Community Radio: FM and Digitalization

Future Distribution Platforms for Community Radio in Europe

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Content:

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1. Introduction

This is an overview and analysis of the present situation for wireless distribution of small-scale radio in Europe with emphasise on community broadcasting. The key questions are:

- If the analogue FM platform will prevail as main distribution platform together with on-line distribution and if there is an imminent need to digitalize on-air broadcasting.

- If there will be a digitalization of wireless radio broadcasting, the crucial decision for a small-scale broadcaster will be to adapt to a system made for and by public service and large-scale commercial networks (DAB/DAB+) *or* for another system under development in Europe and other parts of the world (DRM, DVB-T2 Lite, HD Radio).

The decisive factor for a future possible transition will be to choose systems with the strongest listeners reach within the target audience as well as being sustainable for many decades ahead.

This report will include facts and views, which for most of the time are not observed by mainstream media and also ignored in the national political processes regarding broadcast infrastructures. Hopefully this report will contribute to a more balanced picture of distribution structures for broadcast radio in Europe now and in the future.

This report is presented as a green paper to the pan-European organisation *Community Media Forum Europe (CMFE)* for further discussion and consideration by its board, experts group and members. This is not a research report. The facts and views presented are the responsibilty of the author and do not necessarily reflect the any official standpoint of the CMFE.

2. Local Radio Stations in Europe

A rough estimate of the number of radio stations operating on-air on a local scale in Europe is 9.000.[1]

[1] "Local" public service stations covering regions of a country are not considered here.

A community radio station is a local, regional or national broadcaster, which is operated as *a self-managed association on a not-for-profit basis* with participatory structures. A community station is a broadcaster transmitting its signals on air or via cable.

The European Parliament has defined community media as *media that are non-profit and accountable to the community that they seek to serve. They are open to participation in the creation of content by members of the community. As such, they are a distinct group within the media sector alongside commercial and public media. [...] Social benefit for a community is a primary concern.*

According to the 2012 mapping by Community Media Forum Europe (CMFE)[2] there are 2.237 community radio stations counted in 29 countries (of 47 European countries), to be compared with a world total estimate of 17.000 community radio stations. Most community radio stations are operated on a non-governmental non-profit basis with limited budgets.

The Association of European Radios (AER) is representing the interests of over 4.500 private/commercial radio stations across the EU27 and in Switzerland.

Most local commercial radio and almost all community radios are still broadcasting on analogue FM and some are still on AM (medium wave).[3] Local and Community radio will also be found on the Internet. Globally, there are an estimated total of at least 50.000 radio channels available on the Internet.

3. Digital Radio Developments Update

3.1 Overview

Outside greater metropolitan areas the need to replace the analogue transmitter structures for local radio is not yet a priority. However, if an alternative digital on-air structure is developing and will *reach a major share of the radio listening audience* local radio cannot avoid looking for digital solutions. But still there is

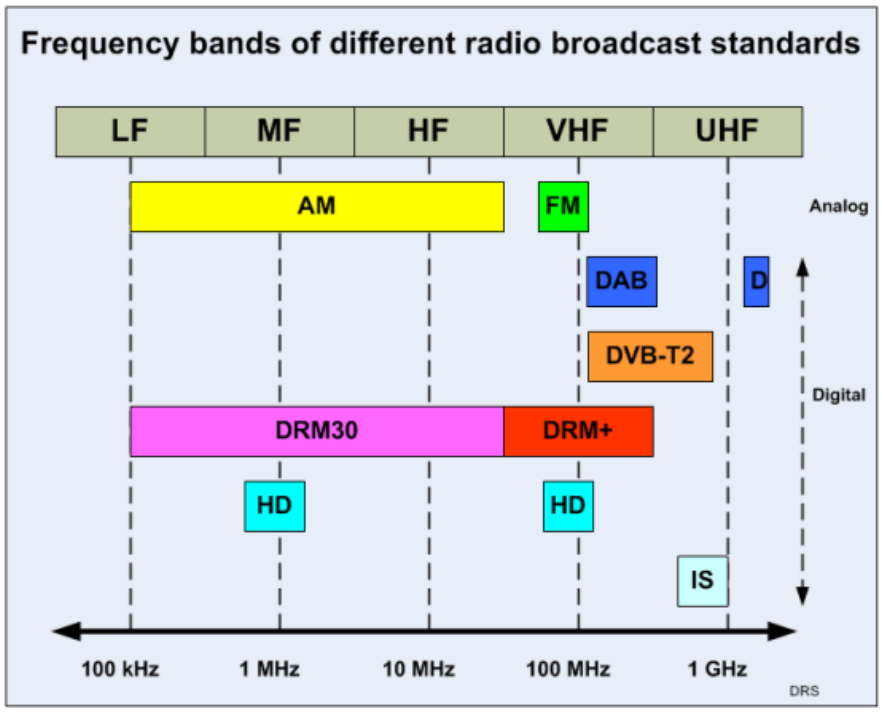
> "…no established digital platform for community broadcasting, radio or television, that provides adequate flexibility, affordability or market penetration to provide an assured migration route. The "push" to digital, driven mainly by the manufacturers of new digital consumer reception equipment and by governments eager to release a radio spectrum "digital dividend" creates a danger that community broadcasting, having established a foothold in the analogue environment could be marginalized in a digital future." [4]

Today digital radio is also received on different distribution platforms: DAB(+), *digital terrestrial television (DVB-T), satellite* and *cable television networks*. Also rapid developments are on the *Internet* (fixed and mobile broadband).

The *International Telecommunications Union* (ITU) is promoting a digital transition for wireless *television* to be completed 2020. However, there is quite another discourse for wireless sound broadcasting. ITU has not yet indicated any need to replace analogue radio

[2] http://cmfe.eu/60-uncategorised/206-first-country-ranking-of-community-media
[3] There are also some community radio stations on the AM band (medium wave) in the U.K.
[4] Community broadcasting in an all-digital environment: A preliminary assessment of options and challenges by Steve Buckley, (Budapest, May 2007)

with any of the present four digital systems technically approved 2012. The ITU approved systems are DAB/DAB+, DRM30/DRM+, HD Radio (IBOC) and ISDB-Tbs. The television standard DVB-T and DVB-T2 also well fit for audio broadcasting. Below is an overview chart picturing how these standards are assigned in the frequency spectrum:



(Chart by Digital Radio Sweden)

Of the five systems for digital radio three are technically feasible for Europe: DAB/DAB+, DRM30/DRM+ and DVB-T2. DAB/DAB+ is already in operation since 1995 in some countries, DRM+ and DVB-T2[5] are newer systems but not yet used for regular radio broadcasting. There are also radio channels distributed by satellite. The future scenario might be that radio will be both on analogue and digital platforms including Internet. With the development of multi-standard receiver chips we might be able to access all various three European digital radio systems together with FM and the Internet on the same radio receiver.[6]

The major factors making a digitalization of radio possible is influenced by the overall economical development in the European Union and the global computerization/ digitalization/compressing technologies/innovation of production and distribution systems for video (television) and audio via mobile devices, foremost smartphones.

