more than 90 percent. Only in Ticino is there no DAB+ platform for private stations available. However, solutions for the Ticino broadcasters will also be examined.

2.3.7 Sales of DAB+ receivers

To date in Switzerland, approximately 1.8 million DAB+ devices have been sold (status: November 2014). This means that - based on the total population - Switzerland is one of the leading countries in Europe. Only in Great Britain, Denmark and Norway are sales figures equivalent or higher.

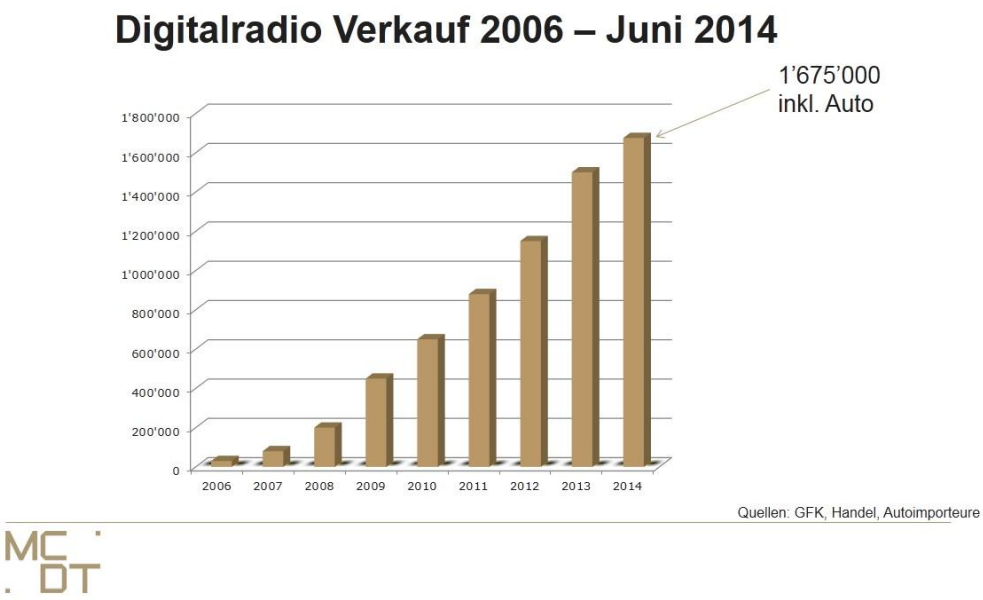

Figure 1: Development of DAB+ sales in Switzerland (June 2014 including cars) *© MCDT*

Although at the end of 2007 only approximately 100,000 DAB devices had been sold, sales of digital receivers suddenly increased when the SRG migrated its popular people music station "Mittelwelle 531" from medium wave to its DAB platform. At that time, the SRG faced the challenge of luring approximately 160,000 listeners from medium wave to DAB within a short time. It is remarkable in this connection that the strong thrust for digital radio reception originated not from young technophiles but from rural seniors who did not want to lose a valued radio station.

[36] Current station lists for the individual DAB+ platforms are available on the corresponding websites:
http://www.broadcast.ch/data_program_dab.aspx;
http://www.swissmediacast.ch/index.php?option=com_content&view=article&id=49&Itemid=76
http://www.digris.ch/
http://2222.ch/radio-numerique/suisse.html

To promote the introduction of digital radio on a broad basis, the SRG founded a dedicated promotion company in 2010. MCDT AG (Marketing and Consulting for Digital Broadcasting Technologies) provides marketing and consultancy services for the introduction of new digital transmission technologies, particularly DAB+. MCDT plans and implements all kinds of measures - from strategic and technological planning to marketing and communication activities. Together with the industries involved (manufacturers, importers, and the digital radio equipment trade, private radio stations and other interested partners), MCDT organises regular workshops and information events, launches and monitors advertising campaigns and observes the market and technological developments in the equipment and automotive markets.[37]

In retrospect, the low sales figures in the early years can be seen as quite beneficial. Because up to 2007 almost exclusively DAB devices were on the shelves. As early as 2006, however, it was apparent that the successor standard DAB+ would take over this role. In the same year DETEC put out to tender the first digital radio platform for private radio stations using this standard. The trade also reacted quickly and adapted its offerings, so that within a short time practically only DAB+ devices were available.

The Swiss market - in contrast, for instance, to Great Britain, where the large-scale commercialisation of DAB radio receivers began much earlier - was therefore well prepared when on 17 October 2012 the SRG switched most of its networks from DAB to DAB+ technology.[38] Today the large majority of all digital radios in household receive radio stations using the DAB+ standard.

Seventy-three percent of all Swiss people listen to the radio on a daily basis. Seventy-five percent of those surveyed say they listen to the radio at home, 25 per cent use the equipment at their workplace and 70 per cent also listen in the car. Every day, each person spends on average 22 minutes in a car. Eighty-six percent of those surveyed switched on the radio during their journey.[39] Fitting cars with DAB+ devices is accordingly important. Up until 2012, with approximately 10,000 devices, however, only an infinitesimally small number of the approximately 4.2 million vehicles in Switzerland were DAB+ enabled. In 2013, however, some 90,000 new vehicles were sold with a built-in DAB+ device and the automobile industry assumes that currently some 30 to 50 percent of all new sales are delivered with a DAB+ radio fitted.

[37] MCDT AG website: http://www.mcdt.ch/

[38] The SRG broadcasts most stations exclusively in the DAB+ format. At the end of 2015, SRF 1, SRF 4News, SRF Musikwelle, RTR, la Première, Option Musique and the three SRG stations in Ticino (in their respective language area) will still be broadcasting in parallel on DAB and DAB+.

[39] Source: KommTech study 2012 (not published)

3 Findings and recommendations of the DigiMig WG

The core element of the DigiMig WG's activity was the development of modules with individual recommendations for the areas of regulation, marketing/communications and technology. The core group discussed the proposals made by the sub-groups, made amendments and adopted them as a joint recommendation of the entire working group.

The proposals subsequently presented in relation to regulation, marketing strategy and technology form the basis for the chronologically coordinated action plan which the DigiMig WG is submitting to the responsible authorities and participants from the media industry (see Chapter 4, Measures for the digital migration)

The action plan constitutes a self-contained unit. All of the above steps must be completed for it to be implemented successfully. In other words: this is not a menu, from which stakeholders can, as it were, choose individual components. Since the package consists of elements which are interlinked and which are coordinated in time, the regulatory authorities, broadcasters and platform operators must coordinate their actions according to the model which is proposed here and implement them in full.

3.1 Measures in relation to regulation

3.1.1 Financial measures in relation to technology support according to existing legislation

Liberal application of the provision in force for technology support

- If a licensed radio broadcaster arranges for its station to be broadcast on a digital platform, based on Article 58 RTVA (investment contributions for new technologies)[40] , OFCOM will support it with a contribution amounting to 33 per cent of the usage fee which the operator of the digital broadcasting platform charges it. This priority measure will remain in force until the new regulation on technology support according to the revised RTVA replaces the current regulations.
- If Parliament sends clear signals in this regard, OFCOM will further increase the extent of its financial support for DAB+ broadcasting.
- The duration of the support should be geared towards the implementation of a market launch strategy which permits an expectation of reasonable private refinancing of digitisation until the FM switch-off (Art. 50 para. 4 RTV Ordinance)[41]

[40] Art. 58 RTVA: http://www.admin.ch/opc/de/classified-compilation/20001794/index.html#a58

[41] Radio and Television Ordinance (RTVO), article 50 paragraph 4 RTVO: http://www.admin.ch/opc/de/classified-compilation/20063007/index.html#a50

3.1.1.1 Adaptation of legislation

An amendment to Article 50 para. 4 RTVO (duration of support) [42] and Article 51 RTVO[43] (scope of investment and depreciation support) will be required, plus amendment of Article 14 DETEC-O[44] (period of support).

3.1.1.2 Who is responsible for implementation?

- Political initiative for adaptation of practice: members of the Federal Assembly;
- Amendment of the RTVO: the Federal Council;
- Amendment of the DETEC Ordinance: DETEC
- Amendment of practice: OFCOM.

3.1.1.3 Explanations/Justification

At present, OFCOM can, in accordance with Article 58 RTVA, arrange for licensed broadcasters to receive contributions based on the cost of introduction of new technologies for the construction of transmitter networks. The support amounts to 75 per cent of the broadcaster's costs for investments or depreciation thereof, with this regardless of whether the broadcaster operates the network itself or these costs are charged on to it by the network operator (Art. 51 para. 1 RTVO). To avoid drawn-out clarification of intractable evidentiary issues, OFCOM decided pragmatically to define the contribution in the case that a broadcaster does not make the investment itself as a lump-sum contribution, amounting to 25 per cent of the usage fee charged to the broadcaster by the platform operator (letter from OFCOM dated 27 February 2013 to broadcasters). This percentage rate is the result of prudent estimates of the share of depreciation on operating costs (33 percent). If, exceptionally, the investment costs are borne directly by the broadcaster, OFCOM will bear 75 per cent of these costs.

As indicated in Section 3.1.1.4 the available resources are currently sufficient to give greater support to the licensed radio stations which use simulcast to broadcast their programme service. A substantial increase in support should result from the new Article 58, which now takes into account not only investments but also the operation of new technologies. On 26 September 2014 Parliament adopted the partial revision of the RTVA by 137 votes to 99 (with 7 abstentions). Whether and when the new regulations will enter into force depends on the outcome of the referendum vote.[45]

[42] Radio and Television Ordinance (RTVO), Art. 50 para.. 4 RTVO: http://www.admin.ch/opc/de/classified-compilation/20063007/index.html#a50

[43] Art. 50 para. 4 and Art. 51 RTVO: http://www.admin.ch/opc/de/classified-compilation/20063007/index.html#a51

[44] DETEC Ordinance on Radio and Television dated 5 October 2007 (DETEC-O; [CC 784.401.11]), Art. 14: http://www.admin.ch/opc/de/classified-compilation/20071544/index.html#a14

[45] Up-to-date information on the partial revision of the Radio and Television Act: http://www.parlament.ch/d/suche/seiten/ratsunterlagen.aspx?gesch_nr=20130048

The Federal Council has a degree of leeway to influence the level of support within the scheme of Article 58 RTVA in its present incarnation. It has therefore specified that up to 75 per cent of the eligible investment and depreciation will be funded through technology support (Art. 51 para. 1 RTVO). With its decision of 5th November 2014[46] it will temporarily increase this to 100% effective in 2015. Thus the share of costs assumed by the Confederation will increase to 33% of the operating costs billed by the digital platform operator to the licensed broadcaster.

In her interpellation of 12 December 2013, National Councillor Valérie Piller Carrard called on the Federal Council to exploit in full the existing legislative basis to guarantee the radio stations increased support in anticipation of the entry into force of the revised RTVA[47]. In its response of 12 February 2014, the Federal Council was sympathetic to the petitioner's intention.

What are the grounds for early, strong support of digital broadcasting during the simulcast phase?

- The broadcasters concerned will incur considerable additional technical costs without initially being able to make major savings via the phasing out of analogue FM broadcasting or in the expectation of a significant increase in the number of listeners.
- The introduction of digital radio is consistent with requirements of the Federal Council, which expects an increase in the range of offerings and in diversity of opinion in the radio sector. DAB+ requires a certain critical mass in order to attract advertising revenue and ultimately new broadcasters. In order to attain this critical mass quickly, a rapid migration of FM radio stations is essential on a broad front;
- Generous financial support of digital broadcasting costs is fully consistent with the revision of the Radio and Television Act adopted in September 2014.[48]

Against this background, the DigiMig WG welcomes the decision of the Federal Council of 5 November 2014, in the context of the revision of the RTVO, to allow complete assumption of the depreciation costs associated with the introduction of DAB+ as a temporary measure. This measure points in the right direction, even if the radio broadcasters, for the reasons outlined above expect significantly greater temporary co-financing of simulcast costs by the Confederation at the time of the entry into force of the revised RTVA with its improved legal basis in Article 58 RTVA (cf. para.3.1.3).

The duration of the assistance provided should be linked to the implementation of appropriate promotional measures. Such measures are a prerequisite for private refinancing of the digital migration. Article 50 paragraph 4 RTVO limits the duration of the support to a maximum of ten years. OFCOM approved the first (modest) contributions in 2009 (see following para. 3.1.1.4). Therefore, the support for the first recipients would expire at the end of 2018.

46 Revision of the Radio- and Television Ordinance of 5 November 2014: http://www.bakom.admin.ch/dokumentation/medieninformationen/00471/index.html?lang=de&msg-id=55099

47 Interpellation 13.4236 by Valérie Piller Carrard on 12.12.2013 'Finanzielle Unterstützung für Regionalradios während der Übertragung via FM und DAB+ [Financial support for regional radio stations during broadcasting on FM and DAB+]", http://www.parlament.ch/d/suche/seiten/geschaefte.aspx?gesch_id=20134236

48 cf. Federal Council Dispatch of 29 May 2013 on the amendment of the RTVA, para. 2.12 and explanation on article 58 [Federal Gazette **2013** 5031f.]: http://www.bakom.admin.ch/dokumentation/gesetzgebung/00512/03026/04299/index.html?lang=de#sprungmarke0_2

Industry-wide coordinated campaigns aimed at encouraging the public to buy DAB+ radio receivers have to date largely failed to materialise due to a lack of available financial resources. Consequently, although market penetration of digital radio is constantly increasing, it is not at a rate at which economically self-supporting operation of DAB+ can be expected in the short or medium term. Therefore the future application of technology support in favour of the co-financing of public promotional campaigns is certainly most welcome (Art. 58 para. 2 E-RTVA, see Federal Council Dispatch of 29 May 2013 on amendment of the RTVA, p. 59).

The provisions in the revised RTVA will facilitate the implementation of the above-mentioned campaigns in financial terms. However, it will be some time before they achieve the desired effect. Therefore, it would be unfair for the "early adopters" among broadcasters, who embraced digital DAB+ at an early stage, to be punished for their courage by removing their technology support at the end of 2018, i.e. before the desired goal – an increase in offerings and diversity of opinion via DAB+ which can be borne by the private sector – could realistically be achieved. In determining the duration of support, attention should be paid rather to the timetable which the DigiMig WG has outlined for the industry-wide transition from FM to DAB+ (cf. Chapter 4.2, Measures 11 to 15).

3.1.1.4 Costs/Time/Effort

The technical broadcasting costs of digital radio depend on the point in time at which the various radio stations commence digital broadcasting operations. In 2014 approximately half of the FM radio stations were also broadcasting their programme services on DAB+. Credible estimates assume that the **operating costs** of full implementation of **digital** broadcasting by all FM private radio stations (excluding costs for tunnel coverage) amount **to approximately CHF 10 - 15 million annually**[49]. The reasons for the cost range lie in the spread of the possible coverage areas and depths of coverage.

OFCOM promised support contributions for DAB+ from 2009 onwards, i.e. CHF 35,000 for the first year, CHF 110,000 for the year 2010, approximately CHF 390,000 CHF in 2011 and approximately CHF 600,000 for the year 2012. For 2013, OFCOM anticipates a subsidy of CHF 1.2 million. For the year 2014, this will increase to CHF 2.1 million.

The technology support is funded from the **revenue from the licence fee** allocated to radio and television broadcasters. Additionally, the Federal Council can **apply a maximum of 1 percent of the revenue from the reception fee** for purposes of technology support (Art. 58 para. 3 RTVA 2006). On the basis of the figures for 2012 relating to revenue from reception fees, this percentage is almost exactly **CHF 13 million**. This funding mechanism remains unchanged according to the Federal Council's draft for the revision of the RTVA (Art. 58 para. 3 draft RTVA 2013).

The **OFCOM account** for technology support showed a balance of approximately **CHF 15.5 million** at the end of 2013. By the end of 2014, a further CHF 500,000 will be allocated from the reception fees to technology support. Depending on whether the Federal Council extends the current fee period[50], which expires at the end of 2014, by one year, this arrangement could con-

[49] For the justification of the cost estimates cf. section 3.4.1

[50] The reception fee is regularly fixed for a period of four years. The last review of the reception fee was on 18 June 2010 for

tinue until the end of 2015. After that, the Federal Council will decide, in accordance with general developments in the broadcasting sector, whether it wishes to redefine the reception fees for the years 2016/2017 or whether it will await the introduction of the new fee collection system. In addition, it is assumed that technology support will be financially supported until 2016 to the tune of CHF 5 million from the custody account. In summary, it is therefore to be assumed that the existing resources are sufficient to allow dedicated support for the digital migration until the introduction of the revised RTVA (provisionally in 2016).

3.1.2 Financial measures for radio stations in mountain regions

Subsidiary funding of DAB+ broadcasting from the fund for mountain regions

- OFCOM supports not only FM broadcasting but also digital broadcasting by licensed radio broadcasters in mountain regions. This takes place within the framework of the support for broadcasting by radio stations in mountain regions[51].
- OFCOM is committed to ensuring that the amount provided in the federal budget for the support of licensed radio stations in mountain regions is not reduced (not below CHF 1 million).

3.1.2.1 Adaptation of legislation

This measure does not require revision of Article 49 RTVO[52] or Article 10 of the DETEC-O[53].

3.1.2.2 Who is responsible for implementation?

OFCOM is responsible for implementation of the measure (adaptation of practice).

3.1.2.3 Explanations/Justification

Pursuant to Article 57 RTVA, OFCOM supports licensed radio stations in mountain regions by granting these stations special support to fund their broadcasting costs in addition to the customary fee splitting. This support is calculated according to the technical cost per person covered and derives from the federal treasury. According to Article 10 DETEC-O, this must be at least CHF 0.57 per person. Since 2007, between 8 and 13 radio stations have benefited annually from this support. Until 2013 OFCOM had CHF 1 million at its disposal for this purpose. This figure was reduced for the year 2014 to CHF 700,000. However, an increase to CHF 1.1 million is planned for 2015.

In accordance with Article 49 para. 3bis RTVO, the amount of support may be a maximum of 25 percent of the broadcasting costs of the beneficiary broadcaster. Most of the entitled radio stations are coming up against this limit. Consequently OFCOM has regularly been able to disburse about two thirds of the envisaged resources.

the years 2011-2014; cf. the corresponding press release at http://www.bakom.admin.ch/dokumentation/medieninformationen/00471/index.html?lang=de&msg-id=33760.

