

Management Summary

Satellite Communications in the Expanded European Union

New Market Opportunities in 21 States

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Summary

The report covers 21 states set to join the European Union. The 221 page, 149,000 word report contains 114 tables and charts. It is aimed at those in marketing, sales, strategic and general management, consulting, regulation and policy making.

The key conclusion of this report is that over the next decade the market for satellite communications in the region studied will grow substantially and will be centered on broadcasting.

However, developments in the region will not replicate those in Western Europe or the United States. The market will centre on DTH and DVB-T with cable as an also-ran. That contrasts with the USA where the issue is a competitive battle between DBS TV and cable (with DBS winning). DTT is a failure in the USA. In Western Europe, cable is largely uneconomic and DVB-T is seen as a freeview concept operating independently of DTH.

Satellite operators have yet to develop appropriate business models for the new paradigms opening up in the 21 countries. We believe that these need to centre on vertical integration with satellite service providers and DVB-T platform providers. Telenor and NSAB-Sirius, though, both have regional teleport operations.

As it currently stands, there are five main pay-TV DTH platforms in the region but the current players are likely to consolidate into two or three platforms. Most DTH households in the region are either pirating signals or watching only FTA channels.

However, we foresee a considerable increase in demand amongst the region's broadcasters (and those broadcasting into the region) for satellite capacity and services. This is arising from duplication of existing thematic channels using subtitling and dubbing, new channels aimed at the region and from existing terrestrial broadcastings within the region.

A key driver for satcoms in the region is the poor quality of existing terrestrial transmission networks. Not only is much of the equipment dated but also it is all-to-frequently unable to offer universal service coverage. Upgrading to DVB-T and using satcoms as a gap-filler are more attractive than heavy expenditure on analogue networks.

Indeed, we suspect that DVB-T will attract EU infrastructure funding. Typically the cost of providing a national DVB-T infrastructure in the region looks to be between US\$50 million and US\$180 million, depending on size and geography of the country involved.

Our research also indicates that the economics of DTH have now substantially shifted the balance away from cable as a multi-channel distribution system. Falling STB prices, increased STB functionality and digital compression technologies are the key drivers here. In a pay-TV DTH environment, the number of subscribers needed to break-even has fallen by two-thirds in the last few years. Moreover, new models of freesat services are beginning to emerge.

DVB-T is likely to be rapidly rolled-out in the region from 2005. Poor international frequency coordination, all too often poor management of spectrum and a plethora of local and regional terrestrial TV channels suggest that DTH will compliment the DVB-T services.

Technically DTH allows local and regional TV channels to expand out of their limited geographic coverage, provide infrastructure for SFNs, extension to areas where it is uneconomic to provide terrestrial transmitters and also cross-border services to reach ethnic minorities. The latter remain a big issue for broadcasters throughout the region.

We foresee an environment where DVB-T will provide a limited number of terrestrial services, primarily concentrating on FTA but, in some countries, with a pay-TV element. DTH will remain competitive through because of its ability to offer several hundred channels, a variety of pay-TV options and universal coverage. It also remains a method of avoiding local content regulations and political interference.

Corruption in and political interference with broadcasting remains a key problem in the region.

We foresee cable as a legacy infrastructure, unable to effectively provide digital services and unable to compete with the more sophisticated offerings of DTH, including PVR STBs, MHP, Open TV and HDTV. The triple play cable option of combined video, voice and broadband access is largely a non-starter in the region.

Related to this is the already close relationship with the region to the EU. GSM mobile telephony has been a massive success in the region to the extent that fixed line telephony is now shrinking (in terms of number of

lines in use) in many countries there. That makes it all the more imperative for PTOs to offer DSL. Most countries have now opened up their local loop infrastructure to alternative DSL providers (a requirement of EU membership).

The growth of GSM to be the largest telephony sector, falling number of fixed lines in use and, overall, low levels of fixed penetration suggests DTH (and DVB-T) platform providers need to consider alternatives to fixed line for interactive services and so on. 3G roll-out (if it ever occurs) is some years behind that of Western Europe.

Many of the cable networks in the region are low capacity, low grade networks and need extensive modernization to offer broadband and digital broadcast services. Low subscriber rates and a tendency towards rate regulation mean that they do not have the cash flow or access to capital needed to upgrade.

Foreign Direct Investment (FDI) is no longer a serious option given the bankruptcy of such MSOs as UPC or the financial difficulties of parent companies faced with other problems in the TMT sector (Vivendi). We have to say, though, that the Western Balkans is attracting some FDI into cable.

