Digital Terrestrial Television in Central and Eastern Europe
Digital Terrestrial Television in Central and Eastern Europe

December 2006
### INTRODUCTION

1. DTT in Eastern Europe: markets are ready but legal framework lags
2. Overview of Markets
3. Projected DTT Timetable in Eastern Europe
4. The deadline for analogue-switch-off: 17 June 2015 at 00.01 hr UTC
5. The European Commission sets targets for ASO and limits rules on funding
6. DTT East and West - Key Differences Summary

### CZECH REPUBLIC

1. Highlights
2. Market overview and current situation
3. Government policy and regulatory environment
   - Current legislation
   - DTT Financing
   - Digital switch-over
   - Conditions for analogue switch-off
   - Two regions switch-off by 2008
4. Transmission companies
   - Network structure
   - Coverage
   - Broadcast services post-ASO
5. Broadcasters
   - Czech Television
   - Incumbent commercial broadcasters
   - New entrants
6. Assessment

### ESTONIA

1. Highlights
2. Market overview and current situation
3. Government policy and regulatory environment
   - Current legislation
   - DTT financing
   - Market for DTT receivers
   - Digital switch-over
4. Transmission company
   - Network structure
   - DTT coverage
   - Broadcast services post-ASO
5. Broadcasters
   - Eesti Televisioon
   - Incumbent commercial broadcasters
   - TV3
   - Kanal Kaks
   - Broadcasters available on the DTT trial
6. Assessment
<table>
<thead>
<tr>
<th>Country</th>
<th>Highlights</th>
<th>Market overview and current situation</th>
<th>Government policy and regulatory environment</th>
<th>Current DTT Status</th>
<th>DTT coverage</th>
<th>Digital switchover plans</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUNGARY</td>
<td>1.</td>
<td>2.</td>
<td>3.</td>
<td>4.</td>
<td>5.</td>
<td>6.</td>
<td>7.</td>
</tr>
<tr>
<td>LITHUANIA</td>
<td>1.</td>
<td>2.</td>
<td>3.</td>
<td>4.</td>
<td>5.</td>
<td>6.</td>
<td>7.</td>
</tr>
<tr>
<td>POLAND</td>
<td>1.</td>
<td>2.</td>
<td>3.</td>
<td>4.</td>
<td>5.</td>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>SLOVENIA</td>
<td>1.</td>
<td>2.</td>
<td>3.</td>
<td>4.</td>
<td>5.</td>
<td>6.</td>
<td>7.</td>
</tr>
</tbody>
</table>
OTHER COUNTRIES ____________________________________________________________ 44
  1. Albania_______________________________________________________________ 44
  2. Bulgaria ______________________________________________________________ 44
  3. Croatia _______________________________________________________________ 45
  4. Latvia_______________________________________________________________ 45
  5. Romania _____________________________________________________________ 46
  6. Slovakia____________________________________________________________ 47

CONCLUSION __________________________________________________________________ 49
  1. Challenges and new approaches___________________________________________ 49
  2. DTT Growth: Will penetration levels be adequate on the eve of ASO? ___________ 49
  3. Implications ___________________________________________________________ 50
     Beyond ASO ____________________________________________________________ 51

ANNEX________________________________________________________________________ 52
  1. DTT in Perspective: Market Evolution in Europe ______________________________ 52
Introduction

1. DTT in Eastern Europe: markets are ready but legal framework lags

While some countries in Western Europe are already on the verge of analogue switch-off, no Eastern European market has yet seen a full commercial launch of DTT services. This may soon change as governments and industry players move forward; however, the technology, business plans and evolution of DTT will not exactly follow the Western pattern. Moreover, achieving analogue switch-off may prove to be more problematic for the countries in the region now that the European Commission and certain international treaties have prescribed challenging timetables.

With roughly half of the forty million TV households in Eastern Europe relying on terrestrial television, the region represents a large market for free-to-air or low-cost multi-channel television. There are several reasons why DTT has not yet been fully introduced into this ripening market.

Political wrangling about the regulatory framework and licensing for DTT has stalled progress and delayed implementation. Recent elections resulting in virtual draws have exacerbated the problem of finding a strong proponent to drive consensus, especially among broadcasters.

Following a pattern seen in the West, commercial broadcasters have been passive and not willing to give up their analogue cash cows for digital uncertainty. Moreover, most of the region is dominated by a handful of Western media companies that have strong market share, high profits, and a shared ambivalence toward DTT. Meanwhile, with few exceptions, Public Service broadcasters (PSBs) are in a weaker relative position than their western European counterparts. A strong and enabled PSB has been the cornerstone of the most successful launches in the West.

Deliberations about the most appropriate business models are not complete. Although the free-to-air model has been the proven driver for mass adoption in the West, shortage of public funding in Eastern Europe has convinced many DTT planners that a commercially funded model may be necessary.

Finally, the Eastern countries are also faced with more technology choices and many are opting for MPEG-4 compression which, though more efficient, increases costs for broadcasters and consumers. This complicates the decision-making process as DTT planners realise that the impact is far-reaching, especially because it implies higher costs to consumers.

Yet, these bottlenecks are beginning to break down; below is a summary of developments.

The Baltic Tigers: Estonia, Latvia, Lithuania

Estonia is taking the lead in the region with a full launch scheduled for the end of this year. Operated by a joint venture between transmission company Levira and a cable operator, the DTT platform will start on a pay basis targeting 50,000 subscribers after two years. Initial coverage will be high, at over half of the population and reach 95% at the end of 2007. Using MPEG-4 compression, the platform will include 18 channels with 3 to 6 free channels also available. Levira (partly owned by Télédiffusion de France) has been setting up infrastructure since 2003 and doing test transmissions since 2004.

In Lithuania, national licenses were awarded last year and a limited service using MPEG-4 video compression is already up and running. It is likely to cover 95% of the country by 2009.
Among the Baltic tigers, Latvia was de-clawed last year as the National Radio and Television Council stalled progress by pushing for a far greater role by the private sector and seeking to limit the involvement of the public broadcaster. The issue revolves around control of transmission infrastructure, but if compromise is achieved Latvia could quickly advance with its neighbours.

**The Big Three: Poland, Hungary, and the Czech Republic**

Smaller and more nimble, the Baltics may achieve earlier success but DTT plans in the Czech Republic may be more fruitful in the long-run. The platform will be based on the proven formula of a free-to-air model, MPEG-2 compression, and strong public service broadcaster support. So far, limited DTT services are up and running, with coverage now more than a third of the population. Public broadcaster Czech Television is simulcasting its two primary channels plus a news channel and sports channel. Even this limited offer has already enticed over 350,000 households to purchase set-top-boxes. With a full launch next year the country could see explosive growth. Meanwhile in neighbouring Slovakia, a four-channel DTT trial operated by the Slovak Telecom subsidiary Rádiokomunikácie began in Bratislava late last year.

Poland, whose TV market is similar in size to Spain, is also getting closer to launch. In 2005 a government committee adopted a roadmap for digital switchover, however, earlier this year the DTT multiplex licensing process was delayed and allocation of licences is expected at the end of 2006. Public broadcaster TVP is supporting the platform and may launch using MPEG-4 compression although the national regulator has shown some preference for the use of MPEG-2 compression. TVP already has a strong offer, having launched thematic channels earlier this year, but its full involvement from launch through analogue switch-off will depend on adequate funding.

In Hungary a draft legal framework is in the works and trials have been operating in Budapest and Kabhegy since 2004 but disagreements between the government and the broadcast regulator persist. Currently, five channels are available to one third of the population. Once passed, the new broadcast law is set to pave the way for the launch of a full DTT platform in Hungary.

In summary, we can expect significant activity in the region next year starting in the Baltics. If political issues can be resolved we could also experience a real breakthrough in the larger markets. We will also see a different approach both technologically (MPEG-4) and in terms of business model (more pay channels). However, there is a real risk that higher equipment costs and a limited free offer will likely impede mass adoption and may result in insufficient penetration levels by the end of the decade.

2. Overview of Markets

This report provides comparative analysis for those Eastern and Central European countries that will be members of the European Union in 2007: Poland, Romania, Hungary, the Czech Republic, Bulgaria, Slovakia, Lithuania, Latvia, Slovenia and Estonia. Several large markets or countries with significant DTT development are studied in-depth. There is additional information on developments in Albania and the countries of former Yugoslavia, as well. Russia, Ukraine, and the regions of the former Soviet Union (excepting the Baltics) are not covered.

There are almost 35 million television households in the countries under study and approximately 47% of those depend on analogue terrestrial as their primary reception means.

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1 For convenience, this report uses the term “Eastern Europe” to denote the countries of the region.
Households and Terrestrial Reception ranked by Television Households (2005)

<table>
<thead>
<tr>
<th>Country</th>
<th>TV Households (000)</th>
<th>Terrestrial only</th>
<th>Primary Market (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poland</td>
<td>12,700</td>
<td>46.0%</td>
<td>5,842</td>
</tr>
<tr>
<td>Romania</td>
<td>6,600</td>
<td>45.0%</td>
<td>2,970</td>
</tr>
<tr>
<td>Hungary</td>
<td>3,800</td>
<td>34.0%</td>
<td>1,292</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>3,700</td>
<td>68.0%</td>
<td>2,516</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>2,700</td>
<td>32.0%</td>
<td>864</td>
</tr>
<tr>
<td>Slovakia</td>
<td>1,900</td>
<td>60.0%</td>
<td>1,140</td>
</tr>
<tr>
<td>Lithuania</td>
<td>1,300</td>
<td>56.0%</td>
<td>728</td>
</tr>
<tr>
<td>Latvia</td>
<td>800</td>
<td>42.0%</td>
<td>336</td>
</tr>
<tr>
<td>Slovenia</td>
<td>700</td>
<td>34.0%</td>
<td>238</td>
</tr>
<tr>
<td>Estonia</td>
<td>600</td>
<td>49.0%</td>
<td>294</td>
</tr>
<tr>
<td><strong>Total/Average</strong></td>
<td><strong>34,800</strong></td>
<td><strong>46.6%</strong></td>
<td><strong>16,220</strong></td>
</tr>
</tbody>
</table>

Source: EBU, IP

Poland dominates the region in market size and represents over a third of all TV households of the countries under study.

Average cable penetration is approximately 37%, close to the Western average. However, the cable industry in Eastern Europe is characterized by a higher level of fragmentation and the pre-eminence of foreign, pan-European players, notably UPC. These foreign operators are expected to drive a period of consolidation over the next several years. A strengthening cable industry will be a direct competitor to DTT. Digital pay television through satellite and ADSL has also made headway in the region.

There are important economic structural differences which will persist into the medium term. Per capita incomes are lower in Eastern Europe and advertising spend is $73.72 per capita in Western Europe compared to $27.50 per capita in Eastern Europe. Average rates for license fees for Public service broadcasters are also lower.

3. Projected DTT Timetable in Eastern Europe

A great deal of uncertainty remains about concrete plans for DTT implementation in the region. Definitive legislation is not yet finalized in any country and many governments are unstable, making a true consensus difficult to achieve.

The table below represents a tentative preliminary analysis of which countries will launch first, what technology will be employed, and when analogue frequencies will be closed. However, as has happened in the West, DTT progress can be severely hindered and delayed by political decisions, or lack thereof.

An added complication for DTT planners in the region is the choice of advanced compression technology (MPEG-4 AVC) which can squeeze more channels and services into the same multiplex. This technology is already being deployed throughout Europe, mainly by satellite operators; however, no DTT platform in Western Europe has yet deployed MPEG-4 for the full array of its channels. The downside is cost both on the broadcaster side and, more importantly, for consumers as equipment (set-top-boxes) prices will be relatively higher. The Czech Republic has opted for MPEG-2, a proven, stable, and cheaper technology. Meanwhile, the Baltics, Slovenia, and Poland have either committed to, or are leaning toward the more advanced technology. The situation is unclear in the other countries.
Another variation from the typical DTT implementation in Western Europe is the tendency to apply a pay TV business model. So far, only the Czech Republic has chosen to drive DTT with a free-to-air channel offer. The rest of the region has either planned for a pay operator or is undecided. The pay model runs counter to what has worked best in the western countries and can act as an impediment to mass adoption.

The Soft Launch milestone shown in the table indicates that significant developments have taken place but at least one of the following elements is missing: full platform broadcasting, more than half population coverage, and set-top-boxes available. Full Launch indicates that all necessary elements are in place. It is the appropriate date to begin to evaluate the market impact of the platform.

### DTT timetable in Eastern Europe (sequence by full launch date)

<table>
<thead>
<tr>
<th>Country</th>
<th>Technology</th>
<th>Business Model</th>
<th>Soft launch</th>
<th>Full launch</th>
<th>Switch-off date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estonia</td>
<td>MPEG-4</td>
<td>pay</td>
<td>Dec 2006</td>
<td>2006</td>
<td>2012</td>
</tr>
<tr>
<td>Lithuania</td>
<td>MPEG-4</td>
<td>pay</td>
<td>Jul 2006</td>
<td>2007</td>
<td>2015</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>MPEG-2</td>
<td>free-to-air</td>
<td>Oct 2005</td>
<td>2007</td>
<td>2012</td>
</tr>
<tr>
<td>Poland</td>
<td>unclear</td>
<td>unclear</td>
<td>2008</td>
<td>2008</td>
<td>2014</td>
</tr>
<tr>
<td>Hungary</td>
<td>unclear</td>
<td>unclear</td>
<td>2008</td>
<td>2008</td>
<td>2012</td>
</tr>
<tr>
<td>Slovakia</td>
<td>unclear</td>
<td>unclear</td>
<td>2008</td>
<td>2008</td>
<td>2012</td>
</tr>
<tr>
<td>Slovenia</td>
<td>MPEG-4</td>
<td>pay</td>
<td>Mar 2007</td>
<td>2008</td>
<td>2012</td>
</tr>
<tr>
<td>Latvia</td>
<td>MPEG-4</td>
<td>free-to-air</td>
<td>2007</td>
<td>2008</td>
<td>2011</td>
</tr>
<tr>
<td>Romania</td>
<td>unclear</td>
<td>unclear</td>
<td>2008</td>
<td>2009</td>
<td>undecided</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>unclear</td>
<td>unclear</td>
<td>2008</td>
<td>2009</td>
<td>undecided</td>
</tr>
</tbody>
</table>

Source: EBU

Switch-off date indicates the time when analogue signals cease nationally. Switch-off dates presented here are based on submissions to European Commission Directorate-General Information Society and Media (COCOM05-51FINAL), January 2006. Most countries in the region have indicated December 31, 2012 with some undecided, and Poland targeting 2014. Lithuania will begin switching off in 2012 and complete the transition in 2015. Latvia is ambitiously targeting January 1, 2011. The decision on setting the date, however, is not purely a national matter. The countries of the region face a real and concrete deadlines set by international treaty and EU guidelines.

### What is MPEG-4?

MPEG-4 is a compression technology that allows more channels to be squeezed into DTT multiplexes. Previous DTT launches in Europe have used the less efficient MPEG 2 Video standard. In October 1998, the Motion Pictures Experts Group (MPEG) developed MPEG-4 Part 2. Together with the ITU (International Telecommunications Union) a Joint Video Team (JVT) was set up and developed MPEG-4 AVC which was later approved as a standard called MPEG-4 Part 10, or ITU-T H.264. Verification tests carried out by JVT showed that the MPEG-4 AVC achieved an improved coding efficiency between 50% and 100% compared to MPEG-2.

The increased coding efficiency of the MPEG-4 AVC codec could be used to reduce the bit capacity required for a TV channel, or improve the picture quality of the channel at the same bit rate.

But before MPEG-4 AVC can be implemented as a reliable standard for the
audiovisual industry, licensing issues need to be resolved. While the patent owners determine the licence fees, a group called MPEG LA negotiates the licence agreements and collects the royalties on their behalf. The following licensing terms for pay TV operators have been established until 31 December 2010:

- Title by title fee of either $0.02 per title or 2% of the price paid to the licensee of the video content or
- An annual fee based on the total number of subscribers.