Also attention should be on the importance of mobile broadband communication for societal values versus wireless broadcast (levels of utility versus entertainment). The possibility for radio to get access to new frequency spectrum is at risk, as mobile broadband will demand an increasing share of e.g. the UHF band. This will in turn create a push for television broadcasters to move into lower bands mainly VHF band III.

[5] Presently, DVB-T is used for radio on the digital terrestrial television networks in Norway, Finland and the United Kingdom.

[6] In January 2014 the Israeli company Siano, has launched of SMS2160, a new multi-standard digital radio receiver chip which supports T-DMB/DAB/DAB+, DRM+, DVB-T2 and FM Radio.

3.2 The DAB System

WorldDMB website lists 21 countries with regular DAB services.[7] There is also an impressive list of other countries, which are said to be involved in the deployment of DAB. However, there is *DAB listening* on a relevant measureable scale in only four countries.

The DAB system was created already 1985 and put into regular operation by BBC 1995. Thus DAB has a quite established presence in the U.K. and also has an advantage position on the agenda in some other European countries. Typically, this is the richest counries with a dominant public broadcaster as in Denmark, Norway, Switzerland and the U.K. The DAB lobbying resources are also quite impressive compared with proponents of competing technologies.

Today the DAB[8] system (invented 1985 and introduced 1995) is promoted by and put in operation by large-scale broadcasters in several European countries.[9] There are regular DAB broadcasting and listening of some significant scale in three European countries: *the United Kingdom*[10]*, Denmark* and *Norway.* Reported weekly listening figures are 23, 15 and 12 percent respectively. DAB is also operational *in Australia.*

In Europe DAB+ is also on an active level in *Germany, France, the Netherlands* and *Switzerland.* However, although the transmission networks cover almost all of *Germany* the listening is reported to be only 1-2 percent. The DAB listening in the other countries are also in this bottom range. In *France* the government has stopped the public radio to develop further into DAB because of costs and the largest commercial networks are not on the DAB trail in France. The Ministry of Culture and Communication has recently authorized the transmission standard DAB+, which will co-exist with the standard already authorized, T-DMB (DMB-R). This reveals that the government still considers digital radio to be a matter for experimentation, in that its decision "*will enrich the period of experimentation in offering two technical paths for digital radio with their particular costs and modes of operation*".[11] Any DAB listening figures have not yet been presented by audience research in France.

In *Sweden* regular DAB broadcast was closed by the government 2005 but unofficially the network operator Teracom since then has maintained DAB coverage in Stockholm/Uppsala and three other metro areas (with a population reach about 35 %). Here a selection of ten public service and commercial radio channels are broadcast. However, no listening figures are recorded and the sale of DAB receivers is negligible.

The issue is still in consultation and a political decision on this is possible in 2015. The government has stated that introducing digital radio should be only “on market terms” (= no

[7] http://www.worlddab.org/country-information

[8] In this document “DAB” as a system label is used for both the older version DAB and the newer DAB+/DMB.

[9] The first on-air test of DAB in Sweden was made by the public radio 1991.

[10] According to weekly listening figures for the fourth quarter of 2013 presented by Rajar the analogue platforms (AM and FM) still dominates. AM/FM has a weekly listening of 58,5 percent . DAB 23,4, digital terrestrial TV platforms 5,2 and online 5,8 %. The 2013 uptake increase of DAB is less than anticipated the year before: DAB +9,8 and Internet +15,6 %. This signals a DAB stagnation, which could be explained by the rapid growth of radio listening on smartphones by young listeners (15-24 yrs.).

[11] http://www.culturecommunication.gouv.fr/

extra state funding for the public radio for this). Also it is already recognized by the government and the Parliament that *DAB is not a suitable system for local radio.* The 2013 political decision is that authorities must present an alternative for community radio 2016 before any decision for setting a close down year for FM can be possible.

The *National Accounting Authority* in Sweden is now considering a decision[12] to look into the process of DAB introduction in Sweden involving government authorities and state owned companies as the radio and TV authority, the public service radio and the transmission provider Teracom. The results of such an inquiry will be presented in the end of 2014 and probably will be decisive for any future officially funded support to DAB developments in Sweden.

In the other Nordic countries *Denmark* and *Norway* DAB has reached a significant level of penetration with approx. 12-15 % audience share on a weekly listening basis. *Finland* opted out of DAB 2007 by reserving Band III (174-240 MHz) exclusively for digital television (DVB-T2).

The only country outside Europe with a significant DAB activity is *Australia.* Digital radio operates in the five mainland state capitals. The commercial and public service formally commenced digital radio services back in 2009. All these extra digital channels must compete with the existing radio stations for any new and existing radio advertising dollars and listeners.

> "While Australian commercial radio broadcasters adopted the new DAB+ standard for the implementation of digital radio, the excessive infrastructure costs will slow regional adoption and rollout. Other issues include the limited coverage area as opposed to existing technologies.
>
> While digital radio has the potential to deliver a range of new and innovative services to listeners through the more efficient use of radio communications spectrum, the introduction is premised on digital radio being used as a supplement to existing radio services rather than a replacement technology. As such, digital radio will be introduced in stages, and operate alongside existing analogue radio services. The final bastion of the analogue transmission spectrum will remain in use for many decades before we are all able to finally hear digital radio across all of Australia."[13]

Unfortunately, there is not much open debate about some important aspects of the DAB system including the crucial question if there are better solutions for a problem, which still is not clearly defined. Today, it seems that the solution comes before the problem. The DAB system is frequently promoted leaving out relevant market analysis and presenting questionable facts about improvement and benefits for the citizens.

In spite of being operational for almost 20 years there are still quite few DAB listeners in Europe as the FM networks still are *the major listening platform in all countries* including the U.K. In order to enhance the development of DAB stakeholders are calling for an FM "switch-off" i.e. forcing the audience to listen via DAB. But closing the FM band seems quite impossible. Some government have already put out statements that even if the major

[12] April 7, 2014
[13] BuddeComm research report http://www.budde.com.au/

national radio networks should go DAB the FM band will stay on for local and community broadcasters as the DAB technology is not suitable for small-scale broadcasting.

Introducing the DAB system is not just a matter of "digitalization of radio" but will also demand the construction of a completely new transmission and receiving infrastructure in a special dedicated frequency band (Band III). As the FM band probably will be retained for radio broadcasting internationally, reserving 174-230 MHz exclusively for a limited number of DAB multiplexes could well be a waste of spectrum.[14] Instead this band can also be used for digital television, which it is also assigned for in the European region (DVB-T).

