

The digital radio shift.

Before FM extinguishes.

A status report for the Norwegian radio shift

Published by Digitalradio Norway 3 October 2016



What is required on oppløpeti digital radio changed?

11. January 2017 extinguished national FM broadcasts for the first time in world history.

Of all the world's countries, the little store Norway preeminence into a digital radio everyday. But is it necessary? Will it strengthen the radio? What does change for the population? And bear one really accompany radio channels of digital radio sets, now that you have all the world's music and podcasts available on mobile?

This report raises her eyes and looks at media's development and digitalization forward now and look specifically at the situation for Norwegian radio. We look closely at why radio medium has retained a strong position and importance for people. For it was not true that "Video killed the radio star" as The Buggle song in 1979.

The report examines the status of the transition from analogue to digital radio. How many have acquired new radio sets? Is content offer better and coverage sufficient? How much of the listening taking place in digital platforms and the challenges experienced listeners?



The report is published by:
Digitalradio Norway
AS www.radio.no

|| You have coverage, but lack reception "

Other relationships: Hox,

distribution chief for radio NRK tests DAB coverage on a måletur. Reports of missing receipt proving to often act on other matters. Coverage is good, but it is necessary to properly use and installation of radio and antenna.

An exciting radio-year

We are facing a very exciting radio-year. A year where radio cannot easily FM first in the world, area by area, is brave and not deleted will be measured in years to come. They have among other things set the agenda in editorial and social media, both for good and bad of risk. promised us more channels and more diversity. That Normally stock not radio the biggest headlines. It is just there and is very important for many Norwegians.

It may generate headlines and loud Debat-ter when Ola and Karl not get what radio program that he / she should listen to, whether the are on the right path. Deliveries have started and is well underway, cause is the ante-nen or missing setting on DAB radio or the reason but there is still a long way to go would have responded to the lies outside radio listener's control. Meanwhile, it will show that expectations you have created! radio is important for many Norwegians. The more important radio program is for you who are listening, the higher the roar if you miss something. That's just how it is. Let us hope that the majority of appears are from category cheers roar.

Radio, like several other media channels, is facing major challenges. Competition for atten-operations and use is greater than ever. After Century Norwegians increasing slowly but surely. But the number of channels of communication increases far faster. It provides great competition, take note in a limited market with limited resources.

Meanwhile, the battle for funding long tough-re than previously. Yes, we are in no doubt that radio shift is good for listeners and Radio in Norway financed mostly by licensing agents (managers media Norway. We also believe that it is important that closes FM advertising money, but also through other revenue streams such as network area by area, not least in order to save the radio channels. So we wait in anticipation. Towards an even better and broader bingo, gifts and more. It conducting media company today is no joke economic additional costs of operating two radio networks. radio offerings - and a continuation of a unifying media channel in a slightly more modern version! We see almost daily in various media that report on media savings should be used instead to create better content. development. Also radio channel has marked and makes tough times.

It played out a merciless battle for media users and advertising simultaneously. And radio will continue to focus on important topics for many people at the same time. This will lay a good foundation crowns. Radio as a media platform selected DAB as an important tool for even greater diversity of channels and voices, and not least, radio still be a so-called gray-tis medium. With radio in car many would have been historically high internet bills. And it would have caused far less radio listening.

Yes, the risk is there. But we think the risk would have been greater for radio as a media channel by not realizing the decisions that have long been taken.

We are both very positive to the Norwegian radiodigitalisering. Norway took a leading role and

The DAB has Digitalradio Norway, NRK, MTG and Bauer Media with CEO Bjarne Hareide in Digilabs Candinavia and several also placed the bar high, something they CEO Lasse Gimnes GimCom AS



Summary.

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Wednesday, 11.01. kl. 11:11 turned the national FM transmitters in Nordland of.

The biggest and most important consequence of this change is that Norway will have a far greater radio offers and that the differences in channel selection between town and country are being erased. This report shows that most radio listeners are prepared. It is also obvious that the change requires a larger information work than previously thought.

Norwegian listeners are digital pioneers

The report shows that there are one or more DAB radios in 7 of 10 Norwegian households and that radio listeners have a high use of digital radio via DAB networks. 64 per cent of radio listeners use daily from the National communications authority dated September 2016. The last or more digital platforms. Measured in listening time has DAB and FM three years there from the broadcasters' side conducted a thorough survey become regular major platforms. 2.1 million Norwegians'd better uses every week to measure and optimize the DAB-net-tet so that listeners get good week to radio channels that would not exist without radio shift.

More listeners will need help

Population coverage of DAB networks corresponds deknin gene from the best DAB networks. NRK DAB network has 99.7 percent, according to a report from the National communications authority dated September 2016. The last three years there from the broadcasters' side conducted a thorough survey to measure and optimize the DAB-net-tet so that listeners get good coverage. NRK, P4 group and Digitalradio Norway has carried out measurements across the country, where, among other suggestions from listeners is monitored. The physical measurements confirm that the coverage matches dek solution maps on Radio.no.

Many will wait with the car in fire

Although most have acquired DAB radio is only 3 of 10 who say they have DAB in the car. It does however, time is not the radio in the car is low presently but that many are waiting with some more demanding upgrade to extinction occurs. Similar patterns of behavior as one under the digitalisation of television. 60 percent of those who have not dab in the car say they will wait to upgrade to FM broadcasts extinguishes. Today there are only occasionally car models that are not available with DAB by the dealer. For aftermarket is a large variety of car radios and adapters, which can either be installed by the car owner himself or of a workshop.

The need for information about the use of new technologies is greater than previously thought. Many inq-looking to Radio.no and NRK public service is all about problems with reception of DAB signals. In many instances, laughing experiencing listeners bad reception although coverage is good. In other words, an urgent need to ensure good information about installation of antennas and how the digital radios work.

FM broadcasts extinguished county for the county - the last two are Troms and Finnmark, which goes out on 13 December 2017. From then on all national radio channels-digital, the same applies to the commercial city canals.

1

Radio can stand in the fight for the public's favor.

Digitalisering av media

All trades and industries upside living major upheavals and changes through digitization and continuous technology development. Most media have experienced considerable changes both in content, production and distribution side. Where the Internet's emergence first gave media new distribution opportunities for home contents they produced, the deck's rapid growth in the use and possibilities challenged media business models and competition for audiences in recent years.

Faced with new technology and a digitized everyday encounters traditional media several challenges.

Newspapers and magazines

Newspapers and magazines are isolated the media channels that have undergone the greatest change so far. Internet's most popular A-learn "refuges" for users quickly got online newspapers. In the competition traffic poured newspapers and magazines out home contents its freely available to click loving netizens. It gave papers sovereign digital positions and amount of space to sell to advertisers. Although advertising revenues replaced the drop in loose-revenue growth was nettannon-tion so high that the medicated fear of bad economic times.

television

The traditional TV media have experienced a decline in their support in recent years, while people's habits of consuming television and video content has changed. Although the use of so-called linear television (live) is high, one is witnessing a major shift in which several actors such as Netflix and Youtube taking an increasing share of consumption. TV media in Norway were digitalized in 2009, when they extinguished the analogue terrestrial network. The reason was that the analogue network did not have enough capacity to carry the channel offer Norwegian broadcasted esters wanted to reach audiences with.

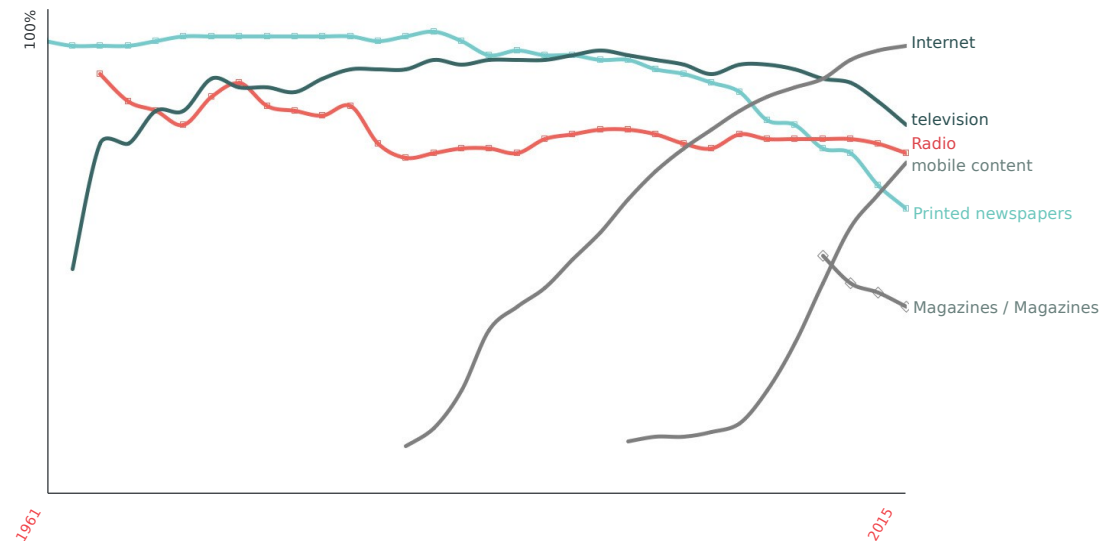
In parallel, major global players like Google and Facebook has taken action on network users and simultaneously developed services and systems that advertisers would-pulls. The traditional paper media are now facing significant ad revenues-ter disappears while payment willingness of users is limited and global players take the role of gatekeeper.

Radio

Radio has some of the same challenges that TV had before digitization. Analogue broadcasting (as FM) is still carrying a shortage of frequencies. In the analogue broadcasting world, it is the nature of frequency resources that is limiting the number of radio channels. Analogue broadcasting will therefore not be able to provide radio with the ability to provide listeners with a wider range. This limits radio's opportunities in the increasingly fierce competition for people's time and attention.

Although support for radio remains stable and high at all ages, it becomes increasingly more challenging to reach younger target groups. They grow up without radio as one of the few mass media, and they can also find entertainment, music and other content on the web that engages them.

Media ducts support historically



Source: Kantar TNS



**VIDEO
NEVER KILLED
THE RADIO
STA**

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N

The Buggle was wrong

In 1979 gave MTV world music video. And with the video "Video Killed The Radio Star" got one said what you expected to happen with radio. Slik did not happen.

Radios fundamental characteristics have given radio to retain its strong position and high consumption, although listeners through technological development has received both TV, MTV, CDs, MP3s, web radios, streaming, the internet and podcasts.

When these properties combined with engaging and good content then fills radio simply an entirely separate matter, which no other media until now has managed to take.

The explanation behind the radio medium stable popularity.

Where is as explanation for the radio medium popularity largely by-remains unchanged and unaffected by changes in the same way as other media channels? The radio has some basic characteristics that it is alone, and it does not require anything of you than that you turn it on.

