

# **Spectrum for Mobile Broadband and Broadcasting: 2025 scenarios for the UHF band & the role of hybrid networks**

<https://marketpublishers.com/r/S8836C26F48EN.html>

Date: September 2014

Pages: 85

Price: US\$ 3,450.00 (Single User License)

ID: S8836C26F48EN

## **Abstracts**

2025 scenarios for the UHF band & the role of hybrid networks

Terrestrial broadcasting plays a significant role in TV reception... but the UHF (Ultra High Frequency) band is highly coveted by the mobile industry.

Hybrid networks could provide an answer to spectrum scarcity in the UHF band.

This report presents the most likely scenarios for the UHF band and the role of hybrid networks between now and 2025.

## Contents

### **1. EXECUTIVE SUMMARY**

### **2. METHODOLOGY & DEFINITIONS**

- 2.1. General methodology of IDATE's reports
- 2.2. 2025 scenarios for the UHF band

### **3. INTRODUCTION**

### **4. BROADCASTING SPECTRUM STATUS**

- 4.1. Cable is becoming the leading mode of TV access on the main TV set
- 4.2. Varying degrees of network digitisation
- 4.3. Terrestrial TV: slower rate of decline
- 4.4. Spectrum used by terrestrial broadcast
  - 4.4.1. Broadcast spectrum in the USA
  - 4.4.2. Broadcast spectrum in Europe
  - 4.4.3. Digital Dividend(s) reduce the amount of spectrum allocated to broadcasters
- 4.5. Satellite TV and radio spectrum
  - 4.5.1. L-Band (1-2 GHz)
  - 4.5.2. S-band (2 GHz)
  - 4.5.3. C-Band (4-8 GHz)
  - 4.5.4. Ku and Ka bands
  - 4.5.5. Satellite TV spectrum in Asia

### **5. MOBILE SPECTRUM STATUS AND FUTURE NEEDS**

- 5.1. On-going developments
  - 5.1.1. At world level
  - 5.1.2. At European level
- 5.2. Mobile spectrum today
  - 5.2.1. Overview of spectrum used for mobile broadband
  - 5.2.2. Mobile spectrum below the UHF band
  - 5.2.3. The 700 MHz band
- 5.3. New frequency bands for mobile broadband
- 5.4. Could parts of the UHF band become new resources for mobile broadband?
  - 5.4.1. Spectrum/mobile licences valuation

#### 5.4.2. Supplemental Downlink (SDL)

## **6. COULD HYBRID NETWORKS SOLVE THE SPECTRUM SCARCITY ISSUE IN THE UHF BAND?**

### 6.1. Definition of hybrid networks

### 6.2. Rationale for hybrid networks

#### 6.2.1. Limits of unicast technologies - Comparing unicast and multicast/broadcast delivery

#### 6.2.2. Why / when use broadcast?

### 6.3. Terrestrial broadcast technologies

#### 6.3.1. Digital television - DVB

#### 6.3.2. eMBMS (evolved Multimedia Broadcast and Multicast services)

### 6.4. Technological evolution related to video resolution

### 6.5. Hybrid approaches

#### 6.5.1. Hybrid Broadcast Broadband (HBB)

#### 6.5.2. Tower overlay

#### 6.5.3. H2B2VS

#### 6.5.4. TDF B2M concept

### 6.6. Chipset and device for hybrid networks perspective

#### 6.6.1. Chipsets

#### 6.6.2. Antennas and band support

#### 6.6.3. Power consumption issue

#### 6.6.4. Set-top boxes and gateways

## **7. 2025 SCENARIOS FOR THE UHF BAND IN EUROPE**

### 7.1. Technology roadmap

### 7.2. Presentation of the scenarios and main assumptions

### 7.3. Scenario 1 - DTT keeps 470-694 MHz in Europe ('status quo')

### 7.4. Scenario 2 - Broadcast networks play a more important role towards mobile devices

### 7.5. Scenario 3 - UHF band mainly used by hybrid networks

### 7.6. Scenario 4 - UHF band used by mobile networks

### 7.7. Conclusion

## **8. GLOSSARY**

## **9. ANNEX: ASO (ANALOGUE SWITCH-OFF) AND DTT ROU (RIGHTS OF USE)**

## Tables

### TABLES

- Table 1: First and second Digital Dividends, worldwide
- Table 2: 2025 scenarios for the UHF band (470-694 MHz)
- Table 3: First and second Digital Dividends, worldwide
- Table 4: Satellite frequency bands and related services
- Table 5: C-band allocations
- Table 6: Ku and Ka-Bands for satellite communications (Europe)
- Table 7: Main frequency bands for UMTS/HSPA/LTE deployment – FDD mode
- Table 8: Main frequency bands for UMTS/HSPA/LTE deployment – TDD mode
- Table 9: Status of the 700 MHz band worldwide
- Table 10: 3GPP 700 MHz allocations in Regions 2 and
- Table 11: APT 700 MHz plan – adoption in Asia-Pacific
- Table 12: Price (eurocents) per MHz per pop. (for 10 years)
- Table 13: DVB-T and DVB-T2 – number of deployments
- Table 14: Main characteristics of DVB-T and DVB-T2
- Table 15: Overview of MBMS support in 3GPP
- Table 16: Resolution, frame rate, encoding, bit rate and adoption for various TV formats
- Table 17: Timescales for video coding standards
- Table 18: Overview of benefits of Hybrid Broadcast Broadband TV
- Table 19: 2025 scenarios for the UHF band (470-694 MHz)
- Table 20: Criteria presented in our scenarios
- Table 21: Scenario 1 - DTT keeps 470-694 MHz in Europe ('status quo')
- Table 22: Scenario 2 - Broadcast networks play a more important role towards mobile devices
- Table 23: Scenario 3 - UHF band mainly used by hybrid networks
- Table 24: Scenario 4 - UHF band used by mobile networks