Thus, $25,000 for 100,000 to 250,000 subscribers; $50,000 for 250,000 to 500,000 subscribers; $75,000 for 500,000 to 1 million subscribers; and $100,000 for more than 1 million subscribers.

### 4. The deadline for analogue-switch-off: 17 June 2015 at 00.01 hr UTC

In June 2006, a new plan regulating frequency usage in the broadcast bands of Europe, Africa and parts of Asia was established. The Geneva 2006 (GE-06) Agreement established two separate plans for an analogue and digital environment in these regions of the world. It is a binding international treaty signed by national administrations and registered with the United Nations. The treaty sets the precise date of 17 June 2015 at 00.01 hr UTC as the end of the transition period. This means that after this time, countries will no longer need to protect the analogue services of neighbouring countries and can freely begin using the frequencies assigned to them in GE-06 for their digital services.

It is possible for countries to begin implementing the GE-06 digital plan during the transition period (between 17 June 2006 and 17 June 2015). However, doing so will require the prior agreement of countries implicated by such an action. Implicated countries are defined as those within a plan entry that need to provide agreement prior to the implementation of an assignment/allotment.

The end of the transition period does not necessarily signify that analogue switch-off will take place throughout a given country. It does, however, mean that analogue services will no longer be protected or available along the borders, and hence could serve as an impetus to switching off analogue services throughout a given country. The transition period, which began on 17 June 2006, is handled between countries through bilateral agreements. Although this does allow for some level of flexibility, national planning strategies will have to give priority to border regions.

<table>
<thead>
<tr>
<th>Border regions may influence ASO strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Country</strong></td>
</tr>
<tr>
<td>Estonia</td>
</tr>
<tr>
<td>Lithuania</td>
</tr>
<tr>
<td>Czech Republic</td>
</tr>
<tr>
<td>Poland</td>
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<tr>
<td>Hungary</td>
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<td>Slovakia</td>
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<tr>
<td>Slovenia</td>
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<tr>
<td>Latvia</td>
</tr>
<tr>
<td>Romania</td>
</tr>
<tr>
<td>Bulgaria</td>
</tr>
</tbody>
</table>

*Source: EBU*
5. The European Commission sets targets for ASO and limits rules on funding

The European Commission has been a strong proponent of the move to an all-digital broadcast environment citing benefits of the technology but so far limiting its own role to an information coordinator, providing Member States with information on DTT planning and publishing Member States intentions on digital switch-over. However, the Commission is indirectly exerting a certain degree of pressure on latecomers by setting a concrete timeframe. The Commission expects the transition to digital to be well advanced by 2010 and proposes a deadline of early 2012 for phasing out analogue terrestrial broadcasting. It is expected that all the countries under study will be members of the EU by this time, if they have not already joined.

The EC recognizes that the benefits of digital switchover for the EU as a whole will only be fully achieved once all Member States have completed switch-off. The Commission has urged Member-States to begin the digital switch-over process, noting that the earlier the transition from analogue to digital broadcasting is started and the shorter the transitional period, the sooner these benefits are realised. The Commission has further recommended that Member-States put in place a strategy to inform consumers of the digital switch-over process, stressing that "consumer information is crucial to drive digital equipment sales" which will allow for digital switch-over.

With few exceptions, all countries in Western Europe have switch-over target dates on or before the Commission’s 2012 recommendation. The common benchmark may be useful in prompting Member States that have not yet launched digital services to do so. A consensus on a common date can also help prevent a digital divide from developing between different regions of Europe. Unless there is an acceleration of DTT deployment in the new Member States, this is a real risk.

Calling for market forces and consumer demand to drive digital switch-over, the Commission notes that “the challenge is to stimulate demand so that it is a service-led process rather than a simple infrastructure change with no perceived added-value for citizens.” However, the Commission recognises that the digital switch-over experience will vary among countries based on local circumstances and as such there can be "no single switchover pattern or formula". The management of digital switch-over is left to Member-States.

While the Commission supports a platform neutral approach, it does not rule out some government intervention since “the principle of technology neutrality does not preclude a Member-State from taking proportionate steps to promote specific technologies for transmission of digital television as a means for increasing spectrum efficiency.” However, any unbalanced approach would need to support public policy objectives and be “transparent, justified, proportionate and timely”, according to the Commission. For the new Member States this may be a moot point, especially if, as expected, many of them will seek to adopt the Euro around 2009. If this happens, the burden of reducing government budget deficits to meet Euro zone requirements will squeeze public expenditures across all sectors: it is unlikely that DTT will be a priority.

Another option that has not yet been fully explored is the possibility of the provision of additional EU funding for digital transition. At the end of the decade some markets such as Romania and Bulgaria may be in need of assistance.
6. DTT East and West - Key Differences Summary

Countries across Western Europe have faced many similar problems especially in the early phases of DTT introduction. Governmental inertia, reluctance from commercial broadcasters, and opposition from cable and satellite operators, has been the norm. Meanwhile, the drivers and main proponents of DTT have tended to be the Public Service Broadcasters and transmission companies. Likewise, these tendencies have characterized the development of DTT in most of the Eastern Countries. However, there are many differences between the regions that are becoming clearer and are impacting how and when DTT will take shape in Eastern Europe. In this section we review some key differences.

1. Eastern countries are launching later.

As outlined above, most of the region may not fully launch DTT services until 2008. In Western Europe it is expected that all countries will launch before that time, with many having developed detailed ASO plans, and some actually achieving full national termination of analogue transmissions.

### DTT Launch Schedule in Western Europe

<table>
<thead>
<tr>
<th>Country</th>
<th>Legislation in place</th>
<th>Soft launch</th>
<th>Full launch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>May 1997</td>
<td>Apr 1999</td>
<td>Sep 1999</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1999</td>
<td>Apr 2003</td>
<td>Apr 2003</td>
</tr>
<tr>
<td>Germany</td>
<td>Spring 2002</td>
<td>Nov 2002</td>
<td>May 2004</td>
</tr>
<tr>
<td>Italy</td>
<td>November 2001</td>
<td>Dec 2003</td>
<td>Jan 2004</td>
</tr>
<tr>
<td>France</td>
<td>August 2000</td>
<td>Mar 2005</td>
<td>Oct 2005</td>
</tr>
<tr>
<td>Switzerland</td>
<td>November 2002</td>
<td>2005</td>
<td>2006</td>
</tr>
<tr>
<td>Belgium</td>
<td>2002</td>
<td>2004</td>
<td>2006</td>
</tr>
<tr>
<td>Austria</td>
<td>2001</td>
<td>2006</td>
<td>2006</td>
</tr>
<tr>
<td>Norway</td>
<td>March 2002</td>
<td>2007</td>
<td>2007</td>
</tr>
<tr>
<td>Denmark</td>
<td>December 2002</td>
<td>Apr 2006</td>
<td>2006</td>
</tr>
<tr>
<td>Ireland</td>
<td>March 2001</td>
<td>2006</td>
<td>2008</td>
</tr>
<tr>
<td>Portugal</td>
<td>2000</td>
<td>2007</td>
<td>2008</td>
</tr>
</tbody>
</table>

2. Eastern countries are tending to adopt more advanced technology.

Five countries in the region have already committed to, or are leaning toward, the advanced compression technology (MPEG-4 AVC).

3. Eastern countries are planning more pay television on DTT.

There is marked tendency for DTT planners in the region to implement a business model based on a package of pay channels. The primary motivation seems to be financial. Governments in the region are unwilling, at this stage, to provide direct or indirect funding for the platform, although many are considering the logic of augmenting Public Service Broadcasters’ financial positions in order to give DTT the best chances for success. Leaving DTT implementation to commercial operators may be the path of least resistance but simply postpone the longer term consequences of slower growth.

4. Per capita GDP levels are lower.

Income levels in the countries under study are expected to show a persistent lag relative to Western Europe. Although this makes cost structures lower on the investment side and causes running costs to be relatively less expensive for certain operations, there is a demand effect on the critical issue of set-top-box prices for consumers. DTT’s current high growth phase in the West has been made possible by affordable
set-top boxes. The cost of set-top boxes, integrated digital TV sets plus the cost of any ancillary equipment represents the principle price component of demand for DTT and appearance of sub-160 euro boxes in late 2002 was the decisive signal that helped introduce the horizontal mass market. The continuing decline in entry level prices for set-top-boxes will reduce the obstacle to digital equipment purchase across all of Europe, however, the price points for mass adoption in the Eastern countries will remain relatively lower and perhaps still out of reach for more depressed regions.

Also, economic growth rates are relatively higher in the region and, if maintained, can have a positive impact on DTT penetration objectives. If the concomitant inflationary risk is manifested, however, it would have greater effect on consumer cyclical goods, like set-top-boxes and IDTVs.

5. Public service broadcasters are weaker.

Inadequate funding has affected many PSBs in Eastern Europe as permissible advertising income has been reduced, and license fees have not kept pace with inflation and new investment requirements. In Western countries, the introduction of DTT has provided an opportunity for PSBs to reassess their principal missions: to provide universal coverage and public service content above and beyond what market-driven commercial broadcasters could offer. European PSBs have used DTT to refine their purposes and achieve their goals when many had feared being left behind and eclipsed by commercial and pay groups in the digital age. PSBs across Europe are the staunchest proponents and key players in DTT while their obligations and responsibilities for ASO are more expansive than for commercial broadcasters. PSBs typically provide more channels, higher coverage and will be required to actively participate in the marketing and communications campaigns surrounding ASO.

6. Commercial Pan-European networks dominate free-to-air television

Five foreign media companies have carved out a strong presence throughout the region. The companies and their primary spheres of influence are shown below.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Primary Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBS SBS Broadcasting Group</td>
<td>Hungary, Romania</td>
</tr>
<tr>
<td>CME Central European Media Enterprises</td>
<td>Czech Republic, Slovakia</td>
</tr>
<tr>
<td>RTL RTL Group</td>
<td>Hungary, Croatia</td>
</tr>
<tr>
<td>MTG Modern Times Group</td>
<td>Baltics</td>
</tr>
<tr>
<td>NC News Corp.</td>
<td>South East Europe</td>
</tr>
</tbody>
</table>

The highest rated channel in each of the countries under study was controlled by one of these companies except in Poland and Romania. In Hungary, the RTL and SBS channels held over 55% of the audience share in 2005.

The political and economic influence of these companies can strongly facilitate or hinder DTT development. Understandably, to protect their current interests, the companies seem to have chosen a strategy corresponding to the latter effect. Throughout Europe, commercial broadcasters have joined DTT efforts reluctantly and only increase their involvement as the platforms achieve a critical mass. Commercial channels do have a financial incentive to minimize simulcast costs and thus promote DTT, but this is tempered by potential additional costs of extending coverage and allocation of marketing budgets.

The scope, resources, and international presence of the companies operating in Eastern Europe give them an additional level of leverage to obstruct DTT development in the region. The gradual progress of DTT is partially attributable to their influence.

Moreover, most of these companies have plans for expansion in the region and they even face new
competition from other western companies. For example, Axel Springer has already acquired a substantial interest in Polish commercial broadcaster Telewizja Polsat for Euros 250 million.

CME has begun acquiring television licenses in Eastern Europe over the past decade. The company lost an important property in Poland but now controls profitable stations in the Czech Republic, Slovakia, Romania, and Slovenia.

### CME Positions in Eastern Europe 2005

<table>
<thead>
<tr>
<th>Country</th>
<th>Channel</th>
<th>Share%</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Republic</td>
<td>TV Nova</td>
<td>41.1</td>
<td>1</td>
</tr>
<tr>
<td>Slovakia</td>
<td>Markíza</td>
<td>31.2</td>
<td>1</td>
</tr>
<tr>
<td>Slovenia</td>
<td>POP TV</td>
<td>26.0</td>
<td>1</td>
</tr>
<tr>
<td>Romania</td>
<td>Pro TV</td>
<td>15.7</td>
<td>2</td>
</tr>
<tr>
<td>Poland</td>
<td>TVN (former CME)</td>
<td>15.0</td>
<td>4</td>
</tr>
</tbody>
</table>

TV Nova dominates free-to-air television in the Czech Republic with a 41% share of the audience and a far greater share of the advertising market. In the first half of 2006, TV Nova represented more than a third of CME’s quarter billion dollars in net revenues. The stations cash flow is strong and rising.

In 2004 CME acquired Croatian network Nova TV for $24 million and has invested an additional $60 million in the station which has not yet turned a profit. The company also has interests in the Ukraine.

MTG controls a number of channels in Estonia and Lithuania and has a 50% stake in the second most popular channel in the Czech Republic.

### MTG Positions in Eastern Europe 2005

<table>
<thead>
<tr>
<th>Country</th>
<th>Channel</th>
<th>Share%</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Republic</td>
<td>PRIMA</td>
<td>22.9</td>
<td>2</td>
</tr>
<tr>
<td>Estonia</td>
<td>TV3</td>
<td>22.2</td>
<td>1</td>
</tr>
<tr>
<td>Estonia</td>
<td>3+</td>
<td>1.7</td>
<td>5</td>
</tr>
<tr>
<td>Hungary</td>
<td>VIASAT3</td>
<td>3.7</td>
<td>4</td>
</tr>
<tr>
<td>Latvia</td>
<td>TV3</td>
<td>18.5</td>
<td>3</td>
</tr>
<tr>
<td>Latvia</td>
<td>3+</td>
<td>3.3</td>
<td>7</td>
</tr>
<tr>
<td>Lithuania</td>
<td>TV3</td>
<td>25.7</td>
<td>1</td>
</tr>
<tr>
<td>Lithuania</td>
<td>TANGO TV</td>
<td>1.6</td>
<td>8</td>
</tr>
<tr>
<td>Slovenia</td>
<td>PRVA TV</td>
<td>2.0</td>
<td>7</td>
</tr>
</tbody>
</table>

MTG does particularly well with younger target groups. In Q3 this year the company reported a 45% market share in the 15-49 age group in Estonia, 40% for that target in Latvia, and in Lithuania the figure was 35%.

The company’s interests also include the mini-pay business which already has over 15.6 million subscribers across 17 countries in Europe. The channels are distributed under agreements with over 1,000 third party cable, satellite and IPTV pay-TV operators across the region. The mini-pay package may represent the main competition to DTT. The Baltic premium service counts 59,000 subscribers in Q3 2006, an 18% increase from the previous quarter.
The company’s CEO has made clear that expansion in the region is planned especially south-east: “The Slovenian market presents considerable potential for MTG over the coming years, as well as a platform for potential expansion into the former Yugoslav republics.”

RTL has retrenched somewhat --the company sold its interests in Poland two years ago -- but still maintains strong presence in Hungary and Croatia. It controls the market leader RTL Klub in Hungary with an audience share of 29% in 2005.

### Other Pan-European Commercial Broadcasters 2005

<table>
<thead>
<tr>
<th>Country</th>
<th>Channel</th>
<th>Share%</th>
<th>Company</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hungary</td>
<td>TV2</td>
<td>26.3</td>
<td>SBS</td>
<td>2</td>
</tr>
<tr>
<td>Romania</td>
<td>Prima TV</td>
<td>4.5</td>
<td>SBS</td>
<td>6</td>
</tr>
<tr>
<td>Hungary</td>
<td>RTL KLUB</td>
<td>29.0</td>
<td>RTL</td>
<td>1</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>BTV</td>
<td>36.9</td>
<td>News Corp.</td>
<td>1</td>
</tr>
</tbody>
</table>

Bulgaria’s first national private television station, BTV, maintained its 37% share of the audience in 2005, despite the addition of a new private television station in the market. BTV’s early and late evening news shows have become the most popular newscasts in Bulgaria, encroaching into what has been traditionally the domain of the public service broadcaster.

Foreign dominance of media in Eastern Europe goes beyond broadcast television. Many of the cable and satellite operators in the region are also controlled by large western media companies. The expertise and financial resources that they have brought to bear have had a profound impact on these industries. Commercial free-to-air broadcasters together with pay satellite and cable operators together form a potentially powerful source of resistance to the launch and growth of DTT.