In theory cable could attract EU regional infrastructure funding; we suspect not though given the widespread failure of or lack of enthusiasm for cable in Western Europe. It is perceived as yesterday's idea.

The satellite service provider sector serving the region is a mixture of locally-based operations and teleports transmitting from Western and Northern Europe into the region. This partly reflects regulatory issues but also the now massive broadcasting base in the UK and effective marketing by such companies as Globecast.

Generally, the regions' satellite service providers have small operations but with limited or no vertical integration covering such activities as programme production, tape play-out, local or long distance fibre, sweat-heart deals with satellite operators and encryption and conditional access.

The investment of satellite service providers (including PTOs and broadcasters) in the region, in total, is under half that of the UK. The report details this in some depth.

Many service providers concentrate on data and VSAT services or SNG. Broadcasters have frequently resorted to operating their own uplink facilities and thus lack economies of scale.

Again, we believe that the teleport operators may wish to look at options for serving the DVB-T sector.

Our research also indicates that in a number of sectors, use of satellites in the region is declining. Trunk international telephony largely switched to fibre, leaving satellites as little more than cable restoration options.

Likewise, for the most part, the region has now abandoned using satellites to connect ISPs to backbone. Only in the Balkans does this remain a significant market. The trend, though, does not rule out the region serving ISPs in the CIS states with IP satellite links.

In much of the region, the VSAT sector is now mature with very few new big networks going in. Much of the VSAT sector now consists of extensions to existing networks or small orders serving, for example, embassies.

We suggest that this is part of a long-term structural change in the nature of the VSAT markets in the region. EU Acquis means that most countries have now opened up their PTT operations to terrestrial competition and there has been considerable investment by the now mostly privatised PTOs. International fibre links are now universally available.

Nevertheless, the VSAT market is now largely liberalised. Turkey completed its liberalisation recently.

There is no significant market at present for two-way broadband access. It is not a viable consumer proposition (because of low disposable incomes) and the take-up amongst the SME sector looks minimal. We found it too small to measure. Our best guess is around 2,500-5,000 units installed. Our research indicates that only a handful of the 1,187 ISPs in the region are offering broadband access via satellite. It simply is not widely been pushed in the region.

There is some limited evidence to suggest that satellite-based broadband (and VSAT services) are attractive in the Balkans and Turkey as backup against earthquakes (a big problem for Turkey as relatively recent experience has shown).

In general, though, we believe that a significant market for satellite-based broadband access will occur only when the next generation of US projects (Spaceway, Wildblue, etc.) prove themselves. It is by no means certain that they will do so.

It would be unrealistic to expect that a US model of combined DTH/broadband access could be applied successfully in the region. GDP per head averages only a tenth of that of the USA. Moreover, the two main US DBS operators have yet to detail their new business models for such services, let alone begin to roll them out.

As the market for broadcasting in the region expands (there is still room for new terrestrial commercial analogue channels let alone numerous new satellite and DVB-T services), there will be increasing demand for backhaul and distribution of channels originating in the region to Western Europe, North America and the Asia-Pacific region.

Clearly the region's public service broadcasters have been active in doing so for years but a growing number of commercial broadcasters are doing so – a surprising number from Serbia included. The region has a large Diaspora which will increase as the countries involved become EU members.

Sample Table: Serbian TV Channels on Satellite

<i>Channel</i>	<i>Satellite</i>	<i>Comments</i>
Anem	Eutelsat W2 at 16° East	<i>DMV (1)</i>
B92	Eutelsat W2 at 16° East	<i>DMV (1)</i>
BK-TV Sat	Atlantic Bird 2 at 8° West	<i>Conax/Nagravision</i>
BK-TV Sat	Eurasiasat 1 at 42° East	<i>FTA</i>
BK-TV Sat	Hot Bird 3 at 13° West	<i>FTA</i>
BK-TV Sat	PanAmSat 8 at 166° East	<i>MDS, uplinked by Tarbs, Australia</i>
BK-TV Sat	Telstar 5 at 97° West	<i>Nagravision, uplinked by Globecast NA</i>
BK-TV Sat	Thaicom 3 at 78.5° East	<i>(2) MDS, uplinked by Unitel Hellas, Greece</i>
Pink Extra	Atlantic Bird 3 at 5° West	<i>Irdeto 2</i>
Pink Extra	Hot Bird 4 at 13° East	<i>Irdeto 2, uplinked by Globecast Paris</i>
Pink Plus	Atlantic Bird 3 at 5° West	<i>Irdeto 2, backhaul to Globecast Paris</i>
Pink Plus	Galaxy 10R	<i>FTA, uplinked through PanAmSat Napa Valley, May not be fully operational (3)</i>
Pink Plus	Hot Bird 4 at 13° East	<i>Irdeto 2</i>
Pink Plus	PanAmSat 8 at 166° East	<i>MDS, uplinked by Tarbs, Australia</i>
Pink Plus	Thaicom 3 at 78.5° East	<i>(2) MDS, uplinked by Unitel Hellas, Greece</i>
Pink TV	Atlantic Bird 3 at 5° West	<i>Irdeto 2</i>
Pink TV Bosnia Herzegovina	Atlantic Bird 3 at 5° West	<i>Irdeto 2</i>
Pink TV Montenegro	Atlantic Bird 3 at 5° West	<i>Irdeto 2</i>
RTS Sat	Express 3A at 11° West	<i>FTA</i>
RTS Sat	Galaxy 10R	<i>FTA, uplinked through PanAmSat Napa Valley, May not be fully operational (3)</i>
RTS Sat	Hot Bird 3 at 13° West	<i>FTA</i>
RTS Sat	PanAmSat 8 at 166° East	<i>MDS, uplinked by Tarbs, Australia</i>
RTS Sat	Thaicom 3 at 78.5° East	<i>(2) MDS, uplinked by Unitel Hellas, Greece</i>