51 Art. 57 RTVA: http://www.admin.ch/opc/de/classified-compilation/20001794/index.html#a57

52 Art. 49 RTVO: http://www.admin.ch/opc/de/classified-compilation/20063007/index.html#a49

53 Art. 10 DETEC-O: http://www.admin.ch/opc/de/classified-compilation/20071544/index.html#a10

The wording of Article 57 RTVA does not limit the scope of the provision to analogue broadcasting. It would be conceivable to apply the credit remaining after funding the FM costs for supporting digital broadcasting in mountain regions.

Special support for radio stations in mountain regions is appropriate because digitisation is a particularly cost-intensive step for these stations to take, given that their coverage areas are only moderately attractive to advertisers. Nevertheless, digitisation will also encompass these regions. Therefore, the extension of the scope of Article 57 RTVA is perfectly legitimate.

3.1.2.4 Costs/Time/Effort

To finance the broadcasting costs of radio stations in mountain regions, Parliament promised **CHF 1 million per year**. However, because OFCOM never fully exhausted this credit, mountain aid for the year 2014 was reduced to CHF 700,000. Now, however, radio stations in mountain regions are also gradually moving over to broadcasting their programmes on DAB+. Therefore the amount of support would have to be raised again. The increase in the budget to CHF 1.1 million for the year 2015 suggested by OFCOM is therefore in full conformity with the objective.

The contributions to digital broadcasting which the individual radio stations in mountain regions can receive are certainly somewhat modest. However, they may be crucial for these radio stations in terms of the decision to invest in DAB+.

3.1.3 Financial measures under new legislation

Use of the surplus from fee-splitting to fund DAB+, temporary increase in technology support

- A significant portion of the surpluses from fee-splitting is used to fund the digital broadcasting of radio programmes on DAB+.
- The Federal Council uses the leeway it enjoys on the basis of Article 58 of the new RTVA to provide sustainable support for FM broadcasters during the simulcast.

3.1.3.1 Adaptation of legislation

Amendment of Article 109a of the new RTVA.

3.1.3.2 Who is responsible for implementation?

It is expected that the electorate will be responsible for the adoption of the new Article 109a of the RTVA within the framework of a referendum. The implementation of Article 58 of the new RTVA rests in the hands of the Federal Council.

3.1.3.3 Explanations/Justification

The DigiMig WG welcomes Parliament's decision to introduce use of the surpluses to promote new broadcasting technologies in accordance with Article 58 RTVA (as well as digital television production processes). Also welcome is the partial extension of the scope of the surpluses to the provision of general information to the public in accordance with Article 58 para. 2 RTVA. This allows public support for industry-wide efforts in favour of broad marketing campaigns for DAB+. On the other hand the DigiMig WG notes that the majority of the surplus from fee-splitting envisaged for new technology support according to Article 109a RTVA remains reserved for

radio broadcasters receiving a share of fees. In relation to the digital migration, this legislative solution means that the vast majority of the fee-splitting radio stations will receive financial support from three different sources (technology support in accordance with Article 58 RTVA, mountain aid in accordance with Article 57 RTVA and fee surpluses in accordance with Article 109a RTVA). A joint use of the surpluses for the benefit of the entire radio industry would have been of great benefit to the digital migration – and thereby ultimately to the fee-splitting radio stations.

As will be set out below (Section 3.4 and 3.2 on marketing), the existing FM broadcasters will have to expect significant costs in the course of the digital migration either in the form of investment or operating costs for digital broadcasting of their programmes or in the form of industry-wide marketing campaigns for digital radio. The DigiMig WG expects that the Federal Council will decided to apply positively the leeway granted it in Article 58 and provide massive support during the financially challenging simulcast phase, so that broadcasters can implement the migration quickly and successfully.

3.1.3.4 Costs/Time/Effort

There is some discussion that after deduction of a liquidity reserve, which the authorities need for the smooth operation of the ordinary fee support scheme, approximately CHF 40 to 45 million might be available for distribution.

Working from the latter figure, approximately 30 million would be used for technical innovations. If these resources were split 50/50 between radio and television stations which have received fee support to date, approximately **CHF 15 million** could be released for funding simulcast operation.

In a new version, Article 58 RTVA states that the Federal Council can use up to a maximum of 1% of the universal radio and television fee to support new technologies. This corresponds to approximately **CHF 13 million** per year.

3.1.4 Relaxation of the FM coverage obligation, shutdown of relinquished FM frequencies

Exemption from the FM coverage obligation if the station is broadcasting on DAB+, no re-assignment of FM frequencies which are relinquished in the course of the digital migration

- On request, DETEC will release a radio broadcaster from its obligation to serve parts of its coverage area using analogue technology on FM if it covers the regions concerned digitally via DAB+.
- The Federal Council and DETEC will refrain from re-assigning to third parties FM frequencies which are relinquished by radio broadcasters in the course of the digital migration.

3.1.4.1 Adaptation of legislation

In order to give broadcasters in general the possibility to opt for DAB+ rather than their FM coverage obligation, Annex 1 of the RTVO will have to be amended. The implementation of this measure in a particular case requires a change to broadcasters' and radio licences. The shutdown of relinquished FM frequencies can also be confirmed in the general section of Annex 1 of the RTVO.

3.1.4.2 Who is responsible for implementation?

Amending the general section of Annex 1 of the RTVO is within the remit of the Federal Council. DETEC is responsible for amending broadcasters' licences and OFCOM is responsible for amending the radio licence.

3.1.4.3 Explanations/Justification

The fundamental obligations of a licensed local radio station include ensuring appropriate coverage in the area assigned to it. According to customary practice, OFCOM, in its planning activities, has had to ensure that local broadcasters have been provided with the frequencies required for this (cf. para. 2 and 3 of Annex 1 of the RTVO)[54]. In the meantime, the main stages for the construction of the radio landscape, as outlined by the Federal Council in Annex 1 of the RTVO, have been completed. OFCOM has therefore decided to withdraw from proactive planning activity in favour of the radio broadcasters (see the OFCOM handbook[55]).

This is accompanied by a transfer of responsibility for technical broadcasting solutions from OFCOM to the individual broadcasters. They will have to decide in the future how they will best reach their audiences. This also includes the choice of broadcasting technologies.

According to Article 38 para. 4 let. a RTVA, DETEC defines the coverage area and the type of broadcasting in the licence. In Article 1 of all local broadcasters' licences, DETEC refers to the geographical definition of the coverage areas pursuant to Annex 1 of the RTVO and in Article 2 defines analogue FM technology as the main vector for broadcasting of programmes. As the broadcaster has also been given the right to use digital (HD radio or DRM+) in parallel to its FM frequencies, DETEC could, on application, allow the broadcaster to serve certain parts of its coverage area digitally via DAB+ instead of via analogue FM frequencies.

It is apparent that during the digital migration process digital broadcasting will for a time complement analogue broadcasting. It seems therefore appropriate to allow the broadcaster to optimise its broadcasting strategy and to allow a combination of analogue and digital coverage.

There are two reasons why such a combination of analogue and digital broadcasting technologies serving a local coverage area would be advantageous:

- Some operators of digital transmitter networks are working to construct regional digital platforms which may be attractive in terms of cost and time to individual local broadcasters as a means for serving the remainder of their FM coverage areas. In such cases, it is appropriate to want to minimise the cost of dual coverage and to seek to relinquish one of the two parallel coverages locally.

[54] Art. 38 para. 4 let. a RTVA: http://www.admin.ch/opc/de/classified-compilation/20001794/index.html#a38

[55] OFCOM handbook dated 1 April 2013 on FM frequency planning and the relevant OFCOM circulars dated 5 April 2013, http://www.bakom.admin.ch/themen/radio_tv/01214/02302/04190/index.html?lang=de

- Local broadcasters must regularly renew or replace their transmitters. In terms of media policy, it would make no sense, during the digital migration process, to oblige a broadcaster to make costly investments in technologically obsolete FM equipment against its will, when it would prefer to embrace the opportunity to convert its coverage to DAB+.

For existing FM broadcasters, relinquishing a FM frequency in the course of digitisation would be a short-term risk, i.e. until the advertising market in the digital arena can be built up and the major advertising revenue remains concentrated on FM. In such a situation a FM broadcaster who is committed to digitisation must have the security that the competent authorities will not assign the analogue frequencies which it is relinquishing to potential new competitors in the FM arena.

The Federal Council has addressed these concerns with the amendment of Annex 1, Section 3.3, Embargo on FM frequencies of the RTVO[56]. The DigiMig WG welcomes this positive initiative by the Federal Council, which serves to give broadcasters the necessary latitude in configuring their technical migration.

3.1.5 Review of the coverage areas by the Federal Council

Status quo concerning the number/structure of FM coverage areas

- In the review of the number and structure of coverage areas in accordance with Article 39 paragraph 4 RTVA[57] the Federal Council is being advised to leave unchanged the topography of the FM radio landscape according to Annex 1 of the RTVO.
- However, updating of the introductory part of Annex 1 of the RTVO might prove useful (adaptation to the changed relationship in the roles of OFCOM and the broadcasters in relation to FM frequency planning).

3.1.5.1 Adaptation of legislation

Amendment of Sections 2 and 3 of Annex 1 of the RTVO is necessary for the implementation of this measure.

3.1.5.2 Who is responsible for implementation?

The Federal Council is responsible for the implementation of the measure.

3.1.5.3 Explanations/Justification

According to Article 39 para. 4 RTVA, the Federal Council reviews periodically, but at the latest after ten years, the number and structure of the local coverage areas. The topography of the existing local FM radio landscape is currently defined in Annex 1 of the RTVO. Since this Annex was adopted on 4 July 2007, its review is due in July 2017 at the latest. The currently valid licences for broadcasting by local FM radio stations expire at the end of 2019. If they were to be

[56] RTVO revision of 5 November 2014, Media Release: http://www.bakom.admin.ch/dokumentation/medieninformationen/00471/index.html?lang=de&msg-id=55099

[57] Art. 39 para. 4 RTVA: http://www.admin.ch/opc/de/classified-compilation/20001794/index.html#a39
Annex 1 to the RTVO: http://www.admin.ch/opc/de/classified-compilation/20063007/index.html#fn-#a37-3

put out to tender again, the tender procedure would take place, on the basis of the Federal Council's decision, from mid-2017.

In this review, the Federal Council could create new coverage areas in the FM band, abolish existing coverage areas or increase the number of local broadcasting licences to be awarded. However, such changes to the FM radio landscape do not appear to be very opportune, for the following reasons:

- Many local radio stations are already on the road to digital migration or will adopt this path in the coming months. In this economically delicate phase of change, for them to expect new competitors in the FM band could threaten the success of the digitisation strategy. Therefore, the number of FM licences should not be increased.
- The structure of the coverage areas will already change as a result of digitisation. It would be anachronistic, in a phase where broadcasters are given greater freedom, to draw up tailored broadcasting solutions and have the State prescribe the form which the broadcasting parameters must assume. This State responsibility was closely associated with the management of the limited frequencies in the FM band, but will become obsolete in the digital era.
- The FM band is and will remain saturated. Any change in the structure of today's coverage areas will trigger delicate and sometimes costly changes in terms of spectrum technology. In the digital migration process it would make no sense to expect broadcasters to invest in the FM transmitter network in order to meet the new regulatory design criteria. Instead, the solution must be to promote digitisation, instead of wanting divide to up the existing analogue FM landscape once again. The Federal Council, as well as the cantonal authorities which have been consulted, have already expressed themselves along these lines many times.

On the other hand it was useful to examine the content of the introductory general section of Annex 1 to the RTVO in order to align it with the newly defined allocation of tasks between the State planning authorities and the private sector third parties as described in the OFCOM handbook on FM frequency planning. The Federal Council adopted this route in the amendment of the RTVO (amendment of Section 2 para. 1 and Section 3.2 of Annex 1 of the RTVO).[58]

[58] Cf. http://www.bakom.admin.ch/dokumentation/gesetzgebung/00909/04667/index.html?lang=de

3.1.6 Import regulations for radio receivers and vehicles?

It would theoretically be conceivable to issue regulations which would require imported vehicles to be compulsorily equipped with DAB+-capable radios or to be compulsorily capable of receiving DAB+.

The DigiMig Working Group has rejected the idea of import regulations after corresponding clarifications from OFCOM. Such regulations are not admissible and contradict the 2009 revised federal law on technical barriers to trade, because of international agreements which Switzerland has concluded with foreign trading partners – primarily the European Union – concerning the reciprocal recognition of conformity assessments in accordance with the "Cassis de Dijon" principle (Mutual Recognition Agreements [MRA])[59]. In addition, the Working Group is of the opinion that such bans could send out negative signals which do the migration process more harm than good.

3.1.7 Recommendations in relation to regulation

- The provisions for technology support currently in force should be applied generously.
- In addition to regular support, broadcasters in mountain regions should receive contributions for DAB+ broadcasting from the support fund for mountain regions.
- Until the conclusion of the digital migration process, the contributions from technology support must be temporarily increased. To achieve this, the surplus from fee-splitting should be used to finance DAB+.
- Broadcasters must be freed from the partial/integral FM broadcasting obligation if they broadcast their programme services on a DAB+ platform.
- OFCOM must no longer reallocate FM frequencies which are relinquished in the course of the digital migration.
- In future, FM coverage areas must not be extended either in terms of their number or their structure.

[59] Federal law on technical barriers to trade
http://www.admin.ch/opc/de/classified-compilation/19950286/index.html

3.2 Measures in relation to the market and communications

The following describes numerous possible measures by means of which the various players in the radio market could be addressed. Some of these are concepts for projects which are then outlined in detail, because in the view of the DigiMig WG they constitute commendable initiatives. Close industry-wide coordination of the various marketing activities is crucial for the success of the migration. This task will be taken on in Switzerland by MCDT AG and the recently established DigiMig Operations GmbH, formed by the three private radio associations for this purpose. They will have to re-evaluate the project outlines with a view to practical implementation and to elaborate new marketing operations.

The measures in relation to the market and communications are aimed at four target groups:

- radio listeners (business to consumer, B2C measures);
- the trade and the automobile industry (business to business, B2B measures);
- the advertising industry;
- the general public (general communication measures).

The private radio industry, together with the SRG, is responsible for the implementation of these measures throughout the migration process. They set out this intention in their business agreement, to which the individual private radio stations must submit endorsements. Monitoring of progress will be performed via usage research, which is also regulated in the above-mentioned business agreement and which will exclusively ascertain growth in the use of digital radio.

3.2.1 Measures for increasing radio listeners (B2C sector)

Measures for the B2C (business to consumer) sector comprise those measures intended to encourage the public to buy DAB+ receivers and to use them to listen to their radio stations:

- Common branding
- Promotion for FM stations in the regions which they can now cover thanks to DAB+
- Extending the range of programming with additional stations broadcast exclusively on DAB+ (in particular special-interest stations)
- Promotion of the expanded geographical coverage in programming
- Promotion on FM for premium programming broadcast on DAB+
- DAB+ roadshow
- Digital radio workshop (kits for senior school students)
- Editorial treatment of the subject of digital radio in the mass media and social media
- Trade-in campaign for FM radio receivers

3.2.1.1 Common branding

If DAB+ is to acquire new listeners, it must be newly and freshly positioned in the market. This demands common visual and sonic branding which should feature in all marketing campaigns.

3.2.1.2 Extending the range of programmes

Today the variety of offerings on FM is limited: the majority of stations are aimed at a majority audience in their respective licence area, with sometimes very similar offerings in terms of music and services. Thanks to its greater transmission capacities, DAB+ can beat this, with a more varied range of stations. In this respect, connecting up additional radio stations broadcasting exclusively on DAB+, especially special-interest stations, with a large number of listeners, could substantially increase the attractiveness of digital radio compared to FM.

However, broadcasters have so far hardly been in a position to offer new and exclusive DAB+ full stations which can be re-financed and the current offerings being constructed are often in an apparently difficult economic position. This may be attributable to the relatively low usage of digital radio and the consequently low usage numbers disclosed so far. More reliable usage figures, including via IP radio, will be available by the end of 2014 as part of the separate DigiMig usage research once the first wave of surveys has been carried out.

Nonetheless, it can still hardly be assumed that it will be economically possible to launch new exclusive full stations in the already saturated radio landscape. Instead, special-interest stations should be launched, particularly if an existing strong brand (radio, TV, online, print) can be used and very extensive resources are available for communication.

Of course, digital terrestrial transmission technology offers benefits for the existing FM stations: DAB+ generally allows larger areas to be covered than FM. This allows existing FM radio stations to appeal to a new, broader audience.

In addition, however, other approaches are needed, such as:

- Existing internet radio stations would have to be won over to DAB. They already have the know-how and technology. DAB would give them the additional terrestrial broadcasting channel.
- Local private radio stations could operate a fan channel for the local football or hockey club, with secondary exploitation of the coverage of the main transmitter and with live reports offering full commentary. It is possible that broadcasting costs could be borne in part or in full by the football clubs and additional sponsors. This model is often used in the USA for the second and third programme services of HD radio stations.
- A channel devoted exclusively to sport (based on the model of the former German DAB+ station “90elf”).
- The concept of an archive radio in the broadest sense (“Today 20 years ago on the radio”) and in the narrowest sense (with new broadcasting partners not yet active in radio, such as the Memoriav association which is active in the area of archiving, etc.).
- A pure traffic and/or service channel for people on the move (with Viasuisse, weather, etc.; in close connection with the additional data options such as SlideShow offered by DAB+).

- A channel aimed exclusively at children, which is targeted thematically and in terms of language at children and which actively involves them.
- Radio 65+, which is dedicated to the world of the elderly or shaped by them.
- The classifieds market (incl. links to additional data such as images, in the used car market)

In all cases the prospects for re-financing through advertising and sponsorship are questionable and competition – and therefore a cut-throat fight against existing DAB+ stations – is a strong factor.

3.2.1.3 Promotion on FM for additional programme service elements not broadcast on DAB+

In a transitional phase it may be appropriate, instead of just parallel digital broadcasting of the FM station (simulcast), to provide the digital version of the FM station with exclusive enhancements (premium components). Each FM broadcaster could incorporate a station split (similar to an advertising window) on DAB+ for this purpose. Specifically, for example, a draw for concert tickets or other gifts could be announced on FM, whilst the actual draw would take place on the DAB+ station. Competitions, puzzles or radio dramas could be launched on FM and concluded on DAB+. This would allow promotion of the DAB+ vector on the FM station (teasers, cross-promotion).