In the next chapter we explore DTT developments in more detail for several countries. As was stated at the outset, no country in the region has yet fully launched a DTT platform and many are still in planning stages. Thus, many of the conditions and elements of launch are highly susceptible to modification, originating from significant market changes, political intervention, or other causes. The road to DTT in the region will almost certainly be marked by a great deal of deviation from the outline set by this report. Nevertheless, monitoring developments and sharing information from the early stages will be important for DTT planners, broadcasters, and TV consumers to understand how the process of digital transition unfolds.
Czech Republic

1. Highlights

- DTT services launched on one multiplex in October 2005 and are available to 38% of the population
- Analogue switch-off is expected by 2010
- Many new broadcasters are ready to join the DTT platform, however, the incumbent commercial broadcasters have shown their reticence and caused delays
- It is expected that 350,000 DTT receivers will be in homes by the end of 2006
- While some legal measures are in place to allow for DTT services to launch, further amendments to the existing Broadcasting Act may be necessary
- Three multiplexes will be available prior to analogue switch-off
- DTT services will be free-to-air and will use the MPEG-2 video compression standard
- Two regions near the border will need to undergo analogue switch-off prior to 2008 given interference issues with Germany

2. Market overview and current situation

- There are 3.7 million households in the Czech Republic, of which more than two-thirds are terrestrial only
- Four nationwide channels make up the terrestrial analogue platform - 2 channels from the public service broadcaster Czech Television (CT1 and CT2) and two commercial channels (TV Nova and Prima TV)
- The Czech Republic currently has one of the highest rates of ADSL adoption in Europe but penetration is quite low.

The terrestrial platform is the strongest television platform in the Czech Republic, accounting for over two-thirds of all households. It provides viewers with access to two channels from the public service broadcaster Czech Television, as well as a channel from Prima TV and TV Nova. As part of its licensing terms, Prima TV is required to broadcast some regional content during parts of the day.

TV Nova is the leading broadcaster in the Czech Republic in terms of advertising revenue and audience market share. It currently accounts for 72% of the television advertising market which is expected to increase further next year since Czech Television is required by the Parliament to decrease the amount of advertisement it presently carries. In terms of audience market share, it held 41.1% of the market in 2005. This compares with 29.8% for the two channels of Czech Television (CT1 and CT2) and 22.9% for Prima TV.

Cable has made some inroads in the country, although it currently accounts for a little more than a fifth of television households. While the two main providers, Karneval and UPC Czech Republic would like to merge, national regulators have put the merger on hold. At this stage, only Karneval has begun the roll-out of digital cable services (1 December 2005). UPC Czech Republic, CS Link and DigiTAV provide satellite services in the Czech Republic and account for less than 10% of television viewing homes.

The DTT platform currently consists of one multiplex launched in October 2005. At launch, it provided the
simulcast of three services from the analogue terrestrial platform (CT1, CT2 and TV Nova) as well as CT24, a continuous news services, from Czech Television. In February 2006, Czech Television launched a further service, CT 4 Sport, dedicated to sport coverage. A second and third multiplex also provide DTT services on a trial-basis.

### Official DTT services

**Offer on Multiplex A (since February 2006)**

<table>
<thead>
<tr>
<th>Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Television 1</td>
</tr>
<tr>
<td>Czech Television 2</td>
</tr>
<tr>
<td>Czech Television 24</td>
</tr>
<tr>
<td>Czech Television 4 Sport</td>
</tr>
<tr>
<td>TV Nova</td>
</tr>
</tbody>
</table>

### Trial DTT services

**Offer on Multiplex B (November 2006)**

<table>
<thead>
<tr>
<th>Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prima TV</td>
</tr>
<tr>
<td>Ocko</td>
</tr>
<tr>
<td>CZ 24</td>
</tr>
<tr>
<td>Top TV</td>
</tr>
<tr>
<td>TA 3</td>
</tr>
<tr>
<td>Noe TV</td>
</tr>
</tbody>
</table>

By March 2006, 150,000 DTT set-top boxes had been sold and it is expected that this figure will more than double by the end of the year with over 350,000 DTT receivers in homes. With DTT services available to 38% of the population, this represents a penetration rate of 15% in these areas.

### 3. Government policy and regulatory environment

The legal foundations for the launch of DTT services are not completely in place, although some debate among governmental institutions have led some to assert that existing broadcasting legislation is sufficient to allow for the launch of commercial DTT services.

<table>
<thead>
<tr>
<th>The main government and regulatory bodies responsible for broadcasting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Council for Radio and Television (RRTV)</strong> - responsible for awarding commercial broadcast licenses and monitoring compliance with license conditions and broadcasting legislation. The public service broadcaster is overseen by the Council for Czech Television.</td>
</tr>
<tr>
<td>2. <strong>Czech Telecommunication Office (CTU)</strong> - manages the frequency spectrum and is charged with preparing the analogue switch-off roadmap (Technical Plan). Responsible for monitoring the utilisation of assigned frequencies and supervising the operation of DTT network.</td>
</tr>
<tr>
<td>3. <strong>National Coordination Group for Digital Broadcasting (NKS)</strong> - governmental working group headed by the Ministry of Informatics responsible for coordinating digital switch-over. Its three subgroups examine technical, regulatory and content issues.</td>
</tr>
</tbody>
</table>
Current legislation

The broadcasting environment is regulated by the Broadcasting Act which entered into force in July 2001. This Act created the RRTV and empowered it to provide broadcast licenses and ensured Czech legislative conformance with European Union broadcast legislation. The Electronic Communications Act of 2005 set up the CTU and provides for the liberalisation of the electronic communications sector. Some minor amendments to the Broadcasting Act have been made regarding DTT services, such as the guarantee that TV Nova and Prima TV are allocated a license on the DTT platform. However, further amendments may be necessary to allow for the introduction of DTT services.

Already, some amendments have been made although they are minor in scope. One amendment ensures that broadcasters on the terrestrial analogue platform - TV Nova and Prima TV - are guaranteed a license on the DTT platform.

The public service broadcaster is regulated by separate legislation. The most recent legislation guarantees that Czech Television is allocated an entire multiplex on the DTT platform which has enabled it to launch DTT services. Other legislation calls for an end to advertisements on Czech Television by 2008, in order to make available an increased amount of advertising revenue for the new broadcasters on the DTT platform.

A political decision is needed to determine whether current legislation is sufficient for DTT services to be launched. According to some members of the RRTV, the regulatory body has sufficient authority to be able to allocate DTT licenses based on the frequencies assigned to the DTT platform by the CTU. In accordance with this position, it allocated 6 DTT licenses to commercial broadcasters in April 2006.

However, two applicants that did not receive licenses, TV Nova and Galaxie Sport, filed separate complaints to the Prague Municipal Court which resulted in the Court revoking the 6 DTT licenses. An appeal has since been lodged by RRTV and the six DTT license-holders and a final court ruling is awaited.

DTT Financing

The government has already announced that it will provide limited funding for digital switch-over. No subsidies will be available for the purchase of set-top boxes, although it may be possible that funding is available for low-income households. Following European Union legislation, the government is committed to remaining technology-neutral and will not favour any digital television platform during the digital switch-over process.

However, in order to help provide viewers with information on digital switch-over, the government has agreed to fund several information campaigns. In a first phase, the government will launch information campaigns in the two regions near the border with Germany that will undergo digital switchover in 2007. It is expected to provide Kc82 million (€2.89 million) for these two campaigns.

As digital switch-over progresses in other parts of the country, further government funding for information campaigns is anticipated.

Digital switch-over

Digital switch-over is expected to take place across the 11 regions of the Czech Republic as set out in the Technical Plan released by the CTU on 8 December 2006. The Technical Plan calls for the launch of DTT services on a regional basis followed by analogue switch-off 3 to 6 months later, much like the approach used in Germany. This approach will limit the simulcast period (and its related costs) and allow for a rapid transition to digital services. The Technical Plan is now awaiting government approval.

The government has set the final deadline for complete analogue switch-off as 31 December 2012, in accordance with the recommendation made by the European Commission. Several earlier dates have also
been proposed by members of the broadcast industry, and six commercial DTT license holders have called for analogue switch-off to be completed by 9 September 2009. However, given that the commercial DTT platform launch has been delayed, this date does not seem realistic.

The CTU put forward the date of 10 October 2010, which has been supported by Czech Television, although commercial broadcasters TV Nova and Prima TV have called for a later date for the completion of analogue switch-off and believe 2010 to be unrealistic. The final date is determined by the Technical Plan.

It should be noted, however, that currently no enforcement mechanisms exist to ensure that broadcasters comply with the Technical Plan. This means that if either TV Nova or Prima TV decides not to cooperate with the Technical Plan, they can continue to broadcast their services on the analogue platform until the expiration of their analogue broadcast licenses (2016 for Prima TV and 2017 for TV Nova) even though this could be counter to the Geneva 2006 Agreement. To encourage Prima TV and TV Nova to adhere to the Technical Plan, they may be awarded bonus DTT licenses.

Conditions for analogue switch-off
The government established several conditions for the completion of analogue switch-off in its Conception for Digital Broadcasting in the Czech Republic approved in March 2006. These conditions include:

- Coverage of DTT services is equivalent to the coverage of analogue terrestrial
- Launch of a targeted information campaign on the transition to DTT at least 3 months prior to analogue switch-off
- Provision of DTT services is simulcast for a period of at least 3 months, but no more than 12 months, before the planned switch-off date (assuming that it will be possible to provide parallel analogue and digital terrestrial television services)
- A sufficient quantity of set-top boxes available at reasonable prices

Two regions switch-off by 2008
Because of frequency interferences with DAB (digital radio) services in Germany, the CTU has agreed to end some analogue services in two regions located near its Germany border.

In Domazlice, located in the south-western part of the Czech Republic, one DTT multiplex was launched on 1 November 2006 with the television programme services of Czech Television. It was anticipated that TV Nova would participate in the launch, but declined to do so at the last minute due to a licensing misunderstanding with the RRTV. Following a planned information campaign, switch-off of the Czech Television analogue channels is planned to take place in the Spring/Summer of 2007. However, Prima TV and TV Nova decided against joining the DTT platform and will continue to broadcast their analogue channels. This means that viewers will need to access both analogue and digital services on the terrestrial platform.

In Usti nad Labem, located in the north, a similar process will take place. DTT services will be launched in the Spring/Summer of 2007 while analogue switch-off is planned for the end of 2007.

4. Transmission companies

Radiokomunikace (CRa) is the incumbent broadcast network operator in the Czech Republic. CRa is majority-owned (94.18%) by the investment group Bivideon and holds a minority stake (40%) in T-Mobile Czech Republic. Together, CRa and T-Mobile have been conducting DVB-H trials.

Other network operators include the Czech Digital Group, which operates one trial DTT multiplex in the
Prague region since 2000. Since 2005, it is owned by a private individual with an 80% share. Cesky Telecom, owned by Telefonica O2, is also able to serve as a broadcast network operator given its position as the incumbent Czech telecom network operator. Both the Czech Digital Group and Cesky Telecom hold trial DTT multiplex licenses until 2007.

**Network structure**

The incumbent network operator CRa, Cesky Telecom and the Czech Digital Group have ten transmission sites. Given the small size of the Czech Republic, it is not realistic that several broadcast networks will co-exist.

**Coverage**

Prior to analogue switch-off, three multiplexes should be available to viewers with various levels of population coverage. Multiplex A has the potential for 75% coverage, Multiplex B can provide 35% coverage while Multiplex C can provide 49% coverage. However, because the launch of DTT services will be linked to analogue switch-off, each region should have full DTT coverage at the time of its DTT launch.

At this stage, Czech Television has launched services on Multiplex A and currently provides coverage to 35% of the population. Services are available in the regions of Prague, Ostrava and Brno. Following the launch of DTT services in the regions of Domazlice and Usti, the DTT coverage will increase to approximately 40% of the population.

Current legislation requires that Czech Television provide DTT coverage to 95% of the population following analogue switch-off. Currently, it has an analogue coverage of 99% for its primary service CT1.

**Broadcast services post-ASO**

According to the Geneva 2006 Agreement, the Czech Republic will have a total of 8 DVB-T layers available (1 in the VHF band and 7 in the UHF bands) in 2015. Of these available layers, it has already been decided that one DVB-T network will be used to provide regional services while Czech Television is being considered for the allocation of a second DTT multiplex. While it is not known what other DVB-T services will be made available, some broadcasters have expressed an interest in providing HDTV services.

A commercial DVB-H trial carried by T-Mobile and CRa from October to November 2006 with 200 trial users may lead to interest from mobile telecom operators to provide mobile TV services.

**5. Broadcasters**

Not all broadcasters in the Czech Republic have been supportive of the launch of free-to-air DTT services financed by advertisements. While the public service broadcaster and potential DTT service providers have strongly supported its launch, TV Nova and Prima TV have shown much more ambivalence.

**Free-to-air Broadcasters 2005**

<table>
<thead>
<tr>
<th>Channel</th>
<th>Share</th>
<th>Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOVA</td>
<td>41.1</td>
<td>CME</td>
</tr>
<tr>
<td>PRIMA</td>
<td>22.9</td>
<td>MTG</td>
</tr>
<tr>
<td>CT 1</td>
<td>21.9</td>
<td>PSB</td>
</tr>
<tr>
<td>CT 2</td>
<td>7.9</td>
<td>PSB</td>
</tr>
<tr>
<td>OTHERS</td>
<td>6.3</td>
<td></td>
</tr>
</tbody>
</table>
Broadcasters that do not currently have services available on the terrestrial platform view DTT as an opportunity to enter a new market and generate revenue through advertisements. However, existing broadcasters on the analogue terrestrial platform will be wary of the introduction of new broadcasters as this will mean increased competition and the potential decrease in advertising revenue.

Because commercial broadcasters will generate revenue through advertisement, debate has arisen as to whether the Czech advertising market is large enough to support many small broadcasters. Some fear that the market will become overly fragmented, revenue will be low and that most broadcasters will suffer. However, this pessimistic view may be propagated by those broadcasters wishing to maintain their current share of the advertisement market on the terrestrial platform or supporting the introduction of pay-DTT services. At this stage, no plans for pay-DTT services have been made.

**Czech Television**

Czech Television has been a strong supporter of the launch of DTT services. It has made its services available for DTT trials and launched its DTT multiplex as soon as legally permitted to do so. Czech Television has also generated new content for the DTT platform, offering not only its two services available on the analogue platform, CT1 and CT2, but also a continuous news service, CT24, and a sports service, CT4 Sport.

In order to help support these initiatives, Czech Television has had a small increase in the television license fee paid by viewers. Between 2005 and 2008, it is expected that the license fee will again increase from CzK100 to CzK 135 per month.

However, this increase in the license fee is to help offset the loss in revenue that the public service broadcaster will face in 2007 when it will decrease its advertisements and 2008 when it will no longer be able to advertise at all (apart from important sporting events with expensive broadcasting rights). In order to provide increased advertising revenue to the broadcasters on the DTT platform, the Parliament decided that Czech Television needed to decrease its advertisements in 2007 and stop all advertisements in 2008.

This decision has been taken with the understanding that the DTT platform would be launched by 2007 in order to increase the amount of advertising revenue available for commercial broadcasters. However, until the commercial DTT platform is launched, this decision is only beneficial to the two commercial broadcasters on the analogue terrestrial platform.

Because the DTT platform has not been launched, some reservations have been raised about decreasing Czech Television’s advertisements in 2007. Rather, it has proposed to maintain its current level of advertisement and use the revenue generated for such projects as the digitalisation of its archives, set-top box subsidies or support for movie production.

**Incumbent commercial broadcasters**

The two broadcasters on the analogue terrestrial platform, TV Nova and Prima TV, have the most to gain from the delayed launch of DTT services. With a combined audience share of 64%, they risk losing viewers with the introduction of new broadcaster service which can translate into lower advertisement revenue.

However, the two broadcasters may support the DTT platform if they can be guaranteed a secure role on the platform through, for example, the allocation of an entire multiplex. This could allow for the maintenance of their existing market share and limit the number of new broadcasters entering the terrestrial television platform. The guarantee of only one DTT service license has not proven to be sufficient.
TV Nova

TV Nova is the most-watched broadcaster in the Czech Republic with an audience share of over 41% in 2005. In terms of advertising revenue, it accounted for 72% of the market in 2005 and expects this figure to increase when Czech Television will decrease its amount of advertisement in 2007.