Moreover, the need for such services as backhaul is compounded by the large number of languages spoken in the region; it forces the main satellite TV operators such as MTV, Discovery, NBC/CNBC and so on to produce numerous different language variations (by subtitling or dubbing) of their channels. This often involves subtitling/dubbing operations in the region with a need to return the programming for tape-playout. Low labour costs in the region make such options attractive.

Use of commercial satellites for military (and associated peace-keeping and administration) traffic has been, and is expected to grow rapidly over the next decade. The wars in the Balkans generated, and continue to generate, such traffic and one might reasonably expect expanded NATO membership in the region to create further demand.

However, the prime user of civil satellites for such traffic is the US Department of Defense. It looks likely that US satellite operators will be increasingly highly favoured in awarding contracts, at the expense of European operators.

Indeed, we believe this to be a very big issue for the satellite communications sector. Perhaps it was inevitable that sooner or later after the cold war ended the United States would distance itself from NATO given that Europe's contribution was small.

However, the current US Administration looks to be indifferent towards extending free trade and keen on establishing the USA as a monopoly controller of advanced military technologies – themselves critically dependent on satellite communications.

Whilst many countries in the region are new NATO members (Turkey being a long-standing NATO bulwark), it looks to us that the denial of access to new technologies will seriously hamper the modernization and effectiveness of the armed forces in the region. Satellite communications were a major issue in the Balkans Wars of the 1990s.

Nevertheless, the region has its own military payload capability in the form of Turksat and three Ku-band transponders allocated to the Greek government on Hellas-Sat. Clearly the military satcoms capabilities of NATO countries in Western Europe (the UK, France, Italy and Spain) provide alternative platforms even though the four countries have not effectively cooperated to allow easy interoperability.

Sample of Country Statistics, Slovakia

Statistic	Value	Comments
Population	5,379,000	EU, as at end of 2001
GDP	US\$28.3 billion	OECD 2002
GDP per head	US\$5,261	OECD 2002
GDP per head at PPP	Euros 11,619	EU, for 2001
Fixed line telephony density	289 per 1,000	
Mobile Density	481 per 1,000	
Number of Fixed Telephone lines in service	1,556,254	ST, end of 2001
Number of Mobile Phone subscribers	2,588,371	Slovak Gov, end of June 2002
Number of Internet Users	1,301,000	TNS Interactive, June 2002
Total number of ISPs	25	DTT Consulting est, March 2003
Number of TV Households	1,956,000	Eutelsat, 2002
Number of DTH terminals	540,000	SES, 2002
Number of SMATV attached terminals	N/A	
Number of Cable TV Households	676,000	Eutelsat 2002
Number of Digital DTH pay-TV subscribers	8,900	UPC Direct
Number of MMDS Households	N/A	
Number of hybrid satcoms Internet terminals	200	DTT estimate
Number of 2-way satcoms Internet access terminals	Minimal	
WTO Basic Telecoms Agreement		

We also believe that the entire framework of international relations is, for better or worse (unfortunately, probably the worse), changing very rapidly. The post-war model, largely based on interdependency, is being rejected by the United States.

US foreign policy now involves replacement of multilateral trade agreements by bilateral arrangements (a seriously second rate option if you believe in free trade) and a serious weakening of the positions of both the United Nations and the WTO.

These factors have massive implications for the EU's aerospace sector and satellite operators. It is too early to even guess the full outcome but we do see considerable tensions between the EU and the USA over the next few years, including damaging trade wars. It is not a good environment for international trade or satellite communications.