By comparing DAB+ with FM it is now reported that squeezing 12 channels into a multiplex lead to a sound quality much below FM. You will need at least 192 kHz according to a 2013 research report.[15] Also the transmission range for DAB is less than FM (and DRM+), which is natural as VHF Band III is on higher frequency range than FM (VHF Band II). You will need to add sub-transmitters (boosters) if replacing a FM transmitter with DAB+ (= more energy)[16]

During the first decade from the first introduction of DAB in the UK and Sweden there was great anticipations that digital transition would copy the model of the television transition: a fast switch from analogue to digital. However, it has now become quite clear that FM will stay on in most countries for years to come. This will make it quite a challenge to establish a parallel consumer driven market for DAB. This could only be possible with some kind of state support financed by taxes or broadcasting license fees. As long as there is uncertainty about the long-time sustainability of the system such infrastructural investments might be hazardous for any government especially in times of a long-term financial crisis in Europe.

Today critics claim that the DAB system is outdated as a solution for future radio. Impeding factors could be:

1) **analogue FM has a strong position** with broadcasters and listeners as it is a well established world standard in over 200 countries,

2) **competing other technologies** for terrestrial digital broadcasting (DRM, HD Radio, ISDB-T and DVB-T/DVB-T2 Lite)

3) the **resistance from small-scale radio** (commercial or community radio) for technical and economical reasons,

4) strategically **positioning as independence from gate-keeping** distribution companies (multiplex operators) and the **demand for net neutrality**

5) the explosive **growth of fixed and mobile broadband** overshadowing benefits with DAB, as online services as Spotify etc. are becoming major music listening platforms,

[14] Band III capability is 40 multiplexes à 1500 kHz which will give space up to 240-480 channels depending on bandwidth demand (quantity versus preferred sound quality level.

[15] Perceived Audio Quality of Realistic FM and DAB+ Radio Broadcasting Systems
(Journal of the Audio Engineering Society Oct.2012)

[16] The central DAB-transmitter system in Stockholm is supported by 4-5 sub-transmitters to match the FM coverage area of the public radio.

6) **less geographical coverage** - a DAB transmitter will need ”gap-fillers” (slaves) to cover same target area as an FM transmitter (=increased energy consumption),

7) the **global smartphone market** is not yet receptive to DAB receiver capacity

8) questionable **inferior indoor reception** quality

9) **inferior sound quality** compared to FM and broadband radio when multiplex channel capacity is fully utilized (12-15 channels per mux),

10) **no spectrum usage replacement in VHF band II suggested** if closing it (the FM band) for radio broadcasting (Technically DAB is only possible in VHF band III).

11) **the high costs of replacing functioning FM networks** with completely new transmission and receiver infrastructures in view of a probable long-term economical crisis prevailing in most European countries.

12) **high overall environmental costs of scrapping the high amount of FM** transmitter systems and receivers on a global scale[17]

13) **dependence on state funding** for infrastructure development and operation with probability of market failure,

14) negligible benefits for *European* industrial developments

15) **some misleading information in promoting** the system (see below).

3.3 The DAB credibility gap

Since the launch of the DAB system there has been an intense promoting campaign by large scale broadcasting operators, mostly public service companies, transmission companies and electronic manufacturers. Year by year this has become a growing credibility burden.

Public service broadcasting companies like "Sveriges Radio" in Sweden is paying an annual membership fee of 11.000 euro to the WorldDMB organization besides putting in its own administrative resources (manpower and travels) for the lobbying.

This campaigning is partly financed by the same politicians who control the broadcasting (TV-) license fee or taxes and are the formal owners of public service as in the four major Nordic countries. As in the U.K. there is no commercial financing of public service in those countries. The public service companies have been setting the agenda for ”digitalization” from the official start 1995 and on. *The community radio sector has never been invited into this process*[18] and being non-governmental non-commercial this sector cannot match the powerful resources of the public service or the commercial sectors. For example in Norway an official at the public broadcaster NRK even wrote the whole text for the MP[19] introducing the bill in the parliament when deciding on the DAB introduction.

[17] The global amount of FM transmitters is estimated to be more than 150.000 and FM receivers more than 2 billion. For example in the U.K. there are 110 million FM receivers and in Sweden more than 20 million.
[18] In the Netherlands the community media organisation OLON was invited and participated in a kind of consultative procedures. But here community radio is regarded as local public service.
[19] MP Kåre Simensen (AP - social democrat)

In contrary to television the European Union has not taken any position regarding audio broadcasting standards - and probably will not. In spite of this on its web site the WorldDMB has been listing the European Commission as a member. The Commission in Brussels has denied that it is a member and this listing was removed in December 2013. A EU institution cannot be member of a lobby organization. Neither are other digital radio standards enjoying any official EU endorsement.

WorldDMB is promoting the advantages of DAB/DAB+, but also spreading some misleading facts via its members. A widely spread disinformation for several years has been that *the FM radio will soon be switched-off in Europe.* However, there has not yet been any such decision by any country in Europe or elsewhere in the world.

The politicians taking decisions on media issues are very vulnerable listening to powerful lobbying. Another ”dirty trick” is the introduction of terms for a FM switch-off. In some countries[20] the official policy is that FM should be switched off when digital listening has reached 50 percent. However, ”digital listening” includes not only DAB but also DVB-T, cable and Internet. This could mean that if Internet listening is reaching 50 % FM should be switched off.

Measuring radio listening and getting a true picture will probably not be possible in the coming years. Today, online listening is in general not included in broadcast audience research. If you listen to BBC World Service in Sweden this is not measured– and probably will not be. With an increasing number of multiplatform receivers many listener will not even notice if listening to FM, DAB or online which will make audience research more complicated. Will people regard iTunes Radio, Spotify, Google play music as radio as well as a commercial broadcaster with content of mostly music with commercials inserted?

Another exaggeration is that *DAB is successfully established in many countries.* But besides four countries (UK, Denmark, Norway and Australia) the DAB listening on weekly basis is just not more than a few percent. For example in *Germany* with a geographical coverage of 92 % the listening is estimated to be a few percent. On its web site WorldDMB is listing *Sweden* as a DAB country with "regular services", but it is not. The regular service mentioned in *the Czech Republic* is a limited L-band transmitter system operated by the manufacturer Pure. To mention a few of the 21 countries listed here.

In order to get a truer picture of any DAB success you will need also figures of receiver uptake and listening as well as financing and cost-benefit analysis.

Another disinformation is that *radio listeners will pay a lot more for online radio than via wireless broadcasting* The consumers are indeed paying for data streams to the broadband operators while broadcasting is “free” (notwithstanding public service TV license fees and/or taxes). But consumers are willing to pay for receiving video on their smartphones and on fixed broadband. Video (television) is the major driving force for expanding the frequency spectrum for mobile broadband. Compared to this audio will represent a small fraction of the total broadband usage. One digital television channel needs

[20] Denmark, Norway and the U.K.

a frequency spectrum, which is equal to the space required for 30-50 digital radio channels. *Radio is rather a bonus service for smartphone users all over the world.*

Small-scale radio (local commercial and community radio) has become a problem for the DAB lobby as the DAB multiplex system is designed for big scale broadcasting as e.g. national public service. This complication has been known for years, but now as an FM switch-off seems increasingly unlikely great efforts are made to get small-scale broadcasters on the DAB bandwagon. If FM will be retained there will be a steep uphill struggle for DAB on a market, which has not yet developed in Europe.

