

# Response to Issues raised in TRAI's Consultation Paper on Mobile TV



[www.nokia.com/mobiletv](http://www.nokia.com/mobiletv)

October 15, 2007

# Response to Issues raised in TRAI's Consultation Paper on Mobile TV

***1. Whether the technology for mobile television service should be regulated or whether it should be left to the service provider.***

Traditional regulation has concentrated on frequency issues leaving technology choices to the market. Technology has been regulated mainly in areas of broadcasting. The world around mobile telephony has been less regulated. However there are several cases where additional technology regulation has proven successful. The adoption of GSM by the European Commission some years ago boosted the market and proved that such a choice has not only been beneficial for the consumers, but also for the industry as a whole.

On similar lines, to facilitate and accelerate the deployment of mobile TV across Europe, the European Commission in July 2007 adopted a strategy to encourage the use of DVB-H as the single European standard for mobile TV (Full release attached as Appendix 1).

The industry, both vendors and service providers, should work together to emulate the success of GSM technology in the Mobile TV arena.

For any technology to enjoy broad adoption, industry traction and deployment, open standards must be implemented end-to-end - Selected Broadcast standard, Service Protection and Purchase (SPP), Electronic Service Guide (ESG), Audio & video formats/codecs and all associated profiles and parameters.

There are leading industry bodies like the bmcoforum (Broadcast Mobile Convergence Forum) and OMA (Open Mobile Alliance) who have defined implementation profiles for DVB-H and who provide interoperability test fests ensuring that products for the selected profile from across vendors are interoperable.

When technology is being mandated, care should be taken in ensuring that the selected technology is open, freely licensable and enjoys broad global industry traction (in terms of deployments and vendors & industry associations support).

***2. If the technology is to be regulated, then please indicate which technology should be chosen and why. Please give reasons in support of your answer.***

Technologies like DVB-H have ensured that television can now fit into our pockets, be our constant companion and entertain us at all times. Mobile TV going main stream presents tremendous opportunities for the industry. It means new content formats, new avenues to

monetize content, new viewing times, new prime times, greater interactive content and smart Mobile TV devices to highlight a few of the opportunities.

The industry has worked over a decade to come to this stage and in the process DVB-H has clearly emerged as a standard that has found maximum acceptability. The reason is relatively simple - DVB-H belongs to the DVB family that is widely accepted for Digital Video Broadcast in Europe and several countries around the world.

However, we have to be very cautious in nurturing this nascent industry. Success of Mobile TV critically requires a totally open and competitive ecosystem similar to the one that has led to the huge success of GSM based mobile telephony.

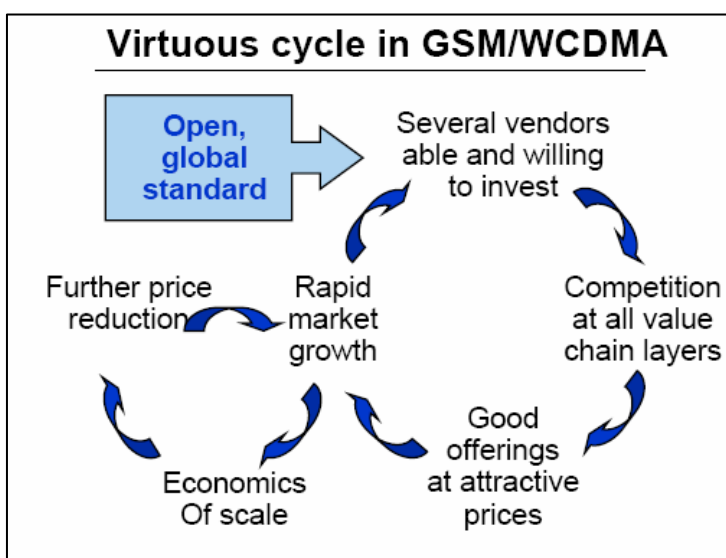
Open standards incentivise companies to invest in new technologies and since many countries and entities get involved in the development, it leads to competition and consequently the introduction of several good offerings at attractive prices.

Once customers in several markets start to accept the technology, the industry can leverage the benefits of economies of scale which in turn leads to competitive pricing. This is when the technology attains mass acceptance.

The classic example of this is the success and global adoption of GSM technology, which is based on open industry standards, in the cellular mobile arena vis-à-vis the marginal regional presence of competing proprietary or vendor locked technologies.

The main beneficiary of the adoption of and strict adherence to open industry standards is the end consumer as it results in a much wider choice of offerings, competitive pricing and most important of all ease of deployment, use and support - all of which are important for mass market adoption.

The benefit of industry adopting an open standard is well explained through the virtuous cycle highlighted in the figure below.



For this virtuous cycle to fructify in the Mobile TV arena, open industry standards must be implemented end-to-end:

- Selected broadcast standard
- Service Protection and Purchase (SPP)
- Electronic Service Guide (ESG)
- Audio and video formats and codecs
- All associated profiles and parameters

If technology is to be regulated, the technology of choice for broadcast Mobile TV should be DVB-H on account of its open nature and the broad industry traction it enjoys.

DVB-H was standardised by ETSI in 2004 and is currently standardised at all levels (including Electronic Service Guide, Service Purchase and Protection and bearer technologies). It has additionally been standardized by the Telecom Industry Association (TIA) to be used in the US.

There are several leading international organizations like the *bmcoforum*, OMA, etc. providing support for DVB-H introduction and interoperability. These bodies have, for example, defined implementation profiles for the Electronic Service Guide (ESG) and Service Purchase and Protection (SPP), the two key elements of the Mobile TV platform, after much industry consultation in publicly available documents from the *bmcoforum* and OMA (Appendix 2 & 3) [<http://www.openmobilealliance.org>, <http://www.bmcoforum.com>]

DVB-H also allows for co-existence with DVB-T thus enabling efficient use and cross leverage of infrastructure and frequencies (eliminating need for separate and dedicated frequency bands) where ever there is a need to have both DTT and Mobile TV services offered simultaneously. This is particularly useful as DVB-H is a mobile broadcasting service complementary to DVB-T services.

The provision of DVB-H services within the overall broadcasting service bouquet is a viable alternative and supplement to traditional TV-Broadcasting services and should be implemented in parallel with DVB-T services. It is therefore important that DVB-H is taken into account in the national requirements for the planning process and that spectrum is made available for DVB-H services even in the initial phase of the DTT developments.