3.2.1.4 DAB+ roadshow

DigiMig operations GmbH and/or MCDT AG will, together with the leading DAB+ marketing companies and stores, plan and implement a roadshow with a high regional impact. The activities will extend down to the municipality/district level and aim to sell a substantial number of receivers directly on the spot at the POS (point of sale) and also to give some away (e.g. by means of a competition, or indirectly thorough other actions). Advertising will be high-density, primarily via electronic media, including the internet and social media, and free of charge (broadcast) by broadcasters. The nominal value of the publicity resources to be used, depending upon the concept, which has yet to be determined, may be in the CHF 40-60 million range.

One possible scenario might see DigiMig Operations GmbH buy or lease trucks for selling, delivering and promoting DAB+. Excluding public holidays and Sundays, these vehicles would visit one or sometimes two locations every day, for half a day respectively, over a period of 4 years. This campaign is aimed at the home, mobile and car after-sales market (cars, for example, will also be fitted on-site). Partners would be importers/retail outlets (from supply to after-sales service). For these 4 years, an independent online sales platform would operate. For this roadshow, DigiMig Operations GmbH/MCDT AG would need an estimated 25 full-time positions. The operating costs for 4 years, according to an initial estimate, amount to approximately CHF 15 to 20 million. Funding should be derived from part of the margin on devices and from sponsors, as well as from technology support.

3.2.1.5 Digital radio workshop (kits for schoolchildren)

In summer 2011, MCDT launched the “Radio Workshop” project, together with sponsors. MCDT AG and partners supplied senior school students in German-speaking Switzerland with 500 digital radio kits, which the students assembled under supervision. With a lot of creativity, the students also designed “their” radio housing; the best ideas were evaluated by a jury and awards

were given[60]. Owing to its great success, the project was also carried out in 2012 in French-speaking Switzerland. In 2012, cooperation with myschool[61] was concluded, communicating the "Digital Radio Workshop" topic on its channels. The "Digital Radio Workshop" project could be implemented on a large scale throughout Switzerland and for all interested schools. The best digital radio kit (as a hybrid radio assembly kit including IP) could be further professionalised and sold in retail outlets (specialist shops, toy shops). It would be worth exploring to what extent additional services, called applications, can be integrated into the kit.

3.2.1.6 Editorial handling of the subject of digital radio in the mass media and social media

In order to allow FM to be phased out, the awareness of digital radio and sales of receivers must be increased markedly. The public must be informed by means of broad-based editorial content about the digital radio phenomenon. Editorial contributions on radio and TV, in print, online and on social media (through publishers, individuals, SRG) are possible in all formats and can be enriched with trailers, testimonials, competitions, games, etc. The technology in and of itself is not the key. Instead, personally relevant stories should be told using the "storytelling" concept, informing the public of the benefits of digital radio (e.g. seeing a school assemble the digital radio kit, DAB+ & ecology, stories from trial listeners, automotive, new stations (sports channel), etc.).

3.2.1.7 Trade-in campaign for FM radio receivers

Trade-in campaigns such as "Every radio counts" (FM vs. digital radio) should encourage the public to purchase digital radio devices. The returned FM devices could be tested for functionality and sent via relief organisations to developing countries. In turn, this would provide material for editorial contributions. Employment programmes could be used for the functionality testing. The trade-in campaign could even possibly be expanded into to a major event. More options/topics such as recycling (dismantling FM equipment into individual items and re-use by consumers) should be investigated.

3.2.2 Measures in relation to the trade and the automobile industry (B2B sector)

Measures for the B2B (business to business) sector include those measures which encourage the equipment trade and the automobile industry to import and sell DAB+ equipment.

- Dealers: motivation for the exclusive sale of FM and DAB+-capable radio receivers
- Importers: convincing them to cease import of radio equipment which can only receive FM
- Radio broadcasters: promotion of the sale of hybrid radio receivers (smart radios) via additional services
- Automotive industry: support for the promotion of DAB+ radio receivers
- Manufacturers: motivating them to cease production of radios which can only receive FM

60 Digital Radio Workshop: the most original designs honoured: http://www.mcdt.ch/de/medien/digitalradio-werkstatt-originellste-designs-honoriert/

61 SRG "SRG mySchool project": http://www.srf.ch/sendungen/myschool/willkommen-bei-srf-myschool"

3.2.2.1 Promotion of the marketing of hybrid radio receivers (smart radios)

The best-selling DAB+ radio receivers are already DAB+ and FM compatible and equipped with a “3-line display”. Their selling price is currently between CHF 40 and 100.

IP and networking are increasingly becoming a mandatory component of radio equipment. For this reason, it is essential to opt for hybrid radios (DAB+, IP, and FM) in the future. In addition, such radios, as long as they are equipped with a corresponding display, also allow the display of music titles, artist, slides, graphics, etc. and also have a back channel to the broadcaster, if they are connected to the internet.

Since the demand for hybrid radios has not been very high to date, this should now be promoted more rigorously. This could be achieved by ensuring that all radio stations offer additional services for stationary and mobile hybrid radios (smart radios) (for example football results, weather maps, image of the CD case, breaking news etc.). With the back channel, it is possible to involve the audience directly and even sell products/music (collaboration with a music service) (cf. Section 3.3.2).

The Association of Swiss Private Radios (ASPR) and SRG have already joined the global “Smart Radio” initiative (cf. Section 3.6).

3.2.2.2 Dealers: motivation for the exclusive sale of hybrid FM and DAB+-capable radio receivers

Dealers must be motivated by appropriate arguments and measures to cease purchasing radio receivers which can only receive FM, but instead to sell only hybrid devices (FM/DAB+/possibly IP).

This measure can be supported, for example in the following ways:

- Communication of the timetable for the FM phase-out scenario;
- Designation by every radio station of a facilitator responsible for DAB+ (anchor person/testimonial). This person will report at least once a week about DAB+;
- Implementation of large-scale cross-media campaigns at least twice a year;
- Organisation of a major special sales campaign twice a year on all channels and sale of radio receivers with the greatest possible impact;
- Granting of free advertising by radio stations as a compensation for dealers' loss of revenue;
- Billboard advertising, POS (point of sale) campaigns with 'event' focus (bands, etc.) locally, advertising on taxis, goods vehicles (haulage companies, etc.);
- Large-scale training of sales staff, incentives for DAB+ sales (commission, etc.)

3.2.2.3 Importers: convincing them to cease import of FM-only radio receivers

Importers must be persuaded in workshops or discussions with manufacturers during major sales fairs to import only those radio receivers which are hybrid FM/DAB+ compatible and where possible equipped for reception via IP.

A timetable for the gradual phase-out of FM must also be communicated to importers.

All importers who join up will be offered advertising support for their products through the trade, e.g. in the form of advertising time on radio and television for the imported radio brands. Visits with importers to retailers may be useful to support them in their efforts to purchase DAB+ equipped radio receivers only.

3.2.2.4 Manufacturers: motivating them to cease production of FM-only radio receivers

Most DAB+ radio receivers are manufactured in China and Korea. At the moment, it is a fact that more and more producers are ceasing to make FM-only receivers. The goal must be to ensure that production of radios which can only receive FM is halted.

3.2.2.5 The automobile industry: support for the promotion of DAB+ radio receivers

First of all, the automobile industry should be well informed, so that they can expertly advise their customers and recommend the fitting of DAB+ receivers. These information measures include:

- regular training of sales and after sales personnel;
- the presentation of new products at internal trade fairs;
- sending newsletters for the attention of automotive garages;
- training of personnel on stands at trade fairs;
- the production and distribution of sales support documentation.

The information campaign for the car industry is a major undertaking, as there are some 8000 showroom operations in Switzerland, of which slightly less than half are showrooms for a particular marque. The 6 biggest marques – VW, Audi, Skoda, BMW, Ford and Mercedes – are responsible for about 50% of new car sales each year.

- For **new cars,** the promotion of **DAB+ car radios fitted as standard** is crucial. At the moment, there is an additional charge of CHF 100 to 700 for fitting DAB+ car radios in new vehicles, depending on the make of car. Though the percentage of fitted DAB+ radio receivers has increased significantly since the end of 2013, the pressure on car manufacturers should be increased, in close cooperation with the Swiss importers and the DAB+ authorities in neighbouring countries, to fit DAB+ car radios as standard, without imposing an additional charge.
- In order to promote the fitting of DAB+ radios to new cars as standard, the private radio stations could unite with the showrooms for specific marques in their coverage area and agree that for each new car sold with a DAB+ radio fitted, the garage gets free advertising time on the local radio station transmitting in the region; with the amount of advertising time defined more precisely.
- For **used cars** it is a matter of supporting the **upgrading** of vehicles with DAB+-compatible car radios. For most cars built after 2002 (approximately 4 million), replacing their radios is not straightforward. However, for this situation simple DAB+ retrofit solutions are already available costing from about CHF 100 CHF[62].

[62] Cf. http://www.digitalradio.ch/de/geraete

- Together with manufacturers of retrofit solutions and showroom owners, the private radio stations could launch a campaign with the aim of fitting the latest DAB+ audio reception technology at the time of the annual service or the winter/summer tyre change. To increase the attraction of retrofitting for drivers, this campaign could include a price reduction on the built-in DAB+ receivers for a specific period of time. The private radio stations could communicate this offer on their stations.

3.2.3 Measures in cooperation with the advertising industry

These include measures for the advertising industry (customers, agencies, marketers, the commercial department of the radio stations) to promote the purchase and use of DAB+ equipment and thereby support the overall market for radio advertising and sponsorship.

The advertising industry (customers, agencies, intermediaries) have to date shown little interest in DAB+. DigiMig Operations GmbH, together with MCDT AG, will now have to inform and involve the sector in such a way that advertising money is not confined to private radio stations which broadcast in simulcast mode. Rather, advertising must also take into account those stations which broadcast exclusively on DAB+. The latter must, however, achieve a coverage which is tempting for advertisers or build up pools of a size which is relevant for advertising.

3.2.3.1 The advertising industry

- **Advertising on DAB+ stations: advertising on stations broadcasting only in simulcast mode (concerns private radio stations only)**
  Dedicated usage research for DigiMig will for the first time allow the usage of digital radios (DAB+ and IP radio) to be determined reliably for the entire industry. This will also make DAB+ interesting for the advertising industry, though the exact format of the data remains to be clarified. However, FM stations broadcasting in simulcast mode on DAB+ do not necessarily generate more listeners who would be of interest to the advertising industry. Where digital broadcasting extends further than analogue, a small additional advertising potential is generated for the respective station (extended listening time on commuter routes).
- **Advertising on stations broadcasting on DAB+ only (private radio stations only)**
  Private radio stations which are broadcast only on DAB+ are generally largely dependent for refinancing on advertising and sponsorship revenue. This requires proof of their coverage to be provided by the RadioControl system currently in effect (audiomatching measured by Media-Watch).
  To date no station has achieved a number of listeners which is seen by the advertising industry as sufficient to generate meaningful advertising revenue. Audience figures such as those enjoyed by FM radio stations are achievable only through major marketing activities, which in turn involve high investment costs. Advertising revenues on stations which broadcast exclusively on DAB+ are still currently not a source for the refinancing of such programme offerings.

- **Additional advertising and sponsorship revenues for the promotion of DAB+ and DAB+ receivers (for private radio stations and the SRG)**
  Factors for the timely and successful introduction of DAB+ in Switzerland include both the digital use in households and the number of DAB+ receivers sold. On the one hand, the market penetration of these devices can be increased through editorial promotion on the SRG and private radio stations. On the other hand, it is important for manufacturers and dealers of DAB+ receivers to also place paid advertising. The extent to which radio stations and marketers are willing to place such advertisements at a reduced price (special discount) is a matter for negotiation. There is also the possibility of revenue for these partners from below-the-line measures, i.e. revenues which are generated more by brand strength than by the conventional sale of advertising and sponsorship.

3.2.3.2 Cross-media advertising campaigns and social media campaigns

The introduction of digital radio (DAB+) in the B2C sector has been progressing via broad-based national campaigns since 2007. During these years, the majority of the campaign budget has been for TV campaigns, because awareness could be rapidly increased and the radio-savvy audience in the 45+ age category could be reached optimally. These TV campaigns were accompanied by poster campaigns, external marketing (events and POS), radio spots/radio trailers and online activities.

As a result of new forms of communication, the growth of social media and new target groups (25+) since 2012 the campaigns have shifted towards cross-media advertising campaigns which use new media forms and actively exploit social media channels. Owing to the wider dissemination and use of social media, these channels will continue to grow over the next few years, and this will lead to another focal point for campaigns, for which Facebook, Twitter and similar communication channels will be used. Over the next few years, the campaigns should focus on national activities as well as on station-specific measures.

3.2.4 General communications measures

3.2.4.1 Communication with the public

The listed B2C and B2B measures must be closely accompanied by intensive communication activities and should further promote, with all participants in the digital migration (for example radio listeners, the trade, the advertising industry, etc.), the awareness of digital radio and the sale of digital radio receivers. These communication measures include, among other things, the production of a regular (monthly/fortnightly) newsletter, writing for and linking with daily and weekly news, writing press releases, active media work and all social media activities (cf. offerings on the digitalradio.ch Facebook page. The overall responsibility for timely, detailed and appropriate communication is borne by DigiMig Operations GmbH).

3.2.4.2 Information about commissioning and de-commissioning transmitters

Over the next few years, in regionally specific discussions between the SRG and the private radio stations concerned, existing relevant FM transmitters or transmission network components will be de-commissioned and new DAB+ transmitters will be put into service. Each changeover must be communicated clearly and in good time, particularly to listeners. DigiMig Operation GmbH and MCDT AG will perform this task.

3.2.4.3 Informing and raising the awareness of political decision-makers and industry organisations

FM is well established and popular among the population, in politics and in associations and organisations active in the media industry. The planned FM switch-off will give rise to resistance, fears and questions among this group. The switch-off of the Beromünster medium-wave transmitter is a prime example. Through early information and involvement (using a communications strategy or stakeholder management) of all parties it must be ensured that the preparation for the FM switch-off and the subsequent switch-off itself run smoothly and without any problems. DigiMig Operations GmbH and MCDT AG will perform this task within the framework of the industry agreement.

3.2.5 Recommendations in relation to the market and communication

- The radio industry will take targeted measures aimed at encouraging the public to buy DAB+ receivers and to use them to listen to their radio programme services.
- The equipment trade, importers and the automobile industry, together with the radio industry, will ensure that the marketing and installation of digital radios are promoted.
- In co-operation with the advertising industry, the radio industry will ensure sustainable integration of advertising on stations which broadcast digitally.
- By means of general communication campaigns, the public, political decision-makers and industry organisations will be informed about the advantages of digital migration and prepared for the process.

3.3 Measures in relation to technology

3.3.1 Setting technical standards for defining coverage via FM, DAB+ and IP radio

Definition of technical minimum standards for comparable coverage via FM/DAB+/IP

- **Definition of FM coverage:**
  A location is deemed to have FM coverage with a local probability of 50% at 1.5 meters above ground if a field strength of >60 dBuV/m[63] is measured and the OBB measurement[64] yields a minimum of "adequate" (green on the 5-digit ITU scale).
- **Definition of DAB+ coverage:**
  A location is deemed to have DAB+ coverage with a local probability of 95% at 1.5 metres above ground if a field strength of >61 dBuV/m is measured and a carrier-to-interference ratio (C/I)[65] of >12 dB is measured. This applies to protection level 3A[66].
- **Definition of IP coverage:**
  IP coverage inside a building is deemed to be provided if a LAN or WLAN internet connection of at least 1 Mbit/s is present per household. Today and in the foreseeable future (the next 10-15 years), no foreseeable radio coverage comparable with DAB+ will be able to be guaranteed in the open and in buildings using mobile radio technologies alone.

This means that a FM station is deemed technically to have migrated if within its FM coverage area (core area and extended area in accordance with the description in Annex 1 of the RTVO) coverage is provided via DAB+ or IP to at least 90% of the population (stationary) and 95% of roads (mobile) according to the defined criteria.

[63] dBuV/m: Decibel-microvolt, a logarithmic measure to describe the signal strength (field strength) of a transmitter at a defined location (e.g. at the receiving antenna of radio equipment)

[64] OBB: system for automatic registration of the objective evaluation. It is used to measure and represent the reception quality of a station in a defined area. Usually, individual reception values are regularly recorded during a car journey, compiled and transferred onto a map. Reception quality along the driven route is plotted in the five colours yellow (very good), red (good), green (adequate), blue (poor) and black (very poor). Cf. also the corresponding provisions in Annex 1 of the RTVO (para. 2) and the explanations on the OFCOM website: http://www.bakom.admin.ch/org/grundlagen/00955/01137/01998/index.html?lang=de

[65] C/I: carrier to interference ratio, the relationship of the carrier signal to the interference signal. This refers to the ratio of the useful signal to the interference signal due to self-interference and extraneous noise. If the ratio is too low, this may cause signal interference or even the complete loss of the signal. In single frequency networks self-interference is caused by reflections from buildings and mountains of the signal from distant transmitters on the same network.

[66] Protection Level: error protection level in DAB+ broadcasting in accordance with ETSI TR 101 496-3. At certain intervals information is sent together with the information signal (e.g. audio data) which can detect and correct transmission errors in the receiver. The more robust the error protection has to be, the more regularly and the more extensively the information is sent. At the same time, the available capacity for the audio files is reduced. A differentiation is made between five error protection levels (Protection levels 1 to 5, from very robust to not very robust); Protection level 1 offers the highest error protection. In practice, protection level 3 is usually selected.

3.3.1.1 Explanations/Justification[67]

The following definitions are intended to provide a generally recognized basis for broadcasters and network planners to answer the question as to when technical coverage is provided in an area in a qualitatively comparable manner by FM, DAB+ or IP radio.