However, in the long-term, the expansion of the EU provides a stronger countervailing model of international relations, based on international trade and interdependency, multilateral rather than bilateral agreements and arrangements.

We have taken a very broad look at EU expansion because it looks clear to us that whilst only ten countries have been admitted in the current round, the rest are rapidly adjusting to become EU members. In practice, all are tying themselves to the EU in much the same way as Norway and Iceland. The main satellite operators serving the Europe Union are also serving (or intend to serve) most of the 21 countries.

At best it will be years before all 21 become EU members and it is by no means certain that Turkey will be accepted. Some of the states in the Western Balkans have a long way to go before membership would be acceptable to the EU.

Nevertheless, the widespread acceptance of EU Acquis amongst all 21 countries means that even the laggards have opened up their domestic markets.

The first 10 countries will join the EU in 2004; in practice, the actual number may be 11 if Northern Cyprus is, as it appears likely, reunites with Cyprus.

The ten are Poland, the Czech Republic, Slovakia, Hungary (The Visegrad countries), Estonia, Latvia and Lithuania (the Baltic states), Slovenia, Cyprus and Malta.

Current expectations suggest that Romania and Bulgaria will join in 2007.

Turkey and Croatia have both applied for membership. The remaining countries are all in the Western Balkans and have been basically offered a deal by the EU whereby if they reform they will be offered membership. Most are probably unlikely to become full EU members before the end of the decade.

EU membership requires that each country adopt EU Acquis before then join the EU. That means that each state is opened up to competition and foreign investment, tariff barriers are removed and all EU Directives implemented. In practice it means that the countries all adopt EU law, that independent broadcasting and regulatory agencies are established, competition introduced into all forms of telecoms and that state control of broadcasting is relinquished.

There is some fudging at the margins in the form of late adoption of some of the more minor elements of Acquis. However, we do not believe that this is a significant impediment to trading in the region.

The biggest problem in reaching EU norms is corruption. Choose your partners carefully in doing business in the region. Corruption remains a problem in broadcasting. In parts of the Balkans it often remains difficult to distinguish between criminality and politics.

The report also comes at a time when we believe the satellite industry has matured. The Chapter 11 Bankruptcy of Loral Space and Communications in mid-June 2003 is probably the last major bankruptcy in the satcoms sector arising from the TMT boom of the 1990s.

This report is, in essence, about market research but we have taken a different approach from the norm. It is not a report on cable and satellite; we have largely ignored cable and concentrated on all forms of commercial satellite communications.

In practice, we believe that the medium to long term market for satellite communications in the region centres on broadcasting and the interplay between DTH and digital terrestrial television. Cable, we believe, is obsolescent and beginning to die. The report provides substantial evidence to back this statement up.

We have detailed in some great depth the underlying trends in satellite communications world-wide. The 21 countries are all users of satellite communications and will adapt to the new technological and market paradigms that are emerging following the collapse in confidence of the TMT sector from 2000.

Central to our model is that the market is now emerging from the recession as underlying demand continues to increase, capacity and expectations are realigned with more sober assessments of reality and the satcoms industry consolidates.

The report shows why there is currently space-segment overcapacity and indicates that the industry is over-optimistic in its forecasts of new satellite orders in the next couple of years. We detail and analyse in considerable depth new capacity coming on stream world-wide. This is part of a "state-of-health" assessment of the satcoms industry.

There was certainly a failure of expectations at the start of the decade but the main DTH operations are a massive success. Demand for ground equipment (mostly STBs) continues to grow both in terms of numbers installed and revenues. The number of satellite channels is growing at around 10% a year. Again, the report provides a wealth of statistics on these issues.

How Significant is the Region to Satellite Communications?

The population of the region, at 195 million, is about 52% of that of the EU. But the region is poor. GDP based on exchange rate valuation is US\$700 million, roughly about half that of France or the UK or Italy. However using PPP (purchasing power parity) measurements, the figure is somewhat higher, at US\$1.5 billion – about the same as the UK.

If all 21 countries were to join the EU today, it would nominally make the Union's economy about 8.2% larger or about 18% larger based on PPP calculations.

The problem is that GDP per head is low – at around US\$3,592. This is about the twice the norm of the Middle East and North Africa excluding the oil rich countries. The figure is somewhat higher though, based on PPP – about 34.5% of the EU average at present.

The general consensus appears to be that EU membership will lead to faster than EU average growth rates. There is certainly evidence to back this up. Most of the economies are now experiencing growth rates well about the current EU average (1% last year).