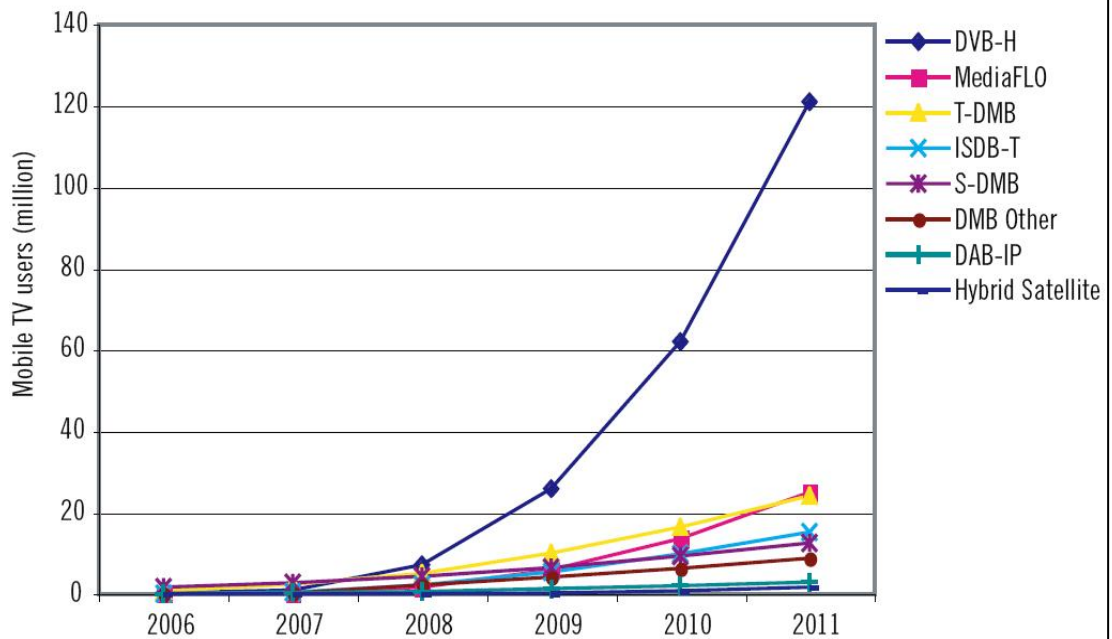
As the DVB-H service does not require separate frequency bands, the implementation of this type of broadcasting service is not directly linked to the national digital switch-over. An early transition from analogue to digital broadcasting on a national basis would, however, support full availability of spectrum for DTT services including new and innovative broadcasting services such as DVB-H. Most European countries have decided a national digital switch over date prior to 2015.

The DVB organization has a working patent pool for DVB-T and according to DVB practices new parts, like DVB-H, will get their own IPR arrangement. All DVB IPR is granted on Reasonable and Non Discriminatory Licensing terms (RAND). Currently there are over 60 manufacturers with products for DVB-H.

India has already adopted the path of DVB standards. DVB-S has been deployed in the country for DTH services and DVB-T for trial DTT services. DVB-H is the latest member of the DVB family, to have been deployed by Doordarshan.

Due to its open nature, standardization and broad industry traction (both in terms of deployments and vendor support), DVB-H is projected to have the dominant share of the global broadcast Mobile TV footprint.

**Figure 1.10: Worldwide broadcast mobile TV users by technology**



Source: Informa Telecoms & Media

## DVB-H and OMA BCAS is becoming the European choice



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## DVB-H Market Implementation in APAC



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## Trial and Network Deployments in MEA



## European Commission adopts DVB-H

The European Commission has selected DVB-H as the technology to be used for broadcast mobile TV across Europe and directed member states accordingly. The following is an extract of the same from the European Union (EU) website.

<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/1118&format=HTML&aged=0&language=EN&guiLanguage=en>

Brussels, 18 July 2007

Reference: IP/07/1118

### COMMISSION OPENS EUROPE'S SINGLE MARKET FOR MOBILE TV SERVICES

*Today, the Commission has adopted a strategy favouring the take-up of mobile TV across the 27 EU Member States. The Commission urges Member States and industry to facilitate and accelerate the deployment of mobile TV across Europe and to encourage the use of DVB-H as the single European standard for mobile TV.*

*"Mobile broadcasting is a tremendous opportunity for Europe to maintain and expand its leadership in mobile technology and audiovisual services," said Viviane Reding, EU Commissioner for the Information Society and Media. "Europe is today at a crossroads. We can either take the lead globally – as we did for mobile telephony based on the GSM standard developed by the European industry – or allow other regions take the lion's share of the promising mobile TV market. 'Wait-and-see' is not an option. The time has come for Europe's industry and governments to switch on to mobile TV."*

Until now, the introduction and take-up of mobile TV in the EU has been slow while Europe's competitors have progressed significantly. Unless Europe takes concrete action immediately, it risks losing its competitive edge. For example, the mobile TV penetration rate of South Korea, Asia's most developed mobile TV market, is close to 10%. Yet penetration in Italy, the EU's most advanced market, is still less than 1%.

The Commission is strongly committed to the success of mobile TV (see [IP/07/340](#)) which could be a market of up to €20 billion by 2011, reaching some 500 million customers worldwide. The Commission sees today's *Communication on Strengthening the Internal Market for Mobile TV* as crucial to create jobs and business opportunities for content creators, service providers and hardware manufacturers, and to bring new value-added services to citizens.

Three key success factors have been identified by the Commission for mobile TV take-up:

- **Standards/interoperability:** The Commission will promote consensus around a common standard, to reduce market fragmentation caused by multiple technical options for mobile TV transmission. The universal success of the GSM standard – which had been strongly supported by the Commission and Member States at the end of the 1980s – proves the benefit of a common standard. Currently, DVB-H (Digital Video Broadcasting for Handhelds) technology is the strongest contender for future



mobile TV, with successful commercial launches and trials in 18 European countries, and increasingly worldwide. The Commission will therefore in the weeks to come prepare the inclusion of DVB-H in the EU's official list of standards (published in the EU's Official Journal) and will thereby legally encourage its use in all 27 Member States. It will look closely at market developments over the next months and come with proposals in 2008 including, if necessary and appropriate, mandating the use of DVB-H.

- **Spectrum:** Today's Communication outlines the need of an EU strategy for the "digital dividend", the premium spectrum that will be freed up by the switch-off from traditional analogue to digital TV broadcasting. The Commission calls upon Member States to make spectrum available for mobile broadcasting as quickly as possible, including in the UHF band (470-862 MHz) as it becomes available. This is considered the most suitable spectrum for mobile multimedia services due to its technical characteristics. The Commission has also initiated the opening to mobile TV services of another frequency band, the so-called L-band (1452-1492 MHz) as a fallback solution.
- **A favourable regulatory environment:** National approaches to regulating mobile TV vary considerably at the moment. This generates regulatory uncertainty across the EU. The Commission considers that mobile TV is a nascent service and as such should benefit from "light touch" regulation. It will organise an exchange of best practice and provide guidance for a coherent framework for mobile TV authorisation regimes.

2008 is considered by the Commission as a crucial year for mobile TV take-up in the EU due to important sports events, such as the European Football Championship and the Summer Olympic Games, which will provide a unique opportunity for raising consumers' awareness and for the adoption of new services.

#### **Background:**

In March 2006 the Commission encouraged setting up a European Mobile Broadcasting Council (EMBC) to promote mobile TV in Europe. It gathered players from the telecommunications, hardware manufacturers and the software, broadcasting and content industries. However, EMBC failed to agree on industry led-solutions. This is why the Commission has now decided to intervene, and to actively support the take-up of mobile TV in Europe.