TV Nova is owned by the CME Group, which controls a constellation of television channels throughout the region (see Introduction). The company’s policy towards DTT has been hesitant. Once the platform is fully launched, however, CME is expected to seek fuller engagement in order to transfer its valuable analogue assets to the digital platform. At this point no new channels or services have been announced.

In terms of DTT, TV Nova has shown limited support. It has agreed to simulcast its television service on the DTT multiplex operated by Czech Television in October 2005 and tendered for several commercial DTT licenses when the RRTV opened the DTT tender process. However, when it failed to receive any licenses, TV Nova used the judicial system to halt the tender process.

Prima TV

Prima TV is partly owned by Premiera primarily as a financial holding but a 50% stake was recently acquired by MTG (see Introduction) which will likely assume greater operational influence. Prima’s 2005 audience share approached 23% and its primary competitor is Nova as the two are locked in a battle with low-cost, mostly imported programming. Although they are fierce competitors for analogue audience share, the companies do share a common short-term interest in the delay of DTT.

Prima TV has proven to be ambivalent. It has shown some support through its partial ownership of Czech Digital Group, which has been trialling DTT services on Multiplex B since 2000. Simultaneously, it has refused to simulcast is analogue service on the official DTT multiplex.

New entrants

Potential DTT service providers have demonstrated their enthusiasm for the platform. This enthusiasm was evident through the high number of applications (33 applications proposing 42 different projects) that the RRTV received for the 6 available DTT licenses.

Broadcasters allocated DTT licenses

<table>
<thead>
<tr>
<th>Broadcaster/Owner</th>
<th>Channel offer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radim Parizek</td>
<td>TV Pohoda</td>
</tr>
<tr>
<td>J&amp;T</td>
<td>Z1</td>
</tr>
<tr>
<td>Regionalni Televizni Agentura</td>
<td>RTA</td>
</tr>
<tr>
<td>Mafra</td>
<td>Ocko</td>
</tr>
<tr>
<td>Fero Fenic</td>
<td>Febio TV</td>
</tr>
<tr>
<td>Barrandov Studios / Trinecke Zelezarny</td>
<td>TV Barrandov</td>
</tr>
</tbody>
</table>

Of these broadcasters, only Ocko is available on an alternative television platform while Regionalni Televizni Agentura provides content to Prima TV. The other services providers are new entrants to the broadcast industry.

Together, these broadcasters set-up ADT, an organisation to support the launch of DTT services and promote an accelerated timetable for the completion of digital switch-over.
The DTT licenses allocated by RRTV stipulated that the broadcasters must begin their DTT transmissions by April 2007. However, most had the intention of beginning in December 2006 and had already begun pulling together the necessary infrastructure for the launch when the Prague Municipal Court rescinded their DTT licenses. The broadcasters have complained about their lost investment and it is likely that they will seek compensation from the government should it ultimately be decided in the judiciary appeal process that their DTT licenses are revoked.

6. Assessment

The Czech DTT platform had a promising start following the launch of Multiplex A by Czech Television and TV Nova in October 2005. Enthusiasm for the platform proved to be high as many broadcasters sought commercial DTT licenses and the RRTV overcame political complacency and allocated 6 commercial DTT licenses.

However, opposition to the tender process for DTT licenses by the commercial broadcaster TV Nova has delayed the commercial DTT launch. TV Nova obviously has a financial interest in maintaining the analogue platform for as long as possible given its dominant position on this platform, especially in the advertisement market. It will need to be convinced that its financial interests can be met on the DTT platform.

TV Nova has agreed to participate with Czech Television on the DTT multiplex operated by CRa and it applied to the RRTV for commercial DTT licenses during the tender process in early 2006. So long as it can find a means of maintaining its market share on the DTT platform, it will likely support the platform.

TV Prima, which often follows the lead of TV Nova, has also proven to be lukewarm towards DTT. On the one hand it has supported and financed DTT trials, on the other hand, it has decided not to simulcast its analogue services in some regions.

The Czech broadcast industry has clearly benefited from the experiences learned in other markets that have successfully launched DTT services. It has decided to offer a free-to-air services that provides viewers with access to many more television programmes services than are currently available on the analogue terrestrial platform. In addition, Czech Television has expanded its content offering, launching two new services on the DTT platform.

As in many other countries, the public service broadcaster, Czech Television, has been the key driving force for the DTT platform. Alongside other, smaller broadcasters who would like to offer services on the terrestrial platform, Czech Television may find the necessary allies to push the government to launch the DTT platform.

Unfortunately the Czech Republic has been plagued by continually weak governments unable to make clear decisions in support of the DTT platform. Rather, these governments have been hampered by fragile majorities that limit their decision-making powers.

It is recognised throughout the Czech Republic that the DTT platform will need to be launched soon in order to meet the government’s - and the European Commission’s - 2012 deadline for analogue switch-off. Failing to meet this deadline, analogue switch-off will need to happen by 2015, at the latest. While some broadcasters may want to delay changing from the current situation for as long as possible, and thus continue to reap financial benefits, it is clearly recognised that DTT will need to launch soon.

To launch successfully, all broadcasters will need to cooperate with the timetable proposed by the CTU in its Technical Plan. While the task may appear difficult, the signs remain positive.
Analogue switch-off

Analogue switch-off may prove to be the next hurdle to overcome. While establishing a clear analogue switch-off timetable is a first step, adhering to it may be more difficult.

Viewers will need to be convinced to adopt DTT services and purchase the necessary receiver. As with any country with a high reliance on the terrestrial platform, the conversion task is not simple. And providing viewers with only 3-6 months for the conversion may not prove to be sufficient.

The experience with weak governments may also hamper the process. Should a government with a fragile majority encounter opposition to analogue switch-off, it may shy away from hard decisions.
Estonia

1. Highlights

- DTT services will be launched on 15 December 2006.
- Viewers are offered a predominantly pay DTT service platform with some free-to-air services to be added at a later stage using the MPEG-4 AVC video compression standard.
- Frequency licenses for three DTT networks have been allocated to the network operator Levira which has already announced its DTT roll-out plans.
- Legislation to allow for the introduction of new broadcasters on the terrestrial platform is likely to be approved by the Parliament in early 2007.
- The legislation is expected to set the analogue switch-off date for 1 February 2012, although the process is likely to begin earlier.

2. Market overview and current situation

- There are approximately 600,000 television households of which 49% rely on the terrestrial platform for their primary television.
- Cable is the largest pay television platform making up nearly two-fifths of the television market.
- Three channels are available on the analogue terrestrial platform - one channel from the public service broadcaster (ETV1) and two channels from commercial broadcasters (Kanal 2 and TV3). Legislation limits the total number of commercial channels on the analogue platform to no more than two.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Market share</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>TV3</td>
<td>22.2%</td>
<td>MTG</td>
</tr>
<tr>
<td>Other</td>
<td>20.8%</td>
<td></td>
</tr>
<tr>
<td>Kanal 2</td>
<td>19.7%</td>
<td></td>
</tr>
<tr>
<td>ETV</td>
<td>17.1%</td>
<td>PSB</td>
</tr>
<tr>
<td>PBK</td>
<td>10.3%</td>
<td></td>
</tr>
<tr>
<td>RTR Planeta</td>
<td>4.8%</td>
<td></td>
</tr>
<tr>
<td>Video &amp; TV Game</td>
<td>2.3%</td>
<td></td>
</tr>
<tr>
<td>3+</td>
<td>1.7%</td>
<td>MTG</td>
</tr>
</tbody>
</table>

The terrestrial platform is currently the largest television reception platform in Estonia. However, it is closely followed by the cable platform which has been able to offer viewers an appealing service of over 60 channels. Unless the terrestrial platform is able to compete effectively against the cable platform, it will continue to decrease its market share.

The cable platform is dominated by two main operators, STV Cable and Starman Cable TV, which together comprise 90% of the total cable market. In order to enhance their service offering, both have recently launched digital cable as well as triple play services (television, Internet and telephone).

The pay satellite platform, offered by Viasat, has made significant additions to its market share in the past
six months due to heavy marketing and significant rebates. It is estimated that at the end of 2006, the pay satellite market will have 5% of the television market. Free-to-view satellite services have proven popular, representing approximately 10% of the market. In April 2006, the incumbent telecom operator Elion launched its IPTV services over DSL. Despite some technical difficulties, IPTV has nevertheless been able to obtain 5% of the television market.

DTT services have been launched in December 2006 on two multiplexes using the MPEG-4 AVC video compression standard. Using primarily a pay business model, the DTT platform offers, at launch, 18 pay television programme services. It is expected that free-to-air services will soon become available. With two multiplexes, a total of 22-24 television services can be made available to viewers. At launch, DTT services are available to over 50% of the population will be extended to 95% of the population by September 2007. A third DTT multiplex is planned to be launched by the end of 2007.

DTT services have been launched by Eesti Digitaaltelevisioni (EDTV - Estonian Digital Television) under the brand name ZUUMtv. EDTV is a newly formed company jointly owned by the leading cable operator Starman (66%) and the network operator Levira (34%). While Starman is responsible for the marketing and sales of services and content acquisition, Levira provides the multiplexing and distribution of services.

### Current DTT platform

<table>
<thead>
<tr>
<th>Multiplex 1</th>
<th>Multiplex 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTA 1 (reserved)</td>
<td>Discovery Channel</td>
</tr>
<tr>
<td>FTA 2 (reserved)</td>
<td>Discovery Science</td>
</tr>
<tr>
<td>FTA 3 (reserved)</td>
<td>Discovery Travel &amp; Living</td>
</tr>
<tr>
<td>FTA 4 (reserved)</td>
<td>Discovery Civilisation</td>
</tr>
<tr>
<td>Eeter TV</td>
<td>Animal Planet</td>
</tr>
<tr>
<td>MTV Estonia</td>
<td>Cartoon Network / TCM</td>
</tr>
<tr>
<td>Hallmark</td>
<td>Eurosport 1</td>
</tr>
<tr>
<td>NASN Europe</td>
<td>PBK</td>
</tr>
<tr>
<td>Euronews</td>
<td>RTR Planeta</td>
</tr>
<tr>
<td>CNN International</td>
<td>NTV Mir</td>
</tr>
<tr>
<td></td>
<td>Ren-TV</td>
</tr>
<tr>
<td></td>
<td>Hustler TV</td>
</tr>
</tbody>
</table>

DTT service are priced at EEK 99 (€6.3) per month with set-top boxes that can either be purchased for EEK 1995 (€128) or rented for EEK 39 (€2.5) per month. This is slightly more expensive than the cable service offering (approximately €5 per month) but significantly cheaper than pay satellite services (€19 per month).

### 3. Government policy and regulatory environment

The legal framework allowing for a complete launch of DTT services is currently being updated. Necessary amendments to the Electronic Communication Act and Broadcasting Act are currently under review by Parliament and it can be expected that the changes will be made in early 2007.
The main government and regulatory bodies responsible for broadcasting

1. **Ministry of Culture** - Decides on conditions for broadcasting licenses and supervises compliance with the Broadcasting Act. Responsible for issuing television licenses to commercial broadcasters.

2. **Ministry of Economic Affairs and Communications** - Responsible for regulating the communications sector, including electronic communications.

3. **Estonian National Communications Board** - The governmental body reporting to the Ministry of Economic Affairs responsible for the electronic communications market. Determines the radio frequencies available for broadcast services and represented Estonia at the ITU during the RRC 04/06.

4. **Broadcasting Council** - Responsible for overseeing the public service broadcaster Eesti Televisioon (ETV) and ensuring compliance with its public service mandate. It is appointed by the Parliament.

**Current legislation**

The broadcast environment is regulated by the Broadcasting Act and the Electronic Communication Act. The Broadcast Act provides regulation for the public service and commercial broadcasters while the Electronic Communication Act regulates, among other communication modes, frequency usage.

The current legislation is sufficient to allow for the launch of DTT services. However, services can only be provided by existing broadcasters. An amendment to the Broadcasting Act is necessary to allow for the introduction of new services and broadcasters on the terrestrial platform.

Already, the National Communications Board has allocated a DTT frequency license to the broadcast network operator Levira for the roll-out of three national multiplexes.

The multiplexes will offer a combination of free-to-air and pay DTT services using MPEG-4 AVC. It is expected that the full DTT platform will provide viewers access to 6-8 free-to-air and 22-24 pay-DTT services. Free-to-air radio services are also likely to be made available. While two multiplexes will be dedicated to pay-DTT services, one multiplex will offer free-to-air television and radio services.

It is expected that the Ministry of Culture will announce a tender for new DTT programme services in Spring of 2007.

**DTT financing**

At this stage, the Government has not announced any plans to help finance digital switchover. Current policy, which requires commercial broadcasters to pay a license fee of EEK 23 million (1.5 million), is viewed by some as a hindrance to the launch and roll-out of digital television. However, new DTT broadcast licenses are unlikely to require broadcasters to pay this license fee.

In addition, the government has allocated some budget for allow local public service broadcasters to purchase new equipment. However, no funding will be made available for the simulcast of analogue and digital transmissions.

**Market for DTT receivers**

With the availability of a DTT pilot in Tallin since May 2004, it is estimated that 1000 households have purchased DTT receivers. However, these receivers use the MPEG-2 standard and will therefore not be able...
to access the services on the commercial DTT platform.

MPEG-4 AVC set-top boxes will be available to viewers on both the vertical and horizontal markets. Pay-DTT subscribers will be able to rent or purchase a DTT set-top box from EDTV while the network operator Levira will approve set-top boxes for sale in the retail market.

EDTV has already purchased the first 10,000 MPEG-2/MPEG-4 AVC standard-definition/high-definition set-top boxes from the Korean manufacturer Kaon Media and distribution has begun as of December 2006. EDTV expects to attract at least 50,000 customers in its first two years of operations.

Digital switch-over

Analogue switch-off has been set for 1 February 2012 in the draft amendment to the Broadcast Act currently before the Parliament. However, it is likely that analogue switch-off will begin in some areas (for low-power gap-fillers) in 2010 before completion in February 2012.

4. Transmission company

The incumbent network operator Levira, is owned by the Estonian government (51%) and the French network operator TDF (49%). Prior to its partial privatisation in 1997, it was known as the Estonian Broadcasting Transmission Centre (ERSK).

It is unlikely that any other network operators will emerge given the small size of the Estonian territory.

Network structure

Currently, Levira provides 99% population coverage for three analogue television channels. This is made possible with Levira’s network of 23 transmission towers, of which 6 are primary stations (Tallinn TV, Valgjärve, Orissaare, Kohtla-Järve, Koeru and Pärnu). The remaining 15 towers are auxiliary stations located throughout the country.

DTT coverage

At the time of launch, DTT services were accessible by over 50% of the population and this is expected to increase to 96% of the population by the end of 2007. All three multiplexes will have the same coverage levels.

Broadcast services post-ASO

Following analogue switch-off, Estonia will have 9 DVB-T coverage layers as per the Geneva 2006 Agreement (2 in the VHF band and 7 in the UHF band) in addition to some regional networks (Harju and Võru counties). It has not yet been decided how these coverage layers will be used. It is expected, however, that one coverage layer (for a fourth multiplex) will be allocated to the public service broadcaster.

The government’s plan for digital television, Concept of Digital Television, produced in June 2004, recommends the introduction of new DVB-T and DVB-H services in Estonia. The use of the MPEG-4 AVC standard provides broadcasters with some of the necessary infrastructure already in place should they wish to provide HDTV services.

Both the leading mobile operator EMT, owned by TeliaSonera, and Levira have announced plans for testing DVB-H services. Trials are likely to begin in the middle of 2007.
5. Broadcasters

The analogue terrestrial platform is dominated by three broadcasters: public service broadcaster Eesti Televisioon, and the commercial broadcasters TV3, and Kanal 2.

Eesti Televisioon

The public service broadcaster Eesti Televisioon (ETV) has suffered financial instability in recent years. This has affected its audience share, which has made it the least watched of the three available channels on the analogue terrestrial platform, compared to 1999 when it was the leading broadcaster. Its current audience share stands at 17%.