European Broadcasting Union (EBU) - the organization for public service companies - has recently promised WorldDMB to assist in convincing the national governments to go DAB.[22] EBU is also promoting the multistandard receiver chip, which will include both DAB/DAB+ and FM but still not DRM+. However, the mobile/ smartphone manufacturers have not yet showed any interest to include this chip in their devices.

In 2012 EBU also recognized that DAB may not be suitable for small-scale broadcasting and when DAB coverage is not possible recommends DRM.[23]

3.4 Digital Radio Mondiale - DRM

DRM started off as a system to digitalize frequencies below 30 MHz (HF) – or as we know it shortwave, medium wave and long wave. This system now labelled as DRM30 is of special interest in emerging economies as Brazil, India and Russia.

DRM+, for frequencies above 30 MHz, is of much later origin than DAB. This system is promising to offer an extra digital choice for future *small-scale local broadcasting* as community radio. For DRM+ frequencies on the FM-band (Band II) (and also Band I and III) can be used, while for DAB can only be used in Band III.[25]

The DAB family is mainly found operating in Northern/Western European countries and Australia while DRM is found on a global scale mainly implemented as DRM30 on shortwave and medium wave bands (Europe, Russia, India), but there have been successful DRM+ field tests in several countries (France, Germany, Italy, Norway, Slovakia, Sweden and the U.K.) For Europe HD Radio (U.S.) and ISDB-Tbs (Japan) are presently not on the agenda as possible alternatives.[26]

As a DAB multiplex can carry up to 16 programmes, where the full multiplex is not fully utilised it becomes very inefficient and means that using DRM+ instead would require about 10% of the DAB radiated power.

It is widely accepted that, when replacing FM transmissions on a one-for-one basis, a DRM+ transmission needs much less spectrum and energy than FM in order to provide the same high audio quality. The spectrum needed for each programme stream is about one quarter

[22] http://digitalradioinsider.blogspot.se/2013/11/neutral-ebu-will-support-dab-lobbying.html
[23] https://tech.ebu.ch/docs/r/r138.pdf
[25] The L Band (1452-1490 MHz) is also available for DAB but it is not considered feasible any longer because of the limited coverage.
[26] However, there has been and will be some test trials of HD Radio in Europe (Switzerland, Norway).

of that needed for an FM audio broadcasting channel. These advantages have been confirmed by DRM+ test transmissions carried out in Edinburgh by the BBC and the DRM Consortium. DRM+ can be configured in different ways in order to offer greater flexibility than FM or DAB broadcasting. DRM+ can, for example, offer the option of allowing much more locally orientated broadcasting within 4-way mini-multiplexes using the same amount of spectrum as a single FM channel.

After several years of trials in several countries DRM+ is now awaiting its introduction for regular broadcasting. Today, this introduction on a major scale will probably be outside Europe in emerging markets as Brazil and India.

Presently, Brazil is considering the choice of digital radio system: HD Radio or DRM+, while DAB is not on the agenda. As there are more than 4.000 community radio FM stations in the country the choice for small-scale broadcasting is very crucial. In a letter to the Brazilian Ministry of Communications 2013 CMFE together with AMARC-Europe strongly recommend the choice of DRM+ for digitalization of community radio in Brazil as well in other parts of the world.

> For community radio, mostly operating its own transmitter systems, also an open system is of importance. One company does not own the rights to the modulation system. The DRM (as well as the DAB) systems are open in contrary to HD Radio, which is a proprietary system. There are royalties paid for DRM but only by the transmitter manufactures. An open system offers the possibility to everybody to develop new applications including open source transmitter software with DAB and DRM. It will be possible for community radio to build own, low-cost transmitters.
> - - -
>
> CMFE sees it valuable that DRM+ main characteristic is that it is the only open worldwide standard for viable digitization of local FM radio in a Eureka 147 compatible way. DRM+ is a universal standard accepted by the European Telecommunications Standards Institute (ETSI) and the International Telecommunications Union.
>
> HD Radio (IBOC) operates with a total bandwidth of 400 kHz, which is not compatible with the existing channel raster of Band II (the FM-band) in Europe and many other parts of the world. DRM+ operates within a bandwidth of 100 kHz, which makes it natural choice for a smooth transition from analogue to digital on the FM band. It would allow 1-4 radio programmes within the same spectrum currently occupied by one FM programme. Additionally it is possible with DRM+ to transmit in the VHF Bands I and III. We also see possibilities to use Single Frequency Network for DRM+ transmitters as a benefit for small-scale broadcasting.[27]

The experts group of the Indian public service consulting report[28] has recommended that *All India Radio*[29] make a transition to DRM medium wave from analogue medium wave to meet the National and Regional coverage. The receiver eco-system for DRM30 and DRM+ is under-

[27] http://cmfe.eu/docs/BrazilDRM+2013.pdf
[28] Prasar Bharati Committee Report http://www.prasarbharaticommittee.in/report
[29] AIR is one of the largest broadcasting organisations in the world in terms of the number of languages of broadcast, the spectrum of socio-economic and cultural diversity it serves. AIR home service compries 376 stations covering 92 % national area and 99,19 % of population. AIR originates programming in 23 languages and 146 dialects.

developed and therefore to foster investment in the Indian receiver market, which will also expand to Pakistan and Bangladesh.

FM is the most popular audio transmission system in India. However, FM reaches to only 43 % of the population and 31 % of the national area. MW and SW together reach to 99 % of the population but fail to provide stereo quality output to the listener as provided by FM. The widespread use of FM follows the integration of FM in the mobile phones, which is the most popular device for assessing radio. It gives FM a distinct advantage over MW transmission as mobile handsets are expected to drive the content demand.

However, the Group on Technology recommends that AIR should transition to DRM30 from AM MW to meet requirements of national/ regional coverage and can continue to reach out to the local audiences through FM. Once the DRM eco-system is stabilized, AIR can consider migration of FM to DRM+. However, the receiver eco-system for DRM is under-developed and therefore to foster investment in receiver eco-system,

According to Yogendra Pal, Advisor at the Ministry of Information & Broadcasting, the transition to DRM30 on MW will reach 70 % of the population by 2016. The second batch of receivers on the Indian market will have both DRM30 and DRM+ capability. Pakistan and Bangladesh, which also are on the DRM track, have expressed interest to take part of this receiver market. Of special interest of this new receiver generation is the inclusion of the new xHE-AAC codec recently standardised for DRM, which will deliver much higher sound quality and enhanced efficiency at low bit rates.