## Technical Merits of DVB-H

DVB-H is/has been deployed in nearly 50 pilots and commercial deployments across the globe. Several of those have led to commercial launches – Albania, Finland, India, Italy and Vietnam. Several other countries are in a process of launching services commercially either during 2H 2007 or 1H 2008, e.g. Germany, Spain, Malaysia, Netherlands, Austria, Czech Republic, Sweden, Indonesia, Philippines and SriLanka to name a few.

The status of public trials and deployments is freely available and maintained by DVB project organization [<http://www.dvb-h.org/services.htm>].

Several technical studies of Mobile TV technologies exist. For example, the bmcoforum has done system neutral comparisons between several mobile TV technologies (Mobile Broadcast Bearer Technologies – A Comparison, January 2007 and Mobile Broadcast Technologies – Link Budgets, January 2007). These public documents compare various Mobile TV systems in similar conditions. These reports can be found on bmcoforum's website under the Studies and White Papers section [<http://www.bmcoforum.org/index.php?id=53>].

DVB-H enables low battery consumption for portable devices due to a unique time slicing method wherein the receiver radio remains switched off for most of the time and reception of the IP data is only at pre-specified time intervals. This can result in up to 90% saving in battery usage.

DVB-H as a technology enables efficient network planning, especially when large SFN cells are used. Having different modulation modes enables adaptable network design. 4K mode offers a compromise between high-speed and small area cells enabled by 2K mode and larger cell area with 8K mode.

DVB-H offers excellent audio and video quality and the quality of the stream can be tailored flexibly to the nature of the content thus enabling optimization of audio-visual quality vs. number of content channels that can be supported in a given bandwidth.

DVB-H offers several advantages in the physical layer:

- DVB-T Compatibility: DVB-H can co-exist with DVB-T. For example, an operator could choose to run 2 DVB-T services alongside a DVB-H broadcast within one DVB-T multiplex. DVB-H can be used in 6, 7, and 8 MHz channels, but also adds the non-broadcast use of 5 MHz
- 2x bigger SFN size with 8k mode
- Better impulse noise and Doppler performance with MPE-FEC
- Seamless switchover from one frequency to the next
- Use of IP makes multi-bearer client implementation in handsets a lot cleaner

DVB-H is an IP based system. It uses the DVB-T radio layer, but the data carried is IP packets instead of MPEG2 video and audio. That means great flexibility in the selection of the carried content. The system is not bound with selected technologies, but can carry all kinds of IP data. IP Datacast was the name used for the first system to be developed. The DVB-H system

has been used not only for mobile television services, but also for broadcasting content to terminals. Such terminals may be stationary or mobile as long as they have DVB-H reception capability, enough storage and an optional connector to external devices. The content may either be consumed in the terminal or transferred e.g. to a PC.

Due to the personal nature of mobile TV, interactive services that are linked to the presented content complement the user experience. Such services have been tried during piloting DVB-H. Voting has been one of the easiest to implement and the most successful applications. The user has a clear, visible means to affect the program flow. DVB-H has been designed for interactivity from day one. OMA BCAST service layer specifications give a tool set to create and link applications to the program content.

Selecting a technology with broad industry traction and a global market brings tremendous business benefits to consider:

- Business benefits resulting from a truly open standard → increased competition → larger deployment footprint → better and cheaper products
- The service layer is specified at OMA BCAST allowing a carrier to utilize broadcast as a complementary rather than disruptive technology

A broad and rapidly expanding global vendor ecosystem has emerged for DVB-H and there are multiple vendors now across product categories (chipsets, terminals, head-end platform, ESG, Middleware, etc.). Details of the same can be found at the DVB project organization [[www.dvb-h.org/products.htm](http://www.dvb-h.org/products.htm)].

Consultancy for system design, network planning, etc. is also being provided by several companies globally.

DVB-H terminals are currently available from several vendors and the market will grow when more commercial systems are taken into use. Nokia estimates that the incremental cost for DVB-H is currently around 7 Euro per terminal and it will go down in the usual manner with economies of scale.

Currently known or announced DVB-H handset availability from Nokia, Samsung, LG, Sagem, Kaon, S3 (SW & HW platform), Siano, Quantum, Sony Ericsson (concept device) and Motorola (prototype).

Nokia continues to broaden its DVB-H terminal portfolio to address multiple price points & design styles so as to address all segments of the market.

There has also been a commercial launch announcement by a vendor of a CDMA handset with DVB-H support. Nokia will also evaluate the opportunity as and when there is a demand for the same.

## Service Purchase and Protection

Mobile TV handsets will be used for consuming digital content from all possible sources: from internet, from TV broadcast and from telecom domain and over numerous different access methods (broadcast, GPRS/WCDMA, WLAN, USB, SMS, etc.).

This requires an open, content agnostic DRM solution that can be used for all content types and all service protection needs.

In the case of Mobile TV, one critical aspect to the success of interoperability is the selection of the system to protect pay-TV services on mobile TV broadcasts. There are two routes that are currently being used - (i) Proprietary technologies provided by companies currently active in the DVB conditional access (CA) business; and (ii) Fully standardized open technologies, specified collectively by the industry. Interoperability can only be guaranteed by selecting a fully standardized solution. The dedicated single purpose service protection solutions, such as proprietary CA systems used in traditional pay TV, cannot meet these complicated needs.

The importance and benefits of interoperability have been highlighted time and time again by major Mobile Network Operators and Broadcasters and there is a clear tendency towards OMA BCAST specified DRM and Smart Card profiles for new installations. The DVB specified 18Crypt is almost identical to the DRM profile and it has been deployed e.g. in Vietnam.

A combination of a generic DRM system and a mobile TV service protection technology fulfilling the requirements of key players is needed. Key European mobile operators are requesting the OMA BCAST smart card profile as their service protection technology of choice. That seems to become the main stream solution, and it has already gained large industry support from all stakeholders, including companies producing proprietary CA systems for traditional broadcast TV.

The **proposed technology for Service Purchase and Protection is OMA BCAST Smart Card profile**. Majority of the service launches during 2007 and early 2008 would use the OMA BCAST DRM profile as an intermittent solution as the Smart Card Profile terminals and network elements will not be available before the end of the first half of 2008. The use of technologies from OMA BCAST ensures future compatibility and minimum overlap in capacity use.


OMA DRM profile has the following benefits:

- It is Open standard.
- It re-uses already implemented functions like OMA DRM, IPSec and purchasing designed for mobile phones
- It includes mobile specific requirements like roaming, personal service consumption and the global market approach
- It is optimal for mobile usage
- It is bearer agnostic with a common IP layer (e.g. for IPTV, MBMS)
- It follows the agreed content formats

- It has been defined for both connected and non-connected terminals (Terminals without a mobile return channel. Usage is e.g. in integrated car terminals.)