Since 2002, ETV has been prohibited from showing commercial advertisements. This measure had been taken in order to help commercial broadcasters which had, until that time, been generating losses. In compensation, commercial broadcasters are required to pay a yearly license fee of EEK 23 million (€1.5 million). However, the fee payment is made directly to the government rather than to ETV. This has had the consequence that ETV is dependent on the Parliament for its funding each year which has been neither stable nor sufficient. Viewer license fees have not been introduced in Estonia.

ETV has been a strong proponent of DTT services. It has actively participated in DTT trials, only ending its participation in February 2005 when the government did not compensate it for the additional transmission costs. ETV is planning to introduce two new services on the DTT platform, a new generalist service ETV2 and a continuous news services ETV24. However, no certainty exists that resources will be available for the launch of these services.

Most recently, the government approved funding for the technical upgrade of ETV facilities necessary to allow for digital transmissions.

Incumbent commercial broadcasters

Commercial broadcasters entered the Estonian terrestrial television market in 1993. Following the decision to end the re-transmission of Russian programming, three channels became available for commercial broadcasters in addition to the one channel already allocated to ETV.

Viewers can access two channels on the analogue platform, TV3 and Kanal 2, which are both owned by Scandinavian media groups. Their analogue licenses are valid until 1 October 2009 and an extension beyond this date has not yet been decided.

Viewers are also able to access analogue channels from Finland in the northern part of the country and from Latvia in the south. Analogue switch-off in Finland, planned for August 2007, will significantly impact the available programme choice and may provide viewers with an incentive to purchase a DTT receiver.

Kanal 2

Kanal 2 has for many years been the second most popular television channel in Estonia, but has recently been able to take a leading position. It currently accounts for a 22.6% audience share. Available since 1993, it has been owned by the Norwegian media group Schibsted since 1995.

TV3

While TV3 had been the most popular channel in Estonia, it has recently slipped to second position with a 19.5% audience share in 2006. Owned since 1996 by the Modern Times Group (MTG), it is the result of the merger between Reklaamitelevisioon and EVTV.
Broadcasters available on the DTT trial

Broadcasters not traditionally identified with the Estonian terrestrial television platform have offered their services for the DTT trial in Tallinn. While the trial was initially launched in December 2003, it only studied technical issues. It was not until May 2004 that the trial was officially launched, offering viewers with access to up to 4 television programme services using the MPEG-2 standard.

Services available included the Russian service RTR Planeta and Ren-TV as well as ETV1 from the public service broadcaster. These services were later replaced by Euronews, TV3+ and BBC World. Following the decision by ETV to end its digital transmission in February 2005, it was replaced by MIR TV.

6. Assessment

Estonia is a DTT leader in Eastern Europe. Its launch of DTT services in December 2006 makes it the first country in the region to offer a wide range of DVB-T services to over 50% of the population. The content offer will revive the terrestrial platform and make it more competitive with other television platforms. Given the highly competitive nature of the television market in Estonia, the DTT launch could not be delayed much longer without further audience erosion on the terrestrial platform. Estonia is also the first country to launch a full MPEG-4 AVC DTT platform.

The network operator Levira and the public service broadcaster ETV have proven to be strong DTT supporters. They have lobbied the government for the launch of services and actively participated in DTT trials. In addition, the decision by ETV to launch two new services will make the free-to-air DTT platform more appealing to viewers and likely help to increase DTT penetration.

However, DTT penetration may be hindered by the decision to launch a primarily pay-DTT platform. Such a platform will likely only target affluent viewers and have limited appeal to those viewers interested in free-to-air services. Yet this decision is financially viable given the limited investments made available by the government. Unlike other countries, such as Finland, the privatisation of the network operator did not enable funding to become available for the DTT platform.

Reaching analogue switch-off by February 2012 will be an ambitious goal. Increasing the penetration of DTT services will be difficult without a combination of new services offered on the free-to-air platform and inexpensive set-top boxes. In this case, the government may find it necessary to provide significant funding for digital switch-over if it hopes to meet the 2012 deadline recommended by the European Commission.
Hungary

1. Highlights

With tests ongoing since 1999, Hungary is operationally almost ready to launch a full array of DTT services to the general public and may do so in 2007 if legislation is cleared. The network operator, Antenna Hungária\(^2\) has been the driving force for the DTT launch and has carried out field trials, studies and seminars with the aim of preparing for a successful launch. Since October 2004, two multiplexes in Budapest and one multiplex in the Kabhegy region have been in operation. At this stage, government legislation is needed to enable a full DTT launch and it is expected in 2007. Hungary aims to launch its DTT services with three multiplexes and gradually increase to six multiplexes prior to analogue switch-off. Current planning designates one multiplex for DVB-H (broadcasting to handheld devices) services. After switch-off, a total of eight multiplexes are allocated in the Geneva 2006 Agreement.

In 2005, the government accepted general strategic goals concerning the launch of DTT services and closure of analogue frequencies. If this planning is confirmed, the National Radio and Television Board (ORTT) will likely open a tender for three national multiplexes in 2007. Meanwhile, the government will finalize legislation and make frequencies available.

2. Market overview and current situation

2005 Audience Shares in Hungary

<table>
<thead>
<tr>
<th>Channel</th>
<th>Share</th>
<th>Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTL KLUB</td>
<td>29</td>
<td>RTL</td>
</tr>
<tr>
<td>TV2</td>
<td>26.3</td>
<td>SBS</td>
</tr>
<tr>
<td>M1</td>
<td>13.8</td>
<td>PSB</td>
</tr>
<tr>
<td>OTHER HUNGARIAN</td>
<td>9.8</td>
<td></td>
</tr>
<tr>
<td>VIDEO</td>
<td>4.4</td>
<td></td>
</tr>
<tr>
<td>VIASAT3</td>
<td>3.7</td>
<td>MTG</td>
</tr>
<tr>
<td>OTHERS</td>
<td>2.3</td>
<td></td>
</tr>
<tr>
<td>DUNA TV</td>
<td>2.2</td>
<td>PSB</td>
</tr>
<tr>
<td>M2</td>
<td>1.6</td>
<td>PSB</td>
</tr>
</tbody>
</table>

Free-to-air television is dominated in Hungary by commercial broadcasters with the top two consistently taking the majority of viewers. Hungary has one of the highest cable penetration rates in the region with over 60% of television households depending on cable as their primary reception means.

\(^2\) In July 2005, Swisscom Broadcast took a 75% stake in the company.
3. Government policy and regulatory environment

There is as yet no firm legal basis for launching DTT in Hungary, however, preparations have been ongoing and it is expected that a legal framework of launching DTT could be established in the middle of 2007. The country’s Information Technology Minister, Kalman Kovacs, intends to introduce legislation to modify the Media Act to include digital transmission. The government could issue tenders for 10 TV stations and two "Internet access frequencies" and has allocated €4 million to create a national digital infrastructure. The Media Act needs two-thirds parliamentary approval for passage.

Early this year disagreements over content regulation between the National Radio and Television Board and the government delayed the process. However, Kovacs recently announced that the ruling socialist-liberal coalition had secured support of the opposition Fidesz and Democratic Forum parties to create a consensus for DTT legislation.

The government is drawing on the results of the Digital Switch Over Strategy report (Draft Plan) to help guide this framework. The key elements of the regulation are still not clear but one thing is certain: the regulation must conform to European Union rules and be platform neutral.

The Hungarian Media Authority is the entity which issues analogue licences based on the Media Law.

The Authority has been preparing a new Media Law draft, which will likely retain this responsibility for the Authority in regards to DTT licensing. Hence, this body will probably make the determination of how DTT licenses be allocated by multiplex or by channel (service). The regulatory tasks are the responsibility of the Prime Minister’s Office.

The Digital Switch Over Strategy draft contains a proposal to raise the budget of the Public Service Broadcasters (PSBs) by 10% to cover the digital switch over costs.

4. Current DTT Status

DTT trials have been ongoing in Hungary since 1999. Currently, there are two multiplexes transmitting (Budapest and Kabhegy). Four public channels, an EPG, and super teletext are broadcasted free-to-air in the current DTT configuration.

Since 1999 there has been a DTT Scientific Club, which contributed to the introduction of DTT technology in Hungary. Antenna Hungária, the Hungarian Broadcasting Network Operator organized several conferences and has been preparing a Digital Newsletter on its website for information and education purposes.

Multiplexes and Channels

Hungary secured eight multiplexes for DTT at the Geneva RRC-06 Conference. In the first phase three multiplexes can be launched perhaps in 2008. After analogue-switch-off (ASO), targeted for 2012, five additional multiplexes will become available. It will be possible to put TV and radio channels and also data in each multiplex, however, according to the current planning, one of the three multiplexes in the first phase of launch will be used for mobile TV services based on DVB-H standard.
Multiplex profile

<table>
<thead>
<tr>
<th>MFN in the UHF band</th>
</tr>
</thead>
<tbody>
<tr>
<td>8k, 64 QAM, 2/3 inner code rate and 1/32 guard interval</td>
</tr>
<tr>
<td>Designed for roof-top aerial reception</td>
</tr>
<tr>
<td>Budapest transmitters: channel 43 and 51 with 1 kW ERP</td>
</tr>
<tr>
<td>Kab-hegy transmitter: channel 64 with 2.5 kW ERP</td>
</tr>
</tbody>
</table>

It is expected that the channels presently broadcast terrestrially, namely, M1 (public), RTL Club and TV2 (commercial), will also be on the DTT network.

The choice of compression and encoding technology (MPEG-2 or MPEG-4) is expected to be decided by the future multiplex operator. Direct regulation of the choice is considered unlikely. Potential future multiplex operators are leaning toward the more advanced MPEG-4 option.

The present DTT network has implemented interactive services (EPG and superteletext) based on MHP and this is expected to become the standard API for the platform.

Current plans call for a combination of free-to-air and pay channels on the platform, however, it is not clear if channels will be chosen individually or by multiplex operator.

5. DTT coverage

According to the Draft Plan transmission networks will apply to a tender for DTT network operation. It expected that Antenna Hungária will be a prominent player in the network operations of DTT.

The frequency plan for the development of the nation-wide DVB-T network established in 2000 consists of the 17 existing main sites plus the addition of 3 new sites. Antenna Hungária has made the necessary technical preparations for DVB-T broadcasting and installed the transmission equipment. In addition, Antenna Hungária has been continuously examining the reception conditions of pilot tests.

The three multiplexes to be launched in the first phase will have 90%, 75% and 50 % coverage, respectively. After ASO, expected in 2012, the other five multiplexes are required to have nationwide coverage.

Broadcasters

Currently, there is no requirement for the main commercial channels to join the DTT platform until 2012, although they are designated launch slots. The companies have shown little interest in DTT so far.

Unlike current practice in most of Europe, the public service broadcaster in Hungary, Magyar Televízió (MTV), has not been granted any additional rights or obligations. New channels are being planned for the DTT platform by the public broadcaster, but it will have to make an application for a place on the multiplex. The Draft Plan does propose to increase the budget of the Public Service Broadcasters by 10% to cover the digital switch over costs.

The role of new entrants is not yet clear. If the conditions are favourable there will certainly be interest in joining the DTT platform but without firm decisions on the legislative framework and business model of DTT, it is premature for new broadcasters to make commitments.
6. Digital switchover plans

Although not yet set in law, the planned analogue switch-off date is 2012. The licences of analogue terrestrial broadcasters will also expire at that time. ASO will occur island-by-island, however, a timetable and sequence has not yet been prepared. According to the Digital Switch Over Strategy draft the simulcast period should be as short as possible, and the possibility of beginning HDTV is also mentioned.

Set-top-boxes are currently available in the retail market and it is expected that at least part of the platform service will be accessible by equipment purchased in the horizontal market.

7. Assessment

With frequencies available, the experience of years of testing, and pressure from the EU and RRC-06 Treaty, DTT in Hungary is ripe for launch. The primary obstacle has always been reluctance from commercial broadcasters and pay operators, but faced with a real launch timetable these players will likely begin providing channels and services. They cannot afford to be left out of a potentially high-growth distribution platform while their analogue frequencies have a limited lifespan.

Many of the key decisions that will affect DTT uptake are still to made. If Hungary were to follow the model adopted by the Czech Republic - a free-to-air platform based on low-cost technology - this would positively impact the growth of DTT in Hungary and make analogue switch-over an easier process to manage. Opting for the Baltic model - a primarily pay offering based on MPEG-4 - would imply more gradual growth.

Hungary has seven countries bordering its national territory, more than another of the countries under study. It is expected that at least Austria and Slovenia will have achieved national analogue-switch-over before Hungary.
Lithuania

1. Key highlights

- DTT services were launched in the capital Vilnius in July 2006 using a primarily pay-DTT business model.
- Further roll out of DTT services is expected in the next few years with a 95% population coverage by 2009.
- The DTT platform consists of 4 nationwide DVB-T multiplexes using the MPEG-4 AVC video compression standard.
- Viewers can currently access 27 pay and 5 free-to-air DTT services in Vilnius. It is not known if the same pay-DTT offer will be made in other areas.
- Analogue switch-off is to begin in 2012.

2. Market overview

- 1.3 million television households of which 56% rely on the terrestrial platform for television.
- Cable is the second most popular television platform but currently suffers from a lack of industry consolidation and high taxes.
- Viasat offers satellite services, but uptake has been minimal. In addition, IPTV services have been launched in 2006 by the leading telecom operator TEO LT.

Broadcasters on the terrestrial platform

On the terrestrial platform, viewers can access 4 national channels in addition to many regional and local services. Some broadcasters, such as Tango TV and TV 1, have a terrestrial coverage of less than 50% of all households. The second channel offered by the public service broadcaster, LTV2, is only available in large cities.

<table>
<thead>
<tr>
<th>National analogue platform</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Channels</strong></td>
</tr>
<tr>
<td>LTV 1</td>
</tr>
<tr>
<td>LNK</td>
</tr>
<tr>
<td>TV 3</td>
</tr>
<tr>
<td>Baltijos TV</td>
</tr>
</tbody>
</table>

Lithuanian National Radio and Television (LTV)

The public service broadcaster, Lithuanian National Radio and Television (LTV), offers viewers two services LTV1 and LTV2. However, the channel LTV2 has a limited population coverage as it was launched only in 2003. While LTV has faced much competition from commercial broadcasters, it has been able to increase its audience viewing sharing in the past year due in part to its offer of popular programming such as the 2006 FIFA World Cup and the Eurovision Song contest.

LTV is highly dependent on government funding for its financing while the remaining revenue is generated from advertisements. A proposal to introduce a viewer license fee to support LTV has been made.
Key commercial broadcasters

Three commercial broadcasters, Baltijos TV, TV 3, and LNK, dominate the terrestrial television market. All have been launched in the early 1990s and have benefited from foreign capital. However, in the past few years, ownership has reverted back to Lithuanian hands with only TV 3 still owned by a foreign group, the Modern Times Group (MTG).

Overall broadcast market share 2005

<table>
<thead>
<tr>
<th>Channel</th>
<th>Market share</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>TV3</td>
<td>25.7</td>
<td>MTG</td>
</tr>
<tr>
<td>LNK</td>
<td>24.8</td>
<td></td>
</tr>
<tr>
<td>OTHERS</td>
<td>17.2</td>
<td></td>
</tr>
<tr>
<td>LTV</td>
<td>13</td>
<td>Public Service Broadcaster</td>
</tr>
<tr>
<td>BALTIJOS TV</td>
<td>9.8</td>
<td></td>
</tr>
<tr>
<td>PIRMAS BALTIJOS KANALAS</td>
<td>4.7</td>
<td></td>
</tr>
<tr>
<td>TV1</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>TANGO TV</td>
<td>1.6</td>
<td>MTG</td>
</tr>
<tr>
<td>5 KANALAS</td>
<td>1.5</td>
<td></td>
</tr>
</tbody>
</table>

3. DTT Regulatory environment

In November 2004, the government approved the framework for the launch and roll-out of the DTT platform in Lithuania. Entitled the Model for Digital Switchover in Lithuania, it establishes what specific digital switch-over measures are to be implemented and by when.

As a next step, the government will present its plan to increase DTT service penetration in preparation for analogue switch-off by the middle of 2008.