As these economies have adjusted to the new international climate in recent years and have adopted EU acquis and gained access to EU markets (and FDI), it is not surprising that they have grown rapidly. Indeed, there is plenty of evidence that poorer countries that joined the EU in the 1970s and 1980s have benefited substantially from access to EU markets as well as access to EU regional funding.

It is difficult to assess how far regional and structural funding has contributed to this. The EU has generally not monitored the impact well. In the Republic of Ireland, it appears to have generated a growth rate of around 2.5% to 3.3% a year but access to EU markets and other factors appear to have contributed most (maybe two thirds to three quarters) of economic growth rate over the last generation.

Basic Economic Details of the 21 States

Country	Population	GDP US\$ billions	GDP per head US\$	GDP per head US\$ PPP, 2001
Czech Republic	10,294,822	73.59	7,148	15,077
Slovakia	5,379,000	28.3	5,261	12,307
Hungary	10,155,000	51.9	4,918	12,996
Poland	38,625,000	176.3	4,565	9,909
Slovenia	1,995,000	18.81	9,429	17,367
Estonia	1,361,000	6.17	4,357	10,066
Latvia	2,345,800	7.58	3,230	7,045
Lithuania	3,458,200	12.9	3,729	7,106
Cyprus	625,600	9.7	15,505	20,824
Malta	385,000	3.52	9,138	17,273
Bulgaria	7,978,000	15.74	1,972	5,710
Romania	22,400,000	39.7	1,772	6,432
Croatia	4,381,000	22.8	5,204	8,091
Bosnia Herzegovina	3,900,000	7.93	2,033	5,454
Serbia	7,498,000	9.71	1,296	2,377
Montenegro	650,575	1.43	2,198	3,500
Macedonia	2,049,000	3.74	1,835	5,086
Kosovo	2,000,000	2.16	1,350	2,700
Albania	3,087,200	4.54	1,471	3,769
Northern Cyprus	137,000	.83	6,058	9,000
Turkey	66,280,000	203.1	3,111	5,960
Total or average	194,985,197	US\$700.45	US\$3,592	US\$7,874
At PPP		US\$1,535.42		

The Satellite Television Market

Our statistics show that cable is the predominant methods of receiving multi-channel television. 29% of TV households take cable TV against 17% DTH. DTH reception, mostly free to air, is thus now very widespread and we believe the economics of the industry is switching heavily in favour of DTH.

Cable expanded rapidly in the region during the 1990s, operating in a weakly regulated environment and frequently off the back of piracy of satellite-delivered TV channels. Networks, often little more than crude SMATV systems, were often developed outside of the formal economy without paying taxes and, all too often, not paying for any programming content. It is not a sustainable business model within an expanded EU, or, indeed, based on EU acquis.

Those countries that did not see a big expansion in cable in the 1990s now predominantly use DTH for multi-channel reception – they include the countries in the Western Balkans and Turkey. Falling prices of digital STBs (and increasing functionality) and the inability of most cable networks to fund upgrading to digital, is swinging the balance of power in favour of DTH. The bankruptcy of UPC, the biggest MSO in the region, is indicative of two problems facing cable:

- The triple play option of pay-TV, broadband access and fixed telephony doesn't work as a successful business model.
- Cable TV is a low price pay-TV option with a strong tendency to be rate regulated. In other words there is both consumer and political pressure to keep rates way below what is needed to modernize service offerings.

Sample Table: Swinging the Balance in Favour of DTH

<i>Key Competitive Issue</i>	<i>Impact</i>
Increasingly Powerful Satellite Compression Technologies	MPEG 2 allows 12 channels per transponder, MPEG-4 48; transmission costs fallen to 12 th of 1993 figures, maybe to a 48 th in future
1994 digital DTH STB cost approximately US\$1,000 without subsidy, now US\$250	Compares to analogue STB prices of 1993/1994. Total network infrastructure costs falling. Serious consumer proposition for CEE households
New Freeview DTH STBs less than US\$160	As cheap as analogue STBs. Quantum fall in total network infrastructure costs. Same price as basic TV set, affordable to most CEE households.
Increasing functionality of STBs – PVR/DVR, Open TV, MHP	More attractive consumer proposition, unmatched by analogue cable nets
Cable based on 1960s US technology Basic cable infrastructure – coax cables, ducting, trenches, not falling in price Cable networks still almost all analogue, many still unmanaged clear though	Lacks functionality without substantial upgrading Infrastructure costs not falling
Cable networks now increasingly regulated and regularised	Upgrading to digital unlikely – low consumer choice and low (or no) functionality of STBs. Not suited to new services such as HDTV, PPV, DVR, Open TV
Cable still dependent on linear roll-out	Increasing costs of payments for content, taxes, installation. Costly need to move from non-managed to managed networks. Non-linear roll-out of DTH services, near zero marginal cost of adding subscriber, limited up-front capital investment in infrastructure
Cable operators pay for STBs	Now affordable STBs means consumer can and does pay for STB – lower investment/capital costs for DTH providers.
Cable confined to urban areas but CEE much more rural than Western Europe (30% plus as against 10-15%) Development of DVB-T networks from 2005	DTH reception universally available throughout region but rural areas still poor. Kills demand for cable basic services, has need for SFN satellite distribution and satellite provision of universal service provision to uncovered areas.
New independent and effective regulation and licensing	Forces cable networks to operate legally, increasing costs, removes competition from unauthorized terrestrial TV stations, allows recourse under law (CME/Czech Republic example)