## Mass market requirement: **Flexible And Future Proof** Service and Content Protection

- Mobile handsets must handle DRM for **all content types** over **all distribution methods**



	Live Streaming	On-demand downloads	Filecast	IPTV
DVB-H	●	●	●	●
Cellular: GSM, EDGE, WCDMA, MBMS	●	●	●	●
WLAN	●	●	●	●
Memory cards	●	●	●	●
PC Synchronization	●	●	●	●

- Proprietary Conditional Access (CA) solutions (based on OSF) originate from **fixed broadcast networks** and support only live streaming over DVB-H.
- They fail to meet the **general DRM needs** in mobile handsets
- NOTE: Each CA vendor has an **own proprietary implementation variation**.

- The **two open standards** based service and content protection methods for mobile devices are:
  1. OMA BCAST Smart Card Profile
  2. DVB IPDC 18Crypt, which is technically similar to OMA BCAST DRM Profile (18Crypt)
- Above methods **reuse** solutions that **already exist** in mobile phones and enable a **holistic approach** for protecting all content types and distribution methods

### 3. What will be the frequency requirement for different broadcast technological standards for terrestrial and satellite mobile television transmission in India?

The optimum frequency range for DVB-H is 470-750MHz. Spectrum from this range should be allocated for Broadcast Mobile TV services. Reasons for this recommendation are outlined below.

The practical upper frequency limit for DVB-H based broadcast Mobile TV is 750 MHz. Any channels below this limit can be used. Higher frequencies in the broadcast band would not be usable due to the interoperability requirements with cellular systems in 800/900 MHz band.

Studies have shown that the mid part (below 750 MHz) of the UHF BSB is the optimal from cost perspective for broadcast mobile TV. Going to lower frequencies like VHF would be better from the propagation point of view, but integrated antennas in the terminal would have such a gain that the total link budget would be worse than in the UHF BSB.

Using higher frequencies like L-band would result in better terminal antenna gain, but the propagation is so much lower (also higher building penetration losses) that the link budget is again lower in the UHF BSB.

DVB has estimated network cost for different frequencies. The results of the calculations are shown in one section of a document: DVB-H vs. T-DMB System Comparison. The document can be downloaded from:

<http://www.dvb-h.org/PDF/060217.DVB-H%20vs%20T-DMB%20System%20Comparison.pdf>

***4. Which route would be preferable for mobile TV transmission – dedicated terrestrial transmission route or the satellite route? Should the mobile TV operator be free to decide the appropriate route for transmission?***

Satellite broadcast mobile television is in use in Korea. Satellite broadcasting has some benefits when outdoor reception is the dominant mode of reception. Whenever indoor reception is needed, the broadcasted signal needs to be enhanced and re-broadcast with terrestrial links. Thus the network cost with equivalent use, especially in urban area, gets more expensive than with terrestrial broadcasting.

We suggest the use of terrestrial broadcasting for Mobile TV end terminals and the option to use satellite link for feeding local terrestrial transmitters. Such a setup was used in UK when conducting the DVB-H trial.

***5. How should the spectrum requirements for Analogue/ Digital/ Mobile TV terrestrial broadcasting be accommodated in the frequency bands of operation? Should mobile TV be earmarked some limited assignment in these broadcasting bands, leaving the rest for analog and digital terrestrial transmission?***

Three key players in the mobile TV services ecosystem need to be considered:

1. Content owner
2. Technology provider
3. Customer owner

The spectrum owner/regulator should decide on the spectrum policy so as to allot spectrum to one or all of the above. A definitive selection criteria need to be defined based on the service provider's ability to provide relevant and sufficient content and their ability to reach out effectively to and support the broad base of consumers.

***6. In the case of terrestrial transmission route, how many channels of 8 MHz should be blocked for mobile TV services for initial and future demand of the services as there are nearly 270 TV channels permitted under downlinking guidelines by Ministry of Information and broadcasting?***

In case of DVB-H, upto 20-25 TV services can be supported in a given 8 MHz channel. Based on anecdotal evidence of TV usage, an individual TV viewer typically has around 4-5 favourite TV services. If we assume a household size of 4 with different viewing preferences, then an

average of around 20 TV services should suffice to cover the household television programming interests.

A recent video quality study by a European operator determined that 22 TV services is the optimal number for 8 MHz DVB-H bandwidth with QPSK modulation and statistical multiplexing (25 fps, 170kbit/s avg, 300kbit/s max video bit rate, 64kbit/s audio)

The test demonstrated the number of services that can be carried by one RF channel:

- 8 TV services can be carried by 1.4 Mbit/s with video quality suitable for “Mobile TV”
- This translates to 0.175Mbit/s per TV service
- $0.175\text{Mbit/s} \times 22 \text{ TV services} = 3.85\text{Mbit/s}$ . The overhead for ESG and FEC is 40%
- $3.85\text{Mbit/s} \times 1.4 = 5.39\text{Mbit/s}$  (QPSK modulation)

The number of channels to be allocated depends totally on the operator need and consumer demand for services. A recommendation is thus difficult to give. Some countries have allocated several multiplexes from their digital dividend for mobile TV services. They will start with one multiplex and widen the usage when the need emerges.

***7. Whether Digital Terrestrial Transmission should be given priority for the spectrum assignment over mobile TV, particularly in view of the fact that the Mobile TV all over the world is essentially at a trial stage.***

Mobile TV is gaining momentum worldwide. Several countries have successfully completed trials and are moving to commercial deployment. The trials results have been so positive and have shown such potential that many other countries have plans to omit trials/pilots, as there is no new information or learning to be obtained, and plan to go directly to the commercial phase.

DTT is facing competition globally from cable TV and DTH services and with the convergence of delivery mechanisms, DTT services may not bear rich fruits even if deregulated. Globally, broadcast mobile TV is seen as a subscriber retention tool and value enhancer for mobile network operators and broadcasters looking for new avenues of growth. For MNOs, broadcast Mobile TV services also help tide over issues related to limited spectrum.

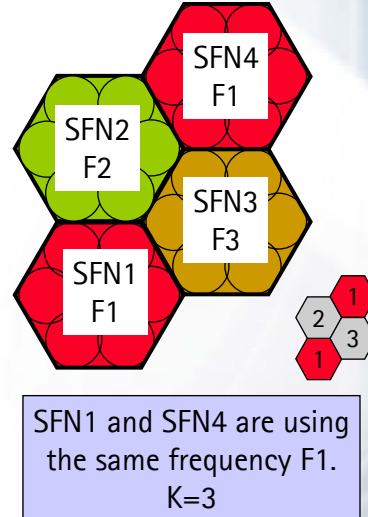
***8. Whether the frequency allocation for the mobile TV should be made based on the Single Frequency network (SFN) topology for the entire service area or it should follow Multi Frequency Network (MFN) approach.***

SFN should be used due to its efficient frequency usage. The network topologies used in other markets have proven that large SFN cells are the optimum solution.

The advantages of SFN planning over MFN planning and situations or scenarios in which SFN planning would be the preferred are outlined below. However, both methods can be utilized to achieve the same results of practical convenience especially when the network coverage areas are not large.