- **FM**
  ITU Recommendation ITU-R BS.412-9 for FM coverage[68], generally recognized in broadcasting circles, is based on large cities, urban and rural areas on different field strengths at a 10 metre antenna height, because of the different propagation conditions and attenuation. These provisions are no longer realistic in view of current settlement densities and reception habits. OFCOM therefore diverges on individual points from the original premises of the Recommendation – e.g. concerning the assumption of antenna height (1.5 metres instead of 10 metres). In order to compensate for these divergences, OFCOM uses a (higher) coverage field strength of 60 dBuV/m[69].
- **DAB+**
  Since DAB+ reception, compared to FM, breaks down abruptly below a specific threshold rather than being lost in the noise as is the case with FM, the requirements for the electromagnetic field strength at the reception location for guaranteed DAB+ reception are more stringent. For example, calculations must use a local probability[70] of 95% for stationary reception and 99% for mobile reception, as against 50% for FM. DAB+ was explicitly developed for good reception in moving vehicles. Therefore, as long as the field strength is sufficiently high, drop out should not be encountered. Because of the technology, in the case of DAB+ a constant delay of 2-3 seconds must be expected, compared with the FM live signal. For portable reception in the home, the following conditions must be met outside the house: a location is deemed to have DAB+ coverage with a local probability of 95% at 1.5 metres above ground if a field strength of >61 dBuV/m is measured and a carrier-to-interference ratio (C/I) of >12 dB is measured. This applies to protection level 3A. In the case of FM the audio quality varies with field strength. With DAB, the audio quality is always equally good above the reception threshold. In relation to coverage with an audio quality comparable to DAB+, therefore, a higher field strength would have to be assumed for FM. In network design, it is a precondition that radio receivers will at least exhibit the minimum sensitivity and selectivity prescribed by the EN 62104 standard[71] .

[67] Reception via cable and satellite is not taken into consideration for the migration; coverage in tunnels is dealt with in a separate section cf. section 3.3.6)

[68] Cf. http://www.itu.int/dms_pubrec/itu-r/rec/bs/R-REC-BS.412-9-199812-I!!PDF-E.pdf

[69] Cf. the OFCOM Handbook on FM frequency planning, para. 5.1.1 and footnote 4 (http://www.bakom.admin.ch/themen/radio_tv/01214/02302/04190/index.html?lang=de)

[70] The local probability describes a defined number of locations (as x percent) in which a field strength determined by the type of reception must be present within a defined area. For example, a local probability of 50 percent mobile indoors means that in at least half of all locations within an area, a radiated signal must attain a measured value (field strength) of at least 60 dB/uV.

[71] European Standard EN 62104:2013-08 Characteristics of DAB receivers

- **Internet Protocol (IP)**
  In the case of wired IP coverage, the minimum data rate of 1Mbit/s per household specified in Swisscom's licence for the universal service in telecommunications is sufficient for reception of radio streams using LAN or WLAN. This prescription was fulfilled by Swisscom in more than 91% of buildings in 2013.
  In the case of mobile coverage, reception parameters such as field strength and C/I are not used in isolation to determine coverage. In addition, current usage within a cell determines to a large extent whether reception is possible or not. The overall capacity of the individual mobile radio cells is frequently insufficient to transmit sufficient parallel streams. In addition, the coverage radius of a 3 or 4G mobile radio cell[72] becomes smaller in the event of major congestion. Thus, depending on the number of users in a cell and on their surfing activity, there is sometimes sufficient capacity for broadcast streaming and sometimes not. Whereas with broadcast technologies users can use their experience to estimate where they have gaps in coverage on a commuter route, for example (and an alternative frequency may be available), in the case of mobile IP streaming it is impossible to predict whether reception is possible for each individual use. Since roaming between providers does not exist in Switzerland, "switching" to another network is also not possible.
- **In conclusion**
  From the coverage viewpoint, stationary broadcast reception in buildings is already currently possible with IP streaming using LAN or WLAN, in addition to FM and DAB+. In principle, reception of radio stations is also possible in a vehicle over mobile networks using the 3G/4G standard. In order to minimise interruptions, the signal must be buffered. In the case of IP streaming this can lead to delays of up to one minute compared to a live FM signal. It must also be expected that in a moving vehicle the buffer will overflow again and again if excessive data must be buffered (dropout). This can lead to time shifts in the audio signal of up to one minute. In traffic jams and in tunnels, reception may break down because very many receivers will then be located in one cell.
  For the next 10-15 years (the estimated time before a new mobile radio generation is available nationally), IP streaming using mobile radio technologies is technically unsuitable, just in terms of capacity and transmission reliability, to replace FM or DAB+ completely.

3.3.1.2 Costs/Time/Effort

In terms of coverage of public roads, it is to be expected that remote and mountain areas will represent the largest deficits for all vectors.

[72] An area covered by an individual mobile radio antenna is termed a mobile radio cell: 3G stands for the third generation of mobile radio standards (UMTS) and 4G for the fourth generation (LTE). The standards differ in terms of the number of possible users and the possible maximum data rates.

3.3.2 Introduction of additional services to promote the digital migration

Radio broadcasters introduce new data services

- Radio broadcasters must prepare for the hybrid use of their stations. This presupposes that they implement the following data services (listing in decreasing order of importance):
- Service Following (DAB-FM) for the simulcast IP phase
- Service Following (DAB-IP) via RadioDNS and DAB EPG
- EPG (Electronic Program Guide) for DAB and IP with station logo
- Traffic Announcement (TA) on DAB and IP (possibly with Push Notification)
- TPEG (Transport Protocol Experts Group) for promoting use in vehicles
- Visual information (slides) relating to the current station
- Tagging for interactive use (deferred use, social media, advertising, etc.)

3.3.2.1 Justification

The data services relating to Service Following can simplify the migration from FM to DAB+ for the public in the period of construction of the DAB+ networks because the receivers switch automatically back and forth between FM and DAB+ if there are gaps in DAB+ reception. After construction of DAB+ networks they will facilitate optimal interworking of DAB+ and IP broadcasting.

Another important function of the additional services is the visualisation of radio programmes. This is indispensable for radio in an environment increasingly shaped visually.

Particularly for mobile use in a private vehicle or on public transport, the additional traffic services – Traffic Announcement and TPEG – are essential.

Tagging represents the bridge to deferred consumption of radio programming.

3.3.2.2 Definitions

- **Service Following mechanism**
  To make the listener's choice of the appropriate transmission path (DAB+ or IP) as simple as possible, a Service Following mechanism is necessary. With Service Following, the key to operation of the radio receiver is no longer the vector, but the stations directly. Thanks to Service Following, this enables the radio receiver to communicate the possible transmission paths (DAB+, FM and IP). The device switches to another reception option if the current vector is no longer available and vice versa. This means that listeners do not have to concern themselves with the technology switchover. The DAB+ standard already provides for the appropriate mechanisms for Service Following between DAB+ and FM.
  For the coming years, it must be assumed that at least part of radio use will use IP broadcasting, complementary to DAB+. This makes sense particular in the stationary environment. This is where Service Following between DAB+ and IP comes into its own. For Service Following between DAB+ and IP, the DAB+ Electronic Program Guide (EPG) and radio DNS are required. This means that the radio receiver can convey the possible transmission paths (DAB+ and IP). The radio receiver can therefore switch to IP if DAB+ is no longer

available and vice versa. Consequently, broadcasters should offer at least the Service Following service. The first hybrid radio receivers with Service Following are already available. In the future, PCs and smart devices such as smartphones and pads will tend to be used more in households for radio reception. Here, however, mechanisms for hybrid use with Service Following are lacking. In addition, DAB+ reception is not yet implemented in smart devices. This will be managed by the "Smart Radio" (formerly EuroChip) initiative of the European Union[73] through the public broadcasters (the European Broadcasting Union - EBU).

- **Electronic Program Guide EPG**
  Electronic Program Guides (EPG) inform listeners about available stations and content. An EPG with information about current and forthcoming programmes and programme segments is desirable. The EPG would have to implement the radio station logo as a minimum, in order to be visible in the vehicle's electronic infotainment system on a par with other services.
- **Traffic Announcement (TA)**
  Traffic announcements are a popular functionality on FM stations. This service must therefore also be provided via Traffic Announcement (TA) on DAB+. In relation to IP, TA can be delivered by an established push service[74] (e.g. Pubnub). On smart devices implementation is possible via an application.
- **TPEG traffic information[75]**
  TPEG is a traffic information service for vehicular traffic and public transport. TPEG has already been introduced by broadcasters in Germany, France and in the Scandinavian countries. The commitment of the car industry to integrate TPEG together with DAB+ is, in view of the long DAB+ introduction process, no longer at the top of the priority list. However, with the launch of TPEG there is an opportunity to encourage the possibility of digital radio reception in cars.
- **Visual radio**
  Enhancement of the radio station using images, tables, etc. (visual radio or radioVIS) can be used to illustrate programme-related information, for example by incorporating the artwork relating to the current track, transmitting the photo of the moderator of the broadcast (DJ), displaying the next artist, etc. Visual radio however, can also be used to display non-programme-related information in connection with different services (weather, sports results, traffic etc.) or for advertising purposes. Finally, visual radio can also be used to reinforce the applied station branding. As a minimum, the station logo should be transmitted as a slide. Such services are extremely important for the take-up of DAB+ receivers in smart devices. It has not been possible to deal with this subject in greater detail in the context of the work to date. In particular, information on the production cost of attractive offerings is not yet available.

[73] Facts and figures on the Smart Radio Initiative of the European Broadcasting Union (EBU): http://www3.ebu.ch/files/live/sites/ebu/files/Advocacy/Digital%20Radio/Smart%20Radio%20Initiative%20-%20July%202014.pdf

[74] Push media or push services describe media in which the information flow is controlled by the transmitter and the flow of communication takes place primarily in one direction, from the transmitter to the receiver. Push services are frequently used by online news platforms, e.g. to transmit headlines.

[75] Open international standard for the transmission of language-independent and multimodal traffic and travel information, developed by the Transport Protocol Experts Group (TPEG), a group of experts founded in 1997 within the European Broadcasting Union (EBU).

- **On-demand services**
  In the future, on-demand services could be used more for mobile use in vehicles. These mobile on-demand services are based on automatic updating of podcasts in the cache of smart devices, which takes place whenever connection is made with free WLANs. In the present considerations, this scenario has been excluded, since it does not actually replace radio but supplements it. Tagging[76] offers the possibility of marking a program for later listening via IP. The standard has not yet been adopted, though initial versions already exist.

3.3.2.3 Transport

EPG, TPEG and slides need part of the multiplex transport capacity. In this context, experience is lacking about how much is actually needed for attractive and meaningful services. However, on the basis of the existing examples the following typical values can be derived:

- 8-16 kbits/s per multiplex for a TPEG service
- 8 kbits/s per multiplex for an EPG service
- 8-16 kbits/s per station for a slideshow service (depending on the image refresh speed). The slideshow can be transmitted by the respective station in the audioframe (XPAD) or for all stations in the multiplex (packet mode)
- Dynamic labels (DLS) require a very low data rate and are therefore embedded in the audio data stream.

3.3.2.4 Evaluation of costs

The development of auxiliary services is still in its infancy. The costs of production, at least for today's services, which are still simple, are included in the general costs of digitisation. For this reason, specific operating cost data is not possible at the current time. For a static service (e.g. station logo) the costs are very moderate. The reasonable projection is probably the content of the online services already produced will be re-worked to generate text, image and EPG services. There will necessarily be a one-off cost for adaptation of the interfaces. These costs depend very much on the needs of the individual broadcasters. In order to obtain a cost estimate, three companies active in the radio industry were asked:

- **Global Radio UK**, a commercial radio group in Great Britain (Capital, Heart, Classic FM, etc.), replied that the costs were very low, because the content of the Android/iOS apps for DAB and RadioDNS would be re-used. The server costs would be approximately €200 /month (Amazon Cloud service).
- **Südwestrundfunk** (SWR), a public broadcaster in Germany, indicated that the development costs for the software would be approximately €2500 for a simple slideshow and an electronic programme guide (EPG). They stated the operating costs are very low, because it is fully automated (approximately €50/month).
- **AIM:** All In Media (AIM), a British manufacturer of complementary data solutions, which also provides operation and hosting of such solutions, reported that a typical slideshow service costs £50 to £100 per month and per station. AIM indicated that the capital outlay for a simple EPG system was approximately £500 to £1,000 per multiplex.

[76] Tagging refers to electronic marking (e.g. by pressing a button) of content which the user wishes to consume later, either via the radio or another internet-enabled device.

3.3.3 DAB+ coverage of national road tunnels

Rapid equipping of road tunnels with DAB+

- 70 percent of radio listeners also listen to the radio in their car. Rapid provision of DAB+ coverage in road tunnels is therefore a key element for the success of the switchover from FM to DAB+.
- The Federal Roads Office (FEDRO) is adopting regulations for installing radio systems in road tunnels. These regulations are expected to enter into force in autumn 2014 and will also regulate the installation of DAB+ in tunnels and the funding model for this operation.
- FEDRO, OFCOM and broadcasters will agree before the end of 2014 on a development plan for DAB+ in road tunnels.
- OFCOM is drawing up a model for the financial support of broadcasters for acceptance of the financing element which they will have to bear for installing DAB+ in tunnels.
- DAB+ installation in the first tunnels in the course of 2015.
- The top-priority tunnels in the national road network route, as well as the cantonal roads, are expected to be equipped by the end of 2018. This top-priority expansion project must cover significantly more tunnels than just those scheduled for modernisation.

3.3.3.1 Adaptation of legislation

The FEDRO regulations in force relating to radio equipment in road tunnels must be adapted accordingly. The regulations must also define the funding model and the portion for which the parties involved (FEDRO, broadcasters) are responsible.[77]

At an appropriate time, it will be necessary to regulate how broadcasters can be supported with regard to taking on their share of the digitisation of tunnels.

The same regulations should also apply to tunnels on cantonal roads.

3.3.3.2 Who is responsible for implementation?

The drafting of the regulations and the development plan for implementation support is a task for FEDRO. For their part, the cantons must adopt or adapt the regulations for development of the cantonal road tunnels. OFCOM will define the regulations for financial support to broadcasters.

[77] The new FEDRO-Directive "Astra 13006" relating to radio equipment in road tunnels was published after the editorial deadline the 27th november 2014 and is only available in French: http://www.astra.admin.ch/dienstleistungen/00129/00183/00520/index.html?lang=fr

3.3.3.3 Explanations/Justification

For the foreseeable future, IP technology on mobile radio networks will not be suitable for effective reception of digital radio in vehicles. DAB+ is the more suitable technology for this. Logically, road and car-transport rail tunnels must be equipped with DAB+. Even if general coverage of public transport with DAB+ were allowed to fail because of the disproportionately high costs, one-off measures should at least be examined.

With the introduction of DAB+ in tunnels, the acceptance of DAB+ as a follow-on technology to FM is guaranteed in vehicles. As more listeners switch from FM to DAB+, it will be indispensable for FEDRO, for safety reasons, that drivers can also be addressed via DAB+ in the case of incidents. An exit from FM which is staggered across different regions is therefore possible only if all tunnels in the respective region have been equipped with DAB+.

The technical basis for equipping road tunnels was drawn up by the SRG in 2012/2013 in the context of a pilot project. Although the current FEDRO regulations envisage that 2 DAB ensembles will be installed per tunnel, the new regulations must be premised on a technical space requirement for four ensembles. In the case of urban tunnels and tunnels at the borders of language regions, even more ensembles may be necessary.

3.3.3.4 Costs/Time/Effort

On the basis of the analyses of the results of the DAB+ test transmissions which the SRG has carried out in various tunnels, FEDRO has submitted a draft for the new regulations. These regulations are expected to enter into force in the autumn of 2014. Then, in 2015, several pilot tunnels could be equipped, in order to prepare for the general rollout. Funding must be guaranteed for this.

The upgrading of the tunnels with the most traffic must take place as soon as possible, not least because it represents a key argument for the standard installation of DAB+ radio receivers in new vehicles and can therefore contribute to the attractiveness of DAB+ among the population. On the road system which is managed by FEDRO, there are 170 tunnels which should be equipped with DAB+. On the road system of the cantons, there are 30 such tunnels. If 40 tunnels are equipped every year from 2015, all tunnels will have been equipped by the end of 2020. The most important tunnels should be equipped by the end of 2018.

If there are four DAB+ ensembles per tunnel, a total investment of CHF 22 to 35 million must be assumed, along with CHF 5 to 7 million for the cantonal tunnels. Since the award of the associated planning and construction contracts will very probably have to take place according to WTO criteria[78], owing to their financial scope, and since the corresponding procedures are very time-consuming, it is all the more important for FEDRO to act quickly and waste no time when adopting its regulations and laying down the phased plan for the digital equipping of tunnels.

[78] The WTO criteria require that orders (orders for supplies and services or construction contracts respectively) which attain or exceed the threshold value must be put out to public tender. In the case of construction, the threshold value is CHF 8.7 million. Further information:
http://www.bbl.admin.ch/bkb/00389/00397/index.html?lang=de

3.3.4 Protection of FM frequencies and decision regarding their future use

In relation to foreign countries, OFCOM continues to protect national FM frequencies; the Federal Council will not decide on the future utilisation of the FM band until after the migration.

- In relation to foreign countries, OFCOM defends the planning rights of the FM frequencies relinquished by leaving them in the databases used for frequency co-ordination with neighbouring administrations as well as in the ITU databases.
- The Federal Council will not decide on the general utilisation of the FM band until the digital migration has been completed. After the cessation of analogue broadcasting, the FM band should remain a priority for broadcasting; harmonisation should be sought at European level.

3.3.4.1 Adaptation of legislation

The future utilisation of the FM band will be decided within the framework of the revision of the National Frequency Allocation Plan NFAP[79].

3.3.4.2 Who is responsible for implementation?

The Federal Council is responsible for the adaptations.

3.3.4.3 Explanations/Justification

- **Safeguarding against irradiation by foreign stations into Switzerland**
  As soon as a domestic frequency change may have an interference effect on foreign frequency allocations in the area close to the frontier, this planned FM frequency allocation must be co-ordinated and agreed on the basis of international telecommunications law with one or more neighbouring countries. The Geneva Agreement 84 (GE84) of the International Telecommunication Union (ITU[80]) regulates the procedure. Additionally, the administrations concerned can conclude further agreements for the efficient handling of co-ordination requests. Each coordinated transmitter is registered in the databases of the administrations concerned and included in future planning. In addition, the transmitters are notified to the ITU and when they commence operation they are registered in the Master International Frequency Register (MIFR) I. The ITU-Radiocommunication Bureau (RB), publishes the transmitters in the International Frequency Information Circular (Space Services BR IFIC). The BR IFIC appears as a DVD which is updated every 2 weeks.