Still DRM+ is developing with a slow pace in Europe. This is not because of technical problems, which are (mostly) solved. But the impact of the semi-established DAB/DAB+ system is hindering thinking further on digitalization of radio: DAB is almost a synonym for digital radio. This is detrimental to the efforts to put DRM+ as an alternative system choice on the agenda for political decision makers and receiver manufacturers. The call from the DAB lobby to close the FM band[30] is another interference as this is the primary band is planned for DRM+ operations.

Taking this into regard *the idea of the two systems- DAB and DRM - co-existing side by side is counter-productive* for DRM+ development and market positioning. A clear choice must be made out of factors as economics, flexibility and system transparency as well as adjustment capacity to the present FM transmission system. In order to present a credible system intended to replace analogue FM in the future probably all sectors of radio broadcasting; public, commercial and community must be included.

It seems unlikely that two different wireless digital radio infrastructures could be successfully introduced in parallel in Europe in competition with a digital radio platform via fast developing and popular mobile broadband .

The recent proposal to transfer a local FM station to a local DAB structures seems hardly feasible outside metropolitan areas. In order to migrate all existing local radio allocations in Europe (commercial, non-commercial and even public) in the future, there seems not

[30] The FM Band (VHF band II 87,5-108 MHz) is not under international pressure to give space for other applications than broadcast radio.

enough spectrum in the band III to generate sufficient DAB allotments. A DAB or DAB+ channel is 1.5 MHz wide and in less populated areas it might contain as little as one program – pure spectrum waste, whereas a DRM+ channel with a similar performance is only 100 kHz wide (half as wide as an FM channel.)

DRM+ is promising to offer an extra digital choice for future local and community radio. For DRM+ frequencies on the FM-band (also VHF Band I and III) can be used, while for DAB can only be used in VHF Band III (also used by television DVB-T). DRM+ will make it possible to digitalize the present FM band and increase channel capacity fourfold.

Today in Stockholm, a test trial is run with a DRM+ transmitter on the FM frequency 97,0 MHz with a power of 500 Watts. The trials are on a private initiative but in consultations with the telecom authority (PTS), which in a consultation process has been recorded as being negative to a re-introduction of DAB in Sweden.

The organisation behind this project is *Digital Radio Sweden* (DRS)[31] an independent non-commercial and non-political NGO. The DRS objective is to present alternative technology to DAB and to broaden the general knowledge about digital radio. The DRS regard it as important to invest in technology, which is optimal for small-scale broadcasters as local commercial or community radio. It is important to find efficient ways to utilize the limited frequency spectrum. DRS say it wants to protect the national economy as well as the consumer interests and promote an efficient spending of public funds (taxes or TV licenses).

Providing that you do not demand more than a modestly increased channel space (2-4 times) the FM band will be enough for additional digital radio channels. An analysis of the Greater Stockholm area indicates today that there are 52 transmitters analogue transmitters assigned on the FM band. Using DRM+ it is possible to operate approximately 200 transmitters in the same space. Also there is also possible to retain the analogue transmissions and give space for simulcasts i.e. an analogue and a digital signal (bandwidth 100 kHz) in the same channel.

In order to expand channel capacity, enhanced sound quality and energy saving DRM+ open for a step-by-step flexible digitalization process. This can be stretched out over a period of several years while maintaining the regular analogue FM broadcasting (Band II). The vacant VHF Band I (47-68 MHz) once used for television can also be considered and developed for additional DRM+ channels.

3.5 DVB-T2-Lite

When used for digital audio broadcasting, the more robust subset of the DVB-T2 standard, was introduced in 2011. DVB-T2-Lite has - due to its significantly greater efficiency (more than a factor of two) and appealing multimedia flexibility - the potential to become a serious competitor to DAB+. This newest standard is suitable for large-scale digital audio broadcasting along with digital television.

DVB-T2-Lite is optimized for mobile reception such as mobile digital radio and TV. DVB-T2-Lite has reduced circuit complexity and relaxed memory requirements and therefore

[31] http://digitalradiosweden.se

consumes less power. DVB-T2-Lite is significantly more spectrum-efficient than analog modulation such as FM or AM. Additionally, DVB-T2-Lite due to its modern radio modem technology, offers significantly higher spectrum efficiency, in the order of 2-3 times as many program channels compared to DAB+ (under similar conditions) according to Digital Radio Sweden. [32]

Digital audio broadcasting using DVB-T2-Lite is operated by Open Channel in Copenhagen since June 2012.

3.6 Broadband Radio

The most rapid developments the last couple of years have been via the Internet on fixed and mobile broadband. According to the Ericsson mobility report[33] 90 percent of the world population will be have 3G coverage 2019 and 65 percent will have 4G/LTE. The number of mobile subscriptions will be tenfold by 2019 increasing to 9,3 billion and of this 5,6 billion will be smartphones. Mobile networks will need to boost capacity by 1,000 times by 2020 to cope with the huge growth. At that time the next generation 5G will enable 10Gbit/s traffic with 1ms latency. 5G also promising to be more secure, with lower energy consumption and lower operating costs.

Besides mobile broadband 3G/4G today one billion Internet users can connect to free wireless networks - Wi-Fi - all over the world. It can be estimated that 3 billion users will access mobile broadband via cellular networks and Wi-Fi.[34] This will probably in the 2020's become the most efficient global platform for radio only second to FM radio.

Many media services for radio and television reception are easily accessible via apps for mobile/smartphone users.[35] They are listening to music via RdioRadio and iTunes Radio or services like Spotify and Pandora. A significant number of mobile/smartphone models (except e.g. the iPhone) are also equipped with FM-receivers. Also the program choice of spoken words has widened by podcasting via Internet.

Some car manufacturers as BMW and Volvo are now introducing the "Connected Car" which will keep both the driver and the car being online for technical communication as well as for information and entertainment.

The fixed and mobile broadband development is having an impact in most countries, which is likely to challenge both radio and television broadcasting. The reason is that broadband communication is seen first of all as an *utility* while radio and television is first of all *entertainment* (music + sports). A mobile phone is a necessity for most while a digital radio receiver is not. Radio and television, as we know it, is at great risk to step by step lose control of its own transmission infrastructure. Radio and television content might increasingly become depended of the Internet distribution infrastructure.

[32] http://digitalradiosweden.se/Radio_basfakta_eng.html
[33] http://www.ericsson.com/res/docs/2013/ericsson-mobility-report-november-2013.pdf
[34] Wireless networks in countryside areas with no fiber access are be fed by mobile broadband networks
[35] A community media app has been developed by AMARC Brazil (Dec 2013)

Presently the European Commission is considering a recommendation on the assignment of the upper part of the UHF-band 694-790 MHz for mobile broadband purposes instead of television broadcasting. This so-called 700 MHz band is already assigned for this purpose in Finland and Sweden. Despite a fierce opposition by the EBU and television broadcasters most countries in Europe are projected to follow this path (which is also on the agenda in other parts of the world) with a transition starting 2017-2019.