## SFN-Areas and Frequency Re-use

- Uniform continuous SFN requirement is leading to very small radio cell sizes.
- If normal frequency re-use patterns are applied to SFN-areas, we will get SFN-islands separated by the re-use distance D.
- The SFN-site area can be selected to be the maximum allowed by GI.
- In theory 3 frequencies could be enough for continuous coverage.
- In practise 4 to 5 frequencies are needed.



### **9. Whether frequency spectrum should be assigned through a market led approach – auctions and roll out obligation or should there be a utilization fee?**

It is advisable for the regulator and other statutory stakeholders to take a cue from global developments in this regard.

### **10. What should be the eligibility conditions for grant of license for mobile television services?**

A definitive selection criteria need to be defined based on the service provider's ability to provide relevant and sufficient content and their ability to reach out effectively to and support the broad base of consumers.

### **11. Whether net worth requirements should be laid down for participation in licensing process for mobile television services? If yes, what should be the net worth requirements for participation in licensing process for mobile television services?**

No comment.

### **12. What should be the limit for FDI and portfolio investment for mobile television service providers?**

No comment.

### **13. What should be the tenure of license for the mobile television service providers?**

The typical payback period for broadcast Mobile TV services is around 4-5 years, but this depends in large measure upon the market and uptake and could also take much longer. In view of this and the fact that India is a nascent Mobile TV market, tenure of the license should ideally be around 15-20 years.



***14. What should be the license fee to be imposed on the mobile television service providers?***

No comment.

***15. Whether in view of the high capital investment and risk associated with the establishment of mobile television service, a revenue share system would be more appropriate***

A revenue share arrangement should be considered to stimulate growth of the service and ease the financial burden on the broadcast network operators.

***16. Whether any Bank Guarantee should be specified for licensing of the mobile television service providers. If yes, then what should be the amount of such bank guarantee? The basis for arriving at the amount should also be indicated.***

No comment.

***17. Whether the licenses for mobile television service should be given on national/ regional/city basis.***

Licenses for Mobile TV should be on a national basis with rollout commitments.

## MISCELLANEOUS

Related industry websites :

- DVB-H Organisation – [www.dvb-h.org](http://www.dvb-h.org)
- Open Mobile Alliance [OMA] – [www.openmobilealliance.org](http://www.openmobilealliance.org)
- Broadcast Mobile Convergence Forum [BMCOforum] - [www.bmcoforum.org](http://www.bmcoforum.org)
- Nokia – [www.nokia.com/mobiletv](http://www.nokia.com/mobiletv)

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## Appendixes

### Appendix 1 - Commission opens Europe's Single Market for Mobile TV services

Reference: IP/07/1118 Date: 18/07/2007

IP/07/1118

Brussels, 18 July 2007

#### Commission opens Europe's Single Market for Mobile TV services

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- **Standards/interoperability:** The Commission will promote consensus around a common standard, to reduce market fragmentation caused by multiple technical options for mobile TV transmission. The universal success of the GSM standard – which had been strongly supported by the Commission and Member States at the end of the 1980s – proves the benefit of a common standard. Currently, DVB-H (Digital Video Broadcasting for Handhelds) technology is the strongest contender for future mobile TV, with successful commercial launches and trials in 18 European countries, and increasingly worldwide. The Commission will therefore in the weeks to come prepare the inclusion of DVB-H in the EU's official list of standards (published in the EU's Official Journal) and will thereby legally encourage its use in all 27 Member States. It will look closely at market developments over the next months and come with proposals in 2008 including, if necessary and appropriate, mandating the use of DVB-H.

- **Spectrum:** Today's Communication outlines the need of an EU strategy for the "digital dividend", the premium spectrum that will be freed up by the switch-off from traditional analogue to digital TV broadcasting. The Commission calls upon Member States to make spectrum available for mobile broadcasting as quickly as possible, including in the UHF band (470-862 MHz) as it becomes available. This is considered the most suitable spectrum for mobile multimedia services due to its technical characteristics. The Commission has also initiated the opening to mobile TV services of another frequency band, the so-called L-band (1452-1492 MHz) as a fallback solution.
- **A favourable regulatory environment:** National approaches to regulating mobile TV vary considerably at the moment. This generates regulatory uncertainty across the EU. The Commission considers that mobile TV is a nascent service and as such should benefit from "light touch" regulation. It will organise an exchange of best practice and provide guidance for a coherent framework for mobile TV authorisation regimes.

2008 is considered by the Commission as a crucial year for mobile TV take-up in the EU due to important sports events, such as the European Football Championship and the Summer Olympic Games, which will provide a unique opportunity for raising consumers' awareness and for the adoption of new services.

#### **Background:**

In March 2006 the Commission encouraged setting up a European Mobile Broadcasting Council (EMBC) to promote mobile TV in Europe. It gathered players from the telecommunications, hardware manufacturers and the software, broadcasting and content industries. However, EMBC failed to agree on industry led-solutions. This is why the Commission has now decided to intervene, and to actively support the take-up of mobile TV in Europe.

#### **For further information:**

[http://ec.europa.eu/information\\_society/newsroom/cf/itemlongdetail.cfm?item\\_id=3535](http://ec.europa.eu/information_society/newsroom/cf/itemlongdetail.cfm?item_id=3535)

## Appendix 2 - Press Release of Industry support to BMCOforum and OMA BCAST

### PRESS RELEASE

April 12, 2007

### **Leading mobile companies to endorse common mobile TV implementation based on OMA BCAST Common implementation profile defined within the Broadcast Mobile Convergence Forum ensures service interoperability and economies of scale for Mobile TV devices**

Hague, the Netherlands - Digitenne, Ericsson, KPN, Nokia, Nokia Siemens Networks, NXP Semiconductors, Sony Ericsson, Telefónica, O2 Europe, T-Mobile, Vodafone and ZTE today announced their support for a Mobile TV implementation profile developed within the Broadcast Mobile Convergence Forum (bmcoforum). The profile simplifies the Open Mobile Alliance (OMA) Mobile Broadcast Services Enabler Suite (BCAST) specification for fast implementations ensuring interoperability and future proofing further developments.

The three main features supported by this profile are:

1. Advanced service and program guide (ESG) enabling a rich set of services
2. Support for multiple broadcast technologies
3. Support for content and service protection, using the Smart Card Profile (based on (U)SIM Card) or the DRM Profile (based on OMA DRM V2.0)

Support for DVB-H broadcast networks and cellular systems, as well as the 3G Mobile Broadcast Service (MBMS), are benefits of the OMA-BCAST specification. This allows companies to extend current business models and broaden current and future Mobile TV services. As a result, operators will be able to offer customers more choice in watching TV on their handset.

The bmcoforum OMA BCAST implementation profile ensures the best possible interoperability between the handsets and broadcast systems, providing customers with a smooth Mobile TV experience, and allowing large scale handset development.

It is the firm belief that such a profile will speed up large scale Mobile TV deployments in Europe

The profile defined by bmcoforum is the first implementation subset of the feature rich Mobile Broadcast Services Enabler Suite 1.0 (OMA BCAST 1.0) developed by the Open Mobile Alliance.