[79] http://www.bakom.admin.ch/themen/frequenzen/00652/00653/index.html?lang=de

[80] Geneva Agreement documentation can be found here: http://www.itu.int/en/ITU-R/terrestrial/broadcast/Pages/FMTV.aspx

In areas close to the border, FM frequencies which are relinquished could be occupied by foreign broadcasters. However, as long as a transmitter is registered in the national databases and in the MIFR, the corresponding rights of use are lodged with the administration concerned, regardless of whether the frequencies are actually being used or not. In order to ensure that FM frequencies which have been relinquished are not used in neighbouring countries, OFCOM will not withdraw the registered transmitters, so the rights of use remain with Switzerland and continue to be legally protected.
On the basis of an initial position, it can be assumed that little additional competition due to irradiation from foreign countries can be expected, since with the exception of Italy all of Switzerland's neighbouring countries adhere to the rules of Geneva Agreement GE84. Currently, Italian broadcasters put their transmitters into operation without any consideration for their neighbours. Switching off FM in Ticino would not be expected to change anything in this regard.

- **So when does a withdrawal of a co-ordinated frequency which has been relinquished make sense?**
  The assessment of a frequency co-ordination is based on the assumed additional interference which a planned frequency utilisation will have on all existing transmitters. If a transmitter is already sensitive to interference from native transmitters and if the additional interference potential of the planned foreign transmitter is comparatively small, then the domestic administration cannot reject the start-up of the foreign transmitter in question using the argument of protection of its domestic frequencies. In the case of over-used Swiss transmitter networks with much self-interference, occasionally a foreign co-ordination request must therefore be approved because the planned foreign transmitter will not cause more interference than the national transmitters. It may therefore be appropriate to sign off Swiss transmitters occasionally if they are no longer in service, in order to relieve the Swiss network and to be able to reject transmitters from abroad.
- **Decision on the future use of the FM band**
  Indirectly, the question will arise as to what purposes the vacated FM band is to be put. This question should be not answered until the digital migration has been successfully completed. In any event, OFCOM would have to apply itself at the European level to ensure that the FM band remains reserved, as a priority, for broadcasting or broadcasting-related applications, even after the cessation of analogue broadcasting. Particular thought should be given in this context to the use of wireless microphones and other means of production. In the final analysis, however, the use of the FM band will have to be harmonised with developments in the European environment.

3.3.5 Elimination of the time difference between broadcasting vectors

Elimination of the time difference between the different broadcasting vectors

- The time difference between the broadcasting vectors, in particular between DAB+ and FM, should be reduced to zero if possible.

3.3.5.1 Explanations/Justification

There are already car radios on the market which can switch automatically between DAB+ and FM. Particularly in the case of tunnels which are not yet equipped with DAB+, these devices switch from DAB+ to FM on entering the tunnel and back to DAB+ after exiting. The current time difference of up to 6 seconds is very irritating for radio listeners. Characteristically, there are already complaints about this from the public, despite the as yet very small prevalence of such switchable radios.

These "time shifts" between different vectors can be eliminated at the transmitter by connecting delay devices in order to adapt the "faster" transmission path to the slower one, so that the FM and DAB+ signals arrive at the receiver at the same time. [81]

Essentially, the timing adjustment can take place not only on the transmitter side but also in radio receivers; individual device manufacturers are offering this already. However, they say that the state of the art only allows them to offset up to 5 seconds. This means that the time difference between DAB+ and FM can probably be handled, but not that between DAB+/FM on the one hand and mobile IP streaming on the other, because the time delays with IP are significantly longer and more importantly, are not constant.

Broadcasters which transmit their programme services via several digital vectors (multiple DAB+ platforms, satellite) will hardly be able to fully compensate for all vectors, or only at relatively great expense.

A genuine "seamless" (i.e. inaudible) transition will not generally be possible to achieve using correction on the transmission side, because the radio receivers have slightly different and often unstable "playback" delays. With correction in the radio receiver itself, compensating for these delays is a much better possibility.

3.3.5.2 Costs/Time/Effort

- **For broadcasters:**
  If delay devices are present already, then only re-setting is necessary;
  Delay devices can be installed and brought into service for a few thousand CHF.
- **For manufacturers:**
  The development costs are low, but the rollout time is very long. However, timing reconciliation will probably be standard in a few years, since a minimum of timing reconciliation is also needed for internal switching between different audio sources (so-called blending).

[81] The transmission of DAB+ signals usually takes a few seconds longer than FM signals, because the digital processing of the signals requires a brief period of time.

3.3.6 A digression: FM in the cable television networks

Various studies of radio usage (cable radio study 2001 / Kommtech study 2012 / MCDT surveys, etc.) in past years indicate that listening to FM programs via cable networks, rather unexpectedly, is still very popular.

Recent surveys by the MCDT in February 2013 and February 2014, depending on the region, extend from about 10 to 30 percent; in German-speaking Switzerland the figure is 27 per cent.

This high proportion means that FM use via cable networks must be included in the migration planning for the DigiMig project. All the more so as the cable network operators intend to cease analogue FM broadcasting, because the FM frequency band on cable will be needed for future expansion of internet capacity.

Initial discussions with swisscable (the industry federation of cable system operators) indicate that there is mutual interest in gradually drawing up a coordinated scenario for the replacement of FM on the cable networks.

3.3.7 Recommendations in relation to technology

- OFCOM will define the technical minimum standards for comparable coverage by FM, DAB+ and IP radio
- The radio broadcasters will introduce data services as an incentive for the switchover and in order to make digital broadcasting channels more attractive
- The FEDRO, together with broadcasters, will ensure that the national road tunnels are rapidly equipped with DAB+ transmitters
- OFCOM will protect domestic FM frequencies which are not being used from foreign countries
- Broadcasters will ensure the elimination of the time differences between the FM, DAB+ and IP radio broadcasting channels

3.4 Development of the costs for broadcasting via FM, DAB+ and IP

3.4.1 Estimated costs for broadcasting the current FM radio stations

- **FM: CHF 32 million/year**
  DigiMig WG estimates the global costs for FM broadcasting by the currently licenced (non)commercial private radio stations, including tunnel coverage and signal provision from the studio to the transmitters at approximately CHF 9 million/year. For broadcasting of the SRG's FM stations, these costs amount to approx. CHF 23 million/year.
- **DAB+: CHF 25 to 35 million/year**
  The broadcasting of all programme services by private FM radio stations via DAB+ will cost CHF 10 to 15 million/year with, for the most part, extended coverage areas. The national broadcasting of all SRG radio programme services will amount to CHF 15-20 million, taking into account its special coverage conditions.
- **IP streaming: at least CHF 64 million/year**
  At 2013 prices the IP transmission of a data volume corresponding to total Swiss radio consumption, would cost broadcasters and customers CHF 64 to 225 million/year, depending on the provider and subscription type.

3.4.2 Cost estimates: determined by many uncertainty factors

Prognoses are subject to a high degree of uncertainty, particularly when they concern the future. Since many factors which affect the broadcasting costs of radio programme services have not yet been determined or reliably recorded, it is very difficult to be able to make a meaningful comparison between the different vectors. It is therefore all the more important to openly state the assumptions which constitute the basis of the various calculations.

The available international studies all proceed at least partly from scenarios which give somewhat excessive weight to the future significance of DAB+ or on the contrary overemphasize the assumed impact of IP broadcasting from today's perspective. Considering the predictably high investments which will have to be made in the coming years, especially in mobile radio networks, and in view of the expected changes in network structures and business models, the costs may move significantly up or down.[82]

3.4.3 FM costs

The main factor of uncertainty for determining the analogue broadcasting costs of the private radio stations is the non-uniform accounting practices of broadcasters. Thus the business study produced on behalf of OFCOM and the private radio stations by Publicom AG (the Publicom Study[83]) refers to the considerable uncertainty of the published financial figures.

[82] Cf. Teracom (Sweden): Can the cellular networks cope with linear radio broadcasting? 2013, http://www.mynewsdesk.com/se/teracom/documents
TUM School of Management, Munich: Broadcast oder Broadband? – Zur Zukunft der terrestrischen Radioversorgung [Broadcast or broadband? – On the future of terrestrial radio coverage], 2014, http://www.br.de/unternehmen/inhalt/technik/digitalradio-dab-studie-100.html

[83] René Grossenbacher, Thomas Hüppin, Felix Neiger (Publicom AG): Die wirtschaftliche Situation des Privatrundfunks in der Schweiz [The economic situation of private broadcasting in Switzerland], Kilchberg 2012: http://www.bakom.admin.ch/dokumentation/zahlen/00545/01234/04025/index.html?lang=de

The study shows approximately 10% of the operating costs for the technology and broadcasting items[84], which would result in approximately CHF 500,000 on average for the private radio stations. However, many broadcasters use the accounting items of technology and broadcasting differently, and also book some of their own services in connection with broadcasting to other items without any explicit link to broadcasting (e.g. administration/personnel costs, etc.). For this reason DigiMig WG, in its calculations of broadcasting costs, assumed an average of approximately CHF 260,000 CHF for the 34 commercial broadcasters (13 with and 21 without fee-splitting), estimating broadcasting costs for the 9 non-commercial broadcasters as CHF 30,000 on average.

The SRG broadcasts three stations nationwide on FM, in German-, French- and Italian-speaking regions respectively and additionally broadcasts in each case the first stations of the other language regions in a language exchange scenario, but not across the whole of Switzerland. There is another FM station in canton Grisons (Radio Rumantsch) and in parts of French-speaking Switzerland (Option Musique)[85]. According to annex 1 para. 3. 2 of the RTVO, coverage for the SRG stations is significantly higher than for the commercial broadcasters' stations.[86] This is apparent in virtually twice the number of transmitters (860 vs. 460). The difference is noticeable in the costs of the networks, especially outside the core coverage areas of the commercial broadcasters.

According to a DigiMig WG estimate, the costs of FM broadcasting of the 34 commercial and 9 non-commercial broadcasters including tunnel coverage and preparation are approximately CHF 9 million per year.

The costs of broadcasting the SRG SSR's 12 FM stations including tunnel coverage and preparation are approximately CHF 23 million per year.

3.4.4 DAB+ costs

3.4.4.1 Open factors relevant to costs

Many parameters which have a direct impact on the costs of DAB+ broadcasting have not yet been determined, making a stable longer-term calculation of the cost of digital broadcasting difficult. These cost-related factors include:

- the extent of digital coverage: today's configuration of DAB+ coverage and of the coverage areas to be served digitally are already very well suited to the first construction phase. In order to meet the requirements for a switchover from FM to DAB+ or even for the switch-off of FM, however, a number of individual expansion phases must be completed and this could lead to changed costs, depending on the definition of comparable coverage;

[84] Publicom Study, p. 29

[85] Art. 4 of the SRG licence
http://www.bakom.admin.ch/themen/radio_tv/marktuebersicht/ssr_srg/04634/index.html?lang=de

[86] Para.3.2, sub-para. 1 of Annex 1 of the RTVO
http://www.admin.ch/opc/de/classified-compilation/20063007/index. html#a83

- the extent of the coverage areas of the local radio stations to be served digitally;
- the importance of IP radio as a complementary vector for reception inside buildings;
- the phasing of network construction;
- the costs of tunnel coverage.

3.4.4.2 Assumptions concerning the transmission rate

In order to calculate the costs of digital broadcasting of the current FM radio stations, the DigiMig WG starts from the hypothesis that the average data rate for digital broadcasting of a station is 64 kbits/s[87]. It is, however, known that not every station needs the same data rate (talk radio stations, i.e. purely speech-based stations, require significantly lower transmission capacities than, for example, technically demanding classical music radio stations).

The data communication rate per ensemble for ancillary services such as an electronic programme guide (EPG), traffic and travel information according to the TPEG (Transport Protocol Experts Group) standard, graphics (slides), etc. described in Section 3.3.2 could use the bandwidth of up to two stations per ensemble. Only part of this capacity is refinanceable. These costs must be borne by the stations. With a higher protection level in the case of ensembles which are not fully used, the costs may on the other hand be somewhat lower, because the defined coverage can be achieved with a lower transmitting power.

3.4.4.3 Assumptions concerning the geographical scope of digital broadcasting

In relation to the dimensions of the future digital coverage areas, the DigiMig WG assumes for its calculations that at least the current FM coverage areas are served digitally in accordance with the criteria defined above (cf. under para. 3.3.1.1).

For **German-speaking Switzerland**, the DigiMig WG estimates that of the 31 local FM broadcasters with/without fee-splitting, 17 will choose regional-language digital broadcasting, whilst some 14 broadcasters will opt for at least sub-regional digital broadcasting in order to digitally serve their current FM coverage areas. Considering only digital broadcasting by the current FM radio stations, this broadcasting scenario is technically feasible with one regional-language DAB+ coverage and one to two regional DAB+ coverages.

In relation to the digital coverage in **French-speaking Switzerland** the DigiMig WG calculation is based on regional-language broadcasting of all FM private radio stations (Romandie Médias SA digital platform). Exception: for the non-commercial Geneva Radio Cité and the small-scale francophone programmes on Biel's private radio station 3, local digital broadcasting is assumed (the island solution).

[87] Corresponds to the minimum data rate which (access-entitled) radio stations are assured on a digital platform, cf. SwissMediaCast AG radio licence dated 10 April 2012, para. 3.3, http://www.bakom.admin.ch/themen/radio_tv/01214/02292/03984/index.html?lang=de , and Romandie Médias radio licence dated 12 February 2013, para. 2.4.1 and 2.4.2, 1st paragraph in each case, http://www.bakom.admin.ch/themen/radio_tv/01214/02292/04147/index.html?lang=de

For broadcasting of the two private radio stations in **Ticino**, their integration into the SRG's existing digital coverage is assumed. However, this might be associated with considerable costs, because the SRG's regional-language network is too comprehensive for a commercial broadcaster and is therefore too expensive without technology support. A local solution could possibly be considered here, with a network which is limited to the centres and the North-South axis.

3.4.4.4 Assumptions concerning billed costs

As far as the SRG and the commercial private radio stations are concerned, the DigiMig WG uses as its basis the fees charged to broadcasters by the multiplex operators SMC and Romandie Médias SA for joint use of the digital platforms in the year 2014. For the 9 complementary broadcasters, the DigiMig WG is assuming that they broadcast on local digital islands, such as those which Digris AG wishes to offer first to non-commercial radio stations.

Finally, the DigiMig WG assumes with regard to the timetable that the expansion of digital coverage will be concluded by the beginning of 2019 at the latest and that the costs of tunnel coverage will not be higher for broadcasters than for FM.

Unlike the private radio stations, the SRG SSR must fulfil significantly more stringent conditions on FM in terms of coverage and availability. It can therefore be assumed that the same coverage conditions will apply to DAB+ as for FM.

On the basis of these current known costs, this DAB+ scenario would cost the existing radio stations a projected CHF 10 to 15 million per year. The SRG SSR network would be expected to cost CHF 15 to 20 million per year, taking into consideration the coverage conditions for broadcasting 13 stations.

The fact that DAB+ broadcasting results in higher costs for the private radio stations than FM is essentially attributable to the uniformly large size of the digital coverage areas. The lower value of CHF 10 million estimated for the private radio stations for digital broadcasting takes into account restrictions on areas and occasional complementary coverage by IP in fixed use.

3.4.5 Costs of IP streaming

3.4.5.1 Size of the volume of data

The usage figures of the MediaPulse radio panel indicate the following radio usage for the second half of 2013[88]:

- For German-speaking Switzerland 3,079,700 listeners at 108.3 minutes per day for the SRG stations and 2,558,800 listeners at 63.4 minutes per day for the private radio stations.
- For French-speaking Switzerland 935,000 listeners at 97.1 minutes per day for the SRG stations and 715,800 listeners at 46.3 minutes per day for the private radio stations.
- For Italian-speaking Switzerland 219,500 listeners at 115.2 minutes per day for the SRG stations and 107,800 listeners at 36.8 minutes per day for the private radio stations.

[88] Cf. http://www.mpgruppe.ch/de/radio/publikationen/semesterzahlen.html

At an average data rate of 64 kbits/s per station, this results in a data volume of 0.3 petabytes/day or 108.4 petabytes/year. This corresponds to approximately three times the total data volume streamed on the Swiss mobile networks in 2013. To ensure that the broadcasting of radio programmes does not put an excessive load on the mobile telecommunications networks, however, the network load should be limited to 5%[89].

In the case of a predicted doubling of the data capacity of the Swiss mobile radio networks every 2 years, broadcasting of the entire radio consumption, **with a network load of five per cent,** would be possible on these networks only in approximately twelve years**.**

Clearly, however, the total consumption will not take place on mobile networks. A large proportion will also be delivered to terminals via the fixed network and WLANs.

At the above usage rates, a radio listener consumes some 20.5 GB of data per year. This corresponds fairly accurately to the total data volume which average users consumed annually in 2011 via fixed and mobile networks for all of their internet activities.

Under these conditions a peak usage of 3 million simultaneous streams could lead to a data stream of 192 Gbit/s. This is a somewhat high data rate, but one which is economically feasible in network technology terms with suitable Content Delivery Network (CDN)[90]mechanisms.

3.4.5.2 Costing

Radio broadcasters currently pay approximately CHF 0.04 per GB to feed their programmes onto the internet. In the case of the radio consumption determined above and the resulting 108.4 petabytes (108,400,000 gigabytes) per year, this results in total infeed costs for broadcasters of CHF 4.34 million. However, this represents only part of the costs. In addition to the proportion which broadcasters pay to feed their programmes onto the internet, in contrast to DAB+ there is also the cost element which listeners have to pay for using the mobile networks to listen to the radio. Given a realistic split of the data volume of 30% mobile use and 70% stationary use, the proportion of the costs borne by listeners for mobile usage in Switzerland, depending on the provider and type of contract, is between CHF 50 and 190 million per year. For stationary use, depending on the provider and type of contract, the corresponding figure is CHF 10 to 20 million per year.