## Figures

### FIGURES

Figure 1: Regional TV access mode split in 2013

Figure 2: Radio spectrum status (2014-2015)

Figure 3: Radio spectrum status (2014-2015)

Figure 4: Change in TV access modes worldwide, 2010-2014

Figure 5: Growth of digital TV penetration worldwide by access mode between 2010 and 2013

Figure 6: Regional TV access mode split in 2013

Figure 7: Penetration rate (% of TVHH) of Terrestrial and Digital Terrestrial TV, by zone (2009-2014)

Figure 8: 470-698 MHz frequency bands ITU-R allocations

Figure 9: TV band spectrum before auction (and after DTV transition), 294 MHz

Figure 10: TV band spectrum after auction (and after DTV transition); fewer MHz, markets determined

Figure 11: Broadcast spectrum in Europe

Figure 12: Timetable for the digital switchover in the world

Figure 13: Satellite spectrum overview

Figure 14: Spectrum allocation in the 1900-2200 MHz bands (Europe)

Figure 15: 450 MHz spectrum in Brazil

Figure 16: Potential channelling arrangements in the 700 MHz

Figure 17: 700 MHz band in the USA

Figure 18: 700 MHz band auction results in Taiwan

Figure 19: APT700 (#28) Lower Duplexer (30 MHz) alignment with Region 1 (EMEA), DD2 spectrum

Figure 20: Overlap between the 700 MHz APT band plan and the 800 MHz band

Figure 21: Proposed prioritisation for mobile broadband frequency bands in the UK

Figure 22: Roadmap for release of more than 500 MHz new spectrum in Sweden

Figure 23: Example of supplemental downlink implementation

Figure 24: A vision of the evolution of the UHF frequency band

Figure 25: Two different approaches to the use of the UHF and VHF bands

Figure 26: Comparison between multicast/broadcast and unicast viewers vs. data rate needs

Figure 27: How MBMS works

Figure 28: Dynamic allocation of spectrum to unicast and broadcast

Figure 29: SFN operating principle

Figure 30: LTE eMBMS with low power (LPLT)

- Figure 31: LTE eMBMS with high power (HPHT)  
Figure 32: In-band and out-of-band eMBMS configurations  
Figure 33: Everything Everywhere DL unicast traffic  
Figure 34: Devices with 4k resolution have four times as many pixels as those with 1080p  
Figure 35: Comparison by TDF of broadcasting costs of HPHT vs LPLT  
Figure 36: Options for TV delivery in the future  
Figure 37: HbbTV features  
Figure 38: HbbTV building blocks  
Figure 39: Tower Overlay over LTE-Advanced  
Figure 40: H2B2VS concept  
Figure 41: B2M prototype  
Figure 42: LG G Pro include a DMB-T tuner in its South Korean version  
Figure 43: Accelerating complexity of new process nodes  
Figure 44: Cost per transistor is rising for the first time  
Figure 45: Technicolor LTE set-top box  
Figure 46: Reliance JIO Android set-top box  
Figure 47: Netgem HYBRIDGE DSL and LTE gateway  
Figure 48: Expected evolution of technologies for mobile broadband and broadcasting

## **PLAYERS COVERED IN THE REPORT**

Alcatel-Lucent  
Anatel  
Arqiva  
Astra  
AT&T  
BBC  
Broadcom  
BT  
China Mobile  
Deutsche Telekom  
DirecTV  
Dish Network  
EE  
Ericsson  
Eutelsat  
FCC  
HbbTV.org

Industry Canada  
Inmarsat  
Intelsat  
Iridium  
KDDi  
Korea Telecom  
KPN  
KT  
Lantiq  
LightSquared  
Mediatek  
Netflix  
Netgem  
NTT DOCOMO  
Ofcom  
Orange  
Qualcomm  
Reliance  
Samsung  
SiriusXM  
Smart Communications  
Sprint (formerly Sprint Nextel)  
Subtel  
Taiwan Mobile  
TDF  
Technicolor  
Telstra  
TerreStar  
Thomson  
Thuraya  
T-Mobile  
TRAI  
Verizon Wireless  
YouTube

## I would like to order

Product name: Spectrum for Mobile Broadband and Broadcasting: 2025 scenarios for the UHF band & the role of hybrid networks

Product link: <https://marketpublishers.com/r/S8836C26F48EN.html>

Price: US\$ 3,450.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

[info@marketpublishers.com](mailto:info@marketpublishers.com)

## Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/S8836C26F48EN.html>

To pay by Wire Transfer, please, fill in your contact details in the form below:

First name:  
Last name:  
Email:  
Company:  
Address:  
City:  
Zip code:  
Country:  
Tel:  
Fax:  
Your message:

**\*\*All fields are required**

Customer signature \_\_\_\_\_

Please, note that by ordering from marketpublishers.com you are agreeing to our Terms & Conditions at <https://marketpublishers.com/docs/terms.html>

To place an order via fax simply print this form, fill in the information below and fax the completed form to +44 20 7900 3970