The main government and regulatory bodies responsible for broadcasting

1. Ministry for Transport and Communications - responsible for proposing and implementing legislation in the area of electronic communications.

2. Ministry for Culture - responsible for proposing and implementing legislation in the area of media and audiovisual policy.

3. Radio and Television Commission (LRTK) - independent agency responsible for regulating and supervising the activities of commercial broadcasters. It issues broadcast licenses and ensures compliance with the license terms.

4. Communications Regulatory Authority (CRA) - independent agency responsible for managing the use of the radio frequency spectrum.
4. Current DTT status

An initial invitation to tender for DTT licenses had been issued in 2002. However, because it failed to attract interest, the government put the licensing procedure on hold.

Since 2002, however, progress has been made. A trial DTT service was launched in 2003 and offered viewers in Vilnius access to 5 services. In 2005, the CRA allocated the four available nationwide DTT multiplexes to two operators, the incumbent telecom operator TEO LT and the broadcast network operator Lithuanian Radio and TV Centre.

Each license holder has been awarded the operation for two national multiplexes each. Under the terms of the licenses, 85% of the multiplex capacity must be used for television services. It is not known how many further DTT multiplexes will be available for DVB-T services following analogue switch-off.

Alongside these developments, the LRTK allocated broadcast licenses for the DTT platform in 2005. It awarded broadcast licenses to Baltijos TV, Tele-3 and TV1 for the re-transmission of their terrestrial services on the digital platform and two slots to the public service broadcaster for the provision of its services LTV1 and LTV2. Altogether, viewers must be able to access five free-to-air DTT services, of which two are reserved for the public service broadcaster.

The license to operate pay-DTT services has been allocated to UAB Mikrovisatos TV which launched services in Vilnius in July 2006. It provides viewers access to 27 pay DTT services. These services have been launched using the MPEG-4 AVC standard.

**DTT platform in Vilnius**

<table>
<thead>
<tr>
<th>Free-to-air services</th>
<th>Pay-DTT services</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTV 1</td>
<td>LNK</td>
</tr>
<tr>
<td></td>
<td>Travel Channel</td>
</tr>
<tr>
<td>LTV 2</td>
<td>5 KANALAS</td>
</tr>
<tr>
<td></td>
<td>National Geographic Channel</td>
</tr>
<tr>
<td>TV3</td>
<td>Pūko TV</td>
</tr>
<tr>
<td></td>
<td>Tango Viasat</td>
</tr>
<tr>
<td>BTV</td>
<td>RTR Planeta</td>
</tr>
<tr>
<td></td>
<td>Fashion TV</td>
</tr>
<tr>
<td>TV1</td>
<td>Pirmasis Baltijos Kanalas</td>
</tr>
<tr>
<td></td>
<td>ESPN Classic Sport</td>
</tr>
<tr>
<td>NTV Mir</td>
<td>JETIX</td>
</tr>
<tr>
<td>TV5 Europe</td>
<td>MTV Baltic LT</td>
</tr>
<tr>
<td>TVP Polonia</td>
<td>Pirmasis Baltijos Muzikinis Kanalas</td>
</tr>
<tr>
<td>Tele 5</td>
<td>Pirmasis Muzikinis Kanales</td>
</tr>
<tr>
<td>Pro 7</td>
<td>TV XXXI</td>
</tr>
<tr>
<td>Deutsche Welle</td>
<td>Hallmark</td>
</tr>
<tr>
<td>Arirang</td>
<td>BBC</td>
</tr>
<tr>
<td>Animal Planet</td>
<td>CNBS</td>
</tr>
<tr>
<td>Discovery Channel</td>
<td></td>
</tr>
</tbody>
</table>

5. DTT coverage

The two network operators allocated multiplexes by the CRA will ensure the roll-out of DTT services in Lithuania. The Lithuanian Radio and TV Centre is the incumbent broadcast network operator while TEO LT is the incumbent telecom operator with 60% of the company owned by the Scandinavian company.
As per the plan agreed with the government, DTT services have been available since July 2006 in Vilnius. As a next stage, services will be roll-out to the five largest cities in Lithuania by the end of 2007, with a 95% population coverage for at least one multiplex to be reached by 2009.

In addition, the public service broadcaster LTV is obliged to provide an equivalent DTT coverage as it currently has on the analogue terrestrial platform. This means that it must reach 98% of the population by the time digital switchover is completed.

### 6. Digital switchover plans

In its submission to the European Commission, Lithuania has stated that it will begin its analogue switch-off in 2012. Analogue switch-off will take place according to a detailed roadmap outlining the date for switch-off in each region. This roadmap has not yet been published.

At this stage, the government has only established one condition for analogue switch-off: 90% of homes that rely on the terrestrial analogue platform must have converted to DTT services.

Plans as to how to use broadcast frequencies following analogue switch-off have not been announced although the government has noted that the launch of DTT services should use technologies that will facilitate the introduction of HDTV services.
Poland

1. Key highlights

- DTT pilots are operating in the cities of Krosno, Rajcza, Warsaw, Wisla, and Wroclaw.
- A government appointed commission has put together a digital switchover plan which has received the support of the broadcast industry.
- The public service broadcaster, TVP, and the key commercial broadcasters have agreed to use the MPEG-4 AVC video compression standard. However, regulators may wish to adopt MPEG-2 for a free-to-air DTT platform.
- Analogue switch-off is expected to be completed by December 2014.

2. Market overview

- 12.7 million television households of which 46% rely on the terrestrial platform for their primary television reception.
- Cable is the second most popular television platform, accounting for over one-third of television households while satellite is watched in approximately one-fifth of homes.
- The largest cable operator is UPC Telwizja Kablowa while Cyfra+ and Polsat Cyfrowy offer digital satellite services. A new satellite platform, Telewizja N, was launched in 2006 and offers several HD channels.

Broadcasters on the terrestrial platform

On the terrestrial platform, viewers can access 7 national channels, although not all broadcasters have complete national coverage. With the availability of digital cable and satellite services, Poland has one of the most vibrant digital television markets in eastern Europe.

**Telewizja Polska (TVP)**

The public service broadcaster, (TVP), offers viewers two national channels TVP 1 and TVP 2 as well as one regional channel TVP 3 Regionalna. Its two channels, TVP 1 and TVP 2, have the highest audience share in Poland.

TVP is able to generate revenue from a viewer license fee, which is one of the highest in Europe based on percentage of income, plus advertisements. Because of the popularity of TVP channels, the public service broadcaster is able to take a large share of the overall advertising market.

**Key commercial broadcasters**

Four commercial broadcasters, Polsat, TVN, TV4 and TV Puls, are available to viewers on the terrestrial television market. However, not all broadcasters are able to provide full population coverage.
Terrestrial analogue platform

<table>
<thead>
<tr>
<th>Channel</th>
<th>Analogue coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>TVP 1</td>
<td>99.6%</td>
</tr>
<tr>
<td>TVP 2</td>
<td>99.1%</td>
</tr>
<tr>
<td>TVP 3</td>
<td>82.1%</td>
</tr>
<tr>
<td>Polsat</td>
<td>85.0%</td>
</tr>
<tr>
<td>TVN</td>
<td>42.5%</td>
</tr>
<tr>
<td>TV4</td>
<td>18.8%</td>
</tr>
<tr>
<td>TV Puls</td>
<td>15.9%</td>
</tr>
</tbody>
</table>

The commercial environment is dominated by the competition between two largest commercial broadcasters, Polsat and TVN. Both TV Puls and TV4 are part of the Polsat group.

However, in April 2005, Polsat and TVN agreed to form the DTT consortium Polski Operator Telewizyjny (POT). It aims to launch DTT services using the MPEG-4 AVC video compression standard. The public service broadcaster, TVP, decided against joining this consortium.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Market share</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>TVP1</td>
<td>25.4%</td>
<td>PSB</td>
</tr>
<tr>
<td>TVP2</td>
<td>20.8%</td>
<td>PSB</td>
</tr>
<tr>
<td>Polsat</td>
<td>15.9%</td>
<td>Springer</td>
</tr>
<tr>
<td>TVN</td>
<td>15.1%</td>
<td>(former CME)</td>
</tr>
<tr>
<td>TVP3 Regionalna</td>
<td>5.17%</td>
<td></td>
</tr>
<tr>
<td>TV4</td>
<td>2.1%</td>
<td></td>
</tr>
<tr>
<td>TVN24</td>
<td>1.7%</td>
<td></td>
</tr>
<tr>
<td>TVN Siedem</td>
<td>1.1%</td>
<td></td>
</tr>
</tbody>
</table>

3. DTT Regulatory environment

The launch of DTT services has been hampered by political and regulatory issues. While the broadcast industry has agreed upon the conditions for a DTT launch, the necessary legislative framework has not been put in place to allow for an official launch of services.

The regulatory regime has also faced difficulty following the controversy caused by the appointment of the head of the newly created Office of Electronic Communications (UKE). The political independence of the new agency was questioned following its close links to the government.

More encouraging, the government adopted the Broadcast Switchover Strategy for Terrestrial Television in May 2005. The plan, produced by a government commission appointed by the Prime Minister, provides the roadmap for digital switchover. However, this plan will need to be updated.
The main government and regulatory bodies responsible for broadcasting

1. **Ministry for Transportation and Construction** - responsible for proposing and implementing legislation in the area of electronic communications.

2. **National Broadcasting Council (KRRiT)** - regulatory agency responsible for allocating broadcast licenses and monitoring compliance with license conditions.

3. **Office of Electronic Communications (UKE)** - regulatory agency established in January 2006 with the responsibility for managing frequencies. It replaces the Office of Telecommunication and Post Regulation (URTiP) and takes on some of the responsibilities previously held by the KRRiT.

4. **Polskie Forum DVB** - established in May 1997, it provides guidance on the key issues affecting DTT roll-out (broadcast requirements, technical and regulatory issues). Its 36 members include broadcasters, network operators, regulators, manufacturers and researchers.

### 4. Current DTT status

DTT trials are available in the cities of Krosno, Warsaw and Wroclaw as part of a multi-frequency network (MFN) and in the cities of Rajcza and Wisla as a single frequency network (SFN). These trials are technical and aim to access coverage, interference and quality of reception as well as demonstrate interactive television services.

The trial in the south eastern part of the country (Silesia and the Podkarpacie region) has been launched in order to enhance the quality of coverage for TVP 3 Regionalna. These trials, operated by the public service broadcaster, use the MPEG-2 standard.

#### Trial DTT multiplex broadcast from Krosno
- TVP 1
- TVP 2
- TVP 3 Rzeszow
- Radio Rzeszow

#### Trial DTT multiplex broadcast from Warsaw
- TVP 1
- TVP 2
- TVP 3 Warszawa
- Polskie Radio Program 1
- Polskie Radio Program 2
- Polskie Radio Trojka
- Radio RAM

It is not known when it will be possible to launch DTT services. As a first step, the KRRiT will need to allocate DTT licenses for the two available nationwide multiplexes which could happen in early 2007.

The business model to be adopted has not yet been announced. However, it is expected that two multiplexes will offer free-to-air DTT services while further multiplexes may offer pay-DTT services. The channels on the analogue terrestrial platform will likely be simulcast on the DTT platform.

A decision still needs to be made whether the DTT platform will use the MPEG-2 standard, the MPEG-4 AVC standard or a combination of the two standards. While broadcasters favour the use of the MPEG-4 AVC standard, the government has not yet confirmed which video compression standard will be used. It may decide to use the MPEG-2 standard for all free-to-air DTT services.
5. DTT coverage

TP EmiTel is the incumbent network operator in Poland. It is part of the Polish telecom group, TP, which is, in turn, owned by France Télécom. Other broadcast network operators exist, however, they hold a very small share of the market.

It is estimated that one multiplex will provide DTT services to 94% of the population while the second multiplex will have 92% population coverage.

6. Digital switchover plans

Initial plans had called for digital switchover to take place across 10 regions, corresponding to the borders of the Polish administrative units, the voivodeship, with a projected 12 month simulcast period. However, the national switchover strategy is expected to be updated and changes are expected.

However, the process is expected to be completed by December 2014, as elaborated in the government’s Broadcast Switchover Strategy for Terrestrial Television document.

Already, the government has set two key conditions for analogue switch-off:

- 95% of the population is able to access DTT services
- 90% of the population is able to afford the necessary equipment

However, it has not elaborated its plans for promoting DTT services or providing set-top boxes to low income households.

Post-ASO plans

Following analogue switch-off, the government plans to make 7 multiplexes available for DTT services. However, it may be possible to provide 8 nationwide DVB-T layers, under the terms of the Geneva 2006 Agreement.

The provision of DVB-H services is also being considered. Already, the network operator TP EmiTel has completed a DVB-H technical trial in Warsaw in 2006.
Slovenia

1. Highlights

- Public service broadcaster RTV Slovenia is expected to launch its DTT services in early 2007. The full DTT platform (with public and commercial services) is not expected to be launched before 2008.
- The fully launched DTT platform will consist of a mixture of free-to-air and pay services using the MPEG-4 AVC video compression standard.
- Between 2-3 multiplexes will be available for DTT services. Further multiplexes may be launched after analogue switch-off, depending on the success of the service offering.
- A DTT trial has been running since 2001, although it only offers promotional programmes.
- The government has announced that analogue switch-off will be completed by 2012.

2. Market overview and current situation

- There are 680,000 households in Slovenia, of which 34% rely on the terrestrial platform for their primary television reception.
- Cable is the most important television reception platform accounting for more than half of primary television reception.
- Six nationwide channels with over 70% coverage are available on the analogue terrestrial platform - three from the public service broadcaster RTV Slovenia (SLO 1, SLO 2, SLO regional) and three commercial channels (POP TV, Kanal A and TV3). Numerous local services are also available.
- RTV Slovenia channels continue to attract a strong audience share with its two main channels.

The Slovenian television market is dominated by two television platforms - cable and terrestrial with satellite and IPTV making up around 5% of television reception. With the capacity to offer viewers access to over 60 television services, cable is proving to be a strong draw and the terrestrial platform will need to offer viewers new services in order to maintain its position as the primary platform in 40% of homes.

POP TV is the most watched commercial channel. Together with its sister channel, Kanal A, they comprised 69% of the total advertising market share in 2005. However, the public service broadcaster RTV Slovenia continues to maintain a strong audience share with RTV 1 and RTV 2.

Satellite services are provided by RTV Slovenia, offering SLO1, SLO2, TV KP, a regional program for Italian minority, and its Parliament service, while two IPTV services have been launched - SiOL (owned by Telekom Slovenije) and T-2 (owned by Zvon Ena Holding). Penetration of IPTV and satellite services are quite low.

Commercial broadcasters have shown a limited interest in the DTT platform. Rather, it has been the public service broadcaster, RTV Slovenia, which has been a strong supporter. While RTV Slovenia is expected to launch its DTT services in early 2007, commercial broadcasters are waiting for the necessary legislation to be put in place before they can tender for DTT licenses and launch services.

It is expected that the government will approve legislation in 2007 adopting a pay-DTT business model using the MPEG-4 AVC video compression standard. The DTT platform hopes to serve as a direct competitor to the existing cable platform.
3. Government policy and regulatory environment

<table>
<thead>
<tr>
<th>The main government and regulatory bodies responsible for broadcasting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Ministry of the Economy</strong> - responsible for proposing and implementing legislation in the area of electronic communications.</td>
</tr>
<tr>
<td>2. <strong>Ministry for Culture</strong> - responsible for proposing and implementing legislation in the area of media and audiovisual policy.</td>
</tr>
<tr>
<td>3. <strong>Post and Electronic Communications Agency (APEK)</strong> - independent regulatory agency responsible for managing the use of the radio frequency spectrum. It also allocates broadcasting licenses based on the binding instructions from the Broadcasting Council. The director is selected by the Government for a five-year mandate.</td>
</tr>
<tr>
<td>4. <strong>Broadcasting Council (SRDF)</strong> - an independent expert body responsible for monitoring compliance with broadcasting license conditions and selecting broadcasters to be allocated broadcast licenses by APEK. Its seven members are appointed by the National Assembly.</td>
</tr>
<tr>
<td>5. <strong>Digital Forum</strong> - working group established to provide recommendations for the launch of digital broadcasting services (DAB and DVB-T). Members include government regulators, broadcasters and manufacturers.</td>
</tr>
</tbody>
</table>

**Current legislation**

The broadcast environment in Slovenia is regulated by the Mass Media Act of 2001 for commercial broadcasters and the Law on RTV Slovenia for the public service broadcaster. The Law on Electronic Communications, adopted in 2004, provides APEK with its current mandate for determining the use of the radio frequency spectrum, including broadcast usage. While current legislation is not sufficient to allow for the launch of commercial DTT services, RTV Slovenia is already authorised to do so.