Free

Radio has always been without cost to listeners. For radio, this is an important attribute, which has ensured that everyone, regardless of situation have free access to the same radio content. On some digital platforms, which we return to in Chapter 3, there are gatekeepers who do not provide the necessary guarantee that radio should be free for listeners.

simplicity

The radio is just there, and it requires nothing of you. It serves up a continuous stream of content after desire you have. Radio has always been just "a switch" away. And by "turning a bit on the dial" has been able to find something new.

When you do something else

One of the foremost characteristics listeners mention when they are asked what radio means to them, the possibility radio enables you to do something else while using it. This is a position that radio is the only - when all other media channels and services screaming for your primary and full attention. A competition that just gets harder and harder and that most lose. There are radio encountered as a secondary medium.

Available unlimited

Through well-developed broadcasted stuff online that send a common message to all recipients ensures that anyone can receive and listen to the same content.

2

radio Norway

Norwegian radio is diverse. Three national and more than two hundred local and regional actors are behind a rich offer of channels, which contributes to the Norwegian radio perform better than radio outside the country in an increasingly tough battle for listeners, viewers, readers and

users.



national players

- The Norwegian Broadcasting Corporation (NRK)
- P4 Group, owned by Modern Times Group (MTG)
- Bauer Media Norway, owned by Bauer Media Group (BMG)

NRK is the country's state-owned general insurance, throwing with a leading position both on television, radio and internet. MTG and BMG engaged in commercial activities with advertising funded radio channels. MTG is an international media and entertaining solution group that in Norway scroll behind TV3 and Viasat, in addition to P4 group. The Group is listed on Nasdaq OMX Stockholm. BMG is a verdensomspennende softening media group with more than 300 magazines in 15 countries, as well as onlinevirksomhet and TV and radio stations, with headquarters in London. In Norway Bauers's channel Radio Norway

Regional and local actors

In addition excites a number of regional players and smaller local radio stations. Outside the national radio operators there acc. Media Authority list as of 20 September 2016 a total of 209 local radio licenses. Since 2013, the number of reduced-listed from 250 local radio licenses. Among the local players are both big regional players with multiple licenses and radio channels, as well as small independent licensees sharing airtime with others.

Among the major players in the local radio market we find 21st Venture, Nea Radio, Hedmark radios, Jærradiogruppen and Radio 102. In addition, P4 group a significant position through P5- and NRJ channels.

Type	Dekning	Radiostasjon	Eier	Finansiering	Dekningspro sent	Distribusjon ^{2,3}	Etablert
Offentlig	Nasjonal	NRK P1	NRK (Staten)	Lisens	99,5/99,7	FM/DAB	1933
		NRK P2	NRK (Staten)	Lisens	99/99,7	FM/DAB	1984
		NRK P3	NRK (Staten)	Lisens	96/99,7	FM/DAB	1993
		NRK Klassisk	NRK (Staten)	Lisens	92,8	DAB	1995
		NRK Alltid Nyheter	NRK (Staten)	Lisens	99,7	DAB/FM	1997
		NRK Sápmi	NRK (Staten)	Lisens	99,7	DAB+/FM	1999
		NRK mP3	NRK (Staten)	Lisens	99,7	DAB+/FM	2000
		NRK Super	NRK (Staten)	Lisens	99,7	DAB+	2007
		NRK Sport	NRK (Staten)	Lisens	92,8	DAB+	2007
		NRK Jazz	NRK (Staten)	Lisens	92,8	DAB+	2008
		NRK P1+	NRK (Staten)	Lisens	99,7	DAB	2013
		NRK P13	NRK (Staten)	Lisens	92,8	DAB+	2014
		NRK Folkemusikk	NRK (Staten)	Lisens	99,7	DAB+	2004
		Regional 16 regionale sendinger	NRK (Staten)	Lisens	..	FM/DAB	fra 1957
		NRK Vær	NRK (Staten)	Lisens	99,7	DAB+	2007
Privat	Nasjonal ⁴	P4	MTG	Reklame	80/92,8	FM/DAB	1993
		Radio Norge	Bauer Media	Reklame	92/92,8	FM/DAB	2004
		P5 Hits	MTG	Reklame	92,8	DAB+	2010
		P6 Rock	MTG	Reklame	92,8	DAB+	2014
		NRJ	NRJ/MTG	Reklame	92,8	DAB+	2010
		P8 Pop	MTG	Reklame	92,8	DAB+	2015
		P7 Klem	MTG	Reklame	92,8	DAB+	2011
		KISS	Bauer Media	Reklame	92,8	DAB+	
		KISSTORY	Bauer Media	Reklame	92,8	DAB+	2015
		Radio Soft	Bauer Media	Reklame	92,8	DAB+	
		Radio Rock	Bauer Media	Reklame	92,8	DAB+	2013
		Lokal 209 lokale konsesjoner	Diverse	Diverse	..	FM/DAB/DAB+	Fra 1982

listener Participation

The total radio listening in Norway has been stable for many years. The official listening figures from Kantar TNS shows that Ola and Kari has made few changes in their'd better-tervaner the last 20 years. In 2015 listened 3 million Norwegians on average on radio 89 minutes every day.

Looking at the breakdown between the various age categories, the figures from Kantar TNS that age group over 60 years are the most loyal radio users, such situation also in terms of traditional TV viewing. Persons over 60 years listened averaging on radio 133 minutes in

2015.

Least radio listening is in the age group 12 to 29 years, but even here the figures have been stable in recent years. People in this age group listened averaging on radio for 54 minutes in 2015. The corresponding figure for al-there's group 30-44 years was 77 minutes and the age group 45-59 years 96 minutes.

NRK

NRK had 65.4 percent of the total radio listening in 2015 and thus far the biggest audience figures when viewing all channels combined. Greatest of all Norwegian channel NRK P1 was 44.6 percent of all radio listening. NRK P2 had 4.2 percent of radio listening in 2015 and P3 had 7.1 percent.

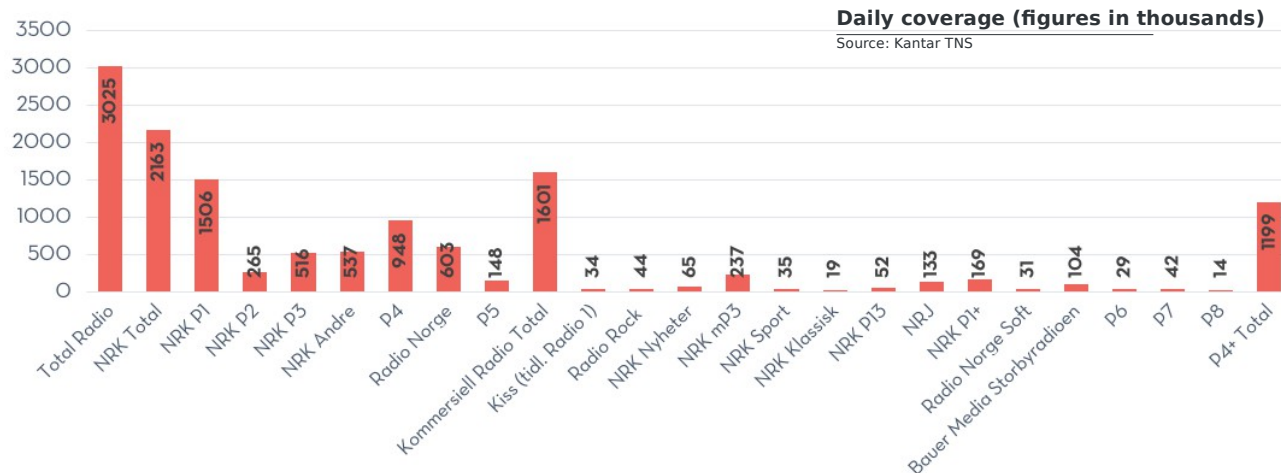
P4 Group

P4 Group (MTG) last year accounted for 20.1 percent of the total radio listening in Norway, and was with the second largest radio operator in Norway. The radio channel P4 alone had 18.5 percent of radiolyttin gene.

Bauer Media

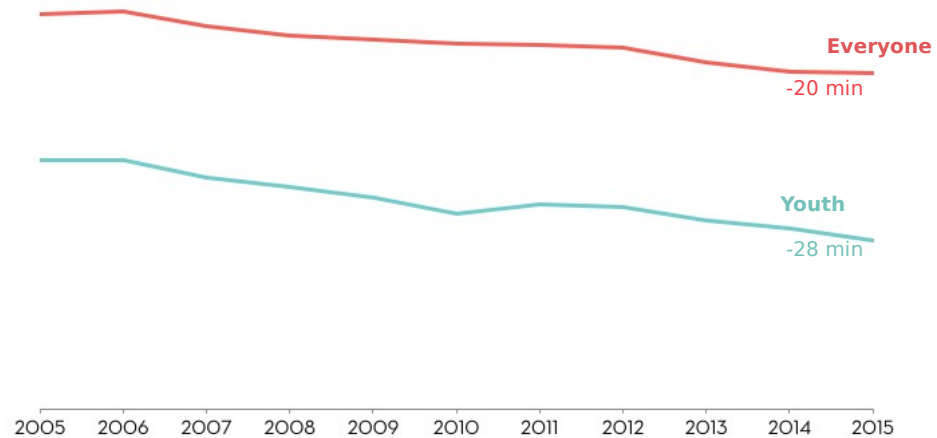
Bauer achieved in 2015 12 percent of the total radio listening in Norway. Greatest in Bauer in Norway was Radio Norway

with 9.6 percent of the listening.



Development of listening time Europe

Source: EBU



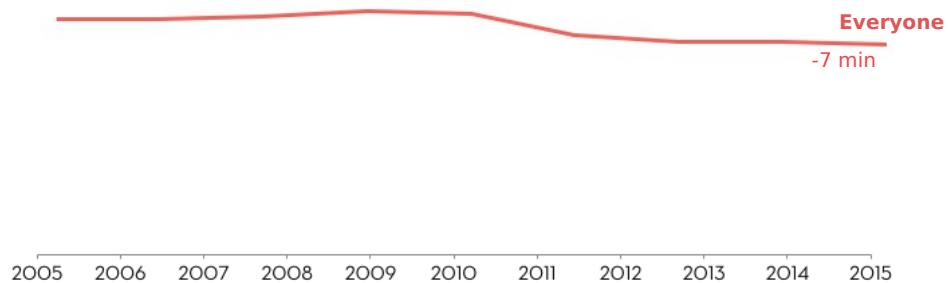
Radio losing time in Europe. Ikke in Norway.

Developments in radio consumption in Europe shows that the time spent on radio becomes smaller, especially in younger audiences. In Norway sees this differently. The last four years, while digitized radio and increased radio promotion, has thus consumption

remained stable, even among younger audiences.

Development of listening time Norway

Source: Kantar TNS





Digital radio in Norway

Radio shift is more than DAB.

Digital radio means that the listener can access the radio via digital platforms and the signal transmitted digitally. It can either be broadcast via DAB, Internet radio via digital TV.