In total, the broadcasting of Swiss radio consumption via IP streaming at current prices would therefore cost between CHF 64 million and 225 million per year (FM costs CHF 32 million at present).

On the basis of current usage, which is still low, and current price models, broadcasting of radio programme services via IP streaming appears at first sight to be cost-effective. Considering the predictably high investments required in mobile radio networks, and the expected changes in network structures within the networks and business models, the costs may change significantly in the future.

[89] Due to a lack of verifiable facts and empirical values this assumption is based on an estimate.

[90] A Content Delivery Network (CDN), also termed a Content Distribution Network, is a network of locally distributed servers linked over the internet, via which content (in particular large media files) are delivered.

The continuing expansion of mobile networks to a coverage level comparable with broadcast networks could also be difficult due to limitations on radiated energy at sites in accordance with the Ordinance on Non-Ionising Radiation (ONIR) or might even make it impossible.[91]

[91] Forum Mobil/ASUT media release dated 3 December 2013
http://www.forummobil.ch/site/index.cfm?id_art=99211&vsprache=DE

3.5 Switzerland and other countries

3.5.1 The Swiss digitisation strategy and developments abroad

Although there are a few approaches towards internationalisation of media regulation[92], media policy is primarily a **national matter**. Likewise, technology questions are answered differently in a national context against a background of respective requirements. This is illustrated by the different attitudes towards digital terrestrial television (Digital Video Broadcast DVB-T) or DAB+ between the north and the south of Europe[93]. In terms of digitisation of radio, Switzerland has a clear lead compared to its close neighbours. There are no concerns that Switzerland is threatened with isolation. Switzerland's digital migration route corresponds to the needs of the Swiss media landscape and the resident audience. The migration will be financed to a large extent by the reception fees paid by local listeners. Wanting to speculate about a coordinated digitisation policy of Switzerland's neighbours would be futile. Their legal, economic and media policy conditions (debate about the public service) are too different.

Switzerland occupies a special position on the map of the continent: surrounded by Europe, it is traversed by important transport routes (the North-South Basel-Chiasso axis, the Basel-Geneva link between Germany and France). In addition to the commercial transport of goods, foreign tourists make considerable use of Swiss roads. Most domestic radio stations broadcast useful traffic information in their programmes[94]. Assuming that the Swiss fleet will be equipped with DAB+ radio receivers more quickly than vehicle fleets abroad in the course of the migration scenario, one day the situation might arise that after a Swiss FM switch-off foreign motorists with older FM radio receivers might not be able to receive traffic reports.

It is a fact that DAB+, using a visual representation of maps, etc. on the radio receiver's display, can provide more detailed information to drivers than FM. With regard to (national) road transport, the communication of the safety agencies in dangerous situations is based not only on radio, but on a variety of elements which inform motorists in a timely manner, across all language barriers and irrespective of level of equipment in vehicles, about the conduct required as a function of the situation (automatically controlled warning signs and traffic lights, etc.). Radio traffic information is only part of a whole range of means of communication in use.

In addition, in the future the hybrid car radio receivers which will be promoted by the automobile industry will also increasingly incorporate an IP connection, which in an emergency will also enable drivers to be addressed via mobile radio. Consequently, safety on the roads will therefore be ensured, even without FM.

[92] Cf. in the audio-visual sphere Directive 2010/13/EU of the European Parliament and the Council dated 10 March 2010 on the coordination of specific legal and administrative regulations of the member states concerning the provision of audio-visual media services ("Audiovisual Media Services Directive" AMSD) or the older agreement ratified by Switzerland and dated 5 May 1989 on trans-frontier television (CC 0.784.405)

[93] Cf. below, section 0

[94] However, only one country has an institutionalised traffic information service throughout the national motorway network: France ("Inforoute"), and this is only available in French. Multilingual radio traffic information broadcast continuously in the major European languages is virtually unknown.

In conclusion: neither the lead which Switzerland has accumulated in relation to digitisation compared to its neighbours nor the special situation of Switzerland in terms of international transit traffic justifies a delay in the digital migration.

3.5.2 Overview of the state of development of DAB+ in Europe (a selection)

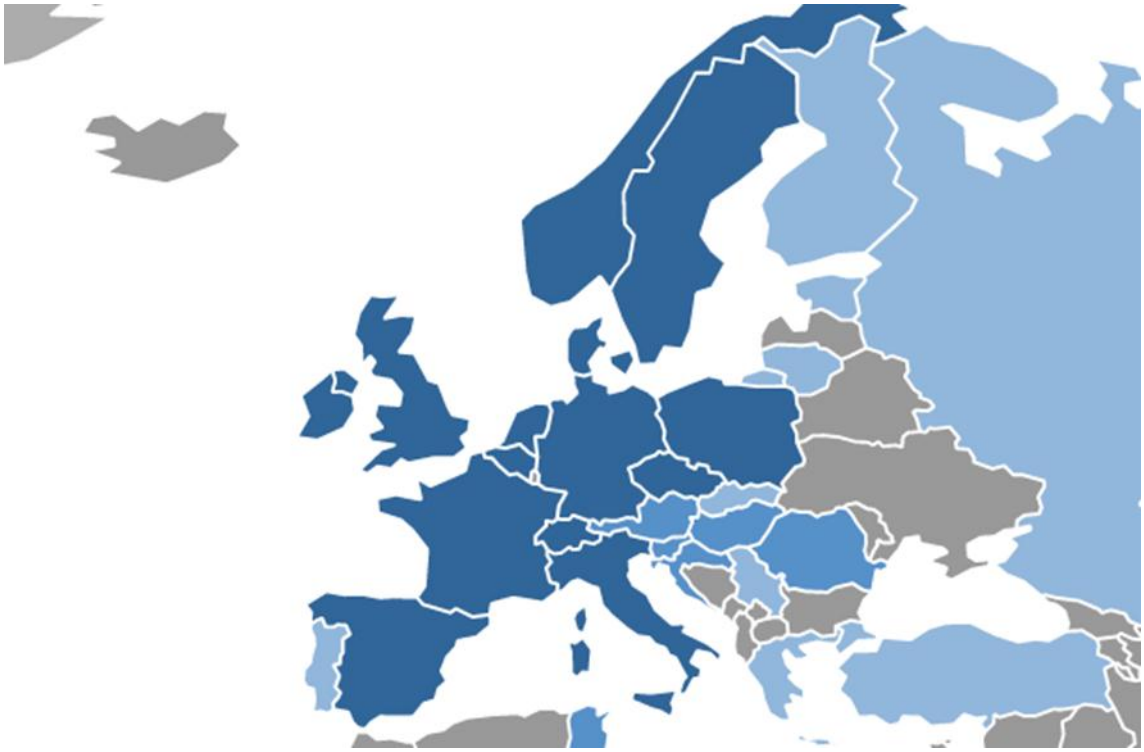

Figure 2: DAB/DAB+ broadcasting in Europe: dark blue: regular operation, mid-blue trial operation, light blue: interest in DAB present, grey: no DAB/DAB+ activities *© WorldDMB*

Meanwhile, the countries of eastern and southern Europe have not really warmed to terrestrial digital radio; DAB+ has established itself in northern Europe in particular, The Scandinavian countries of Norway and Denmark especially have played a leading role in this.[95]

- In **Norway** the Norwegian Ministry for Culture, which is responsible for broadcasting, published an action plan in early 2011 for the digitisation of radio broadcasting, developed in close cooperation between the government, the public service broadcaster NRK and commercial radio broadcasters.[96] According to the plan, the government will decide definitively by March 2015 whether to pull the plug on FM at a national level in January 2017 or - without any further delay – in 2019. The smaller local transmitters should, however, not be affected by the migration; they could remain on FM. Today, 51 percent[97] of Norwegian households listen to radio stations via digital platforms (DAB+, the internet and digital cable networks). Thus all the "absolute conditions for the switch-off" required by the government will be met in 2017

[95] For further information on the development status of digital radio in the various countries of Europe and elsewhere cf. www.worlddmb.org

[96] Norwegian Ministry of Culture: Norwegian proposal on the digitisation of radio, February 4, 2011: http://www.regjeringen.no/upload/KUD/Medier/Rapporter/V-0951E-SummaryReportNo8_2010-11.pdf

[97] Status 5th November 2014, Media release Digitalradio Norge AS: http://www.worlddab.org/system/news/documents/000/004/794/original/Digital_Radio_Listening_in_Norway.pdf?1415207353

- **Denmark** is close to Norway in terms of DAB+ penetration rate (37% of households), but the two current national digital platforms operate on the conventional DAB standard. In 2016, the public broadcaster DR, in accordance with the new strategy, will commence operation of new DAB+ platforms for broadcasting its four FM stations and several exclusive DAB stations. In a second phase, the two DAB platforms already in operation are to be converted to DAB+ by 2018. The Danish government plans subsequently, i.e. in 2019, to phase out FM broadcasting. As in the Norwegian migration plan, the final decision on the FM shutdown will be taken only when at least 50 per cent of listeners consume radio programme services via digital platforms (DAB+, the internet and cable networks).
- **Great Britain** can be considered a DAB nation. In total, more than 400 radio stations can be received in Great Britain via national and regional DAB networks and since 1995 some 18 million DAB devices have been sold. According to the first Rajar quarterly report for 2014[98], digital radio usage (DAB, the internet, DVB-T) is 36.6 percent, and in London usage of radio stations via FM has fallen below 50 percent for the first time. Great Britain is also the leader in terms of equipping vehicles: according to Digital Radio UK[99] in April 2014 some 55 percent of new cars were delivered with a DAB+ device fitted as standard. For several years, the British government has been involved in digitisation of radio broadcasting. In the Digital Radio Action Plan[100] of July 2010, the government expressed its intention of switching off analogue FM broadcasting at the appropriate time. After its early start, DAB has become relatively well embedded in Great Britain. However, this fact now also constitutes the greatest problem for British media policymakers: a switch to the more modern, more efficient DAB+ standard is not currently up for discussion. Nevertheless, experts expect that in Great Britain the government's prescribed conditions for a migration decision - among other things a digital radio usage share, measured in hours, of at least 50 per cent - to be fulfilled by about 2016/2017 and the exit from FM will take place around 2020.

3.5.3 DAB+ in Switzerland's neighbouring countries

3.5.3.1 Germany

In Germany, digital radio has been available using the DAB standards since 1995, though digital radio has failed to make a break-through.

A new start was made with the commissioning of the first national DAB+ platform in 2011. Fourteen stations, including ten private stations and four Deutschlandradio public stations, were broadcast on this so-called *Bundesmux*. Up to 60 million listeners and half the surface area of Germany were covered from the start-up date. Comprehensive coverage is expected to be achieved by 2018. There are also plans by private network operators for a second nationwide DAB+ platform which is to enter into operation in the autumn of 2015.

98 Rajar, a company set up by the BBC and the private radio stations, is responsible for measurement of radio usage. Data for the first quarter of 2014, 15 May 2014: http://www.getdigitalradio.com/dab-news/view/470

99 Digital Radio UK is the industry and marketing organisation for digital radio in Great Britain. It brings together the BBC, private radio stations, the equipment trade and the automotive industry. Media release of 27 May 2014: http://www.getdigitalradio.com/dab-news/view/472

100 Department for Culture, Media & Sport, Digital Radio Action Plan, 10th revised version of 9 January 2014: https://www.gov.uk/government/publications/digital-radio-action-plan

In all the federal States, there are also one or more DAB platforms in operation at the State level, generally operated by the respective State broadcaster or together with private broadcasters. Within Germany, however, differences are noticeable: it is mainly the southern federal States (Bavaria, Baden-Württemberg) which are opting for DAB+. In Bavaria, for example, local digital platforms with public and private stations are in operation in several urban areas.

There are now 2.7 million DAB+ radio receivers in circulation. However, only a small percentage of the population has a DAB+ radio receiver (5% of households).

Concrete plans for digital migration are not currently in evidence in Germany. The Commission for determining the financial needs of broadcasters, the KEF, which enabled the DAB+ expansion thanks to the release of the necessary funds, is demanding from the ARD and Deutschlandradio an overall project for continuing support of the DAB+ process from 2017 onward, including a costing for the introduction of DAB+. In addition, by April 2015 it is expecting statements on the duration and costs of parallel transmission of DAB+ and FM. And finally the KEF wants the declaration of a switch-off date for FM broadcasting.[101]

With the KEF's request for a FM switch-off date, in Germany too the migration discussion is expected to enter a crucial phase. A basis for a decision could be provided by the experts' report which the Federal Ministry for Economic Affairs put out for tender in October 2013. It is to examine whether and under what circumstances FM can be switched off, whether DAB+ is a suitable successor or whether there are any other alternatives.

3.5.3.2 France

On 20 June 2014 DAB+ platforms began regular operation in the cities of Marseilles, Nice and Paris. This was when the Conseil supérieur de l'audiovisuel (CSA), the French broadcasting regulator, also swung in favour of the DAB+ standard, after T-DMB had earlier been favoured as the core broadcasting technology for digital radio[102]. The CSA will now prepare a report about the future of digital radio in France on the basis of experience in the three cities. This report is expected in autumn 2014. It was mainly independent local and regional radio stations, which had previously not had access to the FM spectrum, which called for the long-delayed release of digital broadcasting licences. The major national private radio networks and the public broadcaster Radio France, which share amongst themselves most of the analogue FM frequencies and which have the broadest range of listeners, are boycotting DAB+ and opting instead for later digital broadcasting over IP networks.

[101] 19th Report of the KEF dated 26 February 2014 (Section 2. 1, Nos. 249 to 253): http://www.kef-online.de/inhalte/bericht19/sechstes_2. HTML

[102] http://www.csa.fr/Radio/Autres-thematiques/La-radio-numerique-terrestre/Radio-numerique-possibilite-d-emission-dans-la-norme-DAB2

3.5.3.3 Italy

In Italy, DAB+ has been in regular operation since 2012. Starting from a transmitter network in Trentino (South Tyrol), DAB coverage gradually spread over virtually all urban areas in Italy, with concentrations in northern Italy, Rome and the major motorways.[103] Further extension is planned for 2015, for both the RAI's stations and those of commercial broadcasters. However, DAB+ currently plays only a marginal role in media policy discussions and in the experience of the population.

3.5.3.4 Austria

In Austria digital radio reception is not currently available. Individual trials are being evaluated, e.g. a trial transmission which according to the original schedule was to take place in the second quarter of 2014 in Vienna. In addition, in 2013 the Verein Digitalradio Österreich was formed, an initiative for the advancement of the medium of radio, supported by the professional association of the electrical and electronics industry, together with research establishments, private radio broadcasters, manufacturers and dealers. The members of the association have defined as a goal the establishment of digital radio in Austria. However, the public sector broadcaster ORF and the private station "Kronehit Radio", broadcasting countrywide on FM, are not members of the association and as the main users of FM are sceptical about the introduction of DAB+[104].

Table 5: DAB/DAB+-coverage, device sales and penetration rate in selected European countries (Status: August 2014) Source: WorldDMB

Country	Population	Coverage %	DAB stations	Devices	Household penetration rate
Norway	5'100'000	99.5	22	1'470'000	51
Great Britain	63'200'000	94.0	417	17'500'000	46
Denmark	5'600'000	98.0	24	1'700'000	37
Belgium	11'000'000	95.0	20	-	-
Germany	80'200'000	90.1	120	2'700'000	5
Netherlands	16'700'000	95.0	26	53'900	-
Switzerland	8'000'000	99.0	50	1'675'000	33

[103] Coverage map on digitalradio.it: http://www.digitalradio.it/coverage.html

[104] Cf. Communications Report 2013 of the Austrian Rundfunk & Telekom-Regulierungs-GmbH, p. 76 https://www.rtr.at/de/komp/KBericht2013

3.6 International efforts at standardisation: the Smart Radio Initiative (EBU)

Basically, a radio station broadcasting on the DAB/DAB+/DMB standard can essentially be received only by equipment which has a corresponding chip installed. In Europe the chips required for DAB/DAB+ reception are regularly installed in radio receivers which are now available on the market in a large selection and many versions (e.g. with a Wi-Fi and/or internet connection). In Asia, particularly in South Korea, where the DMB variant of DAB is in use, in addition to conventional radio receivers most smartphones are available with fitted DMB chips. This might be also a reason why DMB is so successful in South Korea.

Meanwhile, European radio broadcasters have also recognised that modern media consumption, especially by young people, is generally via smartphones and traditional radios are seldom to be found in children's and teenagers' rooms.

Accordingly in March 2014 the EBU[105], the European broadcasting industry organisation, launched an initiative which aims to ensure that every radio sold in the EBU area in future can receive terrestrial digital radio (DAB/DAB+ and optionally DRM/DRM+) as well as internet radio, in addition to analogue FM. At the same time the new chip available in principle should also be incorporated in mobile devices such as smartphones and tablets.[106] The initiative wants to signal to the industry that the future of radio will be hybrid, combining the achievements of broadcasting and broadband technology.

The initiative, which is being supported by numerous public service broadcasters (including the SRG) and commercial broadcasters (including the ASPR), replaces the Euro-Chip initiative which was launched in late 2012 with the same objective.

3.7 Security aspects (alerting the population)

The Federal Office for Civil Protection (FOCP) operates a system for alerting the population known as “POLYALERT”. POLYALERT – i.e. polyvalent alerting of the population – was launched in 2009 as a project to replace the remote control of sirens which is still in operation. Since then, the project has become an action programme and will largely ensure alerting of the population until 2025. The FOCP has managed the system for remote control of sirens throughout its life cycle; it is managing the future of the project under its own responsibility. The project plan envisages the capability for remote-controlled triggering of the 5000 or so sirens in Switzerland before the end of 2015. The system is constructed with redundancy; RDS via FM plays an important role in the feed to the sirens. On the basis of the foreseeable FM switch-off, the FOCP has carried out additional system tests with DAB+. The results have shown that it is possible to upgrade the siren control system using DAB+.[107]

[105] European Broadcasting Union; website on digital radio: http://www.eurovision.com/advocacy/initiatives/digital-radio

[106] Further information on the EBU website: http://www.eurovision.com/contents/news/2014/03/radios-hybrid-future-smart-radio.html

[107] http://www.bevoelkerungsschutz.admin.ch/internet/bs/de/home/themen/alarmierung/poly.html

The costs of the DAB+ reception modules amount to approx. CHF 500.00 per siren. In view of the substantial number of sirens, the upgrade must be scheduled and undertaken in good time. OFCOM is in contact with the FOCP concerning the FM switch-off.