RTV Slovenia plans to launch its DTT services in early 2007. Services to be launched include RTV 1, RTV 2, RTV regional (2 separate services) and a new service with the retransmission of the Parliamentary sessions. Several radio services will also be available.

**Proposed DTT legislation**

It is expected that the necessary legislation to allow for the full launch of the DTT platform will be agreed by the government in the middle of 2007. Based on the frequencies made available by APEK, the Broadcasting Council will be able to recommend which broadcasters are able to offer DTT services.

Two nationwide multiplexes will be launched with the possibility for a third multiplex with limited coverage. Based on the recommendation from the Digital Forum, the government is expected to endorse the use of the MPEG-4 AVC standard.

While precise details have not yet been confirmed, it is expected that 20-30 services will be available. This will include the simulcast of existing analogue channels on the free-to-air platform and extensive new national and international content on the pay platform.

Following the adoption of the necessary DTT legislation, the government will need to invite broadcasters to tender for the available DTT licenses. This process is expected to take approximately 1 year. This process will be followed by the roll-out of the DTT network which is expected to take an additional year. It is for this reason that it is unlikely that the full DTT platform, offering the services of public and commercial broadcasters, can be launched before 2008.
Expected market for DTT set-top boxes

Although DTT services have been trialled since 2001, the use of promotional material has not encouraged viewers to purchase DTT receivers. Any DTT receivers in Slovenia have been purchased in the border regions to access DTT services in Italy and Croatia. However, because these receivers have MPEG-2 tuners, they will not be able to receive Slovenian DTT services using MPEG-4 AVC.

The decision to use the MPEG-4 AVC standard may initially slow down penetration as the cost of the DTT receiver may be considered excessively high by consumers. In the long term, however, the cost of an MPEG-4 AVC receiver will decrease to a more affordable price point for a majority of consumers.

It is likely that MPEG-4 AVC set-top boxes will be sold, or rented, to subscribers to the pay DTT platform using a vertical market approach. However, an open market will also exist for free-to-air DTT services.

Financing digital switchover

At this stage, the government has not confirmed plans to make funding available for digital switchover. However, in its submission to the European Commission on its plans for digital switch-over, the government recognised that some funding for DTT services will be necessary. It outlined the following possible forms of support it may consider for digital switchover, in accordance with EC regulations:

- Investment in transmission networks in areas of poor coverage and of less commercial interest to investors (rural and low population density areas),
- Financial compensation to RTV Slovenia for the cost of ensuring that broadcast services are made available to the entire population (high coverage requirements),
- Subsidies to viewers towards the purchase of digital receivers, regardless of the digital platform, but on condition that they encourage the use of open standards for interactivity,
- Financial compensation to broadcasters that have to switch-off analogue services prior to the expiration of their licenses.

Given that the government recognises the importance of making viewers aware of digital switchover, it is likely that the government will also fund information campaigns. The government has also recognised that it may also need to fund set-top boxes for low-income households.

As part of its digitalisation effort, Slovenia could be a recipient for funding from the European Union.

Digital switch-over

In conformity with the recommendation made by the European Commission, the government has confirmed that analogue switch-off will be completed by 2012. However, the planning to meet such a deadline has not been put into place.

It is expected that following the launch of DTT services on a national level, analogue switch-off will take place regionally. The length of the simulcast period will depend on the penetration of DTT services and the speed at which the network can be rolled out.

In a tentative framework for digital switchover, the government has divided the country into three regions and several special units:

- Western region (special units of Nova Gorica and Koper)
- Central region (special unit of the capital city Ljubljana)
- Eastern region
This framework will likely determine how analogue switch-off will proceed, although dates have yet to be announced.

4. Transmission network

Only one transmission network is available in Slovenia and it is operated by RTV Slovenia’s Transmission division. Because it also transmits the analogue channels of the three commercial broadcasters, in addition to its own channels, RTV Slovenia has been able to generate revenue from its network.

Network infrastructure

The current transmission network is made up of 225 transmission sites.

RTV Slovenia estimates that the roll-out of the DTT network will cost approximately €10 million. This includes the cost of purchasing new equipment and necessary constructions at existing transmission sites.

At this stage, RTV Slovenia has not received any special funding for the launch and roll-out of DTT services. Rather, it has relied on revenue generated from its network operation to fund the transmission network upgrade.

Coverage

The current analogue platform provides 97% of the population with access to the two main channels offered by RTV Slovenia. The coverage of the three commercial channels, however, is limited to 75% of the population. Because DTT services will allow commercial broadcasters to increase their current population coverage, it provides an incentive to support the launch of DTT services.

The public service broadcaster is mandated by law to provide its DTT services to 90% of the population. However, this may be increased to ensure a full population coverage.

In a first phase, DTT services will be rolled-out to 50% of the population. This will be increased to 75% in a second phase and until full coverage is attained. While the first multiplex, containing the services of the public service broadcaster, is expected to have over 90% coverage, the second multiplex may only have a population coverage of 80%. This will be increased following analogue switch-off.

Broadcast services post-ASO


Mobile telecom operators have expressed an interest in the provision of DVB-H services and planning for a trial is underway.

At this stage, no plans for the launch of HDTV services have been made.

5. Broadcasters

Four broadcasters provide services on the national analogue terrestrial platform in addition to over 30 local broadcasters offering regional services. While national commercial broadcasters will be able to simulcast their channel on the DTT platform, the status for local broadcasters has not yet been confirmed. Although discussions are underway to launch a multiplex with regional content, local broadcasters will be reluctant to give up their analogue frequencies without a guaranteed slot on the digital platform.
**RTV Slovenia**

The public service broadcaster has been a strong supporter of the launch of DTT services. It has been trialling services since 2001 and has pressed the government to launch DTT services. Current legislation already allows RTV Slovenia to begin DTT transmissions. In fact, it is required to provide the digital transmission of all of its television programme services to the entire territory.

Its delay in launching services is due to the recent decision to use the MPEG-4 AVC standard since the initial digital equipment purchased needs to be upgraded by the manufacturer. Upon reception of the upgraded equipment, RTV Slovenia plans to launch its DTT services. RTV Slovenia will offer viewers the simulcast of its three analogue channels, SLO 1, SLO 2, and RTV-SLO regional services, as well as a new RTV Parliamentary service.

The public service broadcaster generates its revenue from advertisement, viewer license fees and its transmission network. However, it has faced financial difficulties in recent years and, without means to generate additional revenue, it will be difficult for RTV Slovenia to launch new DTT services, such as HDTV or increased content choice.

Advertising revenue had decreased following the adoption of the Mass Media Act in 2001 since it places advertisement restrictions on the public service broadcaster, including less airtime for advertisements and prohibitions against infomercials during the prime time viewing hours.

The viewer television license fee has not been increased since 2004 and is not expected to increase in the near future. In addition, the roll-out of the DTT network will be a cost burden for RTV Slovenia.

**Incumbent commercial broadcasters**

Given the relatively low population coverage of the commercial analogue channels, existing broadcasters have an interest in launching DTT services as this will allow for a wider population coverage. However, the launch of DTT services will also entail more competition from new broadcasters entering the terrestrial platform.

In order to secure a financially viable situation, commercial broadcasters will want to charge viewers to access their new services. It is for this reason that the role of a pay-DTT platform operator has appeal.

At this stage, no commercial broadcaster has undertaken any significant DTT trials.

**POP TV**

Launched in 1995, POP TV is currently the most popular channel in Slovenia. It offers a variety of content, from international films and sitcoms to national news and current events magazines. It is owned by PRO PLUS which is in turn owned by the media conglomerate Central European Media Enterprise (CME). It had a daily audience share average of 27% in 2005.

**Kanal A**

Kanal A was the first commercial broadcaster on the terrestrial platform when it launched its services in 1991. A generalist channel, it offers viewers a variety of local and foreign produced content. Like POP TV, it is owned by the CME production house PRO PLUS. It had a daily audience share average of approximately 9% in 2005 which makes it the fourth watched channel on the national analogue platform.

**TV 3**

TV 3 launched in 1995 with the support of the Roman Catholic Church. However, its religious content did not prove popular with audiences and in 2003, the Croatian businessman Ivan Cáleta bought and
renamed the channel Prva TV. Since July 2006, the channel has been owned by the Modern Times Group (MTG) which reverted back to the original TV 3 name. It currently has the smallest audience share of all broadcasters on the terrestrial platform, although this situation may change given the backing of MTG.

6. Assessment

The launch of DTT services will be welcomed by the public service broadcaster RTV Slovenia which has been a strong driver for the launch. Not only has it undertaken trials since 2001, but it has made new content available for the platform.

The launch of DTT services provides RTV Slovenia with new opportunities. While it will initially need to share the capacity on its multiplex with other broadcasters during the transition period, the public service broadcaster will eventually have the opportunity to offer new services such as HDTV, more content and interactivity. The decision to use the MPEG-4 AVC standard makes the provision of new services all the more possible. However, much will depend on the future financial capabilities of RTV Slovenia.

Commercial broadcasters have shown much more reluctance towards the launch of DTT services and have only recently shown some enthusiasm following the agreement on a financially viable business model. Yet the decision to launch a pay-DTT service may limit DTT penetration. Depending on the pricing package offered, it is likely that only affluent viewers will benefit from the DTT offer. This means that the DTT platform will directly compete with the cable platform for affluent viewers.

In addition, the use of the MPEG-4 AVC standard could further impede penetration as it will limit the number of households that are initially able to afford DTT receivers. Viewers unable to take on a pay-DTT subscription may balk at purchasing an expensive DTT receiver, especially if new content is not made available. However, it can be expected that the price of MPEG-4 AVC receivers will reduce to a comparable price point as MPEG-2 receivers in the next few years.

A low DTT penetration will have a negative impact on analogue switch-off and hinder government plans to reach a targeted 2012 switch-off date. Already, plans to reach a sufficient penetration level are compromised by the relatively late launch of DTT services that will only provide Slovenia with 4-5 years to complete digital switch-over. Such a short simulcast period in a country with a relatively high dependency on the terrestrial platform may not prove to be sufficient without government support measures.
Other countries

1. Albania

Viewers can access four channels on the analogue terrestrial platform, the public service broadcaster’s TV Shqiptar 1 and Shqiptar 2, and the commercial channels Klan TV and Telearberia. The broadcasters for these channels are majority Albanian-owned given the limited amount of foreign investment. Information on the audience market share of each broadcaster is not available.

The pay operator DigitAlb has made DTT services available since July 2003. It offers 27 television programme services on four multiplexes to approximately one-third of the country. However, because the necessary legislative framework is not in place, these services are considered illegal by the broadcast regulator, National Council of Radio and Television (KKRT). DigitAlb has been running the service using a temporary DTT license.

In 2004, the government published a draft strategy for digital television which recommended that analogue switch-off take place between 2016 and 2020. Yet with the adoption of the Geneva 2006 Agreement, this recommended date may need to be revised, especially in the border regions.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Audience market share</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTV</td>
<td>36.9%</td>
<td>News Corp.</td>
</tr>
<tr>
<td>Channel 1</td>
<td>18.7%</td>
<td>PSB</td>
</tr>
<tr>
<td>Nova TV</td>
<td>12.9%</td>
<td></td>
</tr>
<tr>
<td>Planeta</td>
<td>3.3%</td>
<td></td>
</tr>
<tr>
<td>Diema+</td>
<td>2.6%</td>
<td></td>
</tr>
<tr>
<td>Diema2</td>
<td>1.4%</td>
<td></td>
</tr>
<tr>
<td>Evrokom</td>
<td>1.4%</td>
<td></td>
</tr>
<tr>
<td>Skat</td>
<td>1.3%</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>21.5%</td>
<td></td>
</tr>
</tbody>
</table>

In November 2003, the broadcast regulatory body, Council for Electronic Media (CEM) adopted its Statement on Digital Terrestrial Broadcasting which calls for the roll-out of four nationwide DTT multiplexes and 12 regional multiplexes. The requirement for DTT coverage is set at 75% of the population.

Further planning for the launch of DVB-T services have been made by the Ministry of Transport and Communications as part of its planning for the Geneva 2006 Agreement. Its Draft Strategy for the Planning of Digital Terrestrial Broadcasting in the 174-230 MHz and 470-862 MHz Frequency Bands made recommendations on how analogue and digital terrestrial signals can be simulcast during the transition period. Analogue switch-off is expected to be completed by 2015.

2. Bulgaria

The number of television households in Bulgaria is estimated to be 2.7 million, of which 32% rely on the terrestrial platform for their primary television reception. Viewers can access one channel from the public service broadcaster Bulgarian National TV, Kanal 1, as well as two commercial channels, BTV and Nova Television.

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3. Croatia

The Croatian television market is dominated by the terrestrial platform with 62.5% of its 1.9 million television households relying on terrestrial platform for their primary television reception. Satellite is used in approximately one-fourth of homes while cable makes up the remaining 15% of television households.

Viewers can access four channels on the terrestrial platform, two from the public service broadcaster Hrvatska Radiotelevizija (HRT 1 and HRT 2) and two from commercial broadcasters (RTL and Nova TV). HRT has maintained a strong audience share with its first channel, HRT 1, being the most watched.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Audience market share</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRT 1</td>
<td>38.2%</td>
<td>PSB</td>
</tr>
<tr>
<td>RTL</td>
<td>24.8%</td>
<td>RTL</td>
</tr>
<tr>
<td>HRT 2</td>
<td>15.8%</td>
<td>PSB</td>
</tr>
<tr>
<td>Nova TV</td>
<td>13.5%</td>
<td>CME</td>
</tr>
<tr>
<td>Others</td>
<td>7.7%</td>
<td></td>
</tr>
</tbody>
</table>

Preparations are well underway for an official launch of DTT services in 2007. Since May 2002, a DTT trial has been running and providing viewers access to 4 television programme services on a single multiplex. Available content includes the simulcast of the analogue terrestrial platform.

Currently, 7 transmitter sites provide DVB-T services to 75% of the population. With the addition of 10 new transmitter sites, the population coverage is expected to increase to 90% of the population by early 2007. Because of the improved reception quality offered by the terrestrial platform, many households, especially along the coast, have begun purchasing DTT receivers.

Alongside the technical preparations, the Government has is expected to establish the legal framework to allow for the launch of DTT services in 2007. It has already announced that more public service programming should be made available on the DTT platform and it will likely reserve one multiplex for the public service broadcaster.

In July 2005, the Government, the Telecommunication Agency (CTA), public service and commercial broadcasters, the network operator OiV, and the University of Zagreb formed the DVB Forum to develop the strategy for the DTT roll-out and marketing. It will also provide input into the usage of DTT multiplexes and help define when analogue switch-off will take place.

4. Latvia

The television market in Latvia is dominated by the terrestrial and cable television platforms. Of the 800,000 households, approximately 42% rely on the terrestrial platform while a little less than 50% rely on the cable platform. The popularity of the cable platform is due, in part, to the availability of Russian-language services considering that approximately one-third of the Latvian population is Russian-speaking.

The terrestrial platform offers viewers access to two channels, LTV 1 and LTV 7, from the public service broadcaster Latvijas Televīzija (LTV) and two channels, LNT and TV 3, from commercial broadcasters. The four channels have a coverage of at least 89% of the population.

Viewers can also access many regional services of which TV5 Riga has the highest audience share due in part to its availability to 64% of the population.
The initial launch of the DTT platform in Latvia had been hampered by scandal. In 2003, the newly elected government overturned the DTT funding scheme where a subsidiary of the network operator, Digital Radio & Television Centre, received the government’s stake in Latvijas Mobilais Telefons (LMT). In addition, managers from the main contractor for the installation of the DTT network, Kempmayer Media, were indicted for fraud.