Sample Table: Key Issues Facing DTH in the 21 States

<i>Issue</i>	<i>Comments</i>
No culture of premium pay-TV	One nation services uneconomic except in largest countries. Need 1 million subscribers to break-even.
Small national and language markets in terms of number of TV households	DTH pay-TV platforms need to service multiple countries. Needs dubbing/sub-titling, duplication of channels.
Free-to-air DTH market predominates	Means large installed base of DTH receivers, platform providers may need to concentrate on freeview and/or low-pay-TV
Low consumer purchasing power	Needs low prices
Piracy of satellite signals by consumers	Major problem in regional; piracy culturally “acceptable”. Recourse under law difficult. Not convinced that encryption techniques robust in the long term. Many skills in the region behind hacking.
Piracy of satellite signals by cable companies	Declining as industry regularised and regulated. Recourse under law increasingly easy
Piracy of satellite signals by local broadcasters	Rampant in some regions but declining rapidly as station licensing regimes and intellectual property rights laws enforced and regulators become effective. Many forced off the air.
Widespread local TV terrestrial offerings	Terrestrial off air a major competitor in urban areas (Istanbul, etc.).
Network of relatively powerful public service broadcasters	Means strong locally produced content archives, desire of public service broadcasters to maximise number of viewers through national, regional and international satellite transmissions.
Plethora of languages and ethnic groups	Use of satellites to target them – Russian TV into the Baltics, Serbian TV into Western Baltics
Large Diasporas, may increase substantially as EU membership allows rights of residency anywhere in Union.	Satellite transmission into Western European, North American, Australian DTH bouquets. Public service broadcasting use for political purposes.
Adoption of Euro as currency (not mandatory for EU membership and not automatically allowed).	Realignment of GDP per head between exchange rate and PPP values. Fall in real costs to consumers of imported STBs and pay-TV services. Falling currency transactional costs and elimination of exchange rate risks for pay-TV operators.

Penetration of DTH pay-TV in the region remains small at present; nor would we argue that there is rapid take-up at present. Only Poland and Turkey have proved large enough to attract investment into such services. Both at the time of writing, have two pay-TV DTH platforms are we expected that mergers will result in only one in each.

The only other conventional DTH pay-TV platform is UPC Direct. This appears to have around 177,000 subscribers across the Czech Republic, Hungary and Slovakia and is clearly loss making. Its parent company is bankrupt and, by all accounts, market of the service is minimal as a result. It would be a very difficult operation to sell in the current investment climate for TMT assets. Indeed, the logic of UPC operating this service now looks flawed given that it merged its much bigger Polish service with that of Canal Plus. UPC Direct is too small and weak to be a regional force.

However, Modern Times Group appears to be developing another business model for satellite DTH in the Baltics. This is largely an extension of its Scandinavian Viasat service but MTG has considerable investments in terrestrial commercial broadcasting in the region off of which it can ride a locally targeted DTH service. Moreover, there is considerable demand in the region for Russian TV (either local TV in the Russian language or channels originating from Russia itself).

Whilst the Viasat DTH bouquet has nominally been launched in the Baltics, it looks as if MTG is playing down the service as it swaps out the Viaccess conditional access system for Videoguard. Piracy of Viaccess-based services is rampant in the region.

The fourth model that has a presence is DTH reception of pay-TV services primarily available on cable but distributed to head-ends via satellite. It has some of the feel of US C-band DTH. Such services tend to use the cheapest satellite space segment available rather than that optimized for DTH reception. Moreover, they tend to use a variety of less popular encryption and conditional access systems (PowerVu, for example) which make them less susceptible to piracy. Thus, STBs and encoders can be expensive and the number of channels available very limited, especially off of a given satellite.