The UHF spectrum for television (DVB-T and DVB-T2) will gradually shrink. This will also put pressure on the television broadcasters to optimize compression technology. For this the VHF band III will be used in most efficient ways. This will in turn put pressure on the radio broadcasting, which use this band for DAB/DAB+ and hold back any future expansion for DAB, which cannot be utilized in lower bands.[36]

There is also no guarantee for broadcast television not to lose still more UHF spectrum as mobile broadband in a near future is projected to demand approximately *an additional amount of 600-700 MHz bandwidth* as 4G/LTE and 5G technology is developing. This will increase the possibility that broadcast radio in the VHF band III might be scrapped all together 2020 or later.

Wireless broadcasting will be crucial to maintain easily accessible platforms for news, factual programs, information and other community needs as emergency services. But in order to expand platforms for entertainment oriented content an increased spectrum for mobile broadband and a decreased spectrum for broadcasters will not hamper the expanded distribution of music, sports and similar content as this will be accessible on-line by fixed or mobile broadband including Wi-Fi.

4. Public Funding Impeding System Transition

In the countries where the DAB system so far has been established the financing of the transmission structure has been possible by official funding (state subsidies or via public service financing) and not on commercial terms. *This is also the reason why the system has survived the protracted period since its introduction 1995 without being able to replace the FM platform.*

The European Commission has concluded 2013 that a Spanish government €260 million scheme to finance the digitisation and extension of the terrestrial television network in remote areas of Spain was incompatible with EU state aid rules.[37] The measure favours the terrestrial digital technology to the detriment of others. The operators of terrestrial platforms received a selective advantage over their competitors using other technologies and therefore have to pay it back to the Spanish taxpayer.

According to the Commission the Spanish measure unduly distorted competition between DTT players and operators using other technologies. The former have received an undue

[36] DAB can also be used in the L-band, but this is on a high frequency band 1467–1492 MHz with a limited geographical coverage.
[37] http://europa.eu/rapid/press-release_IP-13-566_en.htm#PR_metaPressRelease_bottom

advantage over their competitors and therefore need to return those unfair subsidies to the Spanish taxpayer.

In its decision on subsidies for the digital terrestrial TV in Berlin-Brandenburg, the Commission gave indications on how Member States could support the digital switchover in compliance with EU state aid rules. The Commission's decision in this case has been upheld by the EU General Court. The principle of technological neutrality has furthermore been confirmed in the General Court ruling on the Commission's decision in the Mediaset case .

This decisions on state subsidies strongly indicates that any similar state aid scheme for the DAB radio platform also will be contested by the Commission as there are also competing technical system for radio broadcasting.

Political decisions regarding introduction of a new technology as well as decisions to "switch-off" an established technology can be challenged by organisations and citizens also at a national level. For example in Sweden already it is case for the National Audit Authority and the Attorney General. And some small-scale radio stations broadcasting on FM and the Internet are already preparing complaints to the Competition Authority and the Consumer Authority in case of DAB+ getting a political approval 2015.

An interesting aspect is some local and on-line based commercial stations in Sweden are planning to take their case to the European Commission if there will be any public funding for a DAB introduction for the major broadcasters.[38]

The most interesting, but still not proved in courts, is the possibility to challenge any government of an EU member state while "switching-off" the FM band, which is internationally designated for broadcast radio, also will forbid its citizens to use it.

5. Local Commercial Radio and Digitalization

Via EBU and WorldDMB the major broadcasters are pushing for a soon FM switch-off in order to get the consumers onto the DAB platform. As long as people keep listening to FM radio there will be a difficult market developing for DAB. However, there is a rift between small-scale local commercial radio on one side and larger commercial networks and public service radio on the other.

In November 2013 a group of broadcasters called on the British government to abandon plans for digital radio switchover, claiming the move would jeopardise local radio and cost households "several hundred pounds" each. The group said the switchover posed a serious risk of listeners losing access to radio because most households only have an analogue set. It estimates that there are about 100 million analogue sets still in use in UK homes.

[38] The two major commercial networks are not willing to pay for a DAB infrastructure and expect this will be funded by public means.

The switchover – in which national, regional and large local stations disappear from AM and FM – would hamper smaller local stations and force homes listening on analogue to spend hundreds of pounds on new digital receivers, the statement says.

Scott Taunton, managing director of UTV Media, said:

> We think the concept of migrating stations from AM and FM [to digital] is flawed. There is no consumer demand for this and unlike digital TV switchover there is no digital dividend for the taxpayer. The bulk of people are quite happy with the radio services they already have.[39]

There have been various reports on local commercial broadcaster fiercely opposing any FM "switch-off" as in Norway and Sweden. In Norway the Radio Metro network has protested in news articles and letter to the government.

Association of European Radios (AER) writes that *FM on band II remains an efficient, simple-to-use and free-to-air technology for the vast majority of radio stations across Europe. This efficiency relates to the business-model: it is actually an essential part of the main business model for commercially funded radio.* Thanks to the broad receiver penetration and the very high usage by the listeners the small bandwidth of 20,5 MHz is very efficiently used.

AER also reminds us

> "when there are catastrophes or other emergency situations, citizens naturally switch on their FM radio to be informed, advised or warned, and governments explicitly ask them to do so: FM radio is, for the time being, the most immediate, most efficient and technically most reliable means of mass communication; furthermore, it will still reach its audience even in the event of a power failure, as many receiver devices are powered by batteries. Therefore, one cannot consider a complete migration to digital terrestrial broadcasting – and certainly not an analogue broadcasting switch-off date – before every car and every household can receive a digital signal, and are equipped by a sufficient number of digital receivers.
>
> Markets will decide what is the best-suited technology for digital radio broadcasting in Europe: a choice endorsed by listeners. A smooth transition from analogue to digital technology broadcasting is a significant challenge. There are indeed currently millions of FM-sets in the EU. Switching from analogue to digital broadcasting will represent an important cost and will take time for consumers: there is in Europe on average 6 FM-receivers per households."

AER underscores that a transition that

> extremely large investments are required in new networks for digital broadcasting. The most significant investments are nonetheless related to simulcasting of programmes at the same time via analogue and digital technologies.[41]

Phil Riley, the founder of UK commercial radio group Orion Media, says a radical new approach should be adopted embracing a "multi-platform world", in which FM/AM and DAB operate side by side for at least the next decade. Riley calls on the Government to delay the "flawed" switchover policy. He said the radio industry should stop planning for switchover any time soon, get on with running their businesses in the most sensible way for them, and

[39] http://digitalradioinsider.blogspot.se/2013/11/commercial-radio-against-digital.html#more
[41] AER Position on RSPG opinion on wireless broadband (2013):
http://www.aereurope.org/content/view/1132/43/lang,en_GB/

the Government should end regulatory uncertainty by agreeing to keep the FM frequency for the foreseeable future, and issue new longer term FM licences as a result.