Digital Audio Broadcasting (DAB)

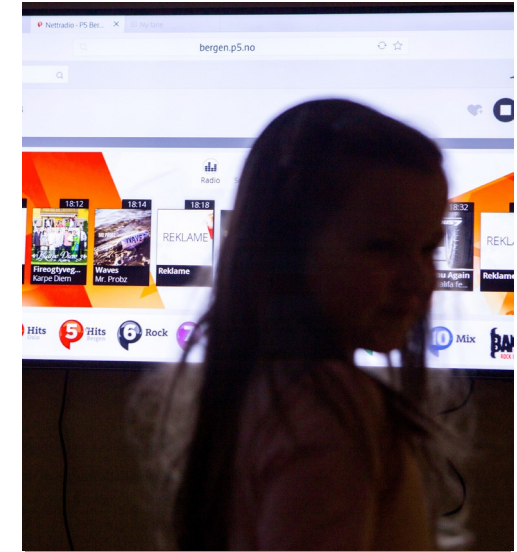
DAB is a standard for broadcasting digitized audio means that a weaker DAB radio signal does not in which the modulation, or "technique" to transmit provide worse quality, such as the FM reception, but radio signal is digital. As a listener, you need a DAB by excessive loss of data packets are instead silent. radio to receive these radio signals. DAB technology makes it possible to transmit more radioka signals in the same frequency range, while FM technology only allows access on one channel by. frequency

Just as by broadcasting via FM radio signals freely avail-cost and no charge to the listener. DAB maintains thus the basic the properties of radio as we discussed the preamble respectively in Chapter 1.

Signals from different transmitters and reflections from hills and mountains disrupt radio signals on the FM band. While this type of radio-echo and signals from multiple transmitters causes amplified signals for DAB. This makes DAB suitable for Norwegian topography and is a major cause of that DAB provides a shed-refri radio experience. Lost information be corrected with error correction in DAB ra dioens decoding, ie lost Datapak ker rectified or received again. The

DAB / DAB +

DAB is often used as generic term for both DAB and DAB +. The technology bar first term DAB, but has since gotten a technical upgrade and been developed to DAB +. DAB + implies a more efficient encoding of sound and fit more channels on the networks without sound degradation.



Internet radio

Radios that support DAB +, game agents also the original DAB format. Older radios do not play DAB -shaped-tet. There are no records showing how many radios purchased with DAB or DAB +. It was sold about

300,000 digital radios in Norway between 2006 to 2010, but the figures do not distinguish between DAB and DAB +. The first DAB + radios hit the market in 2007. The vast majority of radios sold in Norwegian in 2009 has been DAB + radios.

Channels transmitted in either DAB or DAB +, see complete list in the table in the previous chapter. NRK has announced that their other channels are added on to DAB + concurrently with FM extinction in Nordland, January 11, 2017.

Radio or radio via IP means'd better harvester using the internet or mobile network for listening to radio. The cell phone, computer or radio station with internet access. Radio via the Internet means that the transmission of radio broadcasting are broadcast in DAB. sense that anyone who listens receive the same signal, but that each one is listening receives a unique audio stream. Radio stations wishing to make broadcasts their available via IP, do not invest in transmission network as one does in a broadcast, since one uses the capacity and the technology is in internet and mobile networks to send and listen to radio. Radio stations must instead buy or rent server and dat akapasitet. At the receiving end it means that the listener has to pay to listen to the radio, all the time data and mobile traffic costs pretty-ger. Radio over IP is therefore introducing so-called gatekeepers between the listener and

radio channel. Such gateways can be telecommunications and mobile companies and means that radio does not automatically is freely available to the public, so it is broadcast via FM or DAB. Ever since the Internet's entry into the mid-90s has offered listeners streaming radio sound both as an alternative to FM, but also in terms of egenprodu-ed radio channels and through avail-ment and distribution of content "on demand" or as podcasts. Distribution of radio via Internet has been an important satsningsom-advise for Norwegian radio operators in a årrek-ke. In coming years, this will probably be an even more important distribution channel for reaching especially young users.

Radio via digital television

Digitalization of TV has also done radio channels available to listeners in the same way as TV channels. All to-bidders of television in Norway also lets you listen to radio via their decoders and set-up boxes. In practice this means that all Norwegian homes have access to digital radio while

they have a TV deal.

regulatory issues

National FM broadcasts extinguished during 2017 thus all national sent radio transmitted exclusively digital plat-forms. All local radio stations, besides the major commercial channels in big cities, have extended the FM licenses with five years and can then choose whether they want seeking analogue and / or digital distribution.

To send radio DAB need a content licensing, construction licenses and frequency authorization.

Construction license and frequency authorization granted gathered for a joint statement from the Media Authority and National communicationsmyndighet (Nkom). Holders of such permits referred to as "operator".

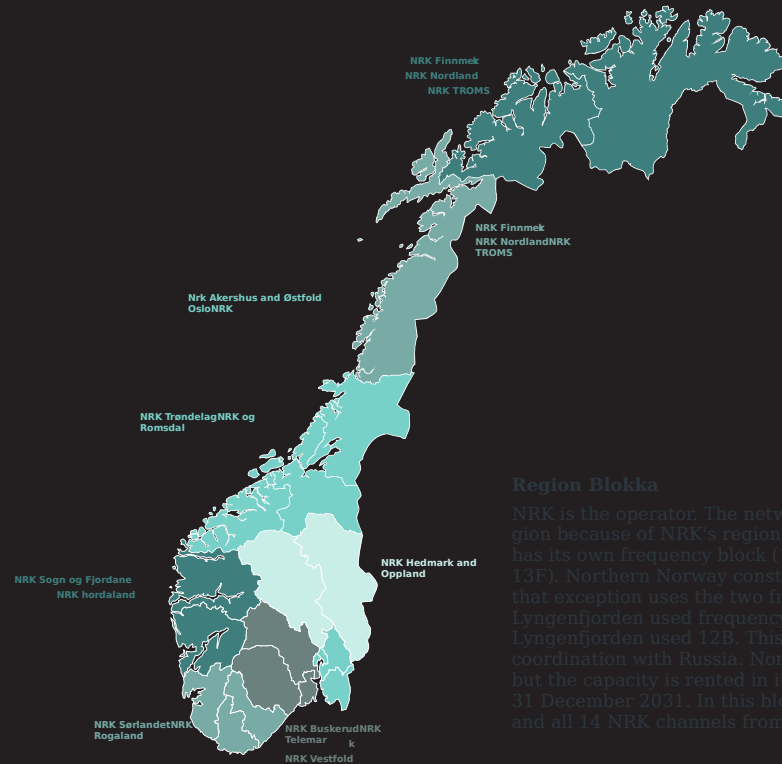
Content Licensing awarded by Medietilsikt and presupposes that one has entered into an agreement to lease capacity of the operators-clean where you want to send.

Less resources to NRK

In FM band NRK allocated approximately 2/3 of the frequency resources. For DAB this image is completely changed, here NRK only 1/4 of the capacity that is available for radio.

Frequencies and networks

The development of DAB in Norway is done through various broadcasting DAB. These transmitter networks are referred to as "blocks" and one has through international conferences frequency negotiated frequency resources for four transmission network with the possibility of coverage in the country.



Region Blokk

NRK is the operator. The network is divided into 7 regions because of NRK's regional broadcasts. Each region has its own frequency block (12B, 12C, 13A, 13E and 13F). Northern Norway constitutes a DAB region, but that exception uses the two frequency blocks. South of Lyngenfjorden used frequency 13E, while north of Lyngenfjorden used 12B. This is due to frequency coordination with Russia. Norkring owns the network, but the capacity is rented in its entirety out to NRK until 31 December 2031. In this block sent 10 NRK channels and all 14 NRK channels from January 11, 2017.

Riksblokk 1

Norkring (Telenor) is the operator and owner of the network. Uses frequency block 12D across the country. Network capacity is leased to Bauer Media and Digitalradio Norway until 31 December 2031. Digitalradio Norway rents on the capacity to P4 Group and NRK. In this block sent the going-cial national channels and 4 of NRK's channels until 11 January 2017.

Riksblokk 2

Norkring (Telenor) is operator and fremti-dig owner of the network as possibly developed. The network will use frequency blocks 11A and 12A in order to cover the whole country. The network is not developed, except in Trondheim regions where Digitalradio Norway will lease capacity for distribution of local radio until December 31, 2016.

Local radio Blokk

Local radio block is divided into 37 regions, where each region may have its own operator. Until 31 December 2016 it has been opened for test broadcasts in local radio block for players who want to have digital test transmissions. 6 local DAB network is in trial operation at present and has a total offering of 47 channels.

During 2016 it awarded konsesjo wells and permits with effect from 1 January 2017 the following operators: P4, Hedmark radios, JærRadioGruppen, Kristiansand local radio, FK Haugesund, Romsdals Budstikke, Nea Radio Comp Event, Radio 3 Bodø, Radio Bardufoss, Radio Tromsø, 21. Venture, Radio Link Telemark, Mediehuset KSU 24/7, Radio Bo and Nordavis. Altogether 29 of the 37 regions allocated so far.

4

Status and
implications for
listeners at
present

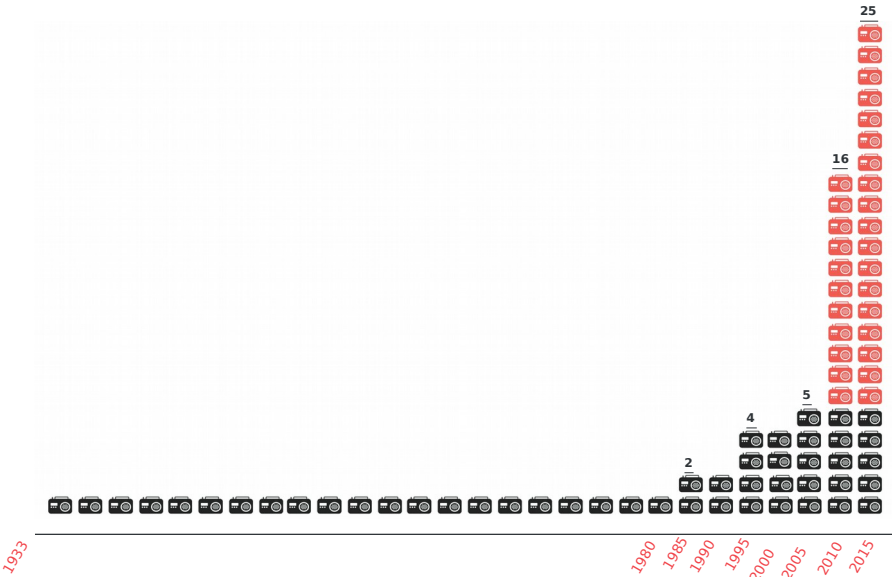


Content Growth and a fairer radio deals

With analog radio went country radioinn ratio of 1 FM. And even among local radios are the big cities, national radio station in 1933 to 5 national radio that have the greatest offer. Therefore, many channels in 2004 (NRK P1, NRK P2, P3, P4 and Radio Norge) - a very modest development over the past 70 years. In addition, the Norwegians since 1982 had digital radio shift erased dif-sit between town and access to local ra diokanaler spread across the country out. 92.8 percent of the population has received 25 national channels, 99.7 percent are from radio stations in the country, at present this offer is 11 January 2017 all NRK's programming distributed on 14 channels (currently 10 channels).