However, a new impetus for the launch of DTT services has emerged. In October 2006, a working group headed by the Ministry of Transport put together the Concept of Developing Terrestrial Digital Television Broadcasting in Latvia which set out a four-phased strategy for digital switch-over as follows:

- **August 2006 - December 2006**: Establish a working group headed by the Ministry of Transport and including representatives of the broadcast industry with the responsibility of implementing digital switchover.
- **January 2007 - December 2007**: Develop a technical plan for the regional launch of DTT services throughout the country and launch DTT services in the capital city Riga.
- **January 2008 - December 2009**: Continue the roll-out of DTT services and begin analogue switch-off in those areas where DTT services are already available.
- **January 2010 - December 2010**: Complete analogue switch-off

According to this strategy, analogue switch-off will be completed by 1 January 2011. However, the final date for analogue switch-off will need to be confirmed by the broadcast regulator, the National Radio and Television Council. Analogue switch-off will take place by region.

It is expected that two multiplexes will be launched offering 8 services each and using the MPEG-4 AVC video compression standard. Services will be available free-to-air and plans for a pay-DTT platform have not been announced. Coverage for at least one multiplex must reach nearly 100% of the population. At this stage, the government does not plan to make funding available for digital switchover.

Already, trial DTT services have been available in Riga since Spring 2002 and provide viewers access to LTV 1, LTV 7, LNT and TV 5 Riga as well as three radio services. It is estimated that 2000 DTT receivers have been sold to access the trial services.

### 5. Romania

There is limited progress towards DTT in Romania. Extensive trials were launched in late 2005 but they are unlikely to lead to a full launch of DTT services in the near future.
About half of Romanian television households rely on cable for their principle means of reception. Romania’s cable industry is one of the strongest in the region. In late 2005 pan-European company UPC took over of the rival cable group Astral Telecom. The country also has several digital satellite platforms, and a small, though growing, ADSL sector.

Romania’s National Audiovisual Council (CNA) allocated frequency (Channel 54) for a six-month DTT trial in Bucharest and a second frequency (Channel 59) was made available to commercial broadcasters in 2006. The CNA will select the broadcasters to participate in the test on the basis of their content and ratings.

In summer 2005, the Digitalisation Council was created to identify frequencies for a third national DTT multiplex intended for commercial broadcasters.

The government has allocated €67 million to upgrade the digital transmission network.

The Romanian transmission company Radiocomunicatii has been running two DTT pilots. Radiocomunicatii distributes TVR’s four channels (TVR1, TVR2, TVR Cultural and TVR International) while also allowing national commercial broadcasters Pro TV and Antena 1 to use transmission equipment on its sites.

### 6. Slovakia

DTT will not launch in Slovakia in the near future. Advanced trials are underway but no firm legal basis for DTT nor detailed multiplex allocation exist.
More than half of Slovak television households rely on terrestrial reception and there is a great deal of consumption of broadcast channels from the Czech Republic.

Under licenses granted in 2004, advanced DTT trials were launched last year in Bratislava by Rádiokomunikácie, a unit of Slovak Telecom (51% owned by Deutsche Telekom). A DTT multiplex with four channels was part of the trial and an additional trial was set for the Banská Bystrica-Zvolen region. The company has been involved in technical trials since 1999.

Another operator, Telecom Corporation, was authorized to run trials in Kosice-Presov.

The government approved a strategy for the implementation of DTT in 2001, but no firm legislation is yet in place. Parliament is now reviewing the draft bill on digital television and is expected to approve it in some form in 2007. At this point the Public Service Broadcaster has been relegated to a secondary role with no special rights or obligations. This bodes ill for rapid DTT development in the country. Experience has shown that a well-financed PSB, granted a full multiplex, can be the driving force of successful DTT platforms.
Conclusion

1. Challenges and new approaches

The introduction and successful operation of DTT in Eastern European countries is facing a number of challenges. The political will and industry consensus must first be established to create the legal basis for DTT providing room for viable business models. Broadcasters, transmission companies, and other industry players need to cooperate and prepare well. DTT planners are also faced with the difficult trade-off between domestic control and foreign investment.

Market conditions have changed since the major western markets launched their DTT platforms. In addition, there are a number of unique characteristics in Eastern Europe which makes replicating a successful Western DTT model simply insufficient. Still, the lessons learned from successful DTT launches, adjusted for local conditions, may be the best way forward. We have seen in the past that high-growth DTT platforms have been driven by Public Service Broadcasters, a free-to-air offer, and declining STB prices, based on a consensus of key market participants.

Many eastern countries are attempting a different and as yet unproven approach. In the western countries, the strategy has been to build a large base of DTT households on a free-to-air offer and then add pay elements once the market has been created. It seems that many Eastern countries are adopting the opposite strategy: beginning with a financially self-sustaining pay platform and then encouraging mass adoption by, presumably, extending a free-to-air offer. Pay platforms were launched in Western Europe, notably the UK and Spain, in the early years of DTT but these ventures ended in financial collapse, and, in the case of Spain, set back DTT progress by several years. Certainly, important market conditions have changed since then and the pay TV approach is being embraced by some countries, for example, Norway. Sweden’s DTT platform is skewed to pay channels and been quite successful in recent years. There is no definitive proof that DTT cannot succeed based on a pay TV model. However, success eventually will need to be defined by mass market penetration as analogue closure dates draw nearer.

In the next section we look at projections of DTT penetration just prior to ASO based on the current status of DTT launch and the intended business model.

2. DTT Growth: Will penetration levels be adequate on the eve of ASO?

The chart below represents a tentative description of DTT growth in the region under the following operational assumptions:

1. Actual launch occurs in the year indicated;

2. The DTT base model is mixed with free-to-air and pay channels available but with a free-to-air offer that exceeds the current analogue terrestrial one;

3. There is some level of government support or subsidy for broadcasters, consumer equipment and general marketing;

4. End user costs for MPEG-2 and MPEG-4 equipment are decreasing and converging;

5. Growth rates in similar countries that have already launched are predictive in countries that have not yet launched.
A great deal of uncertainty remains, however, and growth rates may change significantly. Many of the above assumptions may not hold true as the planning and decision making process continues. These assumptions may be characterized as generally optimistic. The chart indicates the number of DTT households expected in each country through 2012 with penetration shown for that year in the last column. Numbers in **bold** correspond to expected launch year.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Republic</td>
<td>350</td>
<td>525</td>
<td>790</td>
<td>1180</td>
<td>1770</td>
<td>2100</td>
<td>2300</td>
<td>62%</td>
</tr>
<tr>
<td>Estonia</td>
<td>2</td>
<td>40</td>
<td>60</td>
<td>90</td>
<td>150</td>
<td>220</td>
<td>300</td>
<td>50%</td>
</tr>
<tr>
<td>Lithuania</td>
<td>0</td>
<td>65</td>
<td>90</td>
<td>150</td>
<td>220</td>
<td>300</td>
<td>440</td>
<td>34%</td>
</tr>
<tr>
<td>Latvia</td>
<td>2</td>
<td>42</td>
<td>60</td>
<td>90</td>
<td>140</td>
<td>180</td>
<td>270</td>
<td>34%</td>
</tr>
<tr>
<td>Slovakia</td>
<td>0</td>
<td>5</td>
<td>98</td>
<td>155</td>
<td>230</td>
<td>320</td>
<td>550</td>
<td>29%</td>
</tr>
<tr>
<td>Poland</td>
<td>30</td>
<td>50</td>
<td>635</td>
<td>950</td>
<td>1430</td>
<td>2150</td>
<td>3200</td>
<td>25%</td>
</tr>
<tr>
<td>Hungary</td>
<td>1</td>
<td>10</td>
<td>160</td>
<td>240</td>
<td>380</td>
<td>600</td>
<td>900</td>
<td>24%</td>
</tr>
<tr>
<td>Slovenia</td>
<td>2</td>
<td>4</td>
<td>30</td>
<td>45</td>
<td>68</td>
<td>101</td>
<td>152</td>
<td>22%</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>108</td>
<td>162</td>
<td>250</td>
<td>370</td>
<td>14%</td>
</tr>
<tr>
<td>Romania</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>264</td>
<td>396</td>
<td>600</td>
<td>890</td>
<td>13%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>387</td>
<td>741</td>
<td>1923</td>
<td>3272</td>
<td>4946</td>
<td>6821</td>
<td>9372</td>
<td></td>
</tr>
</tbody>
</table>

*Source: EBU*

Early indications are that only the Czech Republic will have converted more than half of TV households in the next six years. Estonia, which fully launched in December 2006, is expected to have 50% of all TV households converted. Most countries will have between 20% and 40% penetration with Romania and Bulgaria lagging at 13% and 14% respectively.

Under the assumptions given above, there may be over nine million DTT households in the region by 2012 with Poland and the Czech Republic accounting for more than half of this figure.

2012 is a critical date because the market penetration of DTT at that time will guide analogue switch-over strategies leading into 2015 when the final deadline set by international treaty occurs. Those countries with poor penetration will have to consider more drastic options such as heavy subsidies or mandated digital tuners. Marketing and public awareness campaigns will require greater scale and governments may be faced with an unattractive trade-off between extending shut-off dates or leaving a significant portion of the population without the means of terrestrial reception. It will become complicated and difficult to maintain analogue transmissions along national borders beyond June 2015.

### 3. Implications

Eastern European governments and DTT planners face a variety of risks should penetration fall short:

- **Loss of control of ASO strategy.** For technical, economic and even social reasons each country develops a specific timetable and sequence for closing analogue frequencies. Where possible some countries opt for a national ASO rather than region-by-region. If this process is not completed by 2015, Eastern countries may be forced to modify these plans in order to comply with international treaties on frequency coordination.
• More bilateral agreements. Surrounding the Geneva 2006 Agreement (GE-06) were a number of unpublished bilateral agreements concerning the border areas between countries. Eastern European governments may need further negotiate bilateral agreements should their ASO dates be postponed beyond 2015.

• Abrupt ASO. If the projections in the chart above are close to the actual penetration, one option is to proceed with ASO anyway and leave a significant proportion of the population without terrestrial television services. This decision may have severe political ramifications.

• Large, unbudgeted subsidies. If governments find the previous option unpalatable, it may be necessary for them to expend large amounts on consumer equipment or other subsidies in order to quickly convert households to digital.

• Abandonment of universal terrestrial services. Perhaps the most important public policy benefit of DTT is the positive economic effect of a competing digital platform. If governments choose to have viewers adopt satellite or cable rather than digital terrestrial for a large segment of the population, this benefit will be lost.

As mentioned at the outset, it is too early in the process to fully understand how, when, and where DTT will take shape in the region. Launch planning is not finalized in many countries and even after launch it will be possible to make modifications to the implementation. However, at this point in time and under the assumptions outlined above there is a real risk of a crisis that DTT penetration levels will be far too low to meet ASO schedule and that a regional digital divide will develop.

**Beyond ASO**

Analogue closures across Europe will be taking place at the same time that many expect a mass market for HDTV, broadcasting to handhelds, and other technologies to develop. HDTV in Eastern Europe is being introduced as a high-end premium service by cable and satellite operators. Previously, DTT capacity constraints limited the potential offer compared to digital satellite and cable operators. In relative terms, this will always be the case, however, with advanced compression becoming available, the capacity required for a single television channel has declined substantially.

If HDTV becomes a market expectation, the release of spectrum after ASO and better compression will enable DTT to meet it with a multi-channel HDTV offer. In addition to HDTV broadcasters are interested in testing the market potential for television to small mobile devices using Digital Video Broadcasting on Handhelds (DVB-H). The technology can be used alongside mobile telephone technology and thus benefit from access to a telecom network and a broadcast network.

To a great extent, the capability of the DTT platforms in Eastern Europe to provide these new services will depend on the earliest possible closure of analogue frequencies. Ultimately, the market demand for these types of services may be the greatest impetus for quickly launching DTT and achieving ASO in the region.
ANNEX

1. DTT in Perspective: Market Evolution in Europe

The development of Digital Terrestrial Television (DTT) and the progress toward Analogue Switch-off (ASO) in Europe can be divided into the following phases:

The main phases of DTT development in Europe

1. 1998 to 2002 - emergence and failure of pure pay TV platforms; delays and aborted launch plans; limited, then stagnant growth.

2. 2002 to 2005 - introduction and success of primarily free-to-air platforms; important role of public broadcasters; emergence of funding controversies; high growth.

3. 2005 to 2008 - last western European countries launch; mixed models develop; new technology adopted; funding controversies resolved; growth continues but slows

4. 2008 to 2010 - mature platforms stabilize; HDTV trialed; Eastern Europe launches; the approach to analogue switch-off (ASO) refined; several countries achieve ASO; growth dependent on stimulus

5. 2010 to 2015 - all countries converted; HDTV becomes widespread; some Eastern countries may lag; mobile TV and interactive applications grow

The first phase of DTT ended in the spring of 2002 with the financial collapse of two commercial ventures in Spain and the UK, and stagnation in Sweden. These platforms attempted to compete against established cable and satellite operators with a traditional pay TV business model that included expensive film and sport content and decoder business subsidies. Without a viable alternative, delays (e.g. France) and aborted launch plans (e.g. Portugal) were characteristic of the period which ended when the UK launched a successful free-to-air platform in 2002.

Key lessons were learned from those early attempts which set the stage for a new structure and model for DTT. These lessons included: developing strong support and presence of Public Service Broadcasters (PSBs); adopting a predominantly free-to-air offering; encouraging a free and open market for consumer equipment to put downward pressure on retail prices; relying less on interactivity and other features to drive growth. Additionally, DTT strategists realized that development needed broad industry consensus and support, particularly from commercial broadcasters whose natural instincts were to try to avoid the increased content and transmission costs. Commercial players also eschewed the eventual audience fragmentation that would be the logical result of a widespread multichannel offering. Governments learned that they could encourage reluctant broadcasters and overcome other obstacles by adopting certain indirect financial support mechanisms, while at the same time maintaining a technology neutral position. Finally, some countries made contingency planning an important part of their implementation blueprints. Recent and upcoming launches have taken these lessons into account. Many of these lessons will assume even greater relevance as ASO approaches.

Europe is currently making the transition from a high-growth DTT model based on a primarily free-to-air model, and characterized by a preeminent role of Public Service Broadcasters (PSBs), fluid markets for low-priced receiving equipment, and limited neutral government intervention. In the current phase, ten countries have established platforms and within the next two years those countries not yet launched are expected to do so.
In the next phase of development all countries will have up and running platforms; growth will continue but may stall for the more mature platforms. Mixed models will develop, most still based on free-to-air content but with a variety of pay components. New technology will begin to be adopted in some markets making HDTV and broadcasting to mobile devices possible. Decisions on funding controversies are likely to be made but at this point it is unclear whether they will be favourable. Growth will be high in newly launched markets but tend to stabilize for mature platforms.

Market conditions in the final phase, during which most ASOs will likely take place, are hard to predict. Many expect that advanced coding, HDTV and broadcasting to handhelds will be characteristic of this period. For many markets additional stimulus to spur growth will be required in the final stage approaching ASO. The way in which funding controversies are resolved will determine what kind of measures can be used and to what extent adequate stimuli can be applied.

Throughout all these phases of DTT development public service broadcasters have demonstrated their commitment to DTT and they will likely provide the continuity throughout the ASO process.

Another ongoing theme will be the relationship with competing platforms which, understandably, have been dismayed by the introduction of DTT and consistently lobbied against it. Neutralizing the often vehement opposition of entrenched cable and satellite operators will continue to be a challenge for the DTT camp.

As individual countries make progress toward ASO some divergence will occur and there is a real risk of uneven development in Europe. The European Commission has been active in encouraging its member states to plan for ASO, even proposing a concrete timetable. International frequency coordination bodies have also pointed out the need for concurrent timing for digitalisation in Europe. Still, market conditions vary widely across Europe and differences in actual ASO dates may be quite substantial.
Digital Terrestrial Television in Central and Eastern Europe