> When consumers simply expect content to be delivered whenever, wherever, in the most convenient manner possible, why have we in radio come to the conclusion that we can simply impose a diminution of platform availability on people, simply because it's currently costing us more money. I'm not sure it's a defendable position, said Riley: I believe multi-platform availability is simply the price we need to pay for being in business in the 21st century.[42]

6. Community Radio and Digitalization

An important element in the basic ideology of community radio is the independence not only regarding content but also transmission. A community radio station should be able to operate without being dependent on a state/public service or a private/commercial transmitter infrastructure.

> The emergence of digital broadcasting systems presents an opportunity for community broadcasting - the transition to digital broadcasting systems is expected to lead to greater spectrum efficiency and a reduction in the need for regulation of the radio spectrum. But it also presents a threat because some current and planned approaches to spectrum management, such as spectrum auctions, tend to disadvantage civil society organizations. Furthermore, some technical options in the digital environment lead to new forms of gatekeeping - digital platform operators - that may not provide assurance of affordable access. In addition, digital broadcasting is currently characterized not by convergence, but rather by a fragmentation of the landscape into a multiplicity of competing technical standards. This has created a highly unpredictable environment for broadcasting development.[43]

The basic global transmission platform for community radio as well as other sound broadcasting is analogue FM. This is very often supplemented by digital transmission on the Internet. Thus, community radio has both a local and global reach.

Still there are a very limited number of community radio stations broadcasting on digital terrestrial platforms. As it has been reported community radio is broadcasting on DAB on a significant scale in *Australia, France* and *Switzerland.* Some local projects on a more limited basis have also been reported in *Germany* and *Sweden.* A *U.K.* DAB trial for local or small-scale radio is on the 2014 agenda for the British media authority Ofcom.

In Europe community radio is present on DAB in *France* and *Switzerland*. This is economically possible because of the basic state funding of community radio in those countries (40 and 70 percent respectively of operational costs), which still is unique in a global perspective. In *Belgium* the government will provide community radio a DAB multiplex free-of-charge. Outside Europe in *Australia t*here has also been a considerable state funding in order to enable community radio to broadcast on DAB. More than 35 community broadcasters have broadcast digitally with funding received from The Department of Broadband,

[42] Westminster Forum on the future of the radio industry (London March 12, 2014)

[43] Community broadcasting in an all-digital environment: A preliminary assessment of options and challenges by Steve Buckley, (Budapest, May 2007)

Communications and the Digital Economy. [45]

In *France* there are six community radio - *radios associatives* - stations broadcasting in the Nantes area (covering 1 million households) on experimental basis since 2010. The media authority CSA has given permission to 30 community radio stations for DAB broadcasts in Paris, Nice and Marseille from June 20, 2014.

The Digris AG company is operating DAB+ islands throughout *Switzerland*, for small radio stations to be able to access a platform for the digital transmission of their programme services in small-scale areas. In the region of Zurich community radio Radio LoRa has secured a place on the DAB+ platform that will start operating in the region of Aarau later 2014. With a start in May 2014 in the same band as the large-scale broadcasters 60-80 small-scale stations will broadcast on DAB+ with OpenDigitalradio in eight cities in Switzerland. Because many community radio and small-scale commercial stations have no FM license, there is good potential on the DAB+ platform on a small regional scale. There is no plan for an FM switch-off.

In some European countries there is some community radio interest to involve in DAB radio developments. In *Austria* Orange community radio might join a future Vienna multiplex. The community media federation of the Netherlands OLON will put a claim with the Ministry of Economical Affairs (including Telecom) for 50-100 coverages in Band III. But it seems that this is met with a very low interest by the 280 licensed public local stations.

In the three countries with a significant DAB presence (more than 12 percent listening on a weekly basis) *Denmark, Norway* and the U.K. community radio are still not on board at all. It should be noted that in those countries the community media sector is strong especially Denmark with the highest level of state funding in Europe. The FM platform is fiercely defended by the Nordic community radio sector and any interest to go DAB instead is still difficult to find.

The major obstacle for community radio to go DAB is the high costs of a transition from FM, which will not be funded by any government in the Nordic countries. Community stations will not venture to leave FM before most listeners also have left this platform. It is deemed necessary to have a considerable overlap period with both an analogue and a digital platform respectively. How to finance parallel transmissions costs for community radio for a period of perhaps 5-10 years is still an unanswered question. A transition to DRM+ will also be an economic burden for community radio but at a much lower level.

For community radio in *Denmark* might be developing in a paradoxical way. An FM switch-off for the major radio channels is set for 2019 with transition from FM and DAB to DAB+. However as community radio rather stay on FM there is on the political agenda a suggestion that community radio should be moved from FM to the Internet. As non-governmental radio stations cannot be forced off the FM band the government will have the decisive power by

[45] http://www.ncoa.gov.au/report/index.html - The Australian National Commission of Audit has now recommended abolishing the grants in in the Communications Portfolio for the Community Broadcasting programme. Community radio is at risk being forced off air if the recommendations will be accepted by the Australian Government.

directing all state funding to community radio, which broadcast exclusively online. [46] This is of course a method to force small-scale radio stations into the DAB fold thus avoiding any legal challenges.

But there is an increasing interest to discuss alternative systems as DRM+ is seen as a low-cost and flexible system compared to DAB/DAB+

7. Digitalization and European Community Media Policy

There is a growing need for citizens' media (including community radio) for access to relevant networks, active citizens participation in media services. Also there is a need for further development of 'mass communication services' next to 'peer-to-peer-services' as a necessary safeguard for 'public discourse' and 'public sphere'. Democracy needs platforms for expressing and exchanging (political) views and for articulating cultural identities.

As a core ideology for community radio transmitter independence is important. Being distributed by a multisector platform owned or operated by state or commercial interests network neutrality should be guaranteed also for community radio. Also access to such networks should be on must carry basis.

