



MiniTV was launched via DMB in Greater Oslo on May 15.
Please find some background info on NMTV, DMB and MiniTV below.

There is a short version on page 7 with suggestions of quick facts.

What is DMB?

Digital Multimedia Broadcasting is a technology that makes the broadcasting of various content possible, including TV, radio, photos, text and files. The different content types can be put together in order to set up services i.e. traffic information, goal notifications, weather forecasts and stock info. DMB is a broadcasting technology, not a streaming technology and can therefore be compared with traditional TV and radio, not with web TV and web radio. That eliminates congestion in the case of many simultaneous viewers.

To be able to receive content and services via DMB you will need an own receiver. That may be multimedia players, navigation equipment (GPS), USB sticks, mobile phones, hand free sets or cameras. The DMB chip itself is the size of a small coin and can therefore be placed inside almost everything with a screen/monitor or in equipment that can transfer data to an external screen or monitor.

DMB is a European standard that is based on Eureka 147 which is the standard for digital radio (DAB). DMB was still first introduced and refined in South Korea where there are 18 million DMB receivers, of which 50% are mobile phones.

NMTV

The Norwegian Broadcasting Corporation (NRK), TV 2 and Modern Times Group (MTG) have discussed DMB testing since February 2008 and have now joined forces through Norwegian Mobile TV Corporation (NMTV), a joint venture company, to explore an exciting market.

The competitors are therefore now working together, believing that they know TV better than any other business. That the screen is smaller than most traditional television sets is not important. The content on the screens is. NMTV wants freedom to the users and a variety of receivers. Certain other companies want DVB-H as a standard for mobile TV, but that will limit the receiver market to mobile phones only.

NMTV was founded on August 13, 2008 and has contributed to governmental hearings about the digital dividend and participated in talks with the Post and Tele Authority and the Media Authority about frequencies, licenses and other issues.

What about the telcos?

NMTV has a good and constructive dialogue with 3 of th 4 biggest telecom operators in Norway about DMB content and services best can be integrated with content and services via telecom networks.

MiniTV may ease the introduction to TV on handhelds, enhance usability and lower the barriers to many users. Distribution via broadcasting and IP works very well in combination and will together lead to a better and more complete offering towards audiences and users. The countless possibilities for cooperation are now being explored by the different companies and NMTV has already signed a deal of cooperation with Norways third biggest telecom operator, Network Norway.

MiniTV

NMTV launched six of the owners channels as MiniTV on May 15. MiniTV is about watching live TV on your way to work, in boats, cars, trains, pubs or while waiting. In other words, wherever while on the go. DMB via USB sticks may also contribute to lower load on corporate networks at web TV peak times during high profile sporting events, press conferences, etc. as employees can watch broadcasted TV instead of streamed TV.

NMTV has frequencies for nine TV channels. All NRKs channels will be free to air throughout the period, whereas TV 2 and MTG plan to introduce pay TV when systems for encryption and payment (Conditional Access Systems/CAS) are in place.

The following channels were launched from day one:

NRK1

NRK2

NRK3

TV 2

TV 2 Nyhetskanalen (News 24)

TV 3

All DMB receiver can also receive the 15 radio channels that are distributed via DAB. The channels are: P4, NRK P1, NRK P2, NRK P3, NRK Gull (Gold), NRK Alltid nyheter (Always News), NRK mP3, NRK Super, NRK Klassisk (Classical Music), NRK Sport, NRK Jazz, NRK Båtvær (Boat Life), NRK Folkemusikk (Folk Music), NRK Oslofjord og NRK Sámi radio.

Any DMB receiver can therefore receive 21 radio and TV channels.

Other services

DMB supports a range of additional services besides radio and TV. This makes for a more attractive service and opens up possibilities for cooperations and increased revenues for NMTV and partners. Services may include programme guides (EPG), interactivity, traffic information, news and score notifications, weather forecasts, stock info and video on demand (VOD).

Area of coverage

MiniTV will theoretically cover the homes of one million people. Measurements in the field do however show that the coverage area is far greater, and these measurements are now being used to enhance the coverage map:

<http://213.88.244.237/paneda/maps/maps-v2/>

Press the left mouse button on the map to get more information on the coverage in an area. Information on coverage conditions and which transmitter you should receive the best signal from will be shown (in Norwegian) to the right of the map.