Alas, we do not have precise statistics as to the number of households taking such services via DTH. The figure may be less than 100,000 and, almost certainly, considerably less than grey market or pirate reception.

There is some evidence, though, to suggest that freesat free to air bouquets are emerging in the region. SES-Astra has argued, unconvincingly, that this has happened with Astra in Poland. In the Balkans, though, Serbian commercial broadcasters are establishing such a platform to expand coverage into neighbouring Serbo-Croat speaking countries or to reach Serbia-speaking ethnic minorities. Bulgaria now has a Thor 3 bouquet offering a mixture of free to air and low pay services.

Another model for DTH is emerging from, of all places, Bosnia-Herzegovina, where the main public service broadcaster appears to be putting together a platform complete with conditional access. However, this involves EU funding and undoubtedly is part of the political process of trying to make Bosnia-Herzegovina a properly functioning state.

DTH v DVB-T

The immediate prospects for DVB-T lie in the Visegrad countries, the Baltic States, Slovenia and Turkey. Testing and legislation are in progress and commercial roll-out can be expected from 2004.

However, DVB-T in the Balkans looks to be at least half a decade away and in neither Malta nor Cyprus is there any significant progress.

We are no longer convinced that there is a pot of gold on offer to governments in released spectrum from analogue close down. The current low level of economic rent expectations can be attributed to low expectations from 3G. Moreover, the likely model for digital broadcasting in the region may emerge as a freeview/low pay-TV platform for DVB-T with an infill and multi-channel premium platform based on satellite.

Satellite Service Providers in the Region

We estimate that there are about 118 uplinking earth stations over 3.6 metres in diameter in the region, excluding military installations, VSAT hubs and two-way stations on ISP premises. The number of stations looks low; the equivalent number in the UK is 238. However, with the certain exception of Cyprus and, to a lesser degree, Turkey, none of these countries acts as a regional broadcasting node. Much of the satellite TV targeted at the region is uplinked elsewhere (UPC Direct in the Netherlands, Cyfra+ in Scandinavia and ViaSat in Sweden).

It is by no means certain that adoption of EU acquis will change this. Viasat continues to uplink some 12 channels from the UK to avoid local regulations in Scandinavia. Canal+ Cyfra uplinks through Scandinavia because broadcasters operating from Poland must be majority owned by local interests. Broadcasting is too politically sensitive for the EU to insist that all local ownership and content regulation rules be removed as a condition of EU membership. It is noted that there are severe restrictions in the USA on ownership of TV stations.

A second reason why the number of uplink stations is low is that many countries in the region only came into existence in recent years (Slovakia, the three Baltic States and all of the states that once constituted Yugoslavia). That means there is no legacy of Intelsat Standard A or large Intersputnik earth stations installed in the 1970s and 1980s for international telephony. By the time the states became independent, fibre had become a cheaper alternative for international interconnectivity, perhaps backed up by using uplink facilities in neighbouring countries.

In the remaining countries, the privatised PTTs tend to retain ownership of the major international gateway stations or specialised transmission companies that have been spun off from PTTs.

There are some exceptions to this pattern. Two satellite operators have taken the vertical integration route in investing in local teleports. They are Telenor in Hungary, Slovakia and Bulgaria and NSAB-Sirius in Latvia.

The major broadcasters in the region have frequently taken to providing their own uplinks. The public service broadcasters usually have their own EBU two-way stations but many commercial broadcasters as well also uplink their full-time mainstream services onto satellite. In a few cases they also act for other parties.

Locally owned, independent private teleports are surprisingly rare and tend to specialise in provision of IP links for ISPs and VSAT services rather than mainstream broadcasting (although many provide SNG).

In theory, at least, the provision of satellite services has now been completely liberalised throughout the region (the position is a little grey in the Balkans, though). Turkey has now fully opened up its market; hitherto Turk Telekom kept control through revenue sharing agreements.

In terms of attracting business from outside the region, only CyTA of Cyprus is a major success, acting as a turnaround point between Europe, Asia and Africa. Indeed CyTA faces competition from other teleport operators in the region because Cyprus is so well endowed with international fibre. METV, based in Cyprus, uses fibre to connect to RR Communications in Israel for uplinking onto AMOS and PanAmSat.

There is a small amount of turnaround uplinking for North African and CIS TV channels in Hungary, pointing to the possibility that Hungary may evolve as a regional broadcasting centre (see section of report on Hungary). HBO uses Hungary as the base for its premium pay-TV services in the region.

The satellite services sector is clearly under some pressure on two fronts, though. Firstly, international trunk telephony via satellite is dying in the region and much of the earth station capacity once used for this is idle or used for cable restoration. Likewise, the use of satellites for ISP links is now very limited. Such links either used local teleports or earth stations located on ISP premises.