Although the total range of Radiokana particles thus Radio has always played a crucial role in may seem extensive, there have been major safeguarding Norwegian language, culture and differences in radio promotion, depending upon where diversity. With a larger and more similar service to you live. One riksdag-growing radio channel, NRK P1, the entire population is maalse solution to has reached out to the entire population (99.5 percent) strengthen radio's ability to continue to play a vital through role.

Number of national radio channels in Norway from 1933 to today.



The digital mertilbudet

The nationwide channels

Of the country's 25 national radio channels are all 20 of them already, about 50 percent of the population solution in primarily on DAB distribution and / or originally established on DAB. In addition to national channels an offer of local radio on DAB. Without digital broadcasting would not these channels existed as they will grow continuously from next year when a number of nationwide offer. More channels such as NRK P1 +, would not exist as they will grow continuously from next year when a number of regions in Lokala-dioblokka are being planned.

local channels

NRK Classic NRK P1 +
NRK mp3 NRK radio
super NRK FOLKEMUSIKK
NRK Weather NRK Sport
NRK Sápmi NRK Jazz NRK
Always New NRK P13 P5
Hits

P6 Rock P7
Squeeze P8 Pop
KISS Tory Radio
Rock Radio Soft

PesjuP9 Retro Radio
247Solørradioen +
Panjab Radio Silk
Road
RadioScansatRockKla
ssikerOrdentlig
RadioVOXLO Radio

Radio Skjeberg Radio
Vision Radio
Trondheim Christian
Radio West

Norwegian listeners are digital pioneers

Norwegian radio listeners have rapidly adopted digital radio. The proportion of daily radiolyt esters using one or more digital platforms, has now risen to 64 percent. DAB and FM are now even major platforms in terms of listening time. 2.1 million Norwegians are listening weekly radio services that would not exist without the digital radio shift.

Norwegian radio listeners have acquired and deployed digital radio quickly and is now the world leader for listening via digital platforms. Kantar TN since 1993 has been responsible for the official lyttertallsmå-tions in Norway and is also behind Digital radio survey, which since 2012 has followed the development of the knowledge, possession and use of digital radio.

Overall digital use among daily ra diolyttere are per Q3 16 **64 percent**. For DAB alone usage figure 54 percent, 19 percent for radio and 13 percent for digital TV.

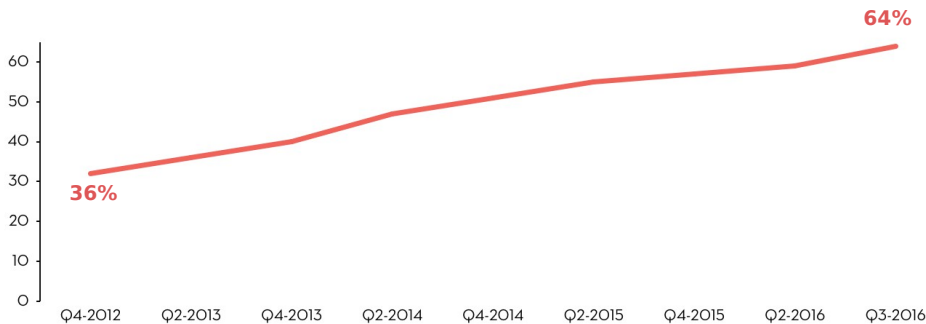
Share of total listening time
In addition to daily use has Digitalradi-undersøkelsen also begun surveying-ge how much time listeners spend on the various platforms. Measured in listening time is DAB per Q3 approximately equal platform FM. Taken together the digital platforms a greater proportion (57 percent) of listening time than FM.

Norwegian radio listeners have adopted digital radio faster than other markets, and the use of digital platforms has increased steadily. This has occurred in line with the increase in the supply of radio channels, increased coverage for DAB, increased access to good digital radio sets and the decision to extinguish FM.

Distribution of listening time shows that hovedvekten of listening in the home is via DAB, but the FM still generates more listening time in the car than DAB.

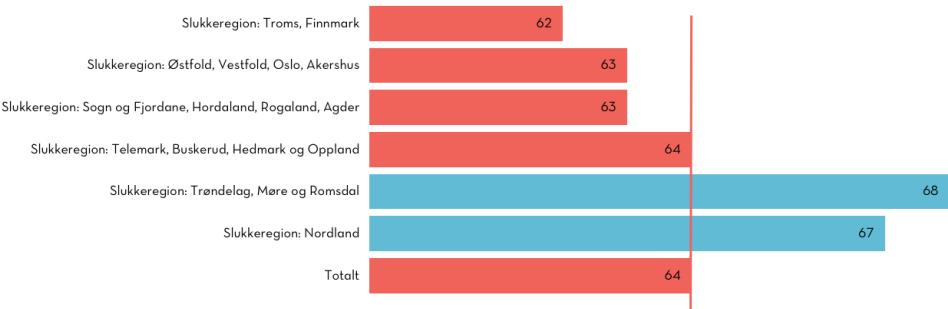
Daily listeners who use digital platforms

Source: Digital radio survey Q3 16



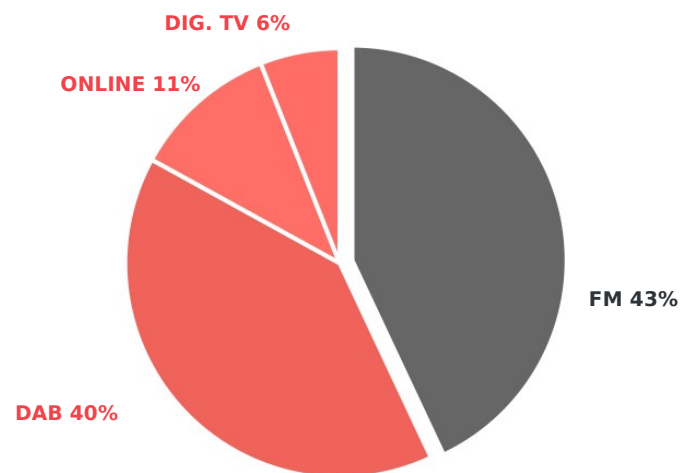
Daily listeners who use digital platforms pr. quench region

Source: Digital radio survey Q3 16



Share of listening time for different platforms

Source: Digital radio survey Q3 16



2.1 million Norwegians

listening to stations that had not existed without radio shift.

A review of the listening figures for the various radio channels show that the population has largely adopted the digital offer.

2.1 million Norwegians listen weekly to radio channels that would not have existed if it had not been for the digital radio shift.

No difference between city and country.

Digital broadcasting network for radio, which makes it possible to broadcast several radio channels on the same frequencies have blurred distinctions between the major towns and villages around the country. The biggest and most important consequence is that everyone in the country gets a much larger channel offers.

The development of DAB in Norway is done through various transmission network for DAB, as discussed in Chapter 3. This means that the solution for the various transmitter networks are not exactly the same.

NRK DAB networks

Norwegian Post and Telecommunications Authority (Nkom) estimated in January 2015 population coverage on NRK DAB networks ("Region Blokk") to 99.5 percent, corresponding NRK P1 coverage on FM. In addition to this NRK has also commissioned several new transmitters, and an updated assessment made by Nkom in September 2016 shows that the coverage is improved further.

New estimates and judgments made by Nkom in September 2016 concluded that population coverage in Region block increased by approximately 0.2 percentage points to an estimated 99.7 percent. In January 2017, NRK will send all of its radio stations on DAB +. Nkom conclusions

valuers with the transition to DAB + can provide a more robust signal and better sensitivity named. This is depending on the layout, further accelerating population coverage. As of 1 January 2015, NRK P1 FM networks by comparison a population coverage of approximately 98.6 percent in FM stereo, mono-coverage is estimated at 99.6 percent, according Nkom.

Nkom has calculated the coverage on all the European, national, county and municipal roads in Norway. These calculations show that the coverage on NRK DAB network in Region block is better than the coverage on FM.

NRK P1 in stereo quality on the FM network.

Veikategori	DAB-coverage	P1 FM-coverage
Europavei	91,2 %	85,6 %
Riksvei	91,5 %	87,7 %
Fylkesvei	92,8 %	88,6 %
Kommunevei	95,6 %	93,0 %
Alle 4 veiklasser	93,2 %	89,3 %

Commercially DAB networks

Lowering DAB has not been a requirement set by the authorities in connection with radio digitalization and the transition from FM to DAB. NRK has yet tested coverage along the coast by and have summarized the results of these measurements in a separate report that was submitted to culture minister in August 2016. The document states NRK delivers DAB coverage at least 27nm (50 km) from shore, and some places even farther out. DAB coverage offshore is generally good. The goal Impure was re-implemented in four different areas: Vesterålen / Andenes, Lofoten / Ballstad, Alesund / Fosnavåg and Vikna / Å. The measurement locations were selected because they are important for kystfishing.

Commercially DAB networks

Norwegian Post and Telecommunications Authority (Nkom) estimated in January 2015 population coverage on the commercial DAB network ("Riksblokk 1") to 92.8 percentages. This means that all national-commercial radio stations have received equal coverage.

Local radio The DAB network

Until 31 December 2016 it has been opened for test broadcasts in Lokalradioblokk for players who want to have digital test transmissions. 6 local DAB networks are in test mode at present. Nkom has not measured coverage of these networks, but the fine-tuning coverage maps radio.no/dekning.