At the Council of Europe conference in Belgrade CMFE spokesman Pieter de Wit stated that

> We need FM frequencies, access to cable networks and access to new digital networks. Especially the digitalization of broadcasting is a challenge. New technologies tend to facilitate large broadcasters and to deny the special needs for small-scale broadcasting. But new technology is meant to offer more, not less possibilities. Technology has to serve media policy, not dictate it.[50]

There is general consideration and support regarding the allocation of both analogue and digital platforms for community radio in two important European policy documents:

1. *Council of Europe*: The Declaration of the Committee of Ministers on the role of community media in promoting social cohesion and intercultural dialogue as adopted in 2009 by the Committee of Ministers of the 47 members states of the Council of Europe, in where it Draws attention to the desirability of allocating to community media, to the extent possible, a sufficient number of frequencies, both in analogue and digital environments, and ensuring that community broadcasting media are not disadvantaged after the transition to the digital environment.[51]

2. *European Parliament* resolution of 25 September 2008 on Community Media in Europe, in where the Parliament "Calls on Member States to make television and radio frequency spectrum available, both analogue and digital, bearing in mind that the service provided by community media is not to be assessed in terms of opportunity cost or justification of the cost of spectrum allocation but rather in the social value it represents."[52]

[46] When the digital terrestrial network was opened for community television the Danish government cut off all state funding for community television exclusively broadcast on cable.
[50] http://www.cmfe.eu/docs/20131206_Belgrade_PACE_input.pdf
[51] https://wcd.coe.int/ViewDoc.jsp?id=1409919
[52] http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P6-TA-2008-0456&language=EN&ring=A6-2008-0263

The official policy on digitalization of community radio has been stated in co-operation by the two European organisations for community radio, CMFE and AMARC Europe in 2011-2013. The policy regarding the choice of analogue and digital platform is that FM should be retained and there is no urgent need for a transition but in case of digitalization the choice for community radio is DRM+, especially where DAB is often not a feasible solution.

The European Commission

In a letter to The European Commissioner for the Digital Agenda, Ms Neelie Kroes (Dec 19, 2011) CMFE and AMARC Europe concluded that *DAB is in many cases unsuitable for community (local) radio stations. We pleaded for preservation of the FM Band for radio broadcasting and introduction of DRM+ (on FM and eventually even on Band III) standard alongside DAB(+).*[53]

In the response, Ms Kroes of the European Commission is *recognizing that the future of radio distribution will be multi-platform. It is stressed that public policy should be technology-neutral and open to adapt to future evolutions.*[54] This remarks support community media in calls on national governments and regulatory bodies to include DRM+ in their radio digitalization programmes.

The AMARC Europe conference "*Communication Rights in the Digital Environment*" (Brussels May 2012), which included CMFE participation, called upon the European Union and its Member States regarding digitalization

> - To provide specific legal and regulatory conditions that fosters the development of the community radio sector in analogue and digital environments.
> - To ensure the equitable allocation of broadcasting spectrum between public service, commercial and community broadcasting services on analogue and digital platforms.
> - To establish measures to provide public financial support to the sector including assisting community radio services that seek to adapt to digital platforms.
> - To ensure that digital broadcasting technologies and laws allow community radios the right to both own and operate their own transmission systems.[55]

In a statement for ***the Working Group on Communications Broadcast Issues*** (CBISS) meeting in Brussels October 23, 2013, AMARC Europe and CMFE

> strongly support the retention of analogue FM. We do not see the urge for an imminent digital transition nor for a switch off. Without proper considerations for local and community radio such a transition can be detrimental to both the individuals and organizations operating community radio stations as well as their listeners as equipment has to be replaced in both ends. For a future transition, DRM+ as a transparent and low cost system should be available for community radios in Europe, next to the more expensive and complex DAB+ system for some situations. [56]

[53] http://www.cmfe.eu/docs/2011_12_19_CMFE_AMARCEUROPE_DIGITALREVOLUTION.pdf
[54] http://www.cmfe.eu/docs/2012_02_06_The_European_Commission_response_digitalization.pdf
[55] http://www.amarc.org/documents/digitaleu/PressRelease-AMARCItl_HearingDigRadio_EN.pdf
[56] http://www.cmfe.eu/docs/CMFEStatementCBISSBrussels2013.pdf

8. Conclusions and recommendations

The DAB platform was the future digital solution for broadcast radio at its introduction 1995 but after almost 30 years it is now outdated as other more efficient, flexible and less costly systems have been introduced. Also the unchangeable fact is that radio listening online is growing as well as what is the core of radio - music listening in general on mobile and fixed broadband. Trying to squeze hundreds of new music or sports channels on air will have very limited societal or industrial values in any European country. Community radio, which is not entertainment oriented, will not benefit being a part of such a transmission structure.

To use public funding for introducing a platform, which still shows few signs to survive in a free market could be catastrophic putting an additional future burden on the taxpayers.

Altough there are good arguments for digitalize broadcast radio distribution there is no imminent need to completely replace the analogue FM structure for decades ahead. With the exeception of greater metropolitian areas there will be no demand for more on-air frequencies for on-air broadcast radio in Europe.

If the market is not manipulated by political manoeuvering there are strong indications that FM will survive for many decades to come. Although being established by state intervention In some countries as in Denmark, Norway and the U.K. the DAB-system will probably be regarded as too costly and technically outdated for future broadcast radio.

Development of digital platforms could be implemented by a step-by-step process, which will reflect natural demand and possibilities on the broadcast market. Without abandoning the FM band in parallel more flexible and adjustable systems as DRM+ and DVB-T2 Lite can develop.

The newest development of multi-standard chips with all systems included will open a free market for distribution platforms (transmitter systems and receivers). In such a free market the best product will win by being the consumer choice. Not by decree.

The purpose of major broadcasters making a transition from FM to DAB is to increase its powerbase both for audience reach by a multitude of additional channels. Such a transmission structure will not benefit local or community radio. This third sector will be at risk to become marginalized in any multiplex except in metropoltian areas as London and Paris where several community radio stations already operate.

The freedom of a community radio station operating its own transmitter will also be lost. Locating all local transmission platforms into one multiplex will be detrimental to local emergency situations as power breaks. In some European countries with a failing democratic structure community radio stations should also be aware of becoming dependent of broadcast providers controlled by the government or state connected companies. Community radio will always be the indpendent media resource which could be operated and controlled directly by the citizens; not public or commercial radio.

CMFE and AMARC Europe concluded 2011 that DAB is in many cases unsuitable for community radio and pleaded for preservation of the FM band alongside an introduction of DRM+. Adding to this position community radio should actively take a fight for retaining FM.

Community radio stakeholders should also start looking into the possibilities of the vacant VHF band I to be opened for digital radio broadcasting as well as frequencies below 30 MHz using DRM+ and DRM30 respectively.

Community radio could seek cooperation with other content providers on small local or regional DAB+ multiplexes, possibly on the basis of local windowing in regional muxes. But a community radio station should beware of accepting offer from major broadcast providers for space in a multiplex. A community radio station today on FM should ony accept such cooperation if

1) participation is on trial basis,
2) it will be guaranteed keeping its assigned FM frequency and
3) if the costs for the multiplex channel is covered by additional outside funding (public or private).

Community radio is recommended to rather cooperate with other small-scale broadcasters as local commercial radio together developing flexible and low-cost local distribution platforms. This might include cooperation with government authorities and manufacturers but also communicating with European and national politicians in order to counter professional lobbying resources by DAB stakeholders. The technical and economical considerations should be based upon the situation after 2020, not today or yesterday. For community radio the democratic and societal values of digitalization should always be considered.

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