A local response to this decline is to shift service offering to areas where fibre is not available or under costly PTT monopoly control such as the former CIS states. Dicto Citius has taken this route but we believe that unless very specialised market segments, such as oil and gas, are targeted, it is not a long term proposition.

As telecoms markets within the region open up, it is clear that a number of the independent teleport operators are shifting towards provision of terrestrially-based telecoms services. These include fibre trunking, local loop infrastructure and DSL.

What we haven't seen much of so far in the region is the development of very sophisticated vertically integrated teleport operators combing such activities as uplinking with studio production, insertion, dubbing and sub-titling, tape-playout, encryption and condition access and so on.

That in turn suggests that there is a market for teleport operators outside of the regional, say in Germany, France or the UK, targeting the broadcasting markets in the region even if they have no teleport operations there of their own. This is especially the case at the moment when the teleport industry is suffering from overcapacity and there is a general unwillingness to invest in new teleport operations.

It is an open secret in the industry that Telenor is looking to sell its satellite operations, leaving the possibility of at least three teleports in the region changing hands. However, Antenna Hungaria itself has been, on and off, up for sale for years. We would not be surprised if, sooner or later, that Eutelsat makes a teleport investment in the region. Intelsat, though, would be more surprising if it did so. Intelsat does not have a strong position in the region which, in any case, is, overall, a smallish and fragmented market.

Satellite Operators in the Region

Overwhelmingly Eutelsat is the predominant operator. Eutelsat began to establish itself early in the market, using its close relationship with CEPT members in the 1980s to establish TDMA service and broadcasting options. The close relationship between what was then largely public sector organisation was expanded in the 1990s when local public service broadcasters started using the EBU's satellite network on Eutelsat.

However a clear factor in the success has been the tenacity with which Eutelsat has cornered the small digital DTH sector notably in Poland and Turkey. Indeed, it has also, by virtue of a deft deal with Canal Plus, now completely cornered the Polish market. The Hot Bird platform accounts for 102 of the 247 Eutelsat channels explicitly serving the region.

SES-Astra does even come a distant second. It is behind Eurasiasat/Turksat and only a bit ahead of Amos (Spacecom). Indeed, SES-Astra's position is even more precarious than the statistics suggest as its major user is UPC Direct, a tiny operation whose parent company is bankrupt.

One may argue, though, that if the SES-Astra share is combined with NSAB-Sirius (seen by some as SES's prime tool in serving Central and Eastern Europe) the figure is better, at about a 12% market share. However, this still looks to be peripheral business for SES.

To give credit to the company, it has stated that it is now targeting the Visegrad countries.

The report provides substantial details of the roles of the satellite operators serving the region including those specifically dedicated to it – Turksat, Hellas-Sat and Eurasiasat.

Some Background on DTT Consulting

DTT Consulting Ltd is that Cats Pajamas of management consulting in satellite communications. Established in 1983 by Roger Stanyard, the principle author of this report, it has been at the forefront of market research on Internet via Satellite, Ka-band communications, DTH Television and Middle East satellite communications. It publishes the leading industry newsletter, Satcoms Insider, edited by Europe's foremost satellite communications journalist, Chris Forrester. Our management consulting team consists of Roger Stanyard, Chris Forrester, Peter Marshal, former head of Globecast North America, and Dr. Dermot Nolan, a leading international expert on DVB-T. Steve Roberts acts as our technical consultant. He joined the business in 1989 after over a decade of hands on experience of satellite communications.

Our areas of expertise in management consulting include digital terrestrial television, Internet and satellite communications. Our past clients have included France Telecom, BT, Comsat, BAe Systems, the BBC, BskyB, New Skies, SMS, Merlin Communications, Lloyds, Motorola, NTL, RTL, PWC, Spectrum Strategy Consulting and others too numerous to mention.

We have access to all of the leading decision takers in the industry and just about every significant satcoms business, at some time, been a customer of client of ours.

The business is headed by Roger Stanyard. After early experience in the computing industry and satellite insurance, he established the industry newsletter Interspace before expanding the business into management consulting and market research. In his time he has undertaken market research on satellite communications in every country and in the world except North Korea.

Roger holds a BSc in Economics from University College London, an MBA from the prestigious Cranfield School of Management and a Post-Graduate Diploma in Finance. His current major interest lies in the effect of changing international relations on the satellite communications marketplace.

How to order this Report

The report costs US\$1,495* (€1,495 or £899* in the UK) plus \$250* (€250/£150*) for each additional copy. It is available in print or electronic form (PDF & MS Word).

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