NMTV has been notified by users who have received signals outdoor on Gardermoen (Oslo airport OSL), Drøbak, Lier, Lillestrøm, Drammen, Holmestrand, Våler and even

Fredrikstad. These observations have not been confirmed by NMTV, but they indicate that coverage may be a lot better than initially believed.

Transmitters

NMTV has established transmitters from Rohde & Schwarz of Germany on four sites around Oslo. The locations are Tryvasshøgda, Kolsås, Brannfjell and Røverkollen. The infrastructure company Paneda from Selje on the Norwegian West Coast has built the DMB network which they are also running and maintaining. KB Mast contributed to the installations.

Encoders

The DMB signals from NRK and MTG are coded in a server room which NMTV rents from NRK in Oslo whereas TV 2 signals are coded in TV 2s main office in Bergen.

Play out of signals happens at the server room in Oslo. Factum Electronics of Sweden delivers the muxes and has installed the hardware together with technical personnel from NRK and TV 2. The encoders used are from the Korean companies OnTimeTek and Pixtree.

Frequencies and licences

NMTV received permission to broadcast DMB signals in VHF Band III on January 14 2009. The licence is valid until June 30, 2011.

That gives NMTV over two years to find out how to best run MiniTV in Norway. Two muxes are used (8C and 11C) That such low frequencies are used makes it a lot cheaper and less complicated to cover large areas, something of an advantage for a country like Norway with rural areas, fjords and mountains. The frequencies have been coordinated by Sweden and Denmark.

NMTV received approval for the DMB transmissions from The Media Authority on January 20. The Media Authority pin pointed the necessity of gaining experiences for TV to handheld devices in Norway and mentioned the following aspects of the launch as especially important to examine closer:

1. Form and type of content.
2. To find well working business models.
3. Test of technologies.
4. Interest among and usage by audiences.
5. Usability issues.
6. Usage patterns.
7. Willingness to pay for terminals, content and services.
8. Costs.
9. Possibilities of revenue.
10. The interest for traditional TV channels as opposed to made for MiniTV channels and on demand content.

Why NMTV launches MiniTV:

1. This is a service that audiences want. Three surveys conducted the last 6 months show that between 42% and 48% are positive or very positive to television to handheld devices.
2. To find out how best to deliver an offering such as MiniTV and additional services.
3. To confirm the choice of technology and to enhance connections between DMB and other distribution technologies (3G, WLAN, etc.).
4. To find the right types and kinds of content and services. What do audiences want? What are the usage patterns throughout day, week, month and year? Who watches MiniTV?
5. Find good ways for competitors to work together when it comes to a new market and to better offer content and services that give an improved offering to audiences.
6. Compare MiniTV to other mobile TV initiatives in other countries and to cooperate with these players to increase accessibility to terminals, share experiences and cooperate on technical solutions and systems.
7. Try out pay services and business models.
8. Find out what kind of terminals audiences want. Do most people want mobile phones with DMB or do they prefer an extra screen in order to be able to use their mobile at the same time as they watch MiniTV?
9. Compare costs and revenues.
10. In other words; learn and build a foundation of experiences on how to best run MiniTV in Norway, also outside Greater Oslo.

NMTVs goal

NMTV is to lay down the foundation of a successful deployment of MiniTV in Norway and will cooperate with various partners to accomplish this. The usage of MiniTV and how the service is perceived among audiences will determine how the DMB transmissions will be taken further and if MiniTV ever comes to the rest of Norway, when it may happen and what content and services that may be continued or introduced.

There will only be free to air channels from the date of launch, but it is essential to NMTV to find solutions that makes the company financially healthy on a long term basis. To find well functioning business models is therefore one of NMTVs priorities. An important part of this is to work with companies within various industries such as telecom, advertising, technology, academia, etc. A major goal to NMTV is to try out new services that may reach out to new and old users in new and old usage situations.

Only in South Korea and Norway?

DMB is not only being used in Norway. The following countries do also have DMB services or plans to launch such services.

South Korea
The Netherlands
France

Malta
Malaysia
Indonesia
Singapore
Vietnam
Cambodia
China
Ghana
Italy

NMTV do also know of other countries where DMB is planned, but where this is still confidential.