Coverage in tunnels

NPRA is responsible for installing DAB reception in tunnels so that all tunnels where one already hears radio



get coverage within one extinguishes FM in 2017. This is being done in connection with the development of the emergency network and it is laid to install DAB in all new tunnels over 500 meters and all existing highway tunnels over 500 meters having an average annual daily traffic of over 5,000 cars. When the system with emergency network and DAB reception is extended, the road authorities send out emergency messages to road users over the radio by breaking into all available DAB + channels. In addition, given traffic messages.



measuring Tours

The last three years have been carried out a thorough mapping for optimizing DAB network so that listeners get good coverage. NRK, P4 group and Digitalradio Norway has undertaken regular measurements in more than three years and pragmatic spoken covering land and sea. Altogether the elapsed more than

Places without coverage

Although population coverage NRK and commercial actors channels is better on DAB than what it has been in FM does not mean that one can take into radio signals absolutely everywhere. In a country like Norway will always be greedy branch tea coats and 40,000 km on Norwegian roads spread over 56 geographically challenging locations that do not receive DAB signals, in the same way as it has always been places without FM coverage. Nkom believes that it



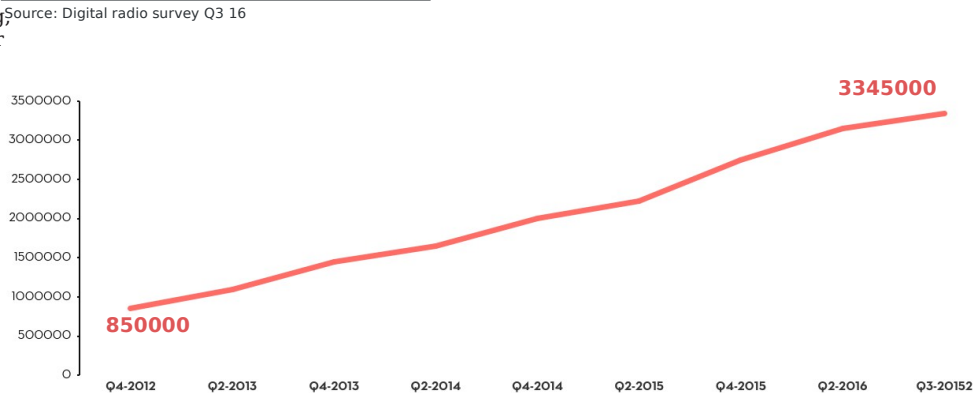
still be.

Devices in the market

In Norway, the distribution of radio prevalent on all radio listeners prefer to use tra tional broadcasting digital platforms and there is good distribution of rather than IP-based streaming radio via eg mo-car instruments that give a publication date manhole phone or computer. Even when the national FM broadcasts disappears we-looking figures from Kar includes computers, mobile phones, digital TV tuners and NS Norwegians still have very many devices that and various types of DAB radios and DAB ADAP-ers suitable for radio reception.

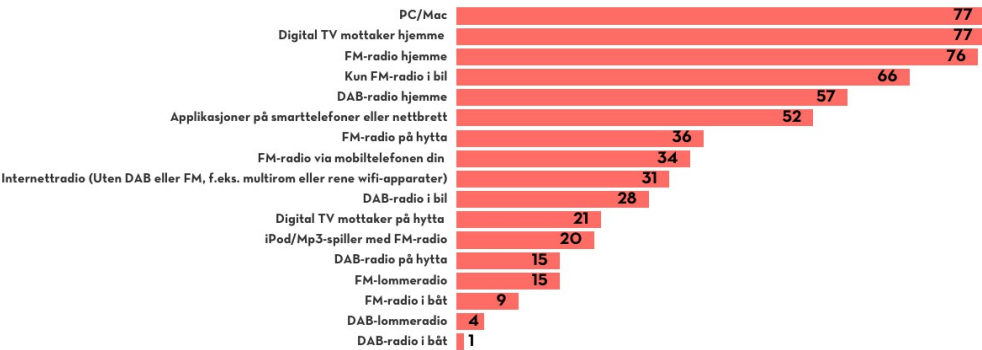
Norwegian radio listeners can thus freely well-ge the Number of DAB radios in Norwegian husstan-when platform they prefer. In a review of listening figures in Q3 2016 was roughly 3.3 for the various digital platforms, we see that millions.

Estimated number of DAB APARAT in Norway



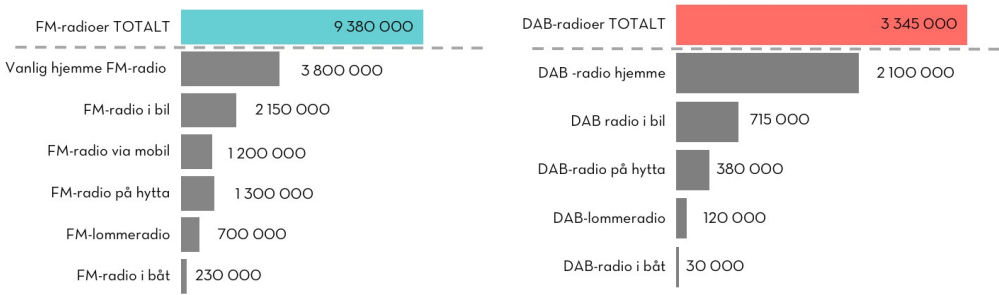
Accessibility equipment for radio listening in Norwegian households (%)

Source: Digital radio survey Q3 16



Estimated number of FM and DAB appliances in Norway

Source: Digital radio survey Q3 16



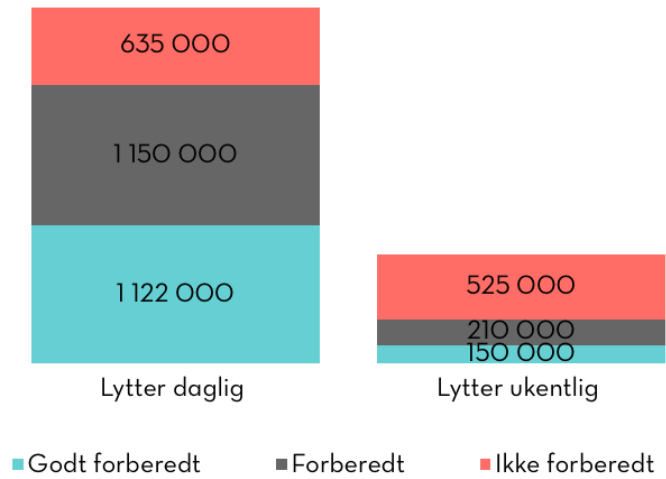
Listeners' degree of preparation

An analysis Kantar TNS made by listener figures and figures for possession and use of digital platforms, shows that 8 out of 10 daily radio listeners are well prepared or prepared for the digital radio shift. The figures are taken from the Digital radio survey for Q3. Analyzes indicated that nearly 2.3 million daily radio listeners are wholly or deldigitale in their radio use. However, there still 635,000 listeners that are not

prepared and exclusively analog listening habits.

How well prepared is different listeners?

Source: Digital radio survey Q3 16



Well prepared

Listening daily / weekly / monthly / rarely / never on radio.**and** Have DAB radio at home and / or uses radio / digital TV to listen to the radio.**and** Have DAB radio in the car if they have a car.

Prepared

Listening daily / weekly / monthly / rarely / never radio,og **either** Have DAB radio at home and / or user nettra-dio / digital TV to listen to the radio.**or** Have DAB radio in the car if they have a car.

not prepared

Listening daily / weekly / monthly / rarely / never on radio.**and** Do not DAB sets, do not use radio / digital TV to listen to the radio.**and** Do not DAB radio in the car if they have a car.

When an error has not "DAB adapter in car" have been clarified in the query text on ownership of radio equipment. This may have led some respondents were unable to copy and re-tered DAB adapter radio in car. DAB ADAP-ter will be included in the query text in the next measurement period and become part of the results at the next reporting.

DAB radio at home

Access to Products

DAB sets for home-mebruk has long been widespread, and today ra dioutvalget with all the electronics arts shops dominated by DAB. If it still sold FM radio commits sell themselves to state this. Figures from the Electronics industry in recent years shows that it sold about

700,000 DAB radios annually. The total market for radio has long been around 800,000 units per. year in Norway, and di-gitalradio sales have thus largely replaced sales of analog sets. Mu zig systems where radio is only one of several sources are still without DAB, but many of these have the opportunity to listen to the radio via the internet.



Bilutfordringen

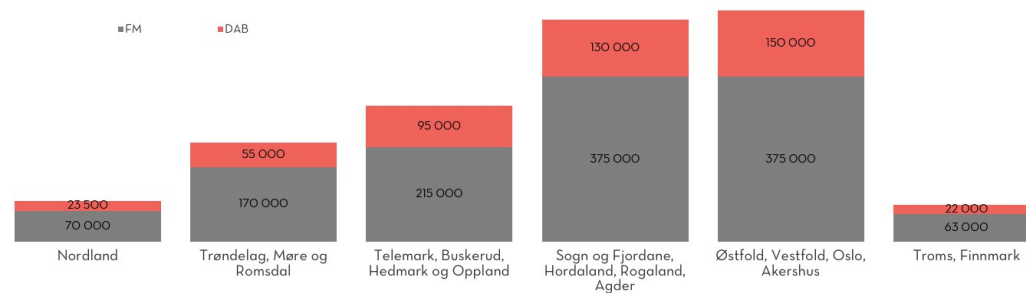
The survey "Cars and car radios" from TNS, completed in May this year, showed that 3 out of 4 with DAB was used more often than car radios that Norwegian cars used daily or almost daily, while 65% had only FM. The survey also showed that the car radio responded that the car radio is used daily or almost daily. By dis-watch had approximately 0.5 million car radio-ne DAB, while about 1.3 million only

The graph below shows how this is distributed among the various regions quench

country divided into the following year.

Daily or almost daily use of car radios

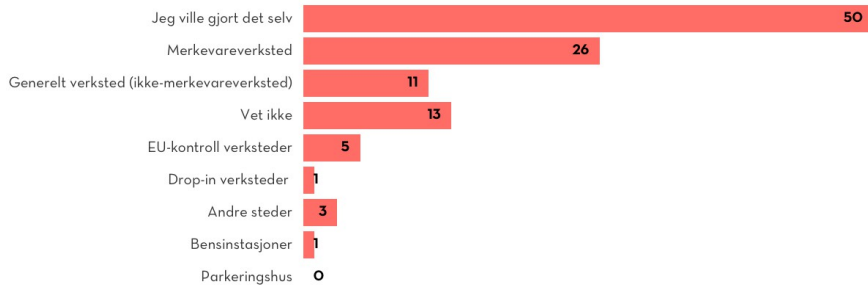
Source: Digital radio survey Q3 16



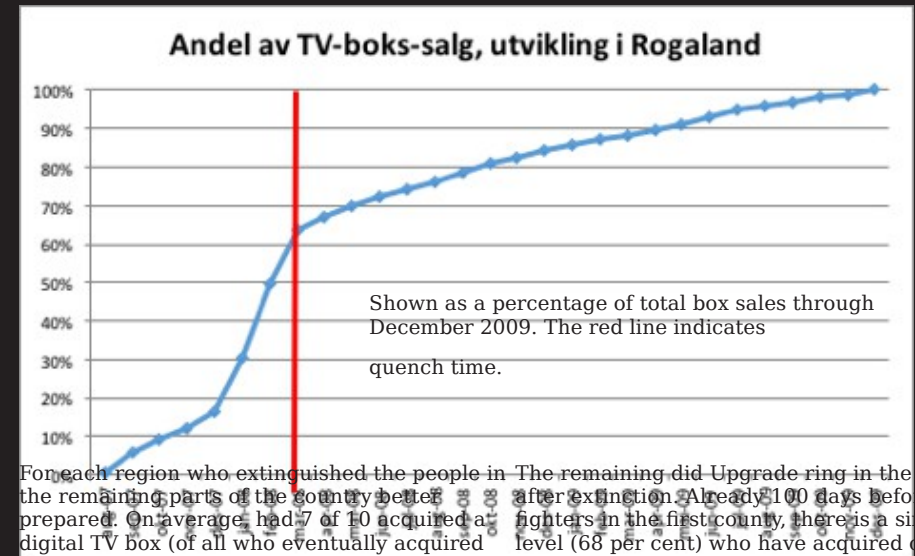
Many pushes bilutfordringen ahead. 7 of 10 specifies in Digitalradiundersøkel-sen that they have not dab in the car. 88% of these say anyway that radio car is important to them. 59% percent are willing to do something about it when FM extinguishes. And 50% say they will do the job yourself.