#### **Quotes**

"Digitenne aims to provide wholesale DVB-H services to the various mobile operators in The Netherlands" explains Marc van Dijk, head of Business Development for Digitenne, the provider of the commercial digital terrestrial TV services in the Netherlands. "We have chosen bmcoforum's implementation profile for OMA BCAST so that the mobile operators have the flexibility to run their own Mobile TV business without losing interoperability. Furthermore the baseline profile of OMA BCAST will allow content providers to develop Mobile TV content that can be used for the whole market."

"Ericsson sees that TV is significantly changing as it evolves from linear TV to personalised and interactive TV. We support open solutions with a common approach for Mobile TV delivery across 3G

networks over HSPA and MBMS as well as in other broadcast networks", says Claes Ödman, head of Multimedia Solutions at Ericsson. "Now, with the OMA BCAST enabler, this is possible in an interoperable manner, allowing the combination of Mobile TV based on Unicast and Broadcast services. The bmcoforum profile will help tremendously in accelerating the deployment and roll-out of such services."

"KPN very much welcomes the bmcoforum initiative to profile the OMA standard. Having an agreed baseline for Mobile TV technology will help us deliver a compelling interactive TV service to our customers. The Mobile TV market has had to wait for a clear technological direction. This important agreement should help all players in the Mobile TV market to speed up the delivery of attractive services on a growing range of affordable, high quality handsets," says Franklin Selgert, innovation manager KPN.

"Nokia warmly welcomes the industry agreement for the end-to-end implementation profile that caters for both DVB-H and 3G solutions," says Jouni Kämäräinen, Director, Multimedia, Nokia. "We see a strong parallel to the early days of development of GSM. The great commitment in the industry for a clear implementation profile will be followed by common test practices that will create a coherent and open market for successful worldwide DVB-H deployments. The bmcoforum implementation profile of the OMA BCAST standard is essential in launching Mobile TV services on a global scale."

"NXP Semiconductors, as a provider of complete 'TV on Mobile System Solutions', fully endorses the efforts of the bmcoforum and supports the production of the bmcoforum implementation profile based on OMA BCAST specification. We see clear industry and customer demand for such an activity and we welcome the opportunity to align our system solution development by combining our 3G mobile phone and integrated DVB-H TV on Mobile reference receivers with the bmcoforum derived OMA BCAST implementation profile," said Kees Joosse, Senior Director, Business Development, BL-Personal Entertainment Solutions, NXP Semiconductors.

"We at Nokia Siemens Networks believe that a fast and successful Mobile TV market requires timely availability of interoperable implementations," says Dr. Thomas Werner, Head of the Business Line Applications in the Business Unit Service Core & Applications at Nokia Siemens Networks. "Many operators use an incremental approach to introduce Mobile TV services. In this context, the bmcoforum profile of the OMA BCAST standard helps speed up implementation and interoperability testing. Starting with basic functionality and enabling more standardised features as the market develops, this profile has the potential to provide a future-proof path towards feature-rich Mobile TV services, delivered over DVB-H, MBMS and Unicast networks alike."

Dave Williams, CTO of Telefónica O2 Europe, said: "We have led DVB-H development in the UK, Germany and Ireland through customer trials and consortium activity. We believe that the OMA BCAST set of standards provides the best option for the implementation of integrated multi-media services using DVB-H broadcast technology in combination with 3G/MBMS packet data services and look forward to its deployment across Europe."

"T-Mobile supports all activities to finalise the specification of OMA Smart Card Profile and OMA ESG. We consider Smart Card Profile and OMA ESG to be the most future proof technologies which will support interactive services for a wide range of handset and provides the highest level of security," says Alexander Gedrovics, head of service platforms at T-Mobile International.

"Vodafone is committed to following the OMA BCAST standard for the implementation of future Broadcast-type multimedia services based on complementary Broadcast network technologies such

as DVB-H and 3G/MBMS. Broadcast Service Protection via Smartcard and the Electronic Service Guide (ESG) are key elements of the OMA BCAS standard which will bring clear customer benefits," says Dr. Alfred Baier, Senior Programme Manager for Mobile TV Technology at Vodafone Group. "We actively support the development of dedicated OMA BCAS implementation profiles within the bmcoforum, as this will help us to provide compelling Mobile TV services and terminals that delight our customers across all of our markets."

"We have introduced the most advanced 3G DVB-H phone to the European market. With the partnership with bmcoforum, ZTE has the strong capability to deliver additional mobile TV phones based in OMA BCAS standard for the global customers" said MR. Li Yingfeng, General Manager of ZTE WCDMA mobile terminal products.

## **About each company**

### **About Digitenne**

Digitenne is the provider of Digital Terrestrial TV services (DVB-T) in the Netherlands. Digitenne provides a wholesale package of about 20 commercial TV channels to retail service providers like KPN and Tele2 for their subscription based digital TV services to Dutch consumers. Furthermore, Digitenne provides the free-to-air digital terrestrial services for the Dutch public broadcasters. The Digitenne free-to-air services provide nationwide rooftop aerial coverage which enabled analogue TV in the The Netherlands being completely switched of in December 2006. Coverage of the commercial Digitenne services with a simple indoor antenna is over half of The Netherlands.

### **About Ericsson**

Ericsson is shaping the future of Mobile and Broadband Internet communications through its continuous technology leadership. Providing innovative solutions in more than 140 countries, Ericsson is helping to create the most powerful communication companies in the world. Read more at [www.ericsson.com](http://www.ericsson.com).

### **About KPN**

KPN is the leading multimedia company in the Netherlands, providing consumers and consumer households with fixed and mobile telephony-, internet- and TV services. To business customers, KPN delivers voice-, internet- and data services as well as fully-managed, outsourced ICT solutions. Both nationally and internationally, KPN provides wholesale network services to third parties, including operators and service providers. In Germany and Belgium, KPN pursues a multi-brand strategy with its mobile operations, and serves multiple customer segments in consumer- as well as business markets.

[www.kpn.com](http://www.kpn.com)

### **About Nokia**

Nokia is a world leader in mobile communications, driving the growth and sustainability of the broader mobility industry. Nokia connects people to each other and the information that matters to them with easy-to-use and innovative products like mobile phones, devices and solutions for imaging, games, media and businesses. Nokia provides equipment, solutions and services for network operators and corporations.

[www.nokia.com](http://www.nokia.com)

### **About Nokia Siemens Networks**

Nokia Siemens Networks is a leading global enabler of communications services. The company provides a complete, well-balanced product portfolio of mobile and fixed network infrastructure



solutions and addresses the growing demand for services with 20,000 service professionals worldwide. The combined pro-forma revenues of ?17.1bn in fiscal year 2006 make Nokia Siemens Networks one of the largest telecommunications infrastructure companies. Nokia Siemens Networks has operations in 150 countries and is headquartered in Espoo, Finland. It is a 50-50 joint venture combining Nokia's Network Business Group and the carrier related businesses of Siemens Communications.