Why not DVB-H in Norway?

EU has NOT chosen DVB-H as the standard for mobile TV in Europe, something that has been falsely reported by a number of media houses. DVB-H has been included in Europe's long list of voluntary standards that members may or may not decide to use. The EU emphasizes that the market needs to decide when it comes to technologies and that it is important to work for interoperability between standards and to help different industries cooperate.

Find various reasons for why NMTV did not choose DVB-H for the launch of TV to handhelds in Norway:

1. There are no available DVB-H frequencies in Norway.
2. DVB-H uses higher frequencies than DMB. That means much higher power consumption and demands more transmitters. Building a network will be more difficult expensive.
3. DMB is an open technology and the audiences do expect a number of free to air channels. DVB-H locks the channels to a SIM-card, hence only to mobile phones. NMTV does not want 'mobile phone TV' but a free and wide choice of all kinds of receiver devices.
4. DVB-H broadcasts can by the distributor be limited to work on only designated mobile phones, i.e. on 10 models that a distributor subsidizes. Audiences may therefore be forced to buy one out of for example 5 Nokia or 5 Samsung phones. That is just as saying to audiences that you may only watch CNN if you have a Sony television set.
5. DVB-T has in Norway been built for reception on roof tops. DVB-H would have to be built in the same way, something that makes indoor coverage impossible. The option is to replan and rebuild the entire DVB network.
6. DMB is a more robust distribution technology. It works in over 700 km/h (tried in a Boeing 737, 20000 feet off the ground) and in all weather conditions.
7. DMB supports a range of additional services such as interactivity, traffic information, EPG and news or sports notifications.
8. There are no DVB-H successes anywhere in the world. Not even in Italy where almost one million heavily subsidized mobile phones were distributed.

Information, short version

In 2008 NRK, TV 2 and MTG established Norwegian Mobile TV Corporation (NMTV) which has just launched 6 TV channels under the name MiniTV. The goal is to find out how MiniTV best can be run in Norway. The corporation has a licence to transmit broadcasts in the VHF band until July 1, 2011. This may be extended if MiniTV proves a success.

MiniTV will theoretically reach over a million inhabitants from four transmitter sites. Measurements are being conducted to help adjust the theoretical coverage maps and preliminary measurements show that the signal reaches far outside what is indicated on this map: <http://213.88.244.237/paneda/maps/maps-v2/>

NMTV has a good dialogue about MiniTV with 3 of the 4 biggest telecom operators in Norway on how content and services via DMB can work with content and services via telecom networks. Other countries in Europe, Asia and Africa have chosen DMB as the technology to deliver TV channels to mobile handsets.

Digital Multimedia Broadcasting (DMB) is a European technology that makes it possible to broadcast various kinds of content such as TV, radio, photos, text and files. You will need a DMB ready receiver, i.e. multimedia players, navigation equipment, mobile phones or handsfree sets to enjoy MiniTV content and services. The main reasons for choosing DMB as the standard for distribution are costs, openness, availability of frequencies and opportunities for cooperation with other markets.

Digital Multimedia Broadcasting (DMB):

- Broadcasting technology (one to many)
- MPEG-4 Compression
- Less expensive and more robust than competing technologies
- Good possibilities for interactivity and additional services
- Uses frequencies in the VHF band (where there is a lot of free space)
- Cover big areas at a low cost
- Is supported by major manufacturers of mobile phones (LG, Samsung, Motorola, Panasonic)
- Works with all kinds of receivers, not only mobile phones
- Basic content and services are free of charge
- Used in over 10 countries in Europe, Africa og Asia

Norwegian Mobile TV Corporation (NMTV):

- Founded on August 13, 2008
- Three owners with the same share: NRK, TV 2 and MTG
- CEO: Gunnar Garfors, NRK.
- Director of the Board, Jon Inge Brattetveit, TV 2
- Four transmitters in Greater Oslo: Tryvasshøgda (1000 W), Kolsås and Røverkollen (300 W), Brannfjell (400 W)
- Frequences VHF band 3, blocks 8C og 11C (199.360 and 219.352 MHz)
- Licence until July 1, 2011
- TV channels: NRK 1, NRK 2, NRK 3, TV 2, TV 2 Nyhetskanalen (News 24) and TV 3

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