Where desired DAB adapter installation alert

Source: Digital radio survey Q3 16



A comparison with the digitalisation of TV



DAB radio to car



Looking at the car sales in Europe and compares this with utbredelsen DAB finds that 60 percent of car sales in the EU in 2015 occurred in 7 countries with large DAB expansion. These countries are the UK, Germany, Norway, Switzerland, Denmark and the Netherlands. (Source: ACEA, 2015)

The market for DAB radio to car can be divided into two main categories; Radios supplied with new car and retrofit products. Digitalradio Norway made a surveying-tingradio in new cars at all the country's car importers summer 2016 of investigation thickness shows that the vast majority of vehicle models now have DAB radio as standard or as an accessory.

Adapters

On the market for DAB adapter for car, going main distinction between fully integrated adapters and those designed for self-assembly. Products for self mounting-exist with several different approaches to installation and use, and affordable way to upgrade from FM to DAB on.

This means that only occasionally are car models that are not available with DAB by the dealer. In cases where DAB is optional, sold in practice often car model with equipment packages containing DAB radio.

Full Integrated adapters

The vast majority of car imports ears have a-ter what Digitalradio Norway experience found solutions for their cars. In certain cases, universal solutions required, when fully integrated adapters not to-ble for all the car models and vintages.

A retrofitted solutions for car can be roughly divided in adapters and car radios.

Bilradio

The range of car radios with DAB in single copy in Norwegian market amounted pr. sep-tember 2016 about 80 models.

Do-it-yourself adapters (GDS)

The range of GDS adapters have increased accounts-ously in Norway, and one count in September 2016 shows 38 different models of self-assembly. The growing produktmangfol-that heralds that the number of sales channels increases. Operators with GDS adapters range includes both electronics



Service Following and NRK region block

and car accessories dealers, garages and service stations.

Great variety of apparatsidenEn review Digitalradio Norway made of radio devices that are on sale on the Norwegian market (including after-assembled and factory-mounted pro-ducts for car) shows that there is very wide variation in terms of both production-ter, functionality and usability. The consequence of this is that the receiving fungal Adherence is different for radio listeners, as well as various appliances require different and bad products in some cases quite a lot of effort from the listener's side, compared to what we are used to from FM.

As explained in point coverage is NRK broadcasting divided into regions in order to provide listeners with various rural broadcasts. This means that NRK's channels broadcast at different frequencies around the country. For that radios should follow the signal when crossing different regions are dependent on that radio has called "Service Following" capability that allows the switching frequency of auto-matically. Service Following is the correct term iihht DAB standard, but manufacturers are free to name this. This feature carries different names depending upon which radio or car one listener has. Although most products on the market now has this feature, there are several adapters on the market

that does not have it.

Navngivelse på "Service Following"-funksjonalitet hos ulike bilprodusenter

Bilmerke	Navn på automatisk frekvensskifte i radioens innstillinger/menyvalg
Audi	Alternate Frequency
Toyota	Alternativ frekvens
Ford	Bibehåll Stationen
Tesla	Har ikke automatisk frekvensskifte
Volvo	DAB-DAB kanalforfølgelse
Mitsubishi	DAB-DAB kobling
Nissan	DAB-DAB tilknytning eller RDS Regional
Volkswagen	Følgefunksjon (DAB-DAB)

Har automatisk frekvensskifte	Har IKKE automatisk frekvensskifte
Integrerte adaptere: Connects2 AutoDAB SWC Dension DAB+G Dension DAB+R norDAB ND400 Semi-int. og selvmonterings-adaptere: Tiny C5, C6, C3+, C2+ Tiny C10, C11 (på vei inn med SF nå) Pure Highway400, Highway600 Clint DAB15 (Expert) Connects2 AutoDAB OEM Dension DAB+U (xxx2GEN/xxx3GEN) Fiamm SmartAntenna SM20 Fiamm SmartAntenna SM21 SmartDAB FM SmartDAB AUX	Integrerte Kufatec mObridge MOST Selvmonterbare: Tiny C2 (utgående) Tiny C3 (utgående) AutoDAB Go AutoDAB AV AutoDAB Lite Denver DAB-10 Zenec ZE-DAB60 InPhase ProDAB+ Connects2 CTDAB-1 Connects2 CTDAB-2 Caliber PMT7OOD Power PCADO14 Senz SCADBT214 PopYourCar 2.0 Eletra Connect

Public attitudes and experiences.

Looking at the car sales in Europe and compares this with utbredelsen DAB finds that 60 percent of car sales in the EU in 2015 occurred in 7 countries with large DAB expansion. These countries are the UK, Germany, Norway, Switzerland, Denmark and the Netherlands. (Source: ACEA, 2015)

Those who have DAB

Figures from Digitalradio survey per September 2016 shows that among the close-mere 70% percent of the population who have acquired one or more DAB radios, provide most that the main feature is sound quality. Secondly, it is the channel offering and coverage scores best.

Those who have not DAB

Digital radio survey shows that those who have not yet acquired DAB largely have plans to do something about it, but feel free to expose the FM actually drain the car. This applies especially for upgrading and replacing all listeners waiting and want to conduct this simultaneously. The figures also show that there is a great need for information about a quarter of these are perplexed about what they should.

Recycling of old FM radios.

Every year comes the large amounts of elec-tronic and electrical waste to Norwegian on-hold. Radios represent a very small volume of all collected electronic and electrical waste. Less than 4.6% of what was collected in the second half of 2015 was radio. Radio recorded in the same category of waste such as mobile phones, toys, videopparater and other small electronics. Approximately 93 percent of the materials in a radio can be re-used when the radio is recovered, according to the return sector company Loop.

What happens with FM radios?

Source: Digital radio survey Q3 16



61%

SKAL FORETA
SEG NOE

13%

VIL IKKE
GJØRE NOE

26%

ER RÅDVILLE



55%

SKAL FORETA
SEG NOE

17%

VIL IKKE
GJØRE NOE

28%

ER RÅDVILLE



47%

SKAL FORETA
SEG NOE

14%

VIL IKKE
GJØRE NOE

34%

ER RÅDVILLE

Norway has a good reception apparatus for electrical and electronic waste and recycling system has been among the best in the world.

Coverage, but could not receive.

Reports of poor coverage turns out in many cases region. Here it is important to listen to the because the listeners using incorrect settings on the frequency block with the strongest signal in the appa unrated or incorrectly installed antenna in a area. car. A number of inquiries to the publication date of kumsservice is in addition to that they are answered also followed up with home-search for the technical personnel.

More coverage complaints also show to be due listeners who try to hear commercial radio in areas that have only NRK coverage.

Experience shows that in many cases is all that you really have coverage, but lacks reception. A DAB radio works somewhat differently than an FM radio. As discussed previously NRK DAB network divided into different regions wells, also called frequency blocks. If one takes the kitchen radio to the lodge should do a channel scan to make sure you listen to the correct frequency block. In car DAB radio will automatically switch to the correct frequency block if the radio has the "Service fol-lowing" (as described above in a separate section) and this is enabled. DAB ra dioer need moreover antenna to function, and incorrect installation of antennas results in poor reception. This is especially true for car adapter. Digital radio Norges review of appliances made in the preceding chapter, thus showing that different functionality and user requirements of the various products on the market make this challenge significantly.

Considerable information needs

Conclusion 100 days before shutoff of national FM broadcasts start is that it is crucial to ensure adequate information and awareness of improper use and installation of radio and antenna.

Areas located along the border to another region (frequency block), will be able to receive signals from neighboring

Some examples

The following is extracted from the log at NRK distribution department, where one has been on home searches to debug.

1. Appeal of very poor reception in houses in Larvik. Fully reception outside the house, but indoor nothing. Beating off the main power switch, and then came back reception. Led bulb purchased by mail order from the US beamed.

2. Listener on Tromøya did not receive. Got help by telephone. Factory reset was medicine.

3. Appeal no / poor reception in Drammen. Wrong block tuned.

4. Sokna: Coverage from 3 different radio blocks can possibly be. The listener had chosen the wrong block

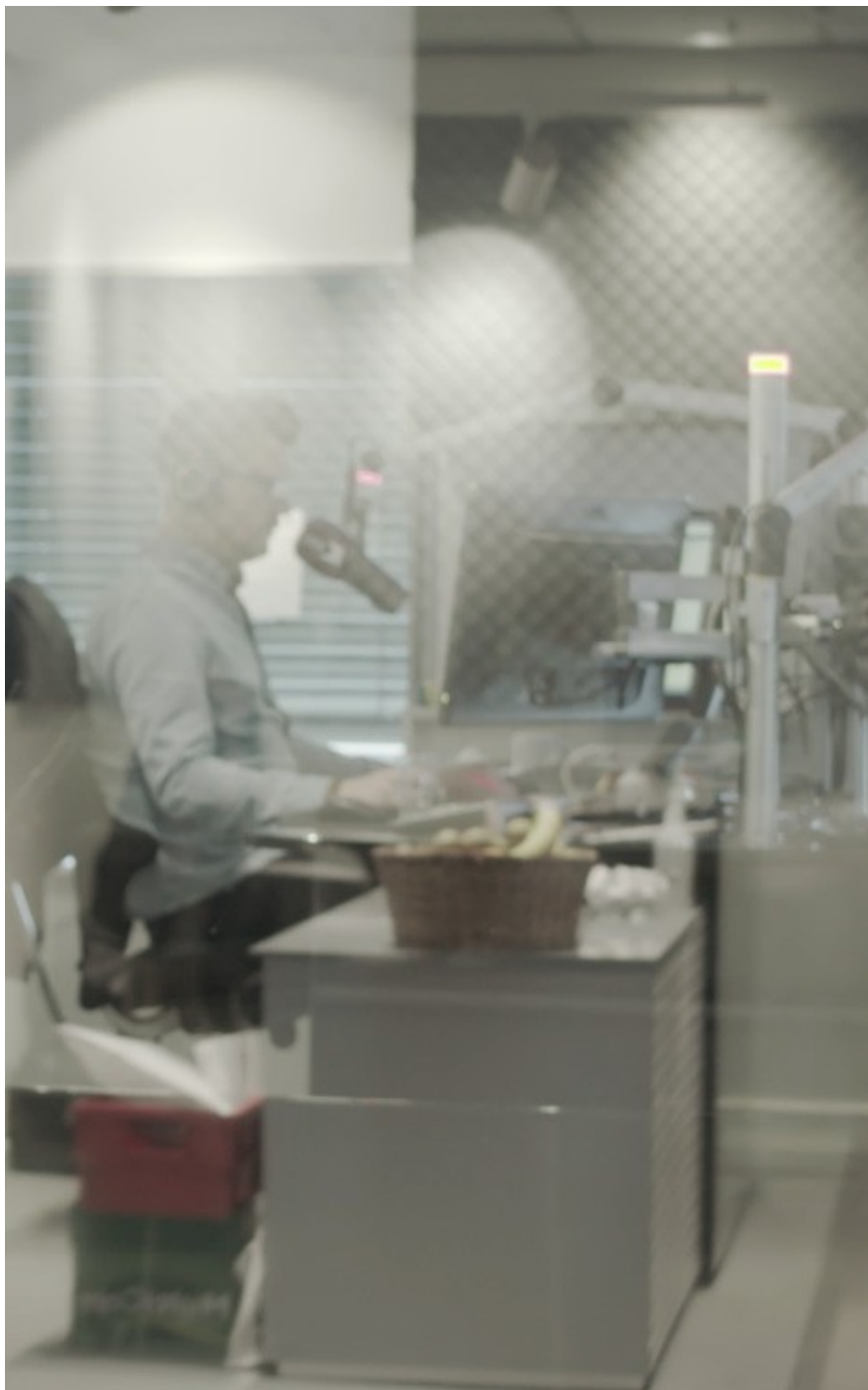
5. Several cases of DAB antennas that were mounted horizontally.