[www.nokiasiemensnetworks.com](http://www.nokiasiemensnetworks.com)

#### **About NXP**

NXP is a top 10 semiconductor company founded by Philips more than 50 years ago. Headquartered in Europe, the company has 37,000 employees working in more than 20 countries and posted sales of EUR 5 billion in 2006. NXP creates semiconductors, system solutions and software that deliver better sensory experiences in mobile phones, personal media players, TVs, set-top boxes, identification applications, cars and a wide range of other electronic devices. News from NXP is located at [www.nxp.com](http://www.nxp.com).

#### **About Sony Ericsson**

Sony Ericsson Mobile Communications serves the global communications market with innovative and feature-rich mobile phones, accessories and PC-cards. Established as a joint venture by Sony and Ericsson in 2001, with global corporate functions located in London, the company employs over 7,500 people worldwide, including R&D sites in Europe, Japan, China and America. Sony Ericsson celebrated the 5th anniversary of the start of the joint venture on 1st October, 2006. Sony Ericsson is the global title sponsor of the Women's Tennis Association, and works with the Association to promote the Sony Ericsson WTA Tour in over 80 cities during the year. For more information on Sony Ericsson, please visit [www.sonyericsson.com](http://www.sonyericsson.com)

#### **About Telefónica O2 Europe**

Telefónica O2 Europe comprises mobile network operators in the UK, Ireland and Slovakia, along with integrated fixed/mobile businesses in Germany and the Czech Republic - all of which use 'O2' as their consumer brand. Telefónica O2 Europe also owns 50% of the Tesco Mobile and Tchibo Mobilfunk joint venture businesses in the UK and Germany respectively as well as having 100% ownership of Be, a leading UK fixed broadband provider. In addition, the group includes the Isle of Man fixed/mobile operator, Manx Telecom.

Telefónica O2 Europe, part of the Telefónica group, is headquartered in Slough, UK, and has more than 38 million mobile and fixed customers.

#### **About T-Mobile**

T-Mobile International is one of the world's leading companies in mobile communications. As one of Deutsche Telekom's three strategic business units, T-Mobile concentrates on the most dynamic markets in Europe and the United States. By the end of 2006, more than 106 million customers are served in the twelve T-Mobile markets. T-Mobile is a partner of FreeMove, an alliance formed by four of Europe's leading mobile companies - Orange, TIM (Telecom Italia Mobile), TeliaSonera, and T-Mobile - to help their customers communicate as easily while travelling abroad as they do at home.

T-Mobile is committed to offering its customers a broad range of easy to use services and products wherever they are. Considerable effort from approximately 50,000 employees focuses on the goal of delivering the best state-of-the-art mobile communications. High quality multimedia networks and continuing investment in the research and development of new ideas are reshaping the way in which people use mobile communications for information, for work, and for fun. Thanks to T-Mobile's

innovative web'n'walk service the mobile Internet is currently conquering the mobile telecommunications markets with full vigour. Customers increasingly use their cell phones to surf the world wide web while travelling.

For more information about T-Mobile International, please visit [www.t-mobile.net](http://www.t-mobile.net)

#### **About Vodafone**

Vodafone is the world's leading international mobile communications group with operations in 25 countries across five continents and over 200 million proportionate customers by the end of January 2007, as well as 36 partner networks. For further information, please visit [www.vodafone.com](http://www.vodafone.com).

#### **About ZTE**

Founded in 1985, with global headquarters in Shenzhen China, and operations in more than 100 countries, ZTE is a leading global provider of fixed line and mobile telecommunications equipment and network solutions. ZTE's product range is covering virtually every sector of the wireline, wireless and terminal markets. ZTE offers its customers a unique range of services. The company delivers innovative, custom-made products and services to major operators in the world, helping them to achieve continued revenue growth and to shape the future of the world's communications. ZTE commits around 10% of annual revenue to research and development and takes a leading role in a wide range of international bodies developing emerging telecoms standards. ZTE is the fastest growing telecoms equipment supplier in the world, and China's only listed telecoms manufacturer, with shares publicly traded on both the Hong Kong and Shenzhen Stock Exchanges. ZTE was the only Chinese IT and telecoms manufacturer listed in BusinessWeek's 2005 Top 100 Information Technology Companies.

For more information about ZTE Corporation, please visit [www.zte.com.cn](http://www.zte.com.cn)

#### **About the bmcoforum:**

bmcoforum (Broadcast Mobile Convergence Forum) is an international lobbying association, providing a discussion platform for companies and institutions dealing with the development of a worldwide open market for mobile broadcast services.

#### **About the Open Mobile Alliance (OMA)**

The Open Mobile Alliance (OMA) delivers open specifications for creating interoperable services that work across countries, operators, fixed and mobile terminals. Driven by users' needs and the expanding market for data services, the member companies of the Open Mobile Alliance stimulate the adoption of new and enhanced information, communication and entertainment services. The Open Mobile Alliance includes contributors from all key elements of the wireless value chain, and contributes to the timely and efficient introduction of services and applications.

The Open Mobile Alliance (OMA) name and logo are trademarks of Open Mobile Alliance Ltd. Other product and company names mentioned herein may be trademarks or trade names of their respective owners.

## Appendix 3 - OMA Press release: Open Mobile Alliance Releases Globally Interoperable Mobile TV standard

### FOR IMMEDIATE RELEASE

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### *Open Mobile Alliance Releases Globally Interoperable Mobile TV Standard*

**Singapore, June 20, 2007** – The Open Mobile Alliance (OMA), an international specifications setting body, announces the public availability of its Mobile Broadcast (BCAST) Version 1.0 Candidate Enabler Release. The specification is an open global standard for interactive mobile TV as well as on-demand video services, and is adaptable to any IP-based mobile content delivery technology. Currently, OMA's BCAST 1.0 can be adapted to broadcast systems like DVB-H as well as cellular systems like 3GPP MBMS, 3GPP2 BCMCS and mobile unicast streaming systems.

Over 35 companies have actively contributed to OMA's new specification, setting the global market requirements of the end result. "The regulatory, cultural and network environments for TV are very complex around the world" says Jari Alvinen, Chairman of the Board, OMA. "Release of this specification demonstrates the effectiveness of OMA efforts in the introduction of globally interoperable mobile TV services. The OMA BCAST Enabler opens the door for all potential players in the Mobile TV Value chain to compete and differentiate their products and services."

"The OMA BCAST specification suite accommodates several bearer network technologies and supports multiple business models," says Sungoh Hwang, Chairman of the OMA BCAST Working Group. "The specification equally caters to deployments driven by broadcasters as well as those driven by operators. Users can now have both interactive and simple broadcast mobile TV, buffered infotainment content on-demand, and any of the many new services that are currently being developed in the market."

#### **OMA BCAST 1.0 Candidate Enabler Release Features**

- Highly functional Service Guide, allowing flexible deployments
- Service and Content Protection using OMA DRM 2.0 or 3GPP/3GPP2 Smartcard
- Distribution Solution for both real-time and non-real-time media content
- Service Interactivity enabling active user involvement with services
- Network agnostic for both IP-based broadcast and cellular bearers

#### **About the OMA Release Program**

To date, OMA has published 51 Enabler Releases. The OMA continuously operates an interoperability program to validate Enabler specifications, as well as the implementations of member products and services. Using a clear working process, the Enabler Release Program is designed to deliver two key milestones for each enabler:

**A *Candidate Enabler Release (CER)*** delivers an approved set of open technical specifications that can be implemented in products and solutions, and then tested for interoperability.