Once the alert is triggered, the watchword which has been instilled in the population since time immemorial is “Listen to the radio!” This slogan is fully applicable in the context of the digital migration. Even though the entire population no longer consumes radio the medium of radio remains suitable for reaching a broad public quickly, simply, everywhere and at any time. According to recent estimates only 88.2% of the total population aged 15 and over in German-speaking Switzerland regularly listen to the radio – and the trend is constantly downward – whilst the proportions in the other language regions are 84.9% [French-speaking Switzerland) and 89.3% [Italian-speaking Switzerland][108] – and in the next five to ten years radio will lose its leading position, in terms of its daily reach, to the internet and online media[109].

According to Article 8 para. 1 RTVO, Swiss broadcasters must among other things insert official alert messages and instructions immediately into their programming. The licences of the SRG and the local private radio stations state what arrangements the broadcasters must make to ensure that they can keep the population informed as far as possible, including in crisis and emergency situations[110]. This obligation naturally continues to apply if the transmission vector for the broadcasting switches from FM to DAB+ in the licence. Since a migration is in the self-interest of broadcasters, who do not want to lose their listeners in the process, only if DAB+ has been widely accepted among the population, it is practically guaranteed that the authorities' urgent alerts will continue to reach the public, either via FM and DAB+ during the simulcast phase, or via DAB+ after the conclusion of the migration.

Finally, Article 8 para. 3 RTVA gives the Federal Council the possibility of also extending the notification obligations, if required, to telecommunications service providers who broadcast programme services. This means that operators of wired or mobile radio networks which among other things offer their customers radio programmes within the framework of their contract can also be covered by the law. In this way it would also be possible to reach people who do not listen to radio via the traditional vectors.

108 http://www.mpgruppe.ch/de/radio/publikationen/semesterzahlen.html

109 Media reports prognos Series 13 (July 2014): Radio 2018 – Szenarien der UKW Abschaltung [Radio 2018 - Scenarios of the FM switch-off] p. 98 f; cf. www.mediareports.de

110 Cf. also Art. 9 and 10 RTVO

3.8 Summary of findings

Radio, the oldest electronic medium, enjoys great popularity, despite the prophecies of doom. The reasons are obvious: Radio reliably entertains and informs, is easy to use, is available everywhere and at all times, and is low-cost. Radio also reliably reaches users in transit, notably in cars.

The technical development potential of today's analogue radio broadcasts via FM is, however, exhausted. The frequencies are congested, further ancillary services are unfeasible and compared to DAB, FM broadcasting is no longer economically viable (cf. Section 2.2.2). However, it is also undisputed that in addition to radio broadcasting technologies other possibilities exist for the transmission of radio programme services. The two most important technologies are compared briefly below, with their most important pros and cons.

3.8.1 Broadcast vs. broadband or: radio vs. the internet?

Today there are two ways of broadcasting radio programmes digitally: DAB+ as a broadcast technology functions like FM on the basis of "One-to-Many"[111]. The internet (broadband), on the other hand, is based on the Internet Protocol (IP) and is from the technical point of view an individual (One-to-One[112]) bidirectional connection with each individual user.

DAB+ has the following main features:

- DAB+, like FM, is a clear "free to air"[113] broadcasting technique. It is suitable for reliable universal service within a defined reception area (region).
- Control of the technology and the reception area lies within the sovereignty of the radio station and/or the regulatory authority and the multiplex operator.
- Broadcasting costs are fixed, regardless of the number of users. They are therefore easier to control than with IP radio.
- DAB+ has a high quality of service and in the future will be easier to use for end users.
- The broadcasting paths (end-to-end reception routes) are clearly defined up to and including the reception equipment and are subject to uniform standards. The radio broadcaster knows how its product will reach the user. Particularly in the case of additional services, this is increasingly important, among other things because of possible enrichment with third-party content (advertising).
- DAB+ is a sustainable, mature broadcast technology. It guarantees both provider and user investment security for many years.
- DAB+ is suitable for providing coverage in emergency situations. Large areas can be covered with few transmitters with an emergency power supply. However, one precondition for this is a secured feed (not IP, but e.g. a radio relay link). There are receivers with an autonomous power supply.
- In conjunction with the internet, DAB+ is also suitable for interactive radio offerings (hybrid radio).

111 "One to Many" (also: "Point to Multipoint" or "Broadcast"): a radio signal is emitted once; in terms of capacity requirements, it does not matter whether the signal is received by one or countless devices.

112 "One to One" (also: "Point to Point" or "Broadband"): an IP signal is transmitted individually for each user, i.e. for each stream, a connection is switched between the web server and the receiving device.

113 "Free to Air": signals can be received free of charge by any suitable device without a contractual relationship.

The characteristics of IP radio:

- Broadcasting costs are variable. They increase proportionally with the number of listeners and therefore directly affect net revenue.
- There are still large gaps in coverage and capacity (primarily in the mobile networks).
- IP is not reliable, unchanging, complete and synchronised "free-to-air" broadcasting, either for listeners or for broadcasters.
- The coverage situation is not constant and is dependent on the respective number of users.
- IP is ideally suited to (in principle) global complementary distribution, which also allows interactive online offerings (games, commentaries, feedback to the studio, etc.).
- Range, technical quality and availability are only within the sphere of influence of the radio stations to a limited extent and are determined by the internet service providers (telecommunications companies) to a large extent.
- The radio broadcaster does not know how its product will reach the user (enriched by advertising, differing technical quality, delays, decoding, etc.).
- There is a virtually unmanageable number of internet platforms with very different business models and technical formats (codecs).
- New issues such as non-discriminatory access to the IP networks (net neutrality) contribute to further uncertainties.
- The IP networks are not appropriate for reliable coverage in emergency situations because of their complexity. Nobody knows whether they could handle the flood of data, even if electrical power was available. IP radio is in a dynamic development process, but for the time being it does not offer users or providers much investment security. There is however substantial development potential, for example through the introduction of eMBMS[114] for radio applications in the context of future mobile radio network expansion.
- IP radio is in a dynamic development process, it does not yet offer users and providers much investment security, despite considerable development potential (eMBMS).

3.8.2 Opportunities

For listeners: DAB+ alone can secure the universal service free-of-charge

Radio listening has always been free, at least in terms of a basic offering of programming with public service content: anyone who paid their reception fee and owned a FM radio could listen to the stations available on FM without restriction and without having to pay any additional charge. Transmission modes based on the internet and/or mobile data, however, involve an additional paid-for contractual relationship with an internet/data network provider. This becomes all the more problematic as soon as the new universal fee for radio and television enters into

[114] eMBMS; evolved Multimedia Broadcast Multicast Service (or new LTE Broadcast: a service in the LTE mobile radio standard which can transmit multimedia data such as mobile TV or radio programmes to many users simultaneously and efficiently. The advantage over the classic method in which a data stream is sent individually to each user is the significantly lower network loading, because the data is transmitted once only, to everyone at the same time. https://tech.ebu.ch/docs/techreports/tr027.pdf

force: then the entire population will pay for a service (the reception of radio programmes) which can, however, only be used if an additional paid-for contract is taken out with a private access provider. Whereas listeners divulge much personal data (duration, time of consumption, identity of the station which is being listened to) when consuming radio via IP, DAB+ allows radio consumption in complete anonymity.

Strategic significance for radio broadcasters

For the radio stations, this is virtually the only opportunity of using DAB+ to ensure a controllable, independent and largely autonomous "free-to-air" digital broadcasting vector for traditional radio. FM is the last analogue broadcasting mode of an electronic medium and from today's viewpoint is an outdated and inefficient technology. If the transfer to an up-to-date broadcasting technology does not succeed now, there is a real danger that radio as a "free-to-air" broadcast medium will die.

Technology support

According to the recommendations of the DigiMig WG, DAB+ is to enjoy massive technology support thanks to the revised RTVA (Art. 58). That is one of the substantial incentives for the private radio stations to invest rapidly in DAB+, to support the marketing measures co-financed by the Confederation (Art. 58 and where applicable 109) and to subscribe to the industry agreement.

Added value of DAB+: Greater variety, more targeted channels, additional services

In addition to additional radio stations, DAB+ already permits an extended offering of one-way and additional services which could also generate additional income. DAB+ is also important in promoting interactivity (radio DNS[115]). Digital radio can therefore be more personal, more informative and simpler than FM thanks to automatic station searching, additional information in text and images, TPEG, etc., and more individual and forward-looking thanks to time-shifting and the electronic programme guide (EPG).

3.8.3 Risks

Added value cannot be demonstrated

In the first place, the added value of DAB+ is not yet obvious and is difficult to quantify for listeners, and this could mean that the planned massive marketing campaigns will not bring the targeted success within the desired time frame.

Loss of the small-scale, federalist private radio landscape

Digital broadcasting could restrict the originally intended federalist, diverse and small-scale radio landscape which legislators wanted; it could accelerate the consolidation already taking place.

[115] In the future, Radio DNS (Domain Name System) should make it possible for information accompanying the radio programme, such as text, images, or download markers to be downloaded via the internet: http://radiodns.org/

DAB+ is not spreading quickly enough to mobile devices

The desired, even faster dissemination of DAB+ could also be obstructed by the fact that FM remains the only world standard for radio broadcasting, which has been technically improved in the last few years and further developed with hybrid applications and apps on smartphones.

The automobile industry and tunnel coverage

The migration process would falter if digital usage does not increase markedly. The automobile industry plays an important role in this. If it takes too long for the majority of new vehicles to have DAB+ fitted as standard and not as an option, and if the most important tunnels are equipped with DAB+ much too late, this would massively disrupt the launch.

However, digitisation of radio in the automobile industry is proceeding rapidly, not least as a result of developments abroad. Practically all car makers now offer fitted DAB radios in vehicles in Switzerland, and in the mid- to upper range increasingly fitted as standard, with no extra charge. The breakthrough in tunnel coverage also seems be assured (see Section 3.3.3).

The take-up of upgrade products for the current vehicle fleet is still hesitant. Because of the continuing good FM coverage there is also no direct commercial pressure, although universal upgrade kits are available on the market for all car models.

The marketing activities for the digital migration must also include neighbouring countries, because many consumers, in particular drivers who live in Switzerland, buy their devices and cars, including accessories, in those countries.

Digital radio and young people

If the numerous marketing measures and in particular the positioning of digital radio in the young generation do not succeed within a reasonable time frame and if DAB+ does not impose itself as the dominant mode of usage, the migration process could become more expensive because FM broadcasting would have to be continued until the last possible moment. The DigiMig AG assesses this risk as low, because this generation is already digitally oriented.

Lack of technology support

The migration could also falter if technology support could not be secured on the hoped-for scale or was even halted before cost savings in FM broadcasting could offset the costs of digital broadcasting to a large extent.

Faster development of IP radio

The technological development of IP radio and its usage could increase more rapidly than expected, as there is no reception devices issue, though the cost problematic remains (transmission costs borne by the user). IP radio could therefore establish itself long-term in mobile (especially in cars) and portable reception, in addition to stationary reception at home. The DigiMig WG, however, sees no downside but considers the two broadcasting technologies as complementary.

FM remains the world standard at present

FM might continue to be the only remaining world standard for radio broadcasting. However, that would be no problem for DAB+ in Switzerland because all DAB+ receivers are also FM-compatible. Europe-wide, however, DAB+ is now clearly imposing itself as a common standard, though this alone does not guarantee market success.

Switzerland's pioneering role

Although more and more countries are actively opting for DAB+, it is no secret that Switzerland has played a leading role in the introduction of DAB+ in Europe. Meanwhile, however, digital broadcasting has become established, and the initial pioneering risk no longer exists. Even if DAB+ does not develop into the hoped-for worldwide successor to FM, that would be irrelevant for Switzerland: radio consumption is almost exclusively a regional matter, and DAB+ units are always simultaneously FM radios.

Significance of the industry agreement

If the promoters of DAB+ in Switzerland, especially the DigiMig WG, do not succeed in winning over all broadcasters and industry exponents to the digital migration process, or if in this phase substantial expansions in FM areas were granted, or if new FM broadcasters were licensed, this would also endanger the project.

The incentives built into the industry agreement work against this risk. They motivate the radio stations to embrace DigiMig. The recommended regulatory measures are designed to ensure that the industry sees the advantages in cooperation.

Mass inertia

Radio listening is strongly associated with habits which have become valued. As long as FM coverage is good and stable, the added value of new technologies is not particularly attractive for many listeners. Experience shows that during technology changes there remains a “hard core” of users who, despite intensive PR and marketing campaigns, will switch only when the old technology ceases to function. Practical experience clearly reflect this effect[116].

3.8.4 Conclusion

DAB+ can provide an industry-wide solution for fast, efficient digital broadcasting of radio programme services. Compared to IP reception, DAB+ offers constantly good signal quality in larger coverage and reception areas and reliable mobile reception. The period of time before FM can be gradually and completely phased out must be as short as possible. This means that digital radio usage must increase rapidly in the next few years. The preconditions for this: attractive new offerings and sufficient devices on the market (especially in cars). The measures which the DigiMig WG proposes with various approaches point in this general direction. In 5 years at most, digital radio usage must amount to at least 50%. In the final analysis, however, the gradual phase-out or switch-off of FM coverage will result in a rapid rise in digital broadcasting.

[116] Cf. Section 2.1.2: Phase-out of medium wave

4 Measures for the digital migration

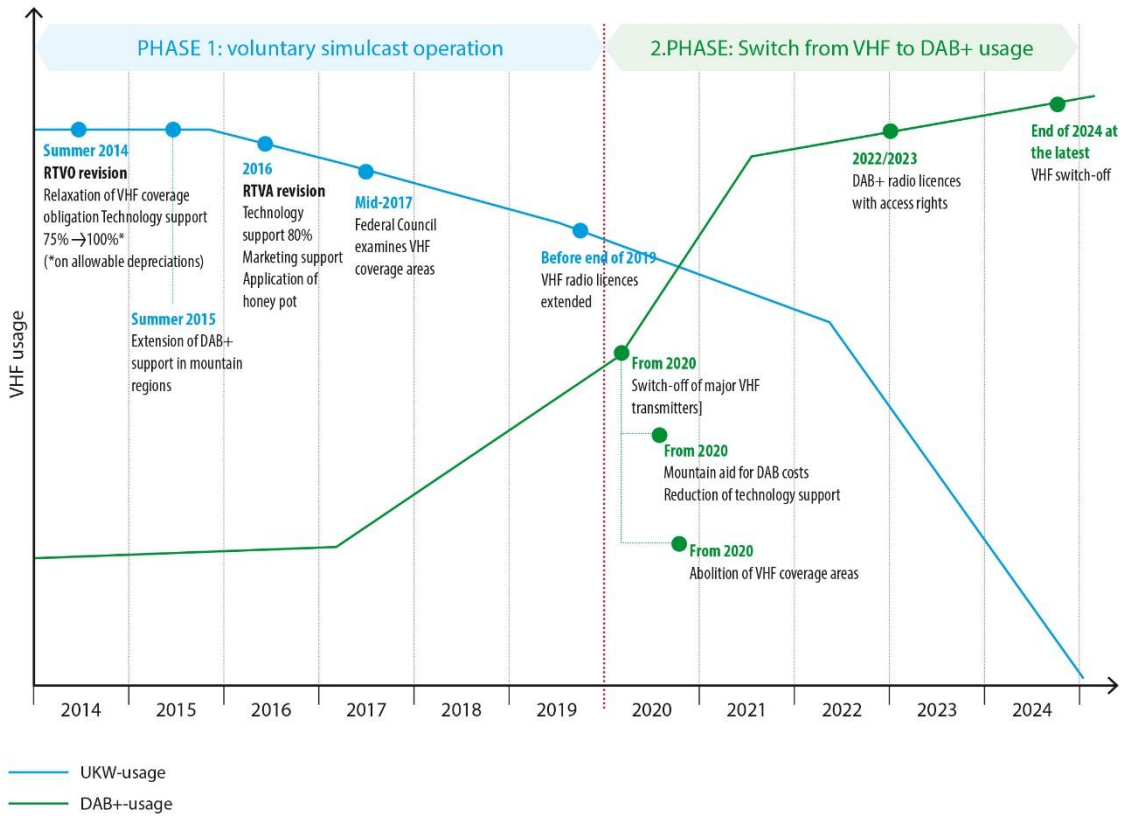

Figure 3: Graphic representation of the most important measures along the time axis *© DigiMig*

The entire digital migration process is expected to take place in two main phases. As the existing local FM radio broadcasters' licences expire at the end of 2019, this year determines the transition from the first to the second phase. In the first phase from 2014-2019 radio stations are expected to be motivated to commence digital operation by various financial and regulatory incentives (Phase 1). In the second phase from 2019 to 2024 at the latest, after which the switchover to DAB+ should be undertaken in close agreement between the Federal Administration and the players in the industry (Phase 2).

The measures described in previous sections are summarised and concretised in this section into an action plan which reflects the Working Group's concepts for the digital migration. The figures at the end of the title of the individual recommendations refer to the section of this report in which the individual measures are explained in greater detail.

4.1 Phase 1: introduction of DAB+ by all FM broadcasters; massive marketing efforts (2014 to end of 2019)

Recommendation 1: Support for new technologies and broadcasting in mountain regions (3.1.1/3.1.2)

The statutory provisions for support for new technologies (Art. 58 RTVA) and for support for broadcasting of radio programmes in mountain regions (Art. 57 RTVA) according to the existing RTVA should be interpreted generously. The duration of the support should permit reasonable private refinancing of the digital migration phase up to the switch off of FM transmitters.

Justification

The radio industry has already embarked on the journey towards digitisation. In autumn 2014 over half of the licensed FM radio stations could be received digitally via DAB+. However, the simulcast phase involves additional broadcasting costs for broadcasters. These cannot be refinanced privately as they do not result in more listeners. Consequently, in this phase the broadcasters are reliant on active financial support on the part of the public sector. Articles 57 and 58 of the RTVA provide the necessary legal basis for this. Even though revised Article 58 RTVA has not yet entered into force, the authorities are being invited to exploit the latitude which the current provisions provide and thereby support the industry's efforts towards digitisation. In its response of 12 February 2014 to the Piller Carrard interpellation (Finanzielle Unterstützung für Regionalradios während der Übertragung via FM und DAB+ [Financial support for regional radio stations during transmission via FM and DAB+[117]]), the Federal Council signalled its readiness[118] to this effect and in the meantime ensured the entry into force by adopting the RTVO amendments.