Experiences from public service.

Radio.no its public service helps Norwegian radio listeners through the transition to digital radio. For help and answers to their questions, audience contact by tea-telephones, email, social media and via radio.no. Since the establishment of the service in 2013 has until September 2016 answered more than 4900 inquiries via email, social media and radio.no in addition came more inquiries by phone.

For 40 percent of the inquiries have not listener specified category. Of those categorized questions make up about 28 percent questions about car. 18 percent are related to coverage and 17 percent are general questions. 10 percent of listeners have questions to DAB radio for houses and 10 percent have a question to the chalet. Channel Q represent 10 percent while other apparatus question constitutes 10 percent of the questions

One sees a significant increase in the number of inquiries now that extinction of FM broadcasts approaching.



5

Status and consequences- for radioaktørene og radio market

The transition to digital radio has led to significant changes for all broadcasters, public and private, and local as national. This applies both framework, distribution and government regulations.

NRK

NRK has digitalisation of radio first and given opportunities to offer a wider radio offerings to a larger proportion of the population. Radio as a media channel has always been an important pillar for securing Norwegian language and kultur.NRK Throughout digitization held forth that this strengthens their ability to perform their public broadcaster mission. There are two primary reasons why this is the case

Same offer to the entire population

Norway is a relatively large country, but with few people. Therefore we live dispersed, with large distances and many small communities. In the digital radio world, it is the 14 radio channels from NRK, regardless of where one lives. There will forever be an important principle that everyone can take part the same media offer from NRK. This would not be possible without a digitization of radio.

Something for everyone

Fragmentation of media use is nothing new in 2010. Certainly all media signals experience that audiences expect and consume content that is narrower

and more specifically to the individual. A public broadcaster must also be able to ensure the relevance and importance within specific target groups and genres. With few radio stations will simply be too broad in application its offer to be "attractive".

Commercial operators (national)

For the commercial radio operators leading the digitalisation of radio with a number of important factors.

From radio to Radiohus

Radio shift has such NRK given the commercial players the opportunity to establish more channels and thus himself-ment and connect diverse audiences with more relevant content.

le actors, such as Facebook and Google in the value chain's and remains "independent"

Level playing field

In an analog FM world was different distributionsmuligheter for players. With new broadcasting DAB get all coming-cial radio channels equal distribution and the same opportunity to reach out to listeners.

Predictable framework

With limited frequency resources have licensing regime for analogue radio led to a number of difficult situations for commercial radio. Concession periods for FM were short and did makes it difficult with long-term radiosatsnir gene. "Beauty contest" led to controversial issuing licenses and channels unexpectedly lost "their licenses." Through digitization has capacity challenge has disappeared and there are opportunities for anyone who wants to develop and operate radio.

No content requirements and licensing fees

Without frequency scarcity disappears also needs by the state to regulate the content of the commercial radioka-squeegees want to send. When nature godet "frequencies" is not working lim-send on who should make radio also disappears relevance for an expensive license fees to the community for the transition to this scarcity by nature. In a digitized radio world governing therefore players selv.Lytterne will simply be the ones who determine who is the best at making radio.

Commercial radio retains its business as usual model without conceding new globa-



6

Norway is the first, but far from alone

Local radio

Through Report No. 24 (2014-2015) Framework for local radio in conjunction with the digitalisation of radio media, it is also facilitated major changes for local radio operators.

- Considerably longer concession periods than for FM

- No content requirements or economics

- Larger coverage areas than for FM

- Equal access opportunities through a highly simplified licensing process and capacity enough to anyone who wishes to operate radio

- A scheme for digitization. A number of local radio operators have been granted support and been awarded funds to expand local DAB networks or bet on internet radio. For 2016 has 33 projects awarded totaling 9.2 million. The support program shall apply annually until local radio sector has reached a satisfactory level.

- Free extended FM licenses in a transition period with fewer requirements than previously.

23 commercial metropolis radios must drain-ke together with the national radioka-squeegees, while around 200 local radio stations have been extended for FM licenses by five years.

DAB and digitalization of radio in the world

Digitization of the radio medium is high on the agenda of the radio industry and radio operators worldwide. On every continent taken initiative and be implemented as digitalising radio medium. Common to all is that broadcasting technology will continue to be the mainstay of a digital radio of the future. Just as in the analog world there is a handful of technologies in the digital broadcasting.

satellite Radio

Besides radio over IP as discussed in Chapter 2, radio distributed via satellite used as a digital platform in the US and Canada.

Satellite Distributed radio is broadcasted stuff of radio signals where the satellites in space send signals to listeners appliances such as satellite TV

receives signals through a para-primabolan **DRM**.

The technology is ideally suited for the best in wide, open landscape. Radio listener needs a certain ra dioapparat to listen, but in addition to the radio you need a subscription to listen to the channels. Early-re attempt establishing satelliteba listed radio in parts of Asia and Africa were dead after they failed to get enough radio listeners to choose to pay for and listen to the radio.

Europe and Australia are the parts of the world where the transition to digital radio has come furthest. It is still quite major differences on how f you have come in the digital radio shift in the different countries. For -without Norway has Germany, Denmark, England, Switzerland and the Netherlands developed nationwide DAB network covering more than 90 percent of the population and four of these (Switzerland, England, Dan marl and Norway) have concrete maalse-downs for a digital radio future

HD radio and **DRM** are other digital platforms. HD is widespread in the US, but DRM is still experimental. HD and DRM uses FM and AM Fri- quences for digital distribution, but with its own technologies converging sentes these into digital signals. Common to both is that they require new appli-ter at the receiving end.

Land med regulære sendinger	Land med prøvesendinger og/eller reguleringer
Australia	Østerrike
Belgia	Bahrain
Tsjekkia	Brunei
Danmark	Kina
Frankrike	Taipei
Tyskland	Vatikanet
Gibraltar	Ungarn
Hong Kong	Israel
Indonesia	Kuwait
Irland	Malaysia
Italia	Monaco
Malta	Mongolia
Nederland	New Zealand
Norge	Romania
Poland	Slovakia
Slovenia	Sør Afrika
Sør Korea	Thailand
Spania	Tunisia
Sverige	Tyrkia
Sveits	De forente arabiske emirater
Storbritannia	

The introduction of digital radio in Norway.

When national FM broadcasts extinguished in 2017 so it is the completion of a digitization which started more than 20 years ago.

Until 1995

Experiments with DAB in Norway began in 1991. When it was created a steering committee from Telecom, and established an effort network in Kongsberg, Oslo and Halden. NRK started with DAB broadcasts in April 1994 with send-re in Winter Park (Oslo), Jonsknuten (Kongsberg) and Høiås (Halden) and from NonStop og Romsdal.

1995-2000

In January 1995 approved the NRK board plans eta bles no DAB station. NRK Always Classic (now NRK Classic). The channel started broadcasting part of the digital radio strategy with broadcasts on DAB, Internet and FM in June 1 of that year, as the world's first pure DAB channel. The same year started P4 up their digital test broadcasts on DAB. A special committee NRK presented the nominations for digitization of NRK's radio offerings. Der suggested one broadcasts would cover 75 percent of the population in 1998, and three-channel radio should be supplemented by Always Classic and one news channel and one sports channel. NRK Always News started broadcasting

14 April 1997. Both NRK Always New Broadcasting Always Classic was eventually sent via smaller FM transmitters in the largest cities.

2000-2005

In 2000 channels NRK mp3, NRK Stortinget and NRK Metro launched as part of the digital radio strategy with broadcasts on DAB, Internet and FM in the main towns. P4 Broadcasting Corporation Radio 2 Digital (Norwegian Aller) and Norkring up-directed Digitalradio Committee as a common unit for actors with a role in connection with the introduction of DAB. Where would the players cooperate including technical solution. Norwegian Local radio Association participated in this work as an observer. The players wanted a stronger involvement of the authorities, and in 2004 it established a working group led by the Media Authority.

Why has radio changed taken 20 years?

Technology Shifts within broadcasting are comprehensive processes that have always taken the time and led to great discussions. Previous radios-kift in Norway from AM to FM took to Compare 30 years.

2005-2011

This working group submitted a report on 19 December 2005, when the entire radio industry stood behind proposals for measures to bring about a transition to DAB. The main conclusion was that there should be a year of liquidation of the FM radio, namely 2014. The working group's report was 11 May 2007 followed by the Storting. 30 (2006-

2007) broadcasting in a digital future. Here, it was determined that there should be a date for liquidation of FM broadcasts until at least half of the households had access to a DAB receiver.

In 2010 established the major broadcasters on the radio side, NRK, P4 and SBS Radio Company Digitalradio Norway AS. A joint information and operator business with for targets to ensure a smooth transition to digital radio for Norwegian radio listeners and radio industry

2011-2016

February 4, 2011, Stortingsmelding no. 8 Parliament's decision was a vital catalyst (2010-2011): Digitali polymerization of radio which speeded up the development of presented. There were in 2017 set as a transmission network for DAB and the target for liquidation of national and commercial FM broadcasts. launch of a host of new radio channels.