An **Approved Enabler Release (AER)** represents Candidate Enabler Releases that have gone through the Interoperability Program (IOP) of OMA. The IOP tests interoperability between different member company's implementations – either within the OMA or through other means.

For more information, visit [http://www.openmobilealliance.org/release\\_program/index.html](http://www.openmobilealliance.org/release_program/index.html)

### **About the Open Mobile Alliance (OMA)**

The Open Mobile Alliance (OMA) delivers open specifications for creating interoperable services that work across countries, operators, fixed and mobile terminals. Driven by users' needs and the expanding market for data services, the member companies of the Open Mobile Alliance stimulate the adoption of new and enhanced information, communication and entertainment services. The Open Mobile Alliance includes contributors from all key elements of the wireless value chain, and contributes to the timely and efficient introduction of services and applications.

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## **Appendix 4 – MDTVA Press Release**

**News Release 2006, 1, 23**

### **Industry Leaders Form Alliance to Foster Growth of Mobile Digital TV and Accelerate DVB-H Deployment in North America**

**Intel, Modeo, Motorola, Nokia and Texas Instruments Working Together to Drive  
the Future of Mobile Entertainment**

Las Vegas, NV – NATPE Mobile++ 2006 Conference and Exhibition – Jan. 23, 2006 - Today, a group of the industry's leading wireless and entertainment companies announced the formation of a new organization created to promote the growth and evolution of Digital Video Broadcasting – Handheld (DVB-H), an open procedure standard for broadcast digital TV reception on mobile devices. The organization, called the Mobile DTV Alliance, includes representatives from Intel Corporation, Modeo [NYSE: CCI], Motorola [NYSE: MOT], Nokia [NYSE: NOK] and Texas Instruments (TI) [NYSE: TXN].

As mobile video entertainment gains increased awareness and achieves greater availability, the Alliance will focus on promoting the best practices and open standards that deliver premium-quality broadcast television to mobile devices for the North American market.

“The mobile TV market is heating up, with both trials and deployments accelerating over the next 12-18 months,” said David Linsalata, Research Analyst for Mobile Markets at IDC. “The support of key industry players in promoting the advantages of the DVB-H standard will significantly aid mobile TV deployment efforts in North America.”

An open procedure, industry-supported standard is expected to foster growth throughout the wireless market with more choices across the value chain from silicon, handsets, services and more. This should allow mobile DTV handsets and services to reach the mass market faster and at a lower cost to consumers.

Using mobile devices capable of decoding DVB-H signals, users will be able to receive live TV programming from the mobile TV function directly on their phone and other devices. In addition, users will benefit from on-demand and interactive programming that would utilize the cellular network, thereby increasing revenue opportunities for operators. The DVB-H standard benefits operators by preserving cellular network bandwidth for voice and other data services. Furthermore, mobile broadcast TV together with 2.5G and 3G networks offer an exceptional user experience and more efficient utilization of operators' spectrum and resources.

There are more than 10 DVB-H network trials that have either concluded or are currently underway around the globe, including Australia, Finland, France, Germany, Italy, the United Kingdom, the United States, and other countries. By 2007, most U.S. major markets are expected to have DVB-H infrastructure built out and ready for deployment.

Members of the Alliance will hold a panel session and DVB-H demonstrations at NATPE Mobile++ later today at the Mandalay Bay Hotel, Las Vegas, to discuss the Alliance and the DVB-H standard.

For additional information on the Mobile DTV Alliance, please visit: [www.mdtvalliance.org](http://www.mdtvalliance.org)

## About the DVB-H Standard

DVB-H is an open procedure standard developed by the DVB Project and enjoys broad industry support with more than 100 companies working on DVB-H components, devices and services today. The open approach of the DVB-H standard nurtures flexibility of business models, competition and sales opportunities for the value chain. The DVB-H standard incorporates OFDM air interface technology with good spectral efficiency, immunity to multi-path fading and good mobile performance.

## Mobile DTV Alliance Member Comments

“Consumers are demanding more content, such as live TV, from their mobile devices, and open procedure standards are key to delivering that content in a cost-effective way,” said Kevin Jones, Director of Business Development for Intel’s Mobility Group. “DVB-H is a very effective way to deliver high-quality, broadcast digital TV to mobile users, and Intel is a member of the Mobile DTV Alliance to help promote the standard and availability of this technology.”

“Participation in the Mobile DTV Alliance by global leaders such as Intel, Motorola, Nokia and Texas Instruments indicates the significant market potential of DVB-H both in the United States and in other countries. With our unencumbered U.S. spectrum rights and significant broadcast experience, Modeo is well-positioned to deliver a DVB-H broadcast network that will give U.S. consumers a superior mobile television experience delivered through DVB-H-enabled portable devices,” commented Michael Schueppert, President of Modeo LLC. Modeo is a subsidiary of Crown Castle International Corp.

“Motorola’s extensive experience in video distribution and cellular tells us that Mobile TV is poised to be one of the next great consumer experience drivers,” said Rob Bero, Director, Broadcast Technologies, Motorola Mobile Devices. “As a founding member of the Mobile Digital TV Alliance, we’re pleased to be working with our fellow industry leaders to bring this experience to market faster and make it more accessible to subscribers everywhere via open standards such as DVB-H.”

“Nokia is committed to the deployment of robust, scalable and interoperable DVB-H systems to ensure an exceptional experience with Mobile TV and related value-added services,” said Juha Lipiainen, Director of Strategy & Business Development for Mobile TV, Nokia. “To this end, Nokia is pleased to be a part of this joint initiative to bring together technology, product and service leaders to ensure common implementation of DVB-H networks and terminals according to open industry standards.”

“The Mobile DTV Alliance provides an open ecosystem for the mobile digital TV marketplace, greatly increasing revenue opportunities, innovation and services to consumers,” said Yoram Solomon, Director of Strategic Marketing and Industry Relations for TI’s Mobile Connectivity Solutions. “DVB-H is the most widely adopted standard in the world, and having an Alliance with members at every level of the wireless ecosystem, including partners and competitors alike, will ensure widespread adoption of DVB-H in North America.”

###

## Safe Harbor Statement

Statements contained in this news release regarding mobile digital TV product availability (including geographic scope and services to be offered), the growth of the mobile digital TV market and other statements of managements’ beliefs, goals and expectations may be considered forward-looking statements as that term is defined in the Private Securities Litigation Reform Act of 1995, and are

subject to risks and uncertainties that could cause actual results to differ materially from those expressed or implied by these statements. The following factors and the factors discussed in the parties' most recent Form 10-Ks could cause actual results to differ materially from the statements contained in this news release: actual market demand for mobile digital TV. The parties disclaim any intention or obligation to update any forward-looking statements as a result of developments occurring after the date of this news release.

#### **Trademarks**

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