Measure 2: Easing of the FM coverage obligation – no re-allocation of relinquished FM frequencies, but defence of these frequency positions in relation to other countries (3.1.4/3.3.4)

The FM coverage obligation should be relaxed from 2015 onwards if the broadcaster provides coverage for the region concerned via DAB+. At the same time the federal authorities should refrain from re-allocating relinquished FM frequencies in the course of the digital migration. OFCOM continues to defend these frequency positions in relation to other countries.

[117] Cf. http://www.parlament.ch/d/suche/seiten/geschaefte.aspx?gesch_id=20134236.
[118] Ibid.

Justification

The two measures essentially serve to save broadcasters from making pointless investments in obsolete FM transmission equipment, reducing broadcasting costs. The embargo on the re-allocation of relinquished FM frequencies gives broadcasters security that they will not be faced with new FM competition during the migration process. Fortunately, the Federal Council has taken up these two proposals by the DigiMig WG in its amendment package for a short-term revision of the RTVO. This should enter into force at the beginning of 2015.

The fact that FM frequencies will not be used does not mean that Switzerland will give up its rights to them. The frequencies remain in the international co-ordination databases and OFCOM continues to be committed to defend them against any foreign causes of interference.

Measure 3: broadcasters and network planners agree on a jointly accepted definition of the technical values for coverage using FM, DAB+ and IP (3.3.1)

Broadcasters, network planners and network operators agree on a uniform definition of the values which must be fulfilled in order for a specific area to be considered as technically covered by FM, DAB+ and IP. The values should be based on the recognised international recommendations of the competent institutions

Justification

In order to be able to compare the quality of coverage achieved in a given region by FM, DAB+ and IP, the various participants must agree on a joint conversion of the quality-related terms into technical specifications which are recognised by all. The DigiMig WG has made such an attempt and in a recommendation (para. 4.3.1) defines when an area might be deemed to be technically covered by FM, DAB+ and IP in a qualitatively comparable manner. This definition should serve as a guideline for various stakeholders for unambiguous clarification of any questions which arise in relation to reception quality.

Measure 4: The radio industry creates appropriate structures for marketing coordination and defines the conditions for usage research related specifically to the migration process

The radio industry coordinates the industry-wide marketing measures in favour of digital radio and has agreed on the requirements of the usage research data which documents the progress of the migration process. For this purpose there is already one public-law organisation and one private organisation.

Justification

Many different marketing activities are essential to prepare the public for digital radio. The various initiatives must be coordinated to achieve maximum effectiveness. There already exist organisations which have experience of publicity campaigns for digital media: For example Marketing and Consulting for Digital Broadcasting Technologies AG (MCDT AG), a subsidiary of the SRG, or DigiMig Operations GmbH. This company was founded by the private broadcasters

in the summer of 2014 in order to prepare for the digital migration. These two companies ensure sufficient structure to take into account the diversity of the players in the media scene and the different financing mechanisms. In this way all involved stakeholders have the opportunity to take part in the marketing efforts throughout the industry.

In addition, industry-wide consensus must prevail in relation to certain points, for example determining the public effect of the marketing campaigns undertaken. It has already been possible to define how progress in the digital migration process should be measured. The proportion of listeners who use radio via digital channels will be used as an indicator. However, an instrument for this measurement must be found as the proportion of digital usage cannot be determined with the measurement method used in Switzerland (Mediawatch). With this solution the radio industry has defined the basic components of usage research specifically focusing on the migration process and will be supervising its implementation.

Measure 5: Equipping the major national road tunnels with DAB+ by the end of 2018 by the FEDRO (3.3.3)

The Federal Roads Office (FEDRO) manages the process of equipping the national road tunnels with DAB+ with immediate effect and ensures that the top-priority tunnels are equipped with DAB+ by the end of 2018. A FEDRO directive regulates the funding of this operation.[119]

Justification

Digital coverage of the different language regions is already very good, though there is still a major coverage gap which in particular hinders mobile radio consumption: the road tunnels are currently not yet digitally equipped. This issue must be resolved in order to bring the automobile industry on board. Otherwise there will be no incentive for the automobile industry to take part in the digital migration and offer more vehicles equipped with digital radios. FEDRO, the Federal Roads Office, supports the equipping of national road tunnels with DAB+ for safety reasons, so that in future drivers can be informed of imminent hazards. It is therefore important for two reasons that the most important road tunnels are equipped without delay by the end of 2018. This strong signal is required to persuade the automobile industry to offer DAB+ on new vehicles as standard and to firmly support the migration process. The costs of equipping the road tunnels with DAB+ should be regulated between FEDRO and broadcasters and specified in a Federal Council directive.

[119] The new FEDRO-Directive “Astra 13006” relating to radio equipment in road tunnels was published the 27th november 2014 an so after the editorial deadline of this reportand. It is only available in French: http://www.astra.admin.ch/dienstleistungen/00129/00183/00520/index.html?lang=fr

Measure 6: Massive support for simulcast costs by the Confederation (3.1.3)

Starting from the entry into force of the revised RTVA, the Confederation will massively support broadcasters' simulcast costs (Art. 58 and 109a RTVA: approx. 80% of the digital operating cost). The Federal Administration will contribute significantly to the industry's marketing effort for the switchover to DAB+ (Art. 58 and 109a RTVA).

Justification

In particular, the new Article 58 RTVA of the revised RTVA will provide the basis for sustainable support for the digital movement. It not only offers financial support for provider's investment costs but also makes it possible to co-finance digital operating costs, direct support of digital platform operators and marketing activities in favour of digitisation. The DigiMig WG recommends that the available options specified in the new Article 58 RTVA are fully exploited during an initial time-limited phase immediately after the entry into force of the revised RTVA. As provided for in law, a percentage of the revenue from the reception fee should be used for technology support. Along with the use of the resources that are available pursuant to Article 109a RTVA for supporting the technology efforts made by the fee-splitting radio stations, this makes a substantial takeover of the simulcast costs (approx. 80%) possible and the Federal Government can make a significant contribution towards the essential marketing effort towards expansion of DAB+. When it has been possible to establish a favourable dynamic and the digital migration is developing positively, the marketing support can then be reduced. After a reasonable period of time for DAB+ to become established, the proportion of the digital operating costs covered by Federal Government can be reduced (cf. Phase 2 of the migration).

Measure 7: FM broadcasters prepare their stations for hybrid use of FM, DAB+ and IP (3.3.2/0)

They make it possible for listeners to access their stations using different technologies.

They enhance their radio programme services with new and attractive additional services.

In order to prevent listeners having to endure unpleasant delays when switching from one broadcasting vector to another, in consultation with the network operators they eliminate, as far as possible, the time difference between these vectors – above all FM and DAB+.

Justification

In future, the public should not have to concern itself about the way in which the desired radio station is received. Modern radio receivers are able to process FM, DAB+ and in some case IP signals as well. It is only necessary for the radio station to be identified in such a way that it can be detected when switching from one vector to another (so-called Service Following). In this way the different technologies, which are complementary, can be connected together. In order to improve the radio experience, broadcasters must exploit the possibilities of DAB+. This not only means that the public can be offered the well-known services on all media channels but also enables new and innovative services to be expanded. The transmission times of FM and DAB+ signals differ for technical reasons and this can cause unpleasant delays when changing from one media channel to another. To mitigate this effect, equipment manufacturers, broadcasters and network operators are being invited to minimise this time difference by technical means (artificial delay of the faster signal, so that both arrive together at the receiver).

Measure 8: No new licences or coverage areas in the FM band from 2017 onward (3.1.5)

As part of the replanning of local coverage areas in the FM frequency band, the Federal Council must leave in their current configuration the number and structure of local coverage areas according to Annex 1 of the RTVO and not envisage any new licences.

Justification

By July 2017 at the latest, the Federal Council must examine the topography of the existing FM radio landscape in accordance with Article 39 para. 4 RTVA. In view of the digital migration which has already begun, a change in the topography of the existing FM radio landscape is not justified. Digitisation will in any event lead to a fundamental reconfiguration of the radio landscape. This will be characterised by regional-language broadcasting by private radio stations with fewer, and therefore larger, coverage areas.

Measure 9: Extension of FM utilisation for a maximum of five years

A new invitation to tender for the FM licences which expire in 2019 will not be progressed. The use of the FM frequencies within the framework of the existing licences will be extended before 2019 for a maximum of five years (until the end of 2024 at the latest). The extension will be granted only to those broadcasters who have commenced digital simulcast operation of their programme services by the end of 2019 at the latest. Anyone who commences simulcast operation earlier will benefit from additional financial incentives. This five year extension phase corresponds to the time frame that the broadcasters require for the digital migration from FM to DAB+.

Justification

The FM licences for local private radio broadcasters expire at the end of 2019. In accordance with the Radio and Television Act, the licences should be put out to tender again at that time. In view of the current digital migration process, however, a renewed tender procedure for the licences in force in 2020 would trigger significant planning uncertainty among local radio stations. In addition they would give the impression that the authorities still regard FM as a broadcasting channel with a future for local radio stations. Competition for FM frequencies would increase their value, and this would be contrary to the official digitisation policy. The DigiMig WG is therefore proposing to DETEC [120] that a tender procedure should not be held in 2019 for the local radio broadcasters' licences and that instead licences already awarded should be extended for a maximum of five years[121]. This period should be used to establish DAB+ as the main channel for radio broadcasting. Therefore a radio broadcaster which wishes to extend its FM broadcasting for a maximum of five years, as outlined above, would be obliged under its licence to also transmit its programme services in parallel via DAB+. The extension period of up to five years marks the time frame for the FM switch-off.

It is conceivable that DETEC will exempt certain categories of local radio broadcasters from the licence obligation at the end of 2019. According to Article 28 para. 1 of the Frequency Management and Radio Licences Ordinance[122], however, the broadcaster will as a result also automatically lose its claim to the FM frequencies granted to it by the radio licence. In order to prevent this, the previous link between the term of the radio licence and that of the broadcaster's licence would have to be broken. To this end, Art. 28 para 1 of the Ordinance would have to be amended accordingly.

[120] DETEC is the licensing authority for broadcasters' licences (Art. 45 RTVA): http://www.admin.ch/opc/de/classified-compilation/20001794/index.html#a45

[121] Art. 46 RTVA, term of the licence: http://www.admin.ch/opc/de/classified-compilation/20001794/index.html#a46

[122] Ordinance on Frequency Management and Radio Licences of 9 March 2007, Art. 28 of the Ordinance: http://www.admin.ch/opc/de/classified-compilation/20063220/index.html#a28

4.2 Phase 2: Gradual switchover from FM to DAB+ from 2020 to 2024

Measure 10: The SRG and private radio stations jointly agree the timetable for switching off FM; gradual coordinated shutdown of FM transmitters

The SRG and private radio stations agree on local and regional FM switch-off plans. These must specify that major FM transmitters will be gradually decommissioned. Comprehensive FM reception would no longer be guaranteed during this phase.

Justification

An agreement between the SRG and the private FM radio stations is vital for the success of the digital migration. The DigiMig WG therefore proposes that the SRG and the local radio associations sign a framework agreement which regulates reciprocal information and regional co-ordination of the dates for decommissioning major FM transmitters. The agreement will define the benchmark figures for the jointly agreed migration process. On the basis of this agreement, the SRG and the local broadcasters will from the year 2020 gradually decommission major FM transmitters in joint actions. This means that from 2020 onwards, comprehensive FM reception will no longer be guaranteed.

Measure 11: Abolition of the FM coverage areas in Annex 1 of the RTVO in parallel with the FM switch-off

From 2020 onwards, the FM coverage areas according to Annex 1 of the RTVO are to be abolished in accordance with the FM switch-off scenarios agreed on a local and regional basis between the SRG and the private radio stations.

Justification

In parallel with the implementation of the plan for the digital migration agreed by the radio industry, the Federal Council will periodically modify the number and structure of the coverage areas with analogue coverage according to Annex 1 of the RTVO. It will also abolish FM coverage areas as soon as they have digital coverage only.

Measure 12: Mountain regions: henceforth support for DAB+ broadcasting exclusively

From 2020 onwards, the focus of support for broadcasting by radio stations in mountain regions (Art. 57 RTVA) will transfer to DAB+ coverage.

Justification

The digital migration measures implemented from 2015 onwards are intended to ensure that by the end of 2019 all radio stations transmitting in mountain regions have commenced simulcast operation. The broadcasters' licences which will be extended from 2020 will provide for DAB+ as the main broadcasting channel. The conclusion is therefore that the financial support for mountain radio stations (in accordance with Article 57 RTVA) will be primarily used from this time onwards to cover the costs of DAB+ broadcasting.

Measure 13: Technology support reduced between 2020 and the end of 2024

From 2020 onwards, the technology support provided until then, used for digital operating costs, will be reduced annually. At the end of 2024 at the latest, or an earlier FM switch-off date, the support will be terminated.

Justification

In 2020 the substantial application of technology support in accordance with Article 58 RTVA to the benefit of broadcasters will already have lasted for four years (cf. Phase 1). The Confederation will use these committed funds to cover the majority share of simulcast costs. As a result of the phase-out of FM coordinated between the SRG and the private radio stations, broadcasters' costs for the simulcast operation would gradually decrease. In addition, in association with appreciable support for the public marketing campaigns, a large proportion of the population should own a digital radio by 2020. It is therefore justified to adapt the amount and application of the support funds from 2020 onwards to the evolution of the digital migration and to gradually reduce it.

Measure 14: providing access rights for licensed local broadcasters on renewal of the DAB+ radio licences

At the end of 2022/2023, the radio licences for the DAB+ platform operators Romandie Médias SA (regional-language in French-speaking Switzerland), Swissmediacast AG (regional-language in German-speaking Switzerland) and Digris AG (local island solutions) are to be extended, with the inclusion of access rights for entitled local broadcasters.

Justification

Broadcasters' licences contain a right of access to the necessary broadcasting infrastructure. Depending on the licence, this can be a FM frequency or a DAB+ platform. Radio licences, however, grant the right to use the frequency spectrum of a country and are subject to a broadcasting obligation. In relation to these two licences, for the FM domain and DAB+ platforms there are substantial differences in the roles.

Whilst in the FM domain, the roles of broadcaster and radiocommunication licensee coincide, in the digital realm these two roles are split between different participants. The radiocommunication licences, which regulate the operation of digital DAB+ platforms, do not have the same period of validity as broadcasters' licences as the two licences are awarded asynchronously.

The DAB+ radio licences for regional broadcasting currently in force do not expire until 2022/2023. When they are renewed, the corresponding access rights for licensed local radio stations will be included in the radio licences. This situation could be used to include the regional broadcasting obligation in the licences. Before 2022, formal access rights for radio broadcasters can only be awarded if the holder of the radio licence is in agreement. Since the companies which operate the DAB+ platforms were often founded as quasi “self-help organisations” of the radio industry and have an interest in the long-term commitment of their customers, the prospects for amicable solutions to be found are good.

Measure 15: Conclusion of the digital migration by the end of 2024 at the latest; thereafter, a decision by the Federal Council on the future use of the FM frequencies (3.3.4)

The migration from FM to DAB+ should be concluded by the end of 2024 at the latest. This should be facilitated by local agreements between the SRG and the private radio stations concerned. The Federal Council will decide on the future use of the FM band after the shut-down of the last FM transmitter (adaptation of the National Frequency Allocation Plan NFAP). If unexpected circumstances have delayed the original timetable, DETEC will take the necessary measures in good time to enable the participants to conclude the migration process.

Justification

By the end of 2024 at the latest, the combined efforts of all those involved (the broadcasting industry, platform operators and the regulatory authorities) should have led to a situation in which the vast majority of the population will be listening to digital radio. FM operation would therefore no longer be required. The shut-down of the FM transmitters should not take place in a single step but gradually on the basis of local agreements between the SRG and the private radio stations concerned. These operations will be accompanied by targeted communication and marketing campaigns. Once the digital migration has been concluded, the Federal Council will have to decide what purpose the unused FM band should have in future and this should be specified in the national frequency allocation plan NFAP.

It is conceivable that circumstances which are still unforeseeable today might in some points delay the scheduled completion of the digital migration. In this case DETEC will have to decide timely measures for the affected partners which can ensure that the original migration plan can be successfully realised. One of these measures could be that the participants are allowed slightly more time for the migration. It is also possible that technology support according to Article 58 RTVA may be temporarily increased in order to better inform the population about digital radio by boosting the communication campaigns.

5 Conclusion - the world of digital radio is opening up

Radio is increasingly becoming part of integrated communications, which encompasses various media and broadcasting vectors. The DigiMig working group is therefore convinced that the two broadcasting techniques of DAB+ and IP radio are not in competition but complement each other.

Radio listening is predominantly a local or regional affair which has a lot to do with much loved habits. This is why the universal service within the traditional transmission area with DAB+ should remain “free to air”. IP radio represents a perfectly reasonable and attractive addition, for supraregional complementary coverage or hybrid offerings.

For radio stations, the switch from FM to DAB+ eliminates the hitherto existing scarcity of frequencies. After full conversion has taken place, digital broadcasting will provide radio stations with a cost-effective and energy-efficient digital broadcasting technology. In principle, DAB+ also allows new local, regional, regional-language or even national radio offerings and additional services.

By agreement and after a needs assessment with the industry, the Federal Council has decided to embark on the path of digitisation and has laid down a clear priority for DAB+. Not least because of the financial burden of such a switch, which affects all broadcasters, it is in the interest of the industry as a whole to forge ahead with the switch-over as quickly as possible.

With the plan for the digital migration which has been drawn up and thanks to the joint efforts of the entire radio industry, it will be possible to implement digital broadcasting successfully. The competent authorities are making a substantial contribution by creating a regulatory environment which supports the migration process, which is important for media policy. In addition, by joining the industry agreement all the radio broadcasters are giving themselves the possibility of actively shaping this process.