

## **HDTV making inroad into Asian markets...despite roadblocks**

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By Dr Ali Ebadi

HDTV has become a part of the mainstream US and Japanese TV industries, with pay-TV operators offering HD bouquets to differentiate their channel offerings. The wider Asia-Pacific region has also jumped on the bandwagon with pay-TV operators in Australia, Hong Kong, Singapore and South Korea airing HD channels and beginning to produce local HD content. The Australian government has mandated that all free-to-air broadcasters transmit at least 1,040 hours of HD programming and advertising per year; the policy calls for the broadcasting of at least 20 hours of content per week with no more than 15% of archive material counting towards the quota. In Hong Kong, incumbent terrestrial TV broadcasters Asia Television (ATV) and Television Broadcasts (TVB) are required to launch at least one HD channel with a minimum of 14 hours of weekly content. DSL pay-TV operator Pacific Century Cyber Works (PCCW) has already conducted equipment trials and launched HD channels as part of its content packages. In South Korea, public broadcaster Korean Broadcasting System (KBS) and commercial broadcasters Munhwa Broadcasting and Seoul Broadcasting System have launched various HDTV channels. Direct-to-home operator SkyLife has its own 24-hour HD channel called SkyHD. The inherent advantages of satellites beaming content immediately over wide geographical areas make it the ideal platform to distribute HD channels across markets spanning the Asia-Pacific region. Today, for example, the Measat-3 satellite beams the Voom HD channel to a growing number of pay-TV operators within a C-band footprint covering over 100 countries. But while the Asia-Pacific collectively represents a large media market with increasing TV penetration rates among households, the region faces a number of technical challenges that hinder the development of a strong commercial HD sector. For broadcasters and satellite operators, large bandwidth requirements for transmitting HD content and high costs for adopting HD platforms represent two key roadblocks hindering the growth of this important market segment. For consumers, lingering confusion over HD displays may be slowing down their take-up of HD channels. Satellite operators have traditionally distributed SD video content utilising MPEG-2 compression, which expends 4.5Mb of capacity to transmit a single channel. Using DVB-S modulation, operators can load up to 44Mb of video channels onto a single 36MHz transponder. While this prove to be cost-effective for the distribution of SD channels, the larger bandwidth requirements for HD channels make the use of this technology cost-prohibitive. To address this issue, broadcasters, satellite operators and pay-TV platforms have begun adopting the new ITU-T H.264 standard, also known as MPEG-4 part 10 or MPEG-4 Advanced Video Coding (AVC) technology. This standard offers better compression-efficiency improved coding, enhanced error robustness and increased flexibility. As a result, MPEG-4 enables two to three times higher compression than MPEG-2, and provides significant savings in video storage capacity and network

bandwidth: Lower data rates: MPEG-4 requires data rates of only 8-10Mb for a single HDTV channel compared to 15-20Mb for MPEG-2. This enables MPEG-4 to offer HD-quality content at about half the data rate of MPEG-2. n Reduced channel bandwidth: With lower data rates, MPEG-4 can encode video with approximately three times fewer bits than MPEG-2 encoders and consume less bandwidth. This enables a greater number of TV programmes to be placed in a given channel bandwidth. In addition, MPEG-4 can deliver better video quality at the same compressed bit rate, or the same video quality at a lower compressed bit rate. Satellite operators are adopting DVB-S2 modulation to complement MPEG-4 and further enhance bandwidth utilisation. The use of DVB-S2, which has about a 30%-capacity gain over DVB-S and loads in excess of 55Mb onto a single 36MHz transponder, will enable satellite operators to distribute up to five HD channels per transponder. These gains are derived from the fact that, first, DVB-S2 supports four modulation formats (QPSK, 8PSK, 16APSK and 32APSK); second, possesses superior forward error-correction coding; third, enables tighter bandwidth shaping; and fourth, uses flexible input stream adaptation to accommodate even multiple MPEG streams. Put together, MPEG-4 DVB-S2 is a technologically superior compression-modulation standard that is being gradually adopted across a variety of technologies, ranging from HDTV broadcasting and HD DVDs to mobile-TV broadcasting, Internet video streaming and video conferencing. But as any industry veteran will tell you, switching to new technologies is no easy feat. Most broadcasters have not fully realised returns from their legacy MPEG-2 platforms and find the higher cost of investing in MPEG-4 unappealing. Pay-TV operators find the higher cost of MPEG-4 decoders, which cost about two to three times of a typical MPEG-2 decoder, a bitter pill to swallow. Although technological hurdles may be overcome in the short run, there is some concern about the long-term impact of paying royalties to the Moving Pictures Expert Group (MPEG) for licensing MPEG-4 technology. To date, nobody has a clear picture on why such royalties are required, given that none were asked for the application of MPEG-2 technology, and how such royalties would be applied. So while the industry tackles the question of MPEG-4 vs MPEG-2, most consumers and households in the Asia-Pacific are still unclear on whether to purchase plasma TVs or liquid crystal display (LCD). Plasma TVs initially displayed the best picture quality on screens larger than about 42 inches while LCDs performed better with smaller screens. However, recent advancements in LCD technology have improved performance on larger screens and driven down costs — consequently, LCDs have become more marketable compared to plasma. With billions invested in new plasma TV and LCD plants churning out millions of units every year, LCDs and plasma are here to stay. The next big thing in TV is the advent of organic light-emitting diode (OLED) displays. OLED technology will enable the production of ultra-thin and flexible or transparent displays that consume low levels of power. These environmentally-friendlier TVs will be able to operate in a broader temperature range while displaying brighter images. The downside is that organic materials used in the production of OLED TVs make the lifespan shorter than plasmas. So while satellite operators resolve the question of limited capacity by adopting MPEG-4 DVB-S2 technology and develop new business models to address higher costs and possible royalties, consumers will have to make up their minds over plasma displays and LCD TVs. Nevertheless, there is a steady optimism that the Asia-Pacific market will see the entry of many new HD channels. With a little bit of luck, HDTV should soon become a key feature of the Asian TV landscape.

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