The prerequisite to liquidate FM broadcasts was that listeners would get digital added value, thus a better digital offerings than on FM. Further to NRK network developed corresponding to the current FM coverage, and the commercial channels must have 90 percent coverage. To only ne liquidate FM broadcasts in 2017 had also found satisfactory solutions for listening in cars, and at least half of radio listeners have daily listening partially or completely to digital radio. Except Forward-step party supported April 17, 2015 Stortingsmelding no. 24 (2014-2015): The frame conditions for local radio in conjunction with the digitalisation of radiome-diet presented. Read more in Chapter

5. With it also got lokalradi-obransjen defined its limits and opportunities in the transition to digital radio.

- A change of kringkastingsteknologiving is extensive. This requires:

- International agreement on technical standards

- International regulation of frequencies

- International market for late-derutstyr and appliances

- A plan that involves national consensus and coordination among relevant actors (trade, insurance-chutes, authorities and NETTUTS Builders)

DAB was introduced in the Norwegian market around the millennium with poor coverage, weak or no substantive added value, few and expensive apparatus, and an excessive belief in sound quality selling point. The actors did not have the finances to build out networks and invest in new content without potential listeners (read: appliances in the market) and an assurance that dobbeltdistribusjo-nen would end at some point. This gave rise to no demand for appliances. No producers or dealers would focus on appliances nobody asked for.

White Paper in 2011 was plannen who broke this vicious circle.

7

Digitalisering og innovation

The transition from FM to DAB in Norway are driven by the radio industry, and their primary motive is a desire to communicate more content to radio listeners.

Radio Digitalization is thus the result of the radio industry's own need to renew and strengthen the radio medium.

paned

- Localized in Selje, Sogn og Fjordane

Sold the first systems for DAB in road tunnels in 2012. Owner and also operates over 200 own TV transmitters in Norway.

TT Micro

- Localized in Oslo, started in 2000

- Originally centered around the auxiliary products for car and home electronics. Started in 2007 with digital radios that currently make up the bulk of business

Because of the transition is that FM equipment must be upgraded or replaced, and it affects the market for radios in Norway. This market has had a sales volume of about 700 to 800 000 units since 2005 (source: Consumer Electronics industry), with a moderate increase in 2014 and 2015. The replacement of radios has happened organically until 2015, as sales of FM radios has largely been replaced by digital radios. The exception is the automotive market, where as late as 2015 was sold a significant number of FM radios. Pr. August 2016 may most new cars come with DAB radio, according to Norwegian car importers.

Paned so early potential of DAB systems for tunnels, and an inter-national development cooperation enabled the company to compete for development projects. Paned has built up expertise in DAB by establishing a development in Sweden and is now competing in Norway with proprietary technology for DAB in vegtun-tunnels and DAB broadcasting centers to radio stations. Paned has pr. August 2016 won contracts for DAB The con--ging in 115 of the country's road tunnels.

The company achieved good sales of its first DAB + radio, Pinell, and radio became an increasingly important part of the company's operations. Until now TT Micro sold over 500,000 DAB products in Norway. To construct radiomo Dells Pinell Go employees TT Micro own industrial designer, but also makes adaptations for other products to the Norwegian market. Today the company is Norway's largest DAB adapters for car. Devel-opment and adaptation of these products are made in cooperation with the Norwegian radio broadcast-launchers. Norway's large and relatively early commitment to DAB networks make it relevant to test products here, which TT Micro has been able to utilize in their efforts to ensure adaptation to Norwegian conditions.

Innovation Norway has cooperated with paned DAB and has emphasized that the company has great potential and is a good example of cooperation between entrepreneurial companies and Innovation Norway can provide great benefits.

The transition to DAB has still created opportunities for Norwegian companies to eta lish new business and to reposition itself in the market:

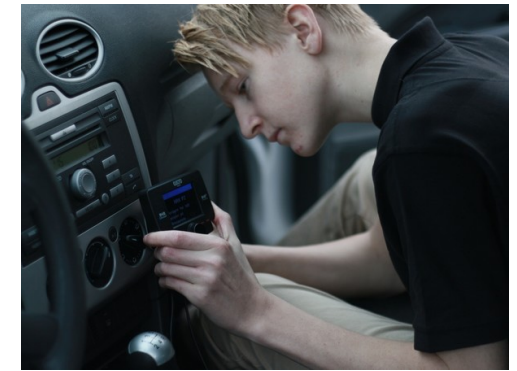
T-Radio AS

Monday 11 April 2015 opened T-Radio AS's new radio factory in Tønsberg. Here works a total of 9 people. The new radial omerkevaren Ixion is now marketed nationally and internationally, and has both DAB and FM. Radio company based on traditional technology from old Tandberg Radio, and the company hopes that the radio is a strong industry in Norway, as it once was.

Sahaga Auto AS

- Localized in Fredrikstad, established in 2012
- Driver importing and distributing fullin-and integrated with DAB adapters for cars

Sahaga Auto AS bases its activities on products that upgrade FM radio to DAB +. The company monopolizes the distribution of MediaDAB adapter in Norway, but also carry other types of products for the digitization of the car radio. Sales are through central agreement with several bilim-porters in Norway, but also distributors in automotive. Sahaga Auto AS also working on product development in cooperation with external companies.



Sahaga AS

- Localized in Fredrikstad, established in 2013
- Importer and manufacturer of DAB radios

Sahaga AS combines import of DAB radio from various brands with production and sales of DAB radios under their own brand POP. The company currently represents brands POP, Revo, Hama and Neo in Norway, Sweden and Denmark, and View Quest in Norway and Sweden. Sahaga was first to market with hearing protection with DAB + (April 2015).

Jensen Scandinavia

- Localized in Oslo, established in 1999
- Import and distribution of products for data networking and multimedia, later also digital radio

DAB has become an essential product group for the company, and given the opportunity to take a new position in the market for forbrukerelek-

tronics.



8

Extinguishing national FM broadcasts



Wednesday 11 January
2017 at 11:11

proposed national FM transmitters in northern countries of. Then extinguish the county until recent transmitters turned off in Troms and Finnmark 13 December. 2017 will be the year Norway receive digital radio broadcasts. As we have pointed out in this report are not FM extinguishing an insulated lever-see that is about to turn off FM. Drains-lowering must be seen in a wider perspective, in a radio switch, as part of a necessary modernization of the radio medium, the primary objective of the radio industry is to strengthen radio by offering more radio throughout the country.

The reason that the national radio operators and the authorities saw it as necessary to extinguish FM as part of the digitization of radio was connected with that it was not economically feasible to operate two parallel-le national broadcasting networks for radio over

long time. Man wanted to rather use the money to develop new content and new channels for the country. A necessity Watching that radio should be able to retain its important position in people's everyday lives.

-At Least half the listeners need to listen daily to a digital radio platform

Målgjøringen of the digital radio shift happens after parliament in 2011 adopted the White Paper no. 8 (2010-2011): Digitalization of radio and that the Media Authority and Nkom in 2015 stated that all the conditions set by Parliament was fulfilled;

Thus it is clear the switching off FM broadcasts for national radioka signals, as well as for the commercial lokalradioene in the largest cities.

- NRK must cover corresponding P1 coverage

- The commercial blocks must have at least 90 per cent population coverage

- The digital radio offer must, represent an added value for listeners

- There must be reasonable and technically to-

Slik slukkes FM-senderne i 2017

Slik slukkes FM-nettet i Norge fylke for fylke. I de mest folkerike delene slukkes NRK kanalene litt før de kommersielle radiokanalene.



Region	Kanal(er)	Dato	Befolkning	
Nordland	NRK, P4, Radio Norge	11.01.2017	240.000	4.7%
Trøndelag, Møre og Romsdal	NRK	08.02.2017		
Trøndelag, Møre og Romsdal	P4, Radio Norge, kommersiell storbyradio	21.04.2017	700.000	13.7 %
Telemark, Buskerud, Hedmark og Oppland	NRK	26.04.2017		
Telemark, Buskerud, Hedmark og Oppland	P4, Radio Norge	16.06.2017	825.000	16.2 %
Sogn og Fjordane, Hordaland, Rogaland, Agder	NRK	21.06.2017		
Sogn og Fjordane, Hordaland, Rogaland, Agder	P4, Radio Norge, kommersiell storbyradio	15.09.2017	1 365.000	26,8 %
Østfold, Vestfold, Oslo, Akershus	NRK	20.09.2017		
Østfold, Vestfold, Oslo, Akershus	P4, Radio Norge, kommersiell storbyradio	08.12.2017	1735.000	34 %
Troms, Finnmark	NRK, P4, Radio Norge	13.12.2017	235.000	4.6 %
Befolkning (ca)			5.100.000	100.0%





Forward Time prospects for radio

As noted in this report, Norwegian radio kept a stable lytteroppslut solution after digitization of the media gained momentum in 2011. This while other traditional media channels have lost support and radio overseas have mis-tet life.

Kantar TNS has made some reflections on the future prospects for Norwegian radio and consequences of digitization which was presented during Radio Days 2016 in September.

Knut- Arne Futsæter in Kantar TNS trek ker forward some crucial "drivers" and "stoppers" for listening on DAB radio.

drivers

- Several stations provide a diverse offering for all
- Good coverage for all stations everywhere
- New devices and services.
- Ease
- Improved sound quality
- Higher quality audio signals
- Stable connection

stoppers

- The most commonly used FM radios must be replaced (Economy)
- FM radios in cars need to be replaced or connected to the adapter (economy and business)
- New media world with ever more media

Important factors in 2017

Secondly drawn special factors that will affect the digital radio shifted in a positive direction.

Characteristics of radio as a medium

- Contents: Entertaining, useful, important, informative, credible, social - a "companion", present, alive

- Edited content and music

- Programs and services that appeal to people

The radio is strong in people's lives and many listeners are very loyal

High availability on digital radiout controllers

- Radio has a great potential in relation to mobile phone. Mobile is available to everyone everywhere. There is widespread and socially acceptable / modern use headsetØkt access to Wi-Fi at home, at work, on the bus, train, car

Radio suitable for modern and busy people

Those loyal listeners acquire and use digital radio equipment

What is expected to happen with radio listening?

2017

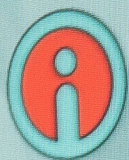
2018

Radio.no

MENY



PROBLEM MED MOTTAK AV DAB?
HER FINNER DU HOVEDÅRSÅKENE - OG HVA
DU KAN GJØRE MED DET



HVORDAN ER DEKNINGEN HOS DEG?
DAB+ GIR FLERE NORDMENN EN BEDRE
RADIOOPPLEVELSE. HER SER DU DEKNINGEN
DER DU FERDES.

Nedtelling til første stenging av
FM-nettet

100:00:00:00

DAGER

TIMER

MIN

SEK

Dette betyr det digitale radioskiftet for deg



Se regionvis slukking

A status report for the Norwegian radio shift

Published by Digitalradio Norway 3 October 2016



